

To our customers,

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## Old Company Name in Catalogs and Other Documents

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

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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

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# DATA SHEET

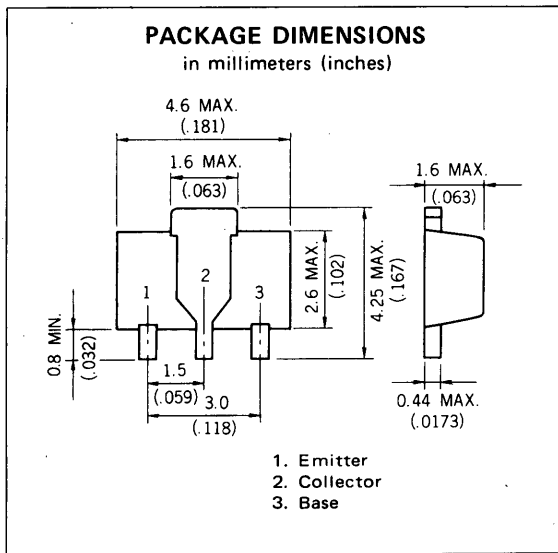
# RENESAS

# SILICON TRANSISTOR 2SD1005

## 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 cm<sup>2</sup> x 0.7 mm

### ELECTRICAL CHARACTERISTICS ( $T_a = 25$ °C)

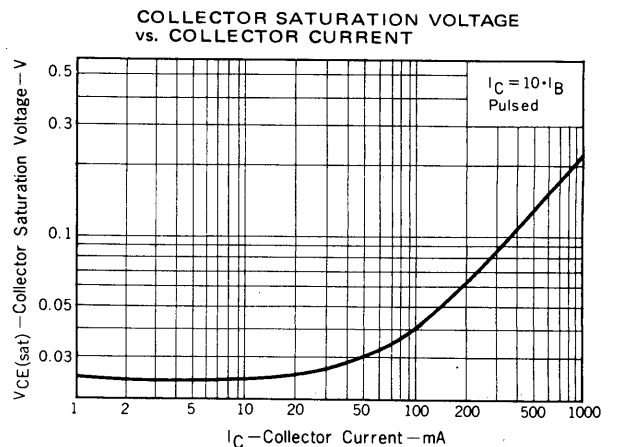
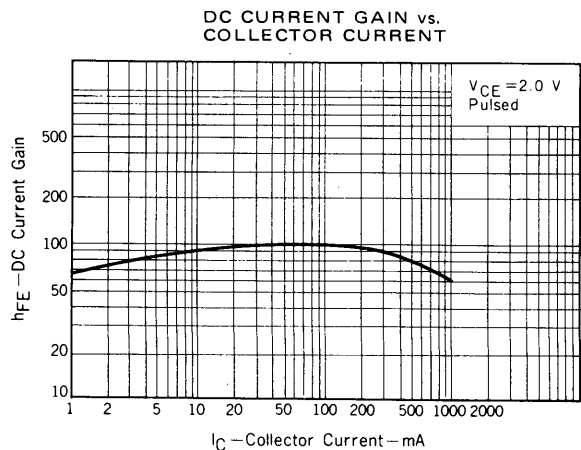
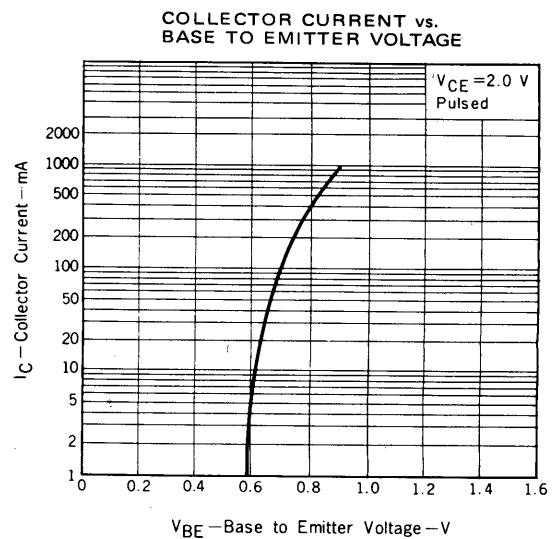
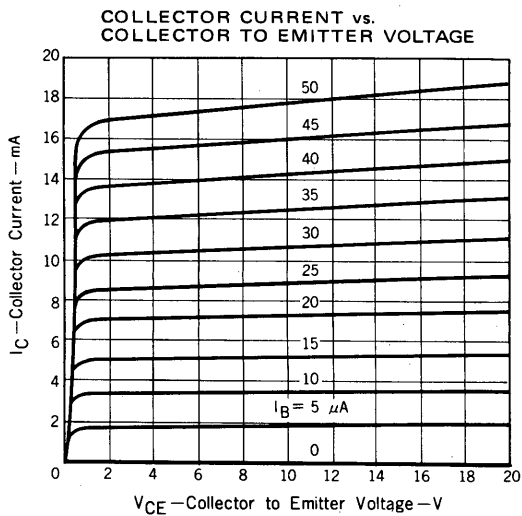
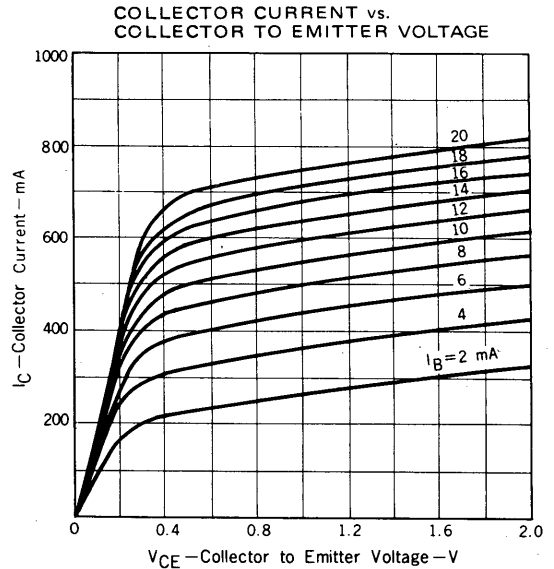
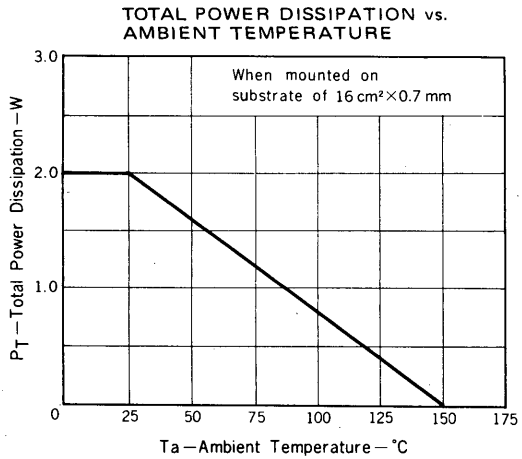
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	$I_{CBO}$			100	nA	$V_{CB} = 100$ V, $I_E = 0$
Emitter Cutoff Current	$I_{EBO}$			100	nA	$V_{EB} = 5.0$ V, $I_C = 0$
DC Current Gain	$h_{FE1}$	90	200	400		$V_{CE} = 2.0$ V, $I_C = 100$ mA ***
DC Current Gain	$h_{FE2}$	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

