

To our customers,

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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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PNP SILICON EPITAXIAL TRANSISTOR FOR HIGH-SPEED SWITCHING

The 2SA1743 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 $V_{CE(sat)}$:
 $h_{FE} \geq 100$ ($V_{CE} = -2\text{ V}$, $I_C = -2\text{ A}$)
 $V_{CE(sat)} \leq 0.3\text{ V}$ ($I_C = -6\text{ A}$, $I_B = -0.3\text{ A}$)
- Full-mold package that does not require an insulating board or bushing

QUALITY GRADES

- Standard
Please refer to "Quality Grades on NEC Semiconductor Devices" (Document No. C11531E) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

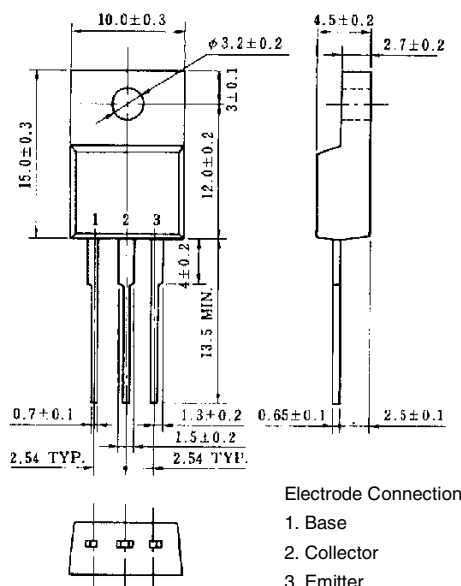
Parameter	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	-100	V
Collector to emitter voltage	V_{CEO}	-60	V
Emitter to base voltage	V_{EBO}	-7.0	V
Collector current (DC)	$I_{C(DC)}$	-10	A
Collector current (pulse)	$I_{C(pulse)}^*$	-20	A
Base current (DC)	$I_{B(DC)}$	-5.0	A
Total power dissipation	P_T ($T_c = 25^\circ\text{C}$)	30	W
Total power dissipation	P_T ($T_a = 25^\circ\text{C}$)	2.0	W
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

* $PW \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 10\%$

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PACKAGE DRAWING (UNIT: mm)



ELECTRICAL CHARACTERISTICS (Ta = 25°C)

