WTQ28-EDFA QSFP28 EDFA Module

Optical performance 3



1. Product Overview

Features

- I2C control interface
- Pluggable
- AGC operation
- LOS function
- Output power monitoring
- 1M Laser Safety Specification compliance
- Environmental Specifications
- The following environmental specifications shall be applicable to the optical module unit:
- Operating Case Temperature: -5 ºC to 70 ºC
- Operating Relative Humidity: 5% to 85% non-condensing
- Storage Temperature: -40ºC to +85ºC
- RoHS: The product shall comply with the RoHS 2.0 2015/863

Applications

2. Recommended Operating Conditions

R/W	ADDR	SIZE (bytes)	Description	Default
RO	0	1	Identifier	0x82 (Vendor Specific:QSFP EDFA)
RO	1	1	Revision Compliance	0x08 (SFF-8636 Rev 2.8, 2.9 and 2. 10)
RO	2	1	Bit7-3: Reserved; Bit2: Flat_mem Upper memory flat or paged. Bit 2 = 1b: Flat memory (lower and upper pages 00h only), Bit 2 = 0b: Paging (at least upper page 03h implemented) Bit1:IntL Digital state of the IntL Interrupt output pin. 1 = IntL not asserted, 0 = IntL asserted. Default = 1. Bit0:Data_Not_Ready Indicates free-side does not yet have valid monitor data. The bit remains high until valid data can be read at which time the bit goes low.	
RO	3	1	Bit7- 1:Reserved; Bit0: L-Rx LOS Latched RX LOS indicator	

R/W	ADDR	SIZE (bytes)	Description	Default
RO	4	1	Bit7- 1: Reserved Bit0: L-Tx Fault Latched TX Transmitter/Laser fault indicator	
RO	5	1	Reserved	0x00
RO	6	1	Bit7: L-Temp High Alarm Latched high temperature alarm Bit6: L-Temp Low Alarm Latched low temperature alarm Bit5: L-Temp High Warning Latched high temperature warning Bit4: L-Temp Low Warning Latched Low temperature warning Bit3-1: Reserved Bit0: Initialization complete flag	
RO	7	1	Bit7: L-Vcc High Alarm Latched high supply voltage alarm Bit6: L-Vcc Low Alarm Latched low supply voltage alarm Bit5: L-Vcc High Warning Latched high supply voltage warning Bit4: L-Vcc Low Warning Latched low supply voltage warning Bit3-0: Reserved	
RO	8	1	Vendor Specific	
RO	9	1	Bit7: L-Rx Power High Alarm Latched high RX power alarm Bit6: L-Rx Power Low Alarm Latched low RX power alarm Bit5: L-Rx Power High Warning Latched high RX power warning Bit4: L-Rx Power Low Warning Latched low RX power warning Bit3-0: Reserved	
RO	10	1	Reserved	0x00
RO	11	1	Bit7: L-EDFA Bias High Alarm Latched high EDFA bias alarm Bit6: L- EDFA Bias Low Alarm Latched low EDFA bias alarm Bit5: L- EDFA Bias High Warning Latched high EDFA bias warning Bit4: L-EDFA Bias Low Warning Latched low EDFA bias warning Bit3-0: Reserved	
RO	12	1	Reserved	0x00
RO	13	1	Bit7: L-Tx Power High Alarm Latched high TX Power alarm Bit6: L-Tx Power Low Alarm Latched low TX Power alarm Bit5: L-Tx Power High Warning Latched high TX Power warning Bit4: L-Tx Power Low Warning Latched low TX Power warning Bit3-0: Reserved	
RO	14	8	Reserved	0x00

R/W	ADDR	SIZE (bytes)	Description	Default
RO	22	2	Internally measured temperature Unit: 1/256 C	
RO	24	2	Reserved	0x00
RO	26	2	Internally measured supply voltage Unit: 100 uV	
RO	28	2	Reserved	0x00
RO	30	2	Vendor Specific	
RO	32	2	Vendor Specific	
RO	34	2	Internally measured RX input power Unit:0. 1dBm	
RO	36	6	Reserved	0x00
RO	42	2	Internally measured EDFA bias Unit: 0.1 mA	
RO	44	6	Reserved	0x00
RO	50	2	Internally measured TX Power Unit:0. 1dBm	
RO	52	34	Reserved	0x00
RW	86	1	Bit7- 1: Reserved Bit0: Tx Disable Read/Write bit that allows software disable of transmitters	
RW	87	6	Reserved	0x00
RW	93	1	Bit7: SW Reset Bit6-0: Reserved	
RW	94	2	Vendor Specific Signal Output Power Unit: 0.1 dBm	
RW	96	3	Reserved	0x00
RW	99	1	Bit7-2: Reserved Bit1: LP/TxDis ctrl Bit0: IntL/LOSL ctrl	0x02 (change of bit1&bit0 has no effect)
RW	100	1	Bit7- 1: Reserved Bit0: M-Rx LOS Mask Masking bit for Rx LOS indicator	0x00
RW	101	1	Bit7- 1: Reserved Bit0: M-Tx Transmitter Fault Mask Masking bit for Tx Transmitter fault	0x00
RW	102	1	Reserved	0x00
RW	103	1	Bit7: M-Temp High Alarm Masking bit for high-temperature alarm Bit6: M-Temp Low Alarm Masking bit for low-temperature alarm Bit5: M- Temp High Warning Masking bit for high-temperature warning Bit4: M-Temp Low Warning Masking bit for low-temperature warning Bit3-0: Reserved	0x00

