SPS-2116VMW-2RG / SPS-2116BVMW-2RG / SPS-2116AVMW-2RG (RoHS Compliant)
12 Gb/s / 1260 to 1620 nm Dual Optical SM Digital Diagnostic Receiver

FEATURES

- SMPTE 2082, SMPTE 424M, SMPTE 292M, SMPTE 259M, and DVB-ASI Compatible
- Speed up to 12 Gb/s
- Reclocker built-in
- Support Full Video Pathological Patterns for HD-SDI, 3G-SDI, 6G-SDI, and 12G-SDI
- Dual Receiver with Duplex LC
- Based on Industry Standard SFP +
- SFF-8472 Digital Diagnostic Function
- Single +3.3 V Power Supply
- RoHS Compliant
- 0 to 70°C Operation: SPS-2116VMW-2RG
- -10 to 85°C Operation: SPS-2116BVMW-2RG
- -40 to 85°C Operation: SPS-2116AVMW-2RG
- Hot-Pluggable

DESCRIPTION

The SPS-2116VMW-2RG series is a dual channel optical single mode receiver module designed to receive optical serial digital signals as defined in SMPTE 2082, SMPTE 424M, SMPTE 292M, SMPTE 259M, and DVB-ASI. It supports up to 12Gbps and is specifically designed to receive the pathological patterns for HD-SDI, 3G-SDI, 6G-SDI, and 12G-SDI. It is with the SFP+ 20-pin connector to allow hot plug capability. Digital diagnostic functions are available via an I^2C.

APPLICATIONS

- SMPTE 2082 Compliant Electrical-to-Optical Interfaces
- High-density Video Routers

ORDER INFORMATION

P/No.	Type	Bit Rate (Gb/s)	RX1		RX2		Package	Temp (°C)	RoHS Compliant
			λ (nm)	Sen. (dBm)	λ (nm)	Sen. (dBm)			
SPS-2116VMW-2RG	2-RX	Up to 12	1260/1620	-1 to -11	1260/1620	-1 to -11	LC SFP+ with DMI	0 to 70	Yes
SPS-2116BVMW-2RG	2-RX	Up to 12	1260/1620	-1 to -11	1260/1620	-1 to -11	LC SFP+ with DMI	-10 to 85	Yes
SPS-2116AVMW-2RG	2-RX	Up to 12	1260/1620	-1 to -11	1260/1620	-1 to -11	LC SFP+ with DMI	-40 to 85	Yes

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	Tstg	-40	85	°C	
Operating Case Temperature	Topr	0 -10 -40	70 85 85	°C	SPS-2116VMW-2RG SPS-2116BVMW-2RG SPS-2116AVMW-2RG
Power Supply Voltage	Vcc	-0.5	3.6	V	

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units / Notes
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Operating Case Temperature	Topr	0 -10 -40		70 85 85	°C / SPS-2116VMW-2RG °C / SPS-2116BVMW-2RG °C / SPS-2116AVMW-2RG
Power Supply Current	I_{CC}		450	500	mA
Data Rate			11.88		Gb/s

