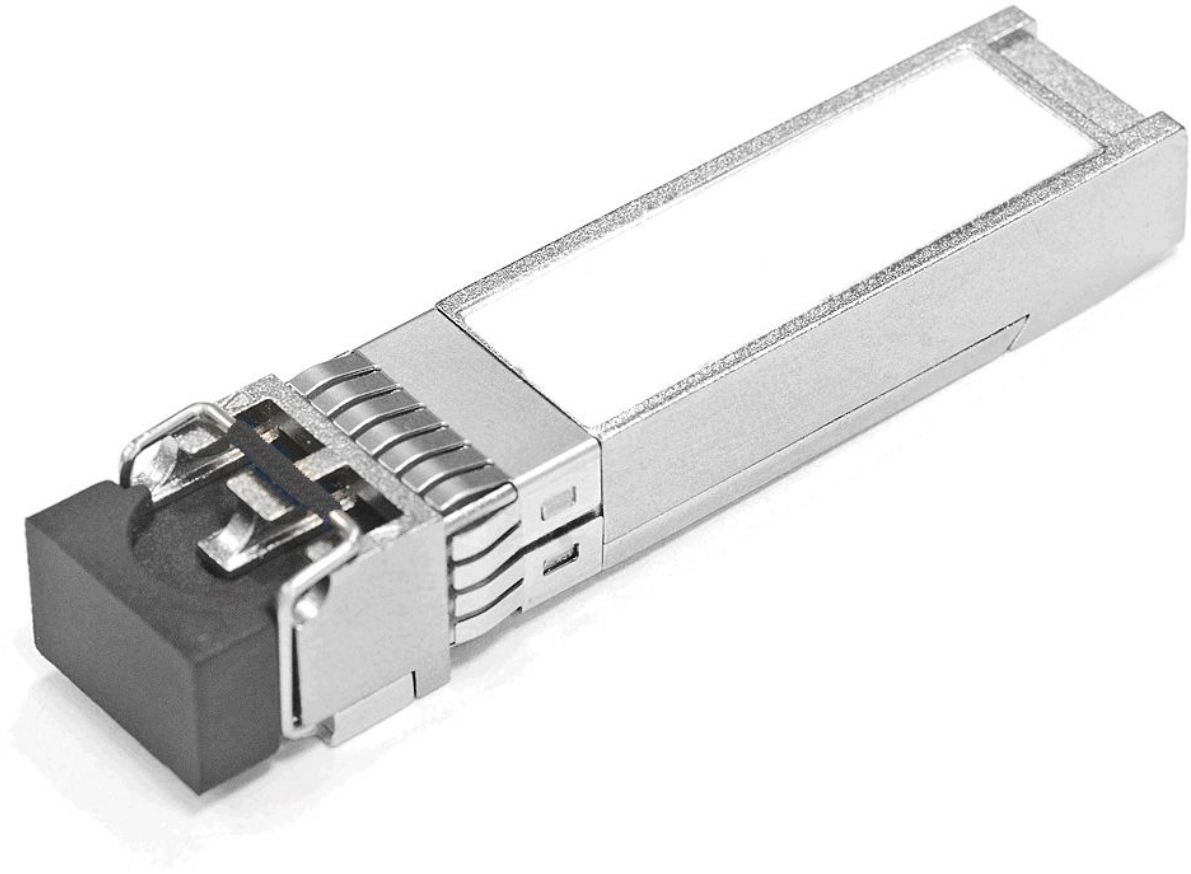
6.144 GB/s 300m SFP+ 850 nm Transceivers



Product Introduction

The RTXM228-610 850nm optical Transceiver supports high speed serial links over multimode optical fiber at signaling rates for wireless base station applications involving the OBSAI or CPRI protocals, as well as related applications. The Transceiver is compliant with SFF-8431 and SFF-8432 for electrical and mechanical specifications. The transmitter converts serial CML electrical data into serial optical data. An open collector compatible Transmit Disable (Tx_Dis) is provided. When TX_DIS is asserted High, Transmitter is turned off. The receiver converts serial optical data into serial CML electrical data. An open collector compatible Loss of Signal is provided. The RX_LOS signal indicates insufficient optical power for reliable signal reception at the receiver. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

Features

- Compliant to SFP+ MSA
- Fully RoHS Compliant
- Up to 300m with 50μm OM3 MMF
- 850nm VCSEL Laser
- LC duplex connector

- Hot pluggable 20pin connector
- Low power consumption <1.0W
- -40℃ to 85℃ operating wide temperature range
- Single +3.3V±5% power supply
- Digital Monitoring SFF-8472 Rev 10 compliant
- Real time monitoring of：
  - Transmitted optical power
  - Received optical power
  - Laser bias current
  - Temperature
  - Supply voltage

