

DATA SHEET

BLV2045N UHF power transistor

Objective specification
File under Discrete Semiconductors, SC08b

1997 Oct 23

UHF power transistor

BLV2045N

FEATURES

- Emitter ballasting resistors for optimum temperature profile
- Gold metallization ensures excellent reliability
- Internal input and output matching for an easy design of wideband circuits.

APPLICATIONS

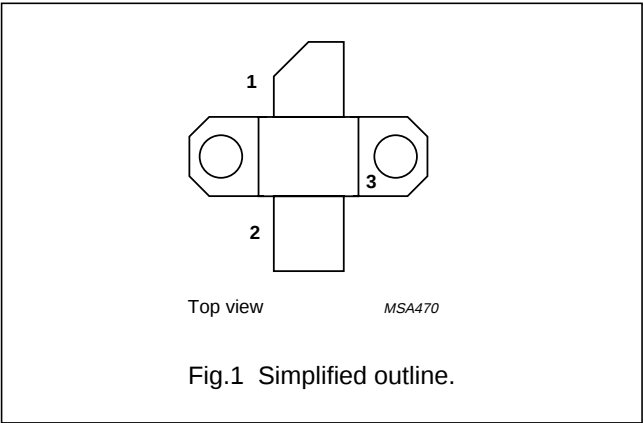
- Common emitter class-AB operation in PCN and PCS applications in the 1800 to 2000 MHz frequency range.

DESCRIPTION

NPN silicon planar UHF power transistor in a 2-lead SOT390A flange package with a ceramic cap. The emitter is connected to the flange.

PINNING - SOT390A

PIN	DESCRIPTION
1	collector
2	base
3	emitter, connected to flange



QUICK REFERENCE DATA

RF performance at $T_h = 25\text{ }^{\circ}\text{C}$ in a common emitter test circuit.

MODE OF OPERATION	f (MHz)	V_{CE} (V)	P_L (W)	G_p (dB)	η_c (%)	d_{im} (dBc)
CW, class-AB	2000	26	30	≥ 10	≥ 40	–
2-tone, class-AB	$f_1 = 2000.0$; $f_2 = 2000.1$	26	30 (PEP)	≥ 10	≥ 35	≤ -30

WARNING
Product and environmental safety - toxic materials.
This product contains beryllium oxide. The product is entirely safe provided that the BeO disc is not damaged. All persons who handle, use or dispose of this product should be aware of its nature and of the necessary safety precautions. After use, dispose of as chemical or special waste according to the regulations applying at the location of the user. It must never be thrown out with the general or domestic waste.

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LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	60	V
V_{CEO}	collector-emitter voltage	open base	–	27	V
V_{EBO}	emitter-base voltage	open collector	–	2.5	V
I_C	collector current (DC)		–	4	A
$I_{C(AV)}$	average collector current		–	4	A
P_{tot}	total power dissipation	$T_{mb} = 25\text{ °C}$	–	t.b.f.	W
T_{stg}	storage temperature		–65	+150	°C
T_j	operating junction temperature		–	200	°C

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-mb}$	thermal resistance from junction to mounting base	$P_{tot} = \text{t.b.f. W}; T_{mb} = 25\text{ °C}$	t.b.f.	K/W
$R_{th\ mb-h}$	thermal resistance from mounting base to heatsink		0.15	K/W

CHARACTERISTICS

 $T_j = 25\text{ °C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; $I_C = 15\text{ mA}$	60	–	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	open base; $I_C = 45\text{ mA}$	27	–	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; $I_E = 15\text{ mA}$	2.5	–	–	V
I_{CES}	collector leakage current	$V_{CE} = 40\text{ V}; V_{BE} = 0$	–	–	3	mA
h_{FE}	DC current gain	$V_{CE} = 26\text{ V}; I_C = 1.5\text{ A}$	45	–	–	
C_c	collector capacitance	$V_{CB} = 26\text{ V}; I_E = i_e = 0$; $f = 1\text{ MHz}$; note 1	–	t.b.f.	–	pF
C_{re}	feedback capacitance	$V_{CE} = 26\text{ V}; I_C = 0$; $f = 1\text{ MHz}$	–	t.b.f.	–	pF

Note

1. Capacitance of die only.

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APPLICATION INFORMATION

RF performance at $T_h = 25\text{ °C}$ in a common emitter test circuit.

