



1. Product profile

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 8V (DC).

The modules have a mono mode optical input suitable for 1 290 nm to 1 600 nm wavelengths, a terminal to monitor the photo diode current and an electrical output having a characteristic impedance of 75Ω .

1.2 Features

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

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 = 8 V	310	-	340	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
MZBO8640-8V -		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 _{stg}	storage temperature		- 40	+85	°C
T _{mb}	operating mounting base temperature		-20	+85	°C
P _{in}	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_B = 8 V; T_{mb} = 30°C; Z_L = 75Ω .

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
S	responsivity	λ = 1 300 nm	850	-	-	V/W
FL	flatness straight line (peak to valley)	f = 40 MHz to 870 MHz	-	-	±0.65	dB
SL	slope straight line	f = 40 MHz to 870 MHz	1	-	2	dB
V _o	Output voltage	Optical power receiving at 0dBm	99	100	101	dBμV
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 _m = 446.5 MHz	^[1] ^[2] -	-	-68	dB
		f _m = 746.5 MHz	^[1] ^[3] -	-	-65	dB
		f _m = 854.5 MHz	^[1] ^[4] -	-	-60	dB
d ₃	third order distortion	f _m = 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; $V_B = 8V$; $T_{mb} = 30^{\circ}C$; $Z_L = 75\Omega$.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
F	equivalent noise input	f = 40 MHz to 450 MHz	-	-	7	pA/ \sqrt{Hz}
		f = 450 MHz to 750 MHz	-	-	8	pA/ \sqrt{Hz}
		f = 750 MHz to 870 MHz	-	-	8.5	pA/ \sqrt{Hz}
S_{λ}	spectral sensitivity	$\lambda = 1\ 310 \pm 20\ nm$	0.85	-	-	A/W
		$\lambda = 1\ 550 \pm 20\ nm$	0.9	-	-	A/W
λ	optical wavelength		1 290	-	1600	nm
L	length of optical fiber; SM type; 9/125 μ m		1	-	-	m
I_{tot}	total current consumption (DC)		310	-	340	mA

[1] Two laser test; each laser with a modulation index of 40%; $P_{opt} = 1\ mW$ (total).

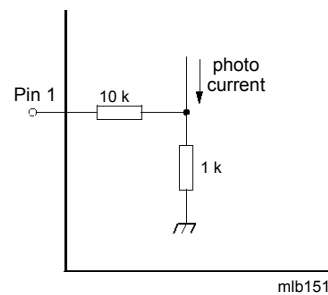
[2] $f_m = 446.5\ MHz$; $f_p = 97.25\ MHz$; $f_q = 349.25\ MHz$.

[3] $f_m = 746.5\ MHz$; $f_p = 133.25\ MHz$; $f_q = 613.25\ MHz$.

[4] $f_m = 854.5\ MHz$; $f_p = 133.25\ MHz$; $f_q = 721.25\ MHz$.

[5] Three laser test; each laser with a modulation index of 60%; $P_{opt} = 1\ mW$ (total).

[6] $f_m = 853.25\ MHz$; $f_p = 133.25\ MHz$; $f_q = 265.25\ MHz$; $f_r = 721.25\ MHz$.

**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

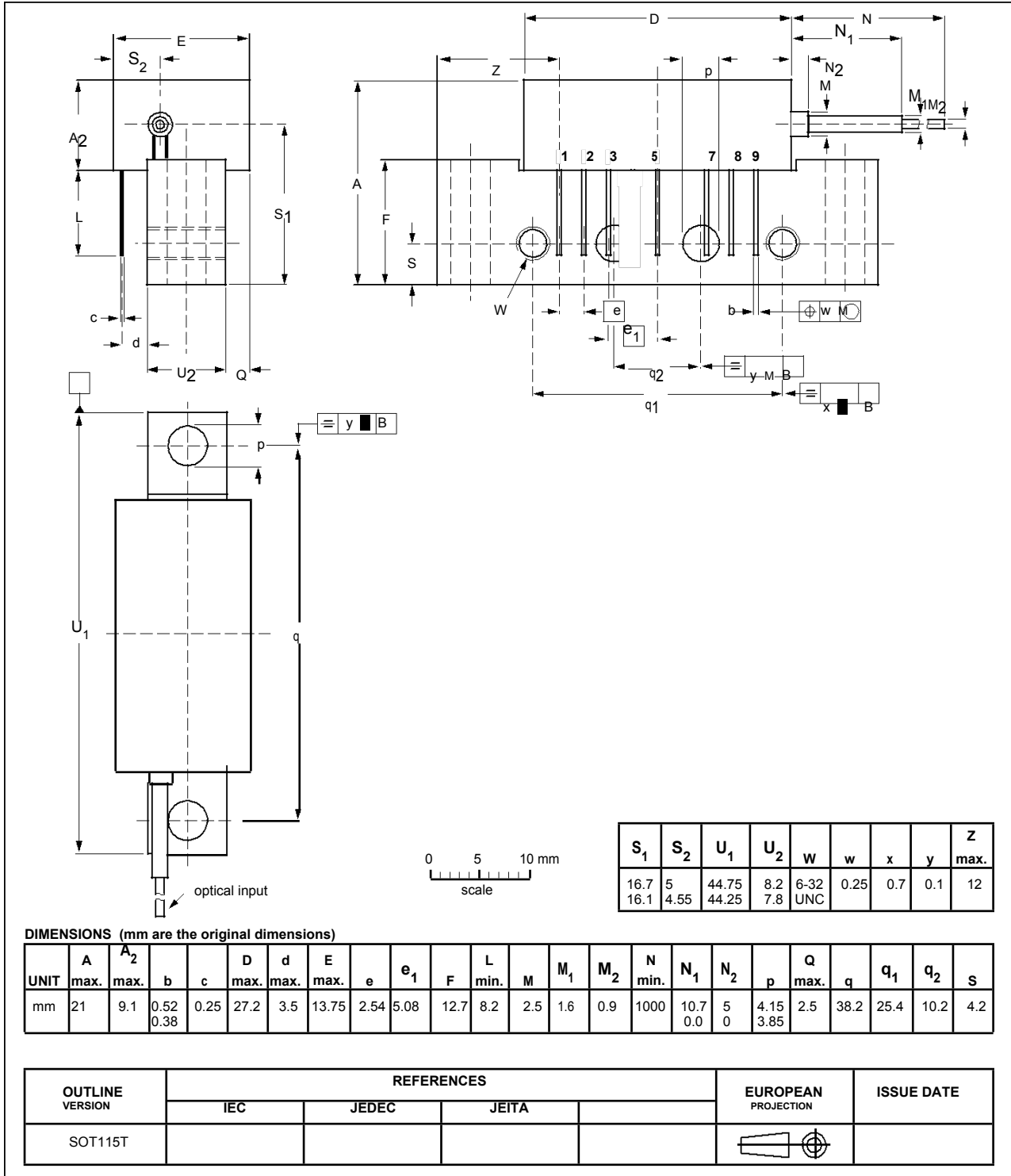


Fig 2. Package outline SOT115T.