

ADM6918/X

18 port 10/100 Mbps Ethernet Switch Controller

ADM6918/X

Communications



Never stop thinking

Edition 2005-11-08

**Published by Infineon Technologies AG,
St.-Martin-Strasse 53,
81669 München, Germany**

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18 port 10/100 Mbps Ethernet Switch Controller

Revision History: 2005-11-08, Rev 1.01

Previous Version:

Page/Date	Subjects (major changes since last revision)
2003-11-25	Rev. 1.0: First release of ADM6918/X
2005-09-09	Changed to the new Infineon format
2005-09-09	Rev. 1.0 changed to Rev. 1.01
2005-11-03	Minor change. Included Green package information

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1 Product Overview

1.1 Overview

The ADM6918/X is a high performance/low cost, eighteen-port 10/100 Mbps Ethernet Switch Controller with all ports supporting 10/100 Mbps full duplex switch function. The ADM6918/X is intended for applications to stand alone the bridge for the low cost ether-switch market. The ADM6918X is the environmentally friendly “green” package version. ADM6918/X can be programmed trunking port active. The trunking port can be connected to server or stacking two switch boxes to enhance the performance.

The ADM6918/X also supports back-pressure in half duplex mode and 802.3x flow control in full duplex mode. When back-pressure is enabled, and there is no receiving buffer available for the incoming packet, the ADM6918/X will force a JAM pattern on the receiving port in half duplex mode and transmit the 802.3x packet back to receiving end in full duplex mode.

An intelligent address recognition algorithm makes ADM6918/X to recognize up to 4096 different MAC addresses and enables filtering and forwarding at full wire speed.

The ADM6918/X has embedded SRAM for the proprietary buffer management. The SRAM is used to store the incoming/outgoing packets. These buffers provide elastic storage for transferring data between low-speed and high-speed segments and buffers are efficiently allocated to improve the efficiency.

1.2 Features

- Supports sixteen 10/100M auto-detect Half/Full duplex switch ports with SS-SMII interface and two 10/100M Half/Full duplex port with RMII/MII interface
- Supports up to 4096 MAC addresses table (4-way hashing)
- Supports two queue for QOS (1:2 or 1:4 or 1:8 or 1:16)
- Supports Port-base, 802.1p and IP TOS priority
- Supports store & forward architecture and Performs forwarding and filtering at non-blocking full wire speed
- Supports buffer allocation with 256 bytes each
- Supports aging function and 802.3x flow control for full duplex and back-pressure function for half duplex operation in case buffer is full
- Supports packet length up to 1536 bytes
- Supports Congestion Flow Control
- Broadcast storm filter and Alert LED
- Port-base VLAN and adjustable VLAN to support up to 32 VLAN group
- Serial CPU interface for counter and port status output
- CPU can see-through to access PHY
- Flexible port trunking on fault tolerance and load balance
- Per port 32bits smart counter for Rx/Tx byte/packet count, error count and collision count
- Rate-limit control (64K/128K/256K/512K/1M/4M/10M/20M)
- Per port auto learning enable/disable and if disable, forward non-learned packet to CPU]
- MAC address table accessible (in each entry, reserve one bit for CPU to enable/disable aging out)
- Forward special multicast, BPDU, GMRP, GVRP and IGMP packets to CPU port
- 128 pin QFP package with 3.3 V/1.8V power supply

1.3 Package Information

Product Name	Product Type	Package	Ordering Number
Ethernet Switch Controller	ADM6918/X	P-FQFP-128-1	Q67801H 70A202 ¹⁾

1) contact Infineon for the updated ordering information

1.4 Data Lengths

- qword: 64-bits
- dword: 32-bits
- word: 16-bits
- byte: 8 bits
- nibble: 4 bits

1.5 Block Diagram

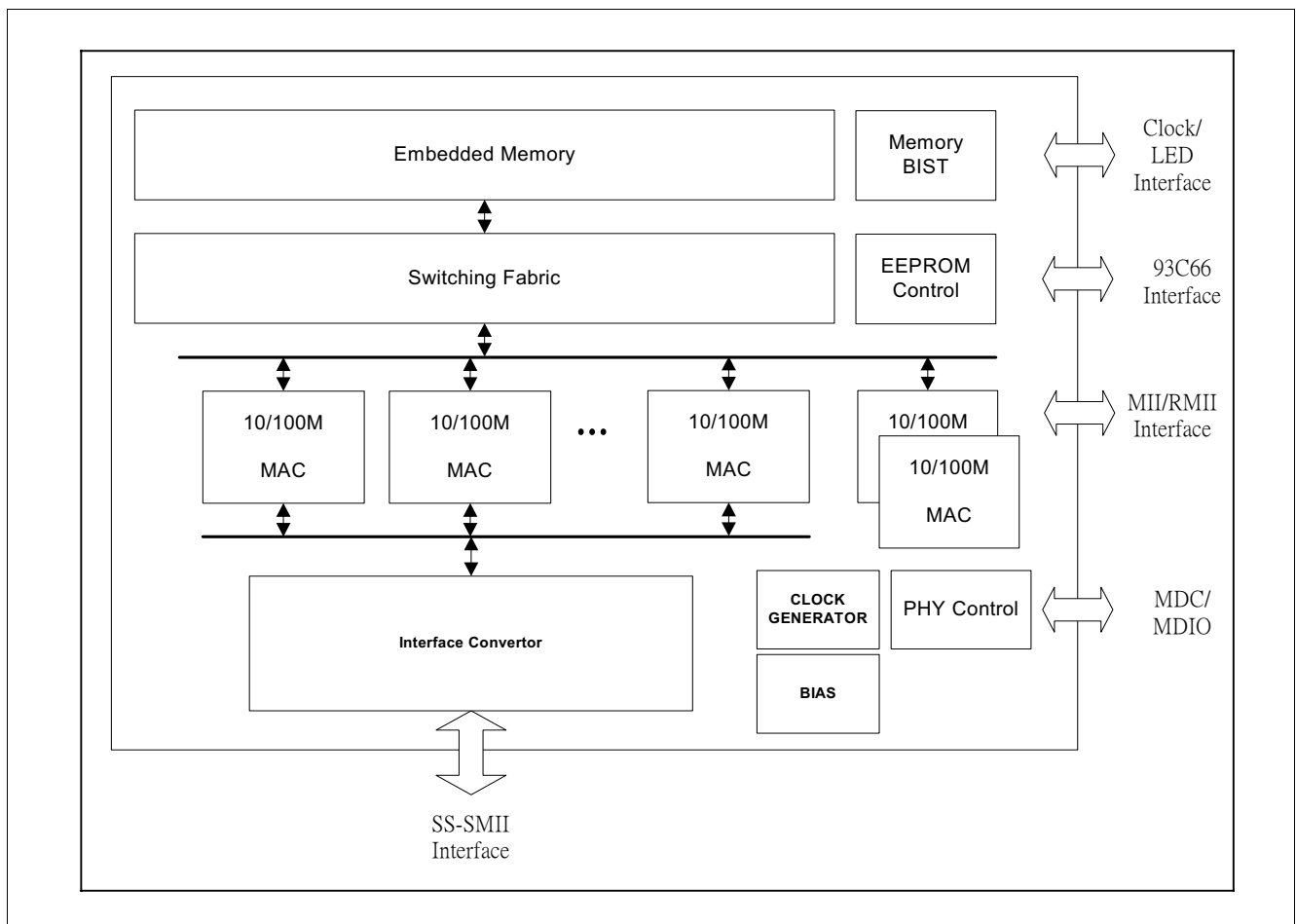


Figure 1 ADM6918/X Block Diagram

2 Interface Description

2.1 Pin Diagram-ADM6918/X (SS-SMII Interface)

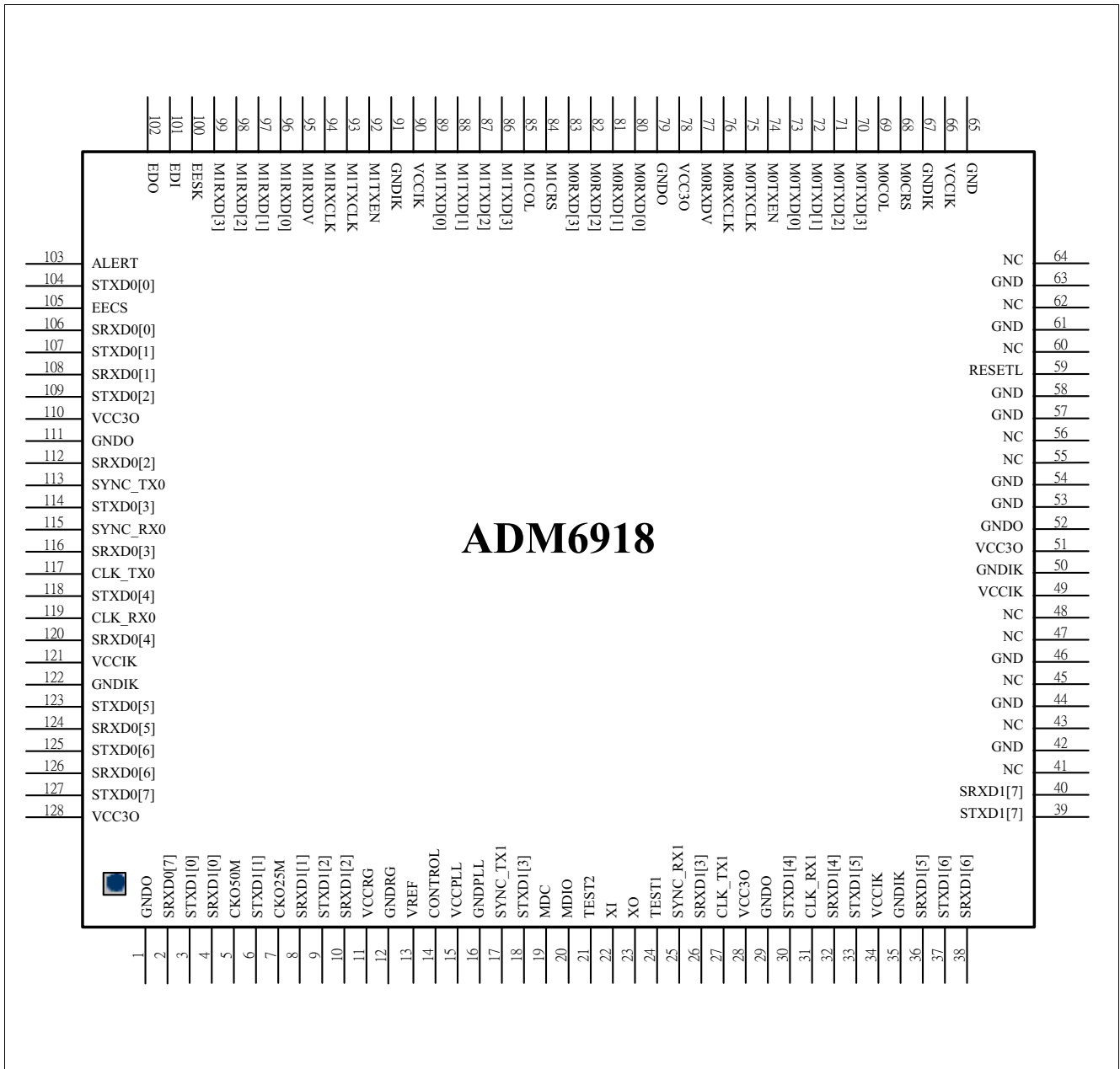


Figure 2 ADM6918/X Pin Diagram (SS-SMII Interface)

2.2 Abbreviations

Standard abbreviations for I/O tables:

Table 1 Abbreviations for Pin Type

Abbreviations	Description
I	Standard input-only pin. Digital levels.
O	Output. Digital levels.
I/O	I/O is a bidirectional input/output signal.
AI	Input. Analog levels.
AO	Output. Analog levels.
AI/O	Input or Output. Analog levels.
PWR	Power
GND	Ground
MCL	Must be connected to Low (JEDEC Standard)
MCH	Must be connected to High (JEDEC Standard)
NU	Not Usable (JEDEC Standard)
NC	Not Connected (JEDEC Standard)

Table 2 Abbreviations for Buffer Type

Abbreviations	Description
Z	High impedance
PU1	Pull up, 10 k Ω
PD1	Pull down, 10 k Ω
PD2	Pull down, 20 k Ω
TS	Tristate capability: The corresponding pin has 3 operational states: Low, high and high-impedance.
OD	Open Drain. The corresponding pin has 2 operational states, active low and tristate, and allows multiple devices to share as a wire-OR. An external pull-up is required to sustain the inactive state until another agent drives it, and must be provided by the central resource.
OC	Open Collector
PP	Push-Pull. The corresponding pin has 2 operational states: Active-low and active-high (identical to output with no type attribute).
OD/PP	Open-Drain or Push-Pull. The corresponding pin can be configured either as an output with the OD attribute or as an output with the PP attribute.
ST	Schmitt-Trigger characteristics
TTL	TTL characteristics

2.3 Pin Description

ADM6918/X pins are categorized into one of the following groups:

- SS-SMII Networking Interface, 60 pins
- MII/RMII Interface, 28 pins
- Power/Ground
- Miscellaneous pins, 16 pins

Table 3 I/O Signals

Pin or Ball No.	Name	Pin Type	Buffer Type	Function
SS-SMII Networking Interface, 60 pins				
106	SRXD0_0	I	TTL	Port 0 to Port 7 SS-SMII Receive Data Bit The receive data should be synchronous to the rising edge of CLK_RX0.
108	SRXD0_1			
112	SRXD0_2			
116	SRXD0_3			
120	SRXD0_4			
124	SRXD0_5			
126	SRXD0_6			
2	SRXD0_7			
115	SYNC_RX0	I	TTL	Port 0 to Port 7 SS-SMII Synchronous Signal This signal is synchronous to the rising edge of CLK_RX0. Active high indicates the byte boundary.
119	CLK_RX0	I	TTL	Reference Receive Clock for Port 0 to Port 7 This signal is 125 MHz input for SS-SMII interface.
104	STXD0_0	O	TTL, 8 mA	Port 0 to Port 7 SS-SMII Transmit Data Bit The transmit data is synchronous to the rising edge of CLK_TX0.
107	STXD0_1			
109	STXD0_2			
114	STXD0_3			
118	STXD0_4			
123	STXD0_5			
125	STXD0_6			
127	STXD0_7			
113	SYNC_TX0	O	TTL, 8 mA	Port 0 to Port 7 SS-SMII Synchronous Signal This signal is synchronous to the rising edge of CLK_TX0. Active high indicates the byte boundary.
117	CLK_TX0	O	TTL, 16 mA	Reference Transmit Clock for Port 0 to Port 7 This signal is 125 MHz output for SS-SMII interface.
4	SRXD1_0	I	TTL	Port 8 to Port 15 SS-SMII Receive Data Bit The receive data should be synchronous to the rising edge of CLK_RX1.
8	SRXD1_1			
10	SRXD1_2			
26	SRXD1_3			
32	SRXD1_4			
36	SRXD1_5			
38	SRXD1_6			
40	SRXD1_7			
25	SYNC_RX1	I	TTL	Port 8 to Port 15 SS-SMII Synchronous Signal This signal is synchronous to the rising edge of CLK_RX1. Active high indicates the byte boundary.
31	CLK_RX1	I	TTL	Reference Receive Clock for Port 8 to Port 15 This signal is 125 MHz input for SS-SMII interface.

Interface Description

Table 3 I/O Signals (cont'd)

Pin or Ball No.	Name	Pin Type	Buffer Type	Function
3	STXD1_0	O	TTL, 8 mA	Port 8 to Port 15 SS-SMII Transmit Data Bit The transmit data is synchronous to the rising edge of CLK_TX1.
6	STXD1_1			
9	STXD1_2			
18	STXD1_3			
30	STXD1_4			
33	STXD1_5			
37	STXD1_6			
39	STXD1_7			
17	SYNC_TX1	O	TTL, 8 mA	Port 8 to Port 15 SS-SMII Synchronous Signal This signal is synchronous to the rising edge of CLK_TX1. Active high indicates the byte boundary.
27	CLK_TX1	O	TTL, 16 mA	Reference Transmit Clock for Port 8 to Port 15 This signal is 125 MHz output for SS-SMII interface.
MII/RMII Interface, 28 pins				
68	M0CRS	I	TTL, PD	MII Port0 Carrier Sense This pin is internal pull-down.
69	M0COL	I	TTL, PD	MII Port0 Collision Input This pin is internal pull-down.
73	M0TXD_0	I/O	TTL, 8 mA, PD	MII Port 0 Transmit Data Bit[0:3] Synchronous to the rising edge of M0TXCLK. RMII Port 0 Transmit Data Bit[0:1] Synchronous to the rising edge of M0RXCLK. RMII MODE[1]: Value on M0TXD_3 will be latched at the rising edge of RESETL to configure port 25 as RMII mode. RMII MODE[0]: Value on M0TXD[2] will be latched at the rising edge of RESETL to configure port 24 as RMII mode.
72	M0TXD_1			
71	M0TXD_2			
70	M0TXD_3			
74	M0TXEN	I/O	TTL, 8 mA, PD	MII/RMII Port 0 Transmit Enable AGDIS. Value on this pin will be latched at the rising edge of RESETL to set aging disable.
75	M0TXCLK	I	TTL, PD	MII Port 0 Transmit Clock Input This pin is 25 MHz input for MII interface.
76	M0RXCLK	I	TTL, PD	MII/RMII Port 0 Receive Clock Input This pin is 25 MHz input for MII interface and 50 MHz REFCLK input for RMII interface.
77	M0RXDV	I	TTL, PD	MII Port 0 Receive Data Valid RMII Port 0 Carrier Sense/Receive Data Valid This pin is internal pull-down.
80	M0RXD_0	I	TTL, PD	MII Port 0 Receive Data Bit[0:3] RMII Port 0 Receive Data Bit[0:1] If in RMII mode, M0RXD_3 used for ext_dup_enable and M0RXD_2 used for ext_dup_full. Internal pull-down. See Sec3.1.27 for details.
81	M0RXD_1			
82	M0RXD_2			
83	M0RXD_3			
84	M1CRS	I	TTL, PD	MII Port 1 Carrier Sense This pin is internal pull-down.

Interface Description

Table 3 I/O Signals (cont'd)

Pin or Ball No.	Name	Pin Type	Buffer Type	Function
85	M1COL	I	TTL, PD	MII Port 1 Collision Input This pin is internal pull-down.
89	M1TXD_0	I/O	TTL, 8 mA	MII Port 1 Transmit Data Bit[0:3] Synchronous to the rising edge of M1TXCLK. RMII Port 1 Transmit Data Bit[0:1] Synchronous to the rising edge of M1RXCLK. BPEN. Value on M1TXD[3] will be latched at the rising edge of RESETL to set Back_pressure enable. Internal pull-up. FCEN. Value on M1TXD[2] will be latched at the rising edge of RESETL to set flow control enable. Internal pull-up. TNKEN. Value on M1TXD[1] will be latched at the rising edge of RESETL to set trunking enable. Internal pull-up. IPGLVING. Value on M1TXD[0] will be latched at the rising edge of RESETL to set shorter IPG. Internal pull-down.
88	M1TXD_1			
87	M1TXD_2			
86	M1TXD_3			
92	M1TXEN	O	TTL, 8 mA, PU	MII Port 1 Transmit Enable ANEN. Value on this pin will be latched at the rising edge of RESETL to set auto_negotiation enable. Internal pull-up.
93	M1TXCLK	I	TTL, PD	MII Port1 Transmit Clock Input This signal is 25 MHz input for MII interface.
94	M1RXCLK	I	TTL, PD	MI1 Receive Clock Input This signal is 25 MHz input for MII interface and 50 MHz REFCLK input for RMII interface.
95	M1RXDV	I	TTL, PD	MII/RMII Port 1 Receive Data Valid This pin is internal pull-down.
96	M1RXD_0	I	TTL PD	MII Port 1 Receive Data Bit[0:3] RMII Port 1 Receive Data Bit[0:1] If in RMII mode, M1RXD_3 used for ext_dup_enable and M1RXD_2 used for ext_dup_full. Internal pull-down. See Sec3.1.27 for details.
97	M1RXD_1			
98	M1RXD_2			
99	M1RXD_3			

Power/Ground

12	GNDRG	Analog GND	–	Ground for Regulator
11	VCCRG	Analog PWR	–	3.3 V Power Supply for Regulator
16	GNDPLL	Analog GND	–	Ground for PLL
15	VCCPLL	Analog PWR	–	1.8 V Power Supply PLL
35, 50, 67, 91, 122	GNDIK	Digital GND	–	Ground for Core Logic
34, 49, 66, 90, 121	VCCIK	Digital PWR	–	1.8 V Power Supply for Core Logic
1, 29, 52, 79, 111	GNDO	Digital GND	–	Ground for I/O PAD

Interface Description

Table 3 I/O Signals (cont'd)

Pin or Ball No.	Name	Pin Type	Buffer Type	Function
28, 51, 78, 110, 128	VCC30	Digital PWR	–	3.3 V Power Supply for I/O PAD
Miscellaneous Pins, 16 pins				
7	CK25MO	O	TTL, 16 mA	25 MHz Clock Output This pin will drive out 25 MHz.
5	CK50MO	O	TTL, 16 mA	50 MHz Clock Output This pin will drive out 50 MHz.
	COL_LED_10M	O	TTL, 16 mA	COL_LED_10M This pin shows collision LED for 10M domain (see EEPROM Register 1ch, Bit[9]).
22	XI	AI	–	Crystal or OSC 50 MHz Input This is the clock source of PLL. The PLL will generate 125 MHz for SS-SMII and 50 MHz for RMII and 25 MHz for MII.
23	XO	AO	–	Crystal 50 MHz Output
59	RESETL	I	TTL, ST	Reset Signal An active low signal with minimum 100 ms duration is required.
103	ALERT	O	TTL, 8 mA	Alert LED Display This pin will show the status of power-on-diagnostic and broadcast traffic.
	COL_LED_100M	O	TTL, 8 mA	COL_LED_100M This pin shows collision LED for 100M domain (see EEPROM Register 1ch, Bit[9]).
21	TEST_2	I	TTL, PD	Industrial Test Pins These pins are internal pull-down.
24	TEST_1			
19	MDC	O	TTL, 16 mA	Management Data Clock This pin output 2.2 MHz clock to drive PHY and access corresponding speed and duplex and link status through MDIO.
20	MDIO	I/O	TTL, 8 mA, PU	Management Data This pin is in-out to PHY. When RESETL is low, this pin will be tristate. This pin is internal pull-up.
100	EESK	I/O	TTL, 4 mA, PU	EEPROM Serial Clock This pin is clock source for EEPROM. When RESETL is low, it will be tristate. This pin is internal pull-up.
105	EECS	I/O	TTL, 4 mA, PD	EEPROM Chip Select This pin is chip enable for EEPROM. When RESETL is low, it will be tristate. This pin is internal pull-down.
101	EDI	I/O	TTL, 4 mA, PU	EEPROM Serial Data Input This pin is output for serial data transfer. When RESETL is low, it will be tristate. This pin is internal pull-up.

Table 3 I/O Signals (cont'd)

Pin or Ball No.	Name	Pin Type	Buffer Type	Function
102	EDO	I	TTL, PU	EEPROM Serial Data Output This pin is input for serial data transfer. This pin is internal pull-up.
14	CONTROL	AO	–	FET Control Signal The pin is used to control FET for 3.3 V to 1.8 V regulator.
13	VREF	AI	–	Regulator Control Input Signal
64, 62, 60, 55, 56, 47, 48, 45, 43, 41	NC			No Connect
65, 63, 61, 58, 57, 53, 54, 46, 44, 42	GND			Ground

3 Function Description

3.1 Introduction

The ADM6918/X uses a “store & forward” switching approach for the following reasons:

1. Store & forward switches allow switching between different speed media (e.g. 10BaseX and 100BaseX). Such switches require the large elastic buffers, especially bridging between a server on a 100Mbit/s network and clients on a 10 Mbit/s segment.
2. Store & forward switches improve overall network performance by acting as a “network cache”.
3. Store & forward switches prevent the forwarding of corrupted packets by the frame check sequence (FCS) before forwarding to the destination port.

3.1.1 Basic Operation

The ADM6918/X receives incoming packets from one of its ports, uses the source address (SA) and VID to update the address table, and then forwards the packet to the output ports determined by the destination address (DA) and VID.

If the DA and VID are not found in the address table, the ADM6918/X treats the packet as a broadcast packet and forwards the packet to the other ports within the same group.

The ADM6918/X automatically learns the port number of attached network devices by examining the SA and VID of all incoming packets. If the SA and VID are not found in the address table, the device adds it to the table.

3.1.2 Address Learning

The ADM6918/X provides two ways to create the entry in the address table: dynamic learning and manual learning. A four-way hash algorithm is implemented to allow 4 different addresses to be stored at the same location. Up to 4k entries can be created and all entries are stored in the internal SSRAM. Two parameters, SA and VID, are combined to generate the 10-bit hash key to allow that the same addresses with different port number can exist in the table at the same time.

Dynamic Learning

The ADM6918/X searches for SA and VID of an incoming packet in the address table and acts as follows:

If the SA+VID was not found in the address table (a new address), the ADM6918/X waits until the end of the packet (non-error packet) and updates the address table. If the SA+VID was found in the address table, then aging value of each corresponding entry will be reset to 0.

Dynamic learning will be disabled in the following condition:

1. Security violation happened.
2. The packet is a PAUSE frame.
3. The first bit of SA is 1_B.
4. The packet is an error packet (too long, too short or FCS error).
5. The CPU port leaning function is disabled or enabled but the CPU port instructs the switch not to learn the packet.
6. The port is in the Disabled or Blocking-not-Listening state in the Spanning Tree Protocol.

Manual Learning

The ADM6918/X implements the manual learning through the CPU's help. The CPU can create or remove any entry in the address table. Each entry could be static or pointed to the output port map table. “Static” means the entry will not be aged forever. It is useful in the security function (forward unknown packets to the CPU port or discard) or monitor function (forward monitored address to the specific port). Output port map table is also helpful

Function Description

in the IGMP function (if the number of the output port is more than one) or the users want to redirect the special packets with reserved DA.

3.1.3 Address Aging

The ADM6918/X will periodically (300 ms) remove the non-static address in the address table. This could help to prevent a station leaves the network and occupies a table space for a long time. Aging function can be disabled from the hardware pin.

3.1.4 Address Recognition and Packet Forwarding

The ADM6918/X forwards the incoming packets between bridge ports according to the DA and VID as follows:

Table 4 Address Recognition and Packet Forwarding

DA	DA+VID was found in the address table (entry not pointed to the output port map table)	DA+VID was found in the address table (entry pointed to the output port map table)	DA+VID was not found in the address table
Unicast Address	No Security Violation		
	Forward packets to the port determined by the address table. The packet may be dropped because of forwarding group boundary violation.	Forward packets to the ports determined by the output port map table constrained by the forwarding group.	Forward packets to the other ports within the same forwarding group.
	Security Violation		
	Drop or forward to CPU	Drop or forward to CPU	Drop or forward to CPU
Broadcast Address (All 1'b1)	No Security Violation		
	Forwarding packets to the other ports within the same forwarding group.	Forward packets to the ports determined by the output port map table constrained by the forwarding group.	Forward packets to the other ports within the same forwarding group.
	Security Violation		
	Drop or forward to CPU	Drop or forward to CPU	Drop or forward to CPU
Reserved Address (01-80-c2-00-00-xx, with the option to forward normally)	No Security Violation		
	Forwarding packets to the other ports within the same forwarding group.	Forward packets to the ports determined by the output port map table constrained by the forwarding group.	Forward packets to the other ports within the same forwarding group.
	Security Violation		
	Same as the above	Same as the above	Same as the above
Reserved Address (01-80-c2-00-00-xx, with the option to forward to CPU)	No Security Violation		
	Forward the packet to the CPU port.	Forward the packet to the CPU port.	Forward the packet to the CPU port.
	Security Violation		
	Same as the above	Same as the above	Same as the above

Function Description

Table 4 Address Recognition and Packet Forwarding (cont'd)

DA	DA+VID was found in the address table (entry not pointed to the output port map table)	DA+VID was found in the address table (entry pointed to the output port map table)	DA+VID was not found in the address table
Reserved Address (01-80-c2-00-00-xx, with the option to discard)	No Security Violation		
	Discard the packet.	Discard the packet.	Discard the packet.
	Security Violation		
	Same as the above	Same as the above	Same as the above
IGMP Packet (Port Enable IGMP)	No Security Violation		
	Forward the packet to the CPU port.	Forward the packet to the CPU port.	Forward the packet to the CPU port.
	Security Violation		
	Drop or forward to CPU	Drop or forward to CPU	Drop or forward to CPU
IGMP Packet (Port Disable IGMP)	No Security Violation		
	Forward packets to the port determined by the address table. The packet may be dropped because of forwarding group boundary violation.	Forward packets to the ports determined by the output port map table constrained by the forwarding group.	Forward packets according the Multicast Option.
	Security Violation		
	Drop or forward to CPU	Drop or forward to CPU	Drop or forward to CPU
Others	No Security Violation		
	Forward packets to the port determined by the address table. The packet may be dropped because of forwarding group boundary violation.	Forward packets to the ports determined by the output port map table constrained by the forwarding group.	Forward packets according the Multicast Option.
	Security Violation		
	Drop or forward to CPU	Drop or forward to CPU	Drop or forward to CPU

3.1.5 Trunking Port Forwarding

ADM6918/X supports the trunking forwarding and any port could be assigned to the trunking port. When one or more of the members link fail, the ADM6918/X will automatically change the transmitting path from the failed link port to normal link port. Port based load balancing is implemented to distribute the loading.

3.1.6 Illegal Frames

The ADM6918/X will discard all illegal frames such as runt packet (less than 64 bytes), oversize packet (greater than 1518 or 1522 bytes) or bad CRC.

3.1.7 Back off Algorithm

The ADM6918/X implements the truncated exponential back off algorithm compliant to the 802.3 standard. ADM6918/X will restart the back off algorithm by choosing 0-9 collision count. After 16 consecutive retransmit trials, the ADM6918/X resets the collision counter.

3.1.8 Buffers and Queues

The ADM6918/X incorporates 18 transmit queues and receive buffer area for the 18 Ethernet ports. The receive buffers as well as the transmit queues are located within the ADM6918/X along with the switch fabric. The buffers are divided into 640 blocks of 256 bytes each. The queues of each port are managed according to each port's read/write pointer.

Input buffers and output queues are maintained through proprietary patent pending UNIQUE (Universal Queue management) scheme.

3.1.9 Half Duplex Flow Control

Back-pressure is supported for half-duplex operation.

When the ADM6918/X cannot allocate a receiving buffer for an incoming packet (buffer full), the device will transmit a jam pattern on the port, thus forcing a collision.

3.1.10 Full Duplex Flow Control

When full duplex port runs out of its receive buffer, a PAUSE command will be issued by ADM6918/X to notice the packet sender to pause transmission. This frame based flow control is totally compliant to IEEE 802.3x. When flow control hardware pin is set to high during power on reset and per port PAUSE is enabled, ADM6918/X will output and accept 802.3x flow control packet.

3.1.11 Inter-Packet Gap (IPG)

IPG is the idle time between any two successive packets from the same port. The value is 9.6us for 10Mbit/s ETHERNET and 960ns for 100Mbit/s fast Ethernet.

3.1.12 Port VLAN or Tag VLAN Support

Two VLAN settings are supported by the ADM6918/X: the port-based VLAN or the tag-based VLAN. For the port-based VLAN the ADM6918/X will use the port number as the index to lookup the forwarding table. For the tag-based VLAN, the ADM6918/X will use the VID to lookup the forwarding table. Each port is assigned a Port VID as the Default VID if tag-based VLAN is used. The ADM6918/X will check TAG, remove TAG, insert TAG, and recalculate CRC if packet is changed.

Table 5 Packets Received are Untagged

Force no Tag	Bypass	Output Port is Tagged or not	Action
Don't Care	No	No	Untag as the original
	Yes	No	Untag as the original
	No	Yes	Add Tag
	Yes	Yes	Untag as the original

Table 6 Packets Received are Tagged

Force no Tag	Bypass	Output Port is Tagged or not	Action
No	No	No	The Tag is removed.
Yes	No	No	Tag as the original. The priority in the TAG header is not checked and VID will not change even if VID is 0 or 1.

Table 6 Packets Received are Tagged (cont'd)

Force no Tag	Bypass	Output Port is Tagged or not	Action
No	Yes	No	Tag as the original. The priority in the TAG header is checked and if the VID is 0 or 1, it may change to PVID (see EEPROM register 1C _H , Bit[3]).
No	No	Yes	Tag as the original. The priority in the TAG header is checked and if the VID is 0 or 1, it may change to PVID (see EEPROM register 1ch, Bit[3]).
No	Yes	Yes	Tag as the original. The priority in the TAG header is checked and if the VID is 0 or 1, it may change to PVID (see EEPROM register 1ch, Bit[3]).
Yes	Yes	No	Tag as the original. The priority in the TAG header is not checked. The VID will not change.
Yes	No	Yes	The Tag will be added and packet will be double tagged output. The VID will not change.
Yes	Yes	Yes	Tag as the original. The priority in the TAG header is not checked. The VID will not change.

