NEC

SILICON TRANSISTOR
2SA1611

AUDIO FREQUENCY, GENERAL PURPOSE AMPLIFIER
PNP SILICON EPITAXIAL TRANSISTOR

FEATURES

- Complementary to 2SC4177
- High DC Current Gain: h_{FE} = 200 TYP. (V_{CE} = –6.0 V, I_C = –1.0 mA)
- High Voltage: V_{CEO} = –50 V

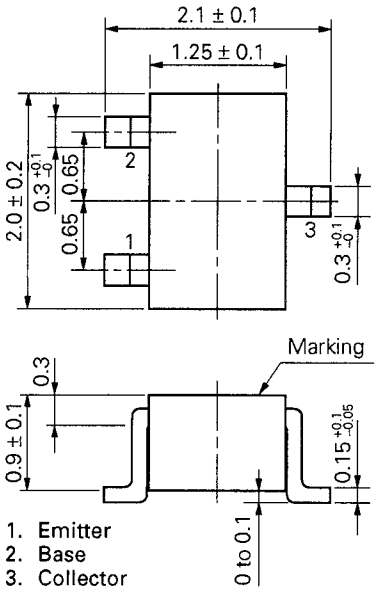
QUALITY GRADE

Standard

Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

PACKAGE DIMENSIONS

in millimeters



ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Collector to Base Voltage	V_{CBO}	–60	V
Collector to Emitter Voltage	V_{CEO}	–50	V
Emitter to Base Voltage	V_{EBO}	–5.0	V
Collector Current (DC)	I_C	–100	mA
Total Power Dissipation	P_T	150	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	–55 to +150	°C

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			–0.1	μA	V_{CB} = –60 V, I_E = 0
Emitter Cutoff Current	I_{EBO}			–0.1	μA	V_{EB} = –5.0 V, I_C = 0
DC Current Gain	h_{FE}	90	200	600		V_{CE} = –6.0 V, I_C = –1.0 mA*
Collector Saturation Voltage	$V_{CE(sat)}$		–0.18	–0.3	V	I_C = –100 mA, I_B = –10 mA
Base to Emitter Voltage	V_{BE}	–0.58	–0.62	–0.68	V	V_{CE} = –6.0 V, I_C = –1.0 mA
Gain Bandwidth Product	f_T		180		MHz	V_{CE} = –6.0 V, I_E = 10 mA
Output Capacitance	C_{ob}		4.5		pF	V_{CB} = –10 V, I_E = 0, f = 1.0 MHz

* Pulsed: PW ≦ 350 μs, Duty Cycle ≦ 2 %

h_{FE} Classification

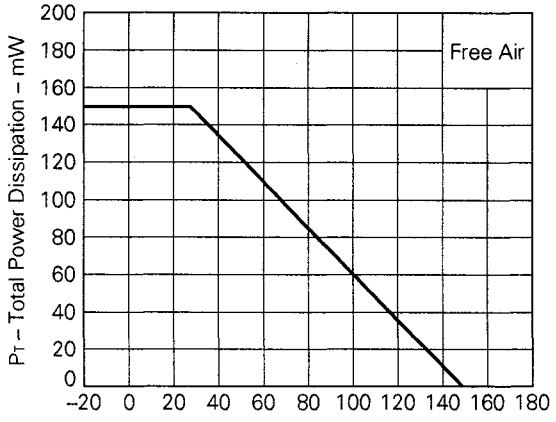
Marking	M4	M5	M6	M7
h_{FE}	90 to 180	135 to 270	200 to 400	300 to 600

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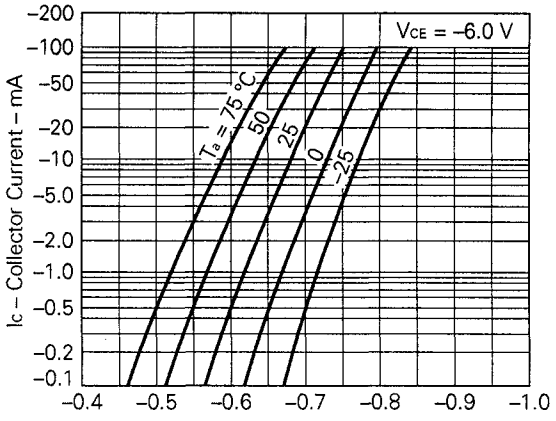
TYPICAL CHARACTERISTICS (T_a = 25 °C)

TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



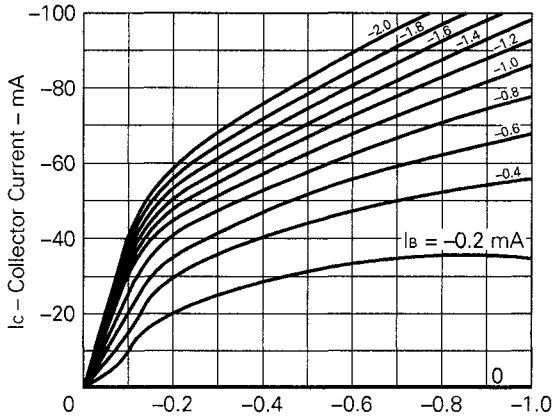
Ta – Ambient Temperature – °C

COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



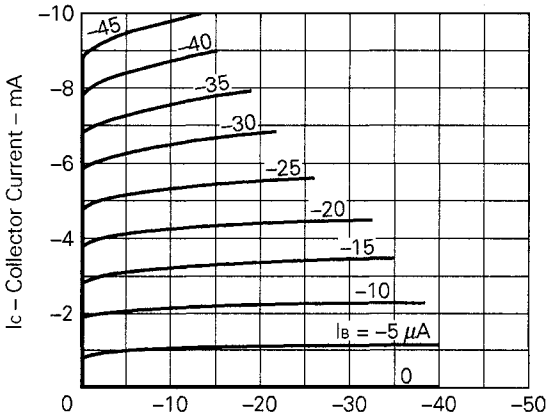
VBE – Base to Emitter Voltage – V

COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



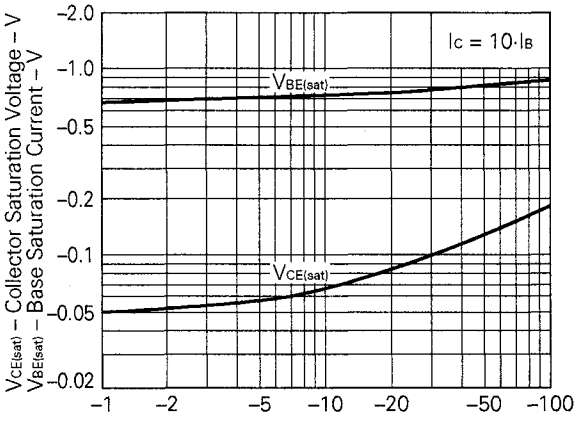
VCE – Collector to Emitter Voltage – V

COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



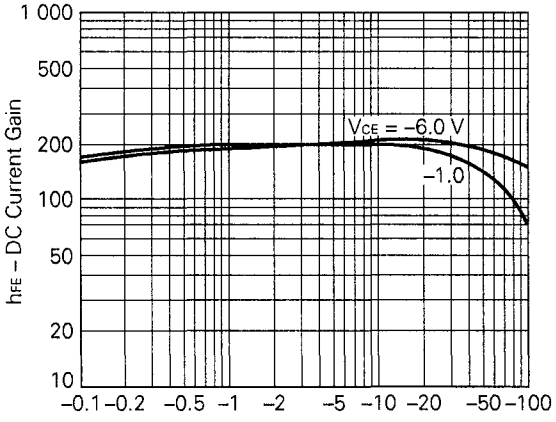
VCE – Collector to Emitter Voltage – V

BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



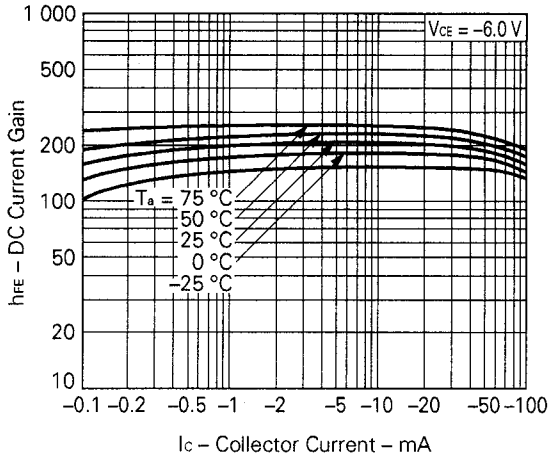
IC – Collector Current – mA

DC CURRENT GAIN vs. COLLECTOR CURRENT

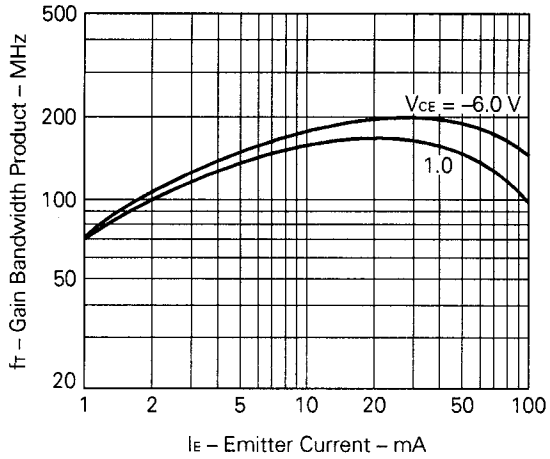


IC – Collector Current – mA

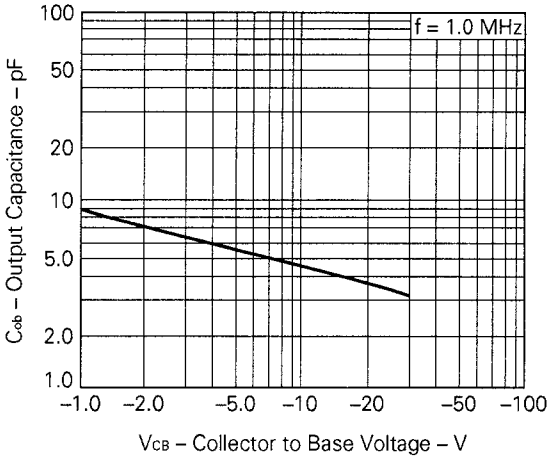
DC CURRENT GAIN vs.
COLLECTOR CURRENT



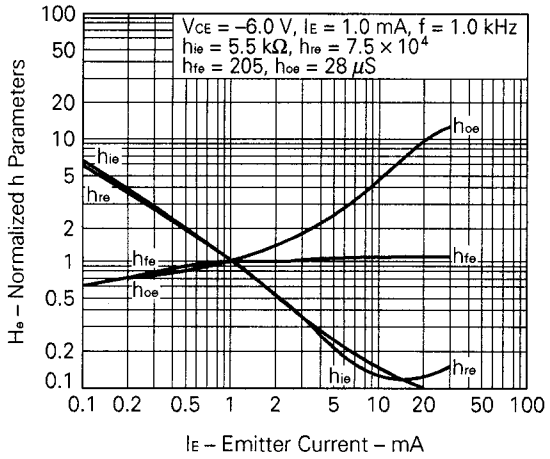
