BFP181T / BFP181TW / BFP181TRW

Vishay Semiconductors

Silicon NPN Planar RF Transistor

Features
- Low noise figure
- High power gain
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Applications
For low noise and high gain broadband amplifiers at collector currents from 0.5 mA to 12 mA.

Mechanical Data
Typ: BFP181T
Case: SOT-143 Plastic case
Weight: approx. 8.0 mg
Marking: 18
Pinning:
1 = Collector, 2 = Emitter,
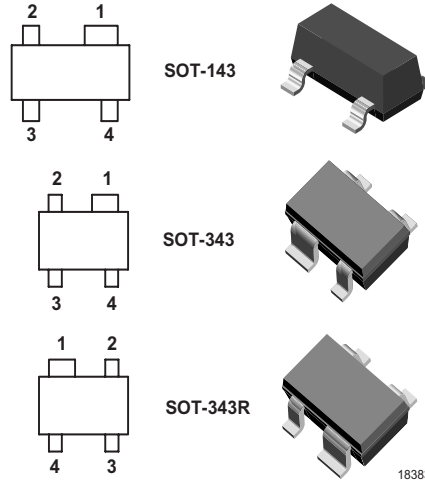3 = Base, 4 = Emitter
Typ: BFP181TW
Case: SOT-343 Plastic case
Weight: approx. 6.0 mg
Marking: W18
Pinning:
1 = Collector, 2 = Emitter,

3 = Base, 4 = Emitter
Typ: BFP181TRW
Case: SOT-343R Plastic case
Weight: approx. 6.0 mg
Marking: WSF
Pinning:
1 = Collector, 2 = Emitter,
3 = Base, 4 = Emitter

SOT-143

SOT-343

SOT-343R

18383

Electrostatic sensitive device.
Observe precautions for handling.

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

Parameter	Test condition	Symbol	Value	Unit
Collector-base voltage		V_{CBO}	15	V
Collector-emitter voltage		V_{CEO}	10	V
Emitter-base voltage		V_{EBO}	2	V
Collector current		I_C	20	mA
Total power dissipation	$T_{amb} \leq 78$ °C	P_{tot}	160	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) mm^3 plated with 35 μm Cu

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1

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Electrical DC Characteristics

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

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Collector-emitter cut-off current	$V_{CE} = 15$ V, $V_{BE} = 0$	I_{CES}			100	μA
Collector-base cut-off current	$V_{CB} = 10$ V, $I_E = 0$	I_{CBO}			100	nA
Emitter-base cut-off current	$V_{EB} = 1$ V, $I_C = 0$	I_{EBO}			1	μA
Collector-emitter breakdown voltage	$I_C = 1$ mA, $I_B = 0$	$V_{(BR)CEO}$	10			V
Collector-emitter saturation voltage	$I_C = 15$ mA, $I_B = 1.5$ mA	V_{CEsat}		0.1	0.4	V
DC forward current transfer ratio	$V_{CE} = 6$ V, $I_C = 5$ mA	h_{FE}	50	100	150	
	$V_{CE} = 6$ V, $I_C = 10$ mA	h_{FE}		100		

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 = 6 mA, f = 500 MHz	f_T		6.8		GHz
	V_{CE} = 8 V, I_C = 10 mA, f = 500 MHz	f_T		8.0		GHz
Collector-base capacitance	V_{CB} = 10 V, f = 1 MHz	C_{cb}		0.3		pF
Collector-emitter capacitance	V_{CE} = 10 V, f = 1 MHz	C_{ce}		0.2		pF
Emitter-base capacitance	V_{EB} = 0.5 V, f = 1 MHz	C_{eb}		0.45		pF
Noise figure	V_{CE} = 5 V, I_C = 3 mA, $Z_S = Z_{Sopt}$, f = 900 MHz	F		1.5		dB
	V_{CE} = 5 V, I_C = 3 mA, $Z_S = Z_{Sopt}$, f = 1.75 GHz	F		2.2		dB
Power gain	V_{CE} = 8 V, I_C = 8 mA, Z_S = 50 Ω, $Z_L = Z_{Lopt}$, f = 900 MHz	G_{pe}		16.5		dB
	V_{CE} = 8 V, I_C = 8 mA, Z_S = 50 Ω, $Z_L = Z_{Lopt}$, f = 1.75 GHz	G_{pe}		13.5		dB
Transducer gain	V_{CE} = 8 V, I_C = 8 mA, Z_0 = 50 Ω, f = 900 MHz	$|S_{21e}|^2$		16		dB

