



PICadvanced

GPON ONU Triplexer OSA with SC-APC Pigtail

PA2-GPON-ONU-TRI-B+-I

Revision 1

Revision History

Revision #	Description	Date
1	Initial release	October 2019

Product Features

- Single fiber bi-directional data links with Asymmetric Data Rate.
- DFB 1310 nm laser diode as 1.244Gb/s transmitter.
- APD 1490nm with TIA and 2.488 Gb/s post amplifier receiver
- PIN1550nm and 2.5GHz bandwidth receiver.
- Single mode fiber package with Pigtail SC/APC connector.
- Kink free P-I characteristics with high return loss.
- RoHS compliant and lead-free.
- Excellent Reliability.
- Operation Temperature: -10°C~85°C.

Product Applications

- Meets ITU-T984.5.
- Gigabit Ethernet Passive Optical Networks (G-PON)- ONU Transceiver.

General

The BOSA is used for 1310nm Tx/1490 (1480~1500nm) Rx 1.244Gbps/2.488Gb/s/1550nm Analog Rx Triplexer Optical Module OSA consists of 1310 nm multi-quantum well structure. DFB laser diode, a 1490nm digital receiver and a 1550 nm analog receiver integrated by a WDM filter. It is suitable for passive optical network transceiver in ONU equipment of FTTP systems.

Performance Specifications

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Reverse Voltage (LD)	V_{RL}	-	2	V
Forward Current (LD)	I_{FL}	-	150	mA
Reverse Voltage (MPD)	V_{RMP}	-	20	V
Forward Current (MPD)	I_{FMP}	-	10	mA
Reverse Voltage (MPD)	V_{RPP}	-	20	V
TIA Supply Voltage	V_{CC}	+3.0	+3.6	V

Damage Input Optical Power ($\lambda=1490\text{nm}$)	P_{DAM}	+5	-	dBm
Operating Case Temperature	T_C	-10	+85	°C
Storage Temperature	T_{STG}	-40	+85	°C
Lead Soldering Temperature (Maximum 10sec)	T_S	-	260	°C

Vcc=3.3V, Tcc=25C, unless specified

Electrical Characteristics

Transmitter

Parameter	Symbol	Min.	Typ.	Max	Unit	Test Condition
Threshold Current	I _{th}	-	-	15	mA	CW, TC = 25°C
		-	-	50		CW, TC = 85°C
Fiber Output Power (CW I _{op} =I _{th} +20mA)	P _f	1.60	-	3.5	mW	Kink free, TC = 25°C
		1.0	-			TC = -10°C~85°C
Slope Efficiency	SE	0.08	-	-	mW/mA	CW, TC = 25°C, I=I _{th} +20mA
		0.05	-	-		TC = 85°C
Rise/Fall Time	T _r /T _f	-	-	200	ps	I _b =I _{th} , 20%~80%, Filter Off
Peak Wavelength	λ	1290	1310	1330	nm	DFB Laser temperature dependence of 0.1nm/°C used
Spectrum Width (RMS)	$\Delta\lambda$	-	-	1	nm	CW, I _{op} = I _{th} +20mA
Monitor Current	I _m	100	200	1000	μA	CW, P _f =2.5mW
SMSR	-	30	-	-	dB	CW, I=I _{th} +20mA
Operating Voltage	V _f	-	1.1	1.5	V	CW, I=I _{th} +20mA
Monitor Dark Current	I _d	-	-	0.1	μA	VRD=10V
Capacitance (MPD)	CPD	-	10	20	pF	VRD=10V, f=1MHz
Tracking Error (CW)	TE	-1.5	-	1.5	dB	P _f =1.8mW at 25°C vs. P _f at 85°C or -10°C by the same I _{mon} at 25°C

Receiver Digital 1490 nm

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	Vcc	2.97	3.3	3.63	V	
Supply Current	Icc	-	25	50	mA	
Optical Wavelength	λ	1480	1490	1500	nm	
Sensitivity	Sen.	-	-	-30.5	dBm	2.488Gbps, PRBS2 ²³ – 1 BER=10 ⁻¹⁰ , ER=10dB
Saturation Power	Psat	-7	-	-	dBm	$\lambda=1490\text{nm}$
APD Breakdown Voltage	Vbr	28.8	-	53.7	V	$I_d=10\mu\text{A}$, TC=25°C
APD Operating Voltage	Vop	-	Vbr-3	-	V	$V_{op}=V_{br}-3V/V_{br}*0.9$
Change of Vbr with temperature		-	0.13		V/°C	$I_d=10\mu\text{A}$, TC=-10~25°C
		-	0.09			$I_d=10\mu\text{A}$, TC=-25~85°C
Optical Isolation from External Source	ISO1	25	-	-	dB	$\lambda=1441\text{nm}\sim 1450\text{nm}$, $\lambda=1530\text{nm}\sim 1539\text{nm}$
	ISO2	36	-	-	dB	$\lambda=1260\text{nm}\sim 1440\text{nm}$, $\lambda=1540\text{nm}\sim 1625\text{nm}$
Cross talk	Ct	-	-45	-40	dB	1310nm/1490nm