R/W	ADDR	SIZE (bytes)	Description	Default
RW	104	1	Bit7: M-Vcc High alarm Masking bit for Vcc high alarm Bit6: M-Vcc Low alarm Masking bit for Vcc low alarm Bit5: M-Vcc High Warning Masking bit for Vcc high warning Bit4: M-Vcc Low Warning Masking bit for Vcc low warning Bit3-0: Reserved	0x00
RW	105	1	Vendor Specific	0x00
RW	106	1	Reserved	0x00
RO	107	1	Max Power Consumption	0x1E (Max Power Consumption 3W)
RO	108	2	Reserved	0x00
RO	110	1	Bit7-4: Advanced Low Power Mode Code indicates maximum power consumption less than 1.5 W. 0000 1.5W or higher 0001 no more than 1 W 0010 no more than 0.75 W 0011 no more than 0.5 W Bit3: Far Side Managed Bit2-0: Min Operating Voltage Code indicates nominal supply voltages lower than 3.3 V. 000 3.3 V 001 2.5 V 010 1.8 V	0x00
RW	111	2	Reserved	0x00
RO	113	2	Reserved	0x00
RO	115	1	ModSelL wait time	0xF0 (2.048ms)
RO	116	1	Reserved	0x00
RW	117	2	Reserved	0x00
WO	119	4	optional password Change New Password Change not Supported	
WO	123	4	optional password entry	
RW	127	1	Page Select Byte 0x00: Table 00h; 0x03: Table 03h;	0x00

3. Recommended Operating Conditions

R/W	ADDR	SIZE (bytes)	Description	Default
RO	128	1	Identifier	0x82 (Vendor Specific:QSFP EDFA)

R/W	ADDR	SIZE (bytes)	Description	Default
RO	129	1	Bit7-6: 00: Power Class 1 (1.5 W max.) 01: Power Class 2 (2.0 W max.) 10: Power Class 3 (2.5 W max.) 11: Power Class 4 (3.5 W max.) and Power Classes 5, 6 or 7 Bit5-2: Reserved Bit1-0: 00: Power Classes 1 to 4 01: Power Class 5 (4.0 W max.) 10: Power Class 6 (4.5 W max.) 11: Power Class 7 (5.0 W max.)	0x40
RO	130	1	Code for connector type	0x07
RO	131	6	Reserved	0x00
RO	137	1	Fiber Channel Transmission Media	0x01
RO	138	9	Reserved	0x00
RO	147	1	Bit7-4: Transmitter technology Bit3: 0: No wavelength control 1: Active wavelength control Bit2: 0: Uncooled transmitter device 1: Cooled transmitter Bit1: 0: Pin detector 1: APD detector Bit0: 0: Transmitter not tunable 1: Transmitter tunable	0x80
RO	148	16	vendor name (ASCII) Free side device vendor name (ASCII)	WincoTek
RO	164	1	Reserved	0x00
RO	165	3	Vendor OUI	Assigned WincoTek OUI at production
RO	168	16	Part number provided by free side device vendor(ASCII) padded on the right with ASCII spaces(20h)	WTQ28-EDFA-PA2208 / WTQ28-EDFA-BA2213 (ASCII)
RO	184	2	Hardware Version (ASCII) i.e. “10” means 1.0, “11” means 1. 1;	10
RO	186	2	Nominal laser wavelength (Wavelength = value / 20 in nm)	0x7918 (1550nm)
RO	188	2	Reserved	0x00
RO	190	1	Maximum Case Temperature	0x00
RO	191	1	Check code for Base ID Fields (addresses 128-190)	
RO	192	1	Reserved	0x00
RO	193	1	Bit7: Reserved Bit6: LPMode/TxDis input signal is configurable using byte 99 Bit5: IntL/RxLOSL output signal is configurable using byte 99, bit 0 Bit4-0: Reserved	0x00

