3.125Gbps CWDM SM SFP Transceiver 40km
HOLS-P3Cxx4-LD-CD

Features:

- ✧ HD-SDI SFP Transceiver available
- ✧ SD-SDI SFP Transceiver available
- ✧ 3G-SDI SFP Transceiver available
- ✧ SMPTE 297-2006 Compatible.
- ✧ Metal enclosure for Lower EMI
- ✧ Wavelength 1270～1610nm is available
- ✧ CWDM DFB laser and PIN photo-detector
- ✧ Up to 40km on 9/125μm SMF
- ✧ Supports video pathological patterns for SD-SDI, HD-SDI and 3G-SDI
- ✧ Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- ✧ Digital Diagnostic functions available through the I2C interface
- ✧ +3.3V single power supply
- ✧ Operating case temperature: Standard : 0 to +70°C
- ✧ Compatible with RoHS

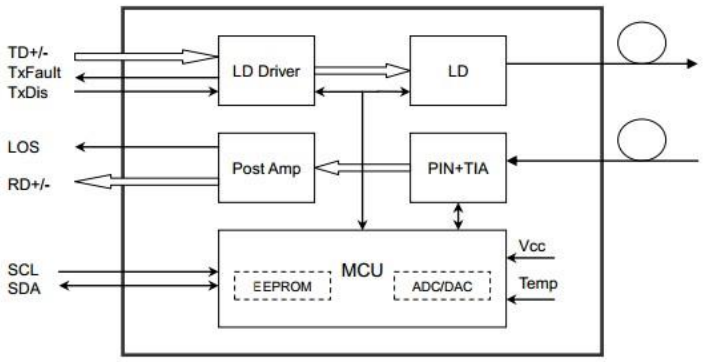
Applications:

- ✧ SMPTE 297-2006 Compatible Electrical to Optical Interfaces.
- ✧ HDTV/SDTV Service Interfaces.
- ✧ CPRI/OBSAI

Description:

HOLS-P3Cxx4-LD-CD is designed to transmit/receive data rates from 50Mbps to 3.125Gbps and is specifically designed for robust performance in the presence of SDI pathological patterns for SMPTE 259M, SMPTE 344M, SMPTE 292M and SMPTE 424M serial rates. The module is fully compliant with SMPTE 297M-2006. The transceiver consists of three sections: a CWDM DFB laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.

Honlus Technology (Hongkong) Limited
Unit 4 7/F, Bright Way Tower, 33 Mong Kok Road, KL, Hongkong
Email: sales@honlus.com
Website: www.honlus.com



● Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	T_S	-40		+85	°C
Case Operating Temperature	T_A	0		70	°C
Maximum Supply Voltage	Vcc	-0.5		4	V
Relative Humidity	RH	0		85	%

● Electrical Characteristics (T_{OP} = 0 to 70 °C, V_{CC} = 3.135 to 3.465 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	Vcc	3.0	3.30	3.60	V	
Supply Current	Icc			450	mA	
Transmitter Section:						
Input differential impedance	R_{in}	90	100	110		1
Single ended data input swing	$V_{in\ PP}$	200		900	mVp-p	
Transmit Disable Voltage	V_D	Vcc – 1.3		Vcc	V	2
Transmit Enable Voltage	V_{EN}	Vee		Vee+ 0.8	V	
Transmit Disable Assert Time	$T_{dessert}$			10	us	
Receiver Section:						
Single ended data output swing	Vout,pp	300		500	mv	3
LOS Fault	$V_{losfault}$	Vcc – 0.5		V_{CC_host}	V	5
LOS Normal	$V_{los\ norm}$	V_{ee}		V_{ee}+0.5	V	5
Power Supply Rejection	PSR	100			mVpp	6

Note:

1. AC coupled.
2. Or open circuit.
3. Into 100 ohm differential termination.

4. 20 – 80 %
5. LOS is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
6. All transceiver specifications are compliant with a power supply sinusoidal modulation of 20 Hz to 1.5MHz up to specified value applied through the power supply filtering network shown on page 23 of the Small Form-factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), September 14, 2000.