GAIN BANDWIDTH PRODUCT vs.
EMITTER CURRENT



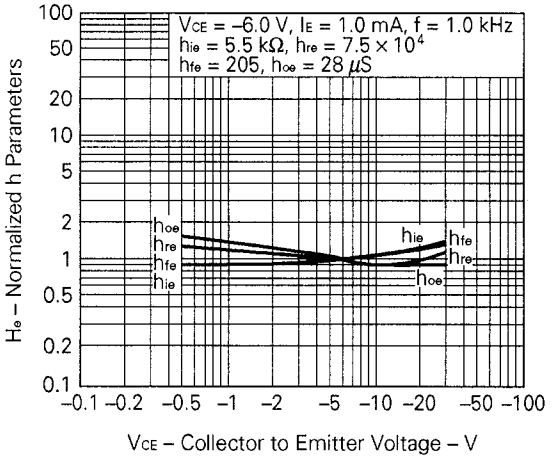
OUTPUT CAPACITANCE vs.
REVERSE VOLTAGE



NORMALIZED h PARAMETER vs.
EMITTER CURRENT



NORMALIZED h PARAMETER vs.
COLLECTOR TO EMITTER VOLTAGE



REFERENCE APPLICATION NOTE

ASSEMBLY MANUAL FOR SEMICONDUCTOR DEVICES	IEI-1207
QUALITY CONTROL OF NEC SEMICONDUCTOR DEVICES	TEI-1202
QUALITY CONTROL GUIDE OF SEMICONDUCTOR DEVICES	MEI-1202

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Application examples recommended by NEC Corporation.

Standard: Computer, Office equipment, Communication equipment, Test and Measurement equipment, Machine tools, Industrial robots, Audio and Visual equipment, Other consumer products, etc.

Special: Automotive and Transportation equipment, Traffic control systems, Antidisaster systems, Anticrime systems, etc.

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