Receiver Analog 1550 nm

Optical Wavelength	λ	1540	1550	1560	nm	-
Responsivity	R	0.85	-	-	A/W	$\lambda=1550\text{nm}$
Capacitance	C	-	-	1	pF	-
Bandwidth	BW	-	2.5	-	GHZ	-

Filters specification

0° Filter specification for 1490nm and spectrum profile for Digital Receiver port. (TC=25°C)

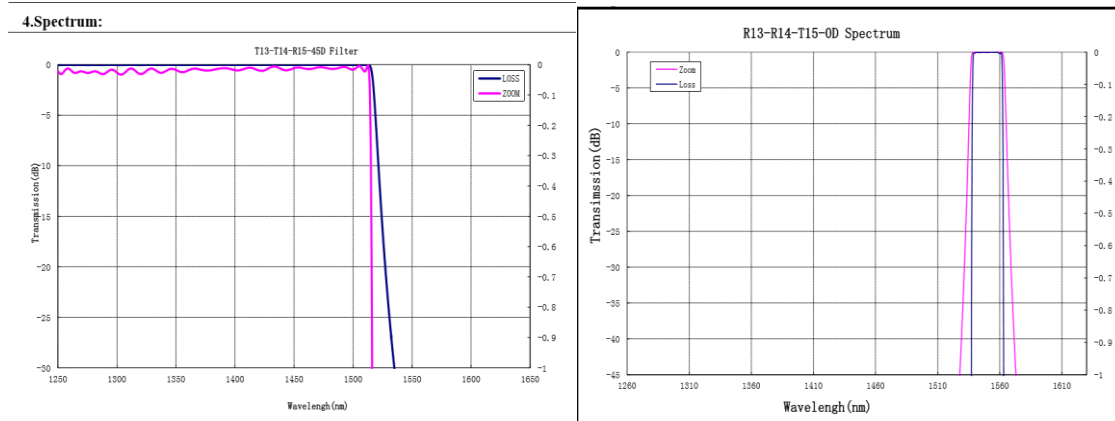
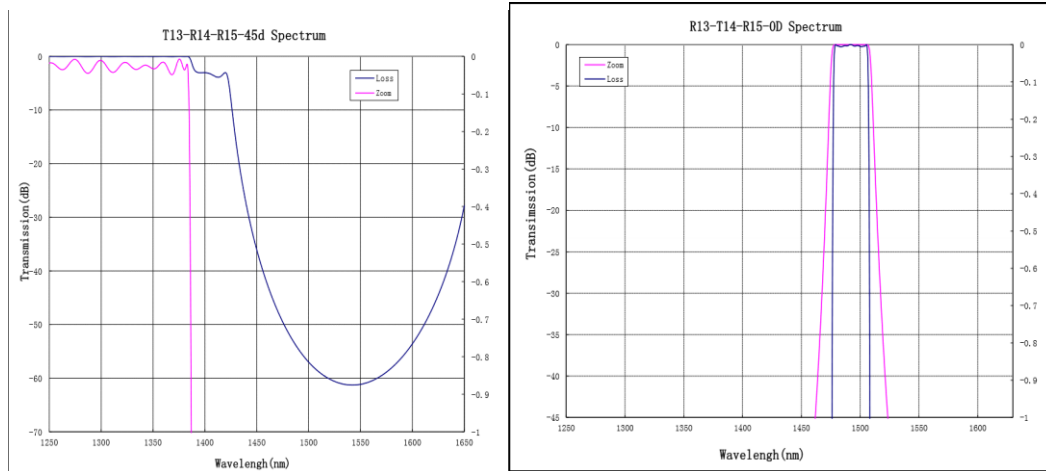
Parameter	Symbol	Min.	Max.	Unit	Note
Pass band Insertion Loss	IL1		< 0.3	dB	$\lambda=1480\sim 1502\text{nm}$
Reject band Isolation	RB1	≥35		dB	$\lambda=1260\sim 1441\text{nm}\&1539\sim 1620\text{nm}$
	RB2	≥30		dB	$\lambda=1442\sim 1450\text{nm}\&1530\sim 1538\text{nm}$

