

3Gbps 40km Video CWDM SFP Single Transmitter MSA

VC1xx09-SFP.TLC.S40

Features

- ◆ SMPTE 297-2006 compatible
- ◆ Supports SDI pathological patterns for SD-SDI, HD-SDI, 3G-SDI
- ◆ LC receptacle optical interface compliant
- ◆ Single +3.3V power supply
- ◆ 18 CWDM DFB laser
- ◆ Digital Diagnostic functions available through the I2C interface
- ◆ International Class1 laser safety certified
- ◆ Operating temperature range:
Commercial: 5°C~70°C
- ◆ RoHS Compliant

Application

- ◆ SMPTE 297-2006 Compatible Electrical-to-Optical Interfaces
- ◆ HDTV/SDTV Service Interfaces
- ◆ Other Optical Links

Standard

- ◆ Compliant with SFP MSA (INF-8074i)
- ◆ Compliant with SFF-8472
- ◆ Compliant with SMPTE

Ordering Information

Part Number	Specifications					
	Package	Data Rate (Gbps)	Wavelength (nm)	Temperature (°C)	Reach (km)	DDM
VC1xx09-SFP-TLC.S40	SFP	2.97	CWDM	-5~70	40	Yes

Note: xx means CWDM wavelength range from 1270nm to 1610nm, as table below.

xx	Wavelength	Band
27	1270nm	O-band
29	1290nm	
31	1310nm	
33	1330nm	
35	1350nm	
37	1370nm	E-band
39	1390nm	
41	1410nm	
43	1430nm	
45	1450nm	
47	1470nm	S-band
49	1490nm	
51	1510nm	
53	1530nm	C-band
55	1550nm	
57	1570nm	
59	1590nm	
61	1610nm	L-band

Specification

Absolute Maximum Ratings				
Parameter	Symbol	Min	Max	Unit
Storage temperature	TS	-40	85	°C
Power Supply Voltage	V _{CC}	0	3.6	V
Relative Humidity	RH	5	95	%

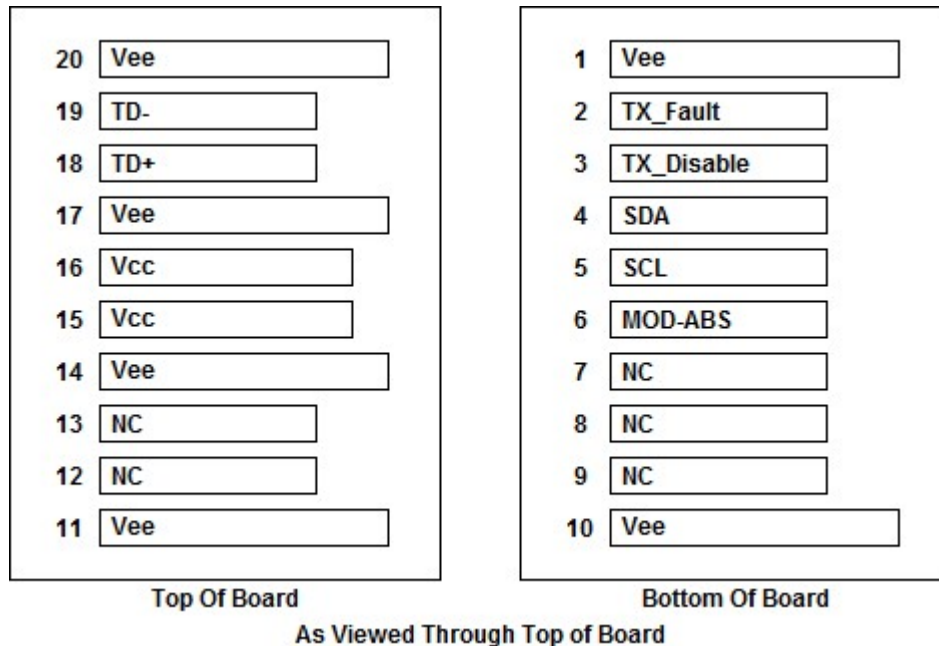
Recommended Operating Conditions						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	T _C	-5		70	°C	
Power Supply Voltage	V _{CC}	3.13	3.3	3.47	V	
Data Rate			2.97		Gbps	
Fiber Length 9/125μm core SMF				40	km	

Electrical Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Total Supply Current	I _{CC}			300	mA	
Transmitter						
Transmitter Differential Input Voltage		400		2400	mV	
Tx_Fault Output Voltage - High	V _{OH}	2.0		V _{CC}	V	LVTTL
Tx_Fault Output Voltage - Low	V _{OL}	0		0.8	V	LVTTL
Tx_Disable Input Voltage - High	V _{IH}	2.0		V _{CC}	V	LVTTL
Tx_Disable Input Voltage - Low	V _{IL}	0		0.8	V	LVTTL
Input Differential Impedance		90	100	110	Ω	

