



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

Table 1 – Absolute Maximum Rating

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Power Supply Voltage	Vcc	0	-	6	V	
Power Supply Voltage	Vcc	0	-	3.6	V	
Output Current	I _{out}	-	-	30	mA	
Soldering Temperature	-	-	-	260	°C	1
Storage Temperature	T _{stg}	-40	-	85	°C	

Note 1: 10 seconds on leads only

Table 2 – Recommended Operating Condition

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Power Supply Voltage	Vcc	4.75	5	5.25	V	
Power Supply Voltage	Vcc	3.1	3.3	3.5	V	
Operating Temperature (Case)	T _{opr}	0	-	70	°C	2
Operating Temperature (Case)	T _{opr}	-40	-	85	°C	2
Data Rate	DR	-	155	-	Mbps	

Note 2: Please refer to ordering information

Table 3 – Transmitter Specifications (Optical)

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Optical Transmit Power	P_o	-15	-	-8	dBm	3
Optical Transmit Power	P_o	-5	-	0	dBm	4
Optical Transmit Power	P_o	-3	-	3	dBm	5
Optical Transmit Power	P_o	0	-	5	dBm	6
Output Center Wavelength	λ	1261	1310	1360	nm	7
Output Center Wavelength	λ	1263	1310	1360	nm	8
Output Center Wavelength	λ	1290	1310	1330	nm	9
Output Spectrum Width	$\Delta \lambda$	-	-	7.7	nm	10
Output Spectrum Width	$\Delta \lambda$	-	-	3	nm	11
Output Spectrum Width	$\Delta \lambda$	-	-	2.5	nm	12
Extinction Ratio	ER	8.2	-	-	dB	13
Extinction Ratio	ER	10	-	-	dB	14
Output Eye		Compliant with ITU-T recommendation G.957				
Optical Rise/Fall Time	t_r / t_f	-	-	2	ns	15
Relative Intensity Noise	RIN	-	-	-116	dB/Hz	
Total Jitter	T_j	-	-	1.2	ns	16

Note 3, 7, 10, 13: C-13-155(C)-T(3)-SSC3

Note 4, 8, 11, 14: C-13-155(C)-T(3)-SSC5

Note 5, 9, 12, 14: C-13-155(C)-T(3)-SSC7

Note 6, 9, 12, 14: C-13-155(C)-T(3)-SSC9

Note 15: 10% to 90% Values

Note 16: Measured with 2^{23} -1 PRBS with 72 ones and 72 zeros

Table 4 – Transmitter Specifications (Electrical)

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Power Supply Current	I_{CC}	-	-	160	mA	17
Data Input Current-Low	I_{IL}	-350	-	-	μA	
Data Input Current-High	I_{IH}	-	-	350	μA	
Differential Input Voltage	$V_{IH}-V_{IL}$	300	-	-	mV	
Data Input Voltage-Low	$V_{IL}-V_{CC}$	-2.0	-	-1.58	V	18
Data Input Voltage-High	$V_{IH}-V_{CC}$	-1.1	-	-0.74	V	

Note 17: Maximum current is specified at V_{CC} = Maximum @ maximum temperature

Note 18: These inputs are compatible with 10K, 10KH and 100K ECL and PECL inputs

Table 5 – Receiver Specifications (Optical)

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Sensitivity	-	-	-	-34	dBm	19
Sensitivity	-	-	-	-35	dBm	20
Sensitivity	-	-	-	-37	dBm	21
Maximum Input Power	P_{in}	-7	-	-	dBm	22
Maximum Input Power	P_{in}	0	-	-	dBm	23
Signal Detect-Asserted	P_a	-	-	-34	dBm	24
Signal Detect-Asserted	P_a	-	-	-35	dBm	25
Signal Detect-Asserted	P_a	-	-	-37	dBm	26
Signal Detect-Deasserted	P_d	-47	-	-	dBm	27
Signal Detect-Hysteresis	-	1.0	-	4.0	dB	
Wavelength of Operation		1100	-	1600	nm	

Note 19: Measured with 2^{23} -1 PRBS with 72 ones and 72 zeros. C-13-155(C)-T(3)-SSC3

Note 20: Measured with 2^{23} -1 PRBS with 72 ones and 72 zeros. C-13-155(C)-T(3)-SSC5