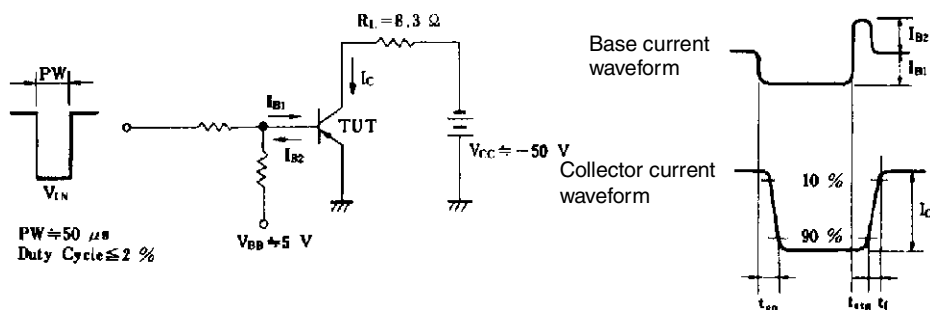
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	$V_{CE0(SUS)}$	$I_C = -6.0\text{ A}$, $I_B = -0.6\text{ A}$, $L = 1\text{ mH}$	-60			V
Collector to emitter voltage	$V_{CEX(SUS)}$	$I_C = -6.0\text{ A}$, $I_{B1} = -I_{B2} = -0.6\text{ A}$, $V_{BE(OFF)} = 1.5\text{ V}$, $L = 180\text{ }\mu\text{H}$, clamped	-60			V
Collector cutoff current	I_{CBO}	$V_{CB} = -60\text{ V}$, $I_E = 0$			-10	μA
Collector cutoff current	I_{CER}	$V_{CE} = -60\text{ V}$, $R_{BE} = 50\text{ }\Omega$, $T_a = 125^\circ\text{C}$			-1.0	mA
Collector cutoff current	I_{CEX1}	$V_{CE} = -60\text{ V}$, $V_{BE(OFF)} = 1.5\text{ V}$			-10	μA
Collector cutoff current	I_{CEX2}	$V_{CE} = -60\text{ V}$, $V_{BE(OFF)} = 1.5\text{ V}$, $T_a = 125^\circ\text{C}$			-1.0	mA
Emitter cutoff current	I_{EBO}	$V_{EB} = -5.0\text{ V}$, $I_C = 0$			-10	μA
DC current gain	h_{FE1}^*	$V_{CE} = -2.0\text{ V}$, $I_C = -1.0\text{ A}$	100			
DC current gain	h_{FE2}^*	$V_{CE} = -2.0\text{ V}$, $I_C = -2.0\text{ A}$	100		400	
DC current gain	h_{FE3}^*	$V_{CE} = -2.0\text{ V}$, $I_C = -6.0\text{ A}$	60			
Collector saturation voltage	$V_{CE(sat)1}^*$	$I_C = -6.0\text{ A}$, $I_B = -0.3\text{ A}$			-0.3	V
Collector saturation voltage	$V_{CE(sat)2}^*$	$I_C = -8.0\text{ A}$, $I_B = -0.4\text{ A}$			-0.5	V
Base saturation voltage	$V_{BE(sat)1}^*$	$I_C = -6.0\text{ A}$, $I_B = -0.3\text{ A}$			-1.2	V
Base saturation voltage	$V_{BE(sat)2}^*$	$I_C = -8.0\text{ A}$, $I_B = -0.4\text{ A}$			-1.5	V
Collector capacitance	C_{ob}	$V_{CB} = -10\text{ V}$, $I_E = 0$, $f = 1.0\text{ MHz}$		230		pF
Gain bandwidth product	f_T	$V_{CE} = -10\text{ V}$, $I_C = -1.0\text{ A}$		80		MHz
Turn-on time	t_{on}	$I_C = -6.0\text{ A}$, $R_L = 8.3\text{ }\Omega$, $I_{B1} = -I_{B2} = -0.3\text{ A}$, $V_{CC} \cong -50\text{ V}$ Refer to the test circuit.			0.3	μs
Storage time	t_{stg}				1.5	μs
Fall time	t_f				0.3	μs