● Optical Parameters(T_{OP} = 0 to 70°C, V_{CC} = 3.135 to 3.465 Volts)

Parameter			Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section:								
Center Wavelength			λ_c	λ_c-6	λ_c	λ_c+6	nm	
Spectral Width			σ			1	nm	
Optical Output Power			P_{out}	0		+5	dBm	1
Optical Rise/Fall Time(SD-SDI)			t_r / t_f			1500	ps	2
Optical Rise/Fall Time(HD-SDI)			t_r / t_f			270	ps	2
Optical Rise/Fall Time(3G-SDI)			t_r / t_f			135	ps	2
Extinction Ratio			ER	5			dB	
Total Output Jitter	PRBS and colour bar	SD-SDI	J_{TX}		70	200	ps	
		HD-SDI			50	135		
		3G-SDI			70	100		
	pathological	SD-SDI			200	300		
		HD-SDI			115			
		3G-SDI			120			
Receiver Section:								
Optical Input Wavelength			λ_c	1260		1620	nm	
Sensitivity(PRBS)		SD-SDI	Sen			-19	dBm	
		HD-SDI				-18		
		3G-SDI				-17		
Sensitivity（Pathological）		SD-SDI	Sen			-19	dBm	
		HD-SDI				-18		
		3G-SDI				-17		
Receiver Overload			P_{ol}	0			dBm	3
RX_LOS Assert			LOS_A	-35			dBm	
RX_LOS De-assert			LOS_D			-19	dBm	
RX_LOS Hysteresis			LOS_H	0.5		4	dB	

General Specifications						
Data Rate	BR			3	GB/s	
Bit Error Rate	BER			10^{-12}		
Max. Supported Link Length on 9/125μm SMF	LMAX			40	km	

Note

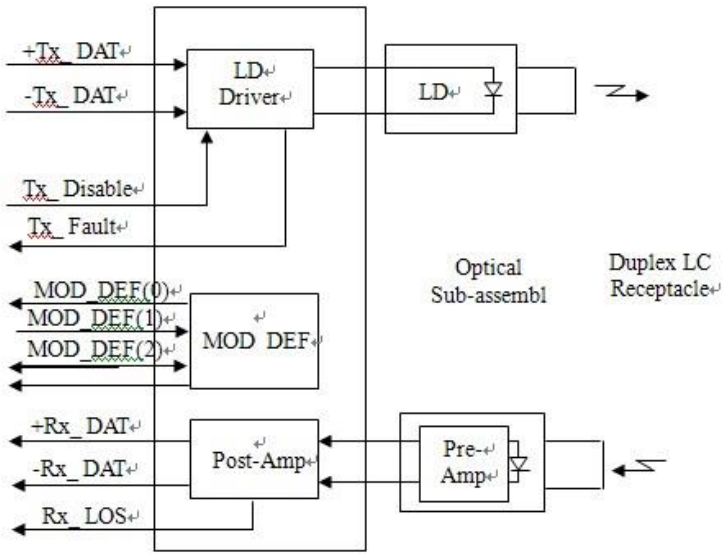
1. The optical power is launched into SMF.
2. Rise and fall times, 20% to 80%, are measured following a fourth-order Bessel-Thompson filter with a bandwidth of 0.75 x clock frequency corresponding to the serial data rate
3. Internally AC-coupled.

● Digital Diagnostic Monitor Characteristics

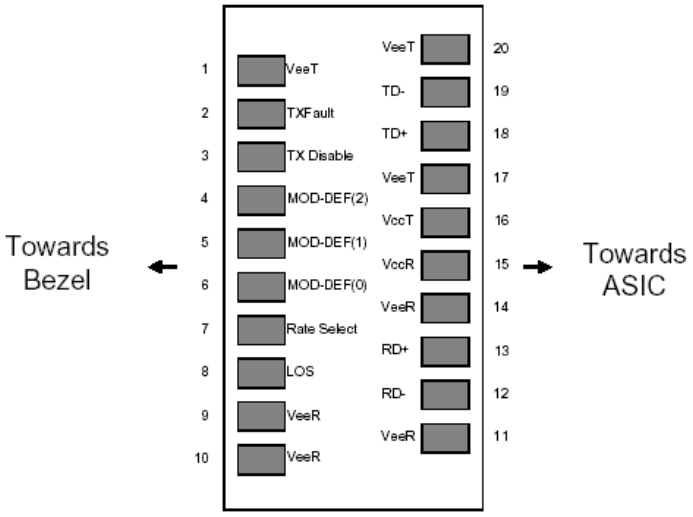
The following digital diagnostic characteristics are defined over the Recommended Operating Environment unless otherwise specified. It is compliant to SFF-8472 Rev10.2 with internal calibration mode. For external calibration mode please contact our sales stuff.

