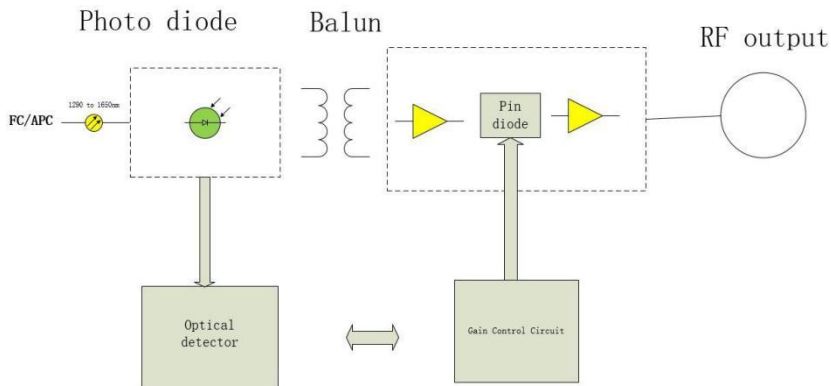


FEATURES

- Excellent linearity
- Extremely low noise
- Excellent flatness
- Rugged construction
- SC/APC and SC/UPC
- AGC



DESCRIPTION

SMOP15 is a low power, but good performance optical receiver. AGC circuitry make output level stably when in the range of -10-0dBm. Small size with FC/APC connector which can be assembled in a small case.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNITS
f	Frequency range		40	1200	MHz
S ₂₂	Output return losses	f=40 to 870 MHz	-	-12	dB
S ₂₂	Output return losses	f=871 to 1200 MHz	-	-10	dB
I _{out}	Total current consumption (DC)	V _B =5V	270	300	mA

HANDLING

Fiberglass optical coupling: maximum tensile strength=5N; minimum bending radius=30mm

LIMITING VALUES

In accordance with the Absolute Maximum Rating System

SYMBOL	PARAMETER	CONDITION	MIN.	MAX.	UNITS
P_{in}	Optical input power		-16	+5	dBm
	Optical return loss	0dBm		-35	dB
T_{stg}	Storage temperature		-40	+85	°C
T_{mb}	Operating mounting base temperature	continuous	-20	+85	°C
ESD	ESD sensitivity	Human body model; R=1.5KΩ;C=100pF	500	-	V

CHARACTERISTICS

(Bandwidth 40 to 1200MHz; $T_{mb}=25^{\circ}\text{C}$, $V_B=5\text{V}$, $Z_S=Z_L=75\Omega$)

SYMBOL	PARAMETER	UNIT	MIN.	TYP.	MAX.	CONDITIONS
S	responsively	V/W	900	-	-	$\lambda=1550\text{nm}$
FL1	Flatness of frequency response	dB	-	± 1.0	± 1.5	f=40 to 1200 MHz, wide band flatness
FL2	Flatness of frequency response	dB	-	-	± 0.4	Narrow bandwidth per 7MHz
SL	Slope	dB	0	1.5	2.0	From 40-1200MHz
S_{22}	Output Return Loss	dB	-12	-	-	f=40 to 870 MHz
S_{22}	Output Return Loss	dB	-10	-	-	f=871 to 1200 MHz
I_{tot}	Total Current Consumption	mA	270	-	300	$V_B=5\text{V}$
Automatic Gain Control Receiving Power: -10-0dBm (According to customer requirements)						
V_{o1}	Output Voltage	dBuV	78.5	82	83	$P_{opt} = -10-0\text{dBm}$ BW=40-1200MHz 42 channels $T=25^{\circ}\text{C}$ OMI=4% per channel
V_{o2}	Output Voltage	dBuV	77	80	81.5	$P_{opt} = -8\sim+2\text{dBm}$ BW=40-1000MHz 42 channels $T=0\sim40^{\circ}\text{C}$ OMI=4% per channel

