

# DATA SHEET

**BGY143**

VHF power amplifier module

Product specification

Supersedes data of June 1993

File under Discrete Semiconductors, SC09

1996 May 21

# VHF power amplifier module

# BGY143

## FEATURES

- 12.5 V nominal supply voltage
- 13 W output power.

## APPLICATIONS

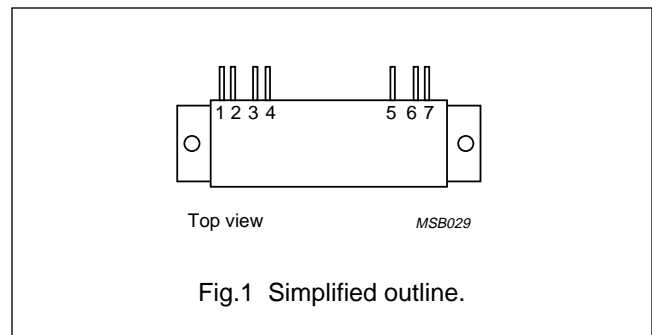
- Mobile communication equipment operating directly from 12 V vehicle electrical systems.

## DESCRIPTION

The BGY143 is a two-stage broadband RF amplifier module in a SOT132B package. The module consists of two NPN transistor dies together with lumped-element matching components.

## PINNING - SOT132B

PIN	DESCRIPTION
1	RF input
2	ground
3	V <sub>S1</sub>
4	ground
5	V <sub>S2</sub>
6	ground
7	RF output
Flange	ground



## QUICK REFERENCE DATA

RF performance at  $T_h = 25\text{ }^\circ\text{C}$ .

MODE OF OPERATION	f (MHz)	V <sub>S1</sub> ; V <sub>S2</sub> (V)	P <sub>D</sub> (mW)	P <sub>L</sub> (W)	$\eta$ (%)	Z <sub>S</sub> ; Z <sub>L</sub> ( $\Omega$ )
CW	146 to 174	12.5	150	$\geq 13$	typ. 48	50

## WARNING

### Product and environmental safety - toxic materials

This product contains beryllium oxide. The product is entirely safe provided that the BeO inserts are 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.

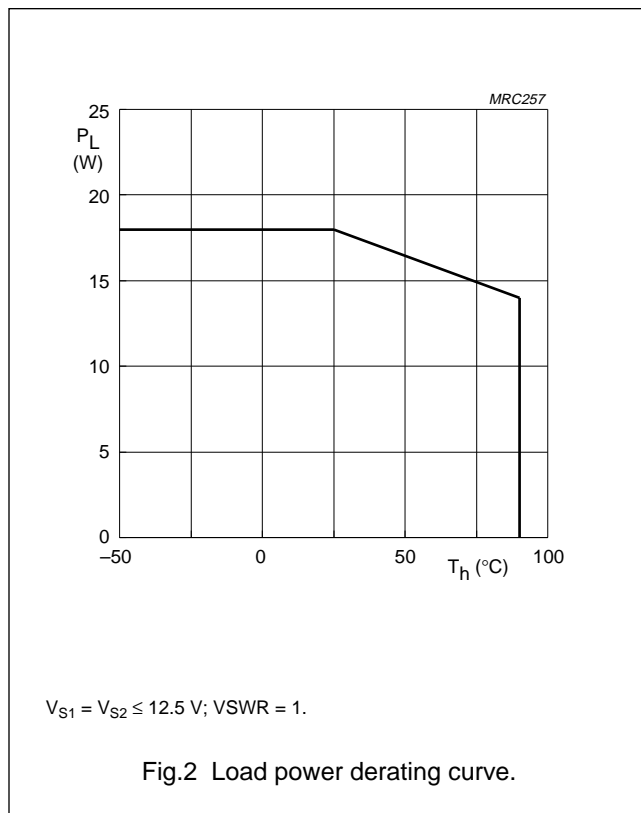
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## LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$V_{S1}$	DC supply voltage	–	15.6	V
$V_{S2}$	DC supply voltage	–	15.6	V
$V_i$	RF input voltage	–	25	V
$V_o$	RF output voltage	–	25	V
$P_D$	input drive power	–	300	mW
$P_L$	load power	–	18	W
$T_{stg}$	storage temperature	–40	+100	°C
$T_h$	heatsink operating temperature	–20	+90	°C