3.1.13 Priority Control

The ADM6918/X provides two priority queues on each output port. Five ways could be used to assign a priority to a packet.

1. The priority assigned to each receiving port
2. The priority field in the 802.1Q Tag Header
3. The IPv4 TOS field in the IPv4 Header
4. Priority assigned by the CPU
5. Management packet (high priority assigned)

3.1.14 Alert LED Display

Two functions are displayed through the Alert LED.

1. Diagnostic Mode after Power on
 - a) After reset or power up, LED keeps on at least 3 second, and processes internal SSRAM self-test.
 - b) If test passes, the ADM6918/X turns off LED and goes to the broadcast storm mode.
 - c) If SSRAM test fails, the ADM6918/X turns off LED, then keeps on.
2. Broadcast Storm Mode after SSRAM Self-test. Packets with DA = ffffffff_H will be counted into the storm counter.

Two thresholds (rising and falling) are used to control the broadcast storm.

 - a) Time Scale: 50ms is used. The max packet number in 100BaseT is 7490. The max packet number in 10BaseT is 749.
 - b) Port Rising Threshold, see [Table 7](#).
 - c) Port Falling Threshold, see [Table 8](#).

Table 7 Port Rising Threshold

Broadcast Storm Threshold	00	01	10	11
All 100TX	Disable	10%	20%	40%
Not All 100TX	Disable	1%	2%	4%

Table 8 Port Falling Threshold

Broadcast Storm Threshold	00	01	10	11
All 100TX	Disable	5%	10%	20%
Not All 100TX	Disable	0.5%	1%	2%

3.1.15 Broadcast Storm Filter

If broadcast storming filter is enabled, the broadcast packets (DA = ffff-ffff-ffff_H) over the rising threshold within 50 ms will be discarded when the alert LED is turned on.

3.1.16 Collision LED Display

Two collision LEDs are supported. (see EEPROM Register 1C_H, Bit[9])

- 100M Collision LED. If collision happens in one of the ports configured 100M, the 100M Collision LED will flash in rate of 2 Hz.
- 10M Collision LED. If collision happens in one of the ports configured 10M, the 10M Collision LED will flash in rate of 2 Hz.

3.1.17 Bandwidth Control

The ADM6918/X allows the user to limit the bandwidth for each input or output port. 64k, 128K, 256k, 512K, 1M, 4M, 10M and 20M are supported.

3.1.18 Smart Discard

The ADM6918/X supports a smart mechanism to discard packets early according to their priority to prevent the resource blocked by the low priority. The discard ratio is as follows:

Table 9 Discard Ratio

Discard Mode Utilization	00	01	10	11
00	0%	0%	0%	0%
01	0%	0%	25%	50%
11	0%	25%	50%	75%

3.1.19 Security Support

4 level security schemes are supported by the ADM6918/X. All the security violation address will not be automatically learned.

The violated packet could be forwarded to the CPU port for management or discarded. When CPU is not present, ADM6918/X also provides a simple way to lock the first address to prevent illegal address access.

3.1.20 Smart Counter Support

Six counters per port are supported by the ADM6918/X.

1. Receive Packet Count
2. Receive Packet Length Count
3. Transmit Packet Count
4. Transmit Packet Length Count
5. The Error Count
6. The Collision Count

3.1.21 Length 1536 Mode

The ADM6918/X provides a function to enable the port to receive packets up to 1536 Byte.

3.1.22 PHY Management (MDC/MDIO Interface)

The ADM6918/X uses the MDC/MDIO interface to set the PHY status. After the reset or power up, the MDC/MDIO controller will delay about 130 ms to wait for the PHY to ready. The ADM6918/X supports two ways to configure the PHY setting.

1. PHY master. The switch only reads the PHY status (speed, duplex, link, and pause). This mode is useful when users want to configure PHY through the CPU help. The ADM6918/X supports an indirect way (a PHY Control Register) for CPU to access PHYs.
2. PHY slave. The switch uses the EEPROM setting to control the PHY attached (only speed, duplex, link, and pause are supported). After the port setting changed, the ADM6918/X will use the new setting to program the PHY again and update the status. 8 commands are provided in this mode to allow the customer to customize the PHY setting.

Note: The PHY address attached to port 0 is 00008_H, the PHY address attached to port 1 is 00009_H, ..., the PHY address attached to port 23 is 0001f_H, the PHY address attached to port 24 is 00006_H and the PHY address attached to port 25 is 00007_H.

3.1.23 Forward Special Packets to the CPU Port (IGMP and Spanning Tree Support)

ADM6918/X will forward the special packets to the CPU port to provide the management function.

1. DA is 01-80-C2-00-00-00 (BPDU)
2. DA is 01-80-C2-00-00-02 (Slow Protocol)
3. DA is 01-80-C2-00-00-03 (802.1x PAE)
4. DA is 01-80-C2-00-00-04 ~ 01-80-C2-00-00-0f
5. DA is 01-80-C2-00-00-20 (GMRP)
6. DA is 01-80-C2-00-00-21 (GVRP)
7. DA is 01-80-C2-00-00-22 (GVRP)
8. DA is 01-00-5E-xx-xx-xx and protocol field is 2 for IPV4 (IGMP)

3.1.24 Special TAG

The ADM6918/X has an ability to insert 4Byte special TAG when packets transmitted to the CPU port or to remove 8Byte additional TAG in the packets when packets are received from the CPU port. The configuration is shown in the CPU Configuration Register. This special function allows the CPU to know the source port which will be used in the IGMP Snooping, Spanning Tree or the Security function. The CPU also could insert additional 8-byte Tag to instruct the switch to handle the packets. The packets format is as follows:

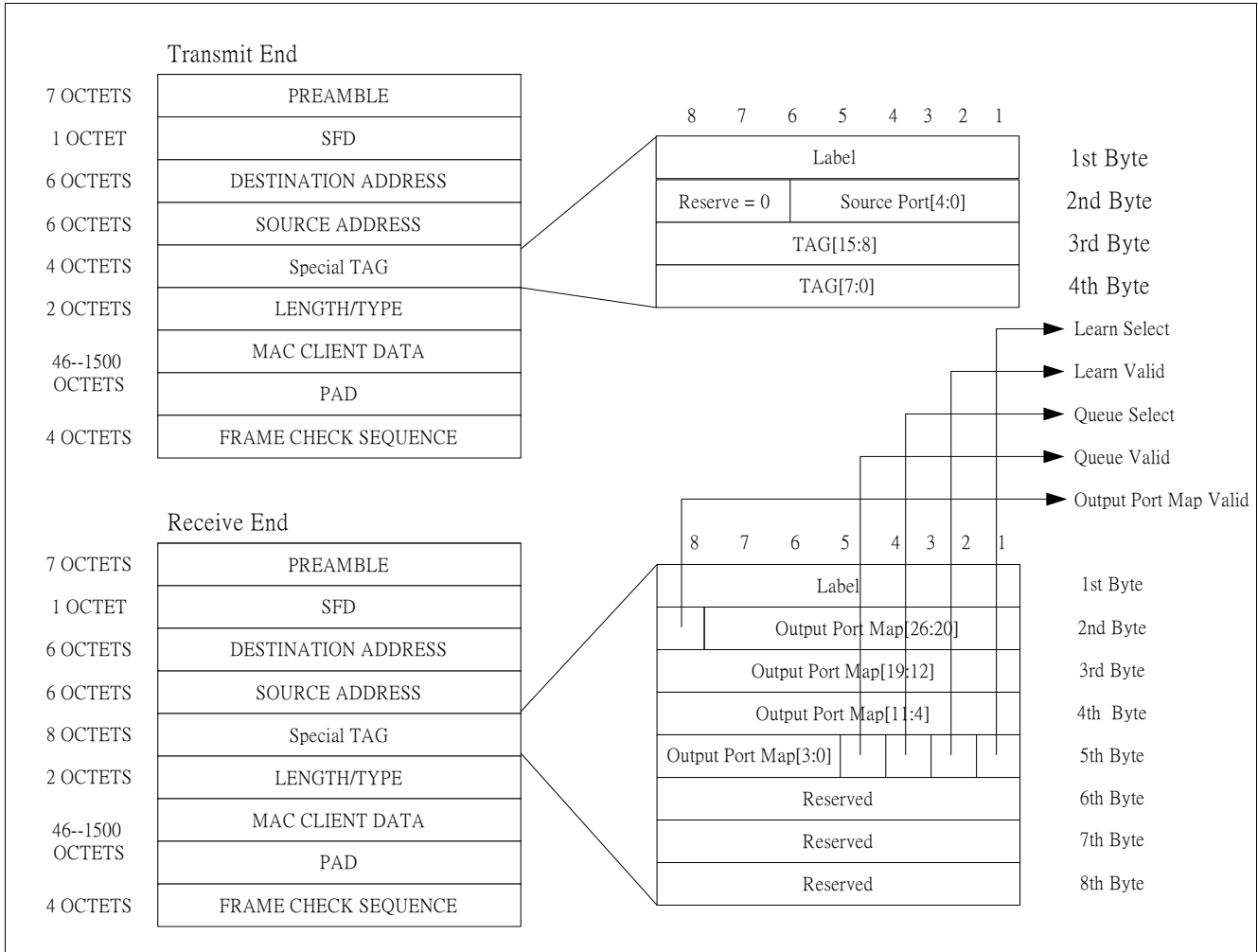


Figure 3 Packet Format

Table 10 Special TAG Fields

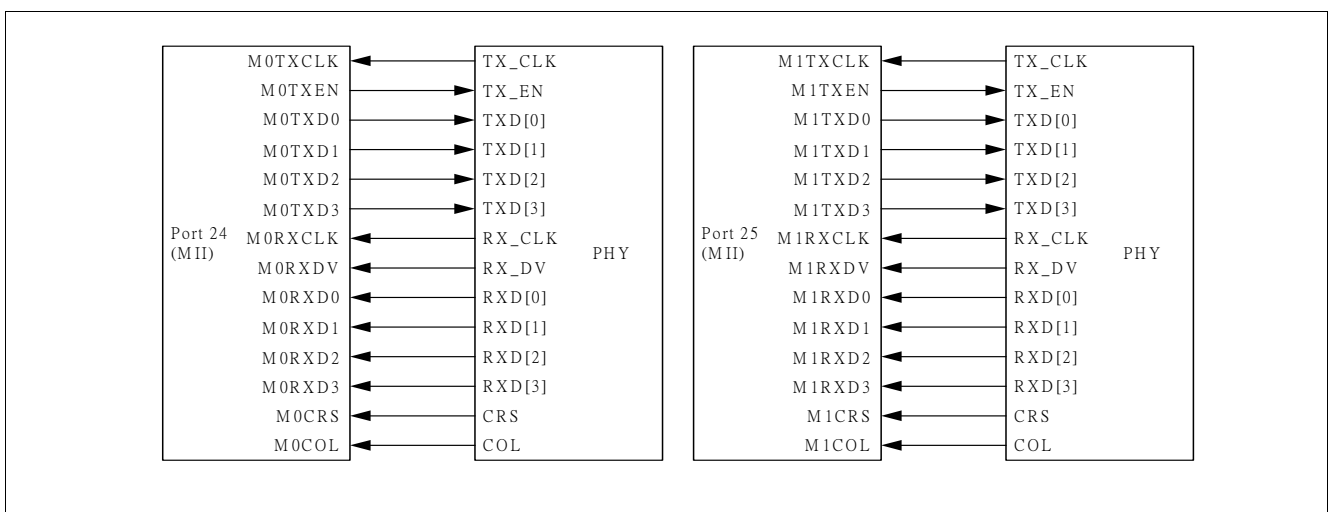
Configuration	Description	Default
Label	The field is used for CPU to decide if the special TAG is valid. If the switch finds the Label doesn't equal to the value assigned by the EEPROM, it must receive as the normal mode. This case exists when user wants the switch to insert 4 byte special tag even for Pause packets.	8b'0
Output Port Map Valid	1 _B , The switch is instructed to override the switch operation. It will forward the packets following the Output Port Map field. 0 _B , The switch will treat the packet as the normal mode.	1'b0

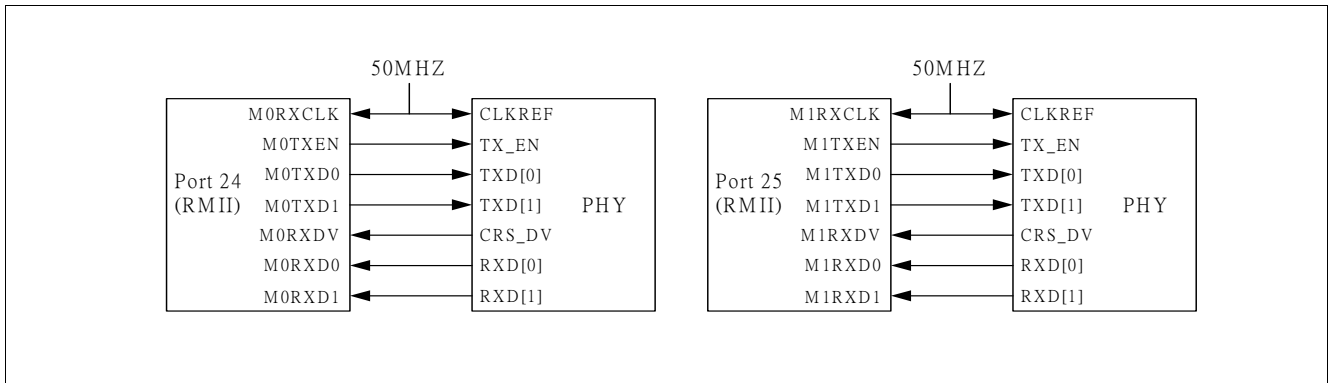
Table 10 Special TAG Fields (cont'd)

Configuration	Description	Default
Output Port Map[26:0]	Bit[26] = 1, the CPU wants to forward packets to more than 2 ports. Bit[26] = 0, the CPU wants to forward packets to only one port. Bit[x], x = 0 ~ 25, the CPU wants to forward packets to Port x. Example: 1. The CPU wants to forward packet to P1 and P2 then the Output Port Map is as follows: Bit 26, 25~24, 23~16, 15~8, 7~0 Map 1, 00, 0000_0000, 0000_0000, 0000_0110 2. The CPU wants to forward packets to P5 only. Bit 26, 25~24, 23~16, 15~8, 7~0 Map 0, 00, 0000_0000, 0000_0000, 0010_0000	27'h0
TAG[25:0]	This value is the same as the TAG header if the CPU port is configured to a TAG port.	16'h0
Source Port[4:0]	This field indicates the source port the packet comes from.	5'h0
Queue Valid	1 _B , The switch is instructed to override the switch operation. It will forward the packets using the Queue Select Field. 0 _B , The switch will treat the packets as the normal mode.	1'b0
Queue Select	1 _B , Mapped for High Queue 0 _B , Mapped for Low Queue	1'b0
Learn Valid	1 _B , The switch is instructed to override the switch operation. The CPU port will use the Learn Field to decide how to learn the packet. 0 _B , The switch will treat the packets as the normal mode. That is, the CPU port will learn or disable learning according the Disable CPU Port Learning Function configured in the CPU Control Register.	1'b0
Learn Select	1 _B , Learn the packet 0 _B , Don't learn the packet	1'b0

3.1.25 Port 24 and Port 25 Interface (Only SS-SMII Package Support)

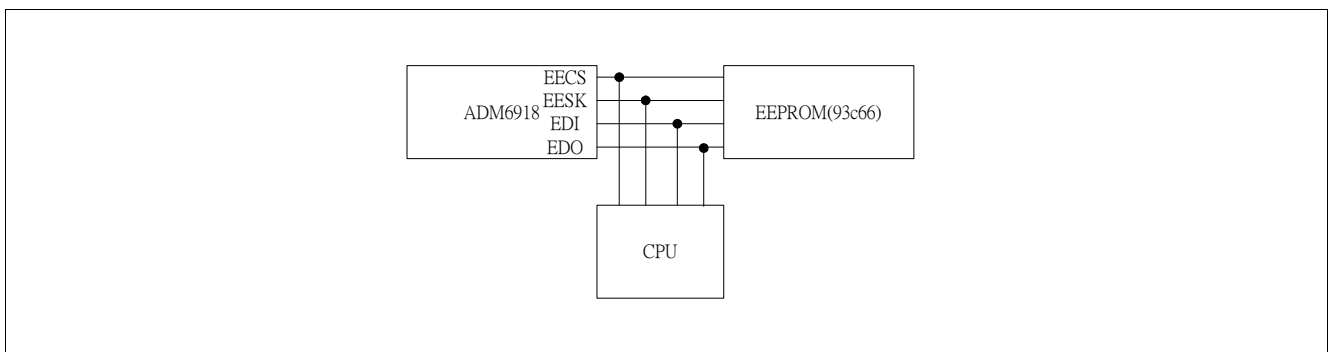
Three interfaces in port 24 and port 25 are supported by the ADM6918/X: (1) MII Interface (2) RMII Interface.


Figure 4 MII Interface Diagram


Figure 5 RMI Interface

3.1.26 Hardware, EEPROM and SMI Interface for Configuration

Three ways are supported to configure the setting in the ADM6918/X: (1) Hardware Setting (2) EEPROM Interface (3) SMI Interface. Users could use EEPROM and SMI interfaces combined with the CPU port to provide proprietary functions. Four pins are needed when using these two interfaces. See the following figure as a description.


Figure 6 Hardware, EEPROM and SMI Interface Configuration

3.1.26.1 Hardware Setting

The ADM6918/X provides some hardware pins where values reside on during power on or reset will be strapped for the default setting.

Table 11 SS-SMII and RMII Pins

SS-SMII Pin Name	RMII Pin Name	Description
M1TXD0	M1TXD0	IPG Average 92 bit time. Internally Pulled Down. 0 _B , Disable IPG Average 92 1 _B , Enable IPG Average 92
M1TXD1	M1TXD1	Trunk En. Internally Pulled Up. 0 _B , Trunking Disable. The ADM6918/X has no trunking function even if EEPROM sets. 1 _B , Trunking Enable. Use EEPROM to configure the trunk member.

Function Description
Table 11 SS-SMII and RMII Pins (cont'd)

SS-SMII Pin Name	RMII Pin Name	Description
M1TXD2	M1TXD2	Pause. Internally Pulled Up. 0_B , The switch doesn't allow the Pause function even if EEPROM set. The only way to start the Pause function is through the CPU help. 1_B , The switch allows the Pause function. This function can be disabled by the EEPROM.
M1TXD3	M1TXD3	Back-Pressure. Internally Pulled Up. 0_B , The switch doesn't allow the Back-Pressure function even if EEPROM set. 1_B , The switch allows the Back-Pressure function. This function can be disabled by the EEPROM.
M1TXEN	M1TXEN	Auto-Neg En. Internally Pulled Up. 0_B , The switch doesn't allow Auto-Negotiation function even if EEPROM set. The only way to start the Auto-Negotiation function is through the CPU help. 1_B , The switch allows the Auto-Negotiation function. This function can be disabled by the EEPROM.
M0TXEN	M0TXEN	Aging Dis. Internally Pulled Down. 0_B , The switch will age the entry in the address table. 1_B , The switch will not age the entry in the address table.
M0TXD0	Don't Support	Port 24 Interface Configuration
M0TXD2	Don't Support	M0TXD0, M0TXD2, Interface 0_B , 0, Port 24 is configured to MII in SS-SMII package (internal value). x_B , 1, Port 24 is configured to RMII in SS-SMII package.
M0TXD1	Don't Support	Port 25 Interface Configuration
M0TXD3	Don't Support	M0TXD1, M0TXD3, Interface configured to MII in SS-SMII package (internal value). x_B , 1, Port 25 is configured to RMII in SS-SMII package

When port 24 or port 25 is configured to RMII mode in SS-SMII package, we can use the hardware pins to configure duplex status of these two ports.

Table 12 Port 24 Duplex Configuration

M0RXD3	M0RXD2	Description
0	0	Duplex status is determined as port 0 ~ port 23.
0	1	Duplex status is determined as port 0 ~ port 23.
1	0	Full Duplex is determined.
1	1	Half Duplex is determined.

Table 13 Port 25 Duplex Configuration

M1RXD3	M1RXD2	Description
0	0	Duplex status is determined as port 0 ~ port 23.
0	1	Duplex status is determined as port 0 ~ port 23.
1	0	Full Duplex is determined.
1	1	Half Duplex is determined.

3.1.26.2 EEPROM Interface

The EEPROM Interface is provided so the users could easily configure the setting without CPU's help. Because the EEPROM Interface is the same as the 93c66, it also allows the CPU to write the EEPROM register and renew the 93c66 at the same time. After the power up or reset (default value from the hardware pins fetched in this stage), the ADM6918/X will automatically detect the presence of the EEPROM by reading the address 0 in the 93c66. If the value = 16'h4154, it will read all the data in the 93c66. If not, the ADM6918/X will stop loading the 93c66. The user also could pull down the EDO to force the ADM6918/X not to load the 93c66. The 93c66 loading time is around 30ms. Then CPU should give the high-z value in the EECS, EESK and EDI pins in this period if we really want to use CPU to read or write the registers in the ADM6918/X.

The EEPROM Interface needs only one Write command to complete a writing operation. If updating the 93c66 at the same time is necessary, three commands Write Enable, Write, and Write Disable are needed to complete this job (See 93c66 Spec. for a reference). Users should note that the EEPROM interface only allows the CPU to write the EEPROM register in the ADM6918/X and doesn't support the READ command. If CPU gives the Read Command, ADM6918/X will not respond and 93c66 will respond with the value. Users should also note that one additional EESK cycle is needed between any continuous commands (Read or Write)

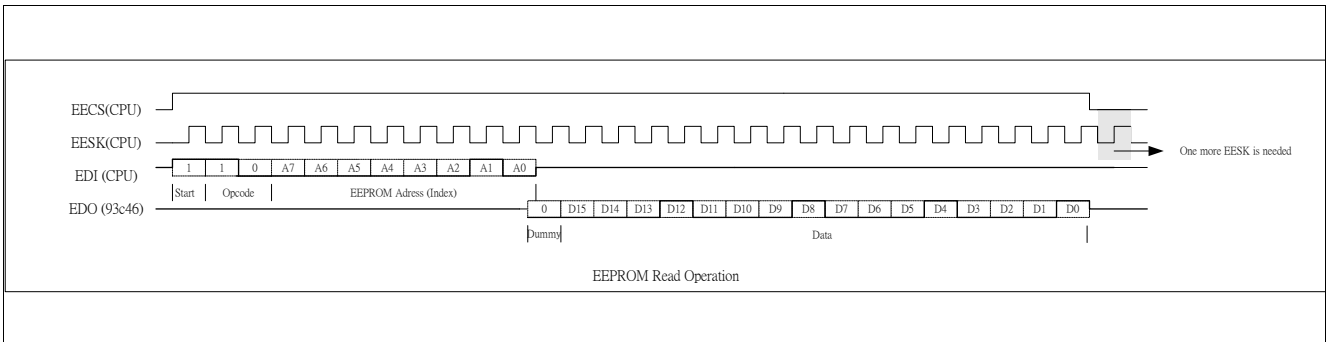


Figure 7 Read 93c66 via the EEPROM Interface (Index = 2, Data = 16'h1111)

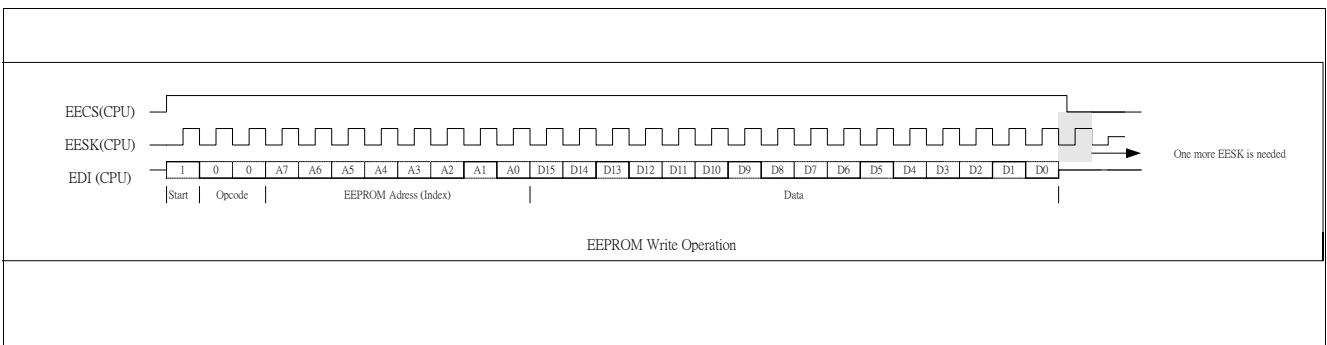


Figure 8 Write EEPROM Registers in the ADM6918/X (Index = 2, Data = 16'h2222)

3.1.26.3 SMI Interface

The SMI consists of two pins, management data clock (EESK) and management data input/output (EDI). The ADM6918/X is designed to support an EESK frequency up to 25 MHz. The EDI pin is bi-directional and may be shared with other devices. EECS pin may be needed (pulled to low) if EEPROM interface is also used.

The EDI pin requires a 1.5 kΩ pull-up which, during idle and turnaround periods, will pull EDI to a logic one state. ADM6918/X requires a single initialization sequence of 32 bits of preamble following power-up/hardware reset. The first 32 bits are preamble consisting of 32 contiguous logic one bits on EDI and 32 corresponding cycles on EESK. Following preamble is the start-of-frame field indicated by a <01> pattern. The next field signals the operation code (OP): <10> indicates read from management register operation, and <01> indicates write to

Function Description

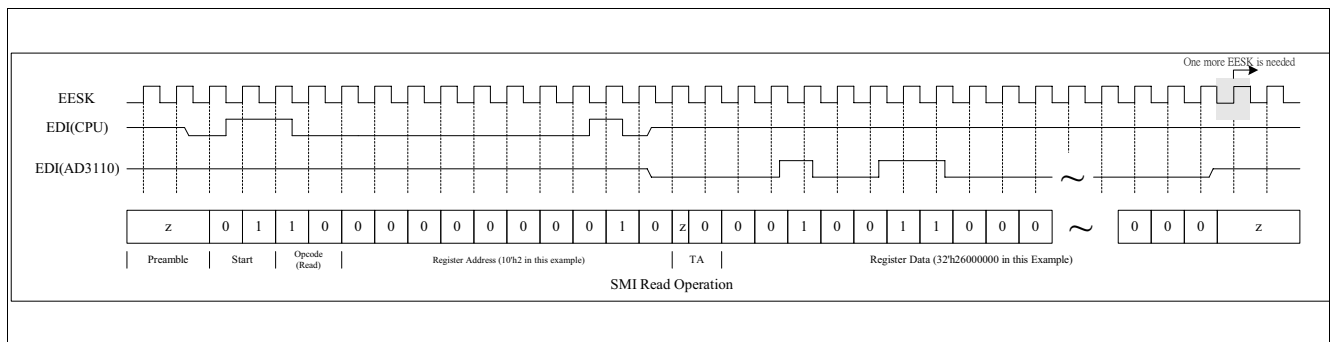
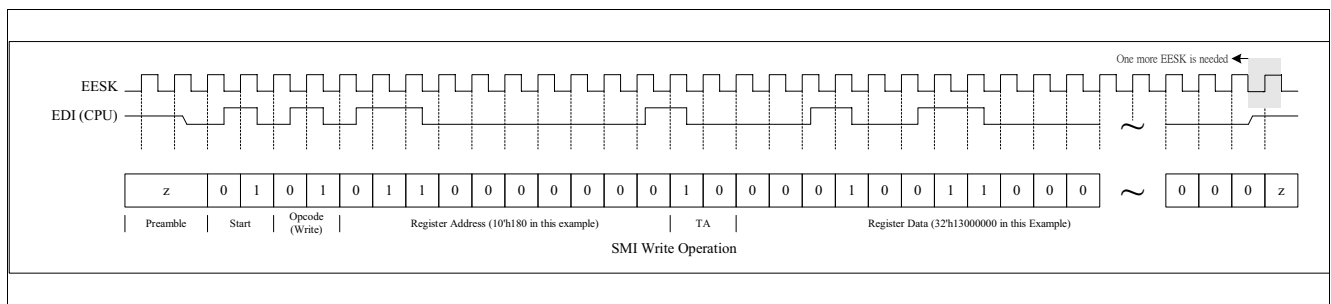
management register operation. The next field is management register address. It is 10 bits wide and the most significant bit is transferred first.

During Read operation, a 2-bit turn around (TA) time spacing between the register address field and data field is provided for the EDI to avoid contention. Following the turnaround time, a 32-bit data stream is read from or written into the management registers of the ADM6918/X.

(A) Preamble Suppression

The SMI of ADM6918/X supports a preamble suppression mode. The ADM6918/X requires a single initialization sequence of 32 bits of preamble following power-up/hardware reset. This requirement is generally met by pulling-up the resistor of EDI. While the ADM6918/X will respond to management accesses without preamble, a minimum of one idle bit between management transactions is required.

When ADM6918/X detects that there is address match, then it will enable Read/Write capability for external access. When address is mismatched, then ADM6918/X will tristate the EDI pin.

(B) Read Switch Register via SMI Interface (Offset Hex = 10'h2, Data = 32'h2600_0000)

Figure 9 Read Switch Register via SMI Interface
(C) Write Switch Register via SMI Interface (Offset Hex = 10'h180, Data = 32'h1300_0000)

Figure 10 Write Switch Register via SMI Interface
(D) The Pin Type of EECS, EESK, EDI and EDO during the Operation
Table 14 Pin Type of EECS, EESK, EDI and EDO during Operation

Pin Name	Reset Operation	Load EEPROM	Write Operation	Read Operation
EECS	Input	Output	Input	Input
EESK	Input	Output	Input	Input
EDI	Input	Output	Input	Input / Output
EDO	Input	Input	Input	Input

4 EEPROM Register Format

The EEPROM can be auto-detected by ADM6918/X through the signature register. The ADM6918/X supports C66 EEPROM. After the EEPROM is loaded, the output pins of ADM6918/X are tristate and released to CPU. The release time is about 30ms after end of RESET. Whenever CPU modifies the setting of C66, the new value will be written to ADM6918/X at the same time. If CPU changes the port setting (Duplex/Speed/AEN), the ADM6918/X will restart the auto-negotiation automatically.

