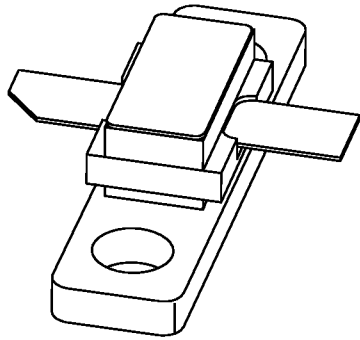


# DATA SHEET



**BLS3135-10**

Microwave power transistor

Product specification

2000 Feb 01

# Microwave power transistor

# BLS3135-10

### FEATURES

- Suitable for short and medium pulse applications
- Internal input and output matching networks for an easy circuit design
- Emitter ballasting resistors improve ruggedness
- Gold metallization ensures excellent reliability
- Interdigitated emitter-base structure provides high emitter efficiency
- Multicell geometry improves power sharing and reduces thermal resistance.

### APPLICATIONS

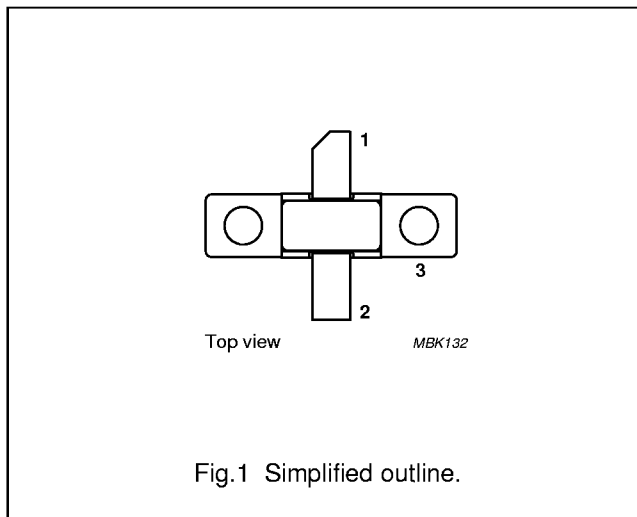
- Common base class-C pulsed power amplifier for radar applications in the 3.1 to 3.5 GHz range.

### DESCRIPTION

NPN silicon planar epitaxial microwave power transistor in a 2-lead rectangular flange package with a ceramic cap (SOT445C) with the common base connected to the flange.

### PINNING - SOT445C

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



### QUICK REFERENCE DATA

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

MODE OF OPERATION	f (GHz)	V <sub>CB</sub> (V)	P <sub>L</sub> (W)	G <sub>p</sub> (dB)	η <sub>c</sub> (%)
Pulsed class-C	3.1 to 3.5	40	≥10	typ. 9	typ. 40

### 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.

## Microwave power transistor

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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	–	75	V
$V_{CES}$	collector-emitter voltage	$R_{BE} = 0$	–	75	V
$V_{EBO}$	emitter-base voltage	open collector	–	2	V
$I_{CM}$	peak collector current	$t_p \leq 100 \mu\text{s}$ ; $\delta \leq 10\%$	–	1.5	A
$P_{tot}$	total power dissipation	$t_p = 100 \mu\text{s}$ ; $\delta = 10\%$ ; $T_h = 25 \text{ }^\circ\text{C}$	–	34	W
$T_{stg}$	storage temperature		–65	+200	$^\circ\text{C}$
$T_j$	operating junction temperature		–	200	$^\circ\text{C}$
$T_{sld}$	soldering temperature	up to 0.2 mm from ceramic cap; $t \leq 10 \text{ s}$	–	235	$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$Z_{thj-h}$	thermal impedance from junction to heatsink	$t_p = 100 \mu\text{s}$ ; $\delta = 10\%$ ; note 1	5.2	K/W
		$t_p = 200 \mu\text{s}$ ; $\delta = 10\%$ ; note 1	5.8	K/W
		$t_p = 300 \mu\text{s}$ ; $\delta = 10\%$ ; note 1	6.3	K/W

**Note**

- Equivalent thermal impedance under pulsed microwave operating conditions.

