To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

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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RENESAS

out/Discontinued

SILICON POWER TRANSISTORS

2SA1006,2SA1006A,2SA1006B/2SC2336,2SC2336A,2SC2336B

AUDIO FREQUENCY POWER AMPLIFIER
PNP/NPN SILICON EPITAXIAL TRANSISTOR
(BUILT IN EMITTER BALLAST RESISTORS)

DESCRIPTION

The 2SA1006, 2SA1006A, 2SA1006B/2SC2336, 2SC2336A and 2SC2336B are silicon epitaxial transistors suited for use as driver stage of 150 to 500 watts complementary symmetry audio amplifier.

FEATURES

- Wide safe operating area (SOA) because of emitter ballast resistors structure.
- High voltage ratings. V_{CEO} = 180V, 200V, 250V
- High f_T : PNP type, 80MHz, NPN type, 95MHz (at 10V 100mA)
- Excellent h_{FE} linearity.

ABSOLUTE MAXIMUM RATINGS

		2SA1006	2SA1006A	2SA1006B	2SC2336	2SC2336A	2SC2336B	
Maximum Voltages and Currents (Ta = 25°C)								
Collector to Base Voltage	V_{CBO}	-180	-200	-250	180	200	250	V
Collector to Emitter Voltage	V_{CEO}	-180	-200	-250	180	200	250	V
Emitter to Base Voltage	V_{EBO}	-5.0				5.0		V
Collector Current	$I_{C(DC)}$	-1.5				1.5		A
Collector Current	$I_{C(pulse)}$*	-3.0				3.0		A
Maximum Power Dissipations								
Total Power Dissipation	$P_{T(Tc=25°C)}$	25				25		W
Total Power Dissipation	$P_{T(Ta=25°C)}$	1.5				1.5		W
Maximum Temperature								
Junction Temperature	T_j	150				150		°C
Storage Temperature Range	T_{stg}	-55 to +150				-55 to +150		°C

*PW ≤ 10ms, duty cycle ≤ 50%

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

2SA1006, 2SA1006A, 2SA1006B/2SC2336, 2SC2336A, 2SC2336B

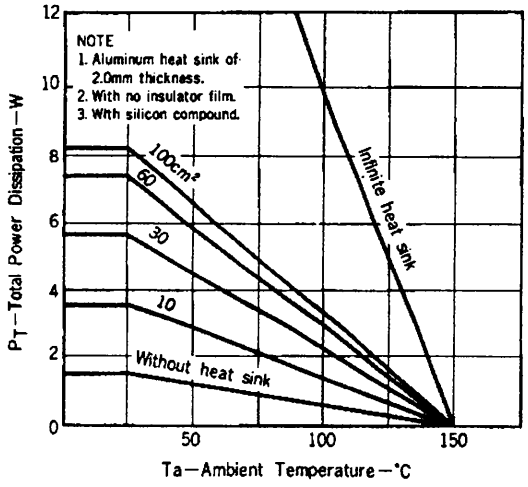
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			-1.0/1.0	μA	V_{CB}=150V, I_E=0
Emitter Cutoff Current	I_{EBO}			-1.0/1.0	μA	V_{EB}=3.0V, I_C=0
DC Current Gain	h_{FE1}	30	120/90			V_{CE}=5.0V, I_C=5.0mA*
	h_{FE2}	60	120	320		V_{CE}=5.0V, I_C=150mA*
Collector Saturation Voltage	$V_{CE(sat)}$		-0.4/0.3	-1.0/1.0	V	I_C=500mA, I_B=50mA*
Base Saturation Voltage	$V_{BE(sat)}$		-1.0/1.0	-1.5/1.5	V	I_C=500mA, I_B=50mA*
Gain Bandwidth Product	f_T		80/95		MHz	V_{CE}=10V, I_C=100mA
Output Capacitance	Cob		45/30		pF	V_{CB}=10V, I_E=0, f=1.0MHz

*Pulse Test PW ≤ 350μs, duty cycle ≤ 2%

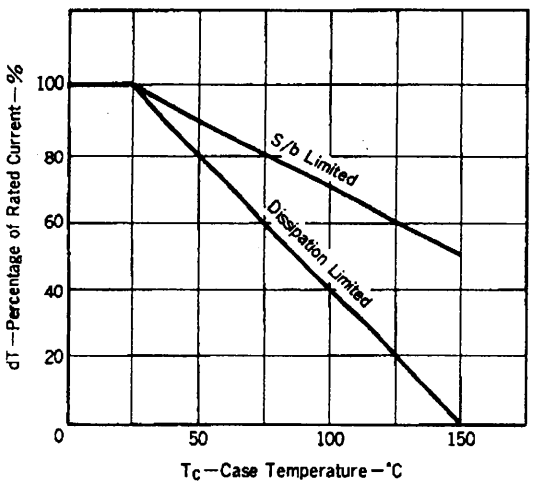
h_{FE2} Classification / R : 60 – 120, Q : 100 – 200, P : 160 – 320