Table 15 EEPROM Format

Offset Hex		Index	Bit 15 - 8	Bit 7 - 0	Type	Default
0200 _H	Low	0 _H	Signature		ro	4154 _H
0201 _H	High	1 _H	Global Configuration		rw	3800 _H
0202 _H	Low	2 _H	Port 0 Configuration		rw	80FF _H
0203 _H	High	3 _H	Port 1 Configuration		rw	80FF _H
0204 _H	Low	4 _H	Port 2 Configuration		rw	80FF _H
0205 _H	High	5 _H	Port 3 Configuration		rw	80FF _H
0206 _H	Low	6 _H	Port 4 Configuration		rw	80FF _H
0207 _H	High	7 _H	Port 5 Configuration		rw	80FF _H
0208 _H	Low	8 _H	Port 6 Configuration		rw	80FF _H
0209 _H	High	9 _H	Port 7 Configuration		rw	80FF _H
020A _H	Low	A _H	Port 8 Configuration		rw	80FF _H
020B _H	High	B _H	Port 9 Configuration		rw	80FF _H
020C _H	Low	C _H	Port10 Configuration		rw	80FF _H
020D _H	High	D _H	Port 11 Configuration		rw	80FF _H
020E	Low	E _H	Port 12 Configuration		rw	80FF _H
020f	High	F _H	Port 13 Configuration		rw	80FF _H
0210 _H	Low	10 _H	Port 14 Configuration		rw	80FF _H
0211 _H	High	11 _H	Port 15 Configuration		rw	80FF _H
0212 _H	Low	12 _H	Reserved		rw	80FF _H
0213 _H	High	13 _H	Reserved		rw	80FF _H
0214 _H	Low	14 _H	Reserved		rw	80FF _H
0215 _H	High	15 _H	Reserved		rw	80FF _H
0216 _H	Low	16 _H	Reserved		rw	80FF _H
0217 _H	High	17 _H	Reserved		rw	80FF _H
0218 _H	Low	18 _H	Reserved		rw	80FF _H
0219 _H	High	19 _H	Reserved		rw	80FF _H
021A _H	Low	1A _H	Port 16 Configuration		rw	80FF _H
021B _H	High	1B _H	Port 17 Configuration		rw	80FF _H
021C _H	Low	1C _H	Miscellaneous Configuration		rw	820 _H
021D _H	High	1D _H	TOS Priority Map	VLAN Priority Map	rw	0 _H
021E _H	Low	1E _H	Forwarding Group 0 Outbound Port Map Low		rw	FFFF _H
021F _H	High	1F _H	Forwarding Group 0 Outbound Port Map High		rw	3FF _H
0220 _H	Low	20 _H	Forwarding Group 1 Outbound Port Map Low		rw	FFFF _H
0221 _H	High	21 _H	Forwarding Group 1 Outbound Port Map High		rw	3FF

EEPROM Register Format

Table 15 EEPROM Format (cont'd)

Offset Hex		Index	Bit 15 - 8	Bit 7 - 0	Type	Default
0222 _H	Low	22 _H	Forwarding Group 2 Outbound Port Map Low		rw	FFFF _H
0223 _H	High	23 _H	Forwarding Group 2 Outbound Port Map High		rw	3FF _H
0224 _H	Low	24 _H	Forwarding Group 3 Outbound Port Map Low		rw	FFFF _H
0225 _H	High	25 _H	Forwarding Group 3 Outbound Port Map High		rw	3FF _H
0226 _H	Low	26 _H	Forwarding Group 4 Outbound Port Map Low		rw	FFFF _H
0227 _H	High	27 _H	Forwarding Group 4 Outbound Port Map High		rw	3FF _H
0228 _H	Low	28 _H	Forwarding Group 5 Outbound Port Map Low		rw	FFFF _H
0229 _H	High	29 _H	Forwarding Group 5 Outbound Port Map High		rw	3FF _H
022A _H	Low	2A _H	Forwarding Group 6 Outbound Port Map Low		rw	FFFF _H
022B _H	High	2B _H	Forwarding Group 6 Outbound Port Map High		rw	3FF _H
022C _H	Low	2C _H	Forwarding Group 7 Outbound Port Map Low		rw	FFFF _H
022D _H	High	2D _H	Forwarding Group 7 Outbound Port Map High		rw	3FF _H
022E _H	Low	2E _H	Forwarding Group 8 Outbound Port Map Low		rw	FFFF _H
022F _H	High	2F _H	Forwarding Group 8 Outbound Port Map High		rw	3FF _H
0230 _H	Low	30 _H	Forwarding Group 9 Outbound Port Map Low		rw	FFFF _H
0231 _H	High	31 _H	Forwarding Group 9 Outbound Port Map High		rw	3FF _H
0232 _H	Low	32 _H	Forwarding Group 10 Outbound Port Map Low		rw	FFFF _H
0233 _H	High	33 _H	Forwarding Group 10 Outbound Port Map High		rw	3FF _H
0234 _H	Low	34 _H	Forwarding Group 11 Outbound Port Map Low		rw	FFFF _H
0235 _H	High	35 _H	Forwarding Group 11 Outbound Port Map High		rw	3FF _H
0236 _H	Low	36 _H	Forwarding Group 12 Outbound Port Map Low		rw	FFFF _H
0237 _H	High	37 _H	Forwarding Group 12 Outbound Port Map High		rw	3FF _H
0238 _H	Low	38 _H	Forwarding Group 13 Outbound Port Map Low		rw	FFFF _H
0239 _H	High	39 _H	Forwarding Group 13 Outbound Port Map High		rw	3FF _H
023A _H	Low	3A _H	Forwarding Group 14 Outbound Port Map Low		rw	FFFF _H
023B _H	High	3B _H	Forwarding Group 14 Outbound Port Map High		rw	3FF _H
023C _H	Low	3C _H	Forwarding Group 15 Outbound Port Map Low		rw	FFFF _H
023D _H	High	3D _H	Forwarding Group 15 Outbound Port Map High		rw	3FF _H
023E _H	Low	3E _H	Forwarding Group 16 Outbound Port Map Low		rw	FFFF _H
023F _H	High	3F _H	Forwarding Group 16 Outbound Port Map High		rw	3FF _H
0240 _H	Low	40 _H	Forwarding Group 17 Outbound Port Map Low		rw	FFFF _H
0241 _H	High	41 _H	Forwarding Group 17 Outbound Port Map High		rw	3FF _H
0242 _H	Low	42 _H	Forwarding Group 18 Outbound Port Map Low		rw	FFFF _H
0243 _H	High	43 _H	Forwarding Group 18 Outbound Port Map High		rw	3FF _H
0244 _H	Low	44 _H	Forwarding Group 19 Outbound Port Map Low		rw	FFFF _H
0245 _H	High	45 _H	Forwarding Group 19 Outbound Port Map High		rw	3FF _H
0246 _H	Low	46 _H	Forwarding Group 20 Outbound Port Map Low		rw	FFFF _H
0247 _H	High	47 _H	Forwarding Group 20 Outbound Port Map High		rw	3FF _H
0248 _H	Low	48 _H	Forwarding Group 21 Outbound Port Map Low		rw	FFFF _H
0249 _H	High	49 _H	Forwarding Group 21 Outbound Port Map High		rw	3FF _H

EEPROM Register Format

Table 15 EEPROM Format (cont'd)

Offset Hex		Index	Bit 15 - 8	Bit 7 - 0	Type	Default
024A _H	Low	4A _H	Forwarding Group 22 Outbound Port Map Low		rw	FFFF _H
024B _H	High	4B _H	Forwarding Group 22 Outbound Port Map High		rw	3FF _H
024C _H	Low	4C _H	Forwarding Group 23 Outbound Port Map Low		rw	FFFF _H
024D _H	High	4D _H	Forwarding Group 23 Outbound Port Map High		rw	3FF _H
024E _H	Low	4E _H	Forwarding Group 24 Outbound Port Map Low		rw	FFFF _H
024F _H	High	4F _H	Forwarding Group 24 Outbound Port Map High		rw	3FF _H
0250 _H	Low	50 _H	Forwarding Group 25 Outbound Port Map Low		rw	FFFF _H
0251 _H	High	51 _H	Forwarding Group 25 Outbound Port Map High		rw	3FF _H
0252 _H	Low	52 _H	Forwarding Group 26 Outbound Port Map Low		rw	FFFF _H
0253 _H	High	53 _H	Forwarding Group 26 Outbound Port Map High		rw	3FF _H
0254 _H	Low	54 _H	Forwarding Group 27 Outbound Port Map Low		rw	FFFF _H
0255 _H	High	55 _H	Forwarding Group 27 Outbound Port Map High		rw	3FF _H
0256 _H	Low	56 _H	Forwarding Group 28 Outbound Port Map Low		rw	FFFF _H
0257 _H	High	57 _H	Forwarding Group 28 Outbound Port Map High		rw	3FF _H
0258 _H	Low	58 _H	Forwarding Group 29 Outbound Port Map Low		rw	FFFF _H
0259 _H	High	59 _H	Forwarding Group 29 Outbound Port Map High		rw	3FF _H
025A _H	Low	5A _H	Forwarding Group 30 Outbound Port Map Low		rw	FFFF _H
025B _H	High	5B _H	Forwarding Group 30 Outbound Port Map High		rw	3FF _H
025C _H	Low	5C _H	Forwarding Group 31 Outbound Port Map Low		rw	FFFF _H
025D _H	High	5D _H	Forwarding Group 31 Outbound Port Map High		rw	3FF _H
025E _H	Low	5E _H	PVID shift	P0 VID	rw	1 _H
025F _H	High	5F _H	P1 VID		rw	1 _H
0260 _H	Low	60 _H	P2 VID		rw	1 _H
0261 _H	High	61 _H	P3 VID		rw	1 _H
0262 _H	Low	62 _H	P4 VID		rw	1 _H
0263 _H	High	63 _H	P5 VID		rw	1 _H
0264 _H	Low	64 _H	P6 VID		rw	1 _H
0265 _H	High	65 _H	P7 VID		rw	1 _H
0266 _H	Low	66 _H	P8 VID		rw	1 _H
0267 _H	High	67 _H	P9 VID		rw	1 _H
0268 _H	Low	68 _H	P10 VID		rw	1 _H
0269 _H	High	69 _H	P11 VID		rw	1 _H
026A _H	Low	6A _H	P12 VID		rw	1 _H
026B _H	High	6B _H	P13 VID		rw	1 _H
026C _H	Low	6C _H	P14 VID		rw	1 _H
026D _H	High	6D _H	P15 VID		rw	1 _H
026E _H	Low	6E _H	Reserved		rw	1 _H
026F _H	High	6F _H	Reserved		rw	1 _H
0270 _H	Low	70 _H	Reserved		rw	1 _H
0271 _H	High	71 _H	Reserved		rw	1 _H

EEPROM Register Format

Table 15 EEPROM Format (cont'd)

Offset Hex		Index	Bit 15 - 8	Bit 7 - 0	Type	Default
0272 _H	Low	72 _H	Reserved		rw	1 _H
0273 _H	High	73 _H	Reserved		rw	1 _H
0274 _H	Low	74 _H	Reserved		rw	1 _H
0275 _H	High	75 _H	Reserved		rw	1 _H
0276 _H	Low	76 _H	P16 VID		rw	1 _H
0277 _H	High	77 _H	P17 VID		rw	1 _H
0278 _H	Low	78 _H	P0, P1, P2, P3 Bandwidth Control Register		rw	0 _H
0279 _H	High	79 _H	P4, P5, P6, P7 Bandwidth Control Register		rw	0 _H
027A _H	Low	7A _H	P8, P9, P10, P11 Bandwidth Control Register		rw	0 _H
027B _H	High	7B _H	P12, P13, P14, P15 Bandwidth Control Register		rw	0 _H
027C _H	Low	7C _H	Reserved		rw	0 _H
027D _H	High	7D _H	Reserved		rw	0 _H
027E _H	Low	7E _H	P24, P25 Bandwidth Control Register		rw	0 _H
027F _H	High	7F _H	Bandwidth Control Enable Register Low		rw	0 _H
0280 _H	Low	80 _H	Bandwidth Control Enable Register High		rw	0 _H
0281 _H	High	81 _H	Reserved		rw	0 _H
0282 _H	Low	82 _H	Reserved		rw	0 _H
0283 _H	High	83 _H	Reserved		rw	100 _H
0284 _H	Low	84 _H	Reserved		rw	0 _H
0285 _H	High	85 _H	Reserved		rw	0 _H
0286 _H	Low	86 _H	Reserved		rw	0 _H
0287 _H	High	87 _H	Reserved		rw	0 _H
0288 _H	Low	88 _H	Reserved		rw	0 _H
0289 _H	High	89 _H	Reserved		rw	0 _H
028A _H	Low	8A _H	Reserved		rw	FF00 _H
028B _H	HIGH	8B _H	Customized PHY Control Group 0		rw	0 _H
028C _H	Low	8C _H	Customized PHY Control Group 1		rw	0 _H
028D _H	HIGH	8D _H	Customized PHY Control Group 2		rw	0 _H
028E _H	Low	8E _H	Customized PHY Control Group 3		rw	0 _H
028F _H	HIGH	8F _H	Group 0 PHY Customized DATA 0		rw	0 _H
0290 _H	Low	90 _H	Group 0 PHY Customized DATA 1		rw	0 _H
0291 _H	HIGH	91 _H	Group 1 PHY Customized DATA 0		rw	0 _H
0292 _H	Low	92 _H	Group 1 PHY Customized DATA 1		rw	0 _H
0293 _H	HIGH	93 _H	Group 2 PHY Customized DATA 0		rw	0 _H
0294 _H	Low	94 _H	Group 2 PHY Customized DATA 1		rw	0 _H
0295 _H	HIGH	95 _H	Group 3 PHY Customized DATA 0		rw	0 _H
0296 _H	Low	96 _H	Group 3 PHY Customized DATA 1		rw	0 _H
0297 _H	HIGH	97 _H	PHY Customized Enable Register		rw	0 _H
0298 _H	Low	98 _H	PPPOE Control Register 0		rw	0 _H
0299 _H	HIGH	99 _H	PPPOE Control Register 1		rw	0 _H

EEPROM Register Format

Table 15 EEPROM Format (cont'd)

Offset Hex		Index	Bit 15 - 8	Bit 7 - 0	Type	Default
029A _H	Low	9A _H	PHY Control Register 0		rw	0 _H
029B _H	HIGH	9B _H	PHY Control Register 1		rw	0 _H
029C _H	Low	9C _H	Disable MDIO Active Register 0		rw	0 _H
029D _H	HIGH	9D _H	Disable MDIO Active Register 1		rw	0 _H
029E _H	Low	9E _H	Disable Port Register 0		rw	0 _H
029F _H	HIGH	9F _H	Disable Port Register 1		rw	0 _H
02A0 _H	Low	A0 _H	IGMP Enable Register 0		rw	0 _H
02A1 _H	HIGH	A1 _H	IGMP Enable Register 1		rw	0 _H
02A2 _H	Low	A2 _H	CPU Control Register		rw	001F _H
02A3 _H	HIGH	A3 _H	MAC Forward Mode Register 0		rw	4 _H
02A4 _H	Low	A4 _H	MAC Forward Mode Register 1		rw	3 _H
02A5 _H	HIGH	A5 _H	MAC Forward Mode Register 2		rw	0 _H
02A6 _H	Low	A6 _H	Trunking Enable Register 0		rw	0 _H
02A7 _H	HIGH	A7 _H	Trunking Enable Register 1		rw	0 _H

4.1 EEPROM Registers

Table 16 Registers Address Space

Module	Base Address	End Address	Note
EEPROM	0200 _H	02A7 _H	

Table 17 Registers Overview

Register Short Name	Register Long Name	Offset Address	Page Number
SIG	Signature	0200 _H	41
GCR	Global Configuration Register	0201 _H	41
PCR_0	Port 0 Configuration Register	0202 _H	43
PCR_1	Port 1 Configuration	0203 _H	46
PCR_2	Port 2 Configuration	0204 _H	46
PCR_3	Port 3 Configuration	0205 _H	46
PCR_4	Port 4 Configuration	0206 _H	46
PCR_5	Port 5 Configuration	0207 _H	46
PCR_6	Port 6 Configuration	0208 _H	46
PCR_7	Port 7 Configuration	0209 _H	46
PCR_8	Port 8 Configuration	020A _H	46
PCR_9	Port 9 Configuration	020B _H	46
PCR_10	Port 10 Configuration	020C _H	46
PCR_11	Port 11 Configuration	020D _H	46
PCR_12	Port 12 Configuration	020E _H	46
PCR_13	Port 13 Configuration	020F _H	46
PCR_14	Port 14 Configuration	0210 _H	46
PCR_15	Port 15 Configuration	0211 _H	46
RES1	Reserved Register 1	0212 _H	46
RES2	Reserved Register 2	0213 _H	47
RES3	Reserved Register 3	0214 _H	47
RES4	Reserved Register 4	0215 _H	47
RES5	Reserved Register 5	0216 _H	47
RES6	Reserved Register 6	0217 _H	47
RES7	Reserved Register 7	0218 _H	47
RES8	Reserved Register 8	0219 _H	47
PCR_16	Port 16 Configuration	021A _H	46
PCR_17	Port 17 Configuration	021B _H	46
MC	Miscellaneous Configuration	021C _H	48
VLAN	VLAN(TOS) Priority Map	021D _H	48
FGOPML_0	Forwarding Group 0 Outbound Port Map Low	021E _H	50
FGOPMH_0	Forwarding Group 0 Outbound Port Map High	021F _H	52
FGOPML_1	Forwarding Group 1 Outbound Port Map Low	0220 _H	51
FGOPMH_1	Forwarding Group 1 Outbound Port Map High	0221 _H	53

EEPROM Register Format

Table 17 Registers Overview (cont'd)

Register Short Name	Register Long Name	Offset Address	Page Number
FGOPML_2	Forwarding Group 2 Outbound Port Map Low	0222 _H	51
FGOPMH_2	Forwarding Group 2 Outbound Port Map High	0223 _H	53
FGOPML_3	Forwarding Group 3 Outbound Port Map Low	0224 _H	51
FGOPMH_3	Forwarding Group 3 Outbound Port Map High	0225 _H	53
FGOPML_4	Forwarding Group 4 Outbound Port Map Low	0226 _H	51
FGOPMH_4	Forwarding Group 4 Outbound Port Map High	0227 _H	53
FGOPML_5	Forwarding Group 5 Outbound Port Map Low	0228 _H	51
FGOPMH_5	Forwarding Group 5 Outbound Port Map High	0229 _H	53
FGOPML_6	Forwarding Group 6 Outbound Port Map Low	022A _H	51
FGOPMH_6	Forwarding Group 6 Outbound Port Map High	022B _H	53
FGOPML_7	Forwarding Group 7 Outbound Port Map Low	022C _H	51
FGOPMH_7	Forwarding Group 7 Outbound Port Map High	022D _H	53
FGOPML_8	Forwarding Group 8 Outbound Port Map Low	022E _H	51
FGOPMH_8	Forwarding Group 8 Outbound Port Map High	022F _H	53
FGOPML_9	Forwarding Group 9 Outbound Port Map Low	0230 _H	51
FGOPMH_9	Forwarding Group 9 Outbound Port Map High	0231 _H	53
FGOPML_10	Forwarding Group 10 Outbound Port Map Low	0232 _H	51
FGOPMH_10	Forwarding Group 10 Outbound Port Map High	0233 _H	53
FGOPML_11	Forwarding Group 11 Outbound Port Map Low	0234 _H	51
FGOPMH_11	Forwarding Group 11 Outbound Port Map High	0235 _H	53
FGOPML_12	Forwarding Group 12 Outbound Port Map Low	0236 _H	51
FGOPMH_12	Forwarding Group 12 Outbound Port Map High	0237 _H	53
FGOPML_13	Forwarding Group 13 Outbound Port Map Low	0238 _H	51
FGOPMH_13	Forwarding Group 13 Outbound Port Map High	0239 _H	53
FGOPML_14	Forwarding Group 14 Outbound Port Map Low	023A _H	51
FGOPMH_14	Forwarding Group 14 Outbound Port Map High	023B _H	53
FGOPML_15	Forwarding Group 15 Outbound Port Map Low	023C _H	51
FGOPMH_15	Forwarding Group 15 Outbound Port Map High	023D _H	53
FGOPML_16	Forwarding Group 16 Outbound Port Map Low	023E _H	51
FGOPMH_16	Forwarding Group 16 Outbound Port Map High	023F _H	53
FGOPML_17	Forwarding Group 17 Outbound Port Map Low	0240 _H	51
FGOPMH_17	Forwarding Group 17 Outbound Port Map High	0241 _H	53
FGOPML_18	Forwarding Group 18 Outbound Port Map Low	0242 _H	52
FGOPMH_18	Forwarding Group 18 Outbound Port Map High	0243 _H	53
FGOPML_19	Forwarding Group 19 Outbound Port Map Low	0244 _H	52
FGOPMH_19	Forwarding Group 19 Outbound Port Map High	0245 _H	53
FGOPML_20	Forwarding Group 20 Outbound Port Map Low	0246 _H	52
FGOPMH_20	Forwarding Group 20 Outbound Port Map High	0247 _H	53
FGOPML_21	Forwarding Group 21 Outbound Port Map Low	0248 _H	52
FGOPMH_21	Forwarding Group 21 Outbound Port Map High	0249 _H	53
FGOPML_22	Forwarding Group 22 Outbound Port Map Low	024A _H	52

Table 17 Registers Overview (cont'd)

Register Short Name	Register Long Name	Offset Address	Page Number
FGOPMH_22	Forwarding Group 22 Outbound Port Map High	024B _H	53
FGOPML_23	Forwarding Group 23 Outbound Port Map Low	024C _H	52
FGOPMH_23	Forwarding Group 23 Outbound Port Map High	024D _H	54
FGOPML_24	Forwarding Group 24 Outbound Port Map Low	024E _H	52
FGOPMH_24	Forwarding Group 24 Outbound Port Map High	024F _H	54
FGOPML_25	Forwarding Group 25 Outbound Port Map Low	0250 _H	52
FGOPMH_25	Forwarding Group 25 Outbound Port Map High	0251 _H	54
FGOPML_26	Forwarding Group 26 Outbound Port Map Low	0252 _H	52
FGOPMH_26	Forwarding Group 26 Outbound Port Map High	0253 _H	54
FGOPML_27	Forwarding Group 27 Outbound Port Map Low	0254 _H	52
FGOPMH_27	Forwarding Group 27 Outbound Port Map High	0255 _H	54
FGOPML_28	Forwarding Group 28 Outbound Port Map Low	0256 _H	52
FGOPMH_28	Forwarding Group 28 Outbound Port Map High	0257 _H	54
FGOPML_29	Forwarding Group 29 Outbound Port Map Low	0258 _H	52
FGOPMH_29	Forwarding Group 29 Outbound Port Map High	0259 _H	54
FGOPML_30	Forwarding Group 30 Outbound Port Map Low	025A _H	52
FGOPMH_30	Forwarding Group 30 Outbound Port Map High	025B _H	54
FGOPML_31	Forwarding Group 31 Outbound Port Map Low	025C _H	52
FGOPMH_31	Forwarding Group 31 Outbound Port Map High	025D _H	54
P0VIDS	P0 VID and PVID Shift	025E _H	54
P1_VID	P1 VID Configuration	025F _H	55
P2_VID	P2 VID Configuration	0260 _H	56
P3_VID	P3 VID Configuration	0261 _H	56
P4_VID	P4 VID Configuration	0262 _H	56
P5_VID	P5 VID Configuration	0263 _H	56
P6_VID	P6 VID Configuration	0264 _H	56
P7_VID	P7 VID Configuration	0265 _H	56
P8_VID	P8 VID Configuration	0266 _H	56
P9_VID	P9 VID Configuration	0267 _H	56
P10_VID	P10 VID Configuration	0268 _H	56
P11_VID	P11 VID Configuration	0269 _H	56
P12_VID	P12 VID Configuration	026A _H	56
P13_VID	P13 VID Configuration	026B _H	56
P14_VID	P14 VID Configuration	026C _H	56
P15_VID	P15 VID Configuration	026D _H	56
RES9	Reserved Register 9	026E _H	47
RES10	Reserved Register 10	026F _H	47
RES11	Reserved Register 11	0270 _H	47
RES12	Reserved Register 12	0271 _H	47
RES13	Reserved Register 13	0272 _H	47
RES14	Reserved Register 14	0273 _H	47

Table 17 Registers Overview (cont'd)

Register Short Name	Register Long Name	Offset Address	Page Number
RES15	Reserved Register 15	0274 _H	47
RES16	Reserved Register 16	0275 _H	47
P24_VID	P24 VID Configuration	0276 _H	56
P25_VID	P25 VID Configuration	0277 _H	56
P0_3_BCR	P0, P1, P2, P3 Bandwidth Control Register	0278 _H	56
P4_7_BCR	P4, P5, P6, P7 Bandwidth Control Register	0279 _H	57
P8_11_BCR	P8, P9, P10, P11 Bandwidth Control Register	027A _H	59
P12_15_BCR	P12, P13, P14, P15 Bandwidth Control Register	027B _H	60
RES17	Reserved Register 17	027C _H	47
RES18	Reserved Register 18	027D _H	47
P24_25_BCR	P24, P25 Bandwidth Control Register	027E _H	61
BCERL	Bandwidth Control Enable Register Low	027F _H	62
BCERH	Bandwidth Control Enable Register High	0280 _H	63
RES19	Reserved Register 19	0281 _H	47
RES20	Reserved Register 20	0282 _H	47
RES21	Reserved Register 21	0283 _H	47
RES22	Reserved Register 22	0284 _H	47
RES23	Reserved Register 23	0285 _H	47
RES24	Reserved Register 24	0286 _H	47
RES25	Reserved Register 25	0287 _H	47
RES26	Reserved Register 26	0288 _H	47
RES27	Reserved Register 27	0289 _H	47
RES28	Reserved Register 28	028A _H	47
CPHYCG0	Customized PHY Control Group 0	028B _H	63
CPHYCG1	Customized PHY Control Group 1	028C _H	65
CPHYCG2	Customized PHY Control Group 2	028D _H	66
CPHYCG3	Customized PHY Control Group 3	028E _H	66
G0PHYCD0	Group 0 PHY Customized DATA 0	028F _H	67
G0PHYCD1	Group 0 PHY Customized DATA 1	0290 _H	67
G1PHYCD0	Group 1 PHY Customized DATA 0	0291 _H	68
G1PHYCD1	Group 1 PHY Customized DATA 1	0292 _H	68
G2PHYCD0	Group 2 PHY Customized DATA 0	0293 _H	68
G2PHYCD1	Group 2 PHY Customized DATA 1	0294 _H	69
G3PHYCD0	Group 3 PHY Customized DATA 0	0295 _H	69
G3PHYCD1	Group 3 PHY Customized DATA 1	0296 _H	69
PHYCE	PHY Customized Enable Register	0297 _H	70
PPPOEC0	PPPOE Control Register 0	0298 _H	71
PPPOEC1	PPPOE Control Register 1	0299 _H	72
PHYCR0	PHY Control Register 0	029A _H	72
PHYCR1	PHY Control Register 1	029B _H	73
DMDIOAR0	Disable MDIO Active Register 0	029C _H	74

EEPROM Register Format

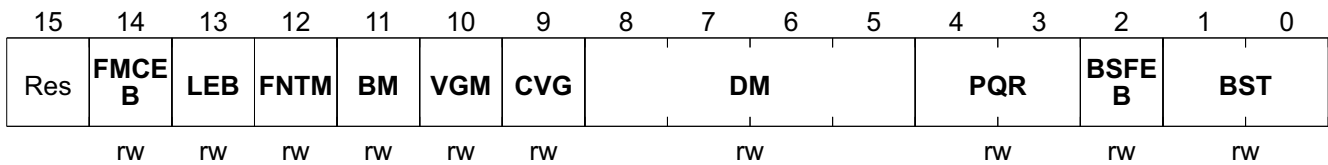
Table 17 Registers Overview (cont'd)

Register Short Name	Register Long Name	Offset Address	Page Number
DMDIOAR1	Disable MDIO Active Register 1	029D _H	75
PDR0	Port Disable Register 0	029E _H	75
PDR1	Port Disable Register 1	029F _H	76
IGMPSCR0	IGMP Snooping Control Register 0	02A0 _H	76
IGMPSCR1	IGMP Snooping Control Register 1	02A1 _H	77
CPUCR	CPU Control Register	02A2 _H	78
SMACFCR0	Special MAC Forward Control Register 0	02A3 _H	80
SMACFCR1	Special MAC Forward Control Register 1	02A4 _H	81
SMACFCR2	Special MAC Forward Control Register 2	02A5 _H	82
TER0	Trunking Enable Register 0	02A6 _H	83
TER1	Trunking Enable Register 1	02A7 _H	84

The register is addressed wordwise.

Table 18 Register Access Types

Mode	Symbol	Description HW	Description SW
read/write	rw	Register is used as input for the HW	Register is read and writable by SW
read	r	Register is written by HW (register between input and output -> one cycle delay)	Value written by software is ignored by hardware; that is, software may write any value to this field without affecting hardware behavior (= Target for development.)
Read only	ro	Register is set by HW (register between input and output -> one cycle delay)	SW can only read this register
Read virtual	rv	Physically, there is no new register, the input of the signal is connected directly to the address multiplexer.	SW can only read this register
Latch high, self clearing	lhsc	Latch high signal at high level, clear on read	SW can read the register
Latch low, self clearing	llsc	Latch high signal at low-level, clear on read	SW can read the register
Latch high, mask clearing	lhmk	Latch high signal at high level, register cleared with written mask	SW can read the register, with write mask the register can be cleared (1 clears)
Latch low, mask clearing	llmk	Latch high signal at low-level, register cleared on read	SW can read the register, with write mask the register can be cleared (1 clears)
Interrupt high, self clearing	ihsc	Differentiate the input signal (low->high) register cleared on read	SW can read the register
Interrupt low, self clearing	ilsc	Differentiate the input signal (high->low) register cleared on read	SW can read the register
Interrupt high, mask clearing	ihmk	Differentiate the input signal (high->low) register cleared with written mask	SW can read the register, with write mask the register can be cleared
Interrupt low, mask clearing	ilmk	Differentiate the input signal (low->high) register cleared with written mask	SW can read the register, with write mask the register can be cleared

EEPROM Register Format


Field	Bits	Type	Description
FMCEB	14	rw	Fast Management Clock Enable Bit 0 _B , The switch will use 2.5 M clock to configure the phys. 1 _B , The switch will use 10 M clock to configure the phys.
LEB	13	rw	Length 1536 Enable Bit 0 _B , The switch can receive packets of less then 1518 bytes. 1 _B , The switch can receive packets of less than 1536 bytes.
FNTM	12	rw	Force No Tag Mode 0 _B , The switch is not configured to Force No Tag Mode. 1 _B , The switch is configured to Force No Tag Mode. In this mode, the ADM6918/X will not recognize the VLAN TAG even if they contain a Tag Header.
BM	11	rw	Bypass Mode 0 _B , The switch is not configured to Bypass Mode. 1 _B , The switch is configured to Bypass Mode. The packets will not be modified when they are transmitted.
VGM	10	rw	VLAN Group Mode 1 _B , The switch is configured to Tagged Based VLAN 0 _B , The switch is configured to Port Based VLAN.
CVG	9	rw	Check VLAN Group 0 _B , The ADM6918/X will disable the Check VLAN Group function. 1 _B , The ADM6918/X will check if the packets and the receiving port are at the same Forwarding Group. That is, the output port map for the receiving packet must contain the receiving port. If they belong to different Forwarding Group, the receiving packets will be discarded. <i>Note: Example: Port 3 receives a packet and finds Forwarding Group contains P0, P1, and P2 (doesn't contain P3). This packet will be dropped.</i>
DM	8:5	rw	Discard Mode This function enables the switch to discard packets according to their priorities if the receiving port disables the flow control function. Users could use this to prevent packets with the low priority to block those with high priority. Bit[8:7] = High Queue Discard Mode (see Sec. 3.1.18) Bit[6:5] = Low Queue Discard Mode

EEPROM Register Format

Field	Bits	Type	Description
PQR	4:3	rw	Priority Queue Ratio The ADM6918/X supports two priorities on each output port using weighted round robin scheme. The ratio between the low and high queue is as follows: Bit[4:3] Ratio 00 _B , 1:2 01 _B , 1:4 10 _B , 1:8 11 _B , 1:16
BSFEB	2	rw	Broadcast Storm Filtering Enable Bit 0 _B , The ADM6918/X disables the broadcast storm filtering function. 1 _B , The ADM6918/X enables the broadcast storm filtering function.
BST	1:0	rw	Broadcast Storm Threshold

Port 0 Configuration Register

PCR_0 **Offset**
Port 0 Configuration Register **0202_H** **Reset Value**
80FF_H

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
BPEB	FSM	PPM	EPP	TVP	SFE	TP	DA	SA	ANEM CR	FCAF D	100F DAAR	100H DAAR	10FD AAR	10HD AAR	
rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw

Field	Bits	Type	Description
BPEB	15	rw	Back Pressure Enable Bit 0 _B , The MAC controller doesn't support back-pressure function in half duplex. 1 _B , The MAC controller supports back-pressure function in half duplex.

EEPROM Register Format

Field	Bits	Type	Description
FSM	14:13	rw	Four Security Mode 00 _B , The switch will forward packets with “unknown source addresses” to the CPU port and not learn it if the receiving port is configured to enable security function. The “unknown source address” means that we can’t find an equal address existed in the learning table and its corresponding port number equals to the receiving port. This function needs CUP’s help because we need to create a “static address” to the learning table from the CPU. “Static” means this address will always exist in the leaning table and can only be removed through the CPU. When the address is configured to “Static”, we can prevent this address from overlapping when it is received from a port without the security function enabled. 01 _B , The switch will discard packets with “unknown source addresses” and not learn it if the receiving port is configured to enable security function. Only packets with source addresses existed in the learning table will be forwarded. 10 _B , The first received packets will be locked at the receiving port if the receiving port is configured to enable security function. Only the packets with the source address same as the locked one will be forwarded and learned. 11 _B , The first received packets will be locked as above. The difference is that the receiving port will not receive and learn packets any more after the link goes down even it links up again (it may happen if the station moves to the other port).
PPM	12	rw	Port-base Priority Mapping 0 _B , Mapped for the Low Queue. 1 _B , Mapped for the High Queue.
EPP	11	rw	Enable Port-base Priority 0 _B , The switch will use the IPv4 or Tag priority fields for the queue mapping (See Bit [10]). If the packets contain no priority field, then the switch will use the Port-Priority for the default priority. 1 _B , The switch will always use the Port-Priority for the queue mapping even if the receiving packets contain IPv4 or Tag information.
TVP	10	rw	TOS over VLAN Priority 0 _B , When the receiving packets contain the IPv4 and Tag Priority at the same time, the switch will use Tag priority field for the queue mapping. 1 _B , When the receiving packets contain the IPv4 and Tag Priority at the same time, the switch will use IPv4 priority field for the queue mapping.
SFE	9	rw	Security Function Enable 0 _B , The switch disables the security function. 1 _B , The switch enables the security function. Four security modes could be selected through Bit[14:13].