**CHARACTERISTICS** $T_j = 25 \text{ }^\circ\text{C}$  unless otherwise specified.

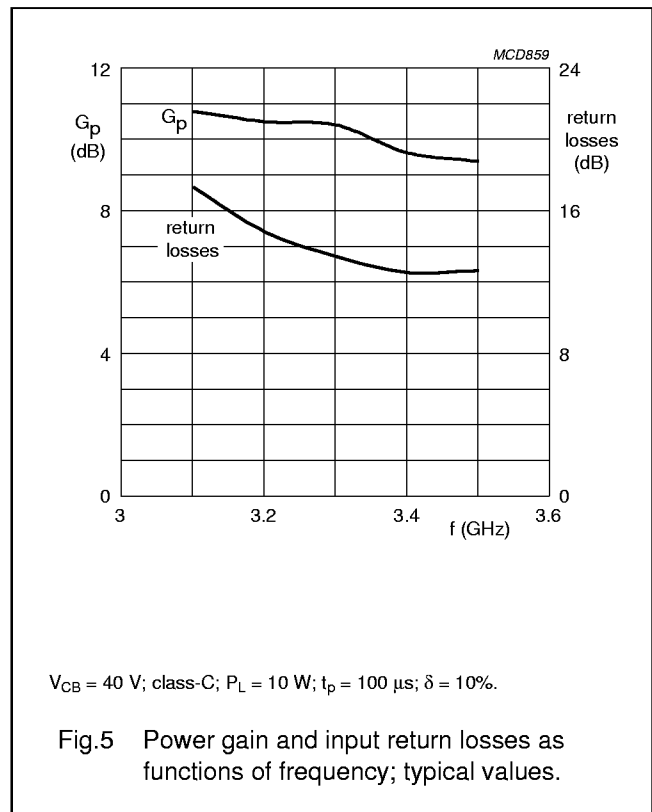
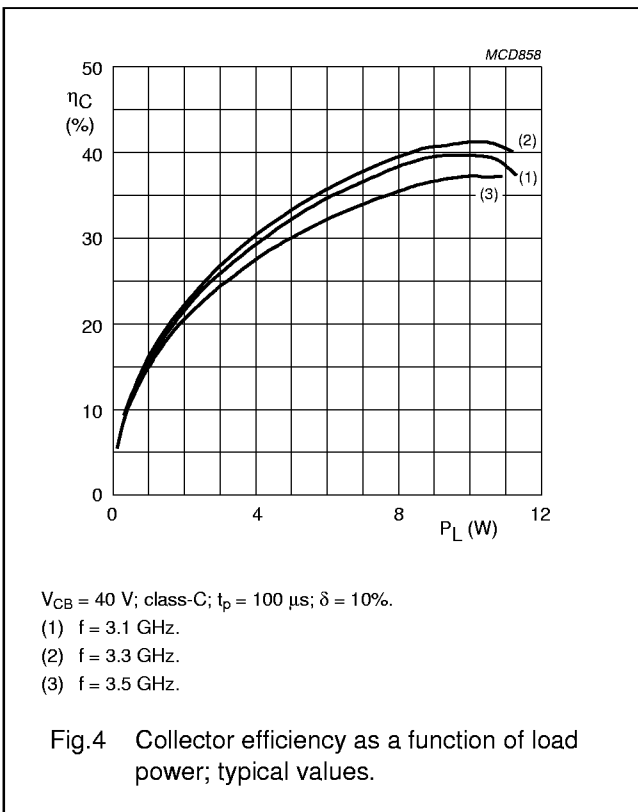
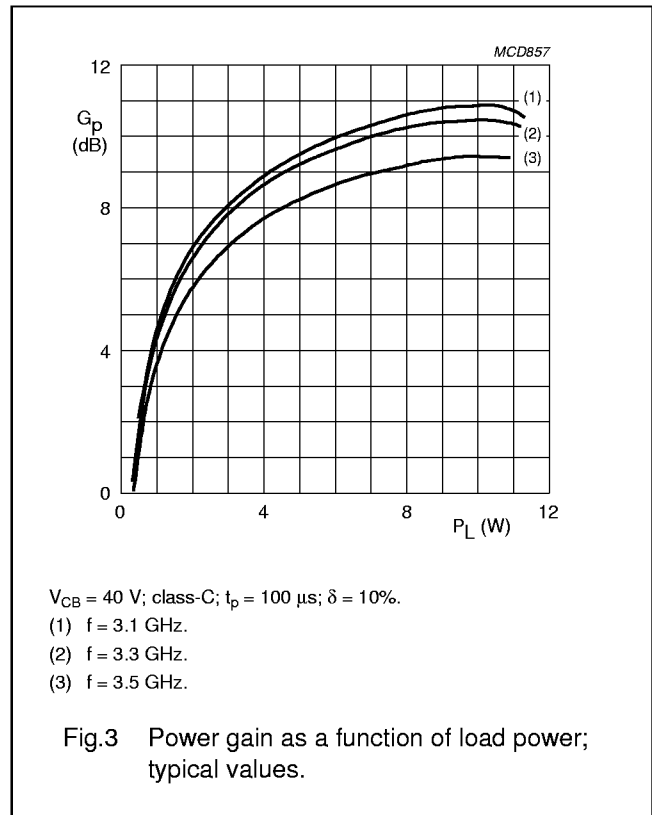
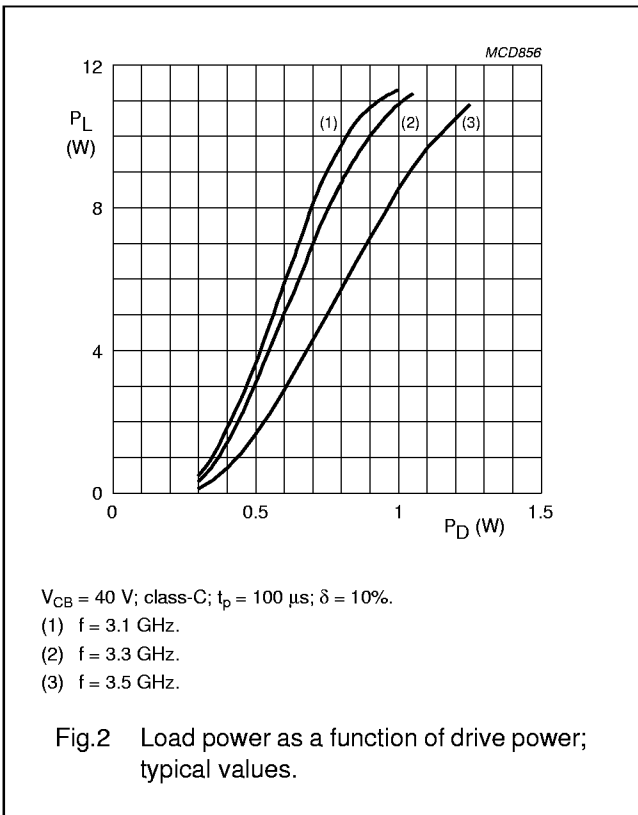
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	$I_C = 2.5 \text{ mA}$ ; open emitter	75	–	V
$V_{(BR)CES}$	collector-emitter breakdown voltage	$I_C = 2.5 \text{ mA}$ ; $V_{BE} = 0$	75	–	V
$I_{CBO}$	collector leakage current	$V_{CB} = 40 \text{ V}$ ; $I_E = 0$	–	0.3	mA
$I_{CES}$	collector leakage current	$V_{CE} = 40 \text{ V}$ ; $V_{BE} = 0$	–	0.5	mA
$I_{EBO}$	emitter leakage current	$V_{EB} = 1.5 \text{ V}$ ; $I_C = 0$	–	0.1	mA
$h_{FE}$	DC current gain	$V_{CE} = 5 \text{ V}$ ; $I_C = 0.25 \text{ A}$	40	–	