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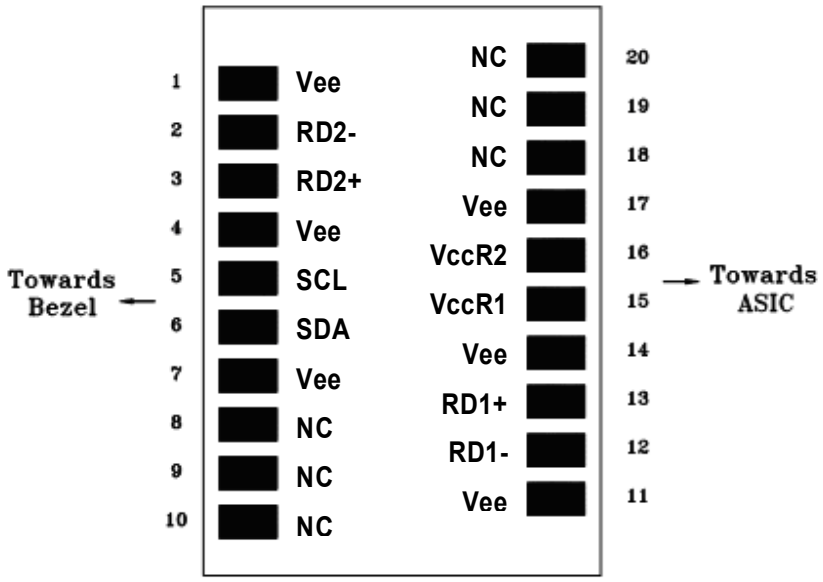
Receiver Optical Specifications (3.13V < Vcc < 3.47V)						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Units**	**Notes**
Sensitivity@11.88Gb/s	Sen			-11	dBm	1
Sensitivity@6Gb/s	Sen			-12	dBm	1
Sensitivity@2.97Gb/s	Sen			-12	dBm	1
Sensitivity@1.485Gb/s	Sen			-12	dBm	1
Receiver Overload	P_{MAX}	-1	---		dBm	
LOS -- Deasserted	LOS_D	---	---	-12	dBm	Transition: low to high
LOS -- Asserted	LOS_A	-30	---	---	dBm	Transition: high to low
Optical Hysteresis	Hys	0.5	2		dB	
Wavelength of Operation	λc	1260		1620	nm	

1. Measured with pathological pattern @ 1310nm; BER < 10^{-12} .

Electrical Characteristics						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**Units**	**Notes**
High-Speed Signal (CML) Interface Specification						
Output Data Rate			11.88		Gb/s	
Differential Output Impedance	Rout		100		Ω	
Low-Speed Signal (LVTTL) Interface Specification						
Output High Voltage		2.4		Vcc	V	
Output Low Voltage		GND		0.5	V	

CONNECTION DIAGRAM



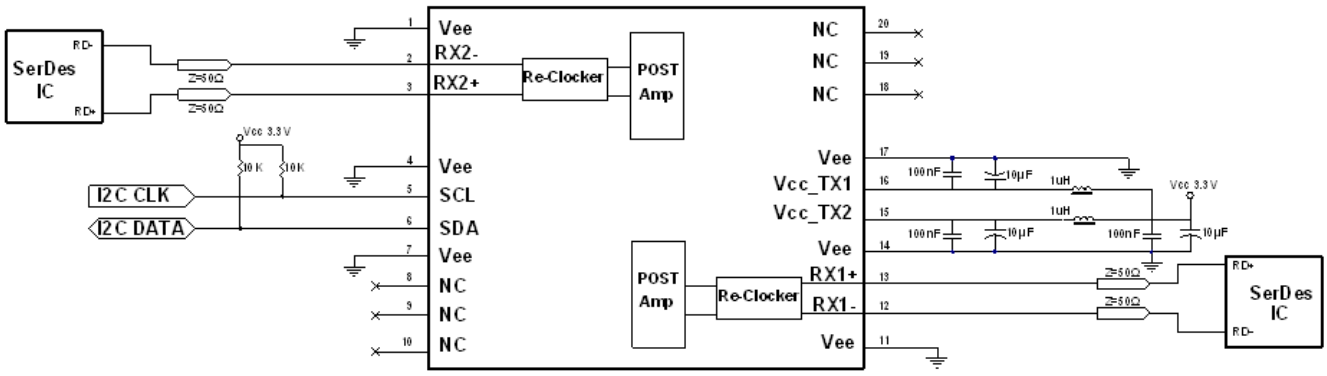
PIN	Name	Function	Notes
1	Vee	Signal Ground	
2	RD2-	Negative Differential Output (2)	AC coupled differential lines with 100 ohm differential termination inside the module
3	RD2+	Positive Differential Output (2)	
4	Vee	Signal Ground	
5	SCL	Serial I^2C Clock	
6	SDA	Serial I^2C Data	
7	Vee	Signal Ground	
8	NC	No Connection	
9	NC	No Connection	
10	NC	No Connection	
11	Vee	Signal Ground	
12	RD1-	Negative Differential Output (1)	AC coupled differential lines with 100 ohm differential termination inside the module
13	RD1+	Positive Differential Output (1)	
14	Vee	Signal Ground	
15	VccR1	Power Supply (1)	+3.3V±5%, Internal connected
16	VccR2	Power Supply (2)	
17	Vee	Signal Ground	
18	NC	No Connection	
19	NC	No Connection	
20	NC	No Connection	