EEPROM Register Format

Field	Bits	Type	Description
TP	8	rw	Tagged Port 0_B , The transmitted port is configured to an untagged port. The transmitted packets from an untagged port will not contain a Tag Header except the transmitted packets are management packet or the Bypass Mode is enabled. 1_B , The transmitted port is configured to a tagged port. The transmitted packets from a tagged port will always contain a Tag Header except the transmitted packets are management packet or the Bypass Mode is enabled.
DA	7	rw	Duplex Ability This bit will be used as Bit 8 (Duplex Select) in the Basic Mode Control Register if bypass management function is not enabled, and be used as Duplex Desired if bypass management function is enabled. 0_B , Half Duplex Enabled. 1_B , Full Duplex Enabled.
SA	6	rw	Speed Ability This bit will be used as Bit 13 (Speed Select) in the Basic Mode Control Register if bypass management function is not enabled, and be used as Speed Desired if bypass management function is enabled. 0_B , 10 Mbit/s Enabled. 1_B , 100 Mbit/s Enabled.
ANEMCR	5	rw	Auto Negotiation Enable in Basic Mode Control Register 0_B , Auto-Negotiation is Disabled. 1_B , Auto-Negotiation is Enabled.
FCAFD	4	rw	802.3x Flow Control Ability in Full Duplex 0_B , (1). Mac controller doesn't support Pause Frames when the port is configured to bypass management function from MDC/MDIO. (2). If the port is not configured to bypass management function form MDC/MDIO, then it will be used as the Pause bit in Auto-Negotiation Advertisement Register and the Pause function will not be advertised. If Auto-Negotiation function is disabled, then this bit is used and Pause is not supported. (3). If the port is not configured to bypass management function from MDC/MDIO and no PHY is attached to this port, the MAC controller will not support Pause Frames in the full duplex. 1_B , (1). MAC controller supports Pause Frames when the port is configured to bypass management function from MDC/MDIO. (2). If the port is not configured to bypass management function form MDC/MDIO, then it will be used as the Pause bit in Auto-Negotiation Advertisement Register and the Pause function will be advertised. If Auto-Negotiation function is disabled, then this bit is used and Pause is supported. (3). If the port is not configured to bypass management function from MDC/MDIO and no PHY is attached to this port, the MAC controller will support Pause Frames in the full duplex.
100FDAAR	3	rw	100Base-TX Full Duplex Ability in Auto-Negotiation Advertisement Register 0_B , 100Base-Tx Full Duplex is not advertised. 1_B , 100Base-TX Full Duplex is advertised.

EEPROM Register Format

Field	Bits	Type	Description
100HDAAR	2	rw	100Base-TX Half Duplex Ability in Auto-Negotiation Advertisement Register 0 _B , 100Base-TX Half Duplex is not advertised. 1 _B , 100Base-TX Half Duplex is advertised.
10FDAAR	1	rw	10Base-T Full Duplex Ability in Auto-Negotiation Advertisement Register 0 _B , 10Base-T Full Duplex is not advertised. 1 _B , 10Base-T Full Duplex is advertised.
10HDAAR	0	rw	10Base-T Half Duplex Ability in Auto-Negotiation Advertisement Register 0 _B , 10Base-T Half Duplex is not advertised. 1 _B , 10Base-T Half Duplex is advertised.

All PCR_x registers have the same structure and characteristics, see [PCR_0](#).
 The offset addresses of the other PCR_x registers are listed in [Table 20](#).

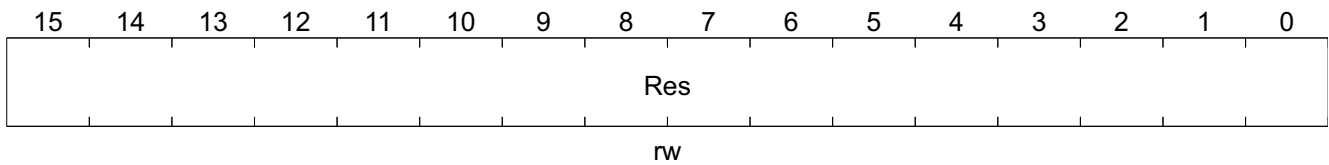
Table 20 PCR_x Registers

Register Short Name	Register Long Name	Offset Address	Page Number
PCR_1	Port 1 Configuration	0203 _H	
PCR_2	Port 2 Configuration	0204 _H	
PCR_3	Port 3 Configuration	0205 _H	
PCR_4	Port 4 Configuration	0206 _H	
PCR_5	Port 5 Configuration	0207 _H	
PCR_6	Port 6 Configuration	0208 _H	
PCR_7	Port 7 Configuration	0209 _H	
PCR_8	Port 8 Configuration	020A _H	
PCR_9	Port 9 Configuration	020B _H	
PCR_10	Port 10 Configuration	020C _H	
PCR_11	Port 11 Configuration	020D _H	
PCR_12	Port 12 Configuration	020E _H	
PCR_13	Port 13 Configuration	020F _H	
PCR_14	Port 14 Configuration	0210 _H	
PCR_15	Port 15 Configuration	0211 _H	
PCR_16	Port 16 Configuration	021A _H	
PCR_17	Port 17 Configuration	021B _H	

Reserved Register 1

RES1	Offset	Reset Value
Reserved Register 1	0212 _H	Table 15

EEPROM Register Format



Field	Bits	Type	Description
Res	15:0	rw	Reserved For the future use and don't modify the values. Default: See Chapter 4

All RESx registers have the same structure and characteristics, see [RES1](#). The offset addresses of the other RESx registers are listed in [Table 21](#).

Table 21 Resx Registers

Register Short Name	Register Long Name	Offset Address	Page Number
RES2	Reserved Register 2	0213 _H	
RES3	Reserved Register 3	0214 _H	
RES4	Reserved Register 4	0215 _H	
RES5	Reserved Register 5	0216 _H	
RES6	Reserved Register 6	0217 _H	
RES7	Reserved Register 7	0218 _H	
RES8	Reserved Register 8	0219 _H	
RES9	Reserved Register 9	026E _H	
RES10	Reserved Register 10	026F _H	
RES11	Reserved Register 11	0270 _H	
RES12	Reserved Register 12	0271 _H	
RES13	Reserved Register 13	0272 _H	
RES14	Reserved Register 14	0273 _H	
RES15	Reserved Register 15	0274 _H	
RES16	Reserved Register 16	0275 _H	
RES17	Reserved Register 17	027C _H	
RES18	Reserved Register 18	027D _H	
RES19	Reserved Register 19	0281 _H	
RES20	Reserved Register 20	0282 _H	
RES21	Reserved Register 21	0283 _H	
RES22	Reserved Register 22	0284 _H	
RES23	Reserved Register 23	0285 _H	
RES24	Reserved Register 24	0286 _H	
RES25	Reserved Register 25	0287 _H	
RES26	Reserved Register 26	0288 _H	
RES27	Reserved Register 27	0289 _H	
RES28	Reserved Register 28	028A _H	

EEPROM Register Format
Miscellaneous Configuration

MC **Offset** **Reset Value**
Miscellaneous Configuration **021C_H** **0820_H**

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Res		Res				CLED E	Res				ERID	Res	RCD	DBF	
rw		rw				rw				rw		rw		rw	

Field	Bits	Type	Description
Res	13:10	rw	Reserved
CLEDE	9	rw	Collision LED Enable 0 _B , The switch will not provide two collision LEDs for 10M and 100M domain individually 1 _B , The switch will provide two collision LEDs for 10M and 100M domain individually and flash in rate of 2 Hz.
Res	8:4	rw	Reserved
ERID	3	rw	Enable Replace VLAN ID 0 _B , The switch will use the original VID received from the Tag Header. 1 _B , The switch will replace the VID with the PVID associated with the receiving port when the received packets are priority tagged or its VID in the Tag Header equals to 1.
Res	2	rw	Reserved
RCD	1	rw	Recommend 16th Collision Drop 0 _B , The Mac controller will retransmit packets even when the collision count is larger than 16. 1 _B , The Mac controller will drop packets when the collision count is larger than 16.
DBF	0	rw	Disable CSMA/CD Back-off Function 0 _B , The Mac controller supports random back off function. 1 _B , The MAC controller will disable random back off function.

VLAN(TOS) Priority Map

VLAN **Offset** **Reset Value**
VLAN(TOS) Priority Map **021D_H** **0000_H**

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
MPQ7	MPQ6	MPQ5	MPQ4	MPQ3	MPQ2	MPQ1	MPQ0	MPQT 7	MPQT 6	MPQT 5	MPQT 4	MPQT 3	MPQT 2	MPQT 1	MPQT 0
rw		rw		rw		rw		rw		rw		rw		rw	

Field	Bits	Type	Description
MPQ7	15	rw	Mapped Priority Queue of TOS 7 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQ6	14	rw	Mapped Priority Queue of TOS 6 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQ5	13	rw	Mapped Priority Queue of TOS 5 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQ4	12	rw	Mapped Priority Queue of TOS 4 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQ3	11	rw	Mapped Priority Queue of TOS 3 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQ2	10	rw	Mapped Priority Queue of TOS 2 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQ1	9	rw	Mapped Priority Queue of TOS 1 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQ0	8	rw	Mapped Priority Queue of TOS 0 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQT7	7	rw	Mapped Priority Queue of Tag Value 7 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQT6	6	rw	Mapped Priority Queue of Tag Value 6 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQT5	5	rw	Mapped Priority Queue of Tag Value 5 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQT4	4	rw	Mapped Priority Queue of Tag Value 4 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQT3	3	rw	Mapped Priority Queue of Tag Value 3 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQT2	2	rw	Mapped priority Queue of Tag Value 2 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue
MPQT1	1	rw	Mapped Priority Queue of Tag Value 1 0 _B , Mapped for Low Queue 1 _B , Mapped for High Queue

EEPROM Register Format

Field	Bits	Type	Description
FG_6	6	rw	Forwarding Group Port 6 0 _B , Port 6 is not in the Forwarding Group 1 _B , Port 6 is in the Forwarding Group
FG_5	5	rw	Forwarding Group Port 5 0 _B , Port 5 is not in the Forwarding Group 1 _B , Port 5 is in the Forwarding Group
FG_4	4	rw	Forwarding Group Port 4 0 _B , Port 4 is not in the Forwarding Group 1 _B , Port 4 is in the Forwarding Group
FG_3	3	rw	Forwarding Group Port 3 0 _B , Port 3 is not in the Forwarding Group 1 _B , Port 3 is in the Forwarding Group
FG_2	2	rw	Forwarding Group Port 2 0 _B , Port 2 is not in the Forwarding Group 1 _B , Port 2 is in the Forwarding Group
FG_1	1	rw	Forwarding Group Port 1 0 _B , Port 1 is not in the Forwarding Group 1 _B , Port 1 is in the Forwarding Group
FG_0	0	rw	Forwarding Group Port 0 0 _B , Port 0 is not in the Forwarding Group 1 _B , Port 0 is in the Forwarding Group

All FGOPML_x registers have the same structure and characteristics, see [FGOPML_0](#). The offset addresses of the other FGOPML_x registers are listed in [Table 22](#).

Table 22 FGOPML_x Registers

Register Short Name	Register Long Name	Offset Address	Page Number
FGOPML_1	Forwarding Group 1 Outbound Port Map Low	0220 _H	
FGOPML_2	Forwarding Group 2 Outbound Port Map Low	0222 _H	
FGOPML_3	Forwarding Group 3 Outbound Port Map Low	0224 _H	
FGOPML_4	Forwarding Group 4 Outbound Port Map Low	0226 _H	
FGOPML_5	Forwarding Group 5 Outbound Port Map Low	0228 _H	
FGOPML_6	Forwarding Group 6 Outbound Port Map Low	022A _H	
FGOPML_7	Forwarding Group 7 Outbound Port Map Low	022C _H	
FGOPML_8	Forwarding Group 8 Outbound Port Map Low	022E _H	
FGOPML_9	Forwarding Group 9 Outbound Port Map Low	0230 _H	
FGOPML_10	Forwarding Group 10 Outbound Port Map Low	0232 _H	
FGOPML_11	Forwarding Group 11 Outbound Port Map Low	0234 _H	
FGOPML_12	Forwarding Group 12 Outbound Port Map Low	0236 _H	
FGOPML_13	Forwarding Group 13 Outbound Port Map Low	0238 _H	
FGOPML_14	Forwarding Group 14 Outbound Port Map Low	023A _H	
FGOPML_15	Forwarding Group 15 Outbound Port Map Low	023C _H	
FGOPML_16	Forwarding Group 16 Outbound Port Map Low	023E _H	
FGOPML_17	Forwarding Group 17 Outbound Port Map Low	0240 _H	

Field	Bits	Type	Description
FG_20	4	rw	Forwarding Group Port 20 0 _B , Port 20 is not in the Forwarding Group 1 _B , Port 20 is in the Forwarding Group
FG_19	3	rw	Forwarding Group Port 19 0 _B , Port 19 is not in the Forwarding Group 1 _B , Port 19 is in the Forwarding Group
FG_18	2	rw	Forwarding Group Port 18 0 _B , Port 18 is not in the Forwarding Group 1 _B , Port 18 is in the Forwarding Group
FG_17	1	rw	Forwarding Group Port 17 0 _B , Port 17 is not in the Forwarding Group 1 _B , Port 17 is in the Forwarding Group
FG_16	0	rw	Forwarding Group Port 16 0 _B , Port 16 is not in the Forwarding Group 1 _B , Port 16 is in the Forwarding Group

All FGOPMH_x registers have the same structure and characteristics, see [FGOPMH_0](#). The offset addresses of the other FGOPMH_x registers are listed in [Table 23](#).

Table 23 FGOPMH_x Registers

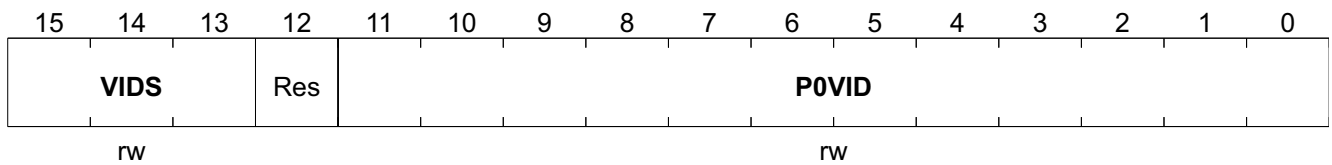
Register Short Name	Register Long Name	Offset Address	Page Number
FGOPMH_1	Forwarding Group 1 Outbound Port Map High	0221 _H	
FGOPMH_2	Forwarding Group 2 Outbound Port Map High	0223 _H	
FGOPMH_3	Forwarding Group 3 Outbound Port Map High	0225 _H	
FGOPMH_4	Forwarding Group 4 Outbound Port Map High	0227 _H	
FGOPMH_5	Forwarding Group 5 Outbound Port Map High	0229 _H	
FGOPMH_6	Forwarding Group 6 Outbound Port Map High	022B _H	
FGOPMH_7	Forwarding Group 7 Outbound Port Map High	022D _H	
FGOPMH_8	Forwarding Group 8 Outbound Port Map High	022F _H	
FGOPMH_9	Forwarding Group 9 Outbound Port Map High	0231 _H	
FGOPMH_10	Forwarding Group 10 Outbound Port Map High	0233 _H	
FGOPMH_11	Forwarding Group 11 Outbound Port Map High	0235 _H	
FGOPMH_12	Forwarding Group 12 Outbound Port Map High	0237 _H	
FGOPMH_13	Forwarding Group 13 Outbound Port Map High	0239 _H	
FGOPMH_14	Forwarding Group 14 Outbound Port Map High	023B _H	
FGOPMH_15	Forwarding Group 15 Outbound Port Map High	023D _H	
FGOPMH_16	Forwarding Group 16 Outbound Port Map High	023F _H	
FGOPMH_17	Forwarding Group 17 Outbound Port Map High	0241 _H	
FGOPMH_18	Forwarding Group 18 Outbound Port Map High	0243 _H	
FGOPMH_19	Forwarding Group 19 Outbound Port Map High	0245 _H	
FGOPMH_20	Forwarding Group 20 Outbound Port Map High	0247 _H	
FGOPMH_21	Forwarding Group 21 Outbound Port Map High	0249 _H	
FGOPMH_22	Forwarding Group 22 Outbound Port Map High	024B _H	

Table 23 FGOPMH_x Registers (cont'd)

Register Short Name	Register Long Name	Offset Address	Page Number
FGOPMH_23	Forwarding Group 23 Outbound Port Map High	024D _H	
FGOPMH_24	Forwarding Group 24 Outbound Port Map High	024F _H	
FGOPMH_25	Forwarding Group 25 Outbound Port Map High	0251 _H	
FGOPMH_26	Forwarding Group 26 Outbound Port Map High	0253 _H	
FGOPMH_27	Forwarding Group 27 Outbound Port Map High	0255 _H	
FGOPMH_28	Forwarding Group 28 Outbound Port Map High	0257 _H	
FGOPMH_29	Forwarding Group 29 Outbound Port Map High	0259 _H	
FGOPMH_30	Forwarding Group 30 Outbound Port Map High	025B _H	
FGOPMH_31	Forwarding Group 31 Outbound Port Map High	025D _H	

P0 VID and PVID Shift

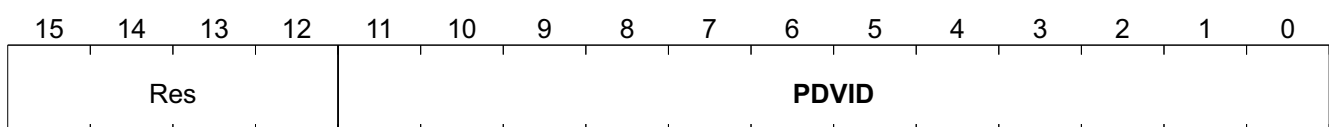
P0VIDS	Offset	Reset Value
P0 VID and PVID Shift	025E_H	0001_H



Field	Bits	Type	Description
VIDS	15:13	rw	<p>VID Shift</p> <p>This function maps 4096 VLAN into 32 Forwarding Groups</p> <p>1. In Tagged Based VLAN, the ADM6918/X will use 5 bits from VID as the Index to map into forwarding groups. 32 forwarding groups are defined in the ADM6918/X. We use F0, F1, ... F31 to call each forwarding group. This looking scheme is different from the Port Based VLAN because Port Based VLAN uses port number as the Index to map into the forwarding groups and then F26 ~ F31 will not be used. The VID is defined as follows:</p> <ul style="list-style-type: none"> The port's Default VID is used if the frame is not 802.3ac Tagged (No Tag Header in the frame). The port's Default VID is used if the frame is 802.3ac Tagged (Tag Header in the frame) and the frame's VID is 0000_H or 0001_H and the Enable Replace VLAN ID function is enabled. The VID in the Tag Header is used if the frame is 802.3 Tagged and the frame's VID is not 0000_H or 0001_H. The VID in the Tag Header is used if the frame is 802.3 Tagged and the frame's VID is 0000_H or 0001_H and Enable Replace VLAN ID function is not enabled. <p>2. The relation between VID Shift, VID and the forwarding group is as follows:</p> <p>Bit[15:13] Forwarding Group</p> <p>000_B , VID[4:0] 001_B , VID[5:1] 010_B , VID[6:2] 011_B , VID[7:3] 100_B , VID[8:4] 101_B , VID[9:5] 110_B , VID[10:6] 111_B , VID[11:7]</p>
POVID	11:0	rw	<p>Port 0 VID</p> <p>The port's Default VID is used if the frame is untagged or if the frame's VID is 0000_H or 0001_H and Enable Replace VLAN ID function (also see Miscellaneous Configuration Register) is enabled.</p>

P1 VID Configuration

P1_VID	Offset	Reset Value
P1 VID Configuration	025F_H	0001_H



rw

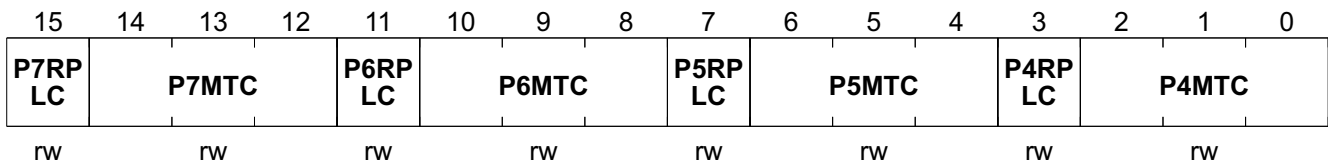
EEPROM Register Format

Field	Bits	Type	Description
P3MTC	14:12	rw	Port 3 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M
P2RPLC	11	rw	Port 2 Receive Packet Length Counted on the Source Port 0 _B , The switch will add length to the P2 counter, default
P2MTC	10:8	rw	Port 2 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M
P1RPLC	7	rw	Port 1 Receive Packet Length Counted on the Source Port 0 _B , The switch will add length to the P1 counter, default
P1MTC	6:4	rw	Port 1 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M
P0RPLC	3	rw	Port 0 Receive Packet Length Counted on the Source Port 0 _B , The switch will add length to the P0 counter, default
P0MTC	2:0	rw	Port 0 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M

P4, P5, P6, P7 Bandwidth Control Register

P4_7_BCR	Offset	Reset Value
P4, P5, P6, P7 Bandwidth Control Register	0279_H	0000_H

EEPROM Register Format



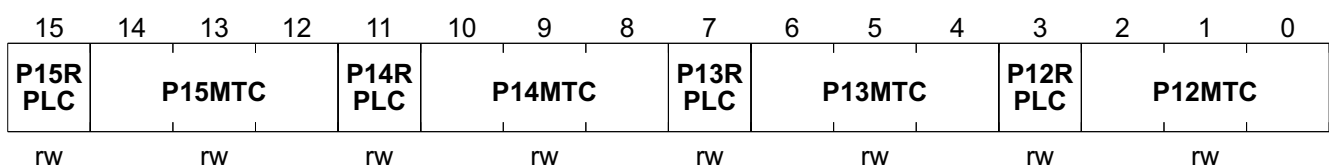
Field	Bits	Type	Description
P7RPLC	15	rw	Port 7 Receive Packet Length Counted on the Source Port 0 _B , The switch will add length to the P7 counter, default
P7MTC	14:12	rw	Port 7 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M
P6RPLC	11	rw	Port 6 Receive Packet Length Counted on the Source Port 0 _B , The switch will add length to the P6 counter, default
P6MTC	10:8	rw	Port 6 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M
P5RPLC	7	rw	Port 5 Receive Packet Length Counted on the Source Port 0 _B , The switch will add length to the P5 counter, default
P5MTC	6:4	rw	Port 5 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M
P4RPLC	3	rw	Port 4 Receive Packet Length Counted on the Source Port 0 _B , The switch will add length to the P4 counter, default

EEPROM Register Format

Field	Bits	Type	Description
P9MTC	6:4	rw	Port 9 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M
P8RPLC	3	rw	Port 8 Receive Packet Length Counted on the Source Port 0 _B , The switch will add length to the P8 counter, default
P8MTC	2:0	rw	Port 8 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M

P12, P13, P14, P15 Bandwidth Control Register

P12_15_BCR	Offset	Reset Value
P12, P13, P14, P15 Bandwidth Control Register	027B_H	0000_H



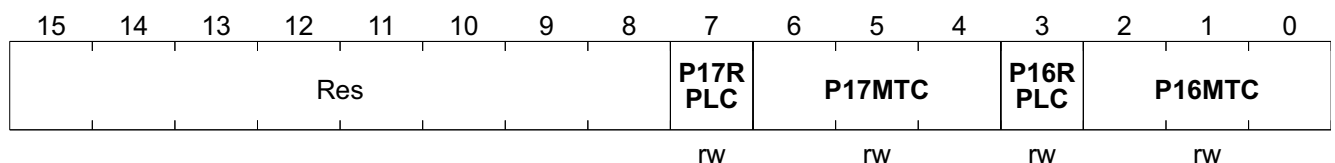
Field	Bits	Type	Description
P15RPLC	15	rw	Port 15 Receive Packet Length Counted on the Source Port 0 _B , The switch will add length to the P15 counter, default
P15MTC	14:12	rw	Port 15 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M

EEPROM Register Format

Field	Bits	Type	Description
P14RPLC	11	rw	Port 14 Receive Packet Length Counted on the Source Port 0 _B , The switch will add length to the P14 counter, default
P14MTC	10:8	rw	Port 14 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M
P13RPLC	7	rw	Port 13 Receive Packet Length Counted on the Source Port 0 _B , The switch will add length to the P13 counter, default
P13MTC	6:4	rw	Port 13 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M
P12RPLC	3	rw	Port 12 Receive Packet Length Counted on the Source Port 0 _B , The switch will add length to the P12 counter, default
P12MTC	2:0	rw	Port 12 Meter Threshold Control 000 _B , 64k, default 001 _B , 128k 010 _B , 256k 011 _B , 512k 100 _B , 1M 101 _B , 4M 110 _B , 10M 111 _B , 20M

P24, P25 Bandwidth Control Register

P24_25_BCR	Offset	Reset Value
P24, P25 Bandwidth Control Register	027E_H	0000_H

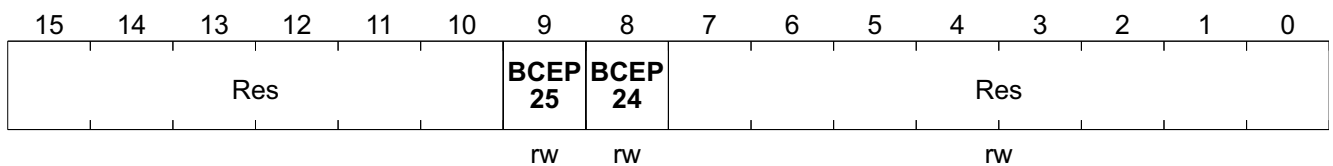


EEPROM Register Format

Field	Bits	Type	Description
BCEP7	7	rw	Bandwidth Control Enable for Port 7
BCEP6	6	rw	Bandwidth Control Enable for Port 6
BCEP5	5	rw	Bandwidth Control Enable for Port 5
BCEP4	4	rw	Bandwidth Control Enable for Port 4
BCEP3	3	rw	Bandwidth Control Enable for Port 3
BCEP2	2	rw	Bandwidth Control Enable for Port 2
BCEP1	1	rw	Bandwidth Control Enable for Port 1
BCEP0	0	rw	Bandwidth Control Enable for Port 0 0_B , Port 0 disables the bandwidth control. 1_B , Port 0 enables the bandwidth control.

Bandwidth Control Enable Register High

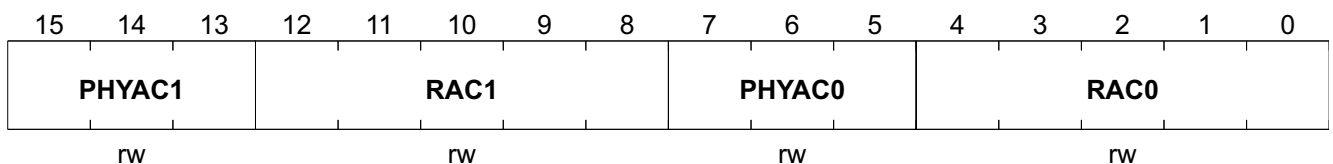
BCERH Offset
 Bandwidth Control Enable Register High 0280_H Reset Value
 0000_H



Field	Bits	Type	Description
BCEP25	9	rw	Bandwidth Control Enable for Port 25
BCEP24	8	rw	Bandwidth Control Enable for Port 24
Res	7:0	rw	Reserved

Customized PHY Control Group 0

CPHYCG0 Offset
 Customized PHY Control Group 0 $028B_H$ Reset Value
 0000_H

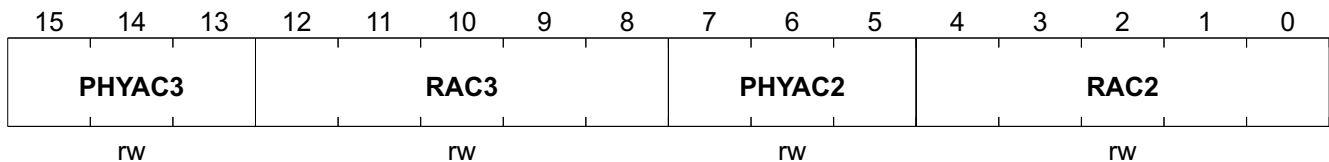


Field	Bits	Type	Description
PHYAC1	15:13	rw	PHY Address of the Command 1 If Bit[2:0] in PHY Customized Enable Register = 010 _B or 011 _B . 000 _B , The switch will write command 1 into Port 0 (PHY Address = 32'h8). 001 _B , The switch will write command 1 into Port 1 (PHY Address = 32'h9). 010 _B , The switch will write command 1 into Port 2 (PHY Address = 32'ha). 011 _B , The switch will write command 1 into Port 3 (PHY Address = 32'hb). 100 _B , The switch will write command 1 into Port 4 (PHY Address = 32'hc). 101 _B , The switch will write command 1 into Port 5 (PHY Address = 32'hd). 110 _B , The switch will write command 1 into Port 6 (PHY Address = 32'he). 111 _B , The switch will write command 1 into Port 7 (PHY Address = 32'hf).
RAC1	12:8	rw	Register Address of the Command 1
PHYAC0	7:5	rw	PHY Address of the Command 0 If Bit[2:0] in PHY Customized Enable Register = 001 _B or 011 _B . 000 _B , The switch will write command 0 into Port 0 (PHY Address = 32'h8). 001 _B , The switch will write command 0 into Port 1 (PHY Address = 32'h9). 010 _B , The switch will write command 0 into Port 2 (PHY Address = 32'ha). 011 _B , The switch will write command 0 into Port 3 (PHY Address = 32'hb). 100 _B , The switch will write command 0 into Port 4 (PHY Address = 32'hc). 101 _B , The switch will write command 0 into Port 5 (PHY Address = 32'hd). 110 _B , The switch will write command 0 into Port 6 (PHY Address = 32'he). 111 _B , The switch will write command 0 into Port 7 (PHY Address = 32'hf).
RAC0	4:0	rw	Register Address of the Command 0

Note: The ADM6918/X supports eight additional commands for the customer to configure the PHY attached. Four groups are defined and each group shares two commands. Group 0 contains P0, P1, P2, P3, P4, P5, P6 and P7. Group 1 contains P8, P9, P10, P11, P12, P13, P14 and P15. Group 2 contains P16, P17, P18, P19, P20, P21, P22 and P23. Group 3 contains P24 and P25. 3 bits enable register is associated with each group. Each command is associated with a PHY address, a register address, and data for writing.

