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

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DATA SHEET

RENESAS

SILICON POWER TRANSISTOR
2SA1010

PNP SILICON EPITAXIAL TRANSISTOR
FOR HIGH-VOLTAGE HIGH-SPEED SWITCHING

The 2SA1010 is a mold power transistor developed for high-voltage high-speed switching, and is ideal for use as a driver in devices such as switching regulators, DC/DC converters, and high-frequency power amplifiers.

FEATURES

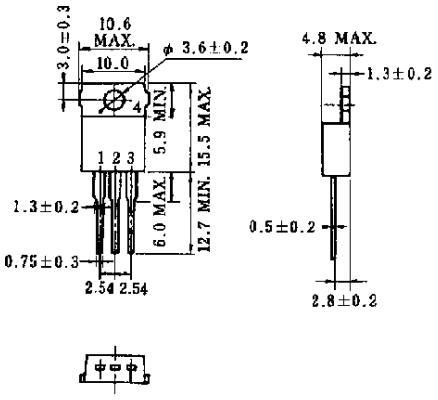
- Low collector saturation voltage
- Fast switching speed
- Complementary transistor: 2SC2334

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	−100	V
Collector to emitter voltage	V_{CEO}	−100	V
Emitter to base voltage	V_{EBO}	−7.0	V
Collector current (DC)	$I_{C(DC)}$	−7.0	A
Collector current (pulse)	$I_{C(pulse)}$*	−15	A
Base current (DC)	$I_{B(DC)}$	−3.5	A
Total power dissipation	P_T (Tc = 25 °C)	40	W
Total power dissipation	P_T (Ta = 25 °C)	1.5	W
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	−55 to +150	°C

* PW ≤ 300 μs, duty cycle ≤ 10%

PACKAGE DRAWING (UNIT: mm)



Pin Connection

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

EIAJ : SC-46
JEDEC : TO-220AB
IEC : —

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

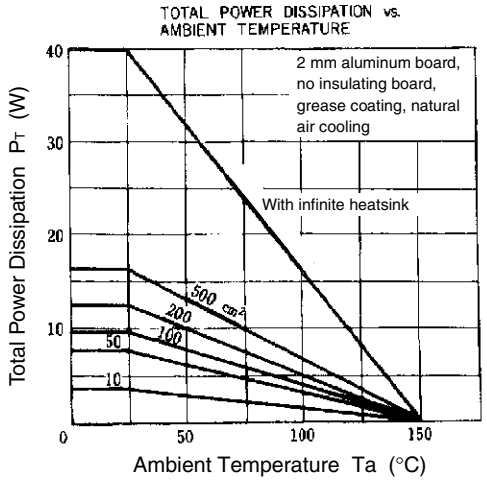
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	$V_{CEO(SUS)}$	I_C = –5.0 A, I_{B1} = –0.5 A, L = 1 mH	–100			V
Collector to emitter voltage	$V_{CEX(SUS)1}$	I_C = –5.0 A, I_{B1} = –I_{B2} = –0.5 A, $V_{BE(OFF)}$ = 5.0 V, L = 180 μH, clamped	–100			V
Collector to emitter voltage	$V_{CEX(SUS)2}$	I_C = –10 A, I_{B1} = –1.0 A, I_{B2} = –0.5 A, $V_{BE(OFF)}$ = 5.0 V, L = 180 μH, clamped	–100			V
Collector cutoff current	I_{CBO}	V_{CB} = –100 V, I_E = 0			–10	μA
Collector cutoff current	I_{CER}	V_{CE} = –100 V, R_{BE} = 51 Ω, Ta = 125 °C			–1.0	mA
Collector cutoff current	I_{CEX1}	V_{CE} = –100 V, $V_{BE(OFF)}$ = 1.5 V			–10	μA
Collector cutoff current	I_{CEX2}	V_{CE} = –100 V, $V_{BE(OFF)}$ = 1.5 V, Ta = 125 °C			–1.0	mA
Emitter cutoff current	I_{EBO}	V_{EB} = –5.0 V, I_C = 0			–10	μA
DC current gain	h_{FE1}	V_{CE} = –5.0 V, I_C = –0.5 A*	40		200	
DC current gain	h_{FE2}	V_{CE} = –5.0 V, I_C = –3.0 A*	40		200	
DC current gain	h_{FE3}	V_{CE} = –5.0 V, I_C = –5.0 A*	20			
Collector saturation voltage	$V_{CE(sat)}$	I_C = –5.0 A, I_B = –0.5 A*			–0.6	V
Base saturation voltage	$V_{BE(sat)}$	I_C = –5.0 A, I_B = –0.5 A*			–1.5	V
Turn-on time	t_{on}	I_C = –5.0 A, R_L = 10 Ω, I_{B1} = –I_{B2} = –0.5 A, V_{CC} ≅ –50 V Refer to the test circuit.			0.5	μs
Storage time	t_{stg}				1.5	μs
Fall time	t_f				0.5	μs

