

1X9 transceiver 2.5G 1310TX/1550RX FC SM



OP-MA635F1S3-20

Overview

OP-MA635F1S3-20 1X9 transceiver allows the system designer to implement a range of solutions for video and other optical transmission systems applications. The transceiver consists of three sections: the transmitter and receiver optical subassemblies, An electrical subassembly. The transmitter section consists of an 1310nm/1550DFB laser. The receiver section consists of a PIN photodiode integrated with a trans-impedance preamplifier (TIA). A PECL logic interface simplifies interface to external circuitry.

Features

- 2.5Gbps 1310laser and PIN – TIA ,LVPECL Signal Detect Output
- 2.5Gbps 1550DFB laser and PIN – TIA, LVPECL Signal Detect Output
- <20Km links with 9/125μm SMF Cables
- DC/DC Coupling
- Industry 1 x 9 Footprint with SC connector
- Single +3.3 V OR +5V Power Supply
- Operating temperature: 0 to +70°C
- RoHS Compliant
- Compliant with FDA 21 CFR 1040.10 and 1040.11, Class

Application

- Video systems
- Other optical transmission systems

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	MAX.	Unit	Reference
Storage Temperature	Ts	-40		100	°C	
Supply Voltage	Vcc	-0.5		6	V	
Data Input Voltage	Vi	GND		VCC	V	
Output Current	Id			50	mA	
Relative Humidity	RH	5		95%	%	
Soldering Temperature	-			260	°C	10 seconds on lead only

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	MAX.	Unit	Reference
Ambient Operating Temperature	Ta	0		70	°C	1
Case Temperature	Tc			75	°C	2
Supply Voltage	Vi				V	
Transmitter Data Input voltage-Low	ViL-Vcc	-1.81		-1.48	V	3
Transmitter Data Input voltage-High	ViH-Vcc	-1.17		0.88	V	3

Note:

1. 0 to +70°C supply
2. Case temperature measurement referenced to the center-top of the internal metal transmitter shield.
3. Compatible with 10K,10KH,and 100K ECL and PECL input signals.

Transmitter Characteristics

Parameter	Symbol	Min.	Typ.	MAX.	Unit	Reference
Optical						
Optical Output Power 9/125 μ m SMF fiber	Pout	-6		-1	dBm Avg.	1
Optical Extinction Ratio	ER	9				2
Center Wavelength	Λ	1260	1310	1360	nm	
Spectral Width –RMS	S			4	nm	
Electrical						
Power Supply Current	Icc			300	mA	4
Differential Input Voltage	ViH-ViL	300			mV	
Data Input Voltage-Low	ViL-Vcc	-2.0		-1.58	V	5
Data Input Voltage-High	ViH-Vcc	-1.1		-0.74	V	5

Note:

1. The maximum Optical Output Power is class 1 laser eye safe.
2. Optical Extinction Ratio is defined as the ratio of the average output optical power of the transmitter in the high (“1”) state to the low (“0”) state.
This Optical Extinction Ratio is expressed in decibels (dB) by the relationship $10\log(\text{P}_{\text{high avg}}/\text{P}_{\text{low avg}})$.
3. These are unfiltered 20-80% values.
4. Maximum current is specified at $V_{\text{cc}} = \text{Maximum @ maximum temperature}$.
5. Compatible with 10K,10KH,and 100K ECL and PECL input signals.

Receiver Characteristics

Parameter	Symbol	Min.	Typ.	MAX.	Unit	Reference
Optical						
Sensitivity	Pout			-18	dBm avg.	1
Maximum Input Power	Pin	-3			dBm avg.	
Signal Detect -- Asserted	SDA			-19	dBm	2
Signal Detect -- Deasserted	SDD	-40			dBm	2
Signal Detect -- Hysteresis		0.5			dB	
Operating Center Wavelength	λ	1480	1550	1580	nm	
Return Loss		12			dB	3
Electrical						
Power Supply Current	Icc			300	mA	4
Data Output Voltage-Low	ViL-Vcc	-2.0		-1.58	V	5
Data Output Voltage-High	ViH-Vcc	-1.1		-0.74	V	5
Signal Detect Output Voltage -- Low	VoL-Vcc	-2.0		-1.58	V	6
Signal Detect Output Voltage --High	VoH-Vcc	-1.1		-0.74	V	6
Signal Detect Output Voltage --Low	Vsd-L			0.5	V	7
Signal Detect Output Voltage -- High	Vsd-H	2.0			V	7

Note:

- 1.The receive sensitivity is measured using a worst case extinction ratio penalty while sampling at the center of the eye.
- 2.SDA-- Transition: low to high. SDD-- Transition: high to low.
- 3.Return loss is defined as the minimum attenuation (dB) of received optical power for energy reflected back into the optical fiber.
- 4.Maximum current is specified at Vcc = Maximum @ maximum temperature.
- 5.Compatible with 10K,10KH,and 100K ECL and PECL input signals.
- 6.PECL Signal Detect Signal Output.
- 7.TTL Signal Output.