Customized PHY Control Group 1

CPHYCG1	Offset	Reset Value
Customized PHY Control Group 1	028C _H	0000 _H



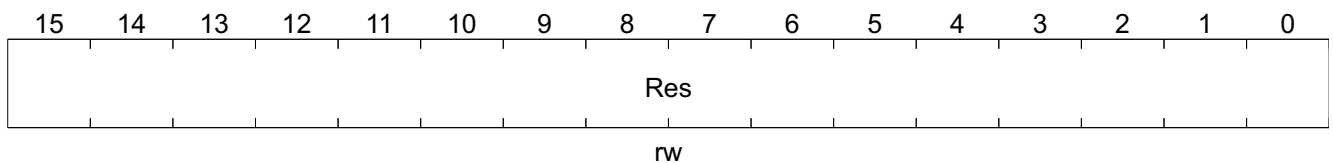
Field	Bits	Type	Description
PHYAC3	15:13	rw	PHY Address of the Command 3 Bit[5:3] in PHY Customized Enable Register = 010 _B or 011 _B . 000 _B , The switch will write command 3 into Port 8 (PHY Address = 32'h10). 001 _B , The switch will write command 3 into Port 9 (PHY Address = 32'h11). 010 _B , The switch will write command 3 into Port 10 (PHY Address = 32'h12). 011 _B , The switch will write command 3 into Port 11 (PHY Address = 32'h13). 100 _B , The switch will write command 3 into Port 12 (PHY Address = 32'h14). 101 _B , The switch will write command 3 into Port 13 (PHY Address = 32'h15). 110 _B , The switch will write command 3 into Port 14 (PHY Address = 32'h16). 111 _B , The switch will write command 3 into Port 15 (PHY Address = 32'h17).
RAC3	12:8	rw	Register Address of the Command 3

EEPROM Register Format

Field	Bits	Type	Description
PHYAC2	7:5	rw	PHY Address of the Command 2 Bit[5:3] in PHY Customized Enable Register = 001 _B or 011 _B . 000 _B , The switch will write command 2 into Port 8 (PHY Address = 32'h10). 001 _B , The switch will write command 2 into Port 9 (PHY Address = 32'h11). 010 _B , The switch will write command 2 into Port 10 (PHY Address = 32'h12). 011 _B , The switch will write command 2 into Port 11 (PHY Address = 32'h13). 100 _B , The switch will write command 2 into Port 12 (PHY Address = 32'h14). 101 _B , The switch will write command 2 into Port 13 (PHY Address = 32'h15). 110 _B , The switch will write command 2 into Port 14 (PHY Address = 32'h16). 111 _B , The switch will write command 2 into Port 15 (PHY Address = 32'h17).
RAC2	4:0	rw	Register Address of the Command 2

Customized PHY Control Group 2

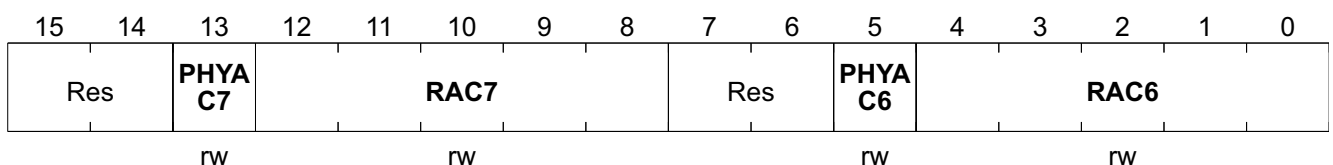
CPHYCG2	Offset	Reset Value
Customized PHY Control Group 2	028D _H	0000 _H



Field	Bits	Type	Description
Res	15:0	rw	Reserved Default 0000 _H

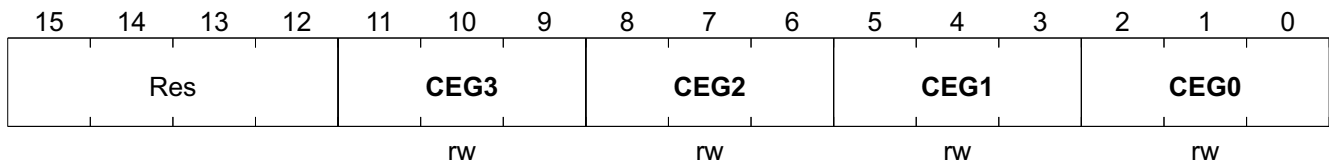
Customized PHY Control Group 3

CPHYCG3	Offset	Reset Value
Customized PHY Control Group 3	028E _H	0000 _H



PHY Customized Enable Register

PHYCE	Offset	Reset Value
PHY Customized Enable Register	0297 _H	0000 _H



Field	Bits	Type	Description
CEG3	11:9	rw	PHY Customized Enable For Group 3 000 _B , Disable writing additional commands into any PHYs in Group 3. 001 _B , Write command 6 into related port specified by the Customized PHY Control Group 3. 010 _B , Write command 7 into related port specified by the Customized PHY Control Group 3. 100 _B , Disable writing additional commands into any PHYs in Group 3. 101 _B , Write command 6 into all PHYs in Group 3. 110 _B , Write command 7 into all PHYs in Group 3. 111 _B , Write command 6 and command 7 into all PHYs in Group 3.
CEG2	8:6	rw	PHY Customized Enable For Group 2 000 _B , Disable writing additional commands into any PHYs in Group 2. 001 _B , Write command 4 into related port specified by the Customized PHY Control Group 2. 010 _B , Write command 5 into related port specified by the Customized PHY Control Group 2. 100 _B , Disable writing additional commands into any PHYs in Group 2. 101 _B , Write command 4 into all PHYs in Group 2. 110 _B , Write command 5 into all PHYs in Group 2. 111 _B , Write command 5 and command 5 into all PHYs in Group 2.
CEG1	5:3	rw	PHY Customized Enable For Group 1 000 _B , Disable writing additional commands into any PHYs in Group 1. 001 _B , Write command 2 into related port specified by the Customized PHY Control Group 1. 010 _B , Write command 3 into related port specified by the Customized PHY Control Group 1. 100 _B , Disable writing additional commands into any PHYs in Group 1. 101 _B , Write command 2 into all PHYs in Group 1. 110 _B , Write command 3 into all PHYs in Group 1. 111 _B , Write command 2 and command 3 into all PHYs in Group 1.

EEPROM Register Format

Field	Bits	Type	Description
CEG0	2:0	rw	PHY Customized Enable For Group 0 000 _B , Disable writing additional commands into any PHYs in Group 0. 001 _B , Write command 0 into related port specified by the Customized PHY Control Group 0. 010 _B , Write command 1 into related port specified by the Customized PHY Control Group 0. 100 _B , Disable writing additional commands into any PHYs in Group 0. 101 _B , Write command 0 into all PHYs in Group 0. 110 _B , Write command 1 into all PHYs in Group 0. 111 _B , Write command 0 and command 1 into all PHYs in Group 0.

PPPOE Control Register 0

PPPOEC0	Offset	Reset Value
PPPOE Control Register 0	0298 _H	0000 _H

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
EP15 TP	EP14 TP	EP13 TP	EP12 TP	EP11 TP	EP10 TP	EP9T P	EP8T P	EP7T P	EP6T P	EP5T P	EP4T P	EP3T P	EP2T P	EP1T P	EP0T P
rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw

Field	Bits	Type	Description
EP15TP	15	rw	Enable Port 15 to Transmit PPPoE Packet Only
EP14TP	14	rw	Enable Port 14 to Transmit PPPoE Packet Only
EP13TP	13	rw	Enable Port 13 to Transmit PPPoE Packet Only
EP12TP	12	rw	Enable Port 12 to Transmit PPPoE Packet Only
EP11TP	11	rw	Enable Port 11 to Transmit PPPoE Packet Only
EP10TP	10	rw	Enable Port 10 to Transmit PPPoE Packet Only
EP9TP	9	rw	Enable Port 9 to Transmit PPPoE Packet Only
EP8TP	8	rw	Enable Port 8 to Transmit PPPoE Packet Only
EP7TP	7	rw	Enable Port 7 to Transmit PPPoE Packet Only
EP6TP	6	rw	Enable Port 6 to Transmit PPPoE Packet Only
EP5TP	5	rw	Enable Port 5 to Transmit PPPoE Packet Only
EP4TP	4	rw	Enable Port 4 to Transmit PPPoE Packet Only
EP3TP	3	rw	Enable Port 3 to Transmit PPPoE Packet Only
EP2TP	2	rw	Enable Port 2 to Transmit PPPoE Packet Only
EP1TP	1	rw	Enable Port 1 to Transmit PPPoE Packet Only
EP0TP	0	rw	Enable Port 0 to Transmit PPPoE Packet Only The ADM6918/X will recognize packets with length-type = 8863 _H or 8864 _H as the PPPOE packets. 0 _B , The port 0 is not configured to transmit PPPOE packets only. 1 _B , The port 0 is configured to transmit PPPOE packets only.

PPPOE Control Register 1

PPPOEC1 **Offset**
PPPOE Control Register 1 **0299_H** **Reset Value**
0000_H

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Res				EMPC	EP25 TP	EP24 TP	Res								
				rw	rw	rw					rw				

Field	Bits	Type	Description
EMPC	10	rw	Enable Management Packet Cross PPPOE PORT Function 0 _B , Management packets could not be transmitted by the PPPOE port. 1 _B , Management packets could be transmitted by any port even if it is configured to PPPOE port.
EP25TP	9	rw	Enable Port 25 to Transmit PPPoE Packet Only
EP24TP	8	rw	Enable Port 24 to Transmit PPPoE Packet Only
Res	7:0	rw	Reserved

PHY Control Register 0

PHYCR0 **Offset**
PHY Control Register 0 **029A_H** **Reset Value**
0000_H

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
PHY1 5	PHY1 4	PHY1 3	PHY1 2	PHY1 1	PHY1 0	PHY9	PHY8	PHY7	PHY6	PHY5	PHY4	PHY3	PHY2	PHY1	PHY0
rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw

Field	Bits	Type	Description
PHY15	15	rw	PHY Port 15 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 15 acts as the master.
PHY14	14	rw	PHY Port 14 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 14 acts as the master.
PHY13	13	rw	PHY Port 13 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 13 acts as the master.

EEPROM Register Format

Field	Bits	Type	Description
PHY12	12	rw	PHY Port 12 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 12 acts as the master.
PHY11	11	rw	PHY Port 11 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 11 acts as the master.
PHY10	10	rw	PHY Port 10 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 10 acts as the master.
PHY9	9	rw	PHY Port 9 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 9 acts as the master.
PHY8	8	rw	PHY Port 8 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 8 acts as the master.
PHY7	7	rw	PHY Port 7 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 7 acts as the master.
PHY6	6	rw	PHY Port 6 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 6 acts as the master.
PHY5	5	rw	PHY Port 5 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 5 acts as the master.
PHY4	4	rw	PHY Port 4 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 4 acts as the master.
PHY3	3	rw	PHY Port 3 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 3 acts as the master.
PHY2	2	rw	PHY Port 2 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 2 acts as the master.
PHY1	1	rw	PHY Port 1 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 1 acts as the master.
PHY0	0	rw	PHY Port 0 0 _B , PHY acts as the slave. The switch will use the setting in the eeprom register to manage PHY attached. 1 _B , PHY attached to port 0 acts as the master. That is the switch will not configure the PHY attached and it will only poll the PHY to know the state that PHY operates.

PHY Control Register 1

EEPROM Register Format

PHYCR1 **Offset**
PHY Control Register 1 **029B_H** **Reset Value**
0000_H

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Res						PHY2 5	PHY2 4	Res							
						rw	rw								

Field	Bits	Type	Description
PHY25	9	rw	PHY Port 25 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 25 acts as the master.
PHY24	8	rw	PHY Port 24 0 _B , PHY acts as the slave. 1 _B , PHY attached to port 24 acts as the master.
Res	7:0	rw	Reserved

Disable MDIO Active Register 0

DMDIOAR0 **Offset**
Disable MDIO Active Register 0 **029C_H** **Reset Value**
0000_H

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
P15B MFE	P14B MFE	P13B MFE	P12B MFE	P11B MFE	P10B MFE	P9BM FE	P8BM FE	P7BM FE	P6BM FE	P5BM FE	P4BM FE	P3BM FE	P2BM FE	P1BM FE	P0BM FE
rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw

Field	Bits	Type	Description
P15BMFE	15	rw	Port 15 Bypass MDIO Function Enable
P14BMFE	14	rw	Port 14 Bypass MDIO Function Enable
P13BMFE	13	rw	Port 13 Bypass MDIO Function Enable
P12BMFE	12	rw	Port 12 Bypass MDIO Function Enable
P11BMFE	11	rw	Port 11 Bypass MDIO Function Enable
P10BMFE	10	rw	Port 10 Bypass MDIO Function Enable
P9BMFE	9	rw	Port 9 Bypass MDIO Function Enable
P8BMFE	8	rw	Port 8 Bypass MDIO Function Enable
P7BMFE	7	rw	Port 7 Bypass MDIO Function Enable
P6BMFE	6	rw	Port 6 Bypass MDIO Function Enable
P5BMFE	5	rw	Port 5 Bypass MDIO Function Enable
P4BMFE	4	rw	Port 4 Bypass MDIO Function Enable
P3BMFE	3	rw	Port 3 Bypass MDIO Function Enable

EEPROM Register Format

Field	Bits	Type	Description
P2BMFE	2	rw	Port 2 Bypass MDIO Function Enable
P1BMFE	1	rw	Port 1 Bypass MDIO Function Enable
P0BMFE	0	rw	Port 0 Bypass MDIO Function Enable 0 _B , Bypass MDIO Disable. The status is dominated by the MDC/MDIO function except the linkup status, which may be disabled, by the port disable function or the spanning protocol. 1 _B , Bypass MDIO Enable. The effect by the function is as follows: Link Status: Port 0 is forced to link up unless the port is disabled or the spanning tree is in disabled state. Speed Status: Port 0 is configured to Bit [6] in the Port Configuration Register. Duplex Status: Port 0 is configured to Bit [7] in the Port Configuration Register. Pause Status: Port 0 is configured to Bit [4] in the Port Configuration Register. Back Pressure Status: Port 0 is configured to Bit[15] in the Port Configuration Register.

Disable MDIO Active Register 1

DMDIOAR1	Offset	Reset Value
Disable MDIO Active Register 1	029D_H	0000_H

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Res						P25B MFE	P24B MFE	Res							
						rw	rw								

Field	Bits	Type	Description
P25BMFE	9	rw	Port 25 Bypass MDIO Function Enable
P24BMFE	8	rw	Port 24 Bypass MDIO Function Enable
Res	7:0	rw	Reserved

Port Disable Register 0

PDR0	Offset	Reset Value
Port Disable Register 0	029E_H	0000_H

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
P15D RT	P14D RT	P13D RT	P12D RT	P11D RT	P10D RT	P9DR T	P8DR T	P7DR T	P6DR T	P5DR T	P4DR T	P3DR T	P2DR T	P1DR T	P0DR T
rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw

EEPROM Register Format

Field	Bits	Type	Description
P15DRT	15	rw	Port 15 Disable Receive and Transmit
P14DRT	14	rw	Port 14 Disable Receive and Transmit
P13DRT	13	rw	Port 13 Disable Receive and Transmit
P12DRT	12	rw	Port 12 Disable Receive and Transmit
P11DRT	11	rw	Port 11 Disable Receive and Transmit
P10DRT	10	rw	Port 10 Disable Receive and Transmit
P9DRT	9	rw	Port 9 Disable Receive and Transmit
P8DRT	8	rw	Port 8 Disable Receive and Transmit
P7DRT	7	rw	Port 7 Disable Receive and Transmit
P6DRT	6	rw	Port 6 Disable Receive and Transmit
P5DRT	5	rw	Port 5 Disable Receive and Transmit
P4DRT	4	rw	Port 4 Disable Receive and Transmit
P3DRT	3	rw	Port 3 Disable Receive and Transmit
P2DRT	2	rw	Port 2 Disable Receive and Transmit
P1DRT	1	rw	Port 1 Disable Receive and Transmit
P0DRT	0	rw	Port 0 Disable Receive and Transmit 0 _B , The port acts as the normal mode. 1 _B , The port will not receive or transmit packets. Learning is disabled in the disabled port.

Port Disable Register 1

PDR1 **Offset**
Port Disable Register 1 **029F_H** **Reset Value**
0000_H

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Res						P25D RT	P24D RT	Res							
						rw	rw								

Field	Bits	Type	Description
P25DRT	9	rw	Port 25 Disable Receive and Transmit
P24DRT	8	rw	Port 24 Disable Receive and Transmit
Res	7:0	rw	Reserved

IGMP Snooping Control Register 0

IGMPSCR0 **Offset**
IGMP Snooping Control Register 0 **02A0_H** **Reset Value**
0000_H

EEPROM Register Format

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
P15E ISF	P14E ISF	P13E ISF	P12E ISF	P11E ISF	P10E ISF	P9E ISF	P8E ISF	P7E ISF	P6E ISF	P5E ISF	P4E ISF	P3E ISF	P2E ISF	P1E ISF	P0E ISF
rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw

Field	Bits	Type	Description
P15EISF	15	rw	Port 15 Enable IGMP Snooping Function
P14EISF	14	rw	Port 14 Enable IGMP Snooping Function
P13EISF	13	rw	Port 13 Enable IGMP Snooping Function
P12EISF	12	rw	Port 12 Enable IGMP Snooping Function
P11EISF	11	rw	Port 11 Enable IGMP Snooping Function
P10EISF	10	rw	Port 10 Enable IGMP Snooping Function
P9EISF	9	rw	Port 9 Enable IGMP Snooping Function
P8EISF	8	rw	Port 8 Enable IGMP Snooping Function
P7EISF	7	rw	Port 7 Enable IGMP Snooping Function
P6EISF	6	rw	Port 6 Enable IGMP Snooping Function
P5EISF	5	rw	Port 5 Enable IGMP Snooping Function
P4EISF	4	rw	Port 4 Enable IGMP Snooping Function
P3EISF	3	rw	Port 3 Enable IGMP Snooping Function
P2EISF	2	rw	Port 2 Enable IGMP Snooping Function
P1EISF	1	rw	Port 1 Enable IGMP Snooping Function
P0EISF	0	rw	Port 0 Enable IGMP Snooping Function The packets with the header (DA = 01005exxxxxx, Length_Type = 0800, IP version = 4, and Protocol type = 2) will be recognized as the IGMP packets, and the switch will forward it to the CPU port. 0 _B , The port 0 is not configured to enable IGMP Snooping Function. And the IGMP packets will be handled as the normal multicast packets. 1 _B , The port 0 is configured to enable IGMP Snooping Function.

IGMP Snooping Control Register 1

IGMPSCR1	Offset	Reset Value
IGMP Snooping Control Register 1	02A1_H	0000_H

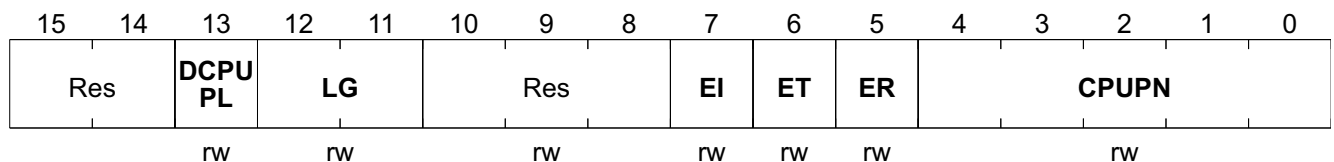
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Res				MCR		P25E ISF	P24E ISF	Res							
				rw		rw	rw								

EEPROM Register Format

Field	Bits	Type	Description
MCR	11:10	rw	Multicast Control Register Packets with the following conditions will follow the Multicast Control Register to handle packets. Conditions: Destination address is not found in the address table. AND Destination address is a multicast address. AND Destination address is not all 1'b1. AND Destination address is not a reserved address(0180c2000~~). OR IGMP packets received by the port which disables the IGMP function. Multicast Control, Action 00 _B , Forward to all ports within the same forwarding group except the self port. 01 _B , Send to the CPU port. 10 _B , Discard. 11 _B , Reserved.
P25EISF	9	rw	Port 25 Enable IGMP Snooping Function
P24EISF	8	rw	Port 24 Enable IGMP Snooping Function
Res	7:0	rw	Reserved

CPU Control Register

CPUCR **Offset**
CPU Control Register **02A2_H** **Reset Value**
001F_H



Field	Bits	Type	Description
DCPUPL	13	rw	Disable CPU Port Learning Function 0 _B , The packets received from the CPU port will be learned. 1 _B , The packets received from the CPU port will not be learned.

EEPROM Register Format

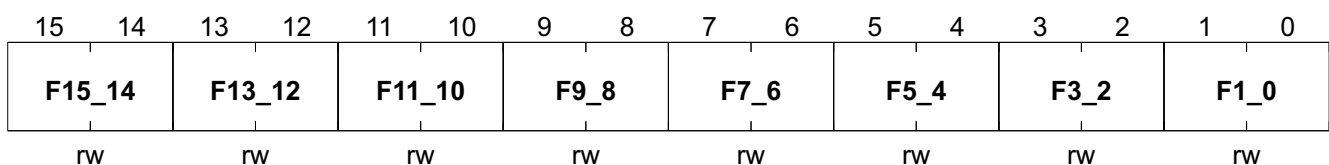
Field	Bits	Type	Description
LG	12:11	rw	<p>Learning Group</p> <p>ADM6918/X has an ability to learn packets according their forwarding groups. The ADM6918/X could be divided into 32 learning groups. We use L0, L1, ... and L31 to call each learning group.</p> <p>0x_B , Normal mode, learning with SA only.</p> <p>10_B , MAC Clone mode, learning with SA and VID[0]. When packets are received and could be learned, they are learned divided into two Groups. Even forwarding groups are learned into L0 and odd forwarding groups are learned into L1.</p> <p>11_B , Learning with SA and VID[4:0]. When packets are received and could be learned, they are learned according to their forwarding group. That is packets belonging to F0 is learned into L0, packets belonging to F1 is learned into L1, ... and packets belonging to F31 is leaned into L31.</p>
Res	10:8	rw	Reserved
EI	7	rw	<p>Enable Insert</p> <p>Enable insert 4-byte special tag when Pause happens and Bit[6] is enabled.</p> <p>0_B , ADM6918/X will add 4-byte special TAG when pause happens.</p> <p>1_B , ADM6918/X will add 4-byte special TAG when pause happens.</p>
ET	6	rw	<p>Enable Transmit</p> <p>Enable transmit 4-byte special tag to the CPU port to support IGMP snooping, spanning tree or the security function.</p> <p>0_B , ADM6918/X will transmit packets as the normal mode.</p> <p>1_B , ADM6918/X will insert addition 4-byte special TAG when it has packets to be transmitted to the CPU port.</p>
ER	5	rw	<p>Enable Receive</p> <p>Enable receive 8-byte special tag from the CPU port to support IGMP snooping, spanning tree or the security function.</p> <p>0_B , CPU will transmit packets as the normal state.</p> <p>1_B , CPU will transmit packets with additional 8-byte special TAG and the ADM6918/X will remove this special TAG, use information contained to forward packets and recalculate CRC value when this packet is re-transmitted.</p>

EEPROM Register Format

Field	Bits	Type	Description
CPUPN	4:0	rw	CPU Port Number The ADM6918/X allows any port to be configured to be the CPU port. The default CPU port is port 31. That is CPU port is not present. 00000 _B , CPU port is configured to port 0. 00001 _B , CPU port is configured to port 1. 00010 _B , CPU port is configured to port 2. 00011 _B , CPU port is configured to port 3. 00100 _B , CPU port is configured to port 4. 00101 _B , CPU port is configured to port 5. 00110 _B , CPU port is configured to port 6. 00111 _B , CPU port is configured to port 7. 01000 _B , CPU port is configured to port 8. 01001 _B , CPU port is configured to port 9. 01010 _B , CPU port is configured to port 10. 01011 _B , CPU port is configured to port 11. 01100 _B , CPU port is configured to port 12. 01101 _B , CPU port is configured to port 13. 01110 _B , CPU port is configured to port 14. 01111 _B , CPU port is configured to port 15. 10000 _B , CPU port is configured to port 16. 10001 _B , CPU port is configured to port 17. 10010 _B , CPU port is configured to port 18. 10011 _B , CPU port is configured to port 19. 10100 _B , CPU port is configured to port 20. 10101 _B , CPU port is configured to port 21. 10110 _B , CPU port is configured to port 22. 10111 _B , CPU port is configured to port 23. 11000 _B , CPU port is configured to port 24. 11001 _B , CPU port is configured to port 25.

Special MAC Forward Control Register 0

SMACFCR0	Offset	Reset Value
Special MAC Forward Control Register 0	02A3 _H	0004 _H



Field	Bits	Type	Description
F15_14	15:14	rw	Forwarding 15_14 The forwarding option for destination address = 0180c2000023 ~0180c20000ff

EEPROM Register Format

Field	Bits	Type	Description
F13_12	13:12	rw	Forwarding 13_12 The forwarding option for destination address = 0180c2000020 ~0180c2000022 (GMRP, GVRP, GARP)
F11_10	11:10	rw	Forwarding 11_10 The forwarding option for destination address = 0180c2000010 ~0180c200001f
F9_8	9:8	rw	Forwarding 9_8 The forwarding option for destination address = 0180c2000004 ~0180c200000f
F7_6	7:6	rw	Forwarding 7_6 The forwarding option for destination address = 0180c2000003 (802.1x PAE address)
F5_4	5:4	rw	Forwarding 5_4 The forwarding option for destination address = 48'h0180c2000002 (Slow Protocol)
F3_2	3:2	rw	Forwarding 3_2 The forwarding option for destination address = 0180c2000001 (Reserved for Pause address), MAC control field = 8808, OP Code != 0001
F1_0	1:0	rw	Forwarding 1_0 The forwarding option for destination address = 48'h0180c2000000 (BPDU)

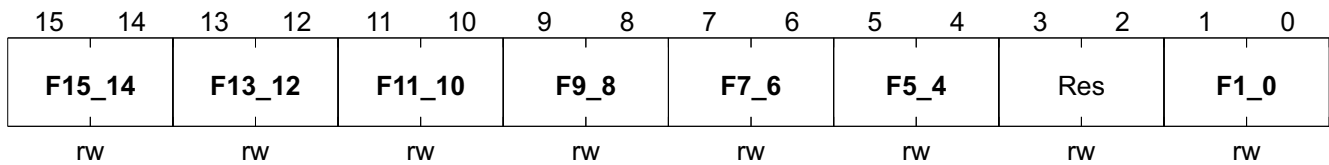
Notes

- The options are defined here: 00_B = The switch will forward the packets as the normal mode. That is for reserved addresses existed in the learning table (because reserved address is multicast address, it could only be created through the CPU help if it really exists in the learning table). We will use "output port field" as the index to lookup the multicast table. At last, the looked output port map (may be modified by the forwarding process) is used as the output ports to forward packets. For reserved addresses, which don't exist in the learning table, it will be broadcast to the forwarding group except the receiving port. 01_B = The switch will discard the packets. 10_B = The switch will forward the packets to the CPU port. If the packet is received from the CPU port, the packet will be forwarded as the normal mode. 11_B = The switch will forward the packet to CPU port. If this packet is received from CPU Port, this packet will be discard.
- The forwarding options stated above will be of no effect for the CPU port when users enable the "Special Tag Function" and its output vector field is valid.

Special MAC Forward Control Register 1

SMACFCR1	Offset	Reset Value
Special MAC Forward Control Register 1	02A4_H	0003_H

EEPROM Register Format



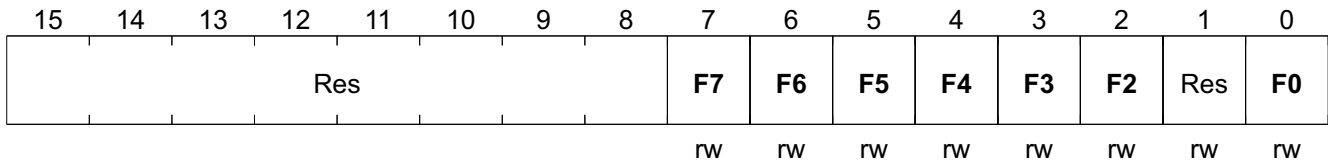
Field	Bits	Type	Description
F15_14	15:14	rw	Forwarding 15_14 The forwarding option for destination address = 0180c2000023 ~0180c20000ff
F13_12	13:12	rw	Forwarding 13_12 The forwarding option for destination address = 0180c2000020 ~0180c2000022 (GMRP, GVRP, GARP)
F11_10	11:10	rw	Forwarding 11_10 The forwarding option for destination address = 0180c2000010 ~0180c200001f
F9_8	9:8	rw	Forwarding 9_8 The forwarding option for destination address = 0180c2000004 ~0180c200000f
F7_6	7:6	rw	Forwarding 7_6 The forwarding option for destination address = 0180c2000003 (802.1x PAE address)
F5_4	5:4	rw	Forwarding 5_4 The forwarding option for destination address = 48'h0180c2000002 (Slow Protocol)
Res	3:2	rw	Reserved
F1_0	1:0	rw	Forwarding 1_0 The forwarding option for destination address = 48'h0180c2000000 (BPDU)

Note: The ADM6918/X will divide packets into management or unmanagement packets. Management packets will not be dropped even if the buffer is full for no flow control environment. Only management packets will be forwarded or received in Blocking-N-Listening or the Learning state.

The options are defined here: 00_B = The packets will not be classified as the management packets and it will be treated as the normal packet. 01_B = The packets will be classified as the management packets and it will be transmitted no modified. 10_B = The packets will be classified as the management packets and it will be transmitted without tag. 11_B = The packets will be classified as the management packets and it will be transmitted with tag or without tag as the system configuration.

Special MAC Forward Control Register 2

SMACFCR2	Offset	Reset Value
Special MAC Forward Control Register 2	02A5 _H	0000 _H

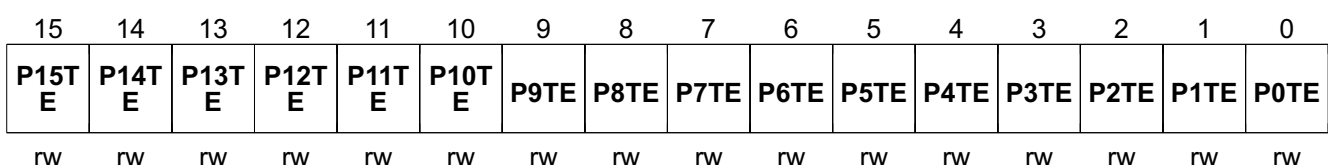
EEPROM Register Format


Field	Bits	Type	Description
F7	7	rw	Forwarding 7 The forwarding option for destination address = 0180c2000023 ~0180c20000ff
F6	6	rw	Forwarding 6 The forwarding option for destination address = 0180c2000020 ~0180c2000022 (GMRP, GVRP, GARP)
F5	5	rw	Forwarding 5 The forwarding option for destination address = 0180c2000010 ~0180c200001f
F4	4	rw	Forwarding 4 The forwarding option for destination address = 0180c2000004 ~0180c200000f
F3	3	rw	Forwarding 3 The forwarding option for destination address = 0180c2000003 (802.1x PAE address)
F2	2	rw	Forwarding 2 The forwarding option for destination address = 48'h0180c2000002 (Slow Protocol)
Res	1	rw	Reserved
F0	0	rw	Forwarding 0 The forwarding option for destination address = 48'h0180c2000000 (BPDU)

Note: The options are defined here: 1_B = The packets will cross forwarding group. 0_B = The packets will not cross the forwarding packet.

Trunking Enable Register 0

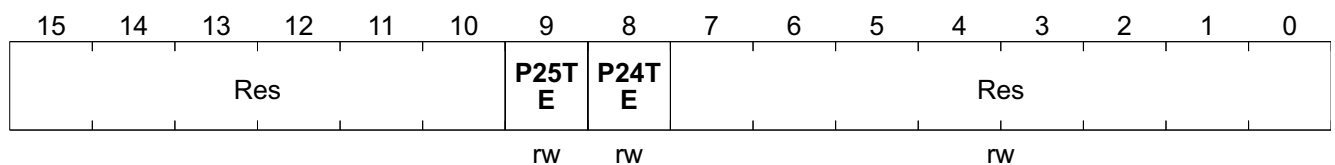
TER0	Offset	Reset Value
Trunking Enable Register 0	02A6_H	0000_H



Field	Bits	Type	Description
P15TE	15	rw	Port 15 Trunking Enable
P14TE	14	rw	Port 14 Trunking Enable
P13TE	13	rw	Port 13 Trunking Enable
P12TE	12	rw	Port 12 Trunking Enable
P11TE	11	rw	Port 11 Trunking Enable
P10TE	10	rw	Port 10 Trunking Enable
P9TE	9	rw	Port 9 Trunking Enable
P8TE	8	rw	Port 8 Trunking Enable
P7TE	7	rw	Port 7 Trunking Enable
P6TE	6	rw	Port 6 Trunking Enable
P5TE	5	rw	Port 5 Trunking Enable
P4TE	4	rw	Port 4 Trunking Enable
P3TE	3	rw	Port 3 Trunking Enable
P2TE	2	rw	Port 2 Trunking Enable
P1TE	1	rw	Port 1 Trunking Enable
P0TE	0	rw	Port 0 Trunking Enable The ADM6918/X supports one trunking port. Any port could be assigned to the trunking port. The trunking function is of the effect only the trunking hardware setting = 1. 0_B , Port 0 is not assigned to a member of the trunking port. 1_B , Port 0 is assigned to a member of the trunking port.