Parameter	Symbol	Min.	Max.	Unit
Temperature monitor absolute error	DMI_Temp	-3	3	degC
Laser power monitor absolute error	DMI_TX	-3	3	dB
RX power monitor absolute error	DMI_RX	-3	3	dB
Supply voltage monitor absolute error	DMI_VCC	-0.1	0.1	V
Bias current monitor absolute error	DMI_Ibias	-10%	10%	mA

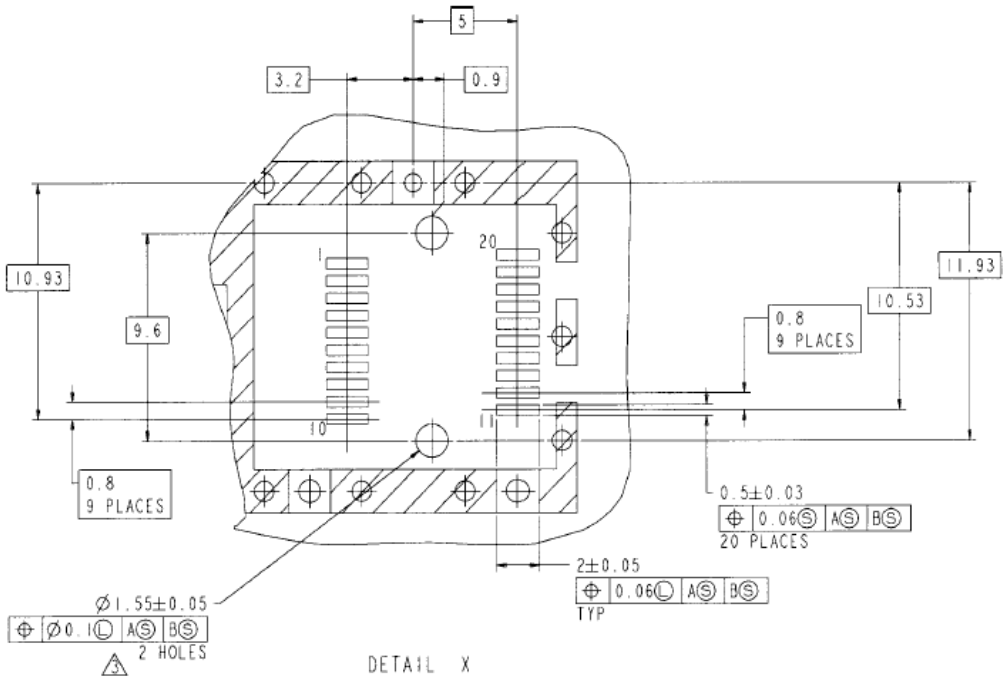
● Block Diagram of Transceiver



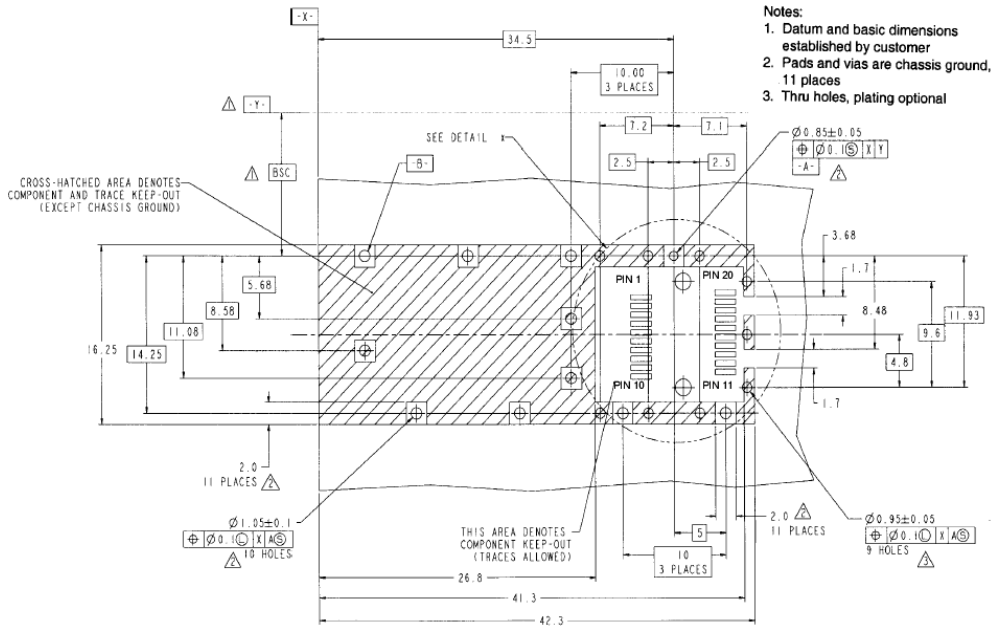
Pin Assignment



Pin out of Connector Block on Host



SFP Host Board Mechanical Layout



SFP Host Board Mechanical Layout(Cont)