TYPICAL CHARACTERISTICS (Ta

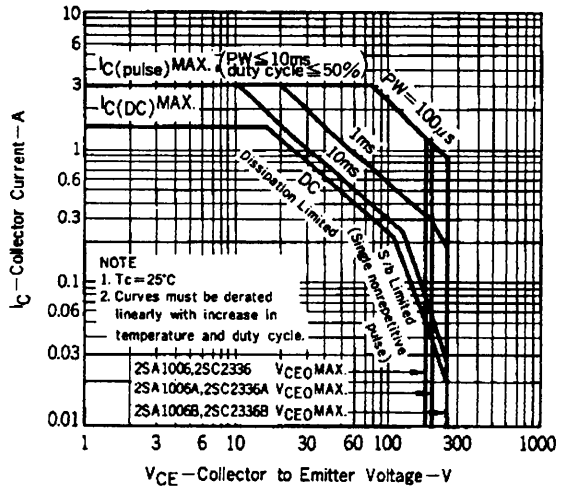
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



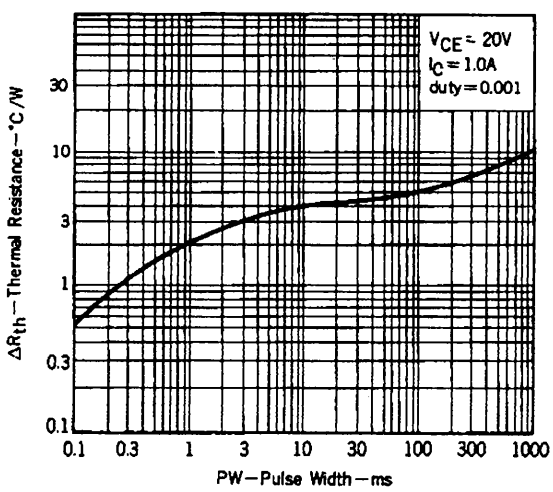
DERATING CURVES FOR ALL TYPES



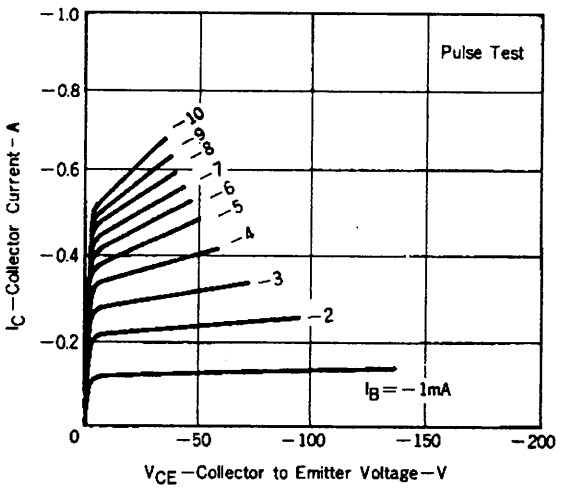
SAFE OPERATING AREA



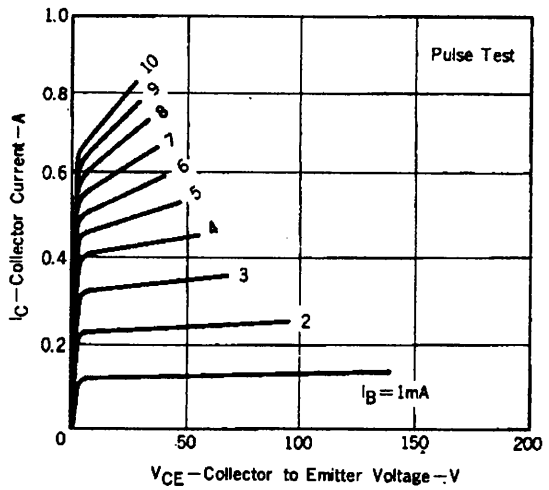
THERMAL RESISTANCE vs. PULSE WIDTH



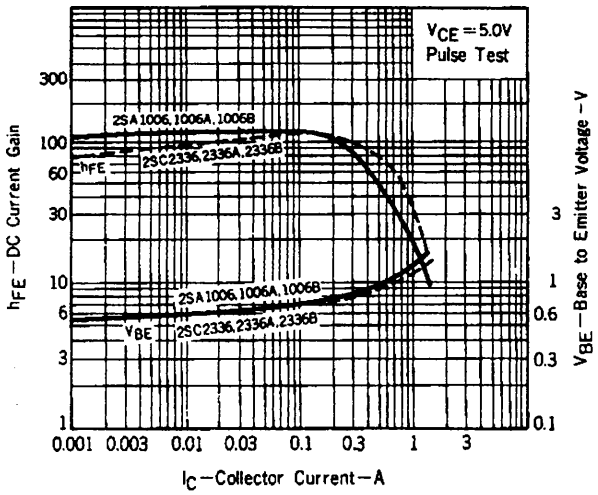
2SA1006, 1006A, 1006B COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