Trunking Enable Register 1

TER1 **Offset**
Trunking Enable Register 1 **02A7_H** **Reset Value**
0000_H



Field	Bits	Type	Description
P25TE	9	rw	Port 25 Trunking Enable
P24TE	8	rw	Port 24 Trunking Enable
Res	7:0	rw	Reserved

5 Switch Register Map

Switch Register Map

Table 25 Switch Register Map

Offset Hex	Bit 31 ~ 0	Type
0 _H	Version ID	ro
1 _H	Link Status	ro
2 _H	Speed Status	ro
3 _H	Duplex Status	ro
4 _H	Flow Control Status	ro
5 _H	Address Table Control Register 0	rw
6 _H	Address Table Control Register 1	rw
7 _H	Address Table Control Register 2	rw
8 _H	Address Table Status Register 0	ro
9 _H	Address Table Status Register 1	ro
A _H	Address Table Status Register 2	ro
B _H	PHY Control/Status Register	rw
C _H	Reserved	ro
D _H	Hardware Status	ro
E _H	RxPKT Overflow	roc
F _H	RxLEN Overflow	roc
10 _H	TxPKT Overflow	roc
11 _H	TxLEN Overflow	roc
12 _H	RxERR Overflow	roc
13 _H	RxCOL Overflow	roc
14 _H	Renew Counter Register	rw
15 _H	Read Counter Control Register	rw
16 _H	Read Counter Status Register	ro
17 _H	Reload MDIO Register	rw
18 _H	P0 ~ P15 Spanning Tree Port State	rw
19 _H	P16 ~ P25 Spanning Tree Port State	rw
1A _H	Source Port Register	ro
1B _H	Transmit Port Register	rw
1C _H	Buffer Status Register 0	roc
1D _H	Buffer Status Register 1	roc
1E _H	Buffer Status Register 2	roc
1F _H	Buffer Status Register 3	roc
1xx _H	Counter Register	rw
2xx _H	EEPROM Register	rw

5.1 Switch Registers

Table 26 Registers Address Space Registers Address Space

Module	Base Address	End Address	Note
Switch	00 _H	1B _H	

Table 27 Registers Overview

Register Short Name	Register Long Name	Offset Address	Page Number
VID	Version ID	00 _H	87
LS	Link Status	01 _H	88
SS	Speed Status	02 _H	89
DS	Duplex Status	03 _H	89
FCS	Flow Control Status	04 _H	90
PHYCR	PHY Control Register	0B _H	97
HS	Hardware Status	0D _H	98
RPCO	Receive Packet Count Overflow	0E _H	99
RPLCO	Receive Packet Length Count Overflow	0F _H	99
TPCO	Transmit Packet Count Overflow	10 _H	100
TPLCO	Transmit Packet Length Count Overflow	11 _H	101
ECO	Error Count Overflow	12 _H	102
CCO	Collision Count Overflow	13 _H	103
RCR	Renew Counter Register	14 _H	103
RCCR	Read Counter Control Register	15 _H	105
RCSR	Read Counter Status Register	16 _H	105
RMDIOR	Reload MDIO Register	17 _H	106
STPS0	Spanning Tree Port State 0	18 _H	107
STPS1	Spanning Tree Port State 1	19 _H	108
SCPR	Source Port Register	1A _H	108
TRPR	Transmit Port Register	1B _H	109

The register is addressed wordwise.

Table 28 Register Access Types

Mode	Symbol	Description HW	Description SW
read/write	rw	Register is used as input for the HW	Register is read and writable by SW
read	r	Register is written by HW (register between input and output -> one cycle delay)	Value written by software is ignored by hardware; that is, software may write any value to this field without affecting hardware behavior (= Target for development.)
Read only	ro	Register is set by HW (register between input and output -> one cycle delay)	SW can only read this register

Switch Register Map
Table 28 Register Access Types (cont'd)

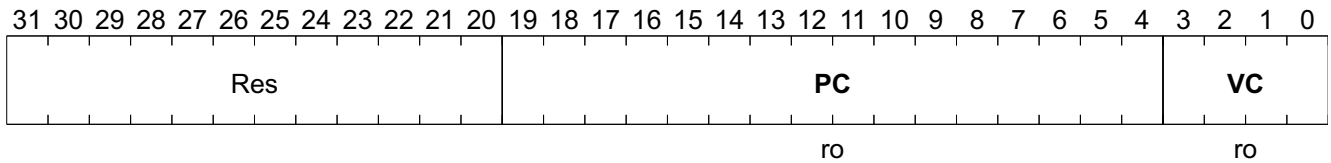
Mode	Symbol	Description HW	Description SW
Read virtual	rv	Physically, there is no new register, the input of the signal is connected directly to the address multiplexer.	SW can only read this register
Latch high, self clearing	lhsc	Latch high signal at high level, clear on read	SW can read the register
Latch low, self clearing	llsc	Latch high signal at low-level, clear on read	SW can read the register
Latch high, mask clearing	lhmk	Latch high signal at high level, register cleared with written mask	SW can read the register, with write mask the register can be cleared (1 clears)
Latch low, mask clearing	llmk	Latch high signal at low-level, register cleared on read	SW can read the register, with write mask the register can be cleared (1 clears)
Interrupt high, self clearing	ihsc	Differentiate the input signal (low->high) register cleared on read	SW can read the register
Interrupt low, self clearing	ilsc	Differentiate the input signal (high->low) register cleared on read	SW can read the register
Interrupt high, mask clearing	ihmk	Differentiate the input signal (high->low) register cleared with written mask	SW can read the register, with write mask the register can be cleared
Interrupt low, mask clearing	ilmk	Differentiate the input signal (low->high) register cleared with written mask	SW can read the register, with write mask the register can be cleared
Interrupt enable register	ien	Enables the interrupt source for interrupt generation	SW can read and write this register
latch_on_reset	lor	rw register, value is latched after first clock cycle after reset	Register is read and writable by SW
Read/write self clearing	rwsc	Register is used as input for the hw, the register will be cleared due to a HW mechanism.	Writing to the register generates a strobe signal for the HW (1 pdi clock cycle) Register is read and writable by SW.

Table 29 Registers Clock DomainsRegisters Clock Domains

Clock Short Name	Description

5.1.1 Switch Register Descriptions
Version ID

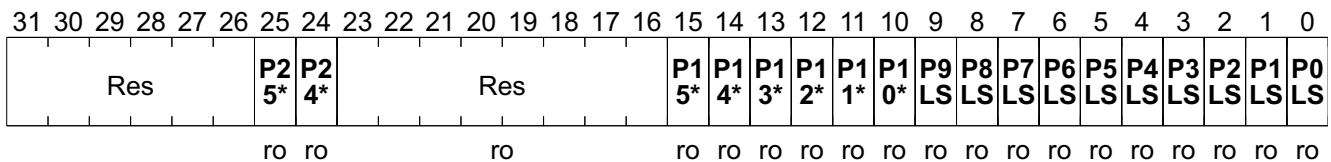
VID	Offset	Reset Value
Version ID	00 _H	0003 1100 _H

Switch Register Map


Field	Bits	Type	Description
PC	19:4	ro	Project Code
VC	3:0	ro	Version Code

Link Status

LS	Offset	Reset Value
Link Status	01_H	0000 0000_H



Field	Bits	Type	Description
P25LS	25	ro	Port 25 Link Status
P24LS	24	ro	Port 24 Link Status
Res	23:16	ro	Reserved
P15LS	15	ro	Port 15 Link Status
P14LS	14	ro	Port 14 Link Status
P13LS	13	ro	Port 13 Link Status
P12LS	12	ro	Port 12 Link Status
P11LS	11	ro	Port 11 Link Status
P10LS	10	ro	Port 10 Link Status
P9LS	9	ro	Port 9 Link Status
P8LS	8	ro	Port 8 Link Status
P7LS	7	ro	Port 7 Link Status
P6LS	6	ro	Port 6 Link Status
P5LS	5	ro	Port 5 Link Status
P4LS	4	ro	Port 4 Link Status
P3LS	3	ro	Port 3 Link Status
P2LS	2	ro	Port 2 Link Status
P1LS	1	ro	Port 1 Link Status
P0LS	0	ro	Port 0 Link Status 0 _B , Port 0 links down. 1 _B , Port 0 links up.

Switch Register Map

Speed Status

SS **Offset** **Reset Value**
Speed Status **02_H** **03FF FFFF_H**

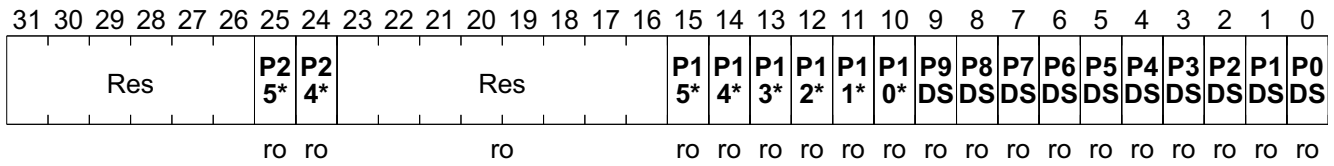
31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0			
Res						P2 5*	P2 4*	Res								P1 5*	P1 4*	P1 3*	P1 2*	P1 1*	P1 0*	P9 SS	P8 SS	P7 SS	P6 SS	P5 SS	P4 SS	P3 SS	P2 SS	P1 SS	P0 SS			
						ro	ro									ro	ro	ro	ro	ro	ro	ro	ro	ro	ro	ro	ro	ro	ro	ro	ro	ro	ro	ro

Field	Bits	Type	Description
P25SS	25	ro	Port 25 Speed Status
P24SS	24	ro	Port 24 Speed Status
Res	23:16	ro	Reserved
P15SS	15	ro	Port 15 Speed Status
P14SS	14	ro	Port 14 Speed Status
P13SS	13	ro	Port 13 Speed Status
P12SS	12	ro	Port 12 Speed Status
P11SS	11	ro	Port 11 Speed Status
P10SS	10	ro	Port 10 Speed Status
P9SS	9	ro	Port 9 Speed Status
P8SS	8	ro	Port 8 Speed Status
P7SS	7	ro	Port 7 Speed Status
P6SS	6	ro	Port 6 Speed Status
P5SS	5	ro	Port 5 Speed Status
P4SS	4	ro	Port 4 Speed Status
P3SS	3	ro	Port 3 Speed Status
P2SS	2	ro	Port 2 Speed Status
P1SS	1	ro	Port 1 Speed Status
P0SS	0	ro	Port 0 Speed Status 0 _B , Port 0 operates in 10M. 1 _B , Port 0 operates in 100M.

Duplex Status

DS **Offset** **Reset Value**
Duplex Status **03_H** **03FF FFFF_H**

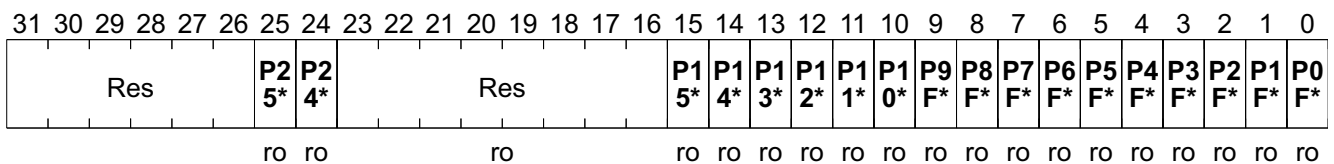
Switch Register Map



Field	Bits	Type	Description
P25DS	25	ro	Port 25 Duplex Status
P24DS	24	ro	Port 24 Duplex Status
Res	23:16	ro	Reserved
P15DS	15	ro	Port 15 Duplex Status
P14DS	14	ro	Port 14 Duplex Status
P13DS	13	ro	Port 13 Duplex Status
P12DS	12	ro	Port 12 Duplex Status
P11DS	11	ro	Port 11 Duplex Status
P10DS	10	ro	Port 10 Duplex Status
P9DS	9	ro	Port 9 Duplex Status
P8DS	8	ro	Port 8 Duplex Status
P7DS	7	ro	Port 7 Duplex Status
P6DS	6	ro	Port 6 Duplex Status
P5DS	5	ro	Port 5 Duplex Status
P4DS	4	ro	Port 4 Duplex Status
P3DS	3	ro	Port 3 Duplex Status
P2DS	2	ro	Port 2 Duplex Status
P1DS	1	ro	Port 1 Duplex Status
P0DS	0	ro	Port 0 Duplex Status 0 _B , Port 0 operates in half duplex. 1 _B , Port 0 operates in full duplex.

Flow Control Status

FCS	Offset	Reset Value
Flow Control Status	04_H	03FF FFFF_H



Field	Bits	Type	Description
P25FCS	25	ro	Port 25 Flow Control Status
P24FCS	24	ro	Port 24 Flow Control Status

Switch Register Map

Field	Bits	Type	Description
Res	23:16	ro	Reserved
P15FCS	15	ro	Port 15 Flow Control Status
P14FCS	14	ro	Port 14 Flow Control Status
P13FCS	13	ro	Port 13 Flow Control Status
P12FCS	12	ro	Port 12 Flow Control Status
P11FCS	11	ro	Port 11 Flow Control Status
P10FCS	10	ro	Port 10 Flow Control Status
P9FCS	9	ro	Port 9 Flow Control Status
P8FCS	8	ro	Port 8 Flow Control Status
P7FCS	7	ro	Port 7 Flow Control Status
P6FCS	6	ro	Port 6 Flow Control Status
P5FCS	5	ro	Port 5 Flow Control Status
P4FCS	4	ro	Port 4 Flow Control Status
P3FCS	3	ro	Port 3 Flow Control Status
P2FCS	2	ro	Port 2 Flow Control Status
P1FCS	1	ro	Port 1 Flow Control Status
P0FCS	0	ro	Port 0 Flow Control Status 0 _B , Port 0 disables flow control function. 1 _B , Port 0 enables Pause function in full duplex or Back Pressure function in half duplex.

Address Table Control and Status Registers

Address Table Control Register 0 (Offset: 5_H)

Address Table Control Register 1 (Offset: 6_H)

Address Table Control Register 2 (Offset: 7_H)

Address Table Status Register 0 (Offset: 8_H)

Address Table Status Register 1 (Offset: 9_H)

Address Table Status Register 2 (Offset: A_H)

The ADM6918/X provides custom commands to access the address table as well as the multicast output port map table. Six registers are used and they mean differently when different tables are accessed.

1. The Control and Status Register Description for the Address Table

Table 30 Control Register Description

Command Field	Entry State	Control Field	Output Port/ Multicast Index	Forwarding Group	MAC Address
Control_2[2:0]	Control_1[31:30]	Control_1[29:26]	Control_1[25:21]	Control_1[20:16]	{Control_1[15:0], Control_0[31:0]}

Table 31 Field Description in the Control Register

Field	Description
MAC Address[47:0]	This field is 48-bit layer-2 address. The address could be the unicast address or the multicast address.
Forwarding Group[4:0]	This field describes the Learning Group the address belongs to.

Table 31 Field Description in the Control Register (cont'd)

Field	Description																																										
Output Port[4:0]/Multicast Index[4:0]	This field has two means. One is described as the output port and the other is described as the multicast index.																																										
Entry State[0]	The Static Bit. When this bit is set to a one, then the address entry will not be aged forever. This bit could be changed only through the CUP's help.																																										
Entry State[1]	<p>This bit is used to distinguish the output port/ multicast index field.</p> <p>When a match (the same MAC address and the same forwarding group in the address table) is found, the value in the output port field is returned as the output port, and may be modified by the forwarding group before the packet is transferred to the output queue.</p> <p>When a match (the same MAC address and the same forwarding group in the address table) is found, the multicast output port map entry addressed by the multicast index is returned as the output port map, and may be modified by the forwarding group before the packet is transferred to the output queue.</p>																																										
Command Field[2:0]/Control Field[3:0]	<p>The command and control fields are combined to provide different operations. Before the operation is initiated, users should confirm if the search engine is available. See the busy bit in the status register.</p> <table border="1"> <thead> <tr> <th>Command Field</th> <th>Control Field</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>000</td> <td>0111</td> <td>Create a new address</td> </tr> <tr> <td>000</td> <td>1111</td> <td>Overwrite an existed address</td> </tr> <tr> <td>001</td> <td>1111</td> <td>Erase an existed address</td> </tr> <tr> <td>010</td> <td>0000</td> <td>Search an empty address</td> </tr> <tr> <td>010</td> <td>1001</td> <td>Search by the port in the Output Port field</td> </tr> <tr> <td>010</td> <td>1010</td> <td>Search by the forwarding group specified in the Forwarding Group field</td> </tr> <tr> <td>010</td> <td>1100</td> <td>Search by the address specified in the MAC Address field</td> </tr> <tr> <td>010</td> <td>1110</td> <td>Search by the address and forwarding group</td> </tr> <tr> <td>010</td> <td>1101</td> <td>Search by the address and output port</td> </tr> <tr> <td>010</td> <td>1011</td> <td>Search by the forwarding group and the output port</td> </tr> <tr> <td>010</td> <td>1111</td> <td>Search by the address, the forwarding group and the output port</td> </tr> <tr> <td>011</td> <td>0100</td> <td>Initial to location by the address field</td> </tr> <tr> <td>011</td> <td>0000</td> <td>Initial to the first address</td> </tr> </tbody> </table>	Command Field	Control Field	Operation	000	0111	Create a new address	000	1111	Overwrite an existed address	001	1111	Erase an existed address	010	0000	Search an empty address	010	1001	Search by the port in the Output Port field	010	1010	Search by the forwarding group specified in the Forwarding Group field	010	1100	Search by the address specified in the MAC Address field	010	1110	Search by the address and forwarding group	010	1101	Search by the address and output port	010	1011	Search by the forwarding group and the output port	010	1111	Search by the address, the forwarding group and the output port	011	0100	Initial to location by the address field	011	0000	Initial to the first address
Command Field	Control Field	Operation																																									
000	0111	Create a new address																																									
000	1111	Overwrite an existed address																																									
001	1111	Erase an existed address																																									
010	0000	Search an empty address																																									
010	1001	Search by the port in the Output Port field																																									
010	1010	Search by the forwarding group specified in the Forwarding Group field																																									
010	1100	Search by the address specified in the MAC Address field																																									
010	1110	Search by the address and forwarding group																																									
010	1101	Search by the address and output port																																									
010	1011	Search by the forwarding group and the output port																																									
010	1111	Search by the address, the forwarding group and the output port																																									
011	0100	Initial to location by the address field																																									
011	0000	Initial to the first address																																									

Table 32 Status Register Description

Busy	Command Result	Bad State	Entry State	Occupy	Output Port/ Multicast Index	Forwarding Group	MAC Address
Status_2[3]	Status_2 [2:0]	Status_1 [29]	Status_1 [28:27]	Status_1 [26]	Status_1 [25:21]	Status_1 [20:16]	{Status_1 [15:0], Status_0 [31:0]}

Table 33 Field Description in the Status Register

Field	Description
MAC Address[47:0]	After the search operation is successful, the switch will return the MAC address in this field. If the search fails, this field doesn't mean anything.
Forwarding Group[4:0]	After the search operation is successful, the switch will return the Forwarding Group in this. If the search fails, this field doesn't mean anything.
Output Port[4:0]/ Multicast Index[4:0]	After the search operation is successful, the switch will return output port / multicast index in this field. The users could use the entry_state[1] returned to distinguish if the entry should point to the multicast output port map table.
Occupy	After the search is successful, the switch will return the value indicating if the entry existed. 0 _B , The searched entry doesn't exist. 1 _B , The searched entry exists.
Entry State[0]	After the search is successful, the switch will return the value in this field indicating if value is static. 0 _B , The searched entry is not static and will be aged. 1 _B , The searched entry is static.
Entry State[1]	After the search is successful, the switch will return the value in this field indicating if the entry points to the multicast output port map table. 0 _B , The entry doesn't point to the multicast output port map table. 1 _B , The entry points to the multicast output port map table.
Bad State	After the search is successful, the switch will return the value indicating if the entry is bad. 0 _B , The entry is not bad and will be used for data storage. 1 _B , The entry is bad and isn't used for data storage.
Command Result[2:0]	This field indicates the access result. 000 _B , Command OK. 001 _B , All Entry Used. This result happens only for the create operation. ADM6918/X uses the 4-way address lookup engine so it allows 4 different addresses stored at each hash location. If these 4 entries are all static, then CPU will not successfully create 5th different address hashed to the same location and 001 will be returned. The only way to create 5th different address is to remove one of early addresses. 010 _B , Entry Not Found. 011 _B , Try Next Entry. 101 _B , Command Error.
Busy	This bit indicates if the table engine for access is available. 0 _B , The engine is available. 1 _B , The engine is busy and it will not access the command from the CPU.

2. Rules to Access the Address Table

1. Check the Busy Bit in the status register to see if the access engine is available. If the engine is busy, wait until the engine is free. If the engine is available, go to the following step.
2. Write the MAC address[31:0] into the control register 0.
3. Write the MAC address[47:32], Forwarding Group, Output Port/Multicast Index, Control Field and the Entry State into the control register 1.
4. Write the Command into the control register 2 to define the operation.
5. Wait for the engine to complete (Check the Busy Bit).

6. Read the desired result returned in the status register.

Note: Before the “Search command”, the CPU should execute the “Initial command” to initial the search pointer. The search engine could search the aim from the top to the bottom. The search engine has an ability to automatically move the pointer to the associated location (The result will be returned). Because more than one entry may match the searching condition (by port, by address, etc.) at the same time, the CPU should continue to restart the search engine until the Command Result = Entry Not is found to confirm that no other matching entries exist.

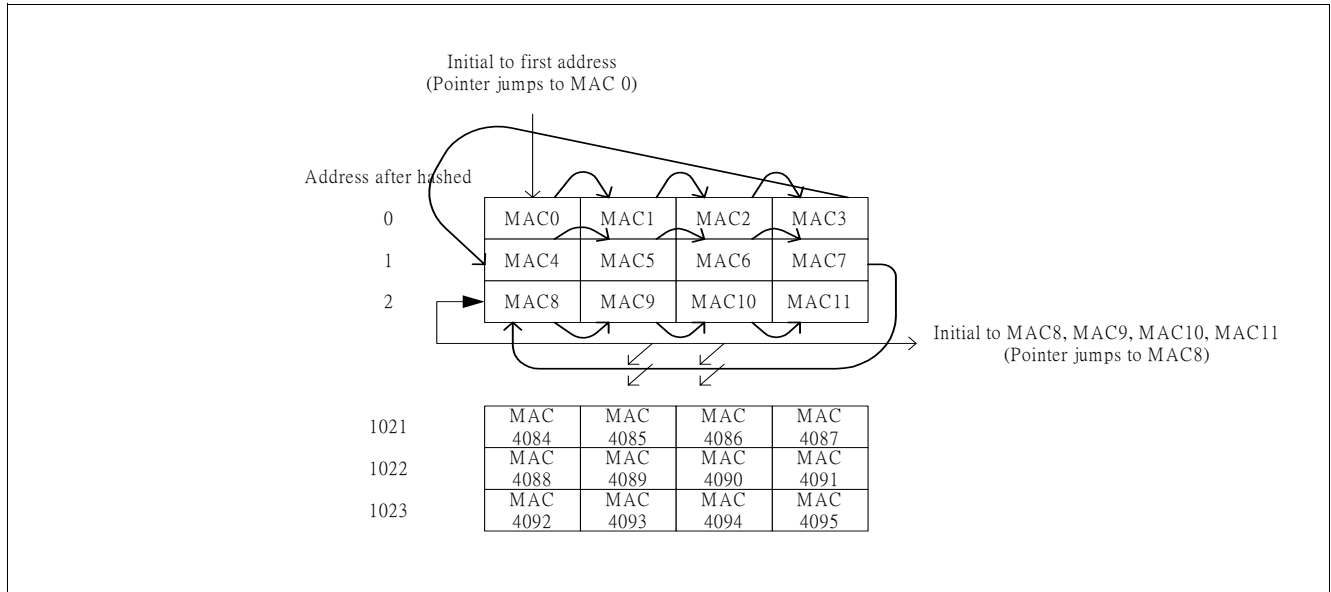


Figure 11 The Search Pointer

3. Example

Table 34 Example

Example	Step
The user needs ADM6918/X to forward the specified unicast packet (DA = 0012_3456_789A _H and Forwarding Group = 2) to port 3 forever.	<p>Step 1: Check the Busy bit. If Busy = 0_B, go to the step 2. If Busy = 1_B, wait.</p> <p>Step 2: Write 3456_789A_H into control register 0.</p> <p>Step 3: Write 5C62_0012_H into the control register 1.</p> <p>Step 4: Write 0000_0000_H into the control register 2 to start the “Create” operation.</p> <p>Step 5: Read the status register 2 to check the busy bit. If Busy = 0_B, check the Command Result to see if the create operation is successful. If Busy = 1_B, wait for completion.</p>

Table 34 Example (cont'd)

Example	Step
The user needs the ADM6918/X to forward the specified multicast packet (DA = 0123_4567_89AB _H and Forwarding Group = 3) to port 5 only. This address could be aged.	Step 1: Check the Busy bit. If Busy = 0 _B , go to the step 2. If Busy = 1 _B , wait. Step 2: Write 4567_89AB _H into control register 0. Step 3: Write 1CA3_0123 _H into the control register 1. Step 4: Write 0000_0000 _H into the control register 2 to start the "Create" operation. Step 5: Read the status register 2 to check the busy bit. If Busy = 0 _B , check the Command Result to see if the create operation is successful. If Busy = 1 _B , wait for completion.
The user wants to know how many stations attached to port 4.	Step 1: Check the Busy bit. If Busy = 0 _B , go to the step 2. If Busy = 1 _B , wait. Step 2: Write 0000_0000 _H into control register 1. Step 3: Write 0000_0003 _H into control register 2 to start the "Initial to the first address" operation. Step 4: Read the status register 2 to check the busy bit. If Busy = 0 _B , check the Command Result to see if the initial operation is successful. If Busy = 1 _B , wait for completion. Step 5: Write 2480_0000 _H into control register 1. Step 6: Write 0000_0002 _H into control register 2 to start the "Search by port" operation. Step 7: Read the status register 2 to check the busy bit. If Busy = 0 _B , check the Command Result to see if the search operation is successful (the Mac address attached to port 4 could be derived from the MAC address in the status register). If Busy = 1 _B , wait for completion. Step 8: If Command Result = "Command OK", it means some other MAC addresses attached to port 4 may exist. We should restart the "Search by port" command again to let the search engine to look another addresses. Step 9: If the Command Result = "Entry Not Found", it means no other addresses attached to port 4 exist.

Control and Status Register for the Multicast Output Port Map Table

1. The Control and Status Register Descriptions

Table 35 Control Register Description

Command Field	Multicast Index	Output Port Map
Control_2[2:0]	Control_0[30:26]	Control_0[25:0]

Table 36 Field Description in the Control Register

Field	Description
Output Port Map	This field describes the output ports associated with the multicast index. Bit [0] is for port 0, Bit[1] is for port 1, ... and Bit[25] for port 25.
Multicast Index	refer to Figure 12 .
Command Field	100 _B , Create an entry in the output port map table (indexed by the Multicast Index). 101 _B , Search an entry in the output port map table (indexed by the Multicast Index).

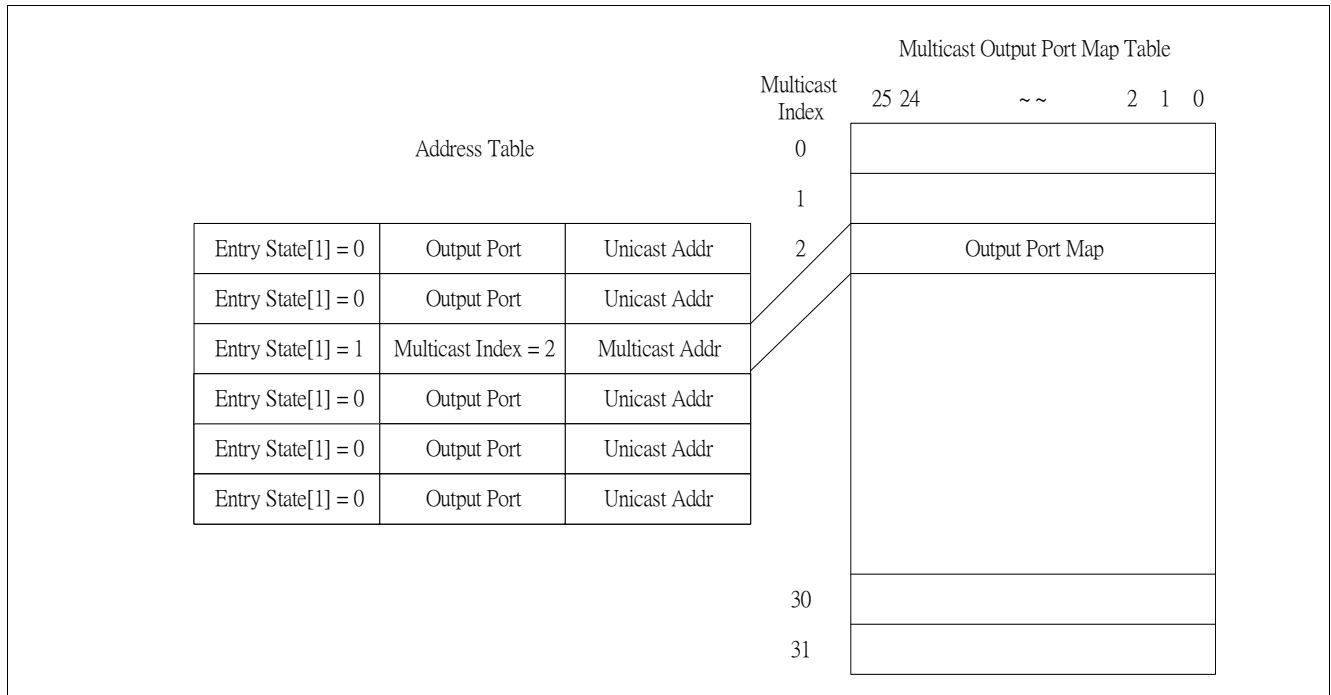


Figure 12 Address Table Mapping to Output Port MAP

Table 37 Status Register Description

Busy	Command Result	Output Port Map
Status_2[3]	Status_2[2:0]	Status_0[25:0]

Table 38 Field Description in the Status Register

Field	Description
Output Port Map	The content associated with the multicast index will be here after searching.
Command Result	000 _B = Command OK
Busy	This bit indicates if the output port map engine is available. 0 _B , The engine is available. 1 _B , The engine is busy and it will not access the command from the CPU.

2. Rules to Access the Multicast Output Port Map Table

1. Check the Busy Bit to see if the access engine is available. If the engine is busy, wait until the engine is free. If the engine is available, go to the following step.
2. Write output port map and the multicast index into the control register 0.
3. Write the command into the control register 2.
4. Read the Busy Bit. If Busy = 1_B, wait. If Busy = 0_B, the operation completes.

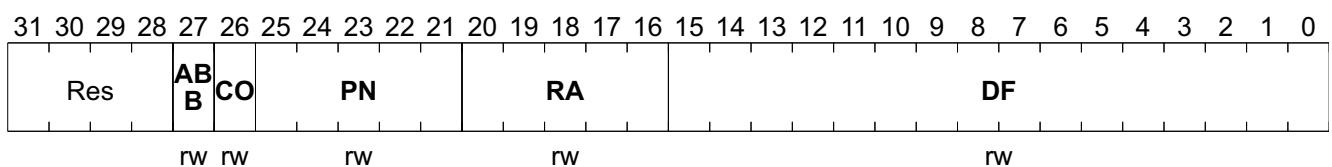
3. Example

Table 39 Example

Example	Step
The user needs the ADM6918/X to forward the specified multicast packet (DA = 0123_4567_89AB _H and Forwarding Group = 3) to port 1, port2 and port 25. This address could be aged. We assume the CPU wants to write output port map into index 1.	<p>Step 1: Check the Busy bit. If Busy = 0_B, go to the step 2. If Busy = 1_B, wait.</p> <p>Step 2: Write 0060_0006_H into control register 0.</p> <p>Step 3: Write 0000_0004_H into control register 2 start the “Write” command.</p> <p>Step 4: Check the Busy bit. If Busy = 1_B, wait. If Busy = 1_B, go to the next step.</p> <p>Step 5: Write 4567_89AB_H into control register 0.</p> <p>Step 6: Write 9c23_0123_H into the control register 1.</p> <p>Step 7: Write 0000_0000_H into the control register 2 to start the “Create” operation.</p> <p>Step 8: Read the status register 2 to check the busy bit. If Busy = 0_B, check the Command Result to see if the create operation is successful. If Busy = 1_B, wait for completion.</p>

PHY Control Register

PHYCR	Offset	Reset Value
PHY Control Register	0B_H	0000 0000_H



Field	Bits	Type	Description
ABB	27	rw	Access (Busy) Bit
CO	26	rw	Command Option 0 _B , Write 1 _B , Read
PN	25:21	rw	Port Number
RA	20:16	rw	Register Address
DF	15:0	rw	Data Field This field indicates the data for reading or writing.

Notes

1. This register allows the user to control the PHY attached through the CUP's help.
2. Rule for Read Operation:
 - Step 1: Poll the Busy bit (Bit[27]) to check if the PHY control module is busy.
 - Step 2: Write the port number (Bit[25:21]), register address (Bit[20:16]), command (Bit[26]) and Access

Switch Register Map

bit(Bit[27]) to start the read operation.

Step 3: Poll the Busy bit (Bit[27]). If Busy = 1_B, wait. If Busy = 0_B, data is returned in the data field.

3. Rule for Write Operation:

Step 1: Poll the Busy bit (Bit[27]) to check if the PHY control module is busy.

Step 2: Write the port number (Bit[25:21]), register address (Bit[20:16]), command (Bit[26]), data field (Bit[15:0]) and Access bit(Bit[27]) to start the write operation.

Step 3: Poll the Busy bit (Bit[27]). If Busy = 1_B, wait. If Busy = 0_B, writing operation completes.

4. Example: The user wants to read the Basic Control Register in Port 1.

Step 1: Read Bit[27] to check if PHY module is in progress.

Step 2: If Bit[27] = 0_B, write Bit[27] = 1_B, Bit[26] = 1_B, Bit[25:21] = 5'h1 and Bit[20:16] = 5'h0.