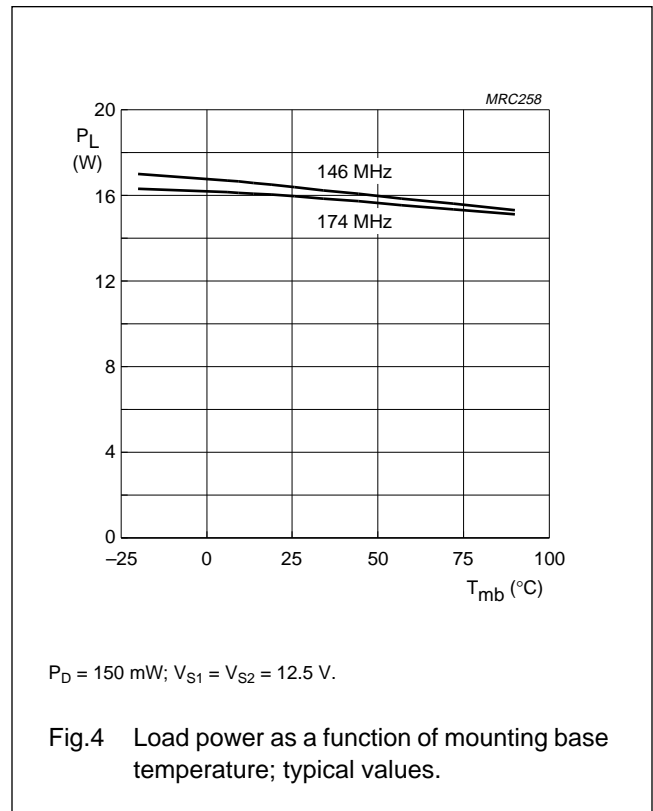
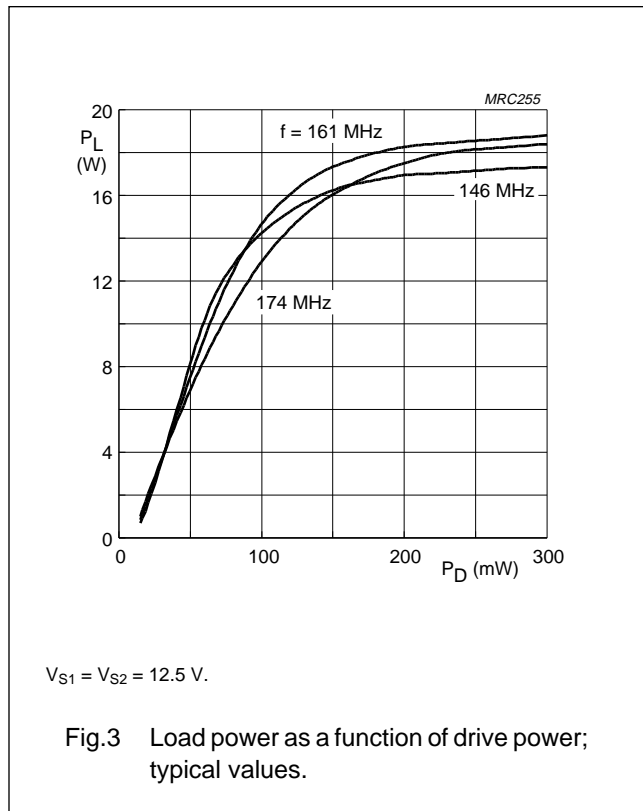
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## CHARACTERISTICS