Optical Transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Average Output Power	P _{OUT}	-2		+3	dBm	
Center Wavelength	λ _C	λ _C -6.5	λ _C	λ _C +6.5	nm	
Spectral Width(-20dB)	Δλ			1	nm	

Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	5			dB	
Optical Rise/Fall Time	T_R/T_F			160	ps	
Transmitter OFF Power	P_{OFF}			-45	dBm	
Jitter P-P	T_J			0.1	UI	
Output Eye Diagram	Complies with SMPTE 297-2006					

Pin Definition



Pin No.	Symbol	Name/Description	Power Seq.	Notes
1	Vee	Ground	1st	
2	TX_Fault	Transmitter Fault Indication, Low: normal; High: abnormal	3rd	1
3	TX_Disable	Transmitter Disable High: Transmitter off; Low: Transmitter on	3rd	2
4	SDA	I2C Serial Clock Signal	3rd	3
5	SCL	I2C Serial Data Signal	3rd	4
6	Mod_ABS	Module Absent, Connect to Vee in Module	3rd	4
7	NC	NC	3rd	
8	NC	NC	3rd	
9	NC	NC	3rd	
10	Vee	Ground	1st	
11	Vee	Ground	1st	
12	NC	NC	3rd	
13	NC	NC	3rd	
14	Vee	Ground	1st	
15	Vcc	Power Supply	2nd	
16	Vcc	Power Supply	2nd	
17	Vee	Ground	1st	

Pin No.	Symbol	Name/Description	Power Seq.	Notes
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled. CML-I	3rd	
19	TD-	Transmitter Inverted DATA in. AC Coupled. CML-I	3rd	
20	Vee	Ground	1st	

Note1. TX_Fault is an open drain/collector and should be pulled up to Vcc on the host with a 4.7k - 10kΩ resistor.

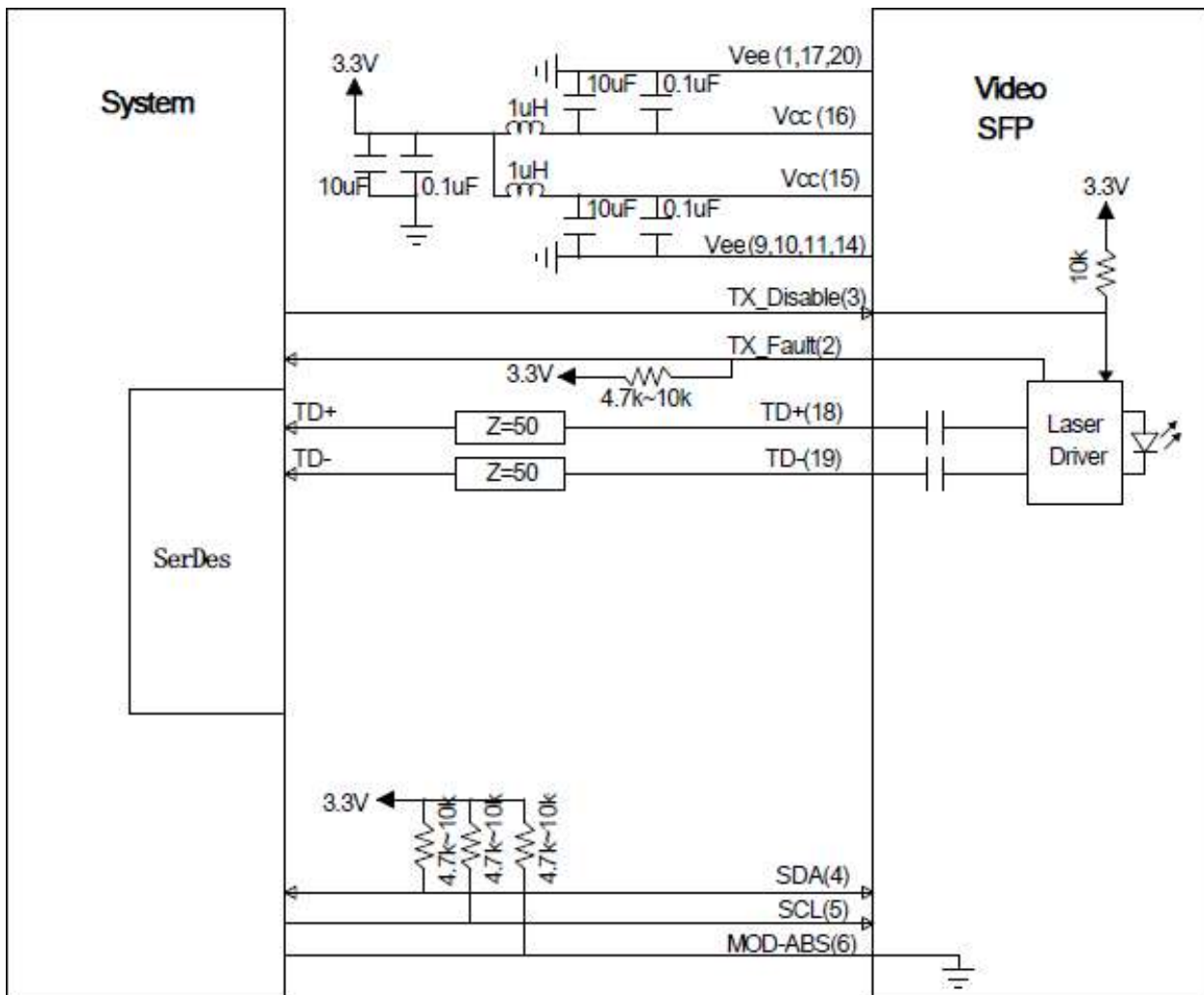
Note2. TX_Disable is pulled up to Vcc with a 4.7k - 10kΩ resistor inside the module. It's states are:

