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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RENESAS

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SILICON POWER TRANSISTOR
2SA1742

PNP SILICON EPITAXIAL TRANSISTOR FOR HIGH-SPEED SWITCHING

The 2SA1742 is a power transistor developed for high-speed switching and features a high h_{FE} at low $V_{CE(sat)}$. This transistor is ideal for use as a driver in DC/DC converters and actuators.

In addition, a small resin-molded insulation type package contributes to high-density mounting and reduction of mounting cost.

FEATURES

- High h_{FE} and low $V_{CE(sat)}$:
  $h_{FE} \geq 100$ MIN. @$V_{CE} = -2.0$ V, $I_C = -1.5$ A
  $V_{CE(sat)} \geq -0.3$ V MAX. @$I_C = -4.0$ V, $I_B = -0.2$ A
- Full-mold package that does not require an insulating board or bushing

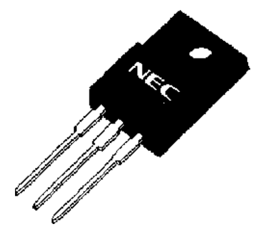
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Parameter	Symbol	Conditions	Ratings	Unit
Collector to base voltage	V_{CBO}		–100	V
Collector to emitter voltage	V_{CEO}		–60	V
Emitter to base voltage	V_{EBO}		–7.0	V
Collector current (DC)	$I_{C(DC)}$		–7.0	A
Collector current (pulse)	$I_{C(pulse)}$	PW ≤ 300 μs, duty cycle ≤ 10%	–14	A
Base current (DC)	$I_{B(DC)}$		–3.5	A
Total power dissipation	P_T	T_C = 25°C	30	W
		T_A = 25°C	2.0	W
Junction temperature	T_j		150	°C
Storage temperature	T_{stg}		–55 to +150	°C

ORDERING INFORMATION

Part No.	Package
2SA1742	Isolated TO-220

(Isolated TO-220)



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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

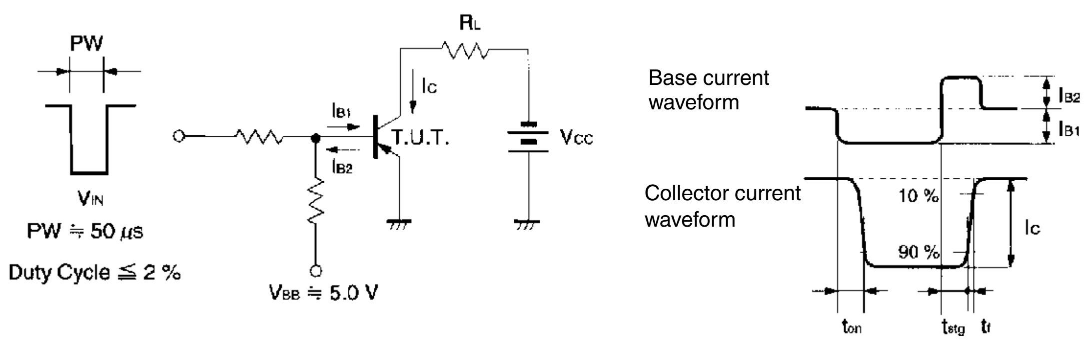
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	$V_{CEO(SUS)}$	I_C = –4.0 V, I_B = –0.4 A, L = 1 mH	–60			V
	$V_{CEX(SUS)}$	I_C = –4.0 A, I_{B1} = –I_{B2} = –0.4 A, $V_{BE(OFF)}$ = 1.5 V, L = 180 μH, clamped	–60			V
Collector cutoff current	I_{CBO}	V_{CB} = –60 V, I_E = 0 A			–10	μA
	I_{CER}	V_{CE} = –60 V, R_{BE} = 50 Ω, T_A = 125°C			–1.0	mA
	I_{CEX1}	V_{CE} = –60 V, $V_{BE(OFF)}$ = 1.5 V			–10	μA
	I_{CEX2}	V_{CE} = –60 V, $V_{BE(OFF)}$ = 1.5 V, T_A = 125°C			–1.0	mA
Emitter cutoff current	I_{EBO}	V_{EB} = –5.0 V, I_C = 0 A			–10	μA
DC current gain	h_{FE1}	V_{CE} = –2.0 V, I_C = –0.7 A Note	100			
	h_{FE2}	V_{CE} = –2.0 V, I_C = –1.5 A Note	100		400	
	h_{FE3}	V_{CE} = –2.0 V, I_C = –4.0 A Note	60			
Collector saturation voltage	$V_{CE(sat)1}$	I_C = –4.0 A, I_B = –0.2 A Note			–0.3	V
	$V_{CE(sat)2}$	I_C = –6.0 A, I_B = –0.3 A Note			–0.5	V
Base saturation voltage	$V_{BE(sat)1}$	I_C = –4.0 A, I_B = –0.2 A Note			–1.2	V
	$V_{BE(sat)2}$	I_C = –6.0 A, I_B = –0.3 A Note			–1.5	V
Collector capacitance	C_{ob}	V_{CB} = –10 V, I_E = 0 A, f = 1.0 MHz		180		pF
Gain bandwidth product	f_T	V_{CB} = –10 V, I_C = –1.0 A		40		MHz
Turn-on time	t_{on}	I_C = –4.0 A, R_L = 12.5 Ω, I_{B1} = –I_{B2} = –0.2 A, V_{CC} ≅ –50 V Refer to the test circuit.			0.3	μs
Storage time	t_{stg}				1.5	μs
Fall time	t_f				0.3	μs