0° Filter specification for 1550nm and spectrum profile for Analog Receiver port. (TC=25°C)

Parameter	Symbol	Min.	Max.	Unit	Note
Pass band Insertion Loss	IL2		< 0.3	dB	$\lambda=1549\sim 1564\text{nm}$
Reject band Isolation	RB3	≥40		dB	$\lambda=1260\sim 1510\text{nm}$
	RB4	≥30		dB	$\lambda=1511\sim 1530\text{nm}\&1574\sim 1630\text{nm}$

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Filter specifications



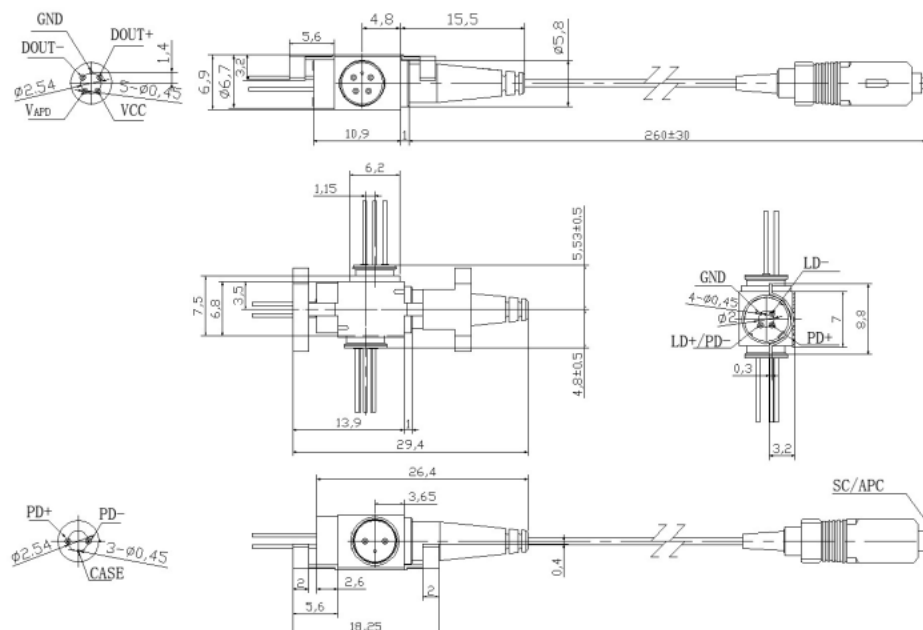
MTBF Testing Report

Testing Describe	Spec.	Unit	Remark
sample size :	11	Pcs	
Normal Temperature(T0):	27.8	°C	
Stress Temperature(T1):	85	°C	
Acceleration Factor :	474.4177		See Table1
confidence level:	90%		See Table1
number of failures	0	Pcs	See Table1
T.R.:	2.3026	Hours	
Acceleration Total Testing Time :	5000	Hours	
MTBF:	11331960.6	Hours	
Failure rate	88	FIT	

TABLE1

Conf. Level	Number of Failures									
	0	1	2	3	4	5	9	10		
95%	2.9957	4.7439	6.2958	7.7537	9.1535	10.513				
90%	2.3026	3.8897	5.3223	6.6808	7.9936	9.2747				
85%	1.8971	3.3724	4.7231	6.0135	7.267	8.4947				
80%	1.6094	2.9943	4.279	5.5151	6.721	7.906				
75%	1.3863	2.6926	3.9204	5.1094	6.2744	7.4227				
70%	1.204	2.4392	3.6156	4.7622	5.8904	7.0056				
										
10%										
5%										

Package Diagram



Unit: mm

Fiber Length 260mm+/-30mm, Connector SC/APC

Key Materials

Materials	Type	Vendor
LD TOCAN	131D-02E-VT5JB-500	MACOM
APD+TIA TOCAN	AAIT2500T05BL-A-2	AOE
PIN TOCAN	AP-I0917T0075TO46-BL2-C	AOE

Label information



S1807000012_44.00

Format:

Sxxxxxxxxx – Serial Number

yy.yy – Vop@25C(Vbr-3)

Order Information

Please contact PICadvanced for ordering and quotation: global@picadvanced.com