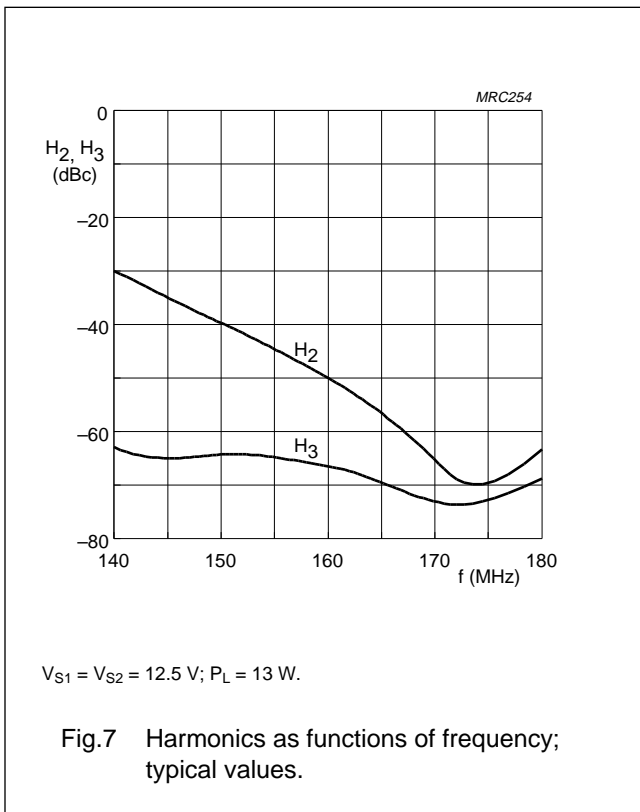
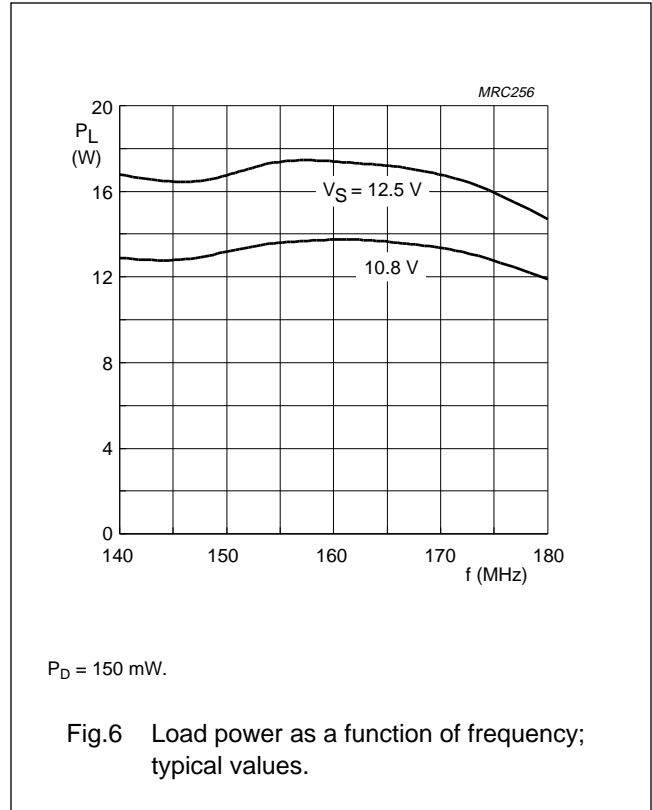
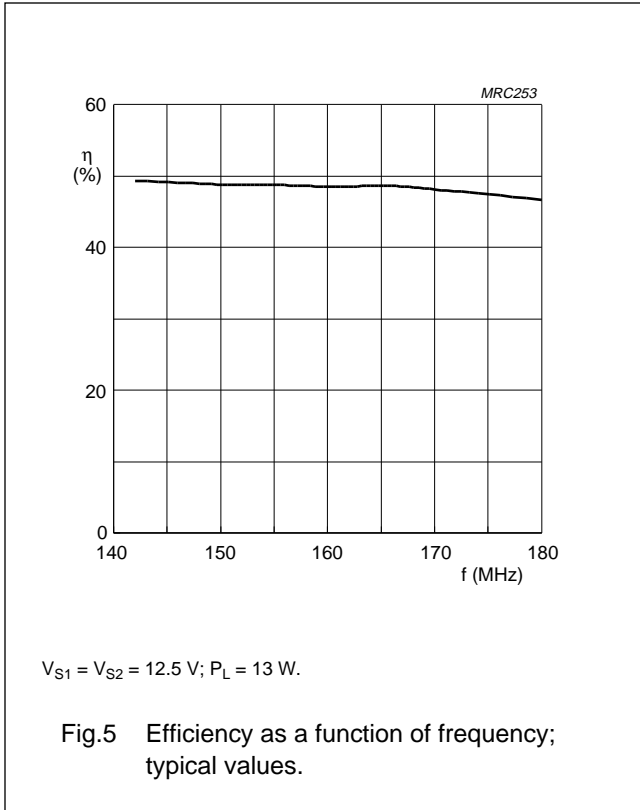
$Z_S = Z_L = 50 \Omega$ ;  $P_D = 150 \text{ mW}$ ;  $V_{S1} = V_{S2} = 12.5 \text{ V}$ ;  $T_h = 25 \text{ }^\circ\text{C}$ ; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency		146	–	174	MHz
$I_{Q2}$	leakage current	$V_{S1} = 0$ ; $P_D = 0$	–	–	10	mA
$P_L$	load power		13	–	–	W
$\eta$	efficiency	adjust $P_D$ for $P_L = 13 \text{ W}$	40	48	–	%
$H_2$	second harmonic	adjust $P_D$ for $P_L = 13 \text{ W}$	–	–34	–25	dBc
$H_3$	third harmonic	adjust $P_D$ for $P_L = 13 \text{ W}$	–	–34	–25	dBc
$V_{SWR}_{in}$	input VSWR	adjust $P_D$ for $P_L = 13 \text{ W}$	–	1.5	3	
	stability	$V_{S1} = V_{S2} = 10.8 \text{ to } 15.6 \text{ V}$ ; $P_L = 1 \text{ to } 15 \text{ W}$ ; $V_{SWR} = 3 : 1$	–	–	–60	dBc
	ruggedness	$P_D \leq 300 \text{ mW}$ ; $V_{S1} = V_{S2} = 15.6 \text{ V}$ duration 5 s; $P_L < 18 \text{ W}$ ; $V_{SWR} = 50 : 1$	no degradation			



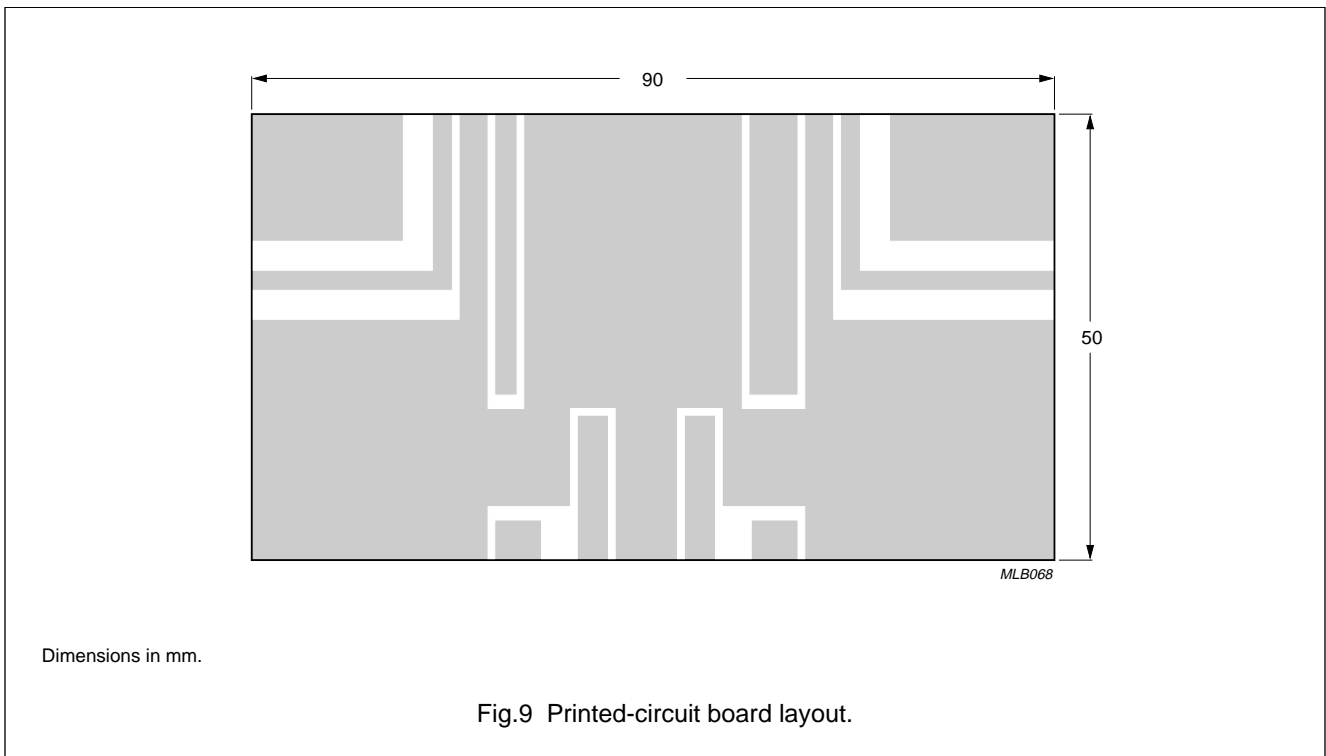
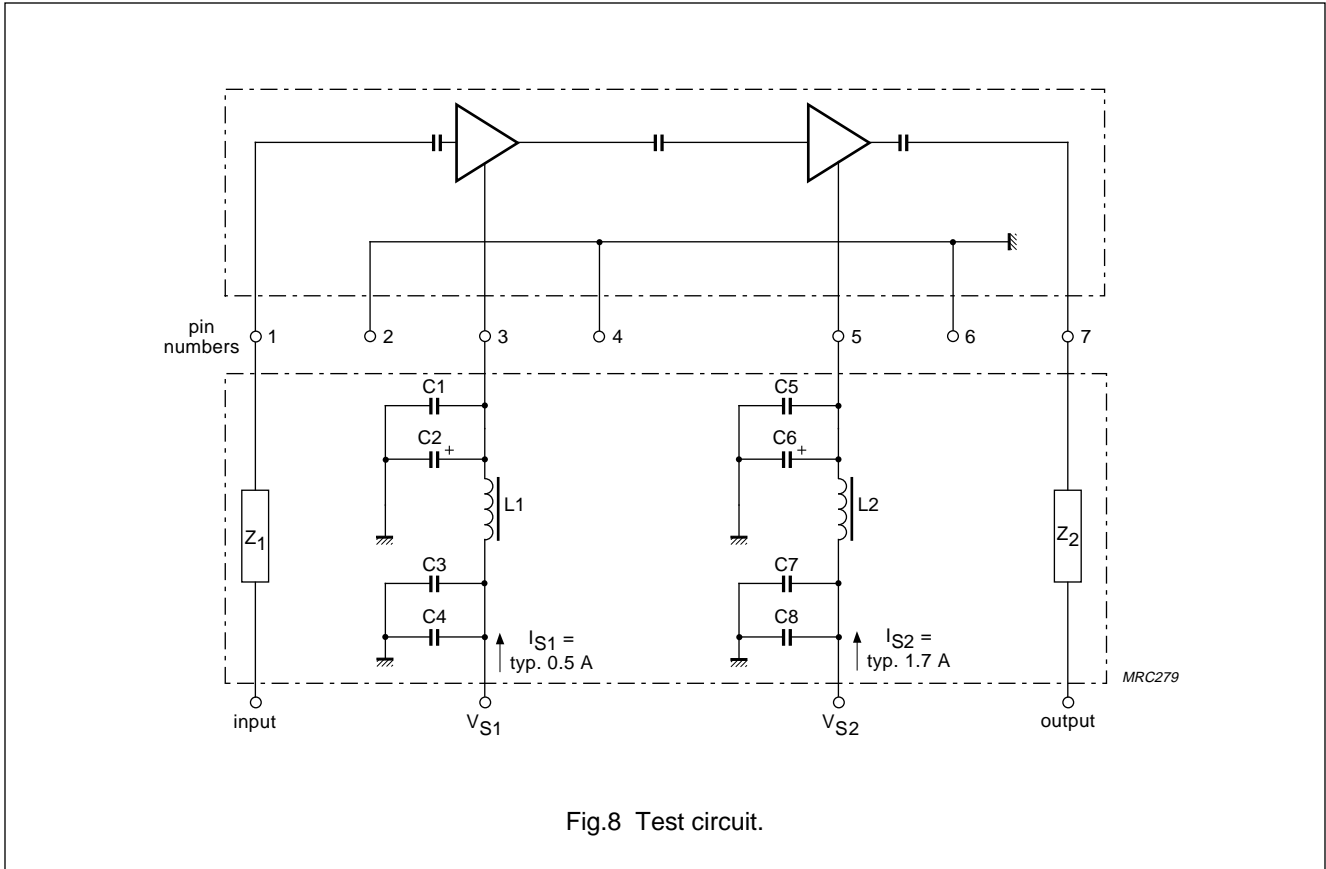
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## List of components used in test circuit (see Fig.8)