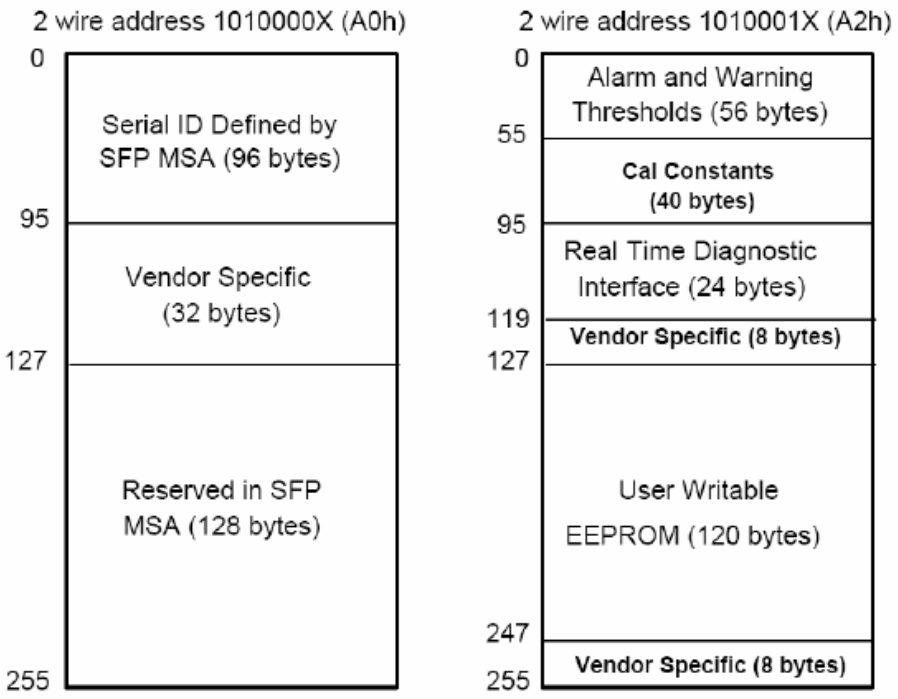
Pin	Symbol	Name/Description	Ref.
1	VEET	Transmitter Ground (Common with Receiver Ground)	1
2	TFAULT	Transmitter Fault. Not supported.	
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	Not Connected	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	4
9	VEER	Receiver Ground (Common with Transmitter Ground)	1
10	VEER	Receiver Ground (Common with Transmitter Ground)	1
11	VEER	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	VEER	Receiver Ground (Common with Transmitter Ground)	1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V.MOD_DEF(0) pulls line low to indicate module is plugged in.
4. LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

● EEPROM Information

The SFP MSA defines a 256-byte memory map in E2PROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X (A0h).The digital diagnostic monitoring interface also defines another 256-byte memory map in EEPROM, which makes use of the 8 bit address 1010001X (A2h). Please see Figure 1. For detail EEPROM information, please refer to the related document of SFF-8472 Rev 9.5. The monitoring specification of this product is described in Table Digital Diagnostic Monitor Characteristics.



EEPROM Memory Map Specific Data Field Descriptions

Serial ID Memory Contents

Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	Fiber Channel
11	1	Encoding	8B10B
12	1	BR, Nominal	Nominal baud rate, unit of 100Mbps
13	1	Reserved	(0000h)
14	1	Length(9um,km)	Link length supported for 9/125um fiber, units of km
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name: Honlus
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number: “HOLS-DPxx405-IL” (ASCII)
56-59	4	Vendor rev	Revision level for part number
60-61	2	Wavelength	Laser wavelength
62	1	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62
Extended ID Fields			
64-65	2	Option	Indicates which optical SFP signals are implemented(001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %

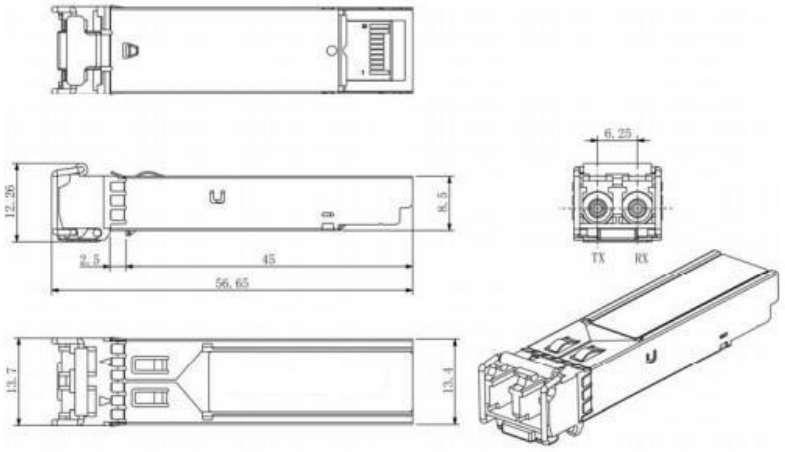
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	Manufacturing date code
92	1	Diagnostic Type	Diagnostics
93	1	Enhanced Options	Diagnostics
94	1	SFF-8472	Diagnostics
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
Vendor Specific ID Fields			
96-127	32	Readable	Vendor specific date, read only

