

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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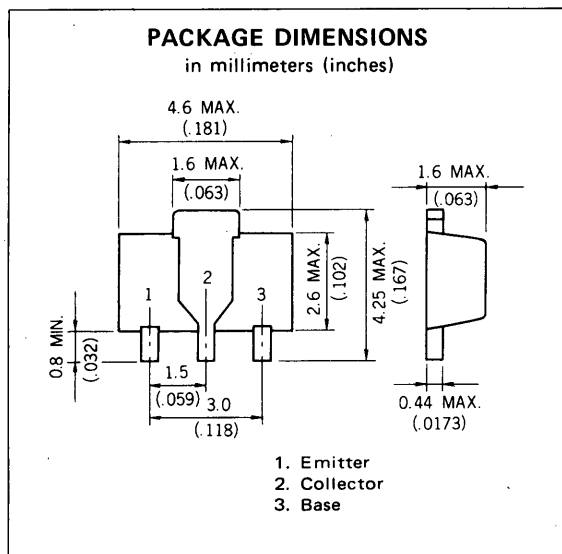
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NPN SILICON EPITAXIAL TRANSISTOR
POWER MINI MOLD

DESCRIPTION

The 2SD1005 is designed for audio frequency power amplifier application, especially in Hybrid Integrated Circuits.



FEATURES

- World Standard Miniature Package : SOT-89
- High Collector to Base Voltage : $V_{CBO} > 100$ V
- Excellent DC Current Gain Linearity : $h_{FE} = 80$ TYP. ($V_{CE} = 2.0$ V, $I_C = 500$ mA)
- Complements to PNP type 2SB804

ABSOLUTE MAXIMUM RATINGS ($T_a = 25$ °C)

Maximum Voltages and Currents

Collector to Base Voltage	V_{CBO}	100	V
Collector to Emitter Voltage	V_{CEO}	80	V
Emitter to Base Voltage	V_{EBO}	5.0	V
Collector Current (DC)	I_C	1.0	A
Collector Current (Pulse)*	I_C	1.5	A

Maximum Power Dissipation

Total Power Dissipation at 25 °C Ambient Temperature**	P_T	2.0	W
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Maximum Temperatures

Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	-55 to +150	°C

*PW ≤ 10 ms, duty cycle ≤ 50 %

**When mounted on ceramic substrate of 16 cm² x 0.7 mm

ELECTRICAL CHARACTERISTICS ($T_a = 25$ °C)

