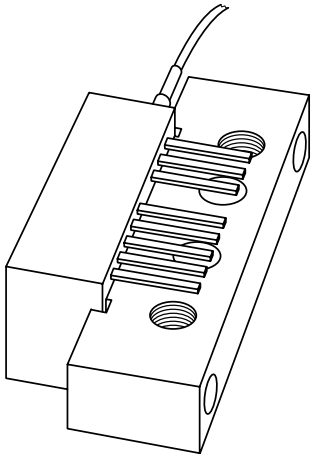
DATA SHEET



BGO747; BGO747/FC0; BGO747/SC0

750 MHz, optical receivers

Preliminary specification

2001 Oct 16

Philips
Semiconductors

PHILIPS

750 MHz, optical receivers

BGO747; BGO747/FC0; BGO747/SC0

FEATURES

- Excellent linearity
- Extremely low noise up to 750 MHz
- Excellent flatness (straight line)
- Standard CATV outline
- Rugged construction
- Gold metallization ensures excellent reliability
- High optical input power range.

APPLICATIONS

- CATV optical node systems operating in the 40 to 750 MHz frequency range.

DESCRIPTION

High dynamic range optical receiver amplifier modules in a standard SOT115 package where the non-jacketed fibre has either no connector or an FC/APC connector or an 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 monomode optical input suitable for 1290 to 1600 nm wavelengths, a terminal to monitor the photo diode current and an electrical output having a characteristic impedance of 75 Ω.

PINNING

PIN	DESCRIPTION
1	monitor current
2	common
3	common
4	$+V_B$ of the photo diode
5	$+V_B$ of the amplifier
7	common
8	common
9	output

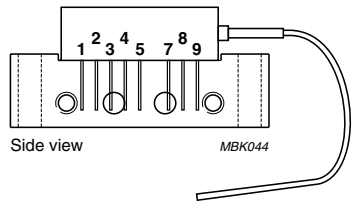


Fig.1 Simplified outline SOT115T (BGO747).

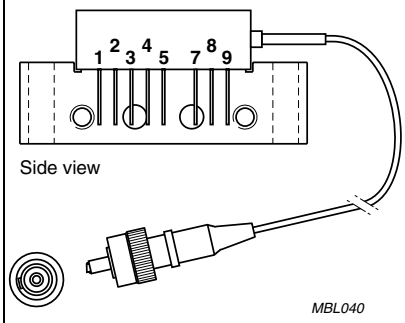


Fig.2 Simplified outline SOT115X (BGO747/FC0).

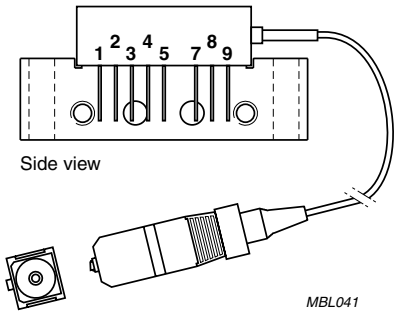


Fig.3 Simplified outline SOT115Y (BGO747/SC0).

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
f	frequency range		40	750	MHz
s_{22}	output return losses	f = 40 to 785 MHz	11	–	dB
	optical input return losses		45	–	dB
d_2	second order distortion	f = 746.5 MHz	–	–63	dBc
F	equivalent noise input	f = 40 to 750 MHz	–	7	pA/√Hz
I_{tot}	total current consumption (DC)	V_B = 24 V	175	205	mA

HANDLING

Fibreglass optical coupling: maximum tensile strength = 5 N; minimum bending radius = 35 mm.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
f	frequency range		40	750	MHz
T_{stg}	storage temperature		–40	+85	°C
T_{mb}	operating mounting base temperature		–20	+85	°C
P_{in}	optical input power	continuous	–	5	mW
ESD	ESD sensitivity	human body model; R = 1.5 kΩ; C = 100 pF	500	–	V

