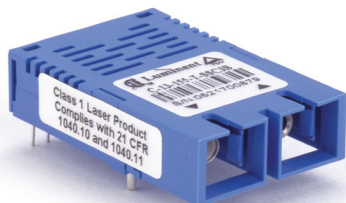


C-13-155(C)-T(3)-SSC3(5/7/9)



Features

- Duplex SC Single Mode Transceiver
- Industry Standard 1x9 Footprint
- Intermediate reach SONET OC-3 SDH STM-1 Compliant
- Single +5V/3.3V Power Supply
- PECL/LVPECL Differential Inputs and Outputs
- TTL/LVTTL Signal Detection Output [C-13-155C-T(3)-SSC3(5/7/9)]
- PECL/LVPECL Signal Detection Output [C-13-155-T(3)-SSC3(5/7/9)]
- Wave Solderable and Aqueous Washable
- LED Multisourced 1x9 Transceiver Interchangeable
- Class 1 Laser Int. Safety Standard IEC 825 compliant
- Uncooled laser diode with MQW structure
- Complies with Telcordia (Bellcore) GR-468-CORE
- ATM 155 Mbps links
- RoHS compliance available

Absolute Maximum Rating

Parameter	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	V_{cc}	0	6	V	C-13-155(C)-T-SSC3(5/7/9)
Power Supply Voltage	V_{cc}	0	3.6	V	C-13-155(C)-T3-SSC3(5/7/9)
Output Current	I_{out}	-	30	mA	
Soldering Temperature	-	-	260	°C	10 seconds on leads only
Storage Temperature	T_{stg}	-40	85	°C	

Recommended Operating Condition

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage ¹	V_{cc}	4.75	5	5.25	V
Power Supply Voltage ¹	V_{cc}	3.1	3.3	3.5	V
Operating Temperature ¹ (Case)	T_{opr}	0	70	°C	
Operating Temperature ¹ (Case)	T_{opr}	-40	85	°C	
Data Rate	-	-	155	-	Mbps

Note 1 : Please refer to ordering information

C-13-155(C)-T(3)-SSC3(5/7/9)

Transmitter Specifications						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Optical Transmit Power	P_o	-15	-	-8	dBm	Output power is coupled into a 9/125 μ m single mode fiber, C-13-155(C)-T(3)-SSC3
Optical Transmit Power	P_o	-5	-	0	dBm	Output power is coupled into a 9/125 μ m single mode fiber, C-13-155(C)-T(3)-SSC5
Optical Transmit Power	P_o	-3	-	+3	dBm	Output power is coupled into a 9/125 μ m single mode fiber, C-13-155(C)-T(3)-SSC7
Optical Transmit Power	P_o	0	-	+5	dBm	Output power is coupled into a 9/125 μ m single mode fiber, C-13-155(C)-T(3)-SSC9
Output center Wavelength	λ	1261	1310	1360	nm	C-13-155(C)-T(3)-SSC3
Output center Wavelength	λ	1263	1310	1360	nm	C-13-155(C)-T(3)-SSC5
Output center Wavelength	λ	1290	1310	1330	nm	C-13-155(C)-T(3)-SSC7(9)
Output Spectrum Width	$\Delta\lambda$			7.7	nm	RMS(σ), C-13-155(C)-T(3)-SSC3
Output Spectrum Width	$\Delta\lambda$			3	nm	RMS(σ), C-13-155(C)-T(3)-SSC5
Output Spectrum Width	$\Delta\lambda$			2.5	nm	RMS(σ), C-13-155(C)-T(3)-SSC7(9)
Extinction Ratio	ER	8.2	-	-	dB	C-13-155(C)-T(3)-SSC3
Extinction Ratio	ER	10	-	-	dB	C-13-155(C)-T(3)-SSC5(7/9)
Output pulse Mask	Compliant with FDDI SMF-PMD1					
Output Eye	Compliant with ITU-T recommendation G.957					
Optical Rise Time	t_r	-	-	2	ns	10% to 90% Values
Optical Fall Time	t_f	-	-	2	ns	10% to 90% Values
Relative Intensity Noise	RIN	-	-	-116	dB/Hz	
Total Jitter	TJ	-	-	1.2	ns	Measured with 2 ²³ -1 PRBS with 72 ones and 72 zeros.