Package Dimensions in mm

Mounting Pad Layout

96 12240

ISO Method E
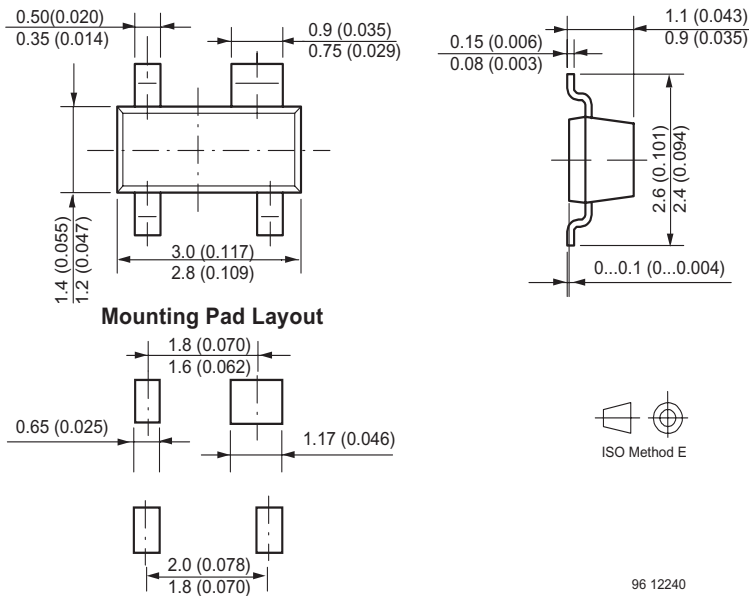
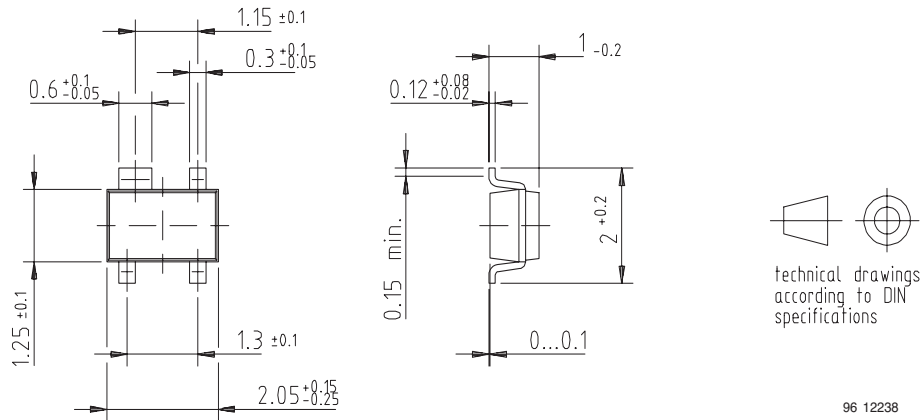**Vishay Semiconductors**

Package Dimensions in mm

96 12237

Package Dimensions in mm

96 12238
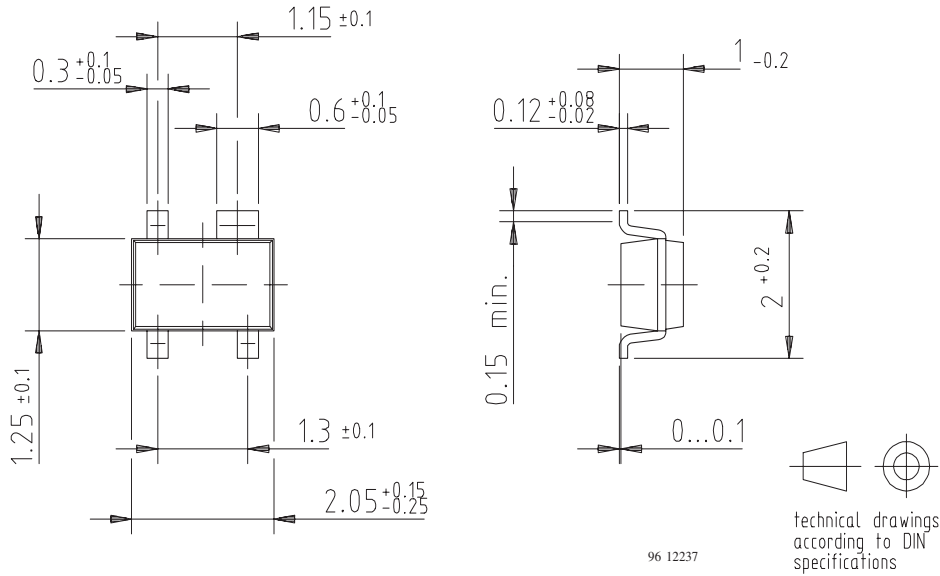
Ozone Depleting Substances Policy Statement

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.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

We reserve the right to make changes to improve technical design
and may do so without further notice.
Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany