



Preliminary Specification
of
Bi-directional Transceiver Devices
(for 1.25Gbps and Analog downstream, and
1.25Gbps upstream transmission applications)
SXT5731-Q
(1.3 μ m(T)/1.49 μ m(Digital R)/1.55 μ m(Analog R))



1. General

SXT5731-Q is a bi-directional transceiver device suitable for fiber optic bi-directional transmission applications, 1.25Gbps and analog downstream and 1.25Gbps upstream.

A laser diode and a monitoring photodiode as transmitter components and a detector PD and a pre-Amplifier as digital receiver components and a detector Analog PD as analog receiver components are mounted into a package integrated with a single mode fiber pigtail.

2. Package dimension and pin assignment

(See attached appendix.)

3. Absolute maximum ratings

Parameter	Symbol	Ratings	Unit
Storage temperature	Tstg	-40~+85	°C
Operating case temperature	Top	-40~+85	°C
Forward current (LD)	IfL	150	mA
Reverse voltage (LD)	VrL	2	V
Reverse voltage (monitoring PD)	VrMP	15	V
Reverse current (monitoring PD)	IrMP	2	mA
Supply voltage (IC)	Vcc	4	V
Reverse current (Digital PD)	IrDP	2	mA
Reverse voltage (Analog PD)	VrAP	27	V
Reverse current (Analog PD)	IrAP	4	mA
Soldering temperature (<10s)	Stemp	260	°C

4. Electrical and optical characteristics

4-1 . Transmitter (Pf=+3dBm, Tc=+25°C, unless otherwise noted.)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Threshold current	Ith	CW	—	4	15	mA
		CW, Tc=-40~+85°C	—	—	45	
Operating output power	Pf	CW, If=Ith+20mA	1	3	5	dBm
		CW, If=Ith+20mA, Tc=-40~+85°C	-2	—	7	
Operating voltage	Vf	CW, Tc=-40~+85°C	—	—	1.8	V
Central wavelength	λ_c	CW	1270	1300	1340	nm
		CW, Tc=-40~+85°C	1260	—	1360	
Spectral width	$\Delta\lambda$	CW, Tc=-40~+85°C (RMS)	—	1.5	5	nm
Tracking error	ΔPf	Im hold(@Pf=2mW(25°C)) CW, Tc=-40~+85°C	-1.5	—	1.5	dB
Monitor current	Im	CW, VrP=5V, Tc=-40~+85°C	120	—	1200	μ A
Monitor dark current	Idmp	VrP=5V	—	1	10	nA
Monitor capacitance	Cmp	VrP=5V, f=1MHz	—	—	10	pF

4-2 . Digital Receiver (Ta=+25°C, Vcc=3.3V, Mon.=3.3V, unless otherwise noted.)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Receiver wavelength	λ_c	—	1480	1490	1500	nm
Sensitivity	Smin	$\lambda=1490\text{nm}$, 1.25Gbps, BER=10 ⁻¹² ER=10dB (*1)	—	—	-26	dBm
Overload	Smax	$\lambda=1490\text{nm}$, 1.25Gbps, BER=10 ⁻¹² ER=10dB (*1)	-4	—	—	dBm
Pre-Amp. Supply current	Icc		—	—	60	mA
Optical Return Loss	ORL	$\lambda=1480\text{nm} - 1500\text{nm}$	20	—	—	dB
Optical Isolation from external source	ISO1	$\lambda=1260\text{nm} - 1360\text{nm}$	17	—	—	dB
	ISO2	$\lambda=1550\text{nm} - 1560\text{nm}$	32	—	—	dB
Optical crosstalk from internal LASER	Xopt	(*2)	—	—	-47	dB

4-3 . Analog Receiver (Vpd=12V, Tc=+25°C, unless otherwise noted.)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input wavelength	λ_{pd}		1550	—	1560	nm
Responsivity	R		0.8	—	—	W/A
Capacitance	Cpd		—	0.8	—	pF
Polarization dependent loss	PDL		—	—	0.5	dB
Dark current	Id	Vpd=15V	—	—	5	nA
Second order inter-modulation distortion	IMD2	$\lambda=1550\text{nm}$, (*3), Vpd=15V	—	—	-68	dBc
Optical Return Loss	ORL	$\lambda=1550\text{nm} - 1560\text{nm}$	40	—	—	dB
Optical Isolation from external source	ISO1	$\lambda=1260\text{nm} - 1360\text{nm}$	22	—	—	dB
	ISO2	$\lambda=1490\text{nm} - 1500\text{nm}$	26	—	—	dB
Optical crosstalk from internal LASER	Xopt	(*2)	—	—	-47	dB

Note:*1.Measured with the standard equipment of SEI.