Transmitter Specifications						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Electrical						
Power Supply Current	I_{CC}	-	-	160	mA	Maximum current is specified at V_{CC} = Maximum @ maximum temperature
Data Input Current-Low	I_{IL}	-350	-	-	μ A	
Data Input Current-High	I_{IH}	-	-	350	μ A	
Differential Input Voltage	$V_{IH}-V_{IL}$	300	-	-	mV	
Data Input Voltage-Low	$V_{IL}-V_{CC}$	-2.0	-	-1.58	V	These inputs are compatible with 10K, 10KH and 100K ECL and PECL inputs
Data Input Voltage-High	$V_{IH}-V_{CC}$	-1.1	-	-0.74	V	

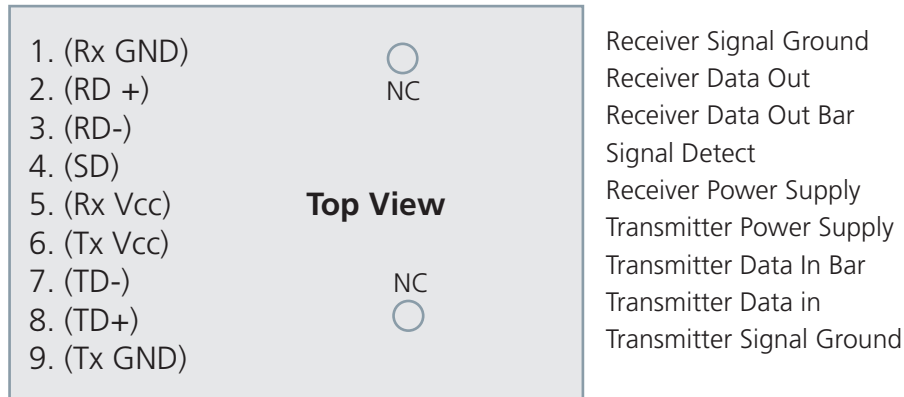
C-13-155(C)-T(3)-SSC3(5/7/9)

Receiver Specifications						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical						
Sensitivity	-	-	-	-34	dBm	Measured with 2 ²³ -1 PRBS with 72 ones and 72 zeros. C-13-155(C)-T(3)-SSC3
Sensitivity	-	-	-	-35	dBm	Measured with 2 ²³ -1 PRBS with 72 ones and 72 zeros. C-13-155(C)-T(3)-SSC5
Sensitivity	-	-	-	-37	dBm	Measured with 2 ²³ -1 PRBS with 72 ones and 72 zeros. C-13-155(C)-T(3)-SSC7(9)
Maximum Input Power	P _{in}	-7	-	-	dBm	C-13-155(C)-T(3)-SSC3
Maximum Input Power	P _{in}	0	-	-	dBm	C-13-155(C)-T(3)-SSC5(7/9)
Signal Detect-Asserted	P _a	-	-	-34	dBm	Measured on transition: low to high, C-13-155(C)-T(3)-SSC3
Signal Detect-Asserted	P _a	-	-	-35	dBm	Measured on transition: low to high, C-13-155(C)-T(3)-SSC5
Signal Detect-Asserted	P _a	-	-	-37	dBm	Measured on transition: low to high, C-13-155(C)-T(3)-SSC7(9)
Signal Detect-Deasserted	P _d	-47	-	-	dBm	Measured on transition: high to low
Signal Detect-Hysteresis		1.0	-	4.0	dB	
Wavelength of Operation		1100	-	1600	nm	

Receiver Specifications						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Electrical						
Power Supply Current	I _{CC}	-	-	100	mA	The current excludes the output load current
Data Input Voltage-Low	V _{OL} -V _{CC}	-2	-	-1.58	V	These outputs are compatible with 10K, 10KH and 100KECL and PECL outputs.
Data Input Voltage-High	V _{OH} -V _{CC}	-1.1	-	-0.74	V	
Signal Detect Output Voltage-Low	V _{SDL} -V _{CC}	-2	-	-1.58	V	C-13-155-T(3)-SSC3(5/7/9)
Signal Detect Output Voltage-High	V _{SDH} -V _{CC}	-1.1	-	-0.74	V	
Signal Detect Output Voltage-Low	V _{SDL} -V _{CC}	-	-	0.5	V	C-13-155C-T(3)-SSC3(5/7/9)
Signal Detect Output Voltage-High	V _{SDH} -V _{CC}	2.0	-	-	V	