Step 3: Poll the Busy bit. If Bit[27] = 0_B, data is returned in the data field. If Bit[27] = 1_B, wait.

Hardware Status

The Reset Value is done by hardware setting.

HS	Offset	Reset Value
Hardware Status	0D _H	Hardware Setting _H

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0							
Res																							BR	P24	TE	IP	FC	BP	AN	AD								
																							M*	25OM		G*	E	E	E	AD								
																							ro	ro	ro	ro	ro	ro	ro	ro								

Field	Bits	Type	Description
BRMII	8	ro	Bond RMII (SS-SMII or Pure RMII Mode) 0 _B , The switch is in SS-SMII package. 1 _B , The switch is in RMII package.
P24_25OM	7:6	ro	Port 24 or Port 25 Operate in RMII or MII Mode 00 _B , Port 24 and Port 25 are both configured to MII mode. 01 _B , Port 24 is configured to RMII; Port 25 is configured to MII. 10 _B , Port 24 is configured to MII; Port 25 is configured to RMII. 11 _B , Port 24 and Port 25 are both configured to RMII.
TE	5	ro	Trunking Enable From Hardware 0 _B , Trunking Disable. 1 _B , Trunking Enable.
IPG92TE	4	ro	IPG 92 Bit Time Enable From Hardware Pin 0 _B , IPG 92 Disable. 1 _B , IPG 92 Enable.
FCE	3	ro	Flow Control Enable For Full Duplex From Hardware Pin 0 _B , Flow Control Disable. 1 _B , Flow Control Enable.
BPE	2	ro	Back Pressure Enable From Hardware Pin 0 _B , Back Pressure Disable. 1 _B , Back Pressure Enable.
ANE	1	ro	Auto-Negotiation Enable From Hardware Pin 0 _B , Auto-Negotiation Disable. 1 _B , Auto-Negotiation Enable.

Switch Register Map

Field	Bits	Type	Description
T25CO	25	roc	Port 25 Transmit Packet Count Overflow
T24CO	24	roc	Port 24 Transmit Packet Count Overflow
Res	23:16	ro	Reserved
T15CO	15	roc	Port 15 Transmit Packet Count Overflow
T14CO	14	roc	Port 14 Transmit Packet Count Overflow
T13CO	13	roc	Port 13 Transmit Packet Count Overflow
T12CO	12	roc	Port 12 Transmit Packet Count Overflow
T11CO	11	roc	Port 11 Transmit Packet Count Overflow
T10CO	10	roc	Port 10 Transmit Packet Count Overflow
T9CO	9	roc	Port 9 Transmit Packet Count Overflow
T8CO	8	roc	Port 8 Transmit Packet Count Overflow
T7CO	7	roc	Port 7 Transmit Packet Count Overflow
T6CO	6	roc	Port 6 Transmit Packet Count Overflow
T5CO	5	roc	Port 5 Transmit Packet Count Overflow
T4CO	4	roc	Port 4 Transmit Packet Count Overflow
T3CO	3	roc	Port 3 Transmit Packet Count Overflow
T2CO	2	roc	Port 2 Transmit Packet Count Overflow
T1CO	1	roc	Port 1 Transmit Packet Count Overflow
T0CO	0	roc	Port 0 Transmit Packet Count Overflow 1 _B , Transmit packet count in port 0 overflows and it will be cleared after read from CPU.

Transmit Packet Length Count Overflow

TPLCO	Offset	Reset Value
Transmit Packet Length Count Overflow	11 _H	0000 0000 _H

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
Res						T2 5*	T2 4*	Res								T1 5*	T1 4*	T1 3*	T1 2*	T1 1*	T1 0*	T9 L*	T8 L*	T7 L*	T6 L*	T5 L*	T4 L*	T3 L*	T2 L*	T1 L*	T0 L*		
						roc	roc									roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc

Field	Bits	Type	Description
T25LCO	25	roc	Port 25 Transmit Packet Length Count Overflow
T24LCO	24	roc	Port 24 Transmit Packet Length Count Overflow
Res	23:16	ro	Reserved
T15LCO	15	roc	Port 15 Transmit Packet Length Count Overflow
T14LCO	14	roc	Port 14 Transmit Packet Length Count Overflow
T13LCO	13	roc	Port 13 Transmit Packet Length Count Overflow
T12LCO	12	roc	Port 12 Transmit Packet Length Count Overflow

Switch Register Map

Field	Bits	Type	Description
T11LCO	11	roc	Port 11 Transmit Packet Length Count Overflow
T10LCO	10	roc	Port 10 Transmit Packet Length Count Overflow
T9LCO	9	roc	Port 9 Transmit Packet Length Count Overflow
T8LCO	8	roc	Port 8 Transmit Packet Length Count Overflow
T7LCO	7	roc	Port 7 Transmit Packet Length Count Overflow
T6LCO	6	roc	Port 6 Transmit Packet Length Count Overflow
T5LCO	5	roc	Port 5 Transmit Packet Length Count Overflow
T4LCO	4	roc	Port 4 Transmit Packet Length Count Overflow
T3LCO	3	roc	Port 3 Transmit Packet Length Count Overflow
T2LCO	2	roc	Port 2 Transmit Packet Length Count Overflow
T1LCO	1	roc	Port 1 Transmit Packet Length Count Overflow
T0LCO	0	roc	Port 0 Transmit Packet Length Count Overflow 1 _B , Transmit packet length count in port 0 overflows and it will be cleared after read from CPU.

Error Count Overflow

ECO	Offset	Reset Value
Error Count Overflow	12_H	0000 0000_H

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
Res						P2 5*	P2 4*	Res								P1 5*	P1 4*	P1 3*	P1 2*	P1 1*	P1 0*	P9 E*	P8 E*	P7 E*	P6 E*	P5 E*	P4 E*	P3 E*	P2 E*	P1 E*	P0 E*	
						roc	roc	ro								roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc	roc

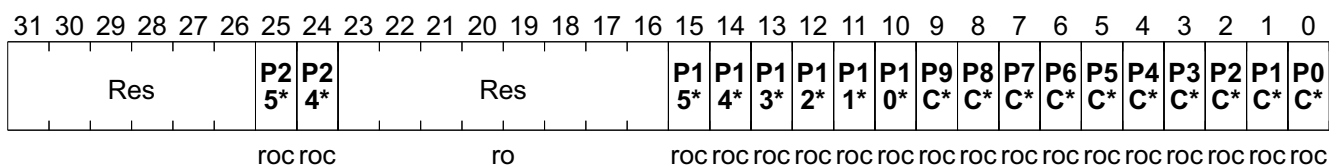
Field	Bits	Type	Description
P25ECO	25	roc	Port 25 Error Count Overflow
P24ECO	24	roc	Port 24 Error Count Overflow
Res	23:16	ro	Reserved
P15ECO	15	roc	Port 15 Error Count Overflow
P14ECO	14	roc	Port 14 Error Count Overflow
P13ECO	13	roc	Port 13 Error Count Overflow
P12ECO	12	roc	Port 12 Error Count Overflow
P11ECO	11	roc	Port 11 Error Count Overflow
P10ECO	10	roc	Port 10 Error Count Overflow
P9ECO	9	roc	Port 9 Error Count Overflow
P8ECO	8	roc	Port 8 Error Count Overflow
P7ECO	7	roc	Port 7 Error Count Overflow
P6ECO	6	roc	Port 6 Error Count Overflow
P5ECO	5	roc	Port 5 Error Count Overflow
P4ECO	4	roc	Port 4 Error Count Overflow

Switch Register Map

Field	Bits	Type	Description
P3ECO	3	roc	Port 3 Error Count Overflow
P2ECO	2	roc	Port 2 Error Count Overflow
P1ECO	1	roc	Port 1 Error Count Overflow
P0ECO	0	roc	Port 0 Error Count Overflow 1 _B , Error count in port 0 overflows and it will be cleared after read from CPU.

Collision Count Overflow

CCO	Offset	Reset Value
Collision Count Overflow	13_H	0000 0000_H

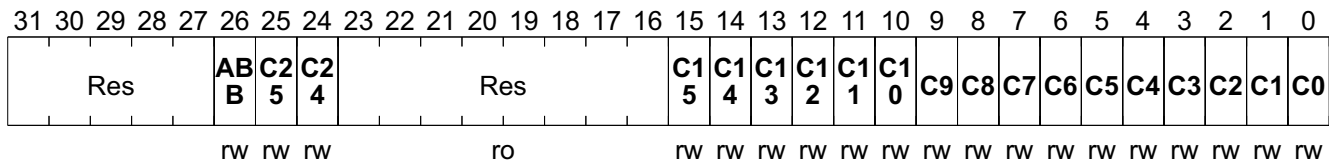


Field	Bits	Type	Description
P25CCO	25	roc	Port 25 Collision Count Overflow
P24CCO	24	roc	Port 24 Collision Count Overflow
Res	23:16	ro	Reserved
P15CCO	15	roc	Port 15 Collision Count Overflow
P14CCO	14	roc	Port 14 Collision Count Overflow
P13CCO	13	roc	Port 13 Collision Count Overflow
P12CCO	12	roc	Port 12 Collision Count Overflow
P11CCO	11	roc	Port 11 Collision Count Overflow
P10CCO	10	roc	Port 10 Collision Count Overflow
P9CCO	9	roc	Port 9 Collision Count Overflow
P8CCO	8	roc	Port 8 Collision Count Overflow
P7CCO	7	roc	Port 7 Collision Count Overflow
P6CCO	6	roc	Port 6 Collision Count Overflow
P5CCO	5	roc	Port 5 Collision Count Overflow
P4CCO	4	roc	Port 4 Collision Count Overflow
P3CCO	3	roc	Port 3 Collision Count Overflow
P2CCO	2	roc	Port 2 Collision Count Overflow
P1CCO	1	roc	Port 1 Collision Count Overflow
P0CCO	0	roc	Port 0 Collision Count Overflow 1 _B , Collision Count in port 0 overflows and it will be cleared after read from CPU.

Renew Counter Register

Switch Register Map

RCR **Offset** **Reset Value**
Renew Counter Register **14_H** **0000 0000_H**



Field	Bits	Type	Description
ABB	26	rw	Access (Busy) Bit
C25	25	rw	Counter Port 25 1 _B , Clear Port 25 Corresponding Counters
C24	24	rw	Counter Port 24 1 _B , Clear Port 24 Corresponding Counters
Res	23:16	ro	Reserved
C15	15	rw	Counter Port 15 1 _B , Clear Port 15 Corresponding Counters
C14	14	rw	Counter Port 14 1 _B , Clear Port 14 Corresponding Counters
C13	13	rw	Counter Port 13 1 _B , Clear Port 13 Corresponding Counters
C12	12	rw	Counter Port 12 1 _B , Clear Port 12 Corresponding Counters
C11	11	rw	Counter Port 11 1 _B , Clear Port 11 Corresponding Counters
C10	10	rw	Counter Port 10 1 _B , Clear Port 10 Corresponding Counters
C9	9	rw	Counter Port 9 1 _B , Clear Port 9 Corresponding Counters
C8	8	rw	Counter Port 8 1 _B , Clear Port 8 Corresponding Counters
C7	7	rw	Counter Port 7 1 _B , Clear Port 7 Corresponding Counters
C6	6	rw	Counter Port 6 1 _B , Clear Port 6 Corresponding Counters
C5	5	rw	Counter Port 5 1 _B , Clear Port 5 Corresponding Counters
C4	4	rw	Counter Port 4 1 _B , Clear Port 4 Corresponding Counters
C3	3	rw	Counter Port 3 1 _B , Clear Port 3 Corresponding Counters
C2	2	rw	Counter Port 2 1 _B , Clear Port 2 Corresponding Counters

Switch Register Map

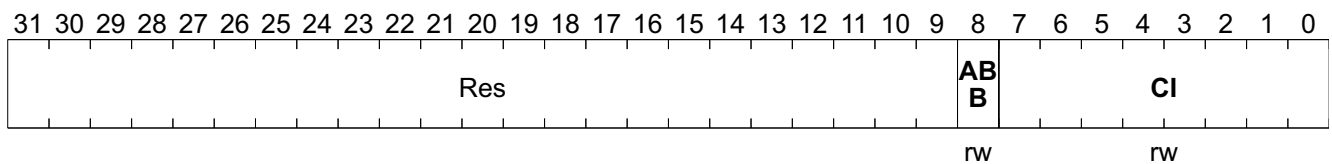
Field	Bits	Type	Description
C1	1	rw	Counter Port 1 1 _B , Clear Port 1 Corresponding Counters
C0	0	rw	Counter Port 0 1 _B , Clear Port 0 Corresponding Counters

Notes

- This register allows the user to reset all counters for the corresponding port. If the renew counter module is busy all other modules about counters are not accessible.
- Rule:
 - Step 1: Poll the busy bit to check if the renew counter module is busy.
 - Step 2: If the renew counter module is available, write the port (Bit[25:0]) the user wants to reset and the busy bit(Bit[26]) to 1.
 - Step 3: Poll the busy bit to check if the renew counter module completes the job.
- Example:
 - Users want to reset P0, P1, P2, P3 corresponding counters.
 - Step 1: Read Bit[26] to check if reset is in progress.
 - Step 2: If Bit[26] = 0, write Bit[26] = 1_B, Bit[25:0] = 00_0000_0000_0000_0000_0000_1111_B into the register.
 - Step 3: Poll the busy bit to check if reset completes.

Read Counter Control Register

RCCR	Offset	Reset Value
Read Counter Control Register	15_H	0000_0000_H



Field	Bits	Type	Description
ABB	8	rw	Access (Busy) Bit
CI	7:0	rw	Counter Index

Read Counter Status Register

RCSR	Offset	Reset Value
Read Counter Status Register	16_H	0000 0000_H

Switch Register Map

Field	Bits	Type	Description
P10MDIO	10	rw	Port 10 MDIO Register Reload
P9MDIO	9	rw	Port 9 MDIO Register Reload
P8MDIO	8	rw	Port 8 MDIO Register Reload
P7MDIO	7	rw	Port 7 MDIO Register Reload
P6MDIO	6	rw	Port 6 MDIO Register Reload
P5MDIO	5	rw	Port 5 MDIO Register Reload
P4MDIO	4	rw	Port 4 MDIO Register Reload
P3MDIO	3	rw	Port 3 MDIO Register Reload
P2MDIO	2	rw	Port 2 MDIO Register Reload
P1MDIO	1	rw	Port 1 MDIO Register Reload
P0MDIO	0	rw	Port 0 MDIO Register Reload 1 _B , Status of Port 0 PHY attached will be reloaded and updated to the switch. After PHY is reloaded, Bit[0] will be cleared.

Spanning Tree Port State 0

STPS0	Offset	Reset Value
Spanning Tree Port State 0	18_H	0000 0000_H

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
P15S TPS	P14S TPS	P13S TPS	P12S TPS	P11S TPS	P10S TPS	P9ST PS	P8ST PS	P7ST PS	P6ST PS	P5ST PS	P4ST PS	P3ST PS	P2ST PS	P1ST PS	P0ST PS																
rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw	rw

Field	Bits	Type	Description
P15STPS	31:30	rw	Port 15 Spanning Tree Port Status
P14STPS	29:28	rw	Port 14 Spanning Tree Port Status
P13STPS	27:26	rw	Port 13 Spanning Tree Port Status
P12STPS	25:24	rw	Port 12 Spanning Tree Port Status
P11STPS	23:22	rw	Port 11 Spanning Tree Port Status
P10STPS	21:20	rw	Port 10 Spanning Tree Port Status
P9STPS	19:18	rw	Port 9 Spanning Tree Port Status
P8STPS	17:16	rw	Port 8 Spanning Tree Port Status
P7STPS	15:14	rw	Port 7 Spanning Tree Port Status
P6STPS	13:12	rw	Port 6 Spanning Tree Port Status
P5STPS	11:10	rw	Port 5 Spanning Tree Port Status
P4STPS	9:8	rw	Port 4 Spanning Tree Port Status
P3STPS	7:6	rw	Port 3 Spanning Tree Port Status
P2STPS	5:4	rw	Port 2 Spanning Tree Port Status
P1STPS	3:2	rw	Port 1 Spanning Tree Port Status
P0STPS	1:0	rw	Port 0 Spanning Tree Port Status

Note: The ADM6918/X supports 4 port status to support Spanning Tree

Protocol.

00_B = Forwarding State. The port acts as the normal

mode.

01_B = Disabled State. The port entity will not transmit

and receive any packets. Learning is disabled in this

state.

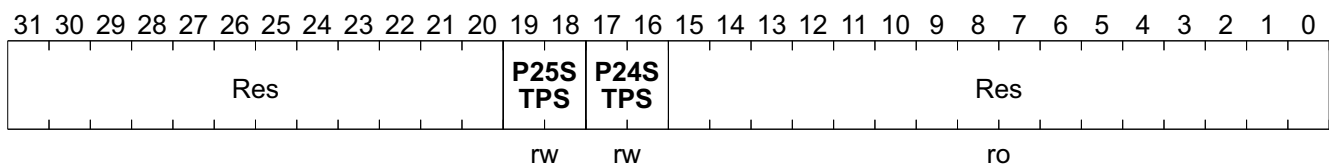
10_B = Learning State. The port entity will only transmit and receive management packets. All other packets are discarded. Learning is enabled for all good frames.

11_B = Blocking-not-Listening. Only the management packets defined by the ADM6918/X will be received and transmitted.

All other packets are discarded by the port entity. Learning is disabled in this state.

Spanning Tree Port State 1

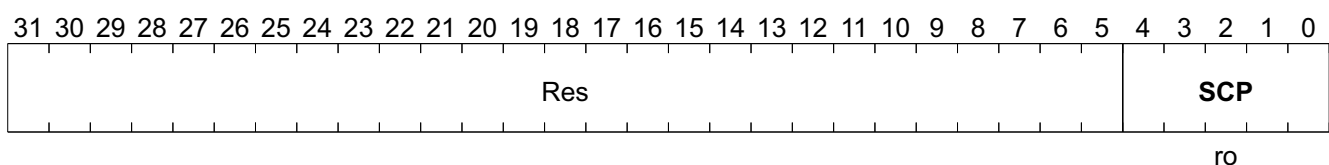
STPS1 **Offset**
Spanning Tree Port State 1 **19_H** **Reset Value**
0000 0000_H



Field	Bits	Type	Description
P25STPS	19:18	rw	Port 25 Spanning Tree Port Status
P24STPS	17:16	rw	Port 24 Spanning Tree Port Status
Res	15:0	ro	Reserved

Source Port Register

SCPR **Offset**
Source Port Register **1A_H** **Reset Value**
0000_0000_H

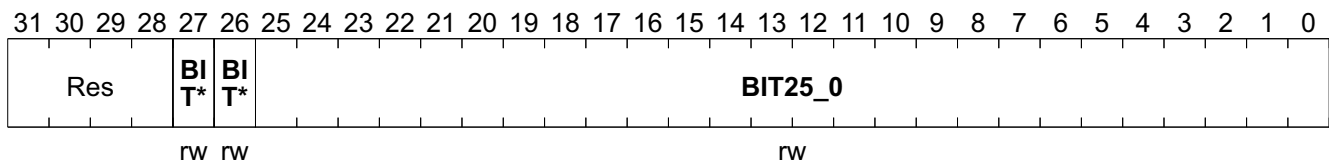


Field	Bits	Type	Description
SCP	4:0	ro	The Source Port The CPU can read this register to get the source port when he receives a packet.

Note: The value will be correct after the SA is transmitted.

Transmit Port Register

TRPR **Offset** **Reset Value**
Transmit Port Register **1B_H** **0000 0000_H**



Field	Bits	Type	Description
BIT27	27	rw	Bit 27 0 _B , The command is not valid. 1 _B , The command is valid.
BIT26	26	rw	Bit 26 The destination ports is more than 1
BIT25_0	25:0	rw	Bit 25_0 The destination ports the CPU wants to forward.

Note: The value should be written before CPU transmits a packet.

Counter Register

Offset **0100_H ~ 019B_H**

Table 40 Counter Register: Offset 0100_H ~ 0167_H

Offset Hex	Index	Description	Offset Hex	Index	Description
The Receive Count					
0100	0	Port 0 Receive Packet Count	011A	1A	Port 0 Receive Packet Length Count
0101	1	Port 1 Receive Packet Count	011B	1B	Port 1 Receive Packet Length Count
0102	2	Port 2 Receive Packet Count	011C	1C	Port 2 Receive Packet Length Count
0103	3	Port 3 Receive Packet Count	011D	1D	Port 3 Receive Packet Length Count
0104	4	Port 4 Receive Packet Count	011E	1E	Port 4 Receive Packet Length Count
0105	5	Port 5 Receive Packet Count	011F	1F	Port 5 Receive Packet Length Count

Table 40 Counter Register: Offset 0100_H ~ 0167_H (cont'd)

Offset Hex	Index	Description	Offset Hex	Index	Description
0106	6	Port 6 Receive Packet Count	0120	20	Port 6 Receive Packet Length Count
0107	7	Port 7 Receive Packet Count	0121	21	Port 7 Receive Packet Length Count
0108	8	Port 8 Receive Packet Count	0122	22	Port 8 Receive Packet Length Count
0109	9	Port 9 Receive Packet Count	0123	23	Port 9 Receive Packet Length Count
010A	A	Port 10 Receive Packet Count	0124	24	Port 10 Receive Packet Length Count
010B	B	Port 11 Receive Packet Count	0125	25	Port 11 Receive Packet Length Count
010C	C	Port 12 Receive Packet Count	0126	26	Port 12 Receive Packet Length Count
010D	D	Port 13 Receive Packet Count	0127	27	Port 13 Receive Packet Length Count
010E	E	Port 14 Receive Packet Count	0128	28	Port 14 Receive Packet Length Count
010F	F	Port 15 Receive Packet Count	0129	29	Port 15 Receive Packet Length Count
0110	10	Port 16 Receive Packet Count	012A	2A	Port 16 Receive Packet Length Count
0111	11	Port 17 Receive Packet Count	012B	2B	Port 17 Receive Packet Length Count
0112	12	Port 18 Receive Packet Count	012C	2C	Port 18 Receive Packet Length Count
0113	13	Port 19 Receive Packet Count	012D	2D	Port 19 Receive Packet Length Count
0114	14	Port 20 Receive Packet Count	012E	2E	Port 20 Receive Packet Length Count
0115	15	Port 21 Receive Packet Count	012F	2F	Port 21 Receive Packet Length Count
0116	16	Port 22 Receive Packet Count	0130	30	Port 22 Receive Packet Length Count
0117	17	Port 23 Receive Packet Count	0131	31	Port 23 Receive Packet Length Count
0118	18	Port 24 Receive Packet Count	0132	32	Port 24 Receive Packet Length Count
0119	19	Port 25 Receive Packet Count	0133	33	Port 25 Receive Packet Length Count
The Transmit Count					
0134	34	Port 0 Transmit Packet Count	014E	4E	Port 0 Transmit Packet Length Count

Table 40 Counter Register: Offset 0100_H ~ 0167_H (cont'd)

Offset Hex	Index	Description	Offset Hex	Index	Description
0135	35	Port 1 Transmit Packet Count	014F	4F	Port 1 Transmit Packet Length Count
0136	36	Port 2 Transmit Packet Count	0150	50	Port 2 Transmit Packet Length Count
0137	37	Port 3 Transmit Packet Count	0151	51	Port 3 Transmit Packet Length Count
0138	38	Port 4 Transmit Packet Count	0152	52	Port 4 Transmit Packet Length Count
0139	39	Port 5 Transmit Packet Count	0153	53	Port 5 Transmit Packet Length Count
013A	3A	Port 6 Transmit Packet Count	0154	54	Port 6 Transmit Packet Length Count
013B	3B	Port 7 Transmit Packet Count	0155	55	Port 7 Transmit Packet Length Count
013C	3C	Port 8 Transmit Packet Count	0156	56	Port 8 Transmit Packet Length Count
013D	3D	Port 9 Transmit Packet Count	0157	57	Port 9 Transmit Packet Length Count
013E	3E	Port 10 Transmit Packet Count	0158	58	Port 10 Transmit Packet Length Count
013F	3F	Port 11 Transmit Packet Count	0159	59	Port 11 Transmit Packet Length Count
0140	40	Port 12 Transmit Packet Count	015A	5A	Port 12 Transmit Packet Length Count
0141	41	Port 13 Transmit Packet Count	015B	5B	Port 13 Transmit Packet Length Count
0142	42	Port 14 Transmit Packet Count	015C	5C	Port 14 Transmit Packet Length Count
0143	43	Port 15 Transmit Packet Count	015D	5D	Port 15 Transmit Packet Length Count
0144	44	Port 16 Transmit Packet Count	015E	5E	Port 16 Transmit Packet Length Count
0145	45	Port 17 Transmit Packet Count	015F	5F	Port 17 Transmit Packet Length Count
0146	46	Port 18 Transmit Packet Count	0160	60	Port 18 Transmit Packet Length Count
0147	47	Port 19 Transmit Packet Count	0161	61	Port 19 Transmit Packet Length Count
0148	48	Port 20 Transmit Packet Count	0162	62	Port 20 Transmit Packet Length Count
0149	49	Port 21 Transmit Packet Count	0163	63	Port 21 Transmit Packet Length Count
014A	4A	Port 22 Transmit Packet Count	0164	64	Port 22 Transmit Packet Length Count

Switch Register Map

Table 40 Counter Register: Offset 0100_H ~ 0167_H (cont'd)

Offset Hex	Index	Description	Offset Hex	Index	Description
014B	4B	Port 23 Transmit Packet Count	0165	65	Port 23 Transmit Packet Length Count
014C	4C	Port 24 Transmit Packet Count	0166	66	Port 24 Transmit Packet Length Count
014D	4D	Port 25 Transmit Packet Count	0167	67	Port 25 Transmit Packet Length Count

Error and Collision Count

0168	68	Port 0 Receive Error Count	0182	82	Port 0 Collision Count
0169	69	Port 1 Receive Error Count	0183	83	Port 1 Collision Count
016A	6A	Port 2 Receive Error Count	0184	84	Port 2 Collision Count
016B	6B	Port 3 Receive Error Count	0185	85	Port 3 Collision Count
016C	6C	Port 4 Receive Error Count	0186	86	Port 4 Collision Count
016D	6D	Port 5 Receive Error Count	0187	87	Port 5 Collision Count
016E	6E	Port 6 Receive Error Count	0188	88	Port 6 Collision Count
016F	6F	Port 7 Receive Error Count	0189	89	Port 7 Collision Count
0170	70	Port 8 Receive Error Count	018A	8A	Port 8 Collision Count
0171	71	Port 9 Receive Error Count	018B	8B	Port 9 Collision Count
0172	72	Port 10 Receive Error Count	018C	8C	Port 10 Collision Count
0173	73	Port 11 Receive Error Count	018D	8D	Port 11 Collision Count
0174	74	Port 12 Receive Error Count	018E	8E	Port 12 Collision Count
0175	75	Port 13 Receive Error Count	018F	8F	Port 13 Collision Count
0176	76	Port 14 Receive Error Count	0190	90	Port 14 Collision Count
0177	77	Port 15 Receive Error Count	0191	91	Port 15 Collision Count
0178	78	Port 16 Receive Error Count	0192	92	Port 16 Collision Count
0179	79	Port 17 Receive Error Count	0193	93	Port 17 Collision Count
017A	7A	Port 18 Receive Error Count	0194	93	Port 18 Collision Count
017B	7B	Port 19 Receive Error Count	0195	95	Port 19 Collision Count
017C	7C	Port 20 Receive Error Count	0196	96	Port 20 Collision Count
017D	7D	Port 21 Receive Error Count	0197	97	Port 21 Collision Count
017E	7E	Port 22 Receive Error Count	0198	98	Port 22 Collision Count
017F	7F	Port 23 Receive Error Count	0199	99	Port 23 Collision Count
0180	80	Port 24 Receive Error Count	019A	9A	Port 24 Collision Count
0181	81	Port 25 Receive Error Count	019B	9B	Port 25 Collision Count

6 Electrical Specifications

6.1 DC Characteristics

6.1.1 Absolute Maximum Ratings

Table 41 Electrical Absolute Maximum Ratings

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
3.3 V Power Supply	V_{CCO}	3.0	–	3.6	V	–
1.8 V Power Supply	V_{CCIK}	1.71	–	1.89	V	–
Input Voltage	V_{IN}	-0.3	–	$V_{CC33} + 0.3$	V	–
Output Voltage	V_{out}	-0.3	–	$V_{CC33} + 0.3$	V	–
Storage Temperature	T_{STG}	-55	–	155	°C	–
Power Dissipation	P_D	–	–	1.0	W	–
ESD Rating	ESD	–	–	3000	V	–

6.1.2 Recommended Operating Conditions

Table 42 Recommended Operating Conditions

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Power Supply	V_{CC}	3.135	3.3	3.465	V	–
Input Voltage	V_{IN}	0	–	V_{CC}	V	–
Junction Operating Temperature	T_j	0	25	115	°C	–

6.1.3 DC Electrical Characteristics for 3.3 V Operation

Under $V_{cc} = 3.0\text{ V} \sim 3.6\text{ V}$, $T_j = 0^\circ\text{C} \sim 115^\circ\text{C}$

Table 43 DC Electrical Characteristics for 3.3 V Operation

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input Low Voltage	V_{IL}	–	–	0.8	V	TTL
Input High Voltage	V_{IH}	2.0	–	–	V	TTL
Output Low Voltage	V_{OL}	–	–	0.4	V	TTL
Output High Voltage	V_{OH}	2.3	–	–	V	TTL
Input Pull-up/down Resistance	R_I	–	50	–	K Ω	$V_{IL} = 0\text{ V}$ or $V_{IH} = V_{CC}$

6.2 AC Characteristics

6.2.1 XI/OSCI (Crystal/Oscillator) Timing

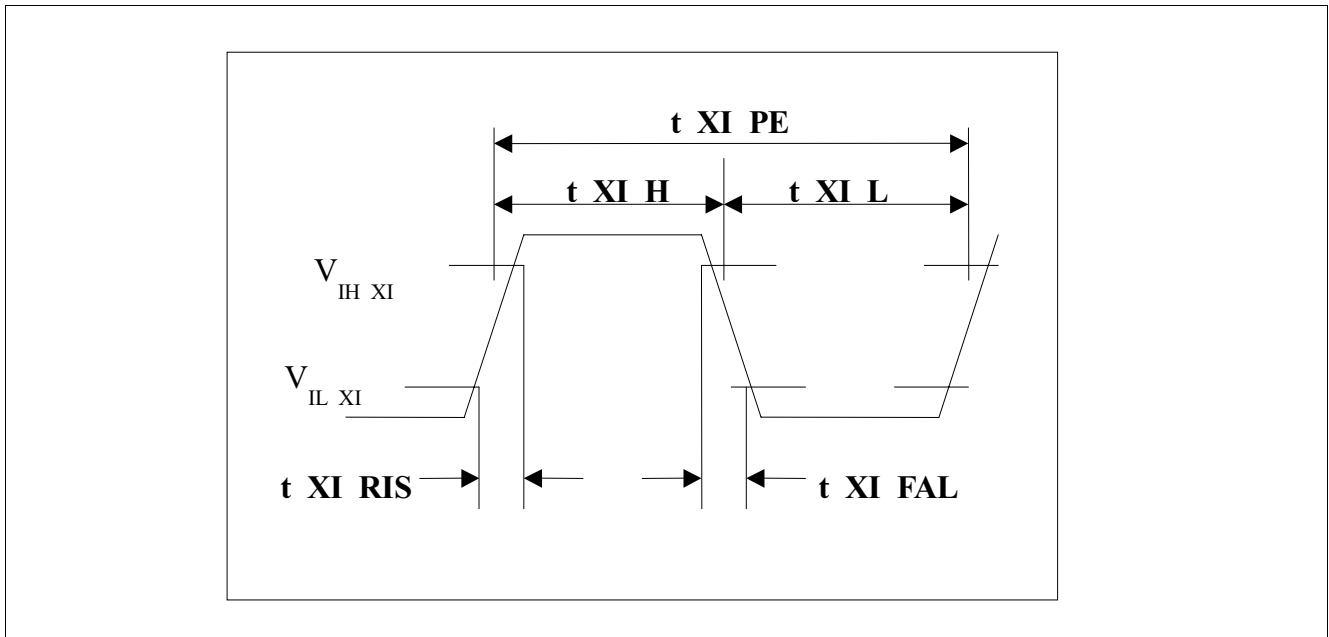


Figure 13 Crystal/Oscillator Timing

Table 44 Crystal/Oscillator Timing

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
XI/OSCI Clock Period	t_{XI_PER}	20.0 - 50ppm	20.0	20.0 + 50ppm	ns	–
XI/OSCI Clock High	t_{XI_HI}	8	10.0	–	ns	–
XI/OSCI Clock Low	t_{XI_LO}	8	10.0	–	ns	–
XI/OSCI Clock Rise Time, V_{IL} (max) to V_{IH} (min)	t_{XI_RISE}	–	–	2	ns	–
XI/OSCI Clock Fall Time, V_{IH} (min) to V_{IL} (max)	t_{XI_FALL}	–	–	2	ns	–