CHARACTERISTICS

Bandwidth 40 to 750 MHz; V_B = 24 V; T_{mb} = 30 °C; Z_L = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
S	responsivity				
	BGO747	λ = 1300 nm	800	–	V/W
	BGO747/FC0, BGO747/SC0	λ = 1300 nm	750	–	V/W
FL	flatness straight line	peak to valley; f = 40 to 750 MHz	–	1	dB
SL	slope straight line	f = 40 to 750 MHz	0	2	dB
s_{22}	output return losses	f = 40 to 785 MHz	11	–	dB
	optical input return losses		45	–	dB
d_2	second order distortion	f_m = 54 MHz; notes 1 and 3	–	–73	dB
		f_m = 446.5 MHz; notes 1 and 4	–	–68	dB
		f_m = 548.5 MHz; notes 1 and 5	–	–67	dB
		f_m = 746.5 MHz; notes 1 and 6	–	–63	dB
d_3	third order distortion	f_m = 55.25 MHz; notes 2 and 7	–	–80	dB
		f_m = 445.25 MHz; notes 2 and 8	–	–75	dB
		f_m = 547.25 MHz; notes 2 and 9	–	–75	dB
		f_m = 745.25 MHz; notes 2 and 10	–	–75	dB
F	equivalent input noise	f = 40 to 750 MHz	–	7	pA/√Hz
s_λ	spectral sensitivity	λ = 1310 ±20 nm	0.85	–	A/W
		λ = 1550 ±20 nm	0.9	–	A/W
λ	optical wavelength		1290	1600	nm
L	length of optical fibre				
	BGO747	fibre; SM type; 9/125 μm	1	–	m
	BGO747/FC0, BGO747SC0	fibre; SM type; 9/125 μm	746	861	mm
I_{tot}	total current consumption (DC)		175	205	mA
$I_{pin\ 4}$	pin diode bias current (DC)		–	25	mA

Notes

1. Two laser test; each laser with 25% modulation index; P_{opt} = 1 mW (total).
2. Three laser test; each laser with 60% modulation index; P_{opt} = 1 mW (total).
3. f_m = 54 MHz; f_p = 187.25 MHz; f_q = 133.25 MHz.
4. f_m = 446.5 MHz; f_p = 97.25 MHz; f_q = 349.25 MHz.
5. f_m = 548 .5MHz; f_p = 109.25 MHz; f_q = 439.25 MHz.
6. f_m = 746.5 MHz; f_p = 133.25 MHz; f_q = 613.25 MHz.
7. f_m = 55.25 MHz; f_p = 109.25 MHz; f_q = 133.25 MHz f_r = 187.25 MHz.
8. f_m = 445.25 MHz; f_p = 193.25 MHz; f_q = 349.25 MHz f_r = 97.25 MHz.
9. f_m = 547.25 MHz; f_p = 217.25 MHz; f_q = 439.25 MHz f_r = 109.25 MHz.
10. f_m = 745.25 MHz; f_p = 133.25 MHz; f_q = 265.25 MHz f_r = 613.25 MHz.