C-13-155(C)-T(3)-SSC3(5/7/9)

Connection Diagram

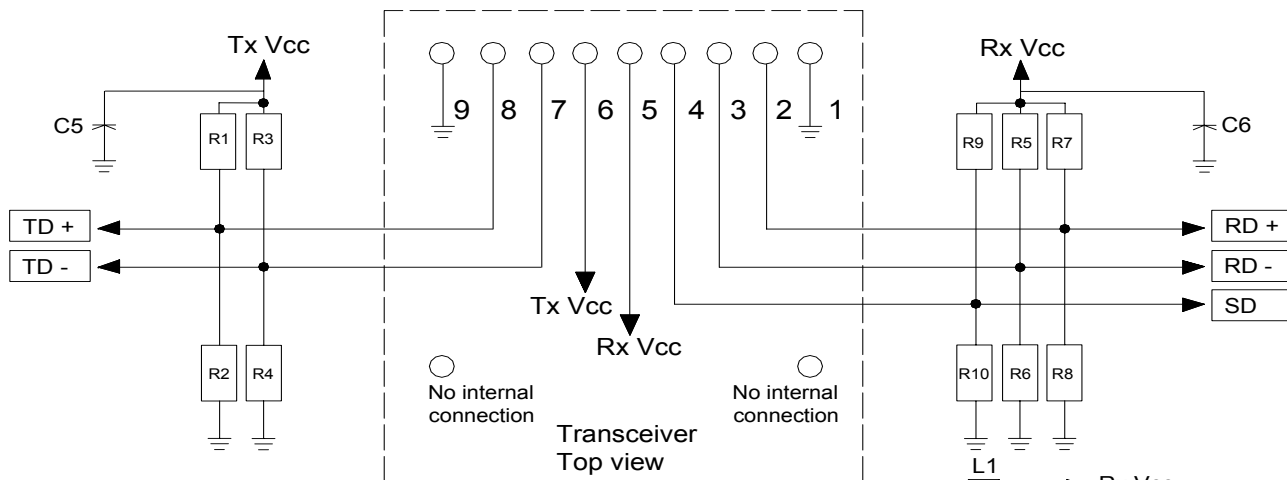


PIN	Symbol	Notes
1	RxGND	Directly connect this pin to the receiver ground plane
2	RD+	See recommended circuit schematic
3	RD-	See recommended circuit schematic
4	SD	Active high on this indicates a received optical signal
5	RxVcc	Dc power for the receiver section
6	TxVcc	Dc power for the transmitter section
7	TD-	See recommended circuit schematic
8	TD+	See recommended circuit schematic
9	TxGND	Directly connect this pin to the transmitter ground plane

C-13-155(C)-T(3)-SSC3(5/7/9)

Recommended Circuit Schematic

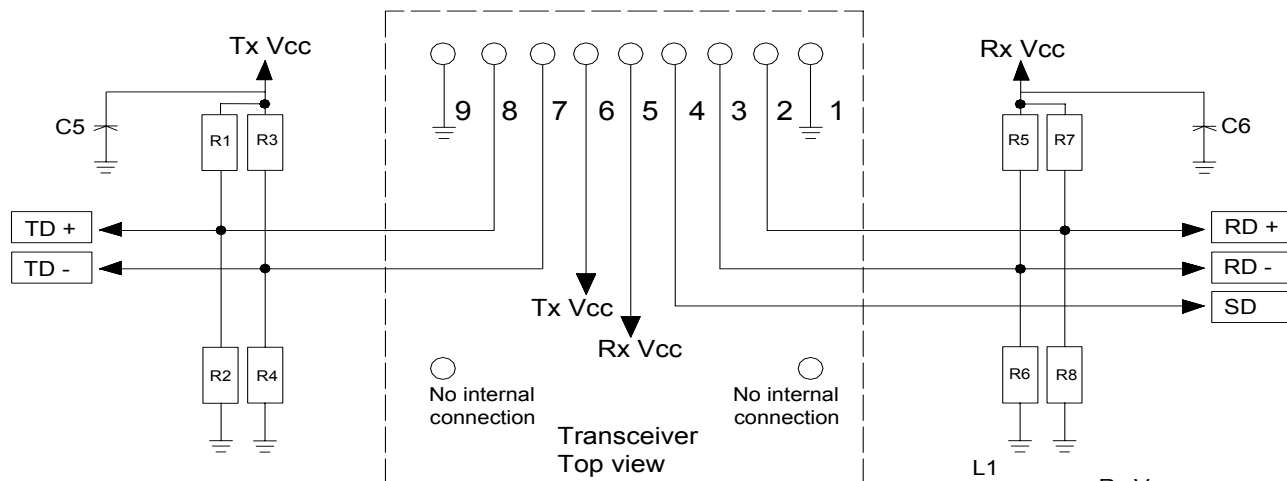
C-13-155-T(3)-SSC3(5/7/9)



