

Features

- Transmission data rate up to 25.78Gbps
- 850nm VCSEL laser
- PIN photo-detector
- Internal CDR on both transmitter and receiver channels
- Low power consumption < 1W
- Hot-pluggable SFP28 form factor
- Up to 70m on OM3 MMF and 100m on OM4 MMF
- Digital diagnostics functions are available (optional)
- Operating case temperature range 0°C to +70°C
- 3.3V power supply voltage
- RoHS-6 compliant

Applications

- IEEE 802.3by 25GBASE-SR

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units	Note
Supply Voltage	Vcc	0	3.6	V	
Storage Temperature	Ts	-40	85	°C	
Case Operating Temperature	Tc	0	70	°C	
Relative Humidity	RH	5	85	%	1

Recommended Operating Conditions

<i>Parameter</i>	<i>Symbol</i>	<i>Min.</i>	<i>Typ.</i>	<i>Max.</i>	<i>Units</i>	<i>Note</i>
Supply Voltage	<i>Vcc</i>	3.13	3.3	3.47	V	
Supply Current	<i>Icc</i>			300	mA	
Fiber Length on 50/125µm high-bandwidth (OM3) MMF				70	m	
Fiber Length on 50/125µm high-bandwidth (OM4) MMF				100	m	

Diagnostics Specification

<i>Parameter</i>	<i>Range</i>	<i>Units</i>	<i>Accuracy</i>	<i>Calibration</i>
Temperature	0 to +70	°C	±3°C	Internal / External
Voltage	3.0 to 3.6	V	±3%	Internal / External
Bias Current	0 to 20	mA	±10%	Internal / External
TX Power	-8 to 3	dBm	±3dB	Internal / External
RX Power	-14 to 0	dBm	±3dB	Internal / External

Transmitter Electro-optical Characteristics

$V_{CC} = 3.13\text{ V to } 3.47\text{ V}$, $T_C = 0^\circ\text{C to } 70^\circ\text{C}$

Parameter		Symbol	Min.	Typ.	Max.	Units	Note
Data rate		BR		25.78		Gbps	
Centre Wavelength		λ_c	840	1310	860	nm	
Spectral Width (-20dB)		σ			0.6	nm	
Average Output Power		P_{avg}	-8.4		2.4	dB	
Optical Power OMA		P_{OMA}	-6.4		3	dBm	
Extinction Ratio		ER	2			dB	
Differential data input swing		$V_{IN,PP}$	40		1000	mV	
Input Differential Impedance		Z_{IN}	90	100	110	Ω	
TX Disable	Disable		2.0		V_{CC}	V	
	Enable		0		0.8	V	
TX Fault	Fault		2.0		V_{CC}	V	
	Normal		0		0.8	V	

Receiver Electro-optical Characteristics

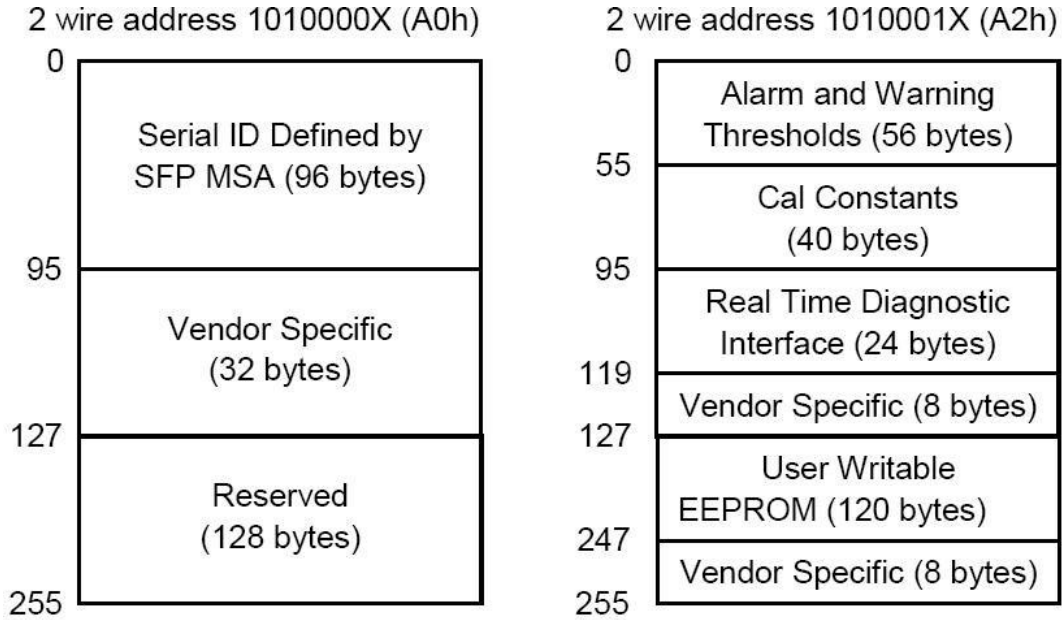
V_{cc} = 3.13 V to 3.47 V, T_c = 0°C to 70°C