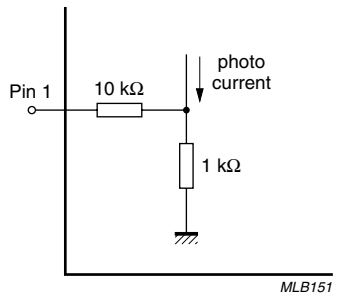
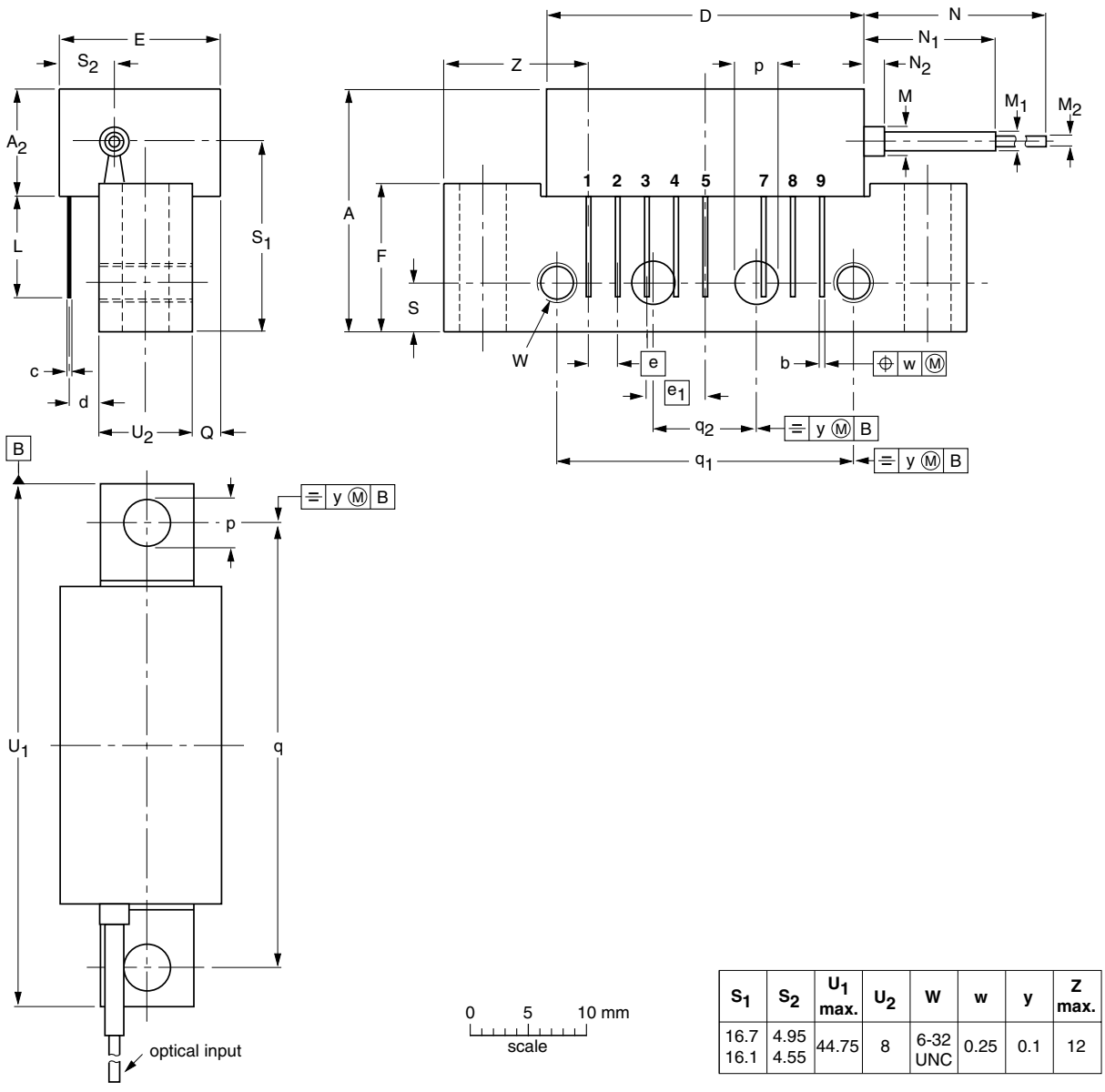


Fig.4 Monitor current pin.

PACKAGE OUTLINES

Rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounting holes; optical input; 8 gold-plated in-line leads **SOT115T**



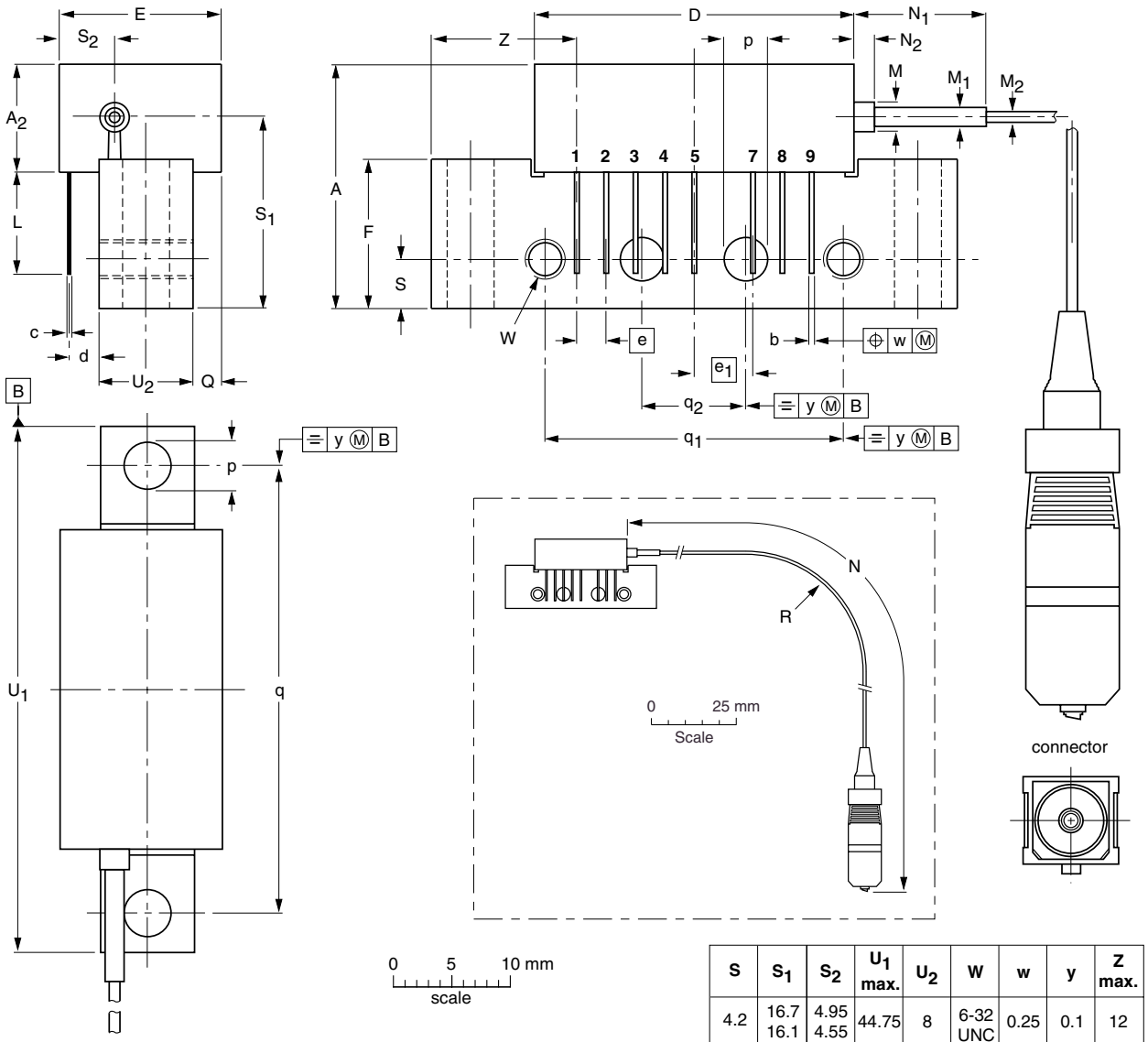
S_1	S_2	U_1 max.	U_2	W	w	y	Z max.
16.7 16.1	4.95 4.55	44.75	8	6-32 UNC	0.25	0.1	12

DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A_2 max.	b	c	D max.	d max.	E max.	e	e_1	F	L min.	M	M_1	M_2	N min.	N_1 max.	N_2 max.	p	Q max.	q	q_1	q_2	S
mm	20.8	9.1	0.51 0.38	0.25	27.2	2.54	13.75	2.54	5.08	12.7	8.8	2.5	1.6	0.9	1000	10.7	5	4.15 3.85	2.4	38.1	25.4	10.2	4.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT115T						~~99-04-13~~ 01-08-10

Rectangular single-ended package; aluminium flange;
2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounting holes;
optical input with connector; 8 gold-plated in-line leads **SOT115Y**



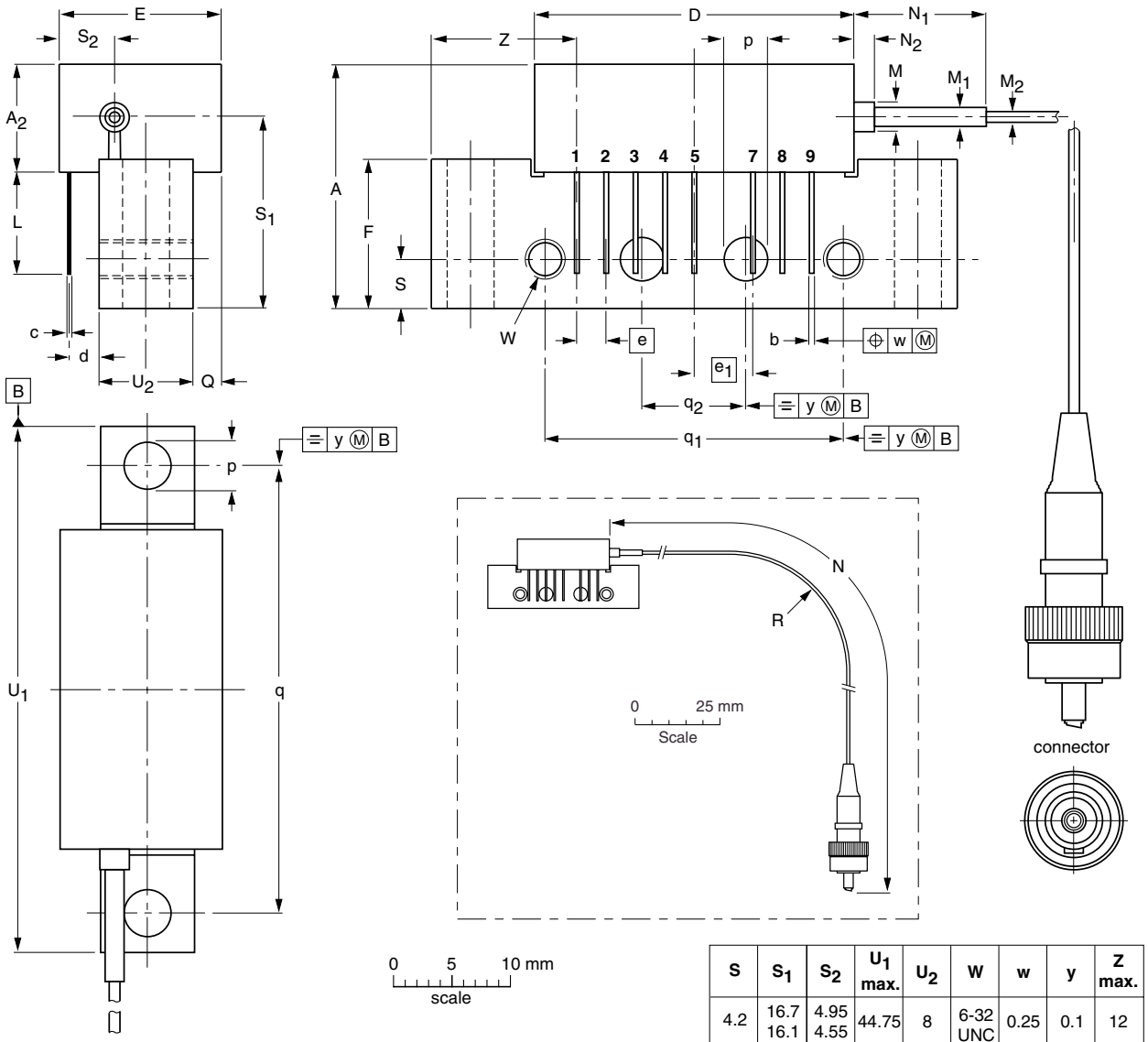
S	S_1	S_2	U_1 max.	U_2	W	w	y	Z max.
4.2	16.7 16.1	4.95 4.55	44.75	8	6-32 UNC	0.25	0.1	12

DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A_2 max.	b	c	D max.	d max.	E max.	e	e_1	F	L min.	M	M_1	M_2	N	N_1 max.	N_2 max.	p	Q max.	q	q_1	q_2	R min.
mm	20.8	9.1	0.51 0.38	0.25	27.2	2.54	13.75	2.54	5.08	12.7	8.8	2.5	1.6	0.9	861 746	10.7	5	4.15 3.85	2.4	38.1	25.4	10.2	35

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT115Y						~~00-01-06~~ 01-08-10

Rectangular single-ended package; aluminium flange;
2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounting holes;
optical input with connector; 8 gold-plated in-line leads **SOT115X**



S	S_1	S_2	U_1 max.	U_2	W	w	y	Z max.
4.2	16.7 16.1	4.95 4.55	44.75	8	6-32 UNC	0.25	0.1	12

DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A_2 max.	b	c	D max.	d max.	E max.	e	e_1	F	L min.	M	M_1	M_2	N	N_1 max.	N_2 max.	p	Q max.	q	q_1	q_2	R min.
mm	20.8	9.1	0.51 0.38	0.25	27.2	2.54	13.75	2.54	5.08	12.7	8.8	2.5	1.6	0.9	861 746	10.7	5	4.15 3.85	2.4	38.1	25.4	10.2	35

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT115X						~~00-01-06~~ 01-08-10

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DATA SHEET STATUS[1]	PRODUCT STATUS[2]	DEFINITIONS
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