



## 1. Product profile

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### 1.1 General description

High dynamic range optical receiver amplifier modules in a standard SOT115 package where the non-jacketed fiber has either no connector or has an FC/APC or SC/APC connector.

The amplifier supply voltage pin and the photo diode bias voltage pin both connect to 24 V (DC).

The modules have a mono mode optical input suitable for 1290 nm to 1600 nm wavelengths, a terminal to monitor the photo diode current and an electrical output having a characteristic impedance of  $75 \Omega$ .

### 1.2 Features

- Excellent linearity
- Low noise
- Excellent flatness
- Standard CATV outline
- Rugged construction
- Gold metallization ensures excellent reliability
- High optical input power range.

### 1.3 Applications

- CATV optical node systems operating in the 40 MHz to 870 MHz frequency range.

## 1.4 Quick reference data

Table 1: Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f	frequency range		40	-	870	MHz
$S_{22}$	output return losses	f = 40 MHz to 870 MHz	-	-	-10	dB
	optical input return losses		45	-	-	dB
$d_2$	second order distortion	f = 543.25 MHz	-	-	-65	dB
F	equivalent noise input	f = 40 MHz to 870 MHz	-	-	8.5	pA/√ Hz
$I_{tot}$	total current consumption (DC)	$V_B = 24\text{ V}$	110	-	140	mA

## 2. Pinning information

Table 2: Pinning

Pin	Description
1	monitor current
2	common
3	common
5	+ $V_B$ of the amplifier
7	common
8	common
9	output

### 3. Ordering information

**Table 3: Ordering information**

Type number	Package		
	Name	Description	Version
CMO807	-	rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 6-32 UNC and 2 extra horizontal mounting holes; optical input; 8 gold-plated in-line leads	SOT115T

### 4. Limiting values

**Table 4: Limiting values**

In accordance with the Absolute Maximum Rating System (IEC 0134).

Symbol	Parameter	Conditions	Min	Max	Unit
f	frequency range		40	870	MHz
T <sub>stg</sub>	storage temperature		-40	+85	°C
T <sub>mb</sub>	operating mounting base temperature		-20	+85	°C
P <sub>in</sub>	optical input power	continuous	-	3	mW
ESD	ESD sensitivity	human body model; R = 1.5 kΩ ; C = 100 pF	500	-	V

### 5. Characteristics

**Table 5: Characteristics**

In accordance with the Absolute Maximum Rating System (IEC 0134); bandwidth 40 MHz to 870 MHz; V<sub>B</sub> = 24 V; T<sub>mb</sub> = 30°C; Z<sub>L</sub> = 75 Ω.

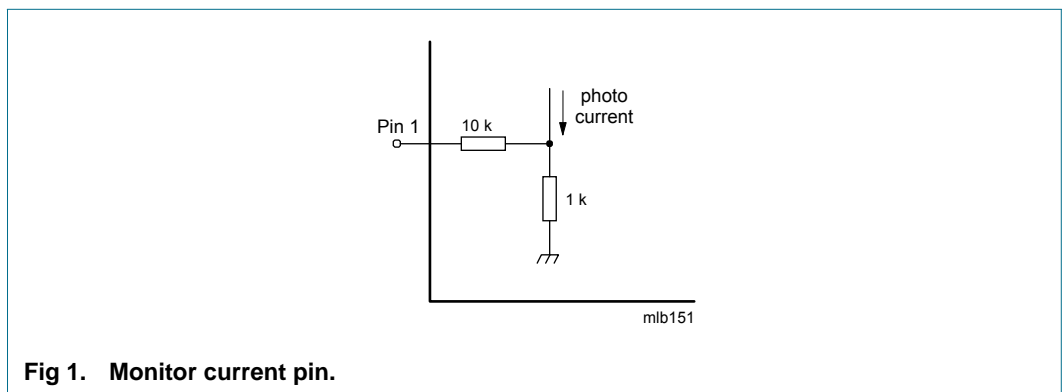
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
S	responsivity	λ = 1300 nm	850	-	-	V/W
FL	flatness straight line (peak to valley)	f = 40 MHz to 870 MHz	-	-	±0.75	dB
SL	slope straight line	f = 40 MHz to 870 MHz	0	-	2	dB
s <sub>22</sub>	output return losses	f = 40 MHz to 870 MHz	10	-	-	dB
	optical input return losses		45	-	-	dB
d <sub>2</sub>	second order distortion	f <sub>m</sub> = 446.5 MHz	[1][2] -	-	-65	dB
		f <sub>m</sub> = 746.5 MHz	[1][3] -	-	-61	dB
		f <sub>m</sub> = 854.5 MHz	[1][4] -	-	-55	dB
d <sub>3</sub>	third order distortion	f <sub>m</sub> = 853.25 MHz	[5][6] -	-	-70	dB

**Table 5: Characteristics** ...continued

In accordance with the Absolute Maximum Rating System (IEC 0134); bandwidth 40 MHz to 870 MHz;  $V_B = 24\text{ V}$ ;  $T_{mb} = 30^\circ\text{C}$ ;  $Z_L = 75\ \Omega$ .