<i>Parameter</i>	<i>Symbol</i>	<i>Min.</i>	<i>Typ.</i>	<i>Max.</i>	<i>Units</i>	<i>Note</i>
Data rate	<i>BR</i>		25.78		Gbps	
Centre Wavelength	<i>λ_c</i>	840	850	860	nm	
Receiver Sensitivity (OMA)	<i>P_{sens}</i>			-10	dBm	
Stressed Sensitivity (OMA)				-5.2	dBm	
Receiver Power (OMA)				3	dBm	
LOS De-Assert	<i>LOS_D</i>			-13	dBm	
LOS Assert	<i>LOS_A</i>	-30			dBm	
LOS Hysteresis		0.5			dB	
Differential data output swing	<i>V_{out,PP}</i>	300		850	mV	
LOS	<i>High</i>	2.0		V _{cc}	V	
	<i>Low</i>			0.8	V	

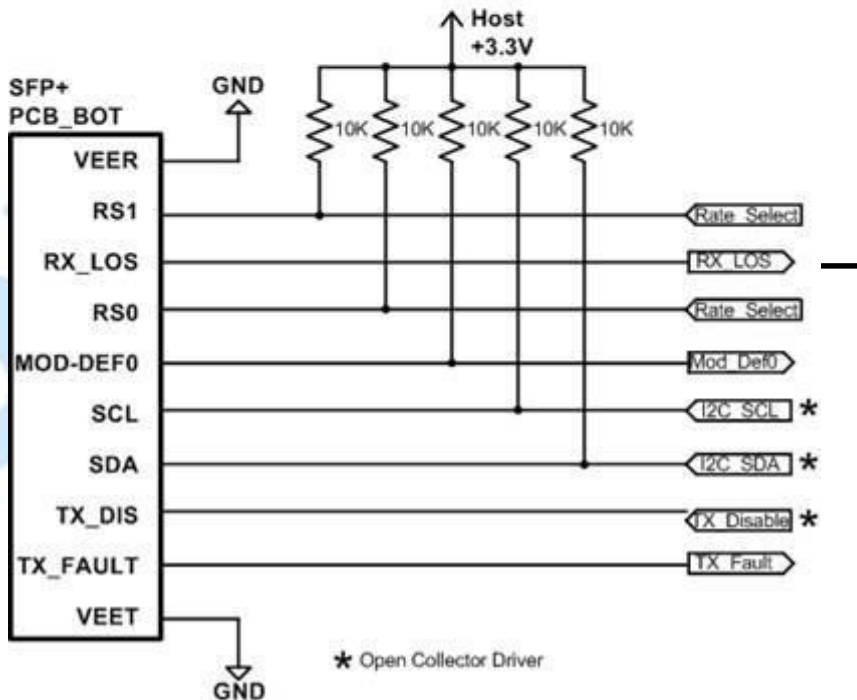
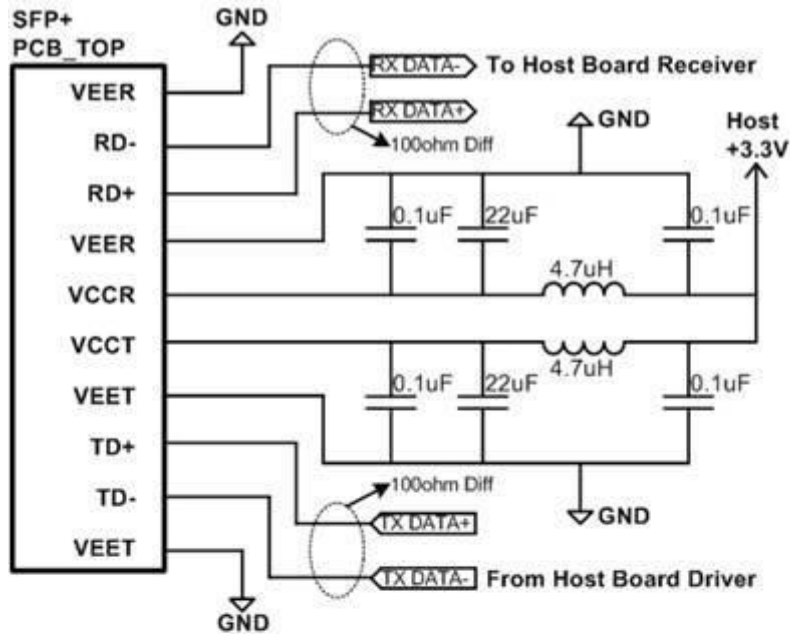
Notes:

