
CWDM / 3 Gb/s Medium Power Single Optical SM Digital Diagnostic Transmitter

FVD2-2T-SM30-XX

Features

- SMPTE 297-2006 Compatible
- Speed from 50kbps to 3Gbps
- Support Video Pathological Patterns for SD-SDI, HD-SDI and 3G-SDI
- Dual CWDM Transmitter: 1270 nm to 1610 nm
- Based on Industry Standard SFP
- SFF-8472 Digital Diagnostic Function
- Two Independent TTL Laser Disable Input
- Single 3.3V power supply
- Operating case temperature : 0°C to 70°C
- ROHS Compliant
- Hot Pluggable
- Class 1 Laser International Safety Standard IEC-60825 Compliant



Applications

- SMPTE 297-2006 Compliant Electrical-to-Optical Interfaces
- High-density Video Routers

Description

The FVD2-2T-SM30-XX is single channel optical single mode transmitter module designed to transmit optical serial digital signals as defined in SMPTE 297-2006. It supports from 50 Mbps to 3 Gbps and is specifically designed for transmitted the SMPTE 259M, SMPTE 344M, SMPTE 292M and SMPTE 424M SDI pathological patterns. It is with the SFP 20-pin connector to allow hot plug capability. Digital diagnostic functions are available via an I²C. It is with a CWDM DFB laser transmitters. There are eighteen center wavelengths available from 1270 nm to 1610 nm, with each step 20 nm, except 1370nm, 1390nm.

I. Absolute Maximum Ratings

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Note
Storage Temperature	T _{stg}	-40	85	°C	
Operating Case Temperature	T _c	0	70	°C	
Power Supply Voltage	V _{cc}	0	4	V	
ESD Tolerance on all pins			1	KV HBM	
Relative Humidity		5	95	% RH	non-condensing

II. Recommended Operating Conditions

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V
Operating Case Temperature	T _c	0		70	°C
Baud Rate		50		3000	Mb/s
Power Supply Current	I _{cc}		200	300	mA

III. Optical and Electrical Characteristics

Transmitter Specifications (0°C < T_c < 70°C, 3.13V < V_{cc} < 3.47V)

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Optical						
Optical Transmit Power	P _o	-5	-2	0	dBm	1
Output Center Wavelength	λ	λ _c -5.5	λ _c	λ _c +7.5	nm	2
Output Spectrum Width	Δλ			1	nm	-20 dB width
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	5	7.5		dB	
Relative Intensity Noise	RIN			-120	dB/Hz	
Optical Rise Time / Fall Time	tr / tf			135	ps	3, SMPTE 424M
				270	ps	3, SMPTE 292M
				800	ps	3, SMPTE 344M
				1.5	ns	3, SMPTE 259M

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Electrical						
Differential Input Voltage	$V_{IH} - V_{IL}$	200	-	1200	mVp-p	AC coupled input
Disable Input Voltage -- Low	$V_{TDIS,L}$	0	-	0.8	V	TX Output Enabled
Disable Input Voltage -- High	$V_{TDIS,H}$	2.0	-	$V_{CC}+0.3$	V	TX Output Disabled
SCL, SDA	V_{OH}	2.5	-	$V_{CC}+0.3$	V	
	V_{OL}	0		0.5	V	

Notes

1. Output power is power coupled into a 9/125 μm single mode fiber.
2. ITU-T G.694.2 CWDM wavelength from 1270nm to 1610nm, (except 1370nm, 1390nm)
3. 20% to 80%, unfiltered.

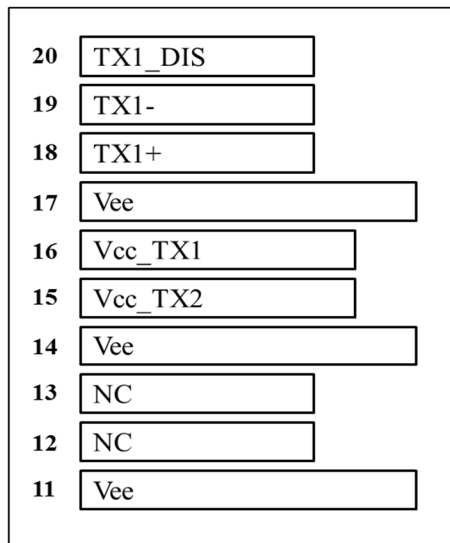
IV. Module Definition

Module Definition	PIN 5	PIN 6	Interpretation by Host
4	SCL	SDA	Serial module definition protocol