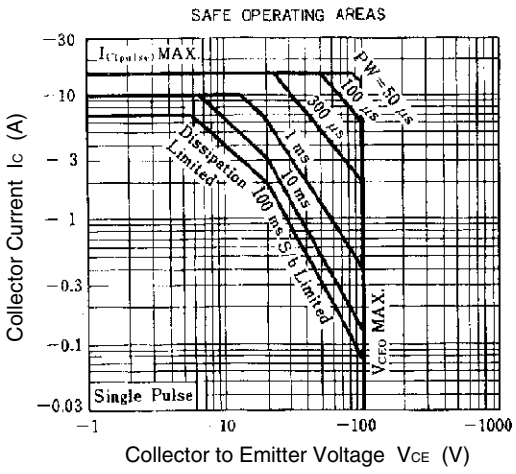
* Pulse test PW ≤ 350 μs, duty cycle ≤ 2%

h_{FE} CLASSIFICATION

Marking	M	L	K
h_{FE2}	40 to 80	60 to 120	100 to 200

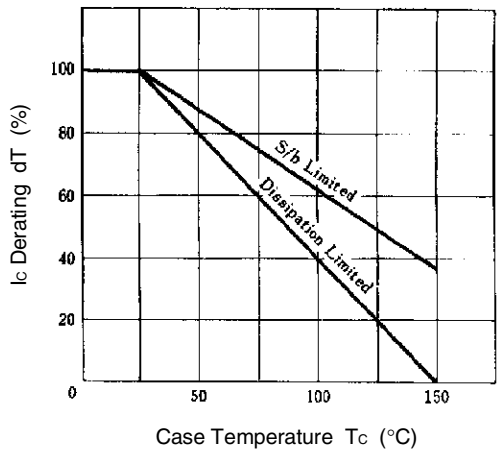
TYPICAL CHARACTERISTICS (Ta = 25°C)



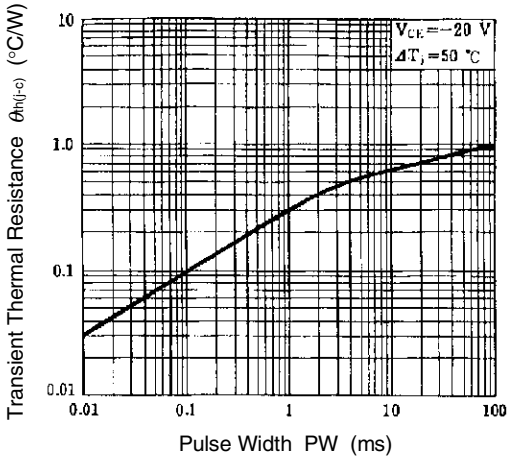


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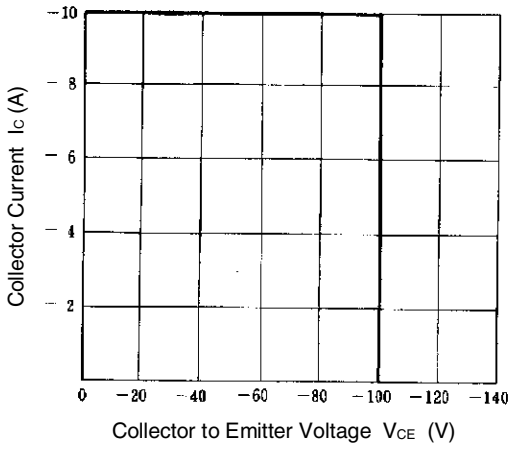
DERATING CURVE OF SAFE OPERATING AREA