**APPLICATION INFORMATION**RF performance at  $T_h = 25 \text{ }^\circ\text{C}$  in a common-base test circuit.

MODE OF OPERATION	f (GHz)	$V_{CE}$ (V)	$P_L$ (W)	$G_p$ (dB)	$\eta_c$ (%)
Class-C; $t_p = 100 \mu\text{s}$ ; $\delta = 10\%$	3.1 to 3.5	40	$\geq 10$	$\geq 7.5$ typ. 9	$\geq 35$ typ. 40

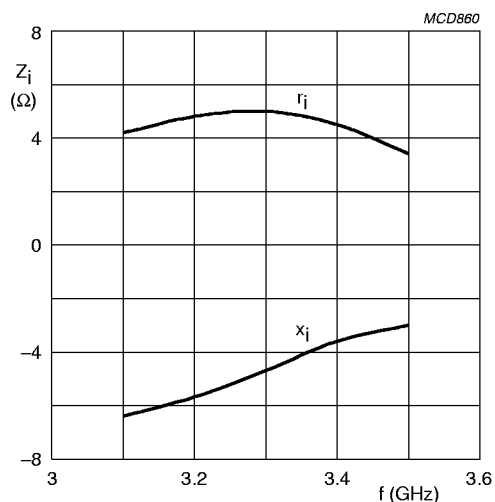
Microwave power transistor

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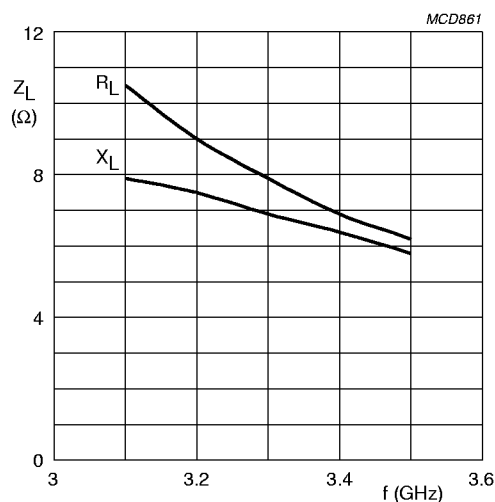
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$V_{CB} = 40$  V; class-C;  $P_L = 10$  W.

Fig. 6 Input impedance as a function of frequency (series components); typical values.

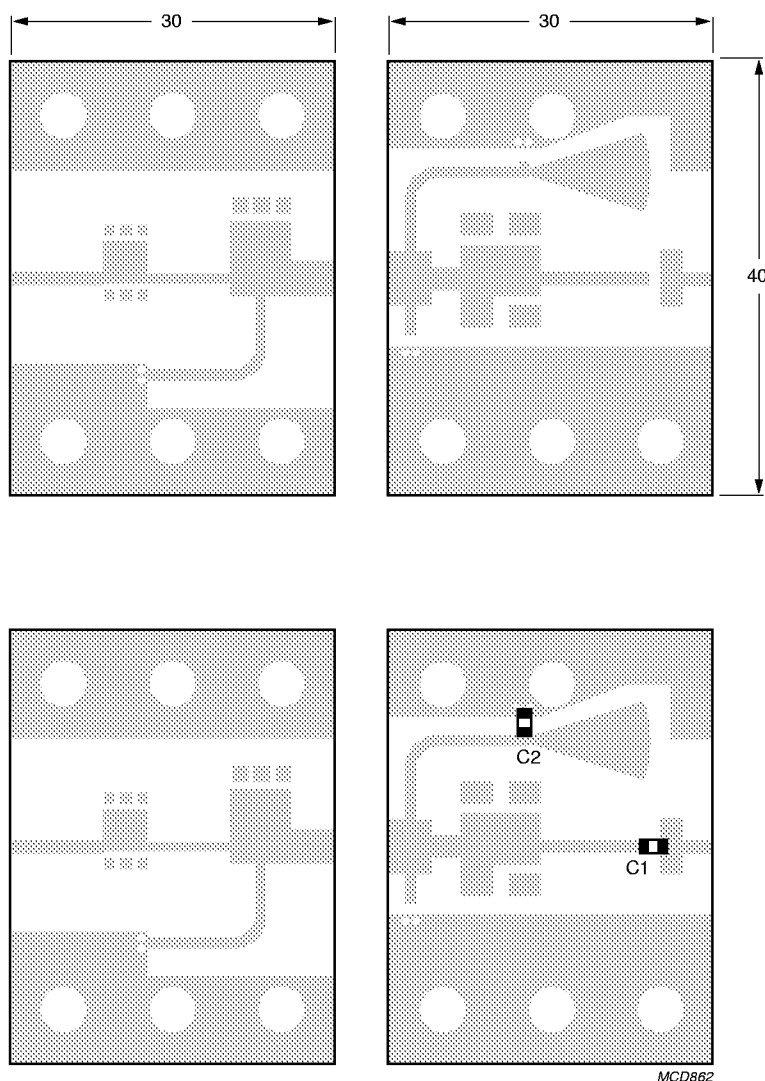


$V_{CB} = 40$  V; class-C;  $P_L = 10$  W.