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page2

CTB	Composite Triple Beat	dB	-	-	-60	Optical power -1dBm 42 channels PAL-D .175.25MHz OMI=4% per channel
CSO	Composite Second Order distortion	dB	-	-	-60	
C-spurious	Carrier to spurious	dB	-	-	-57	
CTB	Composite Triple Beat	dB	-	-	-57	Optical power +1dBm 42 channels PAL-D .175.25MHz OMI=4% per channel
CSO	Composite Second Order distortion	dB	-	-	-56	
C-spurious	Carrier to spurious	dB	-	-	-56	
CNR	Noise carrier rating	dB	45	-	-	Optical power -7dBm 42 channels PAL-D .175.25MHz OMI=4% per channel

Please note:

Vo1 are according to the optical change from -10dBm ~0dBm. For example, In -10dBm the output level is 80dBuV, but in the 0dBm maybe output level is 82dBuV.

Vo2 are according to the temperature change .for example: when the temperature stay 40°C, the output level will lower 0.5dB than 25°C. When the temperature stay 0°C, the output level will higher 0.5dB than 25°C.

The minimum of CNR in different optical power
 $C/N \geq 46$ @ -8dBm in the frequency =175.25MHz
 $C/N \geq 47$ @ -7dBm in the frequency =175.25MHz
 $C/N \geq 48$ @ -6dBm in the frequency =175.25MHz
 $C/N \geq 49$ @ -5dBm in the frequency =175.25MHz
 $C/N \geq 50$ @ -4dBm in the frequency =175.25MHz
 $C/N \geq 51$ @ -3dBm in the frequency =175.25MHz
 $C/N \geq 52$ @ -2dBm in the frequency =175.25MHz
 $C/N \geq 53$ @ -1dBm in the frequency =175.25MHz
 $C/N \geq 54$ @ 0dBm in the frequency =175.25MHz

The module normally operates at $V_B=5\pm 0.25$ V

Immunity test

According to ICE61000-4-3 standard.

Test was performed in STC lab using SANLAND SMOP45 measuring equipment according to requirements. All test was conducted in STC chamber. Distance between DUT and antenna 3m. All test was conducted for two antenna orientation - vertical and horizontal and for three frequency ranges from 80MHz to 1GHz; 1GHz to 2GHz; 2GHz to 3GHz three ranges use same antenna.

Immunity signal parameters:

- Field strength 3V/m
- Frequency step 1%
- Step time 3s
- 1KHz AM modulation 80%

Measuring equipment:

- Spectrum analyzer
- Converter 75R to 50R
- RF cable VIABLUE TVR 2.0 SILVER 120 dB Class A+

Spectrum analyzer configuration:

- VBW 10KHz
- RBW 30KHz
- Reference level 80dBuV
- Sweep time 1.5s
- Attenuator 0dB
- Trace max hold

DUT configuration

- CATV enable
- DUT in vertical position
- DUT powered by 5V stabilized PSU

Test result:

- 80MHz to 1GHz pass
- 1GHz to 2GHz pass
- 2GHz to 3GHz pass

Certification

The measurement result is according to

ANSI_SCTE 06 2009.

ICE61000-4-3.

EN 607286 Cable networks for television signals, sound signals and interactive services.

Part6: Optical equipment services.

EN 607283 Cable networks for television signals, sound signals and interactive services.

Part3: Active wide band equipment for cable services.