R/W	ADDR	SIZE (bytes)	Description	Default
RO	194	1	Reserved	0x00
RO	195	1	Bit7: Memory Page 02 provided: coded 1 if implemented, else 0 Bit6: Memory Page 01h provided: coded 1 if implemented, else 0. Bit5: Rate select is implemented Bit4: Tx_DISABLE is implemented and disables the serial output as defined by the relevant transmitter specification. Bit3:Tx_FAULT signal implemented,coded 1if implemented, else 0 Bit2-1: Reserved BIt0::Pages20-21h implemented.Default =0 (not implemented).	0x98
RO	196	16	Serial number provided by vendor (ASCII) padded on the right with ASCII spaces(20h) i.e. “504015 ”	
RO	212	8	Vendor's manufacturing date code 212-213 : ASCII code, two low order digits of year. (00 = 2000). 214-215 : ASCII code, digits of month (01 = Jan. through 12 = Dec.) 216-217 : ASCII code, day of month (01 - 31) 218-219 : ASCII code, vendor specific lot code, may be blank	
RO	220	1	Bit7-6: Reserved Bit5: Temperature monitoring implemented (0b=Not implemented or pre-Rev 2.8, 1b=Implemented) Bit4:Supply voltage monitoring implemented (0b=Not implemented or pre-Rev 2.8, 1b=Implemented) Bit3: Received power measurements type..0=OMA 1=Average Power Bit2: Transmitter power measurement. 0=Not supported 1=Supported Bit1-0: Reserved	0x3C
RO	221	1	Bit7-5: Reserved Bit4: Initialization Complete Flag implemented Bit3-2: Reserved Bit1: TC readiness flag implemented 0= TC readiness flag not implemented. 1= TC readiness flag is implemented. Bit0: Software reset is implemented.	0x11
RO	222	1	Reserved	0x00
RO	223	1	Check code for the Extended ID Fields (addresses 192 to 222)	

R/W	ADDR	SIZE (bytes)	Description	Default
RO	224	32	Vendor Specific EEPROM	0x00

4. Pin Descriptions

Pin No.	Definition	Pin No.	Definition
1	GND	38	GND
2	N.C.	37	N.C.
3	N.C.	36	N.C.
4	GND	35	GND
5	TXD (REV)	34	N.C.
6	RXD (REV)	33	N.C.
7	GND	32	GND
8	ModSel	31	AMP_DIS
9	Module Reset	30	VCC
10	VCC	29	VCC
11	SCL	28	Interrupt
12	SDA	27	Module Present
13	GND	26	GND
14	N.C.	25	N.C.
15	N.C.	24	N.C.
16	GND	23	GND
17	N.C.	22	N.C.
18	N.C.	21	N.C.
19	GND	20	GND

5. Pin Descriptions

Supply	Min	Typ	Max	Unit
3.3 V Digital Supply Voltage	3.14		3.47	V
3.3V Total Supply Current			900	mA
Power Dissipation			3	W

6. Technical Table 1

Parameter	Min	Typ.	Max	Units	Comments
Wavelength range	1528		1561	nm	Input/output,
Working channels	1		40	Ch	Single or multi-channels
Operation mode	AGC	AGC	AGC	AGC	

Parameter	Min	Typ.	Max	Units	Comments
Input power	-30		- 14	dBm	WTQ28-EDFA-PA2208
Input power	-22		-9	dBm	WTQ28-EDFA-BA2213
Input power monitor accuracy	-0.5		0.5	dB	
Optical Gain		22		dB	Fixed gain
Output Signal power	-8		8	dBm	WTQ28-EDFA-PA2208
Output Signal power	0		13	dBm	WTQ28-EDFA-BA2213
Output power monitor accuracy	-0.5		0.5	dB	
Gain Flatness			1.5	dB	Room Temperature, Gain=22dB
Noise figure		6	7	dB	Gain=22dB, Max output
Polarization Dependent Gain			0.5	dB	
Polarization Mode Dispersion			0.5	ps	

7. Technical Table 4

I²C bus specifications	Minimum	Typical	Maximum
I²C Clock frequency	10kHz	100kHz	100kHz