Fig. 7 Load impedance as a function of frequency (series components); typical values.

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Dimensions in mm.

The components are situated on one side of the copper-clad printed-circuit board with Duroid dielectric ( $\epsilon_r = 2.2$ ), thickness 0.38 mm. The other side is unetched and serves as a ground plane.

C1 = 10 pF (ATC 100A); C2 = 100 pF (ATC 100A).

Fig.8 Component layout for 3.1 to 3.5 GHz class-C test circuit.

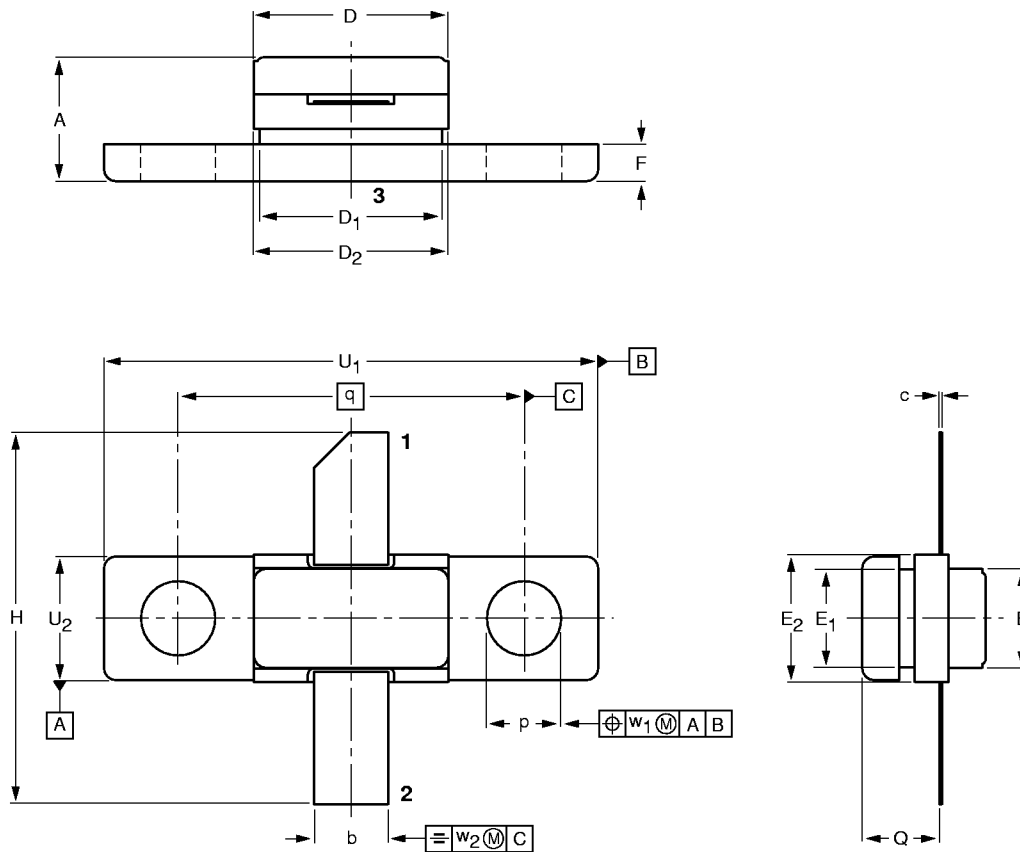
Microwave power transistor

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PACKAGE OUTLINE

Flanged hermetic ceramic package; 2 mounting holes; 2 leads

SOT445C



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	c	D	D <sub>1</sub>	D <sub>2</sub>	E	E <sub>1</sub>	E <sub>2</sub>	F	H	p	Q	q	U <sub>1</sub>	U <sub>2</sub>	w <sub>1</sub>	w <sub>2</sub>
mm	5.57 4.70	3.15 2.95	0.15 0.09	8.13 7.87	7.65 7.35	8.15 7.85	4.20 3.93	4.25 3.95	5.31 5.01	1.82 1.22	15.84 14.64	3.35 3.05	3.33 3.03	14.22	20.47 20.17	5.18 4.98	0.51	1.02

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT445C						97-05-23