

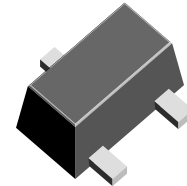
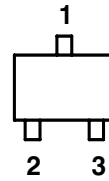


Silicon NPN Planar RF Transistor

Description

The main purpose of this bipolar transistor is broadband amplification up to 2 GHz. In the space-saving 3-pin surface-mount SOT-490 package electrical performance and reliability are taken to a new level covering a smaller footprint on PC boards than previous packages.

In addition to space savings, the SOT-490 provides a higher level of reliability than other 3-pin packages, such as more resistance to moisture.



16867



Electrostatic sensitive device.
Observe precautions for handling.

Due to the short length of its leads the SOT-490 is also reducing package inductances resulting in some better electrical performance. All of these aspects make this device an ideal choice for demanding RF applications.

Applications

For low noise and high gain broadband amplifiers at collector currents from 0.2 mA to 5 mA.

Features

- Low supply voltage
- Low current consumption
- Low noise figure
- 50 Ω input impedance at 945 MHz
- High power gain
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



Mechanical Data

- Typ:** S852TF
- Case:** SOT-490 Plastic case
- Weight:** approx. 2.5 mg
- Pinning:** 1 = Collector, 2 = Base, 3 = Emitter

Parts Table

Part	Marking	Package
S852TF	52	SOT-490

Absolute Maximum Ratings

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Collector-base voltage		V _{CBO}	12	V
Collector-emitter voltage		V _{CEO}	6	V
Emitter-base voltage		V _{EBO}	2	V
Collector current		I _C	8	mA
Total power dissipation	T _{amb} ≤ 125 °C	P _{tot}	30	mW
Junction temperature		T _j	150	°C
Storage temperature range		T _{stg}	- 65 to + 150	°C

Maximum Thermal Resistance

Parameter	Test condition	Symbol	Value	Unit
Junction ambient	1)	R_{thJA}	450	K/W

1) on glass fibre printed board (25 x 20 x 1.5) mm³ plated with 35 μm Cu

Electrical DC Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

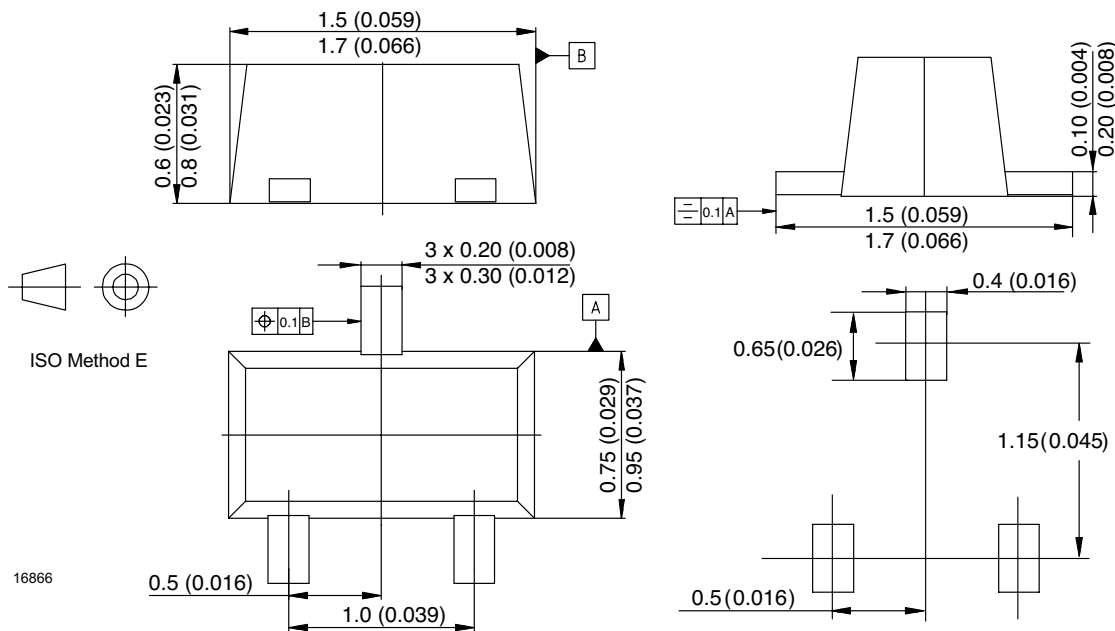
Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Collector-emitter cut-off current	$V_{CE} = 12\text{ V}, V_{BE} = 0$	I_{CES}			100	μA
Collector-base cut-off current	$V_{CB} = 8\text{ V}, I_E = 0$	I_{CBO}			100	nA
Emitter-base cut-off current	$V_{EB} = 1\text{ V}, I_C = 0$	I_{EBO}			1	μA
Collector-emitter breakdown voltage	$I_C = 1\text{ mA}, I_B = 0$	$V_{(BR)CEO}$	6			V
Collector-emitter saturation voltage	$I_C = 5\text{ mA}, I_B = 0.5\text{ mA}$	V_{CEsat}		0.1	0.4	V
DC forward current transfer ratio	$V_{CE} = 5\text{ V}, I_C = 30\text{ mA}$	h_{FE}	40	90	150	

Electrical AC Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Transition frequency	V _{CE} = 3 V, I _C = 1 mA, f = 500 MHz	f _T		4.7		GHz
	V _{CE} = 2 V, I _C = 1.5 mA, f = 500 MHz	f _T		5.2		GHz
Collector-base capacitance	V _{CB} = 1 V, f = 1 MHz	C _{cb}		0.25		pF
Noise figure	V _{CE} = 2 V, I _C = 0.5 mA, Z _S = Z _{Sopt} , f = 450 MHz	F _{opt}		1.1		dB
	V _{CE} = 3 V, I _C = 1 mA, Z _S = Z _{Sopt} , f = 945 MHz	F _{opt}		1.7		dB
	V _{CE} = 2 V, I _C = 1.5 mA, Z _S = Z _{Sopt} , f = 945 MHz	F _{opt}		1.9		dB
Power gain	V _{CE} = 2 V, I _C = 0.5 mA, f = 450 MHz	G _{pe} @ F _{opt}		11.5		dB
	V _{CE} = 3 V, I _C = 1 mA, f = 945 MHz	G _{pe} @ F _{opt}		10.5		dB
	V _{CE} = 2 V, I _C = 1.5 mA, f = 945 MHz	G _{pe} @ F _{opt}		12.5		dB
Transducer gain	V _{CE} = 2 V, I _C = 1.5 mA, f = 945 MHz, Z _O = 50 Ω	S _{21e} ²		10		dB
Real part of input impedance	V _{CE} = 3 V, I _C = 1 mA, f = 945 MHz	Re(h _{11e})		50		Ω
	V _{CE} = 2 V, I _C = 1.5 mA, f = 945 MHz	Re(h _{11e})		50		Ω

Package Dimensions in mm



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It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

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3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

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