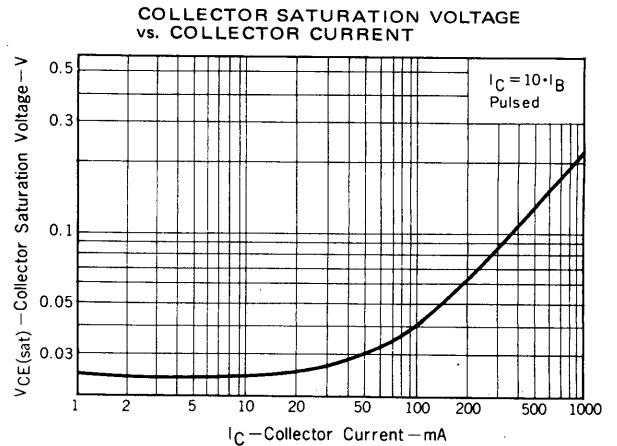
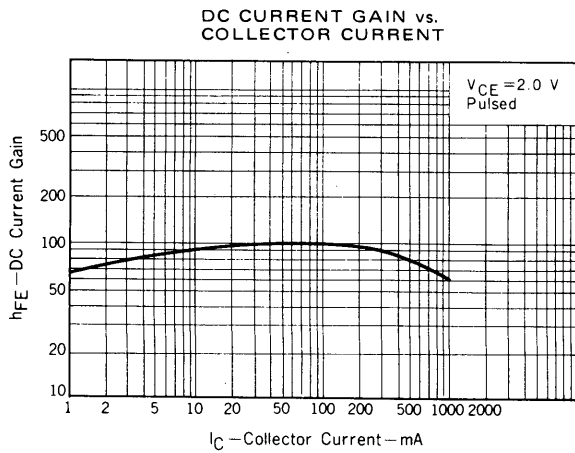
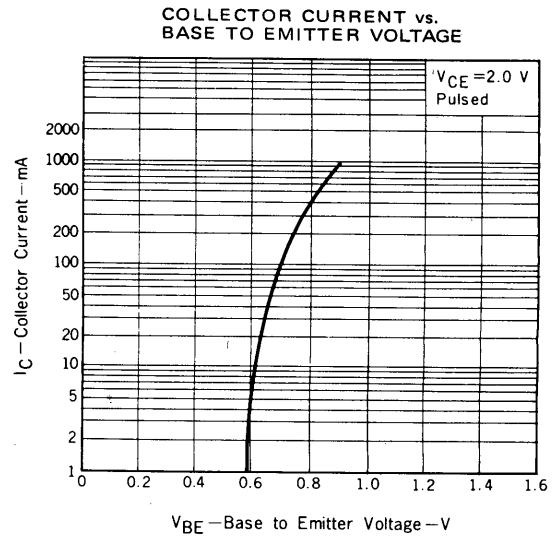
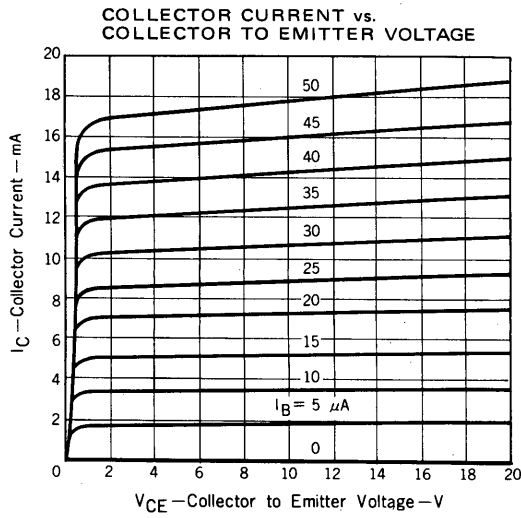
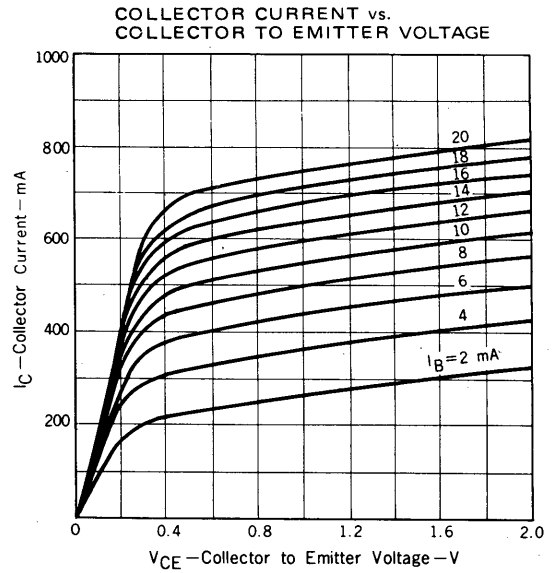
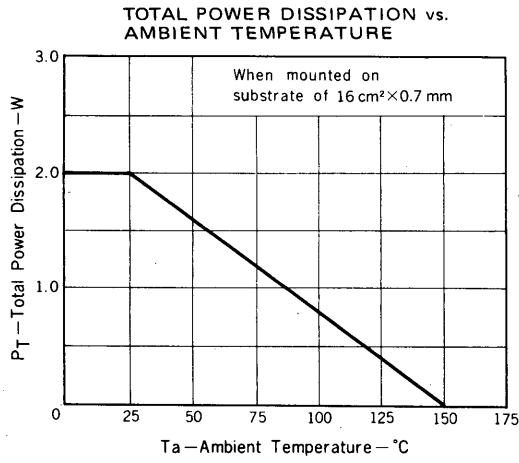
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			100	nA	$V_{CB} = 100$ V, $I_E = 0$
Emitter Cutoff Current	I_{EBO}			100	nA	$V_{EB} = 5.0$ V, $I_C = 0$
DC Current Gain	h_{FE1}	90	200	400		$V_{CE} = 2.0$ V, $I_C = 100$ mA ***
DC Current Gain	h_{FE2}	25	80			$V_{CE} = 2.0$ V, $I_C = 500$ mA ***
Collector Saturation Voltage	$V_{CE(sat)}$		0.15	0.50	V	$I_C = 500$ mA, $I_B = 50$ mA ***
Base Saturation Voltage	$V_{BE(sat)}$		0.9	1.50	V	$I_C = 500$ mA, $I_B = 50$ mA ***
Base to Emitter Voltage	V_{BE}	600	630	700	mV	$V_{CE} = 10$ V, $I_C = 10$ mA ***
Gain Bandwidth Product	f_T		160		MHz	$V_{CE} = 5.0$ V, $I_E = -10$ mA
Output Capacitance	C_{ob}		12		pF	$V_{CB} = 10$ V, $I_E = 0$, $f = 1.0$ MHz