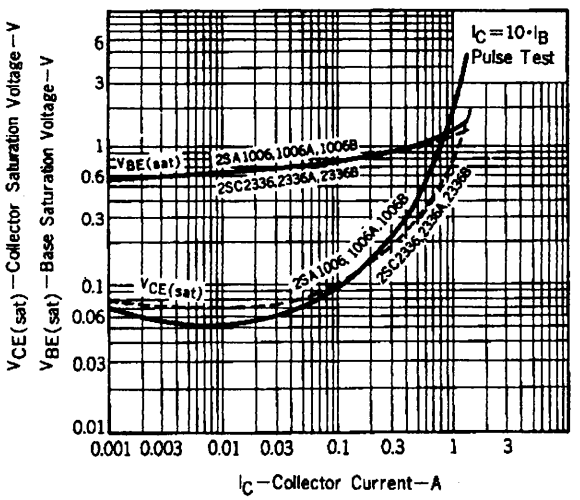
2SC2336, 2336A, 2336B COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



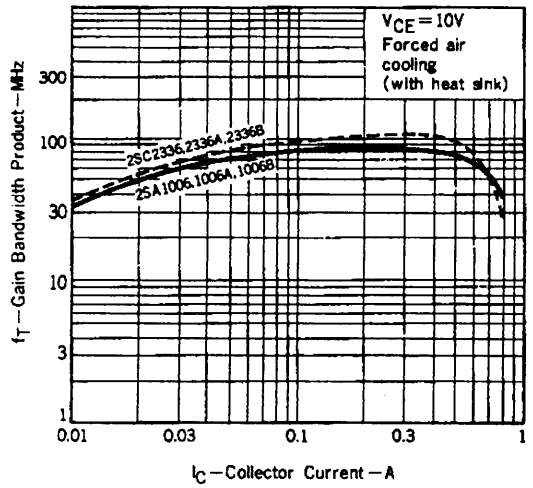
DC CURRENT GAIN, BASE TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



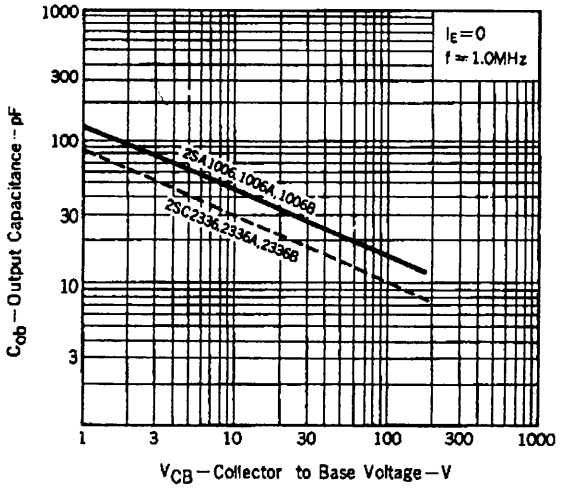
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



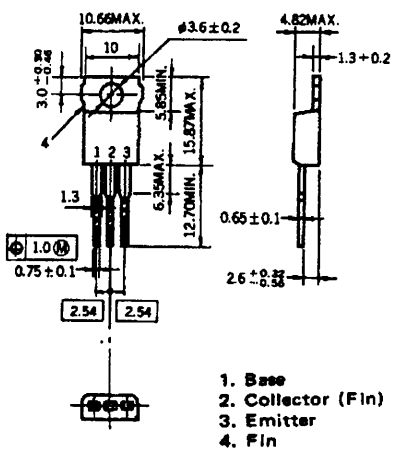
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE

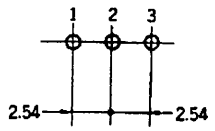


PACKAGE DIMENSIONS (Unit : mm)

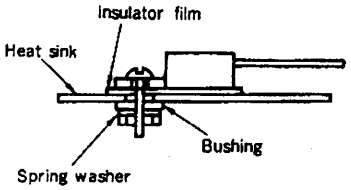


1. Base
2. Collector (Fin)
3. Emitter
4. Fin

Holes for mounting



Mounting instruction



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