* Pulse test $PW \leq 350\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

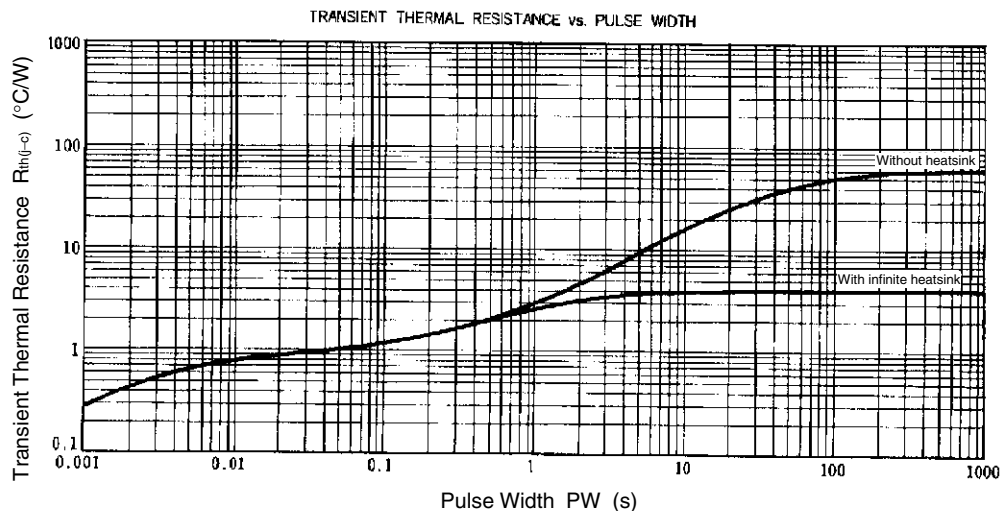
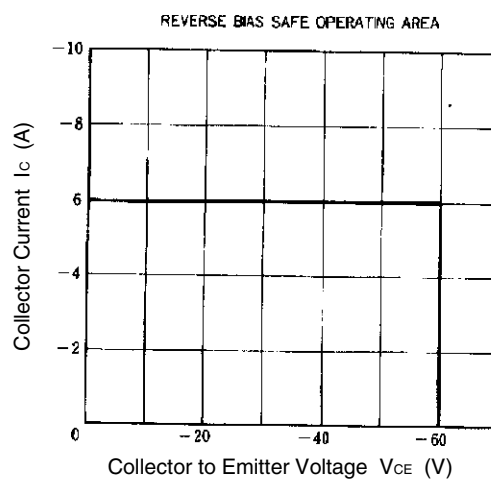
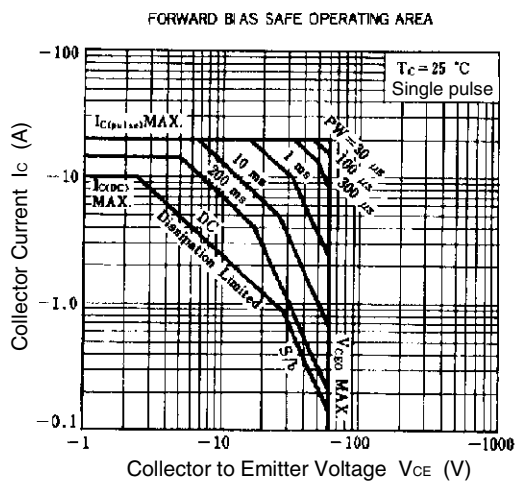
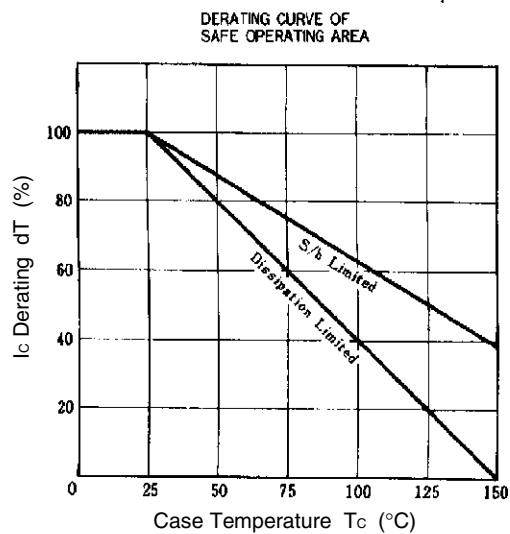
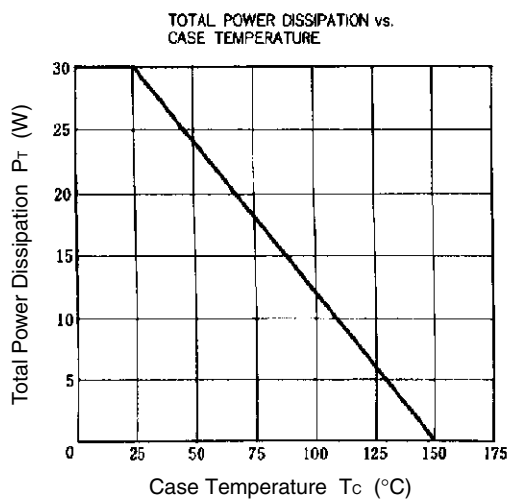
h_{FE} CLASSIFICATION