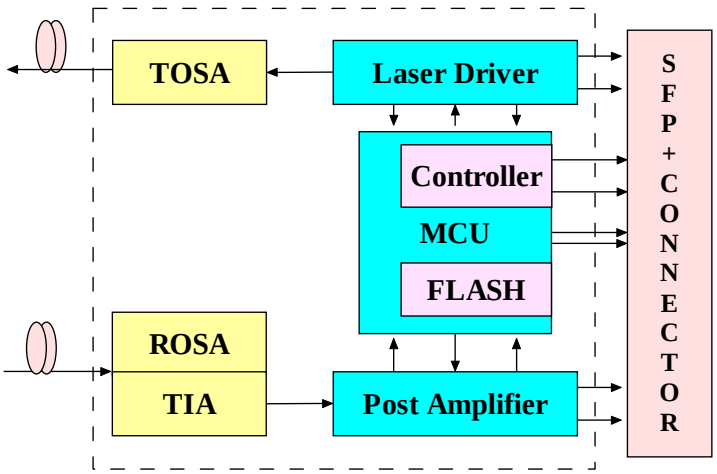
Applications

- Wireless and cellular base station system interconnect:
  OBSAI rates 6.144Gb/s, 3.072 Gb/s
  CPRI rates 4.9152 Gb/s, 2.4576 Gb/s
- 2/4GFC Data Storage

Standards

- SFF-8432
- SFF-8431
- SFF-8472

Block diagram



Ordering Information

Part No.	Specifications								Application
	Package	Data rate	Laser	Optical Power	Detector	Sensitivity (OMA)	Top	Reach (OM3)	Other	
RTXM228-610	SFP+	6.1445 Gb/s	850nm VCSEL	-8.0~ -1.0dBm	PIN	< -11.5dBm	-40~85 °C	300m	DDM	OBSAI/ CPRI 2/4 GFC

Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Storage Temperature Range	Ts	°C	-40	85
Relative Humidity	RH	%	0	95
Supply Voltage	V_{CC}	V	-0.3	4.0

Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Operating Case Temperature Range	Tc	°C	-40		85
Power Supply Voltage	Vcc	V	3.14	3.3	3.46
Bit Rate	BR	Gb/s	2.4576		6.25
Bit Error Ratio	BER				10^{-12}
Link Length on 50um MMF (OM3) (2000MHz.km)	L	m			300

Electric Ports Definition

Parameter	Symbol	Unit	Min	Typ	Max	Note
Supply Voltage	V_{CC}	V	3.14	3.3	3.46	
Supply Current	Icc	mA		180	285	
Transmitter						
Input Differential Impedance	R_{IN}	Ω	80	100	120	1
Differential Data Input Swing	V_{IN}	mVp-p	180		700	
Transmit Disable Voltage	V_{DIS}	V	2		V_{CCHOST}	
Transmit Enable Voltage	V_{EN}	V	V_{EE}		V_{EE}+0.8	
Transmit Fault Assert Voltage	V_{FA}	V	2.2		V_{CCHOST}	
Transmit Fault De-Assert Voltage	V_{FDA}	V	V_{EE}		V_{EE}+0.4	
Receiver						
Differential Data Output Swing	V_{OD}	mVp-p	300		850	
Output Rise Time	t_{RISE}	ps	28			
Output Fall Time	t_{FALL}	ps	28			
LOS Fault	V_{LOSFT}	V	2		V_{CCHOST}	
LOS Normal	V_{LOSNR}	V	V_{EE}		V_{EE}+0.8	

Optical Characteristics

(Tc=-40 ℃ to 85 ℃, Vcc= 3.14 to 3.46V, Data rate: 6.144Gb/s)

Parameter	Symbol	Unit	Min	Typ	Max	Note
Transmitter						
Nominal Wavelength	λ	nm	840	850	860	
RMS spectral width		nm			0.65	
Max. Optical Output Power		dBm			-1.0	
Optical Modulation Amplitude (OMA*)	Pout	dBm	-4.0			1
Average launch power of OFF Transmitter	P_{OFF}				-35	
Extinction Ratio	ER	dB	3.0			2
Relative Intensity Noise	R_{IN}	dB/Hz			-128	
Optical return loss tolerance	ORLT	dB			12	
Jitter deterministic @ γ t	Jpk-pk	UI		0.21		
Jitter total @ γ t, BER<10^{-12}	Jpk-pk	UI		0.38		
Jitter deterministic @ δ t	Jpk-pk	UI		0.28		
Jitter total @ δ t, BER<10^{-12}	Jpk-pk	UI		0.49		
Receiver						
Center Wavelength	λ_C	nm	840		860	
Receiver Sensitivity EOL (OMA)	R_{SENSE1}	dBm			-11.5	3
Receiver overload		dBm	-1.0			4
Receiver Reflectance	R_{REFL}	dB			-12	
LOS Assert LOS	LOS_A	dBm	-30			
LOS De-Assert LOS	LOS_D	dBm			-14	
LOS Hysteresis		dB	0.5			

Note:

1. OMA* = OMA - TDP
2. PRBS 2^7-1
3. Sensitivity for PRBS 2^7-1 and BER better than or equal to 10E-12, achieved with worst case ER and transmitter loopback over >300m of OM3 MMF, includes all penalties over live time.
4. PRBS 2^7-1 and BER better than or equal to 10E-12