Notes +3.3V:
 R1=R3=R5=R7=R9=130 Ω
 R2=R4=R6=R8=R10=82 Ω
 C1=C2=C3=C5=C6=0.1 μ F
 C4=10 μ F
 L1=L2=1 μ H

Notes +5V:
 R1=R3=R5=R7=R9=82 Ω
 R2=R4=R6=R8=R10=130 Ω
 C1=C2=C3=C5=C6=0.1 μ F
 C4=10 μ F
 L1=L2=1 μ H

C-13-155C-T(3)-SSC3(5/7/9)



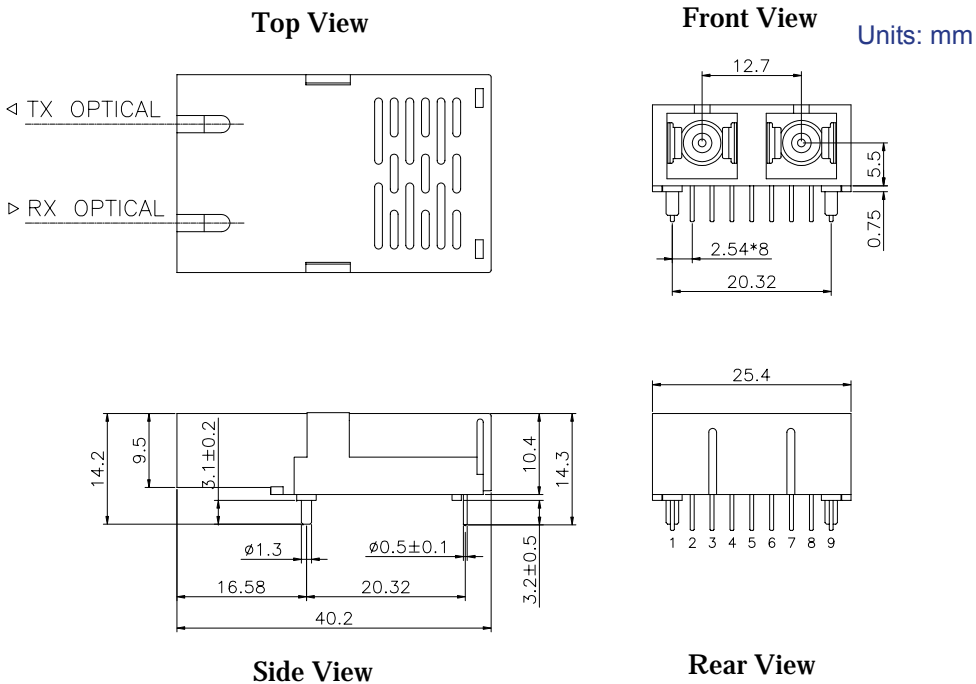
Notes +3.3V:
 R1=R3=R5=R7=130 Ω
 R2=R4=R6=R8=82 Ω
 C1=C2=C3=C5=C6=0.1 μ F
 C4=10 μ F
 L1=L2=1 μ H

Notes +5V:
 R1=R3=R5=R7=82 Ω
 R2=R4=R6=R8=130 Ω
 C1=C2=C3=C5=C6=0.1 μ F
 C4=10 μ F
 L1=L2=1 μ H

The split-loaded terminations for ECL signals need to be located at the input of devices receiving those ECL signals. The power supply filtering is required for good EMI performance. Use short tracks from the inductor L1/L2 to the module Rx Vcc. / Tx Vcc. A GND plane under the module is required for good EMI and sensitivity performance.

