1310 nm RX / 1550 nm RX / 3 Gb/s Medium Power 1-Fibre BIDI SM Digital Diagnostic Dual Receiver

FVD1-2R-SM30

Features

- SMPTE 297-2006 Compatible
- 1-Fibre BIDI Dual Receiver with Simplex LC
- Speed from 50 Mbps to 3Gbps
- Support Video Pathological Patterns for SD-SDI, HD-SDI and 3G-SDI
- Dual Receiver with Duplex LC
- Based on Industry Standard SFP
- SFF-8472 Digital Diagnostic Function
- Single 3.3V power supply
- Operating case temperature : 0°C to 70°C
- ROHS Compliant
- Hot Pluggable

Applications

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

Description

The FVD1-2R-SM30 is a 1-fibre dual channel optical single mode receiver module designed to receive optical serial digital signals as defined in SMPTE 297-2006. It supports from 50 Mbps to 3Gbps and is specifically designed for received 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. Each receiver can receive signal from 50 Mbps to 3Gbps with up to 30 km of single-mode fiber when using the SPB-9110VW-T3T5G as the transmitter. A maximum distance of 10 km is achievable with 3Gbps pathological signals.

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	-20	85	°C	
Power Supply Voltage	Vcc	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	Icc		130	180	mA

Ⅲ. Optical and Electrical Characteristics

Receiver Specifications (0oC < Tc < 70oC, 3.13V < Vcc < 3.47V)

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Optical						
Wavelength of Operation	λ_{RX1}	1260	1310	1360	nm	1
	λ_{RX2}	1480	1550	1580	nm	2
Sensitivity for SMPTE 424M 2.97 Gb/s	Sen	0		-18	dBm	Pathological
		0		-20	dBm	PRBS 2^{23}-1, ER=1E-12
Sensitivity for SMPTE 292M 1.485 Gb/s	Sen	0		-20	dBm	Pathological
		0		-21	dBm	PRBS 2^{23}-1, ER=1E-12
Signal Detect -- Asserted	Pa			-20	dBm	Transition: low to high
Signal Detect -- Deasserted	Pd	-29			dBm	Transition: low to high
Signal detect -- Hysteresis		1		6	dB	
Optical Return Loss			-27		dB	

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Electrical						
CML Output (Differential)		550	660-	850	mVp-p	AC coupled output
Optical Rise Time / Fall Time	tr / tf			135	ps	3, SMPTE 424M
				270	ps	3, SMPTE 292M
				800	ps	3, SMPTE 344M
				1.5	ps	3, SMPTE 259M
Output LOS Voltage -- Low	V_{OL}	0	-	0.5	V	IOL=-1.6mA, 1 TTL unit load
Output LOS Voltage -- High	V_{OH}	2.5		Vcc+0.3	V	IOL=-1.6 μA, 1 TTL unit load
SCL, SDA	V_{OH}	2.5	-	Vcc+0.3	V	
	V_{OL}	0		0.5	V	

Notes

1. At least 30 dB optical isolation for the wavelength 1480 to 1580 nm...
2. At least 30 dB optical isolation for the wavelength 1260 to 1360 nm.
3. 20% to 80%, unfiltered.

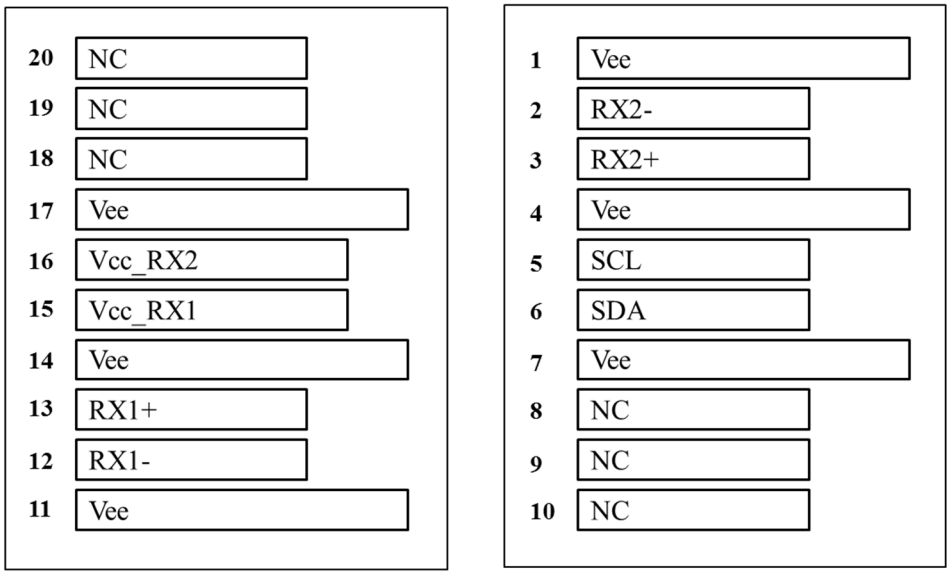
IV. Module Definition

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^2PROM protocol of the ATMEL AT24C01A/02/04 family of components.