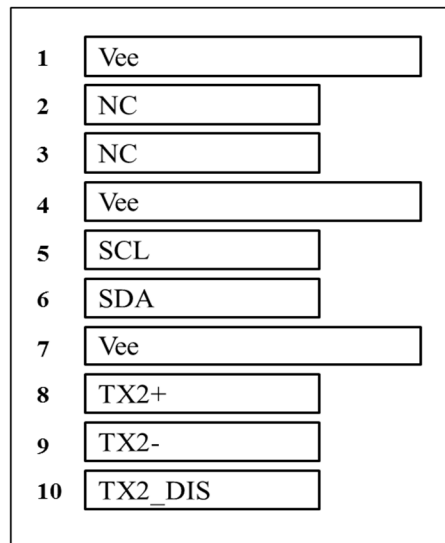
Module Definition 4 specifies a serial definition protocol. For this definition, upon power up, SCL and SDA appear as no connector(NC).

When the host system detects this condition, it activates the serial protocol. The protocol uses the 2-wire serial CMOS E^2 PROM protocol of the ATMEL AT24C01A/02/04 family of components.

V. Pin Information

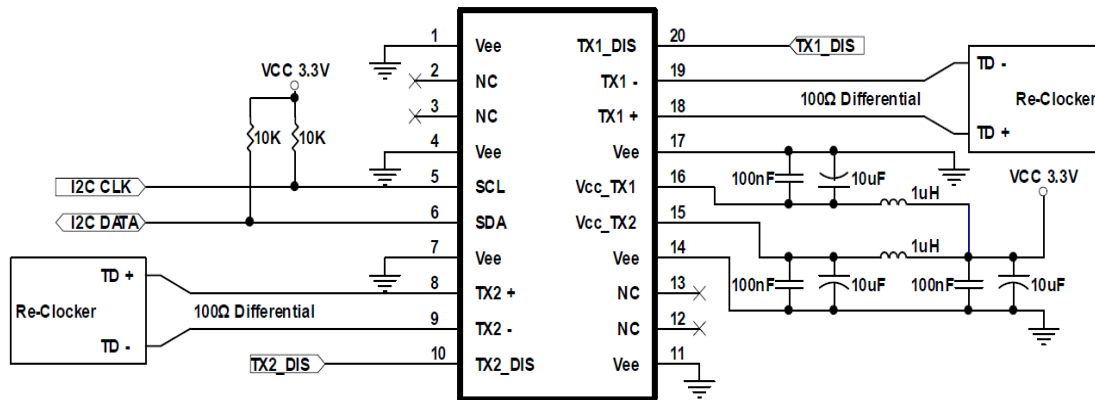


Top of Board

Bottom of Board
(as viewed thru top of board)

Pin	Name	Function	NOTE
1	Vee	Signal Ground	
2	NC	No Connection	
3	NC	No Connection	
4	Vee	Signal Ground	
5	SCL	Serial I ² C Clock	
6	SDA	Serial I ² C Data	
7	Vee	Signal Ground	
8	TX2+	Positive Transmitter Data In(2)	AC coupled differential lines with 100 ohm differential termination inside the module
9	TX2-	Negative Transmitter Data In(2)	
10	TX2_DIS	Transmitter Disable (2)	Internal 4.7 k Ω pull-up. The bias current and modulation current are turned off if TX2_DIS = HIGH.
11	Vee	Signal Ground	
12	NC	No Connection	
13	NC	No Connection	
14	Vee	Signal Ground	
15	Vcc TX2	Power Supply (2)	+3.3V $\pm$ 5%
16	Vcc TX1	Power Supply (1)	+3.3V $\pm$ 5%
17	Vee	Signal Ground	
18	TX1+	Positive Transmitter Data In (1)	AC coupled differential lines with 100 ohm differential termination inside the module
19	TX1-	Negative Transmitter Data In (1)	
20	TX_DIS	Transmitter Disable (1)	Internal 4.7 k Ω pull-up. The bias current and modulation current are turned off if TX1_DIS =HIGH