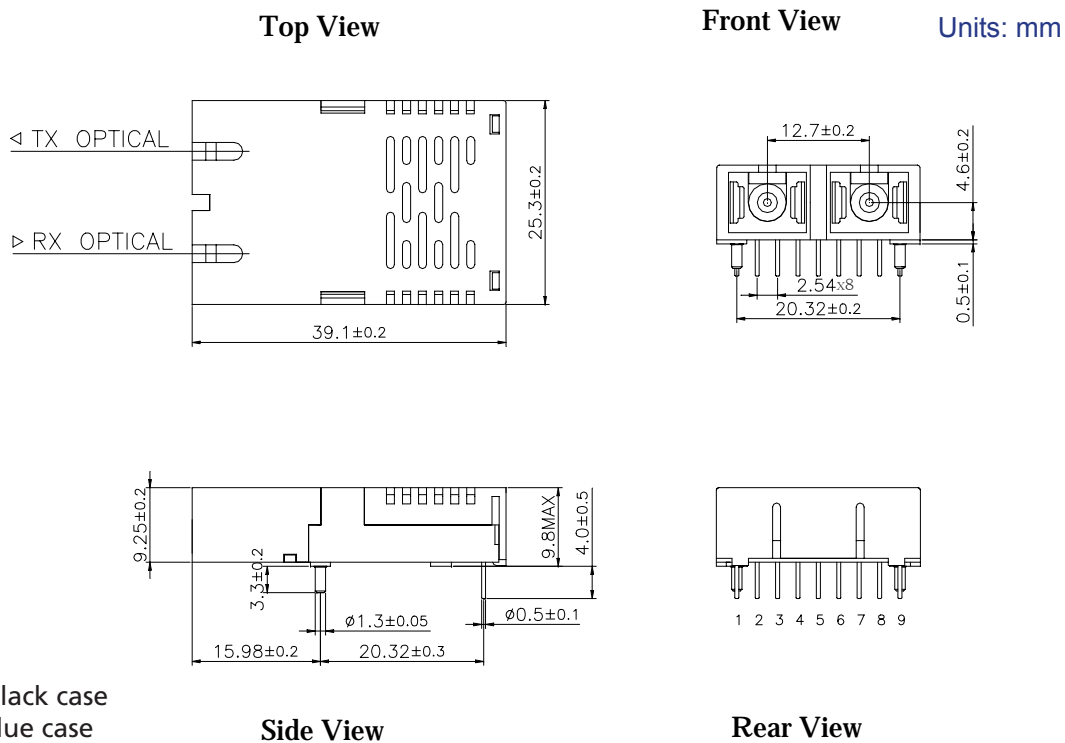
C-13-155(C)-T(3)-SSC3(5/7/9)

Package Diagram (10.4 mm SC transceiver assembly)



Blank/A: Black case

Package Diagram (9.8 mm SC transceiver assembly)



C/D: Black case
B/E: Blue case

C-13-155(C)-T(3)-SSC3(5/7/9)

Ordering Information

Available Options:

C-13-155-T(3)-SSC3	C-13-155-T(3)-SSC7	C-13-155-T(3)-SSC3-G5	C-13-155C-T(3)-SSC3-G5
C-13-155-T(3)-SSC3A	C-13-155-T(3)-SSC7A	C-13-155-T(3)-SSC3A-G5	C-13-155C-T(3)-SSC3A-G5
C-13-155-T(3)-SSC3B	C-13-155-T(3)-SSC7B	C-13-155-T(3)-SSC3B-G5	C-13-155C-T(3)-SSC3B-G5
C-13-155-T(3)-SSC3C	C-13-155-T(3)-SSC7C	C-13-155-T(3)-SSC3C-G5	C-13-155C-T(3)-SSC3C-G5
C-13-155-T(3)-SSC3D	C-13-155-T(3)-SSC7D	C-13-155-T(3)-SSC3D-G5	C-13-155C-T(3)-SSC3D-G5
C-13-155-T(3)-SSC3E	C-13-155-T(3)-SSC7E	C-13-155-T(3)-SSC3E-G5	C-13-155C-T(3)-SSC3E-G5
C-13-155C-T(3)-SSC3	C-13-155C-T(3)-SSC7	C-13-155-T(3)-SSC5-G5	C-13-155C-T(3)-SSC5-G5
C-13-155C-T(3)-SSC3A	C-13-155C-T(3)-SSC7A	C-13-155-T(3)-SSC5A-G5	C-13-155C-T(3)-SSC5A-G5
C-13-155C-T(3)-SSC3B	C-13-155C-T(3)-SSC7B	C-13-155-T(3)-SSC5B-G5	C-13-155C-T(3)-SSC5B-G5
C-13-155C-T(3)-SSC3C	C-13-155C-T(3)-SSC7C	C-13-155-T(3)-SSC5C-G5	C-13-155C-T(3)-SSC5C-G5
C-13-155C-T(3)-SSC3D	C-13-155C-T(3)-SSC7D	C-13-155-T(3)-SSC5D-G5	C-13-155C-T(3)-SSC5D-G5
C-13-155C-T(3)-SSC3E	C-13-155C-T(3)-SSC7E	C-13-155-T(3)-SSC5E-G5	C-13-155C-T(3)-SSC5E-G5
C-13-155-T(3)-SSC5	C-13-155-T(3)-SSC9	C-13-155-T(3)-SSC7-G5	C-13-155C-T(3)-SSC7-G5
C-13-155-T(3)-SSC5A	C-13-155-T(3)-SSC9A	C-13-155-T(3)-SSC7A-G5	C-13-155C-T(3)-SSC7A-G5
C-13-155-T(3)-SSC5B	C-13-155-T(3)-SSC9B	C-13-155-T(3)-SSC7B-G5	C-13-155C-T(3)-SSC7B-G5
C-13-155-T(3)-SSC5C	C-13-155-T(3)-SSC9C	C-13-155-T(3)-SSC7C-G5	C-13-155C-T(3)-SSC7C-G5
C-13-155-T(3)-SSC5D	C-13-155-T(3)-SSC9D	C-13-155-T(3)-SSC7D-G5	C-13-155C-T(3)-SSC7D-G5
C-13-155-T(3)-SSC5E	C-13-155-T(3)-SSC9E	C-13-155-T(3)-SSC7E-G5	C-13-155C-T(3)-SSC7E-G5
C-13-155C-T(3)-SSC5	C-13-155C-T(3)-SSC9	C-13-155-T(3)-SSC9-G5	C-13-155C-T(3)-SSC9-G5
C-13-155C-T(3)-SSC5A	C-13-155C-T(3)-SSC9A	C-13-155-T(3)-SSC9A-G5	C-13-155C-T(3)-SSC9A-G5
C-13-155C-T(3)-SSC5B	C-13-155C-T(3)-SSC9B	C-13-155-T(3)-SSC9B-G5	C-13-155C-T(3)-SSC9B-G5
C-13-155C-T(3)-SSC5C	C-13-155C-T(3)-SSC9C	C-13-155-T(3)-SSC9C-G5	C-13-155C-T(3)-SSC9C-G5
C-13-155C-T(3)-SSC5D	C-13-155C-T(3)-SSC9D	C-13-155-T(3)-SSC9D-G5	C-13-155C-T(3)-SSC9D-G5
C-13-155C-T(3)-SSC5E	C-13-155C-T(3)-SSC9E	C-13-155-T(3)-SSC9E-G5	C-13-155C-T(3)-SSC9E-G5

Part numbering Definition:

C - 13 - 155(C) - T(3) - S SC TxPower Temperature and Package - RoHS compliance

- 13 = Wavelength 1310nm
- Communication protocol (155 Mbps)
155 = PECL Signal Detection Output
155C = TTL Signal Detection Output
- T = +5V Transceiver, FP
T3= +3.3V Transceiver, FP
- Single mode fiber
- Connector options
- Tx Power range
3= -15 to -8 dBm
5= -5 to 0 dBm
7= -3 to +3 dBm
9= 0 to +5 dBm
- Temperature range and package
Blank = commercial temperature(0 to 70 °C), 10.4 mm, Black case
A = industrial temperature(-40 to 85 °C), 10.4 mm, Black case
B = industrial temperature(-40 to 85 °C), 9.8 mm, Blue case
C = industrial temperature(-40 to 85 °C), 9.8 mm, Black case
D = commercial temperature(0 to 70 °C), 9.8 mm, Black case
E = commercial temperature(0 to 70 °C), 9.8 mm, Blue case
- Blank = RoHS non-compliant product
G5 = RoHS 5/6-compliant product (lead exemption)

Warnings:

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

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