Receive Sensitivity measured with a prbs31 pattern @25.78125Gb/s, BER 1E-5;

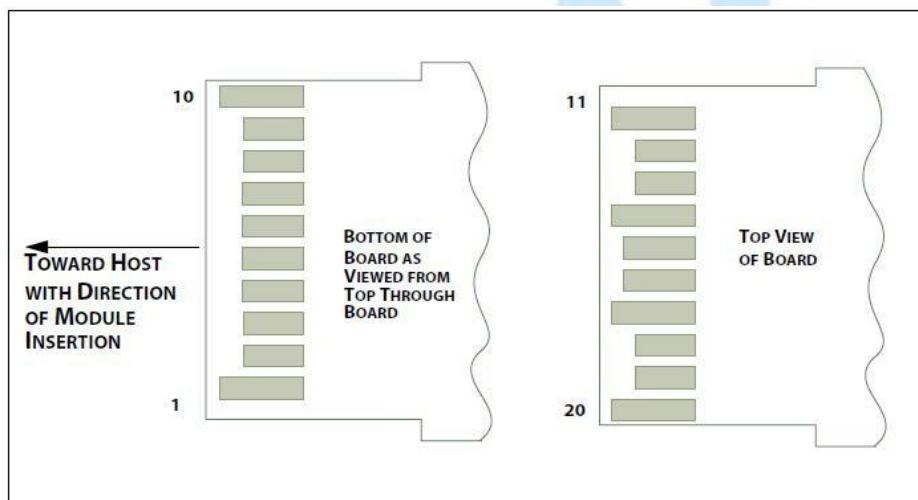
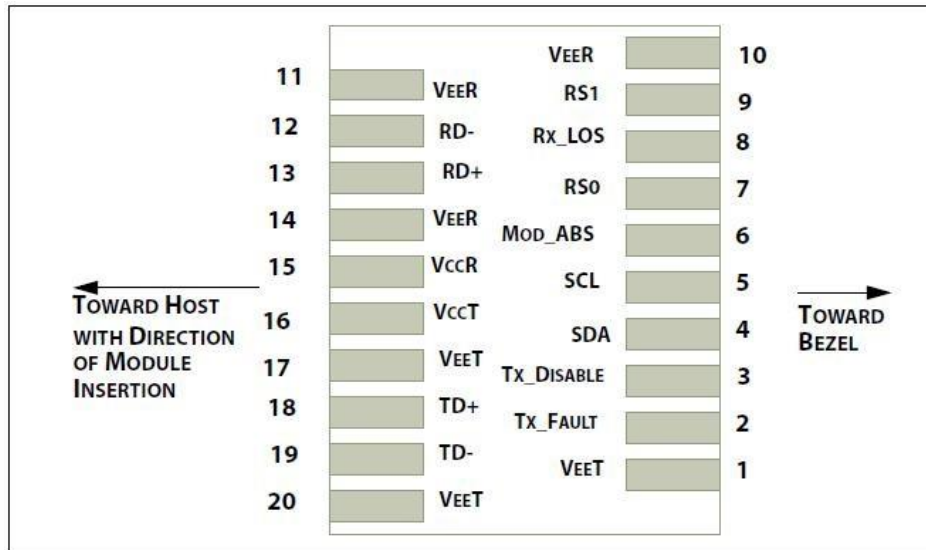
Digital Diagnostic Memory Map



