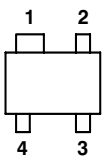
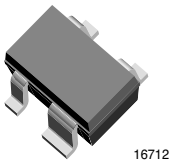
25 GHz Silicon NPN Planar RF Transistor

Features

- Very low noise figure
- Very high power gain
- High transition frequency f_T = 24 GHz
- Low feedback capacitance
- Emitter pins are thermal leads
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC





Electrostatic sensitive device.
Observe precautions for handling.

Applications

For RF front-ends, low noise, and wideband applications, such as in analogue and digital cellular and cordless phones
(DECT, PHD), in TV systems (e.g. satellite tuners), in high frequency oscillators up to 12 GHz, in pagers and radar detectors.

Mechanical Data

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

Parts Table

Part	Marking	Package
TSDF1920W	YH3	SOT-343R

Absolute Maximum Ratings

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

Parameter	Test condition	Symbol	Value	Unit
Collector-base voltage		V_{CBO}	10	V
Collector-emitter voltage		V_{CEO}	3.5	V
Emitter-base voltage		V_{EBO}	1.5	V
Collector current		I_C	40	mA
Total power dissipation	$T_{amb} \leq 60$ °C	P_{tot}	200	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

Electrical DC Characteristics

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

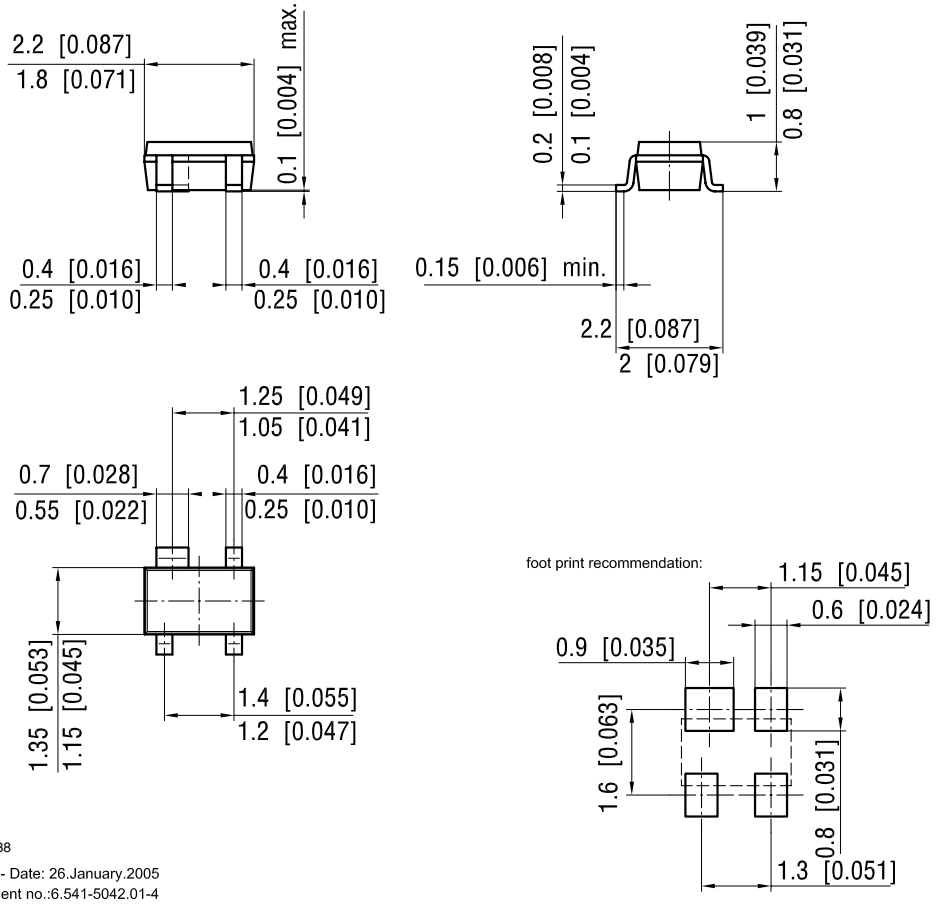
Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Collector-emitter cut-off current	V_{CE} = 5 V, V_{BE} = 0	I_{CES}			100	µA
Collector-base cut-off current	V_{CB} = 5 V, I_E = 0	I_{CBO}			100	nA
Collector-emitter breakdown voltage	I_C = 1 mA, I_B = 0	$V_{(BR)CEO}$	3.5			V
Collector-emitter saturation voltage	I_C = 30 mA, I_B = 3 mA	V_{CEsat}		0.1	0.25	V
DC forward current transfer ratio	V_{CE} = 2 V, I_C = 20 mA	h_{FE}	50	100	150	

Electrical AC Characteristics

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

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Transition frequency	V_{CE} = 2 V, I_C = 25 mA, f = 1 GHz	f_T		24		GHz
Collector-base capacitance	V_{CB} = 2 V, f = 1 MHz	C_{cb}		0.15	0.3	pF
Collector-emitter capacitance	V_{CE} = 2 V, f = 1 MHz	C_{ce}		0.4		pF
Emitter-base capacitance	V_{EB} = 0.5 V, f = 1 MHz	C_{eb}		0.6		pF
Noise figure	V_{CE} = 2 V, I_C = 5 mA, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, f = 2 GHz	F		1.2		dB
Power gain, maximum stable gain	V_{CE} = 2 V, I_C = 25 mA, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, f = 2 GHz	$G_{pe} = G_{ms} = \lvert S_{21e}/S_{12e} \rvert$		19		dB
Transducer gain	V_{CE} = 2 V, I_C = 25 mA, $Z_S = Z_L$ = 50 Ω, f = 2 GHz	$\lvert S_{21e} \rvert^2$	13.5	16.4		dB
Third order intercept point at output	V_{CE} = 2 V, I_C = 25 mA, $Z_S = Z_L$ = 50 Ω, f = 2 GHz	IP_3		22		dBm
1 dB compression point	V_{CE} = 2 V, I_C = 25 mA, $Z_S = Z_L$ = 50 Ω, f = 2 GHz	P_{-1dB}		12		dBm

Package Dimensions in mm



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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.

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

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