VII. Application Schematics



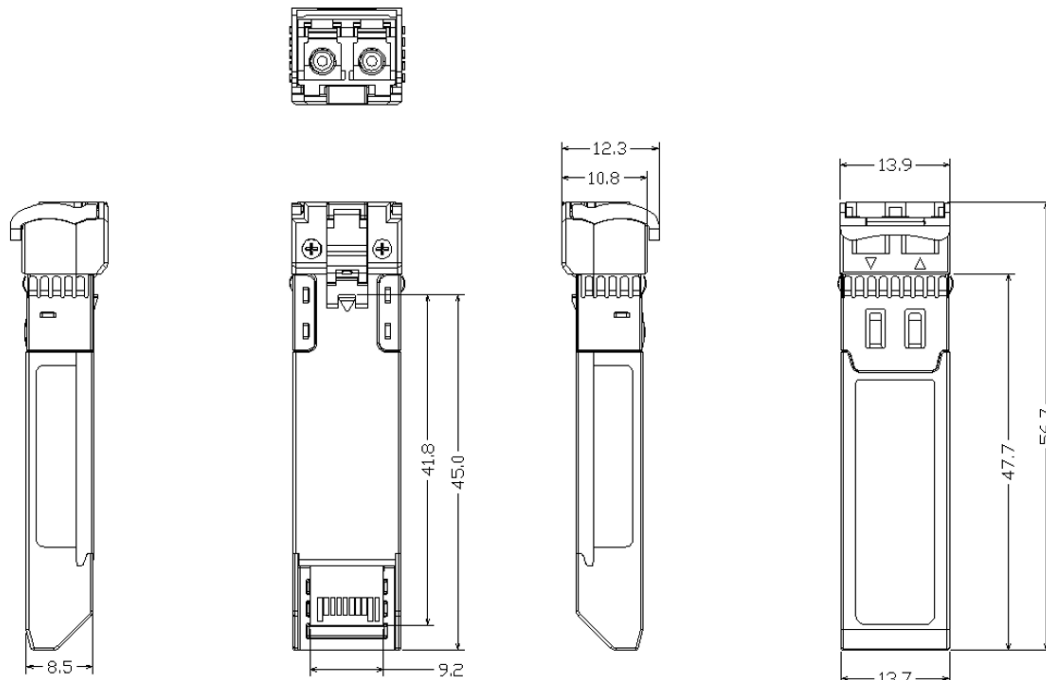
1. Consult the Chipset manufacturer's applications information for biasing required for TX outputs. Some chipset outputs are internally biased and may not need external bias resistor.

VII. Outline Diagrams

Package Outline

Dimensions are in millimeters

Tolerances are $\pm 0.2\text{mm}$, unless otherwise specified



VIII. Ordering Information

FVD	Core	-	Tx/Rx	-	Mode	Distance	CWDM wavelength
FOTTU	2 : 2core		2T : 2Tx	-	MM : Multimode	03 : 300m	27 : 1270
Video SFP	1: 1core		1T : 1Tx		SM : Single mode	10 : 10km	~
For SDI			2R : 2Rx			30 : 30km	61 : 1610
			1R : 1Rx			50 : 50km	See below Table
			1T1R : 1TR			80 : 80km	
			1B : 1BOSA				
			2B : 2BOSA				

CWDM Wavelength (0 ~ 70°C)

Code	Min (nm)	Typical (nm)	Max (nm)	Latch Color	Code	Min (nm)	Typical (nm)	Max (nm)	Latch Color
27	1264.5	1270	1277.5	Light purple	47	1464.5	1470	1477.5	Gray
29	1284.5	1290	1297.5	Sky blue	49	1484.5	1490	1497.5	Violet
31	1304.5	1310	1317.5	Yellow Green	51	1504.5	1510	1517.5	Blue
33	1324.5	1330	1337.5	Yellow Ocher	53	1524.5	1530	1537.5	Green
35	1344.5	1350	1357.5	Pink	55	1545.5	1550	1557.5	Yellow
41	1404.5	1410	1417.5	Silver	57	1564.5	1570	1577.5	Orange
43	1424.5	1430	1437.5	Black	59	1584.5	1590	1597.5	Red
45	1444.5	1450	1457.5	Yellow Orange	61	1604.5	1610	1617.5	Brown

CWDM : 16 Wavelengths from 1270 nm to 1610 nm, each step 20 nm, except 1370nm, 1390nm,

IX. More information

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