Recommended Interface Circuit



Pin Assignment



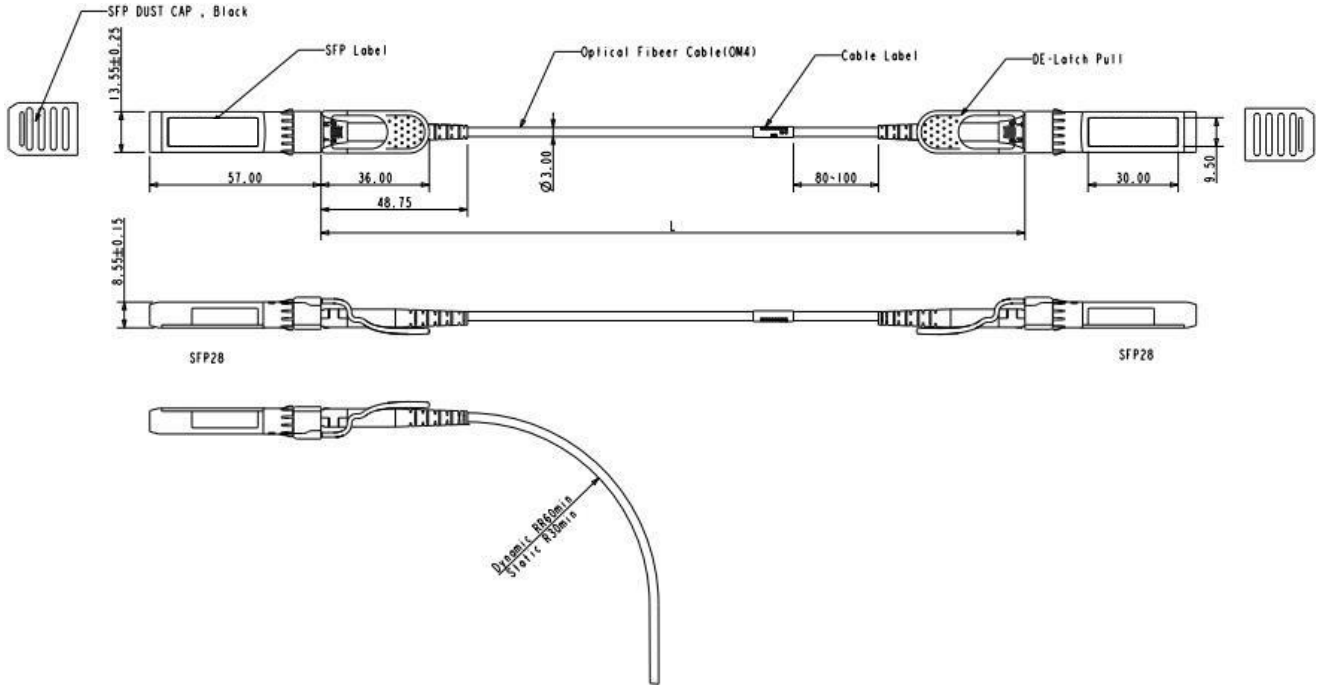
Pin Descriptions

<i>PIN</i>	<i>Logic</i>	<i>Symbol</i>	<i>Name / Description</i>	<i>Note</i>
1		VeeT	Module Transmitter Ground	1
2	LVTTL-O	TX_Fault	Module Transmitter Fault	2
3	LVTTL-I	TX_Dis	Transmitter Disable; Turns off transmitter laser output	
4	LVTTL-I/O	SDA	2-Wire Serial Interface Data Line	2
5	LVTTL-I	SCL	2-Wire Serial Interface Clock	2
6		MOD_ABS	Module Definition, Grounded in the module	
7	LVTTL-I	RS0	Receiver Rate Select	
8	LVTTL-O	RX_LOS	Receiver Loss of Signal Indication Active LOW	
9	LVTTL-I	RS1	Transmitter Rate Select (not used)	
10		VeeR	Module Receiver Ground	1