Note 21: Measured with 2^{23} -1 PRBS with 72 ones and 72 zeros. C-13-155(C)-T(3)-SSC7(9)

Note 22: C-13-155(C)-T(3)-SSC3

Note 23: C-13-155(C)-T(3)-SSC5(7/9)

Note 24: Measured on transition: low to high. C-13-155(C)-T(3)-SSC3

Note 25: Measured on transition: low to high. C-13-155(C)-T(3)-SSC5

Note 26: Measured on transition: low to high. C-13-155(C)-T(3)-SSC7(9)

Note 27: Measured on transition: high to low

Table 6 – Receiver Specifications (Electrical)

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Power Supply Current	I_{CC}	-	-	100	mA	28
Data Output Voltage-Low	$V_{OL}-V_{CC}$	-2	-	-1.58	V	29
Data Output Voltage-High	$V_{OH}-V_{CC}$	-1.1	-	-0.74	V	
Signal Detect Output Voltage-Low	$V_{SDL}-V_{CC}$	-2	-	-1.58	V	30
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	31
Signal Detect Output Voltage-High	$V_{SDH}-V_{CC}$	2.0	-	-	V	

Note 28: The current excludes the output load current

Note 29: These outputs are compatible with 10K, 10KH and 100KECL and LVPECL outputs.

Note 30: PECL/LVPECL, C-13-155-T(3)-SSC3(5/7/9)

Note 31: TTL/LVTTL, C-13-155C-T(3)-SSC3(5/7/9)

Connection Diagram

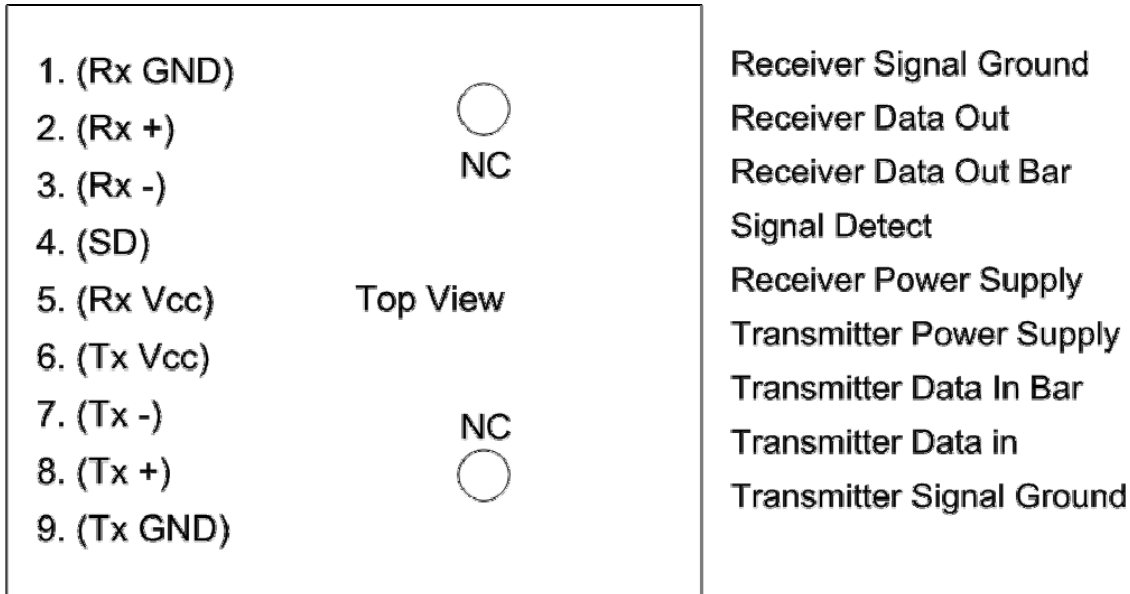
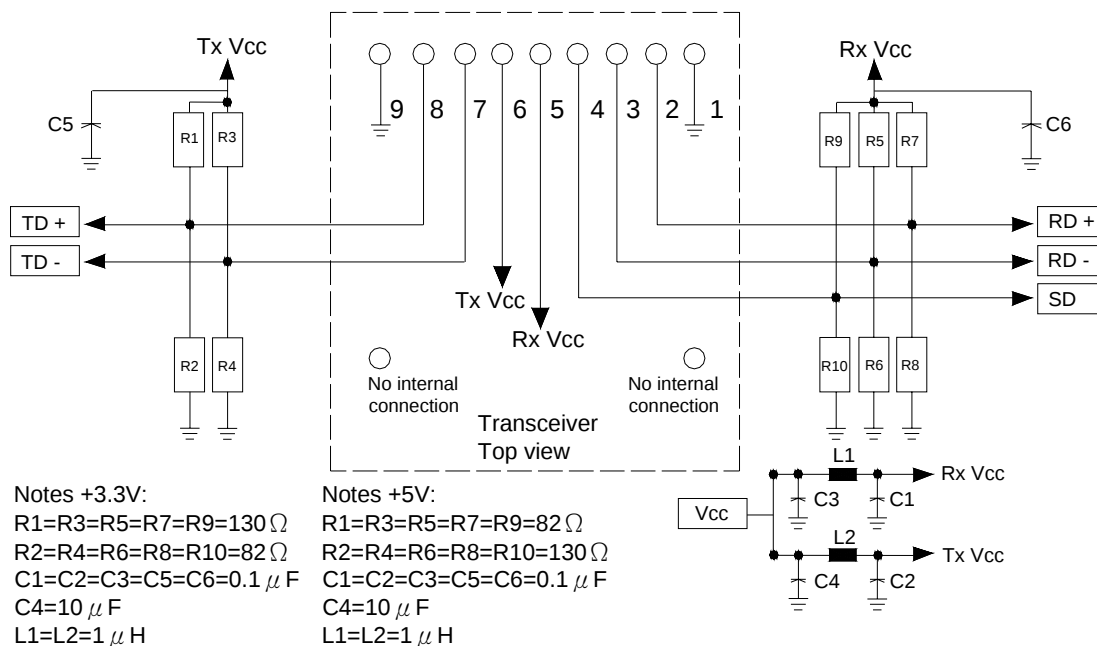


Table 7 – Pin Definitions

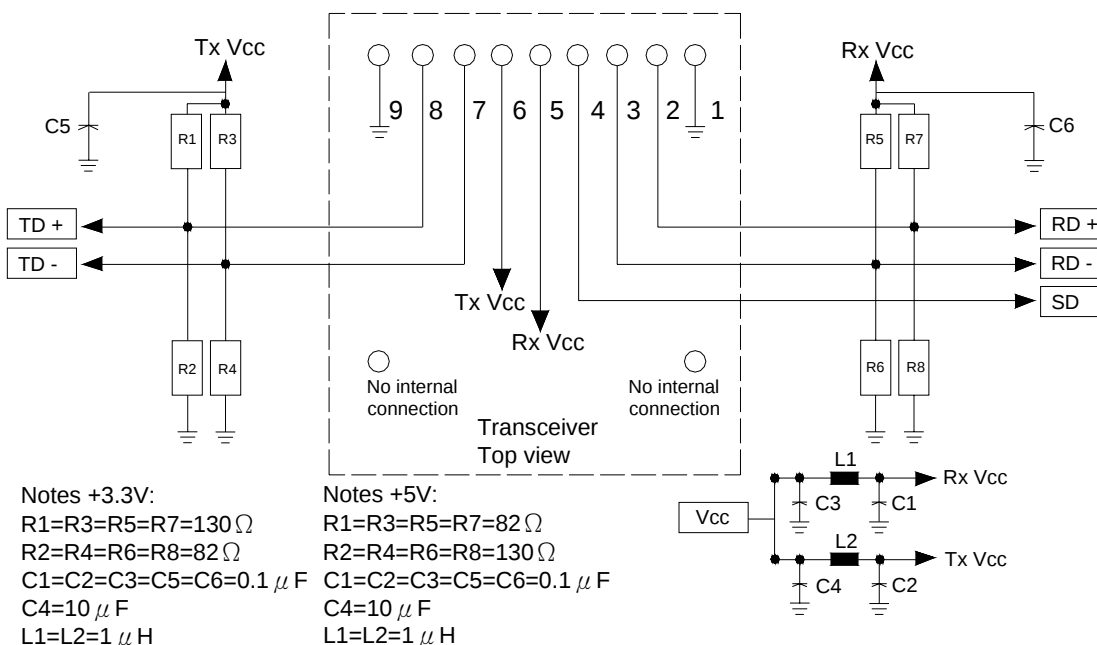
Pin	Unit	Notes
1	RxGND	Directly connect this pin to the receiver ground plane
2	RD+	See recommended circuit schematic
3	RD-	See recommended circuit schematic
4	SD	Active high on this indicates a received optical section
5	RxV _{CC}	DC power for the receiver section
6	TxV _{CC}	DC power for the transmitter section
7	TD-	See recommended circuit schematic
8	TD+	See recommended circuit schematic
9	TxGND	Directly connect this pin to the transmitter ground plane

Recommended Circuit Schematic

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



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



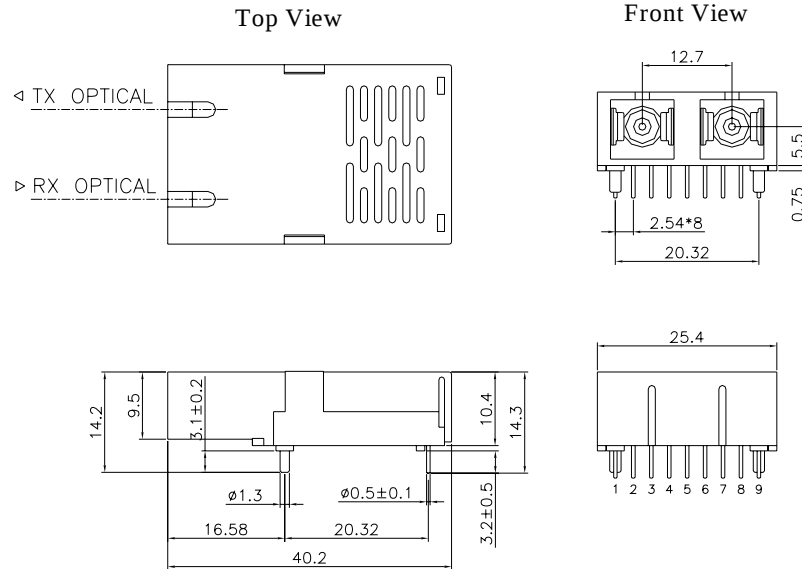
The split-loaded terminations for ECL signals need to be located at the input of devices receiving those ECL signals. The power supply filtering is required for good EMI performance. Use short tracks from the inductor L1/L2 to the module Rx Vcc. / Tx Vcc.

A GND plane under the module is required for good EMI and sensitivity performance.

Package Diagram (10.4 mm SC transceiver assembly)

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

Units: mm

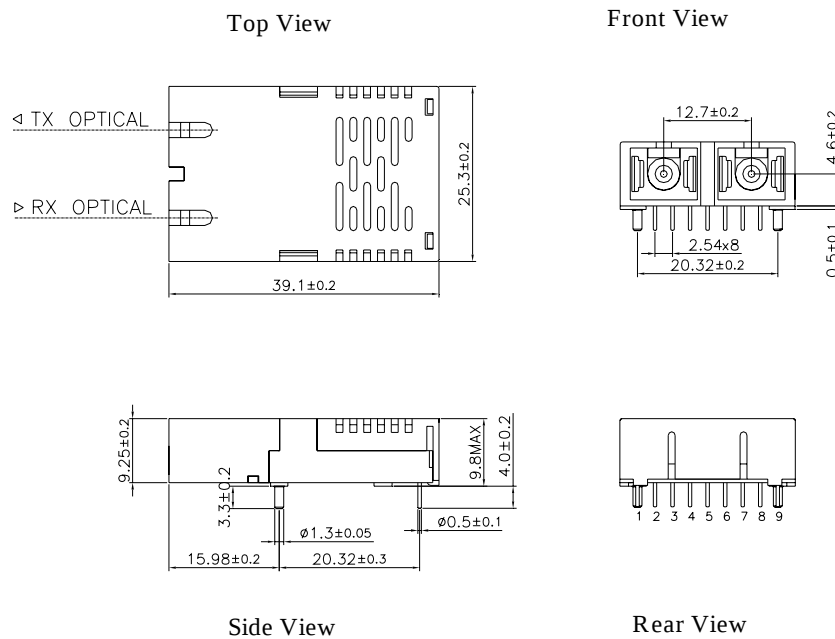


Blank/A: Black case

Package Diagram (9.8 mm SC transceiver assembly)

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

Units: mm



C/D: Black case

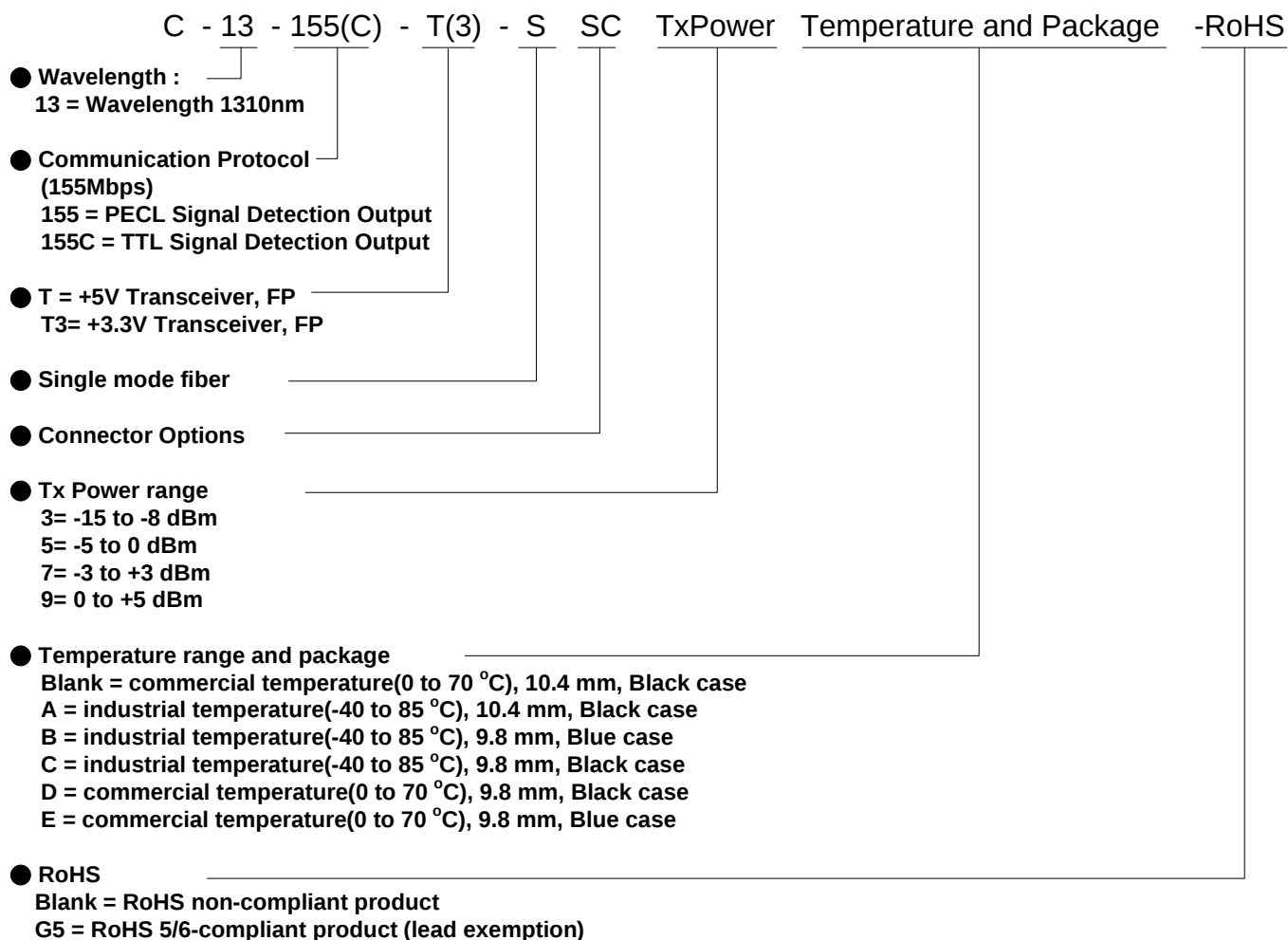
B/E: Blue case

Order Information

Table 8 – Order Information

Part No.	Part No.	Part No.	Part No.
C-13-155-T(3)-SSC3	C-13-155-T(3)-SSC5	C-13-155-T(3)-SSC7	C-13-155-T(3)-SSC9
C-13-155C-T(3)-SSC3	C-13-155C-T(3)-SSC5	C-13-155C-T(3)-SSC7	C-13-155C-T(3)-SSC9
C-13-155-T(3)-SSC3A	C-13-155-T(3)-SSC5A	C-13-155-T(3)-SSC7A	C-13-155-T(3)-SSC9A
C-13-155C-T(3)-SSC3A	C-13-155C-T(3)-SSC5A	C-13-155C-T(3)-SSC7A	C-13-155C-T(3)-SSC9A
C-13-155-T(3)-SSC3B	C-13-155-T(3)-SSC5B	C-13-155-T(3)-SSC7B	C-13-155-T(3)-SSC9B
C-13-155C-T(3)-SSC3B	C-13-155C-T(3)-SSC5B	C-13-155C-T(3)-SSC7B	C-13-155C-T(3)-SSC9B
C-13-155-T(3)-SSC3C	C-13-155-T(3)-SSC5C	C-13-155-T(3)-SSC7C	C-13-155-T(3)-SSC9C
C-13-155C-T(3)-SSC3C	C-13-155C-T(3)-SSC5C	C-13-155C-T(3)-SSC7C	C-13-155C-T(3)-SSC9C
D-13-155-T(3)-SSC3D	D-13-155-T(3)-SSD5D	D-13-155-T(3)-SSD7D	D-13-155-T(3)-SSD9D
D-13-155C-T(3)-SSC3D	D-13-155C-T(3)-SSD5D	D-13-155C-T(3)-SSD7D	D-13-155C-T(3)-SSD9D
D-13-155-T(3)-SSC3E	D-13-155-T(3)-SSD5E	D-13-155-T(3)-SSD7E	D-13-155-T(3)-SSD9E
D-13-155C-T(3)-SSC3E	D-13-155C-T(3)-SSD5E	D-13-155C-T(3)-SSD7E	D-13-155C-T(3)-SSD9E
C-13-155-T(3)-SSC3-G5	C-13-155-T(3)-SSC5-G5	C-13-155-T(3)-SSC7-G5	C-13-155-T(3)-SSC9-G5
C-13-155C-T(3)-SSC3-G5	C-13-155C-T(3)-SSC5-G5	C-13-155C-T(3)-SSC7-G5	C-13-155C-T(3)-SSC9-G5
C-13-155-T(3)-SSC3A-G5	C-13-155-T(3)-SSC5A-G5	C-13-155-T(3)-SSC7A-G5	C-13-155-T(3)-SSC9A-G5
C-13-155C-T(3)-SSC3A-G5	C-13-155C-T(3)-SSC5A-G5	C-13-155C-T(3)-SSC7A-G5	C-13-155C-T(3)-SSC9A-G5
C-13-155-T(3)-SSC3B-G5	C-13-155-T(3)-SSC5B-G5	C-13-155-T(3)-SSC7B-G5	C-13-155-T(3)-SSC9B-G5
C-13-155C-T(3)-SSC3B-G5	C-13-155C-T(3)-SSC5B-G5	C-13-155C-T(3)-SSC7B-G5	C-13-155C-T(3)-SSC9B-G5
C-13-155-T(3)-SSC3C-G5	C-13-155-T(3)-SSC5C-G5	C-13-155-T(3)-SSC7C-G5	C-13-155-T(3)-SSC9C-G5
C-13-155C-T(3)-SSC3C-G5	C-13-155C-T(3)-SSC5C-G5	C-13-155C-T(3)-SSC7C-G5	C-13-155C-T(3)-SSC9C-G5
D-13-155-T(3)-SSC3D-G5	D-13-155-T(3)-SSD5D-G5	D-13-155-T(3)-SSD7D-G5	D-13-155-T(3)-SSD9D-G5
D-13-155C-T(3)-SSC3D-G5	D-13-155C-T(3)-SSD5D-G5	D-13-155C-T(3)-SSD7D-G5	D-13-155C-T(3)-SSD9D-G5
D-13-155-T(3)-SSC3E-G5	D-13-155-T(3)-SSD5E-G5	D-13-155-T(3)-SSD7E-G5	D-13-155-T(3)-SSD9E-G5
D-13-155C-T(3)-SSC3E-G5	D-13-155C-T(3)-SSD5E-G5	D-13-155C-T(3)-SSD7E-G5	D-13-155C-T(3)-SSD9E-G5

Part Numbering Definition:



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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