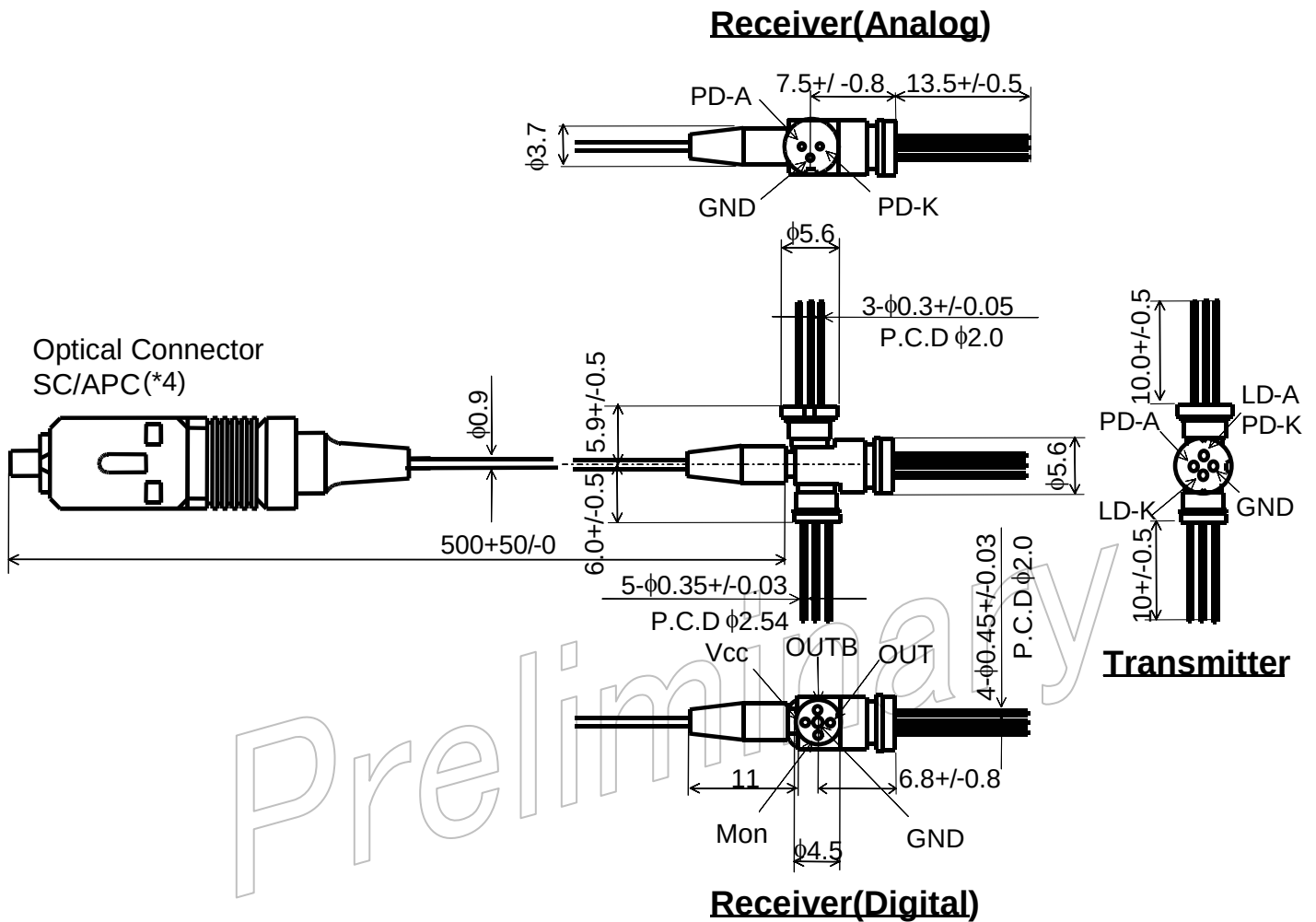
Note:*2. $X_{opt}=10 \times \log\{(I_{X_{opt}}/R)/Pf\}$. $I_{X_{opt}}$ is photocurrent at $Pf=2dBm$.

Note: *3. Two tone two laser test ($f1=373.25MHz$, $f2=451.25MHz$), $OMI=40\%$, $0.5mW$ per laser,
Load impedance for PIN diode= 230Ω (insert 180Ω in front of 50Ω -transmission line)

Precaution

- (1) Radiation emitted by laser devices can be dangerous to the eyes. Avoid eye or skin exposure to direct or scattered radiation.
- (2) The modules should be handled in the same manner as ordinary semiconductor devices to prevent the electro-static damages. For safe keeping and carrying, the modules should be packaged with ESD proof material. To assemble the modules on PCB, the workbench, the soldering iron and the human body should be grounded.
- (3) The stress to the fiber pigtail may cause the damage on the performance. The fiber pigtail may snap off by dropping the module.
- (4) Please pay special attention to the atmosphere condition because the dew on the module may cause some electrical damages.
- (5) Under such a strong vibration environment as in automobile, the performance and reliability are not guaranteed.

Outline Drawings



Symbol	Function	Supply voltage
OUT	Data output	-
OUTB	Inverted Data Output	-
Vcc	Power pin.	+3.3V
Mon.	For SEI internal use.	+3.3V
GND	Ground pin.	-

Note:*4. IEC and JIS compliant. Detailed design not specified in the IEC

Revision Record

Document No.	Date of issue	Description	Incorporated by	Checked by	Approved by
HUW0424031-01A	June 24,2004	Preliminary issue.	M. Furumai	Y. Yamasaki	M. Yoshimura
HUW0424031-01B	June 28,2004	Changed digital receiver pin assignment from Vpd to Mon.	M. Furumai	Y. Yamasaki	M. Yoshimura
HUW0424031-01C	Feb.10,2005	Changed outline drawings. Changed IMD2 temp. condition. Changed max. IMD2 spec from -70 to -68dBc.	M. Furumai	Y. Yamasaki	M. Yoshimura

Preliminary