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

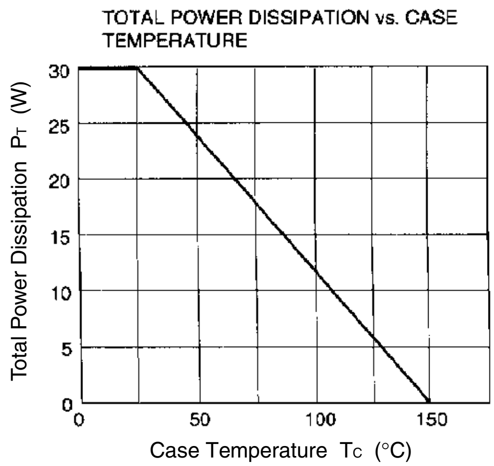
h_{FE} CLASSIFICATION

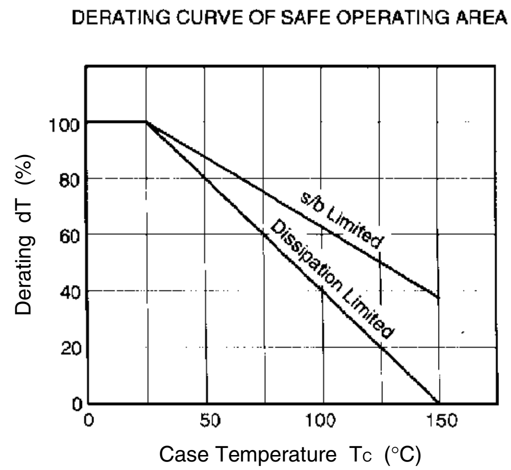
Marking	M	L	K
h_{FE2}	100 to 200	150 to 300	200 to 400