Ⅴ. Pin Information

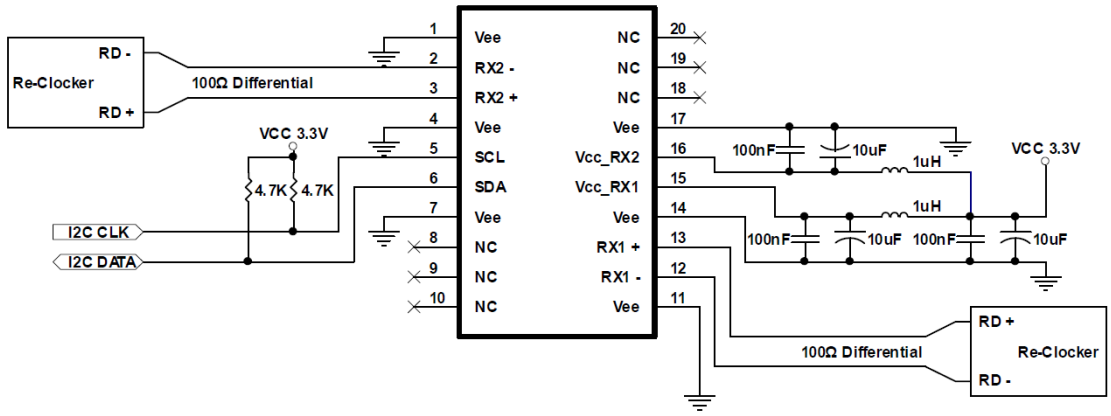


Top of Board

Bottom of Board
(as viewed thru top of board)

Pin	Name	Function	NOTE
1	Vee	Signal Ground	
2	RX2-	Negative Differential Output (2)	
3	RX2+	Positive Differential Output (2)	
4	Vee	Signal Ground	
5	SCL	Serial I2C Clock	
6	SDA	Serial I2C Data	
7	Vee	Signal Ground	
8	NC	No Connection	
9	NC	No Connection	
10	NC	No Connection	
11	Vee	Signal Ground	
12	RX1-	Negative Differential Output (1)	
13	RX1+	Positive Differential Output (1)	
14	Vee	Signal Ground	
15	Vcc RX1	Power Supply (1)	+3.3V±5%
16	Vcc RX2	Power Supply (2)	+3.3V±5%
17	Vee	Signal Ground	
18	NC	No Connection	
19	NC	No Connection	
20	NC	No Connection	

Ⅵ. Application Schematics



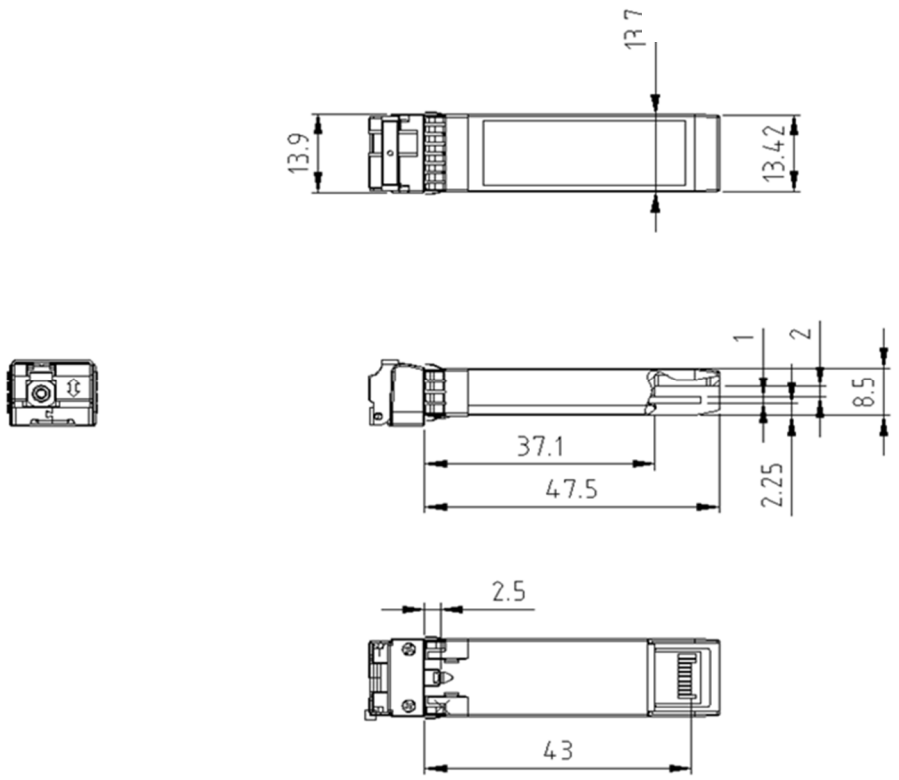
1. Consult the Chipset manufacturer's applications information for biasing required for TX outputs. Some chipset outputs are internally biased and may not need external bias resistor.

Ⅶ. Outline Diagrams

Package Outline

Dimensions are in millimeters

Tolerances are ±0.2mm, unless otherwise specified



Ⅷ. Ordering Information

FVD	Core	-	Tx/Rx	-	Mode	Distance
FOTTU Video SFP For SDI	2 : 2core 1: 1core		2T : 2Tx 1T : 1Tx 2R : 2Rx 1R : 1Rx 1TR:1Tx+1Rx 1B : 1BOSA 2B : 2BOSA	-	MM : Multimode SM : Single mode	03 : 300m 10 : 10km 30 : 30km 50 : 50km 80 : 80km

Ⅸ. More information

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