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Transmitter Characteristics

Parameter	Symbol	Min.	Typ.	MAX.	Unit	Reference
Optical						
Optical Output Power 9/125μm SMF fiber	Pout	-5		0	dBm Avg.	1
Optical Extinction Ratio	ER	9				2
Center Wavelength	λ	1500	1550	1580	nm	
Spectral Width –RMS	S			1	nm	
Optical Rise/Fall Time	tT/tf			260	ps	3
Electrical						
Power Supply Current	Icc			300	mA	4
Differential Input Voltage	ViH-ViL	300			mV	
Data Input Voltage-Low	ViL-Vcc	-2.0		-1.58	V	5
Data Input Voltage-High	ViH-Vcc	-1.1		-0.74	V	5

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Operating Center Wavelength	λ	1260	1310	1360	nm	
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Signal Detect Output Voltage -- Low	VoL-Vcc	-2.0		-1.58	V	6
Signal Detect Output Voltage --High	VoH-Vcc	-1.1		-0.74	V	6
Signal Detect Output Voltage --Low	Vsd-L			0.5	V	7
Signal Detect Output Voltage -- High	Vsd-H	2.0			V	7

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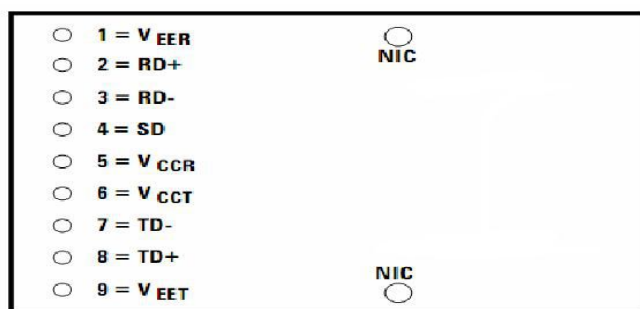
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Pin Description

Pin	Symbol	Function/Description
1	VeeR	Receiver Signal Ground. Directly connect this pin to receiver signal ground plane.
2	RX+	Receiver Data Out. RD+ is an open-emitter output circuit. Terminate this high speed differential PECL output with standard PECL techniques at the follow-on device input pin.
3	RX-	Inverse receiver Data Out. RD- is an open-emitter output circuit. Terminate this high speed differential PECL output with standard PECL techniques at the follow-on device input pin.
4	SD	Signal Detect. Active high on this indicates a received optical signal. Signal Detect is a single-ended PECL output. If Signal Detect output is not used, leave it open-circuited. This Signal Detect output can be used to drive a PECL input on an upstream circuit.
5	VccR	Receiver Power Supply.
6	VccT	Transmitter Power Supply.
7	TD-	Inverse Transmitter Data In. Terminate this high-speed differential PECL input with standard PECL techniques at the transmitter input pin.
8	TD+	Transmitter Data In. Terminate this high-speed differential PECL input with standard PECL techniques at the transmitter input pin.
9	VeeT	Transmitter Signal Ground Directly connect this pin to the transmitter signal ground plane.
Mounting Pins		The mounting pins are provided for transceiver mechanical attachment to the circuit board. They are embedded in the nonconductive plastic housing and are not connected to the transceiver internal circuit. They should be soldered into plated-through holes on the printed circuit board

Pin Assignment



TOP VIEW

NIC = No Internal Connection (Mounting Pins)

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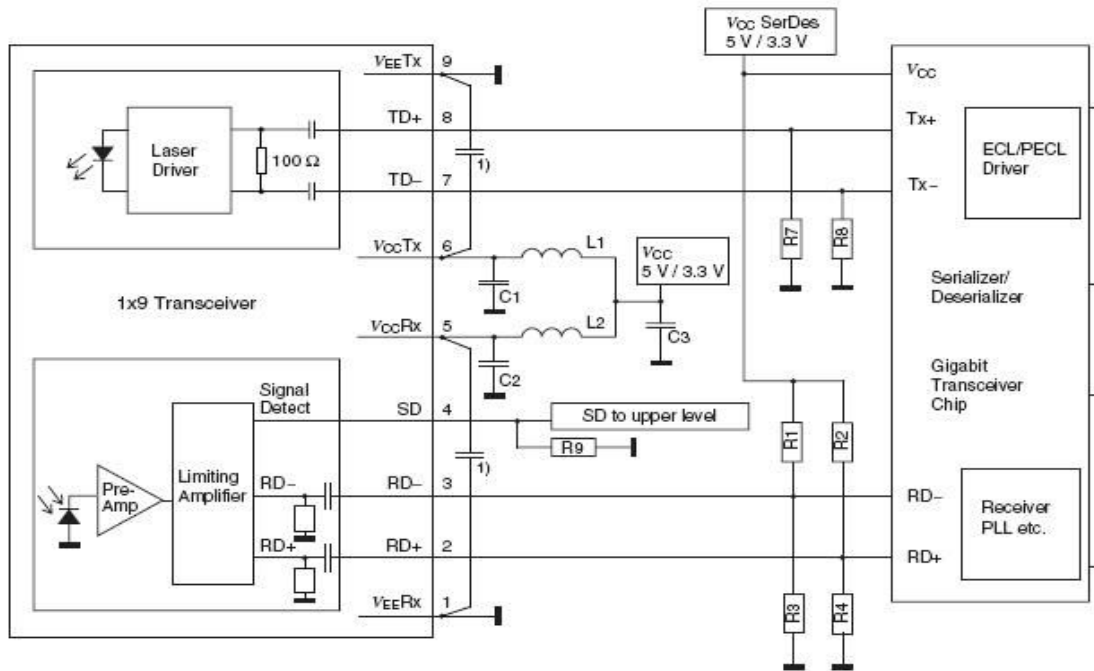
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Recommended Interface Circuit



- C1/2/3 = 4.7 μ F
- L1/2 = 1 μ H
- R1/2/3/4 = Depends on SerDes chip used
- R7/8 = Biasing (depends on SerDes chip)
- R9 = open (5 V/3.3 V TTL)
- = 510 Ω (5 V PECL)
- = 270 Ω (3.3 V PECL)

Place R1/2/3/4/7/8 close to SerDes chip.
Place R5/6 close to 1x9 transceiver.

Package Dimensions

