

Edgecore AS7315-27X

Fan Module CPLD Specification

Revision 1.0



OPEN
Compute Project

Revision History

Revision	Date	Author	Description
1.0	9/25/2019	Jeff Catlin	Initial OCP Release

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Feature	AS7315-27X
CPU sub-system	CPU: Intel ® Atom™ Processor C3508,1.6GHZ DDR SDRAM: 8GB x 2 2400MHz with ECC (SO-DIMM) DDR4 SPI Flash (Boot): 16MB x 2 M.2 SSD: 32GB MLC TPM: SLB 9665XT2.0 FW5.63 INFINEON
Management	UART RS232 console port (RJ45), Out-band Management Ethernet port (RJ45), Alarm port on fantray (RJ45).
Timing	GNSS GPS Receiver(SMB), Stack Sync (RJ45), 1GE Stack (RJ45), BITS (RJ45), TOD PPS (RJ45)
MAC	BroadcomBCM88470, 300Gbsfull duplex switching
Ethernet Ports	3x100GE QSFP28 (two support stacking), 4x1/10/25G SFP28 and 20x1/10G SFP+
CPLD	Altera 5M2210ZF324I5N (FBGA324) and 5M1270ZF256I5 (FBGA256)
FPGA	Altera EP4CGX30CF23I7N
PCB	20-Layers, EM891Kfor Mainboard 14-Layers,CPU module 8-Layers,TG 150 Power Connection Board 4-Layers, TG 150 FAN Board 4-Layers, TG 150Backplane Board
Power Supply	Max 300W PSU, DC to DC, 1+1 redundant load-sharing, hot-swappable Notes: The airflow is left to right (PSU side is inlet) from chassis system view.
Cooling	5 fan-tray modules with 5 pcs of 40mm x40mm x 28mm 12V fans, hot-swappable
Dimension	L(Depth):299.8±0.5mm(11.8031±0.0196inch) x W(Width):438.4±0.5mm(17.259808 ± 0.0196 inch) x H(Height):43.25±0.5mm(1.7027±0.0196inch)

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Address	Register	R/W	Default value
0x01	CPLD version	Read Only	0x01
0x04	Fan CPLD Reset	Read& Write	0x80
0x05	Interrupt Status	Read& Write	0xE0
0x06	Interrupt Mask	Read& Write	0x00
0x0F	Fan Module Present	Read Only	0xFF
0x12	Front Fan4 Module Speed	Read Only	0x00
0x13	Front Fan3 Module Speed	Read Only	0x00
0x14	Front Fan2 Module Speed	Read Only	0x00
0x15	Front Fan1 Module Speed	Read Only	0x00
0x16	Front Fan0 Module Speed	Read Only	0x00
0x41	Fan4 Module PWM	Read& Write	0x09
0x42	Fan3 Module PWM	Read& Write	0x09
0x43	Fan2 Module PWM	Read& Write	0x09
0x44	Fan1 Module PWM	Read& Write	0x09
0x45	Fan0 Module PWM	Read& Write	0x09

Table 1 Fan CPLD I/O Register Table

Offset 0x01 CPLD version (ReadOnly)

Bit	Name	R/W	Reset Value	Description
7:0	CPLD_ver[7:0]	R	001	[7:3]: Reserved [2:0]: CPLD version

Offset 0x04 Fan CPLD Reset (Read & Write)

Bit	Name	R/W	Reset Value	Description
7	Reset_CPLD	R/W	1	1: CPLD is placed in normal operation state. 0: CPLD is placed in reset state.
6:0	(Reserved)	R/W	0	

Offset 0x05 Interrupt Status (Read Only)

Bit	Name	R/W	Reset Value	Description
7	FAN_INT	R/W	1	1: No interrupt 0: There is INTR to CPU
6	FAN_idle	R/W	1	1: Fan module normal operating 0: Fan module stop operating
5	FAN_PW_EN	R/W	1	1: Fan power enable 0: Fan power disable
4:0	(Reserved)	R/W	0	

Offset 0x06 Interrupt Mask (Read Only)

Bit	Name	R/W	Reset Value	Description
7	FAN_INT_MASK	R/W	0	1: System Interrupt function enable 0: System Interrupt function disable
6	FAN_idle_MASK	R/W	0	1: System Interrupt function enable 0: System Interrupt function disable
5:0	(Reserved)	R/W	0	

Offset 0x0F Fan Module Present (Read Only)

Bit	Name	R/W	Reset Value	Description
7:5	(Reserved)	R/W	0	

4	FAN5_PRES (FAN4)	R	1	1: Fan5 isn't inserted 0: Fan5 is inserted
3	FAN4_PRES (FAN3)	R	1	1: Fan4 isn't inserted 0: Fan4 is inserted
2	FAN3_PRES (FAN2)	R	1	1: Fan3 isn't inserted 0: Fan3 is inserted
1	FAN2_PRES (FAN1)	R	1	1: Fan2 isn't inserted 0: Fan2 is inserted
0	FAN1_PRES (FAN0)	R	1	1: Fan1 isn't inserted 0: Fan1 is inserted