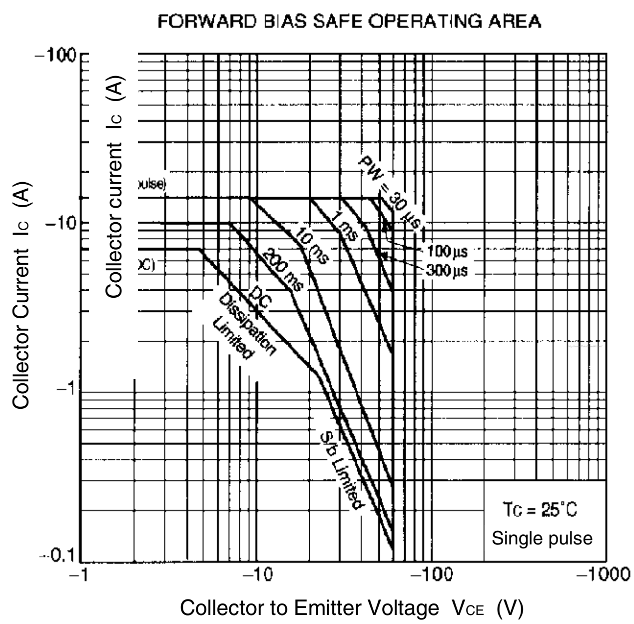
SWITCHING TIME (t_{on}, t_{stg}, t_f) TEST CIRCUIT

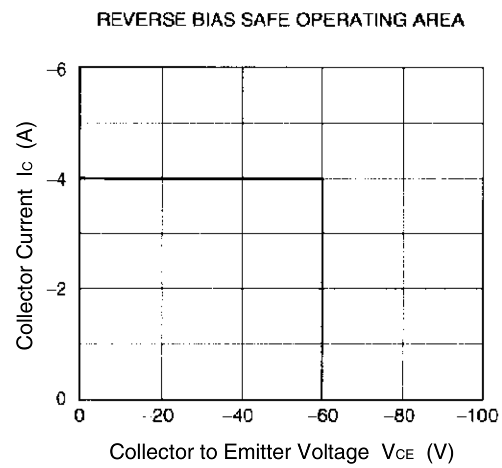


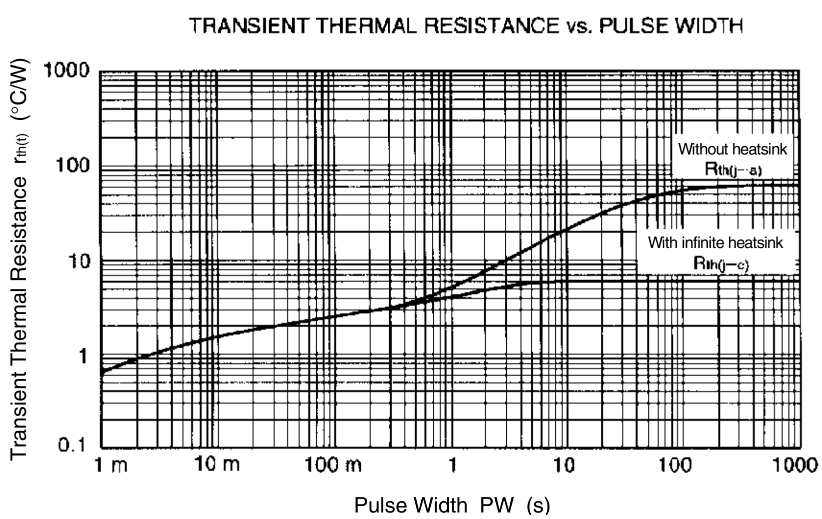
TYPICAL CHARACTERISTICS (T_A = 25°C)