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
F	equivalent noise input	f = 40 MHz to 450 MHz	-	-	7	pA/√ Hz
		f = 450 MHz to 750 MHz	-	-	8	pA/√ Hz
		f = 750 MHz to 870 MHz	-	-	8.5	pA/√ Hz
S $\lambda$	spectral sensitivity	$\lambda = 1310 \pm 20\text{ nm}$	0.85	-	-	A/W
		$\lambda = 1550 \pm 20\text{ nm}$	0.9	-	-	A/W
$\lambda$	optical wavelength		1290	-	1600	nm
L	length of optical fiber; SM type; 9/125 $\mu\text{m}$		1	-	-	m
I $_{tot}$	total current consumption (DC)		110	-	140	mA

- [1] Two laser test; each laser with a modulation index of 40%;  $P_{opt} = 1\text{ mW}$  (total).
- [2]  $f_m = 446.5\text{ MHz}$ ;  $f_p = 97.25\text{ MHz}$ ;  $f_q = 349.25\text{ MHz}$ .
- [3]  $f_m = 746.5\text{ MHz}$ ;  $f_p = 133.25\text{ MHz}$ ;  $f_q = 613.25\text{ MHz}$ .
- [4]  $f_m = 854.5\text{ MHz}$ ;  $f_p = 133.25\text{ MHz}$ ;  $f_q = 721.25\text{ MHz}$ .
- [5] Three laser test; each laser with a modulation index of 60%;  $P_{opt} = 1\text{ mW}$  (total).
- [6]  $f_m = 853.25\text{ MHz}$ ;  $f_p = 133.25\text{ MHz}$ ;  $f_q = 265.25\text{ MHz}$ ;  $f_r = 721.25\text{ MHz}$ .



**Fig 1. Monitor current pin.**

6. Package outline

Rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounting holes; optical input; 7 gold-plated in-line leads

SOT115T

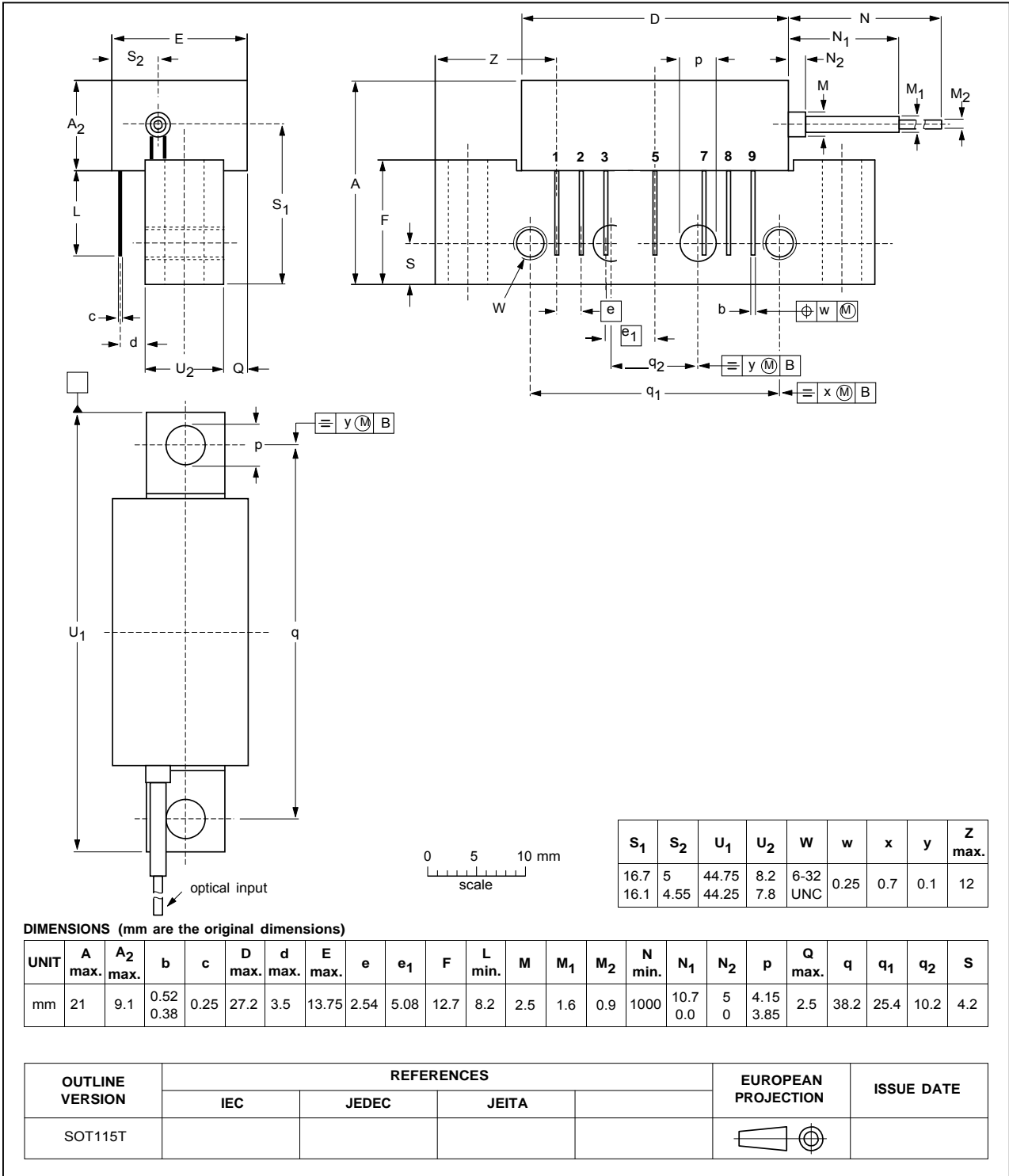


Fig 2. Package outline SOT115T.

