

## **F5 Networks Compatible transceiver F5-UPG-SFP+-R**

### **PART NUMBER: F5-UPG-SFP+-R-C**

#### **PRODUCT FEATURES:**

Hot-swappable SFP+ F5 Networks compatible transceiver

Compliant with IEEE Std 802.3-2005 10G Ethernet  
10GBase-SR

Electrical interface specifications per SFF-8431

Management interface specifications per SFF-8431 and SFF-8472

SFP+ MSA package with duplex LC connector

Uncooled 850nm VCSEL Laser Class 1 safety certified

Up to 10,3Gb/s bi-directional data links

Digital Diagnostic Monitoring available



#### **SPECIFICATIONS:**

<b>Original Part Number:</b>	F5-UPG-SFP+-R
<b>Device type:</b>	SFP+ SR
<b>Package:</b>	SFP MSA
<b>Data rate:</b>	10,3Gbps
<b>Wavelength:</b>	850nm
<b>Distance/Power Budget:</b>	Up to 300m on 2000 MHz·km MMF
<b>Optical components</b>	LED: Laser VCSEL
<b>Output power:</b>	-5 ~ -1dBm
<b>Receiver Sensitivity:</b>	< -9,9dBm
<b>Power Supply Voltage:</b>	3,3V
<b>Connector:</b>	Dual LC
<b>Fiber type:</b>	Multimode
<b>Operating Temperature:</b>	0 - 70 °C
<b>DDM / DOM:</b>	With
<b>Application:</b>	10 Gigabit Ethernet
<b>Compatibility:</b>	100 % F5 Networks Compatible
<b>ROHS:</b>	Compliant

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### ABSOLUTE MAXIMUM RATINGS:

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Minimum	Maximum	Unit
Storage Temperature	Ts	-40	85	°C
Relative Humidity	RH	5	95	%
Supply Voltage	Vcc	-0,5	4,0	V

### RECOMMENDED OPERATING CONDITIONS:

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Case Temperature	Tc	0	25	70	°C
Supply Voltage	Vcc	3,135	3,3	3,465	V
Data rate	-	-	10,3125	-	Gb/s

### TRANSCEIVER ELECTRICAL CHARACTERISTICS:

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes	
Module Supply Current	Icc	-	-	290	mA	-	
Power Dissipation	Pd	-	-	1000	mW	-	
<b>Transmitter</b>							
Input Differential Impedance	Zin	-	100	-	Ω		
Differential Data Input Swing	Vin, p-p	180	-	700	mVp-p		
TX_FAULT	Transmitter Fault	V <sub>OH</sub>	2,0	-	Vcc	V	TX_FAULT
	Normal Operation	V <sub>OL</sub>	0	-	0,8	V	
TX_DISABLE	Transmitter Disable	V <sub>IH</sub>	2,0	-	Vcc	V	TX_DISABLE
	Transmitter Enable	V <sub>IL</sub>	0	-	0,8	V	
<b>Receiver</b>							
Output Differential Impedance	Zo	-	100	-	Ω		
Differential Data Output Swing	Vin, p-p	300	-	850	mVp-p		
Data Output Rise Time, Fall Time	tr,tf	28	-	-	Ps	1	
RX_LOS	Loss of signal (LOS)	V <sub>OH</sub>	2,0	-	Vcc	V	RX_LOS
	Normal Operation	V <sub>OL</sub>	0	-	0,8	V	

Notes:

1. 20-80%

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### TRANSMITTER OPTICAL CHARACTERISTICS:

Parameter	Symbol	Minimum	Typical	Maximum	Unit	Notes
Launch Optical Power	Po	-5	-3	-1	dBm	1
Center Wavelength Range	$\lambda_c$	840	850	860	nm	-
Extinction Ratio	EX	3	-	-	dB	2
Optical Modulation Amplitude	OMA		Refer Table 1		dBm	1
Spectral Width (RMS)	$\Delta\lambda$		Refer Table 1		nm	-
Transmitter and Dispersion Penalty	TDP	-	-	3,9	dB	-
Optical Return Loss Tolerance	ORLT	-	-	12	dB	-
Pout @TX-Disable Asserted	Poff	-	-	-30	dBm	1
Eye Diagram	IEEE Std 802.3-2005 10Gb Ethernet 10GBASE-SR compatible					

Notes:

- 50/125 $\mu$ m fiber with NA = 0,2, 62,5/125 $\mu$ m fiber with NA = 0,275.
- Measured with a PRBS 231-1 test pattern @10,3125Gbps.

**Table 1.** Minimum Optical Modulation Amplitude as a function of center wavelength and spectral width

Center Wavelength h (nm)	RMS Spectral Width (nm)								
	Up to 0,05	0,05 to 0,1	0,1 to 0,15	0,15 to 0,2	0,2 to 0,25	0,25 to 0,3	0,3 to 0,35	0,35 to 0,4	0,4 to 0,45
840 to 842	-4,2	-4,2	-4,1	-4,1	-3,9	-3,8	-3,5	-3,2	-2,8
842 to 844	-4,2	-4,2	-4,2	-4,1	-3,9	-3,8	-3,6	-3,3	-2,9
844 to 846	-4,2	-4,2	-4,2	-4,1	-4,0	-3,8	-3,6	-3,3	-2,9
846 to 848	-4,3	-4,2	-4,2	-4,1	-4,0	-3,8	-3,6	-3,3	-2,9
848 to 850	-4,3	-4,2	-4,2	-4,1	-4,0	-3,8	-3,6	-3,3	-3,0
850 to 852	-4,3	-4,2	-4,2	-4,1	-4,0	-3,8	-3,6	-3,4	-3,0
852 to 854	-4,3	-4,2	-4,2	-4,1	-4,0	-3,9	-3,7	-3,4	-3,1
854 to 856	-4,3	-4,3	-4,2	-4,1	-4,0	-3,9	-3,7	-3,4	-3,1
856 to 858	-4,3	-4,3	-4,2	-4,1	-4,0	-3,9	-3,7	-3,5	-3,1
858 to 860	-4,3	-4,3	-4,2	-4,2	-4,1	-3,9	-3,7	-3,5	-3,2

The F5-UPG-SFP+-R is a Class 1 laser product. It fully complies with the multi-sourcing agreement (MSA) which enables it to work in all MSA compliant platforms. The F5-UPG-SFP+-R must be operated within the specified temperature and voltage limits.

The optical ports of the module shall be terminated with an optical connector or with a dust plug.