COMPONENT	DESCRIPTION	VALUE	CATALOGUE NO
C1, C5	multilayer chip capacitor	1 nF	4822 590 06614
C2, C6	tantalum capacitor	6.8 $\mu$ F, 35 V	2022 001 00067
C3, C7	multilayer chip capacitor	10 nF	2222 852 47103
C4, C8	multilayer chip capacitor	100 nF	2222 852 47104
L1, L2	1 turn 0.5 mm copper wire on ferrite coil	1 $\mu$ H	3122 108 20153
Z <sub>1</sub> , Z <sub>2</sub>	stripline; note 1	50 $\Omega$	

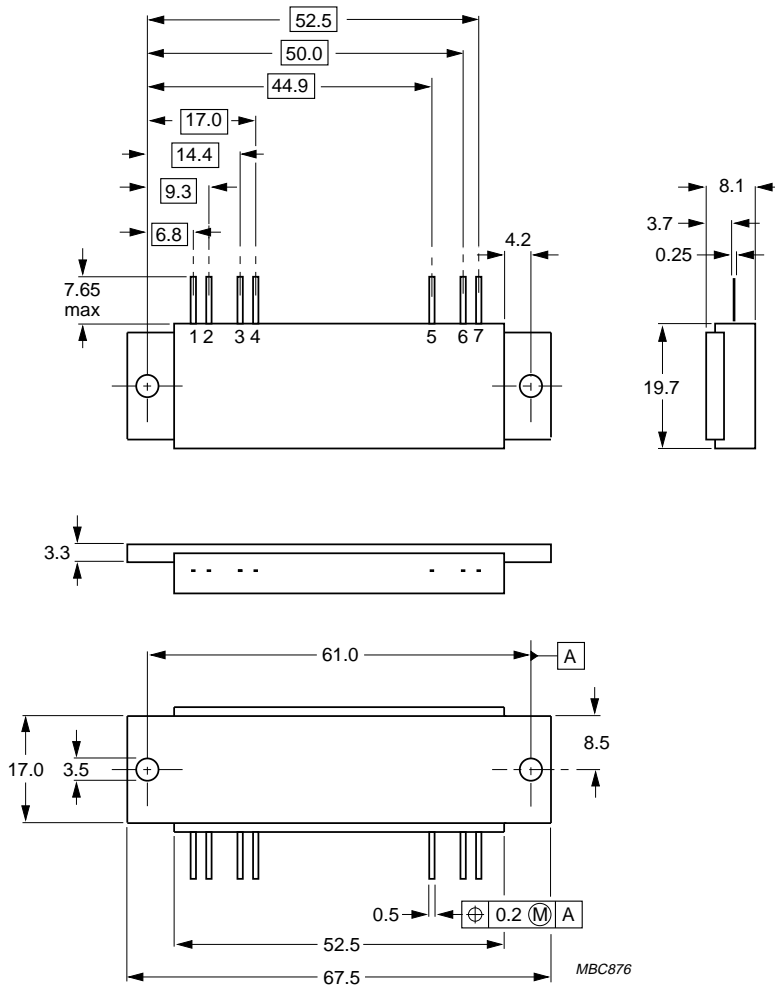
**Note**

1. The striplines are on a double copper-clad printed-circuit board, with epoxy dielectric ( $\epsilon_r = 4.7$ ), thickness  $\frac{1}{16}$  inch.

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## PACKAGE OUTLINE



Dimensions in mm.

Fig.10 SOT132B.



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**DEFINITIONS**

<b>Data sheet status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

**LIFE SUPPORT APPLICATIONS**

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