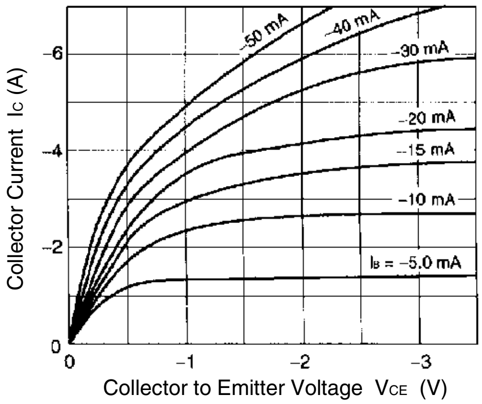




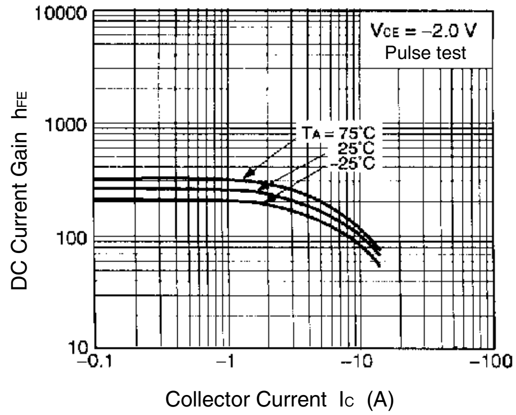




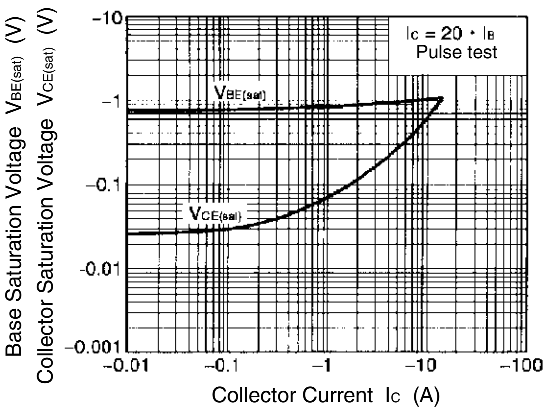
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



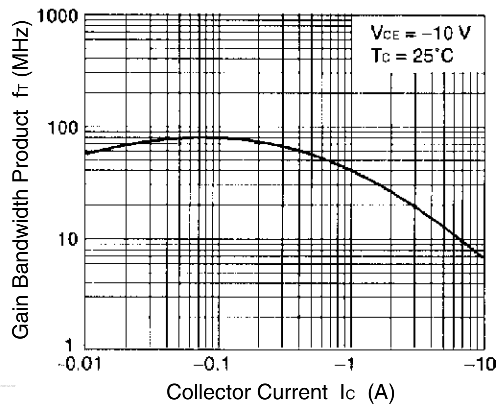
DC CURRENT GAIN vs. COLLECTOR CURRENT



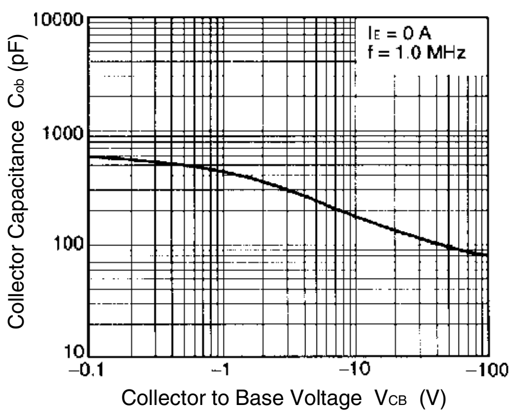
COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



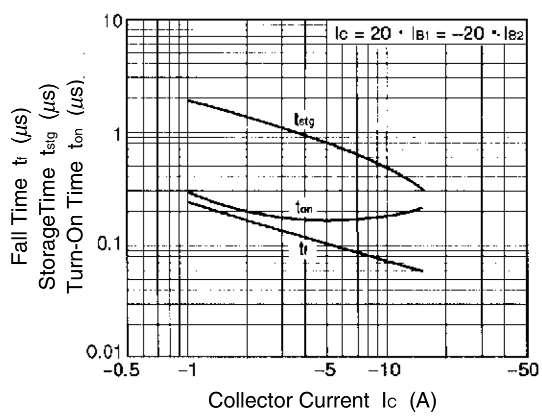
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



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



PACKAGE DRAWING (UNIT: mm)

Isolated TO-220