11		VeeR	Module Receiver Ground	1
12	CML-O	RD-	Receiver Inverted Data Output	
13	CML-O	RD+	Receiver Data Output	
14		VeeR	Module Receiver Ground	1
15		VccR	Module Receiver 3.3 V Supply	
16		VccT	Module Receiver 3.3 V Supply	
17		VeeT	Module Transmitter Ground	1
18	CML-I	TD+	Transmitter Non-Inverted Data Input	
19	CML-I	TD-	Transmitter Inverted Data Input	
20		VeeT	Module Transmitter Ground	1

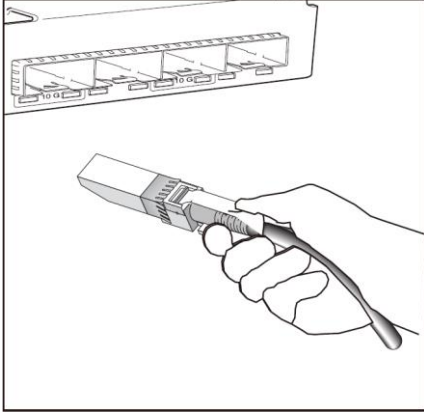
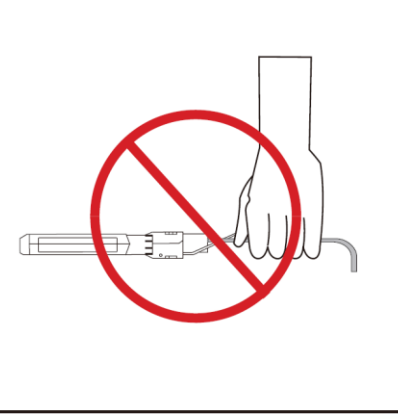
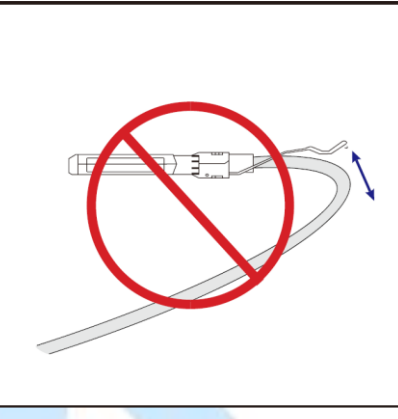


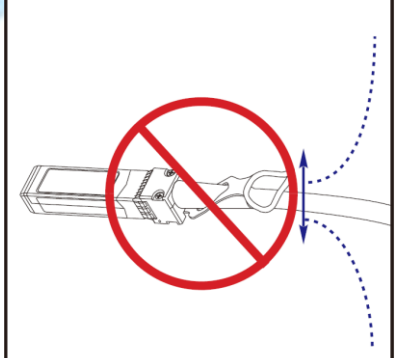
Notes:

1. Module ground pins GND are isolated from the module case.
2. Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board.

