

065-80LR10G10KM Small Form-factor Pluggable+ (SFP+) 10 Gigabit LR 10 km Span Interface Module



The Signamax 065-80LR10G10KM is a Small Form-factor Pluggable+ (SFP+) singlemode fiber module that supports 10 Gigabit Ethernet over singlemode fiber cable at distances up to 10 kilometers. It adheres to the IEEE 802.3ae standard for 10 Gigabit Ethernet over singlemode fiber at 1310 nm, and is a cost-effective method of providing changeable 10 Gigabit Ethernet singlemode interfaces to switches and media converters equipped with a standard SFP+ slot.

Applications

- Metro Access Rings
- Point-to-Point networking
- 10GBaseLR
- 8x/10G Fiber Channel
- OC-192 SONET

Key Features

- RoHS Compliant
- Digital Diagnostics are Externally Calibrated
- Operating Temperature: 0 °C to 70 °C
- 1310nm uncooled DFB LD
- 10 Km link distance (indicative only)
- Hot pluggable
- Metal enclosure, low EMI
- Single 3.3V power supply
- 0.8 W (typical) Power Dissipation

Ordering Information

Part Number	Description
065-80LR10G10KM	10GBaseLR SFP+ Module 1310 nm – SM/LC, 10 km

Summary Specification

PART NUMBER	Model / Spectrum	Light Source	Link Power Budget	Typical Max. Distance**	Supply Voltage	Operating Temp.
065-80LR10G10KM Blue Clasp	LR 1310 nm	DFB Laser	6.5 dBm	10 km	3.3 V	0 ~ 70 °C

** Maximum distances attainable on singlemode fiber circuits are dependent upon a circuit's conditions; i.e., the number of splices and patch panels and the number of bends in the circuit path. For comparison with competing products, please use the Link Power Budget for meaningful comparisons.

SPECIFICATIONS

DETAILED SPECIFICATIONS

• **APPLICABLE STANDARDS**

IEEE 802.3ae (10GBaseLR 10 Gigabit Ethernet)

• **ABSOLUTE MAXIMUM RATINGS**

Storage Temperature: TS -40 -- 85 °C
Supply Voltage: VccT / VccR -0.5 – 5.5 V
Input Voltage: VIN 0 – 5.5 V
Operating Humidity: 0-85 %

• **RECOMMENDED OPERATING CONDITIONS**

PARAMETER	SYMBOL	MIN	TYPICAL	MAX	UNITS	NOTE
Ambient Operating Temperature	T_{AMB}	0		70	°C	
Supply Voltage	V_{CC}	3.1	3.3	3.5	V	
Supply Current (3.3V)	$I_{TX} + I_{RX}$				mA	

• **TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS**

$V_{CC} = 3.1 \text{ V to } 3.5\text{V}$, $T_A = 0 \text{ °C to } 70 \text{ °C}$

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Transmitter Differential Input Voltage	TD +/-	400		1600	mV _{P-P}	A
Output Optical Power 9/125 μm fiber	P _{out}	-8		1	dBm	A
Extinction Ratio	ER	3.5			dB	A
Center Wavelength	λ_c	1290	1310	1330	nm	A
Spectral Width (20dB)	$\Delta\lambda$			<1	nm	A
Side Mode Suppression Ratio	SMSR			30	dB	A
Tx Fault - High	$V_{Fault\ H}$	2		V_{CC}	V	A
Tx Fault - Low	$V_{Fault\ L}$	V_{ee}		$V_{ee}+0.5$	V	A
Tx Disable - High	$V_{Disable\ H}$	2		V_{CC}	V	A
Tx Disable - Low	$V_{Disable\ L}$	V_{ee}		$V_{ee}+0.8$	V	A

Note A: All data measured at 10.3125 Gbps, PRBS 2³¹-1, NRZ.

• **RECEIVER ELECTRO-OPTICAL CHARACTERISTICS**

$V_{CC} = 3.1 \text{ V to } 3.5 \text{ V}$, $T_A = 0 \text{ °C to } 70 \text{ °C}$

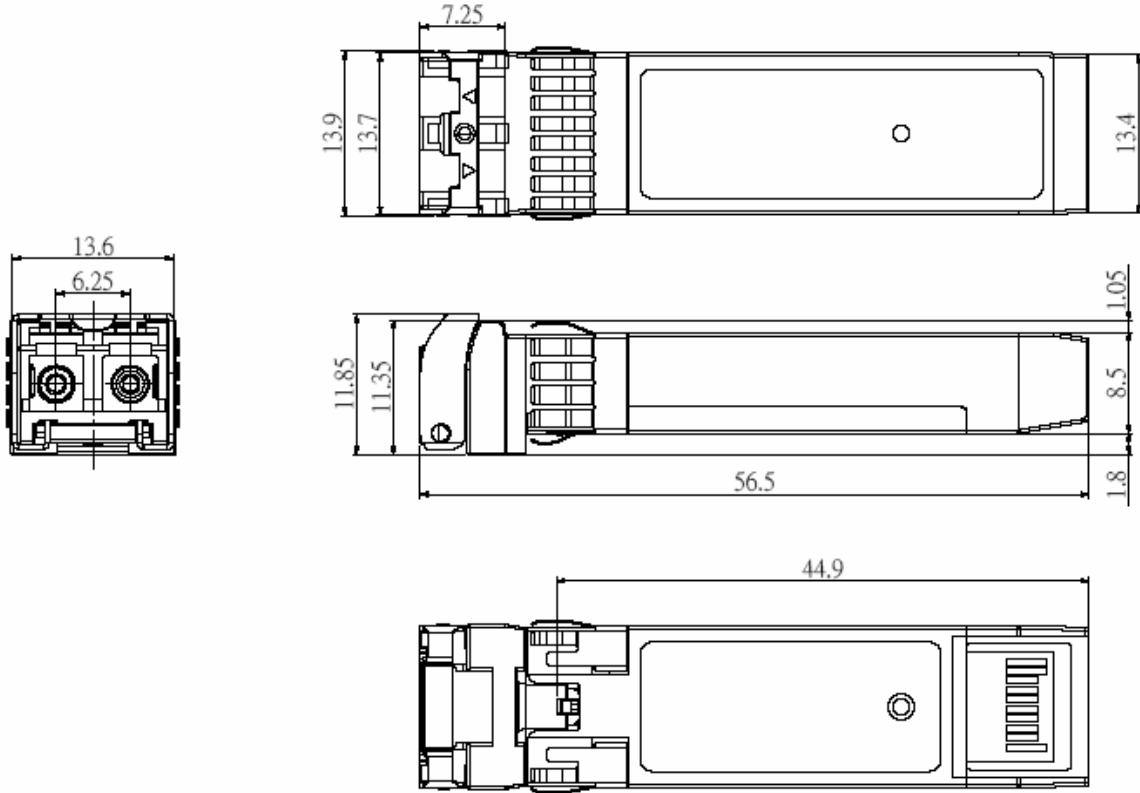
PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Receiver Differential Output Voltage	RD +/-	600	800		mV _{P-P}	
Receiver Overload	P _{IN} MAX	0.5			dBm	A,B
Receiver Sensitivity	P _{IN} MIN			-14.5	dBm	A,B
Operating Center Wavelength	λ_c	1290		1330	nm	
Receiver LOS Assert Level	P _{RX LOS A}	-30			dBm	B
Receiver LOS Deassert Level	P _{RX LOS D}			-14.5	dBm	B
Receiver Loss of Signal Hysteresis		0.5	2		dB	B

Note A: BER better than or equal to 1×10⁻¹²

Note B: Measured in the center of the eye opening with 2³¹ -1 PRBS, NRZ

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