- Low (0 - 0.8V): Transmitter on
- (0.8 - 2.0V): Undefined
- High (2.0 - 3.465V): Transmitter Disabled
- Open: Transmitter Disabled

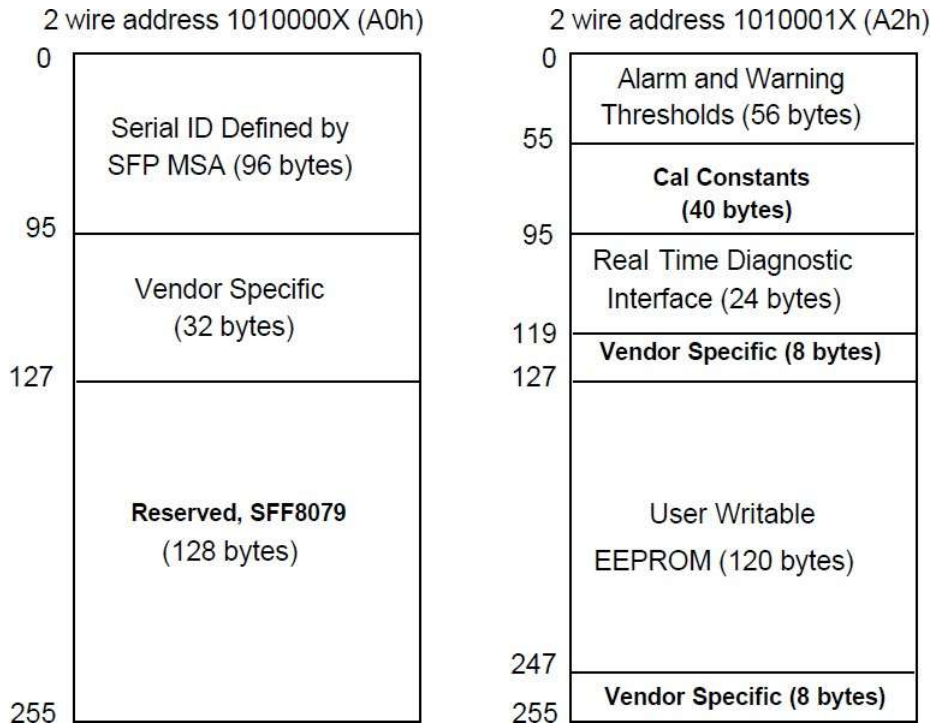
Note3. SDA&SCL (I2C) shall be pulled up with a 4.7k - 10kΩ resistors on host board.

Note4. Mod_ABS is connected to Vee inside the module.