6.2.2 Power On Reset

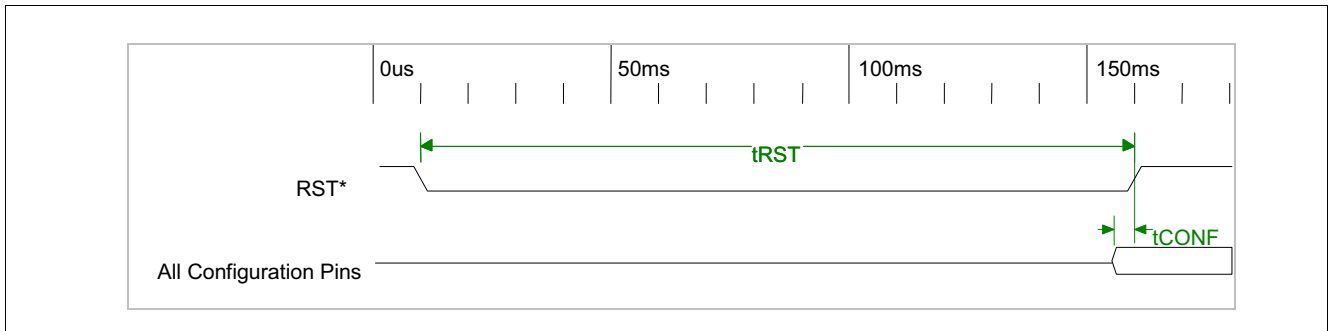


Figure 14 Power on Reset Timing

Table 45 Power on Reset Timing

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
RST Low Period	t_{RST}	150	–	–	ms	–
Start of Configuration Pins	t_{CONF}	100	–	–	ns	–

6.2.3 EEPROM Interface Timing

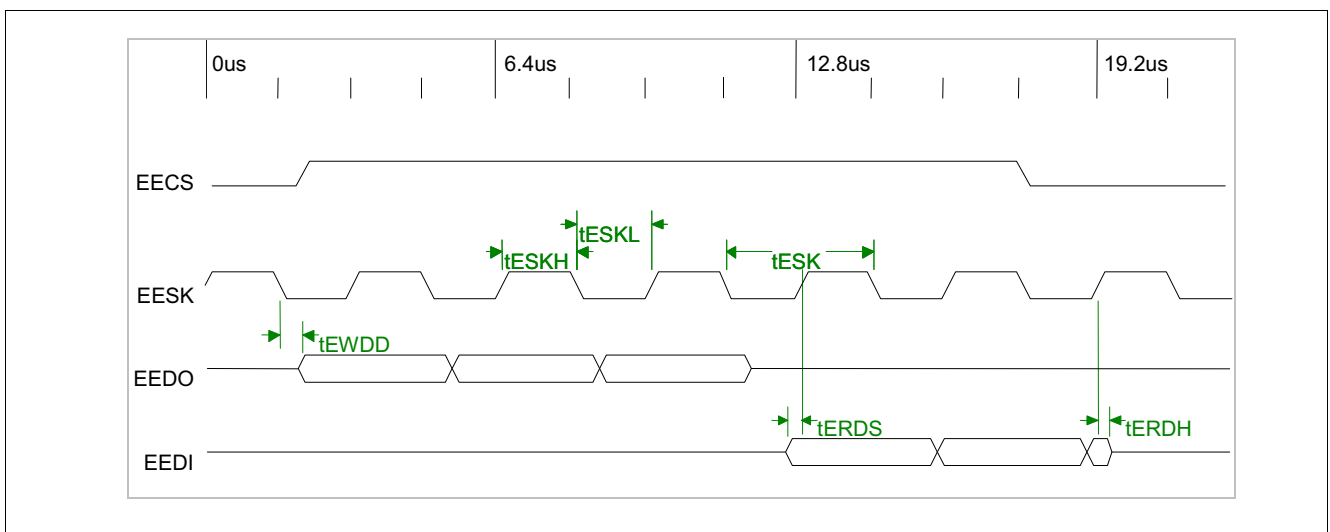


Figure 15 EEPROM Interface Timing

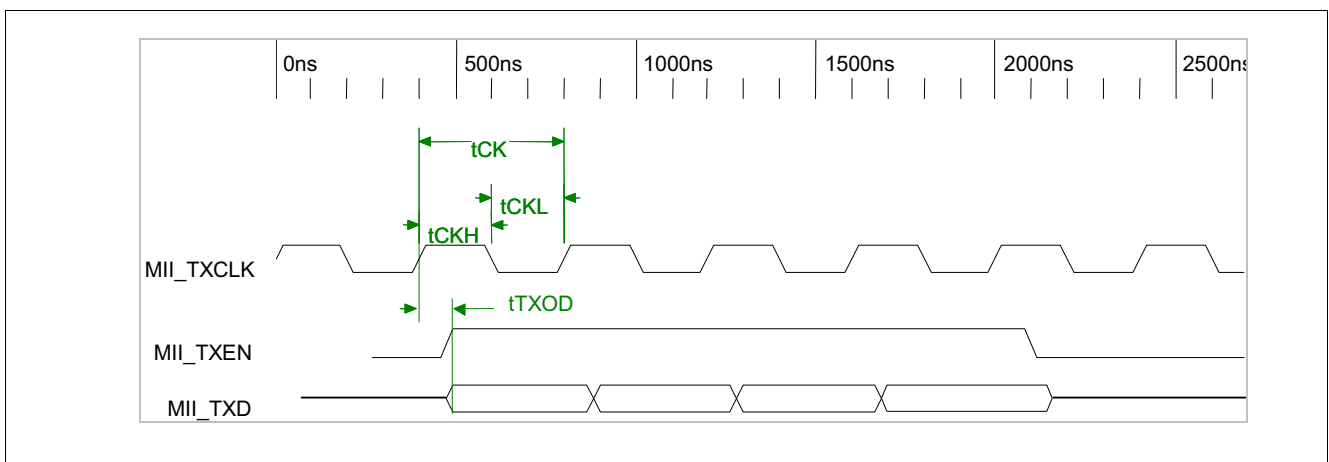
Table 46 EEPROM Interface Timing

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
EESK Period	t_{ESK}	–	3.2	–	μs	–
EESK Low Period	t_{ESKL}	–	1.6	–	μs	–
EESK High Period	t_{ESKH}	–	1.6	–	μs	–
EEDI to EESK Rising Setup Time	t_{ERDS}	10	–	–	ns	–

Table 46 EEPROM Interface Timing (cont'd)

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
EEDI to EESK Rising Hold Time	t_{ERDH}	10	–	–	ns	–
EESK Falling to EEDO Output Delay Time	t_{EWDD}	–	–	20	ns	–

6.2.4 10Base-TX MII Output Timing


Figure 16 10Base-TX MII Output Timing
Table 47 10Base-TX MII Output Timing

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
MII_TXCLK Period	t_{CK}	–	400	–	ns	–
MII_TXCLK Low Period	t_{CKL}	160	–	240	ns	–
MII_TXCLK High Period	t_{CKH}	160	–	240	ns	–
MII_TXD, MII_TXEN to MII_TXCLK Rising Output Delay	t_{TXOD}	10	–	20	ns	–

6.2.5 10Base-TX MII Input Timing

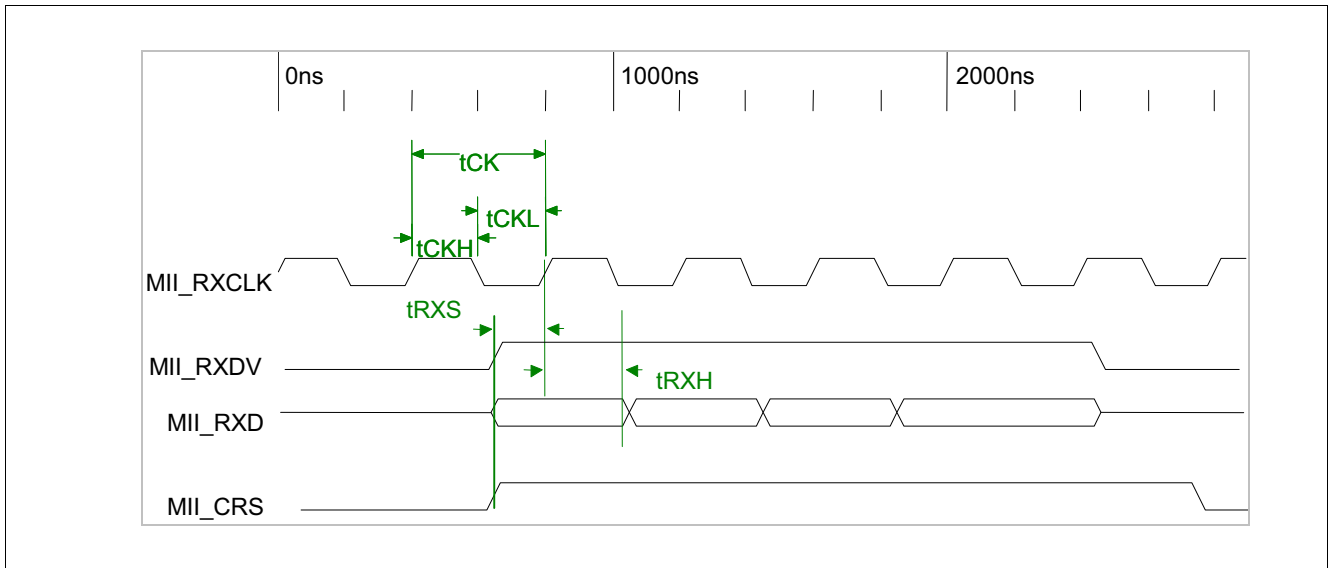


Figure 17 10Base-TX MII Input Timing

Table 48 10Base-TX MII Input Timing

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
MII_RXCLK Period	t_{CK}	–	400	–	ns	–
MII_RXCLK Low Period	t_{CKL}	160	–	240	ns	–
MII_RXCLK High Period	t_{CKH}	160	–	240	ns	–
MII_CRS, MII_RXDV and MII_RXD to MII_RXCLK rising setup	t_{RXS}	10	–	–	ns	–
MII_CRS, MII_RXDV and MII_RXD to MII_RXCLK rising hold	t_{RXH}	10	–	–	ns	–

6.2.6 100Base-TX MII Output Timing

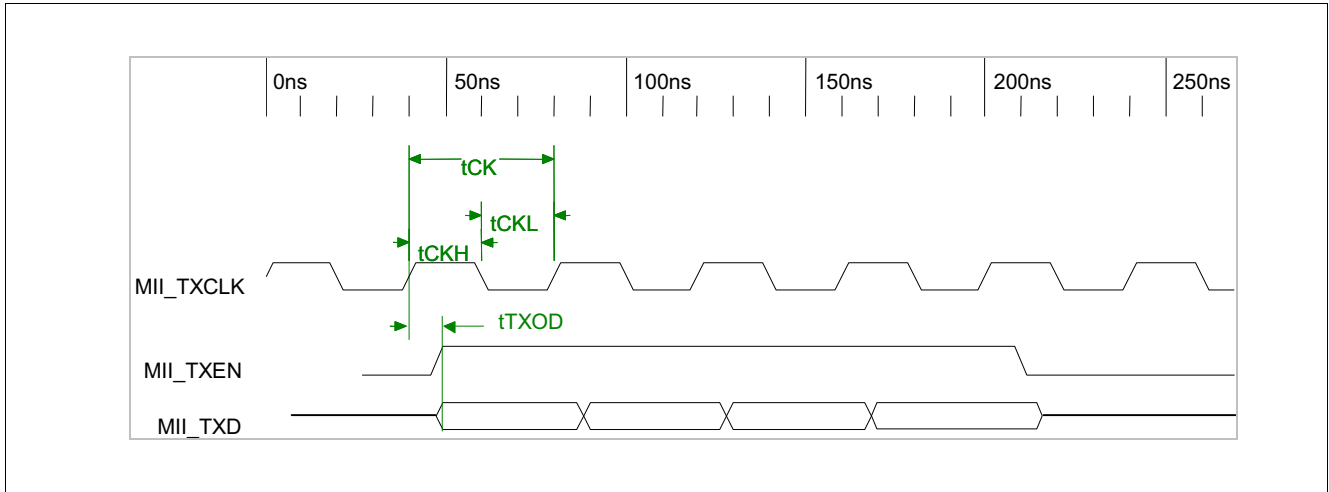


Figure 18 100Base-TX MII Output Timing

Table 49 100Base-TX MII Output Timing

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
MII_TXCLK Period	t_{CK}	–	40	–	ns	–
MII_TXCLK Low Period	t_{CKL}	16	–	24	ns	–
MII_TXCLK High Period	t_{CKH}	16	–	24	ns	–
MII_TXD, MII_TXEN to MII_TXCLK Rising Out put Delay	t_{TXOD}	10	–	20	ns	–

6.2.7 100Base-TX MII Input Timing

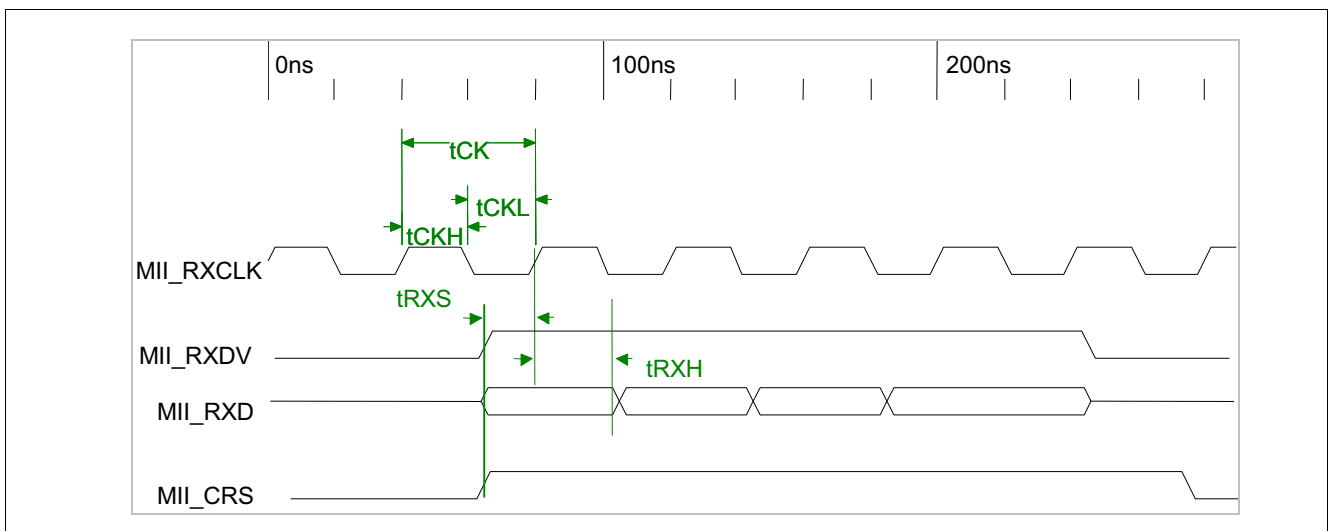


Figure 19 100Base-TX MII Input Timing

Table 50 100Base-TX MII Input Timing

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
MII_RXCLK Period	t_{CK}	–	40	–	ns	–
MII_RXCLK Low Period	t_{CKL}	16	–	24	ns	–
MII_RXCLK High Period	t_{CKH}	16	–	24	ns	–
MII_CRSDV, MII_RXDV and MII_RXD to MII_RXCLK rising setup	t_{RXS}	10	–	–	ns	–
MII_CRSDV, MII_RXDV and MII_RXD to MII_RXCLK rising hold	t_{RXH}	10	–	–	ns	–

6.2.8 Reduced MII Timing

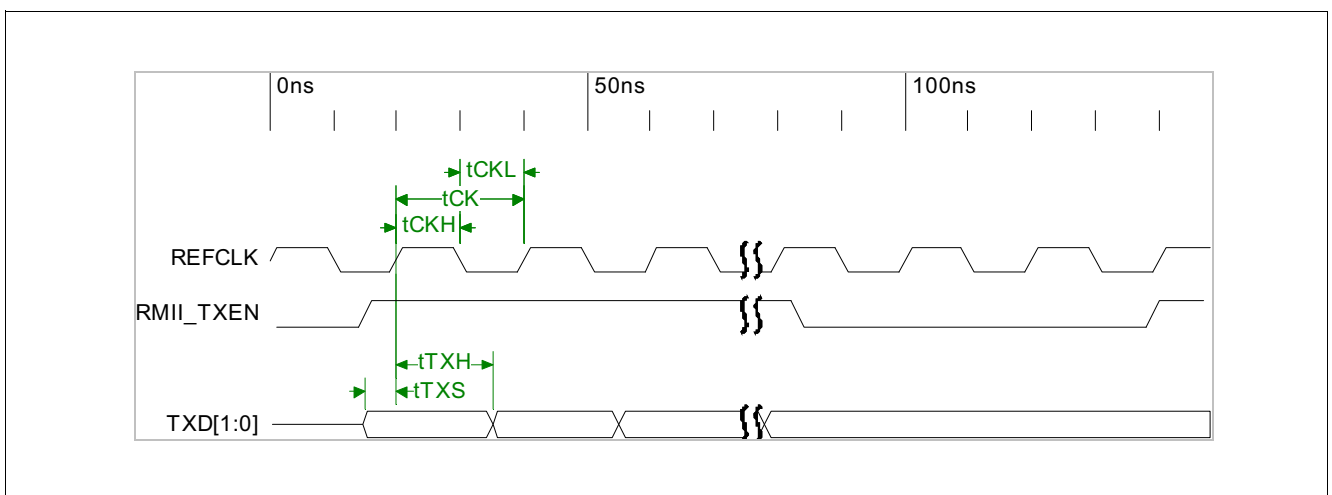
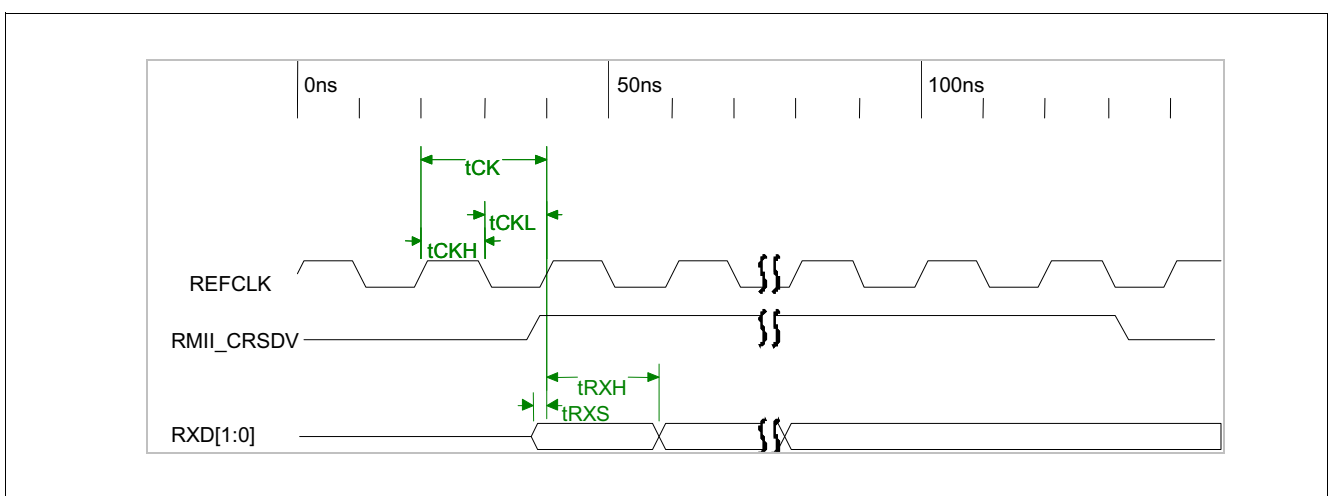
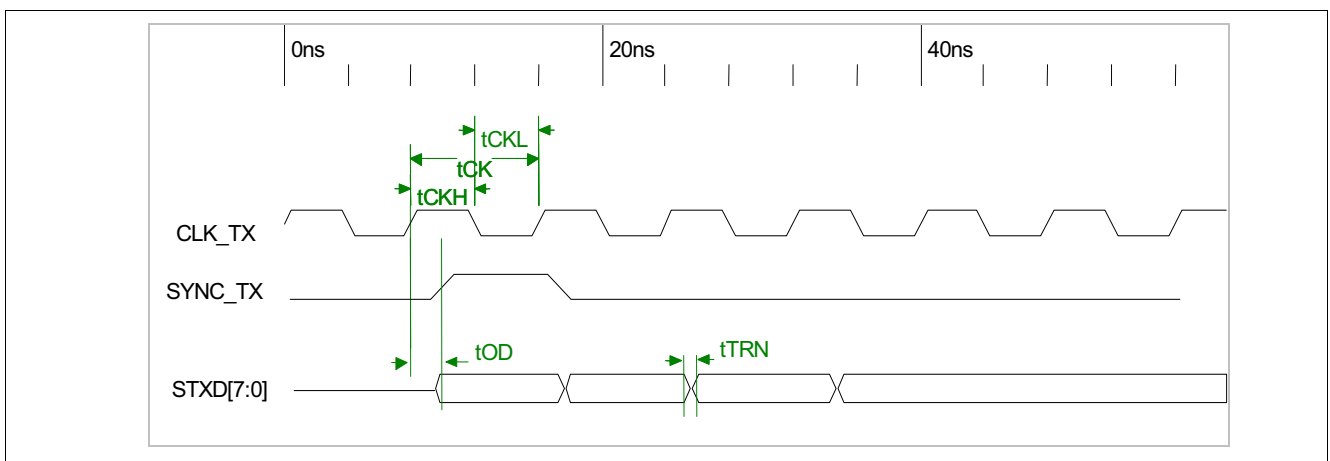

Figure 20 Reduced MII Timing (1 of 2)

Figure 21 Reduced MII Timing (2 of 2)

Table 51 Reduced MII Timing

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
RMII_REFCLK Period	t_{CK}	–	20	–	ns	–
RMII_REFCLK Low Period	t_{CKL}	–	10	–	ns	–
RMII_REFCLK High Period	t_{CKH}	–	10	–	ns	–
TXEN, TXD to REFCLK rising setup time	t_{TXS}	4	–	–	ns	–
TXEN, TXD to REFCLK rising hold time	t_{TXH}	2	–	–	ns	–
CSRDV, RXD to REFCLK rising setup time	t_{RXS}	4	–	–	ns	–
CRSDV, RXD to REFCLK rising hold time	t_{RXH}	2	–	–	ns	–

6.2.9 SS_SMIIT Transmit Timing


Figure 22 SS_SMIIT Transmit Timing
Table 52 SS_SMIIT Transmit Timing

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
SS_SMIIT Output Clock Period	t_{CK}	–	8	–	ns	–
SS_SMIIT Output Clock Low Period	t_{CKL}	–	4	–	ns	–
R SS_SMIIT Output Clock High Period	t_{CKH}	–	4	–	ns	–
Txdata/TxSync output delay to CLK_TX	t_{OD}	2	–	5	ns	–
Txdata/RxSync Rise/Fall Time	t_{TRN}	–	1	–	ns	–

6.2.10 SS_SMI_{II} Receive Timing

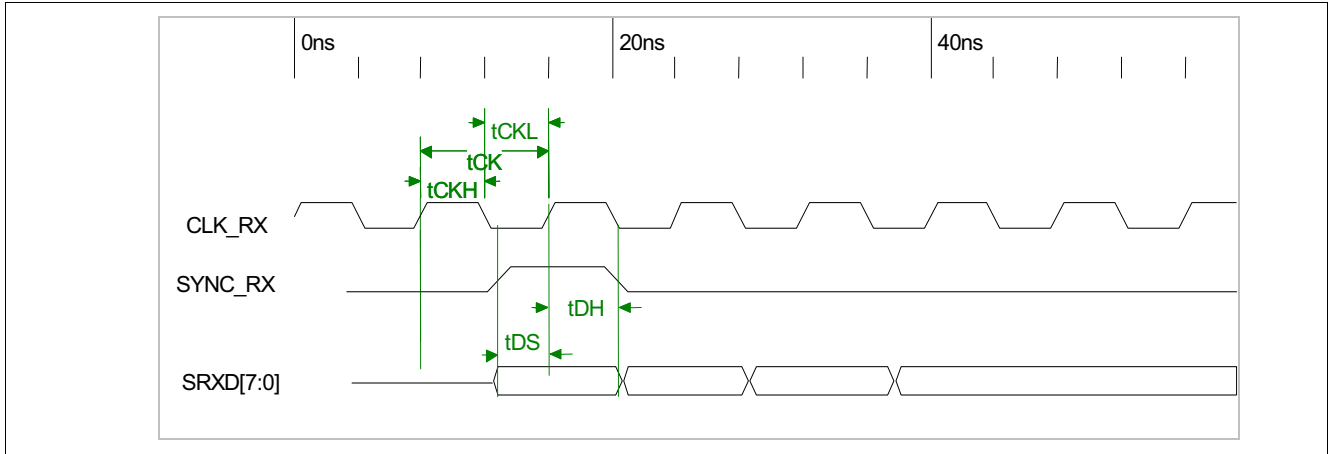


Figure 23 SS_SMI_{II} Receive Timing

Table 53 SS_SMI_{II} Receive Timing

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
SS_SMI _{II} CLK_RX Clock Period	t_{CK}	–	8	–	ns	–
SS_SMI _{II} CLK_RX Low Period	t_{CKL}	–	4	–	ns	–
SS_SMI _{II} CLK_RX High Period	t_{CKH}	–	4	–	ns	–
Rxdata/RxSync setup to CLK_RX rising edge	t_{DS}	1.5	–	–	ns	–
Rxdata/RxSync hold from CLK_RX rising edge	t_{DH}	1	–	–	ns	–

6.2.11 Serial Management Interface (SDC/SDIO) Timing

SDC/SDIO timing is same as MDC/MDIO except Data Length is 32 bits.

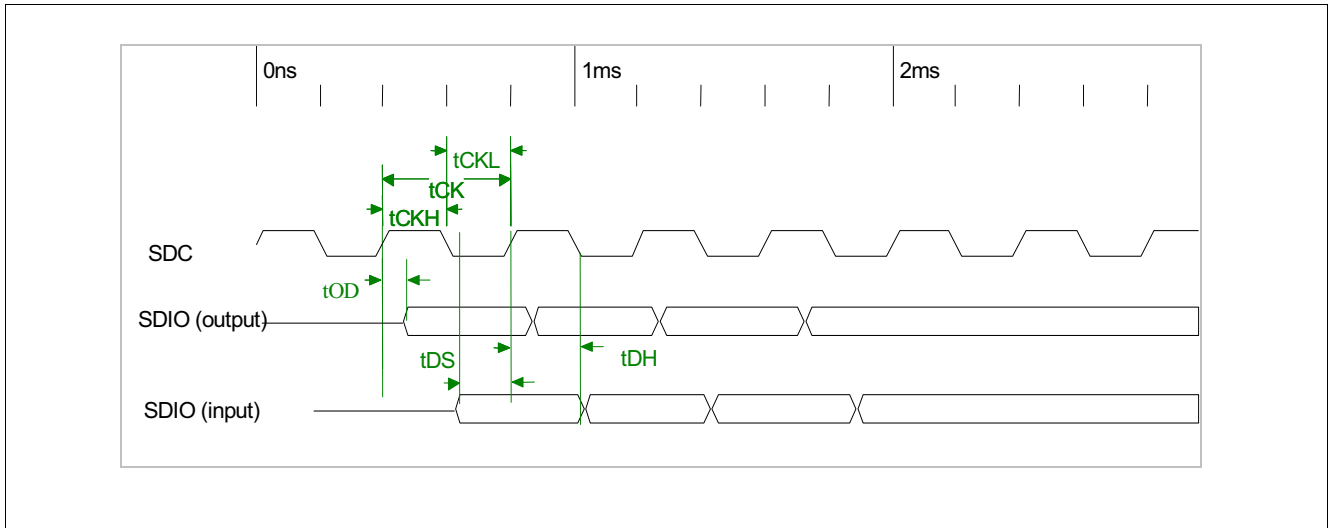


Figure 24 Serial Management Interface (SDC/SDIO) Timing

Table 54 Serial Management Interface (SDC/SDIO) Timing

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
SS_SMI CLK_RX Clock Period	t_{CK}	–	400	–	ns	–
SS_SMI CLK_RX Low Period	t_{CKL}	–	200	–	ns	–
SS_SMI CLK_RX High Period	t_{CKH}	–	200	–	ns	–
S DC to S DIO Output Delay	t_{OD}	–	–	20	ns	–
S DIO Input to S DC Setup Time	t_{DS}	10	–	–	ns	–
S DIO Input to S DC Hold Time	t_{DH}	10	–	–	ns	–

7 Packaging

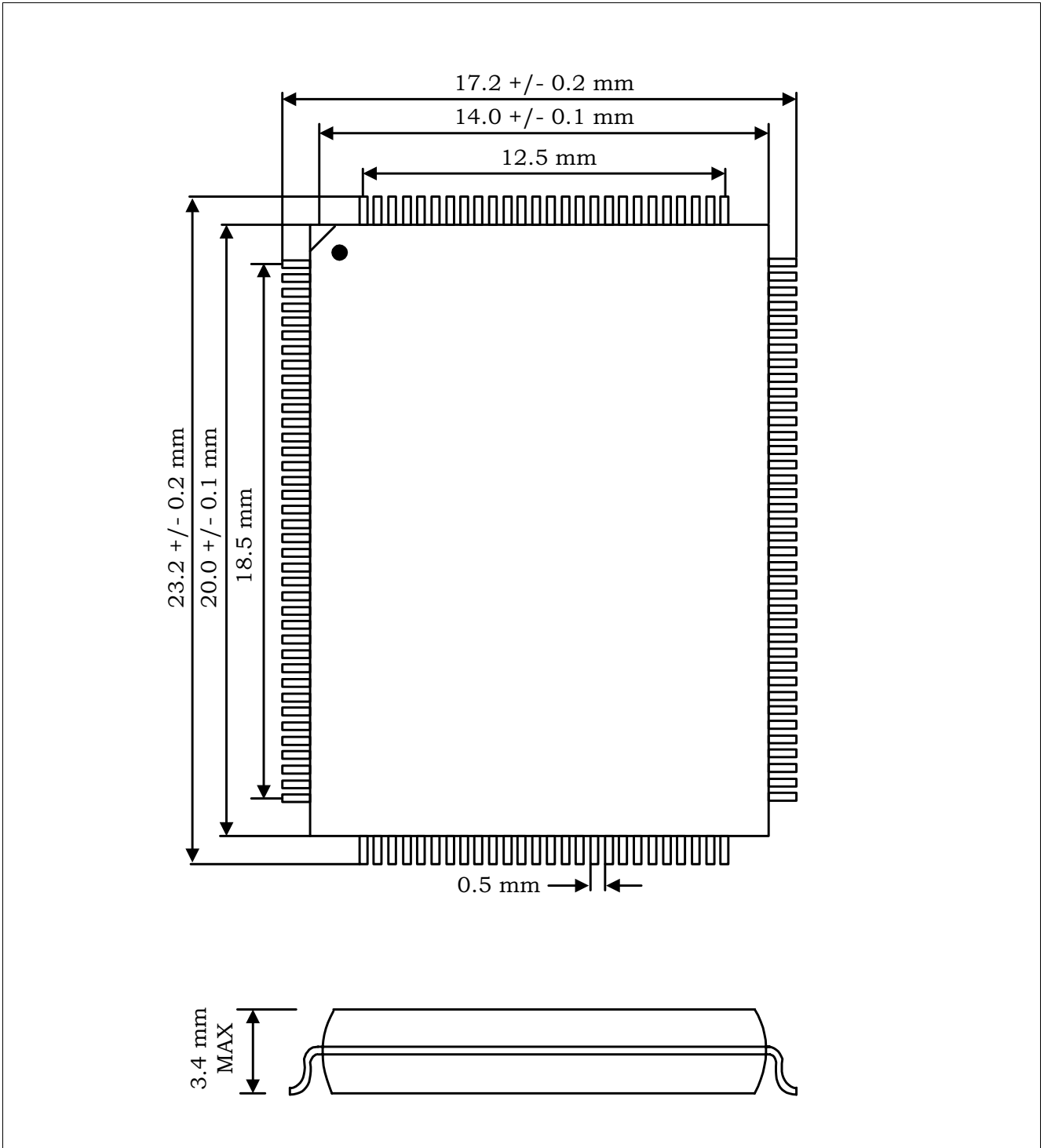


Figure 25 ADM6918/X Packaging

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