8. Technical Table 5

1	0	1	0	0	0	0	R/W

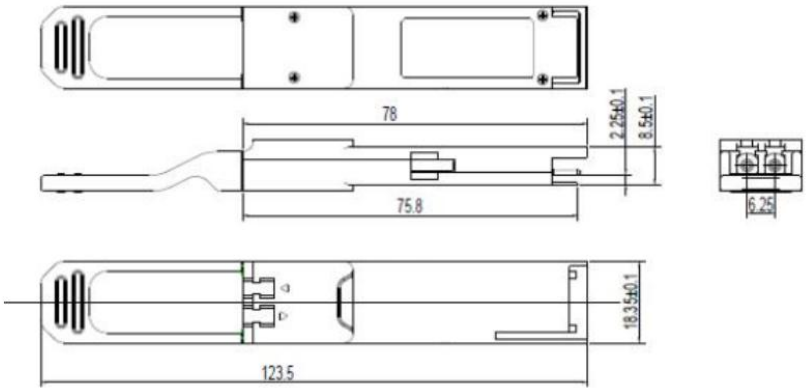
9. Technical Table 8

R/W	ADDR	SIZE (bytes)	Description	Default
RO	128	2	Temp High Alarm Unit: 1/256 C	0x4B00 (75 C)
RO	130	2	Temp Low Alarm Unit: 1/256 C	0xFB00 (-5 C)
RO	132	2	Temp High Warning Unit: 1/256 C	0x4600 (70 C)
RO	134	2	Temp Low Warning Unit: 1/256 C	0x0000 (0 C)
RO	136	8	Reserved	
RO	144	2	Vcc High Alarm Unit: 100 uV	0x8DCC (3.63 V)
RO	146	2	Vcc Low Alarm Unit: 100 uV	0x7404 (2.97 V)

R/W	ADDR	SIZE (bytes)	Description	Default
RO	148	2	Vcc High Warning Unit: 100 uV	0x878C (3.47 V)
RO	150	2	Vcc Low Warning Unit: 100 uV	0x7A44 (3. 13 V)
RO	152	8	Reserved	
RO	160	8	Vendor Specific	
RO	168	2	Vendor Specific	
RO	170	2	Vendor Specific	
RO	172	2	Vendor Specific	
RO	174	2	Vendor Specific	
RO	176	2	RX Power High Alarm Unit:0. 1dBm	WTQ28-EDFA-PA2208:0xFF9C(-10dBm) WTQ28-EDFA-BA2213:0xFFCE(-5 dBm)
RO	178	2	RX Power Low Alarm Unit:0. 1dBm	WTQ28-EDFA-PA2208:0xFEAC(-34dBm) WTQ28-EDFA-BA2213:0xFEFC(-26dBm)
RO	180	2	RX Power High Warning Unit:0. 1dBm	WTQ28-EDFA-PA2208:0xFF88(-12 dBm) WTQ28-EDFA-BA2213:0xFFBA(-7 dBm)
RO	182	2	RX Power Low Warning	WTQ28-EDFA-PA2208:0xFEC0(-32dBm)
			Unit:0. 1dBm	WTQ28-EDFA-BA2213:0xFF10(-24 dBm)
RO	184	2	EDFA Bias High Alarm Unit:0. 1mA	0X1388 (500 mA)(TBD)
RO	186	2	EDFA Bias Low Alarm Unit:0. 1mA	0x0000 (0 mA)
RO	188	2	EDFA Bias High Warning Unit:0. 1mA	0x0FA0 (400 mA)(TBD)
RO	190	2	EDFA Bias Low Warning Unit:0. 1mA	0x0000 (0 mA)
RO	192	2	Tx Power High Alarm Unit:0. 1dBm	0x001E (3 dB)
RO	194	2	Tx Power Low Alarm Unit:0. 1dBm	0xFFE2 (-3 dB)
RO	196	2	Tx Power High Warning Unit:0. 1dBm	0x0014 (2 dB)
RO	198	2	Tx Power Low Warning Unit:0. 1dBm	0xFFEC (-2 dB)
RO	200	16	Reserved	
RO	216	8	Vendor Specific	
RO	224	4	Reserved	
RO	228	1	Reserved	
RO	229	1	Reserved	
RW	230	12	Reserved	

R/W	ADDR	SIZE (bytes)	Description	Default
RW	242	1	Bit7: M-Rx Power High Alarm Bit6: M-Rx Power Low Alarm Bit5: M-Rx Power High Warning Bit4: M-Rx Power Low Warning Bit3-0:Reserved	0x00
RW	243	1	Reserved	
RW	244	1	Bit7: M-EDFA Bias High Alarm Bit6: M-EDFA Bias Low Alarm Bit5: M-EDFA Bias High Warning Bit4: M-EDFA Bias Low Warning Bit3-0:Reserved	0x00
RW	245	1	Reserved	
RW	246	1	Bit7: M-Tx Power High Alarm Bit6: M-Tx Power Low Alarm Bit5: M-Tx Power High Warning Bit4: M-Tx Power Low Warning Bit3-0:Reserved	0x00
RW	247	9	Reserved	

10. Technical Figure 1



11. Revision History

Version	Date	Description	Prepared by
V6	2025	Unified WincoTek datasheet format	WincoTek
V6.1	2026-10-23	Engineering and format review	WincoTek