Typical Application Circuit



Digital Diagnostic Memory Map



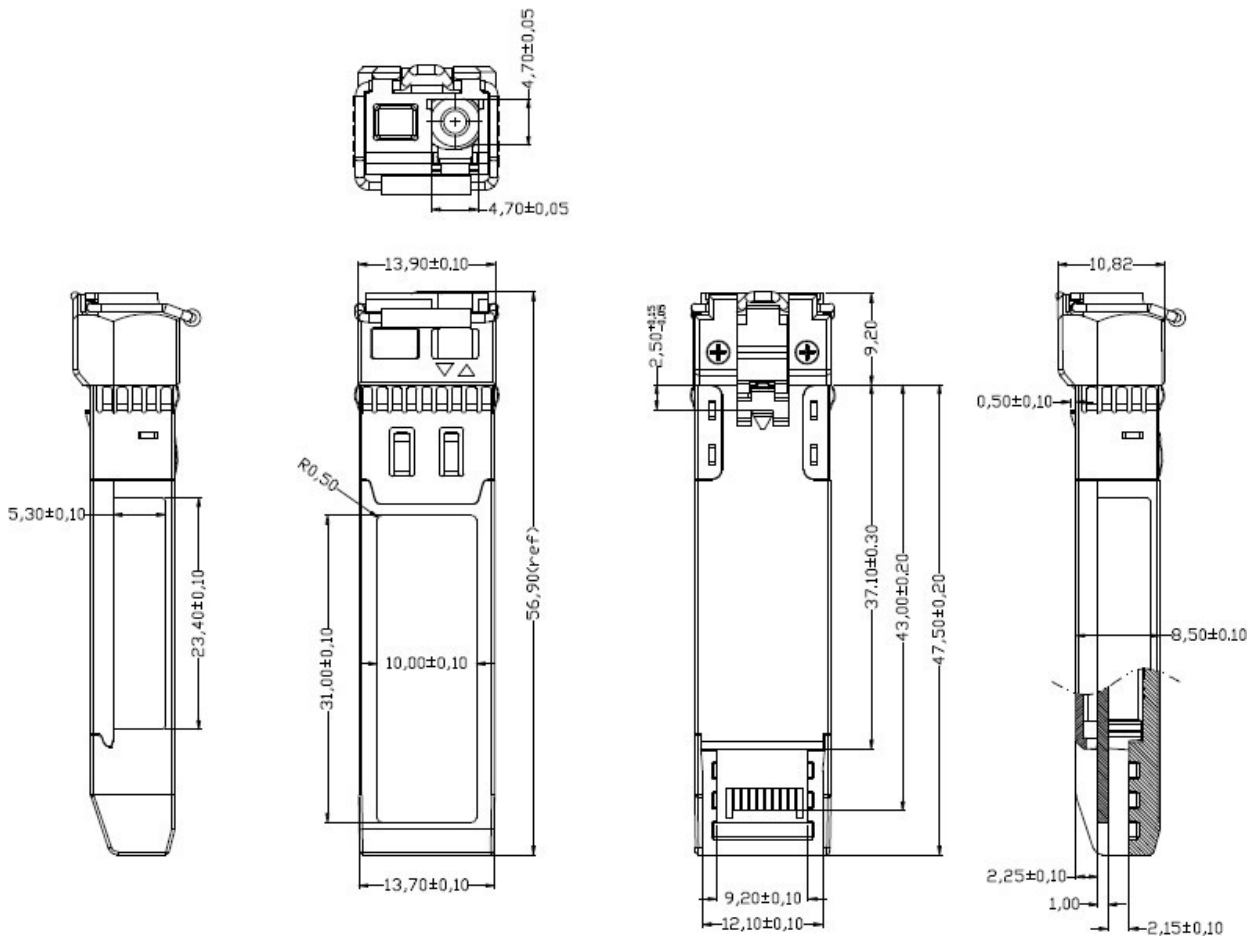
EEPROM Serial ID Memory Contents

The optical transceiver contains an EEPROM. It provides access to sophisticated identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information. When the serial protocol is activated, the host generates the serial clock signal (SCL, Mod Def 1). The positive edge clocks data into those segments of the EEPROM that are not writing protected within the SFP transceiver. The negative edge clocks data from the SFP transceiver. The serial data signal (SDA, Mod Def 2) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

The Module provides diagnostic information about the present operating conditions. The transceiver generates this diagnostic data by digitization of internal analog signals. Calibration and alarm/warning threshold data is written during device manufacture. Received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring all are implemented. The diagnostic data are raw A/D values and must be converted to real world units using calibration constants stored in EEPROM locations 56 - 95 at wire serial bus address A2h. The digital diagnostic memory map specific data fields define as following.

Package Outline

Dimensions are in millimeters. All dimensions are ± 0.1 mm unless otherwise specified. (Unit: mm)



For More Information

Data Controls Inc.

Add: 8F VORT Asakusabashi Ekimae V, 1-20-4 Yanagibashi, Taito-ku, Tokyo 111-0052, Japan

Tel: +81-3-5829-5805

E-mail: sales@dci.jp

<https://www.dci.jp>