Photodiode pin monitoring voltage corresponding to the table

O.P.-Power dBm	Voltage V	O.P.-Power dBm	Voltage V	O.P.-Power dBm	Voltage V	O.P.-Power dBm	Voltage V	O.P.-Power dBm	Voltage V	O.P.-Power dBm	Voltage V
2.00	1.5849	-1.00	0.7943	-4.00	0.3981	-7.00	0.1995	-10.00	0.1000	-13.00	0.0501
1.90	1.5488	-1.10	0.7762	-4.10	0.3890	-7.10	0.1950	-10.10	0.0977	-13.10	0.0490
1.80	1.5136	-1.20	0.7586	-4.20	0.3802	-7.20	0.1905	-10.20	0.0955	-13.20	0.0479
1.70	1.4791	-1.30	0.7413	-4.30	0.3715	-7.30	0.1862	-10.30	0.0933	-13.30	0.0468
1.60	1.4454	-1.40	0.7244	-4.40	0.3631	-7.40	0.1820	-10.40	0.0912	-13.40	0.0457
1.50	1.4125	-1.50	0.7079	-4.50	0.3548	-7.50	0.1778	-10.50	0.0891	-13.50	0.0447
1.40	1.3804	-1.60	0.6918	-4.60	0.3467	-7.60	0.1738	-10.60	0.0871	-13.60	0.0437
1.30	1.3490	-1.70	0.6761	-4.70	0.3388	-7.70	0.1698	-10.70	0.0851	-13.70	0.0427
1.20	1.3183	-1.80	0.6607	-4.80	0.3311	-7.80	0.1660	-10.80	0.0832	-13.80	0.0417
1.10	1.2882	-1.90	0.6457	-4.90	0.3236	-7.90	0.1622	-10.90	0.0813	-13.90	0.0407
1.00	1.2589	-2.00	0.6310	-5.00	0.3162	-8.00	0.1585	-11.00	0.0794	-14.00	0.0398
0.90	1.2303	-2.10	0.6166	-5.10	0.3090	-8.10	0.1549	-11.10	0.0776	-14.10	0.0389
0.80	1.2023	-2.20	0.6026	-5.20	0.3020	-8.20	0.1514	-11.20	0.0759	-14.20	0.0380
0.70	1.1749	-2.30	0.5888	-5.30	0.2951	-8.30	0.1479	-11.30	0.0741	-14.30	0.0372
0.60	1.1482	-2.40	0.5754	-5.40	0.2884	-8.40	0.1445	-11.40	0.0724	-14.40	0.0363
0.50	1.1220	-2.50	0.5623	-5.50	0.2818	-8.50	0.1413	-11.50	0.0708	-14.50	0.0355
0.40	1.0965	-2.60	0.5495	-5.60	0.2754	-8.60	0.1380	-11.60	0.0692	-14.60	0.0347
0.30	1.0715	-2.70	0.5370	-5.70	0.2692	-8.70	0.1349	-11.70	0.0676	-14.70	0.0339
0.20	1.0471	-2.80	0.5248	-5.80	0.2630	-8.80	0.1318	-11.80	0.0661	-14.80	0.0331
0.10	1.0233	-2.90	0.5129	-5.90	0.2570	-8.90	0.1288	-11.90	0.0646	-14.90	0.0324
0.00	1.0000	-3.00	0.5012	-6.00	0.2512	-9.00	0.1259	-12.00	0.0631	-15.00	0.0316
-0.10	0.9772	-3.10	0.4898	-6.10	0.2455	-9.10	0.1230	-12.10	0.0617	-15.10	0.0309
-0.20	0.9550	-3.20	0.4786	-6.20	0.2399	-9.20	0.1202	-12.20	0.0603	-15.20	0.0302
-0.30	0.9333	-3.30	0.4677	-6.30	0.2344	-9.30	0.1175	-12.30	0.0589	-15.30	0.0295
-0.40	0.9120	-3.40	0.4571	-6.40	0.2291	-9.40	0.1148	-12.40	0.0575	-15.40	0.0288
-0.50	0.8913	-3.50	0.4467	-6.50	0.2239	-9.50	0.1122	-12.50	0.0562	-15.50	0.0282
-0.60	0.8710	-3.60	0.4365	-6.60	0.2188	-9.60	0.1096	-12.60	0.0550		
-0.70	0.8511	-3.70	0.4266	-6.70	0.2138	-9.70	0.1072	-12.70	0.0537		
-0.80	0.8318	-3.80	0.4169	-6.80	0.2089	-9.80	0.1047	-12.80	0.0525		
-0.90	0.8128	-3.90	0.4074	-6.90	0.2042	-9.90	0.1023	-12.90	0.0513		

Notes:

The calculation formula of: $\text{dBm} = 10 \cdot \lg(0.001 \cdot \text{mV}^2 / R)$

When measured the optical power corresponding to the monitor volt. may cause some tolerance that the range is $\pm 0.08\text{V}$

Before you measure, please clean the connector and fix it very well.

Dimension

Package outline drawing