● Diagnostics Memory Contents(A2h)

Data Address	Length (Byte)	Name of Length	Description and Contents
Diagnostic and control/status fields			
0-39	40	A/W Thresholds	Diagnostic Flag Alarm and Warning Thresholds
40-55	16	Unallocated	
56-91	16	Ext Cal Constants	Diagnostic calibration constants for optional External Calibration
92-94	3	Unallocated	
95	1	CC_DMI	Check code for Base Diagnostic Fields (addresses 0 to 94)
96-105	10	Diagnostics	Diagnostic Monitor Data (internally or externally calibrated)
106-109	4	Unallocated	
110	1	Status/Control	Optional Status and Control Bits
111	1	Reserved	Reserved for SFF-8079
112-113	2	Alarm Flags	Diagnostic Alarm Flag Status Bits
114-115	2	Unallocated	

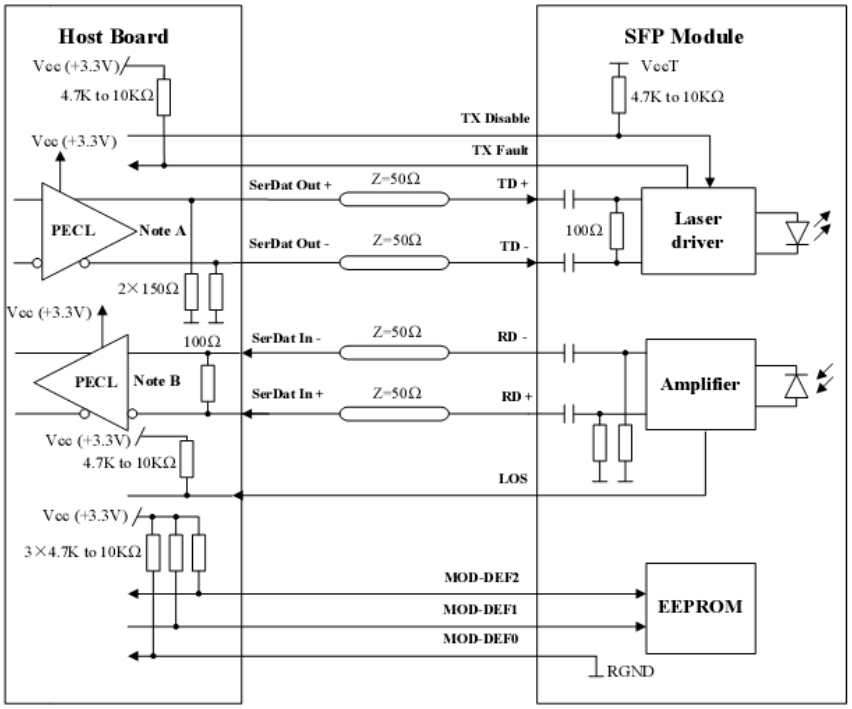
116-117	2	Warning Flags	Diagnostic Warning Flag Status Bits
118-119	2	Ext Status/Control	Extended module control and status bytes
General use fields			
120-127	8	Vendor Specific	Vendor specific memory addresses
128-247	120	User EEPROM	User writable non-volatile memory
248-255	8	Vendor Control	Vendor specific control addresses

● Mechanical Dimensions



Mechanical Drawing

Recommended Circuit



Note A: Circuit assumes open emitter output

Note B: Circuit assumes high impedance internal bias @Vcc-1.3V

CWDM wavelength guide

Wavelength guide					
code	λ_c	code	λ_c	code	λ_c
27	1270nm	39	1390nm	51	1510nm
29	1290nm	41	1410nm	53	1530nm
31	1310nm	43	1430nm	55	1550nm
33	1330nm	45	1450nm	57	1570nm
35	1350nm	47	1470nm	59	1590nm
37	1370nm	49	1490nm	61	1610nm