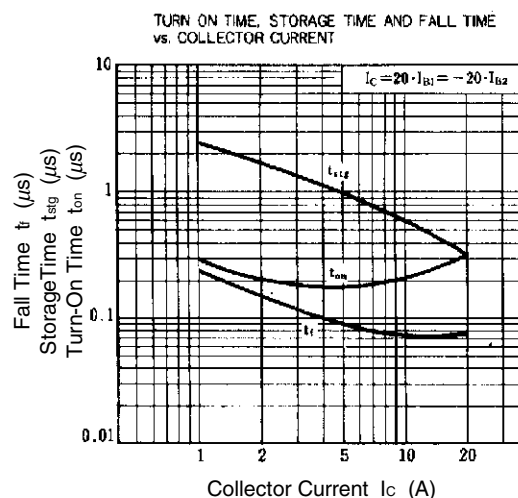
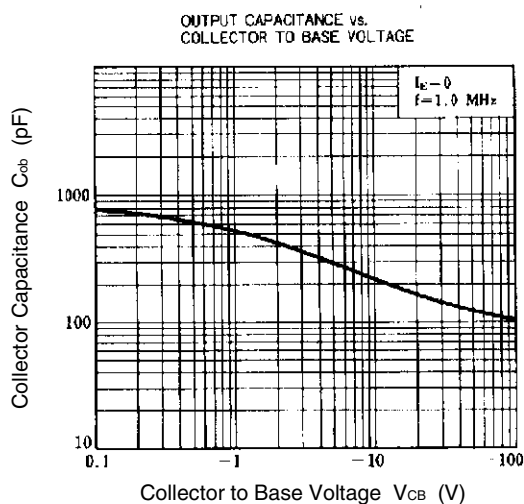
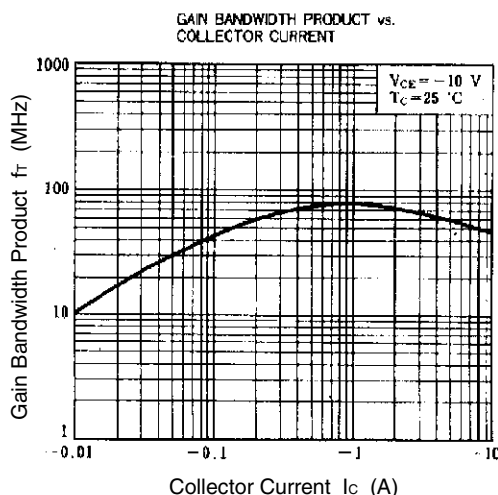
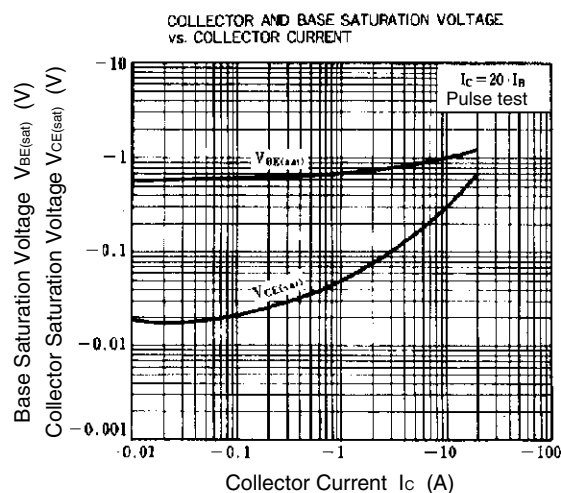
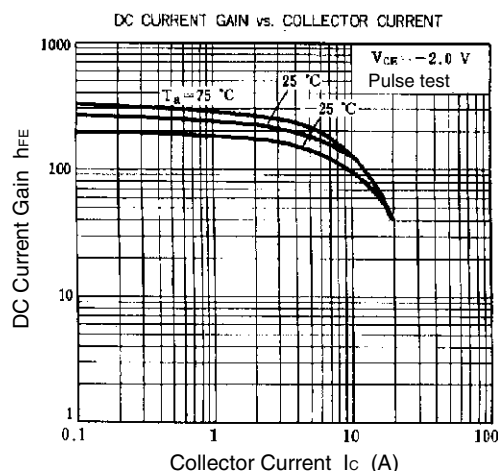
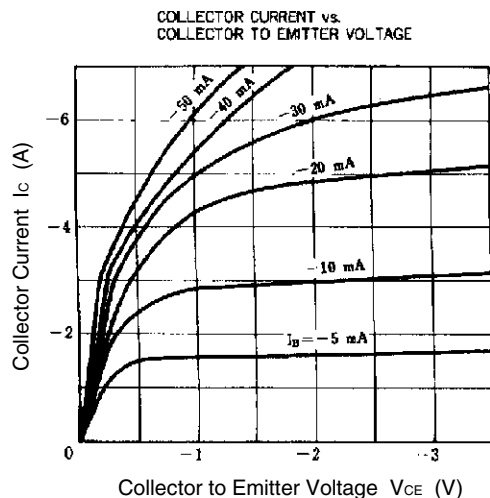
Marking	M	L	K
h_{FE2}	100 to 200	150 to 300	200 to 400

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



TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)





[MEMO]

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