25 GHz Silicon NPN Planar RF Transistor

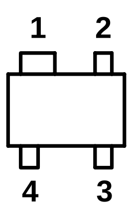
Electrostatic sensitive device.
Observe precautions for handling.

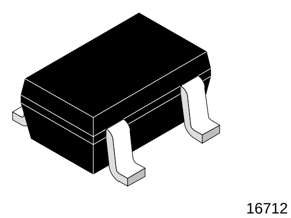
Applications

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

Features

- Very low noise figure
- Very high power gain
- High transition frequency f_T = 25 GHz
- Low feedback capacitance
- Emitter pins are thermal leads





TSDF2005W Marking: YH2
Plastic case (SOT 343R)
1 = Emitter, 2 = Base, 3 = Emitter, 4 = Collector

Absolute Maximum Ratings

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

Parameter	Test Conditions	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	12	mA
Total power dissipation	$T_{amb} \leq 132$ ˚C	P_{tot}	40	mW
Junction temperature		T_j	150	˚C
Storage temperature range		T_{stg}	–65 to +150	˚C
Junction ambient	on glass fibre printed board (25 x 20 x 1.5) mm^3 plated with 35 μm Cu	R_{thJA}	450	K/W

Electrical DC Characteristics

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

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Collector 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
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	$V_{(BR)CEO}$	3.5			V
Collector-emitter saturation voltage	I_C = 5 mA, I_B = 0.5 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	

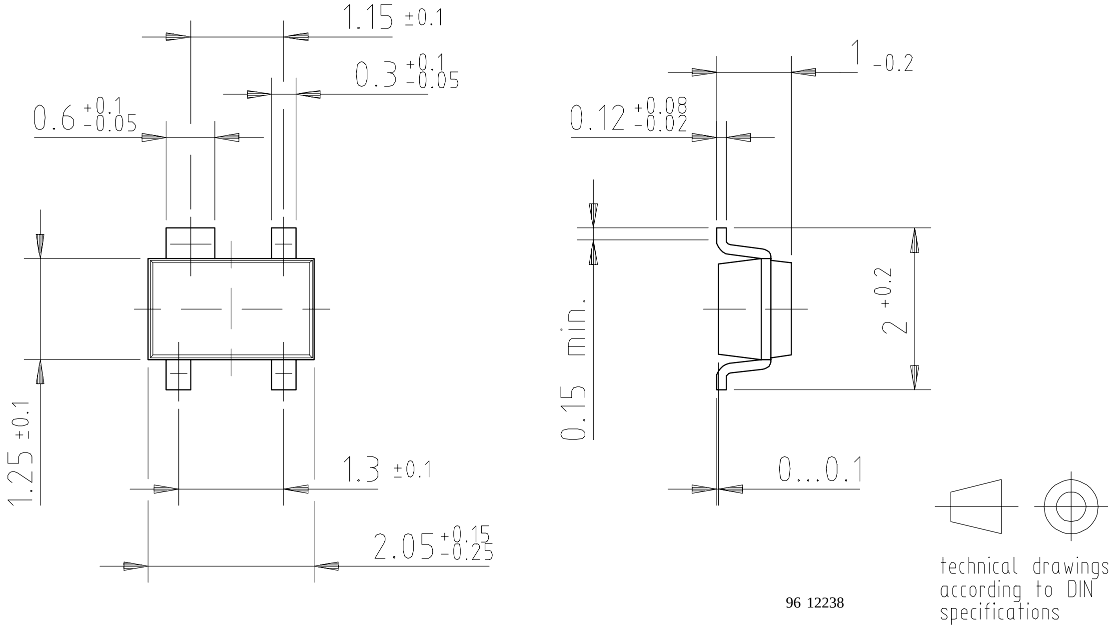
Electrical AC Characteristics

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

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Transition frequency	V_{CE} = 2 V, I_C = 10 mA, f = 1 GHz	f_T		25		GHz
Collector-base capacitance	V_{CB} = 2 V, f = 1 MHz	C_{cb}		0.05	0.08	pF
Collector-emitter capacitance	V_{CE} = 2 V, f = 1 MHz	C_{ce}		0.3		pF
Emitter-base capacitance	V_{EB} = 0.5 V, f = 1 MHz	C_{eb}		0.3		pF
Noise figure	V_{CE} = 2 V, I_C = 2 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 = 5 mA, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, f = 2 GHz	$G_{pe} = G_{ms}$ *)		21		dB
Transducer gain	V_{CE} = 2 V, I_C = 5 mA, $Z_S = Z_L$= 50 Ω, f = 2 GHz	$\vert S_{21e} \vert^2$	14	17		dB
Third order intercept point at output	V_{CE} = 2 V, I_C = 10 mA, $Z_S = Z_L$= 50 Ω, f = 2 GHz	IP_3		15		dBm
1 dB compression point	V_{CE} = 2 V, I_C = 10 mA, $Z_S = Z_L$= 50 Ω, f = 2 GHz	P_{-1dB}		5		dBm

*) $G_{ms} = | S_{21e}/S_{12e} |$

Dimensions of TSDF2005W in mm



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.

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