MODE OF OPERATION	f (MHz)	V_{CE} (V)	I_{CQ} (mA)	P_L (W)	G_p (dB)	η_c (%)	d_{im} (dBc)
CW, class-AB	2000	26	60	30	≥ 10	≥ 40	–
2-tone, class-AB	$f_1 = 2000.0; f_2 = 2000.1$	26	60	30 (PEP)	≥ 10	≥ 30	≤ -30

Ruggedness in class-AB operation

The BLV2045N is capable of withstanding a load mismatch corresponding to $V_{SWR} = 3 : 1$ through all phases under the following conditions: $f_1 = 2000.0\text{ MHz}$; $f_2 = 2000.1\text{ MHz}$; $V_{CE} = 26\text{ V}$; $I_{CQ} = 60\text{ mA}$; $P_L = 30\text{ W (PEP)}$; $T_{mb} = 25\text{ °C}$.

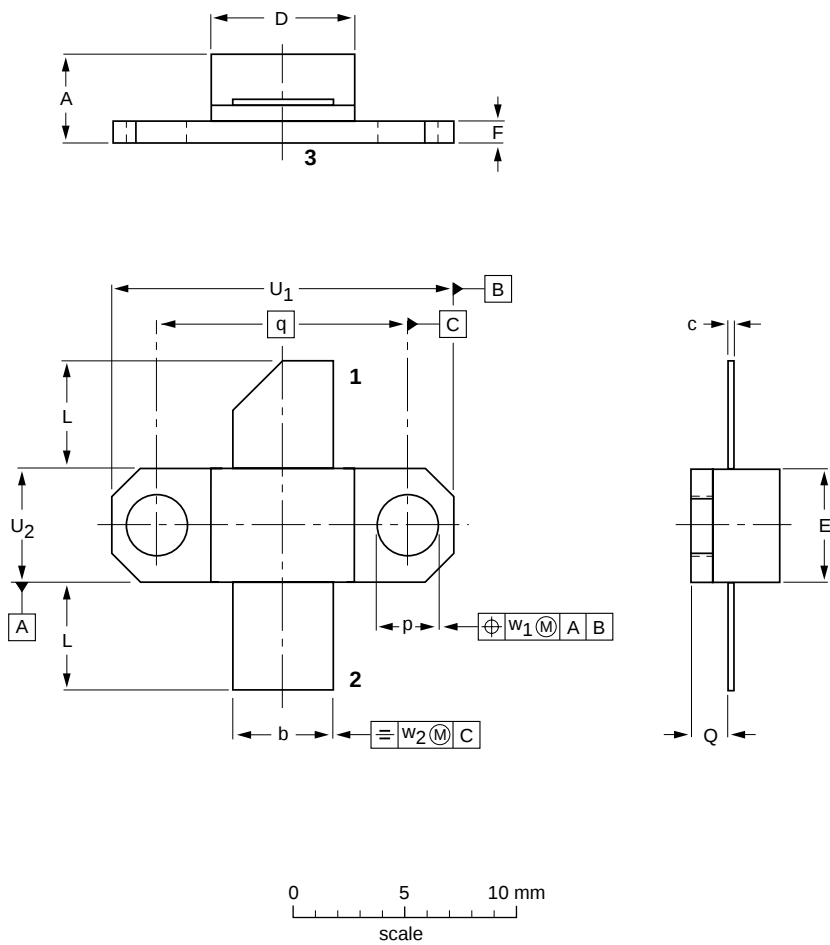
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PACKAGE OUTLINE

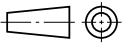
Flanged ceramic package; 2 mounting holes; 2 leads

SOT390A



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	b	c	D	E	F	L	p	Q	q	U ₁	U ₂	w ₁	w ₂
mm	4.37 3.55	5.72 5.46	0.16 0.10	8.69 8.07	6.91 6.29	1.66 1.39	6.10 5.33	3.43 3.17	2.32 2.00	14.22	19.03 18.77	6.43 6.17	0.51	1.02

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT390A						97-05-29

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DEFINITIONS

Data Sheet Status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

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