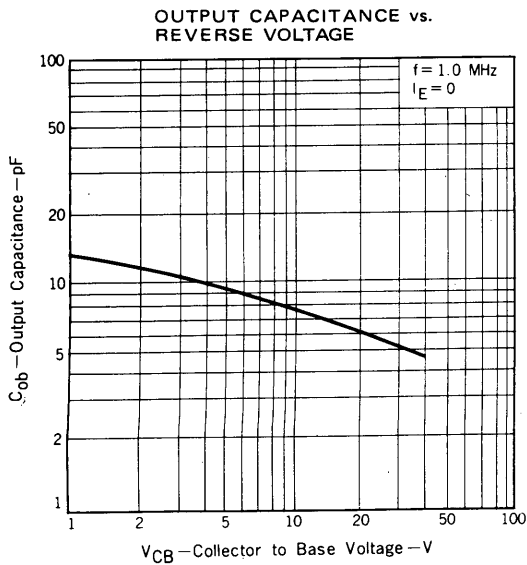
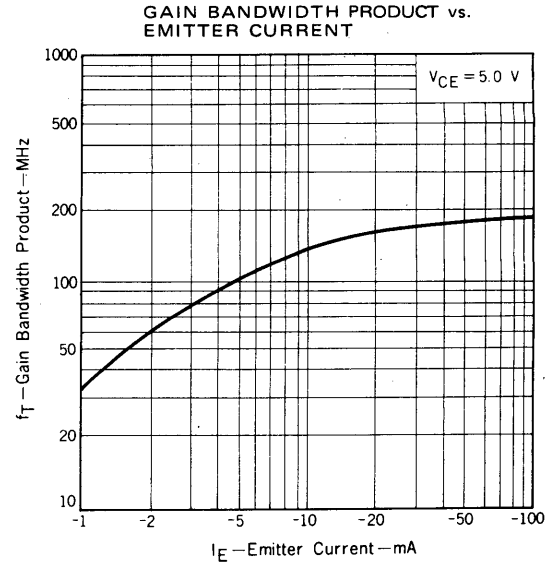
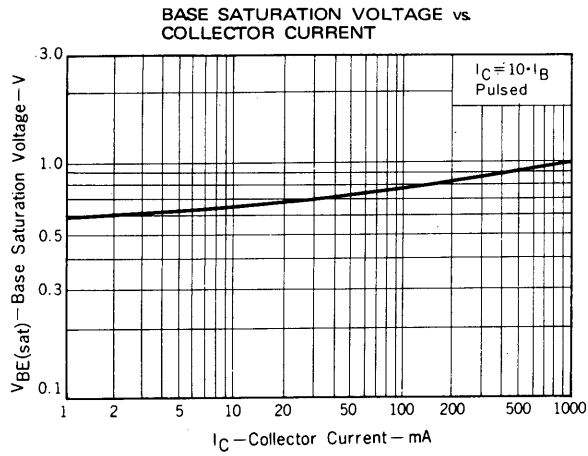
***Pulsed: PW ≤ 350 μs, duty cycle ≤ 2 %

h_{FE} Classification

MARKING	BW	BV	BU
h_{FE1}	90 - 180	135 - 270	200 - 400

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)





REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system.	TEI-1202
Quality grade on NEC semiconductor devices.	IEI-1209
Semiconductor device mounting technology manual.	IEI-1207
Semiconductor device package manual.	IEI-1213
Guide to quality assurance for semiconductor devices.	MEI-1202
Semiconductor selection guide.	MF-1134

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