

065-80SR10G300M Small Form-factor Pluggable+ (SFP+) 10 Gigabit SR 300 meter Span Interface Module



The Signamax 065-80SR10G300M is a Small Form-factor Pluggable+ (SFP+) multimode fiber module that supports 10 Gigabit Ethernet over multimode fiber cable at distances up to 300 meters. It adheres to the IEEE 802.3ae standard for 10 Gigabit Ethernet over multimode fiber at 850 nm, and is a cost-effective method of providing changeable 10 Gigabit Ethernet multimode interfaces to switches and media converters equipped with a standard SFP+ slot.

Applications

- High-speed storage area networks.
- Computer cluster cross-connections.
- Custom high-speed data pipes.
- 10GE Storage, 8G Fiber Channel.
- Inter-rack connection.

Key Features

- 10 Gbps serial optical interface, compliant with the IEEE 802.3ae 10GBaseSR standard.
- Electrical interface compliant with SFF-8431 specifications for enhanced 8.5 and 10 Gigabit small form factor pluggable module “SFP+”.
- 850 nm VCSEL transmitter, PIN photo-detector.
- 2-wire interface for management specifications is compliant with SFF-8472 digital diagnostic monitoring interface specifications for optical transceivers.
- Operating temperature: 0°C to 70°C.
- All-metal housing for superior EMI performance.
- Low power consumption.
- Advanced firmware allows customer system encryption information to be stored in the transceiver.
- Cost effective SFP+ solution, enables higher port densities and greater bandwidth.

Ordering Information

Part Number	Description
065-80SR10G300M	10GBaseSR SFP+ Module 850 nm – MM/LC, 300 meters

Summary Specification

PART NUMBER	Model / Spectrum	Light Source	Link Power Budget	Typical Max. Distance**	Supply Voltage	Operating Temp.
065-80SR10G300M Light Brown Clasp	SR 850 nm	VCSEL	6.5 dBm	300 meters	3.3 V	0 ~ 70 °C

DETAILED SPECIFICATIONS

- **APPLICABLE STANDARDS**
 IEEE 802.3ae (10GBaseLR 10 Gigabit Ethernet)
- **ABSOLUTE MAXIMUM RATINGS**
Storage Temperature: TS -40 -- 85 °C
Supply Voltage: VccT / VccR 0 – 3.6 V
Input Voltage: VIN 0 – 3.6 V
Operating Humidity: 5-95 %
- **RECOMMENDED OPERATING CONDITIONS**

PARAMETER	SYMBOL	MIN	TYPICAL	MAX	UNITS	NOTE
Ambient Operating Temperature	T_{AMB}	0		70	°C	
Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Data Rate		-	10.3125	-	Gbps	
Power Consumption		-	600	800	mW	

- **MULTIMODE FIBER SPAN DISTANCES ACHIEVABLE**

FIBER TYPE	MINIMUM MODAL BANDWIDTH @ 850 nm (MHz · km)	OPERATING RANGE
62.5 µm MMF	160	2 to 26 meters
	200	2 to 33 meters
50 µm MMF	400	2 to 66 meters
	500	2 to 82 meters
	2000	2 to 300 meters

- **TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS**

$V_{cc} = 3.135\text{ V to }3.465\text{ V}$, $T_A = 0\text{ °C to }70\text{ °C}$

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Center Wavelength	λ_t	840	850	860	nm	
RMS spectral width	P_m	-	-	Note A	nm	
Average Optical Power	P_{avg}	-6.5	-	-1	dBm	
Optical Power OMA	P_{oma}	-	-	Note A	dBm	
Laser Off Power	P_{off}	-	-	-30	dBm	
Extinction Ratio	ER	3.5	-	-	dB	
Transmitter Dispersion Penalty	TDP	-	-	3.9	dB	
Relative Intensity Noise	R_{in}	-	-	-128	dB/Hz	12dB reflection
Optical Return Loss Tolerance		-	-	12	dB	
Single Ended Output Voltage Tolerance		-0.3	-	4	V	
C Common Mode Voltage Tolerance		15	-	-	mV	
Tx Input Diff Voltage	V_I	90		350	mV	
Tx Fault	V_{oL}	-0.3		0.4	V	At 0.7mA
Data Dependent Input Jitter	DDJ			0.1	UI	
Data Input Total Jitter	TJ			0.28	UI	

Note A: Trade-offs are available between spectral width, center wavelength and minimum OMA.

DETAILED SPECIFICATIONS (continued)

• **RECEIVER ELECTRO-OPTICAL CHARACTERISTICS**

V_{cc} = 3.135 V to 3.465 V, T_A = 0 °C to 70 °C

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Center Wavelength	λ_r	840	850	860	nm	
Receiver Sensitivity (OMA)	P _{sens}	-	-	-11.1	dBm	
Stressed Sensitivity (OMA)		-	-	-7.5	dBm	
Los Assert	LosA	-30	-	-	dBm	
Los Dessert	LosD	-	-	-12	dBm	
Los Hysteresis	LosH	0.5	-	-	dB	
Overload	Pin	-	-	-1	dBm	
Receiver Reflectance		-	-	-12	dB	
Single Ended Output Voltage Tolerance		-0.3	-	4	V	
Rx Output Diff Voltage	V _o	150		425	mV	
Rx Output Rise and Fall Time	Tr/Tf	30			ps	20% to 80%
Total Jitter	TJ			0.7	UI	
Deterministic Jitter	DJ			0.42	UI	

• **DIGITAL DIAGNOSTIC FUNCTIONS**

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Temperature Monitor Absolute Error	DMI_Temp	-3		3	°C	Over operating temperature
Laser Power Monitor Absolute Error	DMI_TX	-3		3	dB	
RX Power Monitor Absolute Error	DMI_RX	-3		3	dB	-1dBm to -12dBm range
Supply Voltage Monitor Absolute Error	DMI_VCC	-0.08		0.08	V	Full operating range
Bias Current Monitor	DMI_Ibias	-10%		10%	mA	

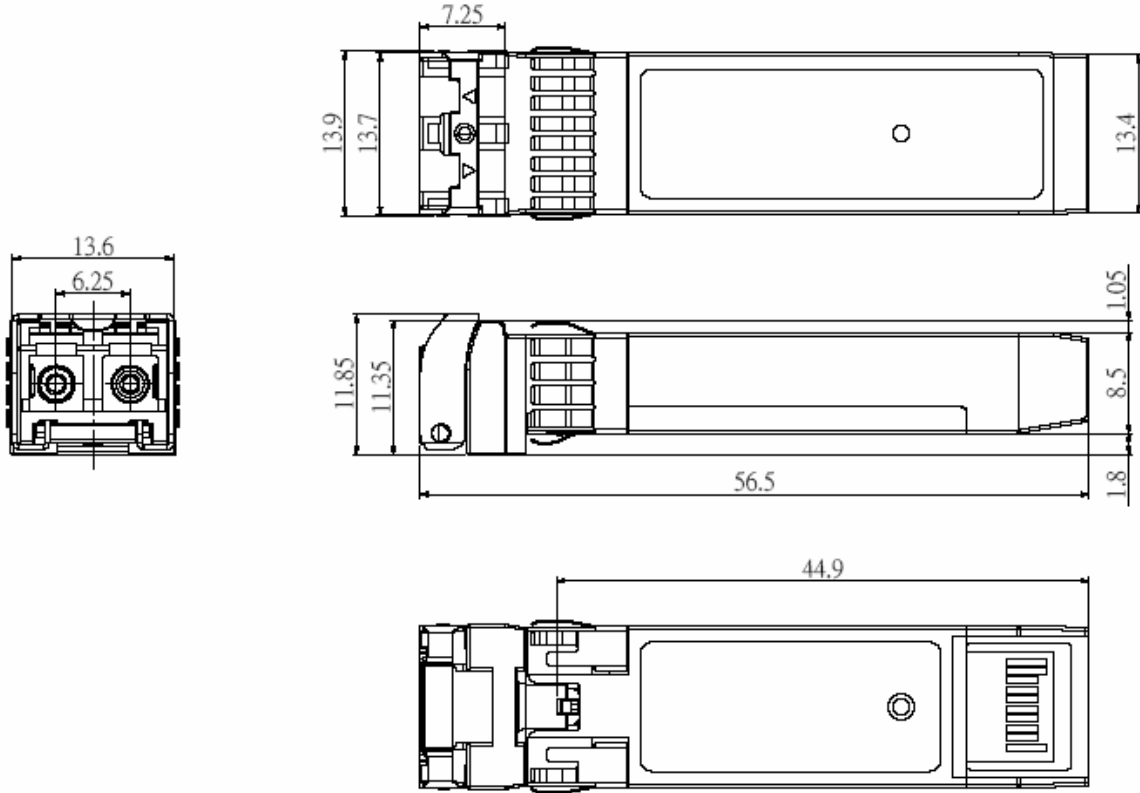
• **TIMING REQUIREMENTS**

V_{cc} = 3.135 V to 3.465 V, T_A = 0 °C to 70 °C

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
TX_DISABLE Assert Time	t _{off}			10	μs	Time from rising edge of TX Disable to when the optical output falls below 10% of nominal.
TX_DISABLE Negate Time	t _{on}			1	ms	Time from falling edge of TX Disable to when the modulated optical output rises above 90% of nominal.
Time to initialize, include reset of TX_FAULT	t _{init}			300	ms	From power on or negation of TX Fault using TX Disable.
TX_FAULT assert time	t _{fault}			100	μs	Time from fault to TX Fault on.
TX_DISABLE to reset	t _{reset}	10			μs	Time TX Disable must be held high to reset TX Fault.
LOS Assert Time (off to on)	t _{loss_on}			100	μs	Time from LOS state to RX LOS assert.
LOS Deassert Time (on to off)	t _{loss_off}			100	μs	Time from non-LOS state to RX LOS deassert.
Rate-Select Change Time	t _{ratesel}			10	μs	Time from rising or falling edge of Rate Select input until receiver bandwidth is in conformance with the appropriate specification.
Serial ID Clock Rate	f _{serial_clock}			100	kHz	

DETAILED SPECIFICATIONS (continued)

• **DIMENSIONS (mm)**



• **REGULATORY COMPLIANCE**

Feature	Test Method	Performance
Electrostatic Discharge (ESD) to optical connector	Variation of IEC 61000-4-2	Typically withstand at least 15kV without damage when port is contacted by Human Body Model probe.
Immunity	Variation of IEC 61000-4-3	Typically show no measurable effect from a 10 V/m field swept from 27 MHz to 1 GHz applied to the transceiver without a chassis enclosure.
Electromagnetic Interference (EMI)	FCC Class B CENELEC EN55022 Class B (CISPR 22A)	Margins are dependent on customer board and chassis design.
Laser Eye Safety	FDA21 CFR 1040.10 and 1040.11	Class 1 Laser Safety product.

• **WARRANTY**

Lifetime