Offset 0x10 Fan Module Direction (Read Only)

Bit	Name	R/W	Reset Value	Description
7:0	(Reserved)	R/W	0	

Offset 0x12 Front Fan4 Module Speed (Read Only)

Bit	Name	R/W	Reset Value	Description
7:0	FAN1_SENSOR (FAN4)	R	0	0: Fan failed 1 ~ 255: the number of fan rotations in 600ms Fan speed (RPM) = Reg_value * 100 EX: register value : 80 The RPM value is 80*100 = 8000

Offset 0x13 Front Fan3 Module Speed(Read Only)

Bit	Name	R/W	Reset Value	Description
7:0	FAN2_SENSOR (FAN3)	R	0	0: Fan failed 1 ~ 255: the number of fan rotations in 600ms Fan speed (RPM) = Reg_value * 100 EX: register value : 80 The RPM value is 80*100 = 8000

Offset 0x14 Front Fan2 Module Speed (Read Only)

Bit	Name	R/W	Reset Value	Description
7:0	FAN3_SENSOR (FAN2)	R	0	0: Fan failed 1 ~ 255: the number of fan rotations in 600ms Fan speed (RPM) = Reg_value * 100 EX: register value : 80 The RPM value is 80*100 = 8000

Offset 0x15 Front Fan1 Module Speed (Read Only)

Bit	Name	R/W	Reset Value	Description
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7:0	FAN4_SENSOR (FAN1)	R	0	0: Fan failed 1 ~ 255: the number of fan rotations in 600ms Fan speed (RPM) = Reg_value * 100 EX: register value : 80 The RPM value is 80*100 = 8000
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Offset 0x16 Front Fan0 Module Speed (Read Only)

Bit	Name	R/W	Reset Value	Description
7:0	FAN5_SENSOR (FAN0)	R	0	0: Fan failed 1 ~ 255: the number of fan rotations in 600ms Fan speed (RPM) = Reg_value * 100 EX: register value : 80 The RPM value is 80*100 = 8000

Offset 0x41 Fan4 Module PWM (Read& Write)

Bit	Name	R/W	Reset Value	Description
7:4	(Reserved)	R/W	0	
3:0	FAN_PWM_1 (FAN4)	R/W	1001	0100 : 5 x 6.25% = 31.5% duty cycle 0101 : 6 x 6.25% = 37.5% duty cycle 0110: 7 x 6.25% = 43.75% duty cycle 1110: 15 x 6.25% = 93.75% duty cycle 1111: 16 x 6.25% = 100% duty cycle

Offset 0x42 Fan3 Module PWM (Read& Write)

Bit	Name	R/W	Reset Value	Description
7:4	(Reserved)	R/W	0	
3:0	FAN_PWM_2 (FAN3)	R/W	1001	0100 : 5 x 6.25% = 31.5% duty cycle 0101 : 6 x 6.25% = 37.5% duty cycle 0110: 7 x 6.25% = 43.75% duty cycle 1110: 15 x 6.25% = 93.75% duty cycle 1111: 16 x 6.25% = 100% duty cycle

Offset 0x43 Fan2 Module PWM (Read& Write)

Bit	Name	R/W	Reset Value	Description
7:4	(Reserved)	R/W	0	
3:0	FAN_PWM_3 (FAN2)	R/W	1001	0100 : 5 x 6.25% = 31.5% duty cycle 0101 : 6 x 6.25% = 37.5% duty cycle 0110: 7 x 6.25% = 43.75% duty cycle 1110: 15 x 6.25% = 93.75% duty cycle 1111: 16 x 6.25% = 100% duty cycle

Offset 0x44 Fan1 Module PWM (Read& Write)

Bit	Name	R/W	Reset Value	Description
7:4	(Reserved)	R/W	0	
3:0	FAN_PWM_4 (FAN1)	R/W	1001	0100 : 5 x 6.25% = 31.5% duty cycle 0101 : 6 x 6.25% = 37.5% duty cycle 0110: 7 x 6.25% = 43.75% duty cycle

				1110: 15 x 6.25% = 93.75% duty cycle 1111: 16 x 6.25% = 100% duty cycle
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Offset 0x45 Fan0 Module PWM (Read& Write)

Bit	Name	R/W	Reset Value	Description
7:4	(Reserved)	R/W	0	
3:0	FAN_PWM_5 (FAN0)	R/W	1001	0100 : 5 x 6.25% = 31.5% duty cycle 0101 : 6 x 6.25% = 37.5% duty cycle 0110: 7 x 6.25% = 43.75% duty cycle 1110: 15 x 6.25% = 93.75% duty cycle 1111: 16 x 6.25% = 100% duty cycle