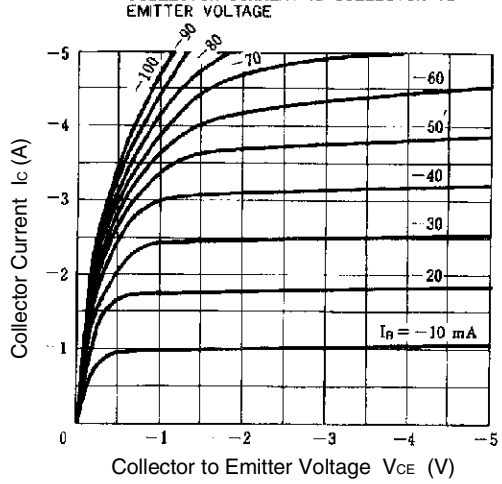
TRANSIENT THERMAL RESISTANCE



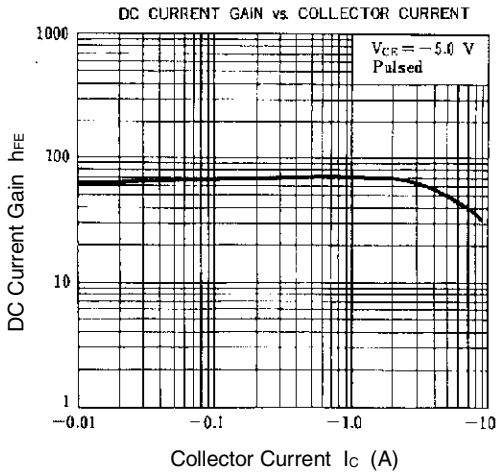
REVERSE BIAS SAFE OPERATING AREAS



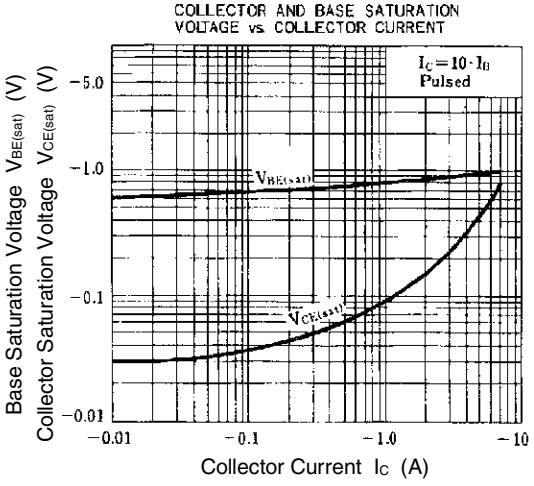
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



DC CURRENT GAIN vs. COLLECTOR CURRENT

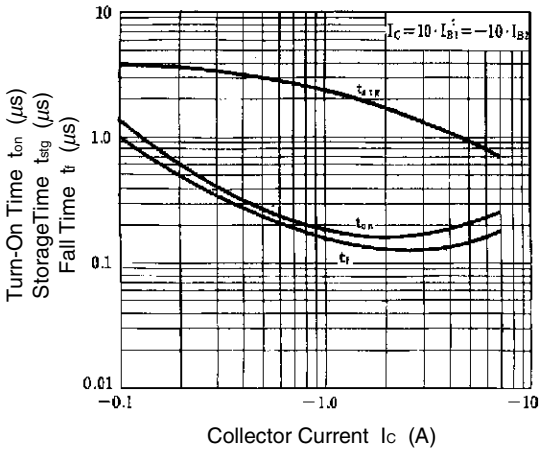


COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT

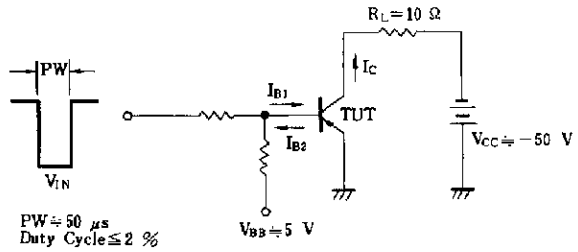


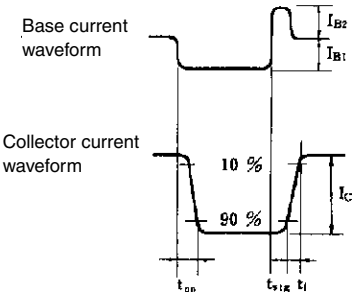
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TURN ON TIME, STORAGE AND FALL TIME
vs. COLLECTOR CURRENT



SWITCHING TIME (t_{on}, t_{stg}, t_f) TEST CIRCUIT





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