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.

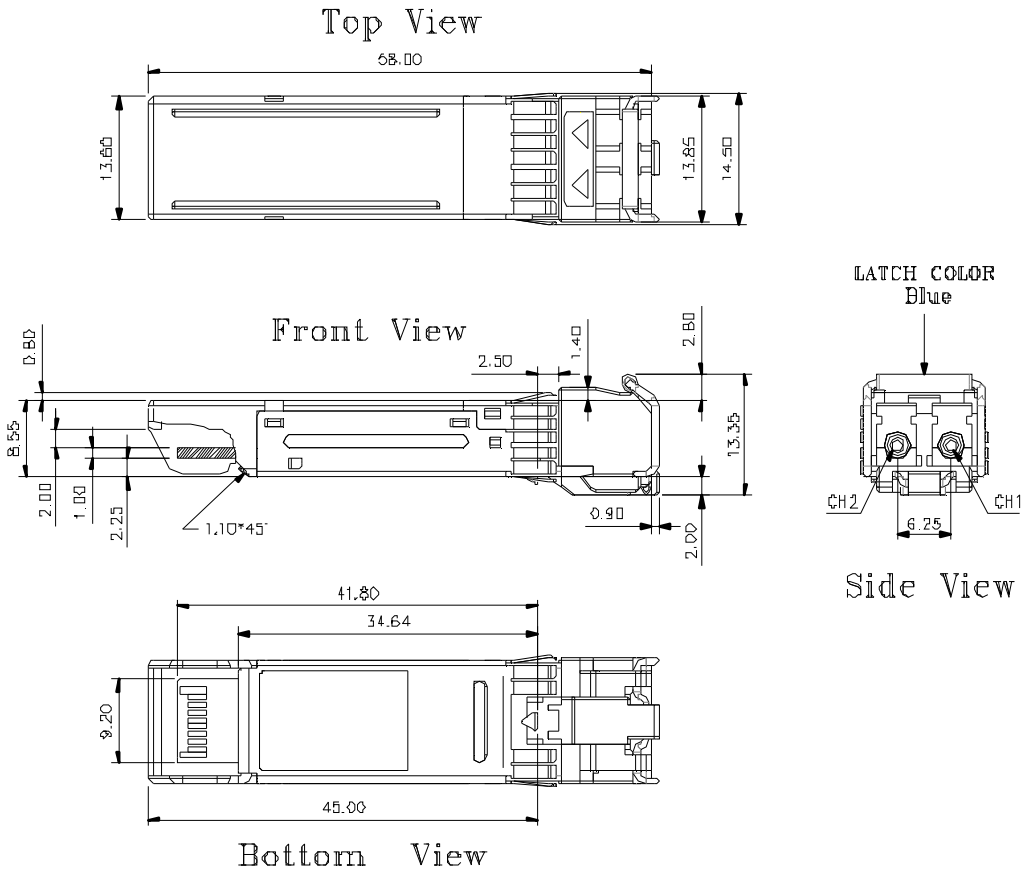
RECOMMENDED CIRCUIT SCHEMATIC



1. Consult Chipset manufacturer's data sheet and application data for appropriate receiver input biasing network.

PACKAGE DIAGRAM

Units in mm



Note: Specifications subject to change without notice.

REVISION HISTORY

Version	Subject	Release Date
1.0	Initial datasheet	2023/2/16