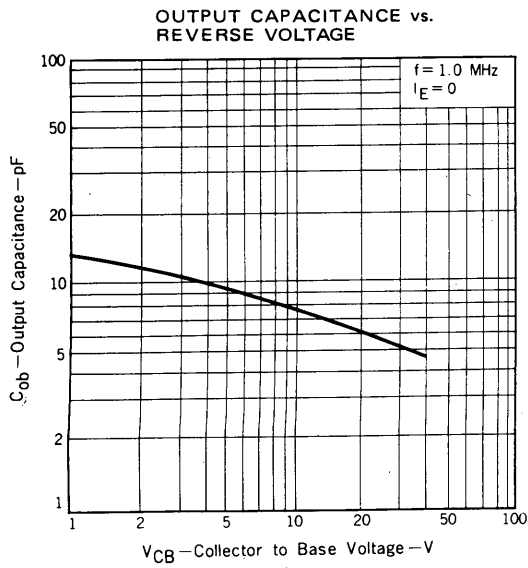
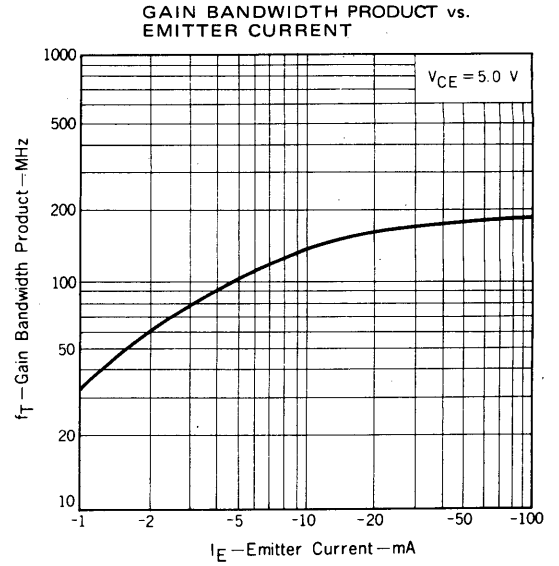
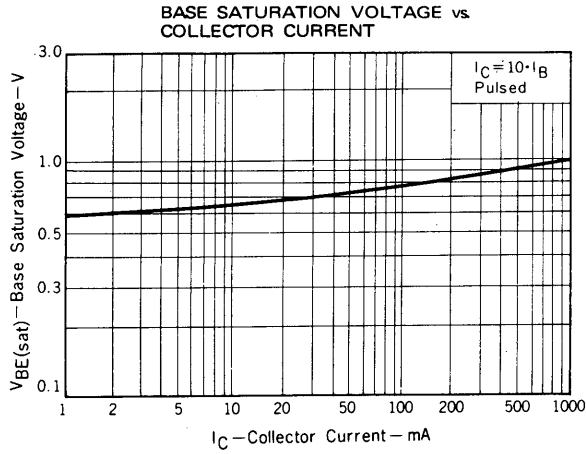
\*\*\*Pulsed: PW ≤ 350 μs, duty cycle ≤ 2 %

### $h_{FE}$ Classification

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

TYPICAL CHARACTERISTICS (Ta = 25 °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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