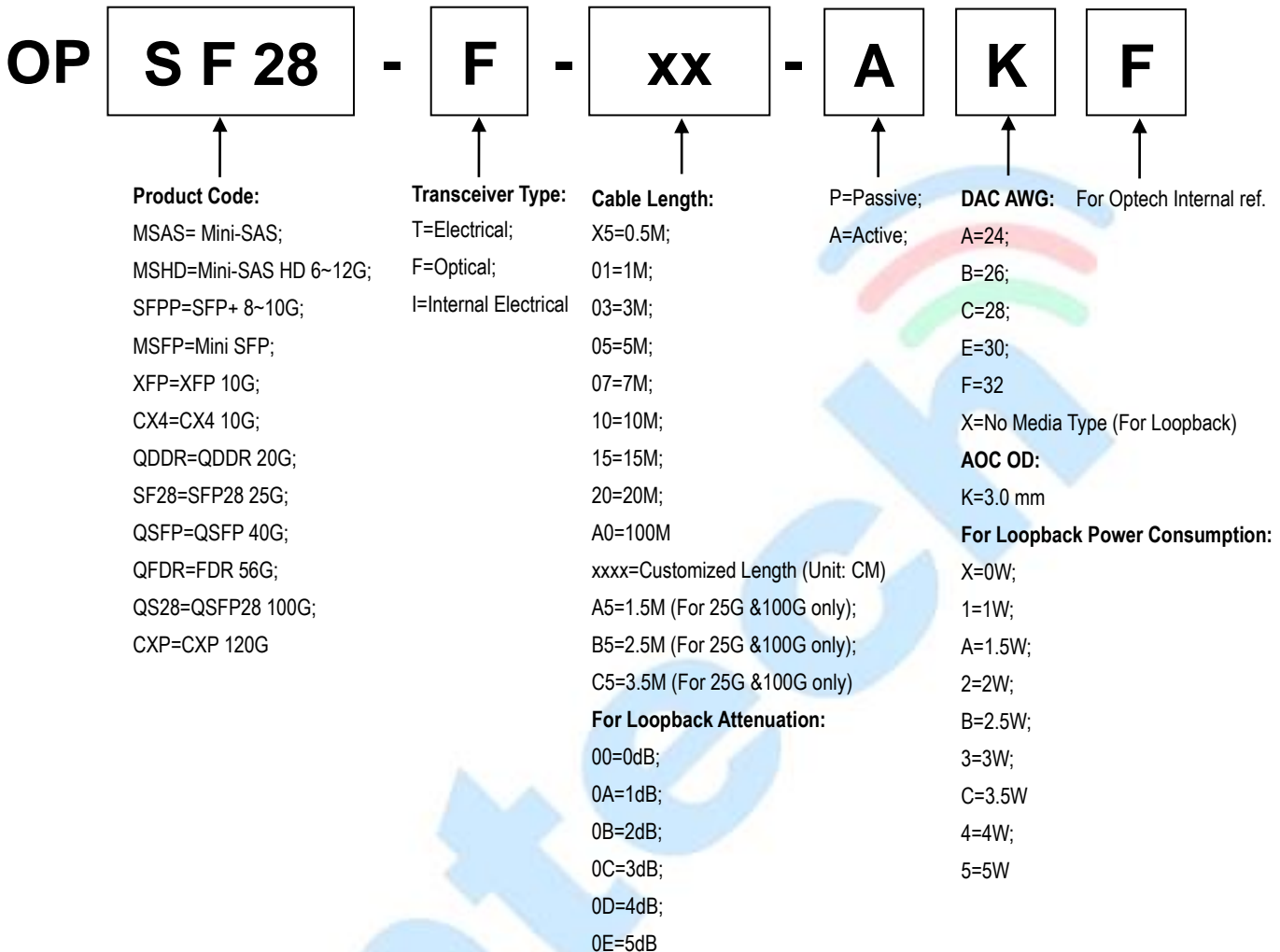
Dimensions



Important Notice

		
<p>Holding the SFP+ connector by its sides, insert the connector into the port on the switch</p>	<p>Do not handle by cable</p>	<p>DO NOT Over-bend the cable behind the connector</p>
		
<p>DO NOT twist the cable</p>	<p>DO NOT kink the cable</p>	<p>DO NOT bend up and down the cable</p>

Ordering Information



Part Number	Model Number	Length (M)	Voltage	Temperature
OPSF28-F-03-AKF	Active Optical Cable	3	3.3V	0°C ~ 70°C
OPSF28-F-05-AKF	Active Optical Cable	5	3.3V	0°C ~ 70°C
OPSF28-F-10-AKF	Active Optical Cable	10	3.3V	0°C ~ 70°C
OPSF28-F-20-AKF	Active Optical Cable	20	3.3V	0°C ~ 70°C

Note: All information contained in this document is subject to change without notice.