

### 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  $V_{CE(sat)}$ :  
 $h_{FE} \geq 100$  ( $V_{CE} = -2$  V,  $I_C = -2$  A)  
 $V_{CE(sat)} \leq 0.3$  V ( $I_C = -6$  A,  $I_B = -0.3$  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.

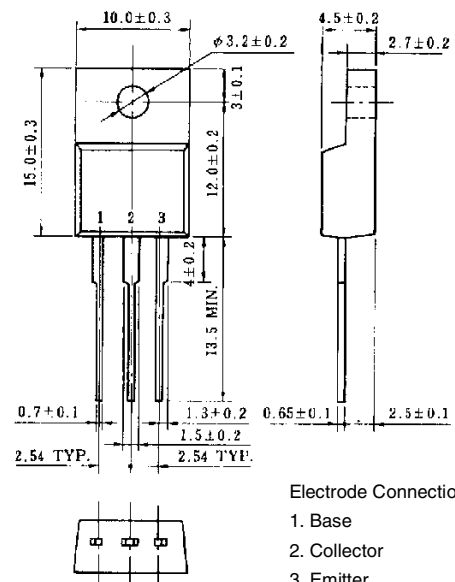
#### ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

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	$^\circ\text{C}$

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

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 Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

#### PACKAGE DRAWING (UNIT: mm)



**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

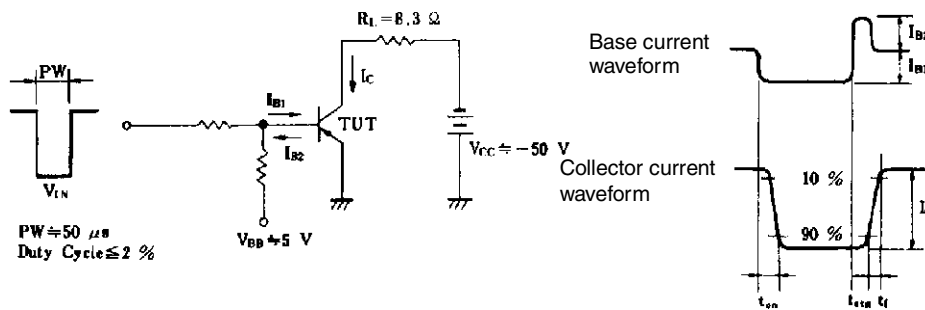
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	$V_{CE0(SUS)}$	$I_C = -6.0\text{ A}$ , $I_B = -0.6\text{ A}$ , $L = 1\text{ mH}$	-60			V
Collector to emitter voltage	$V_{CEX(SUS)}$	$I_C = -6.0\text{ A}$ , $I_{B1} = -I_{B2} = -0.6\text{ A}$ , $V_{BE(OFF)} = 1.5\text{ V}$ , $L = 180\text{ }\mu\text{H}$ , clamped	-60			V
Collector cutoff current	$I_{CBO}$	$V_{CB} = -60\text{ V}$ , $I_E = 0$			-10	$\mu\text{A}$
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	$\mu\text{A}$
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	$\mu\text{A}$
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	$\mu\text{s}$
Storage time	$t_{stg}$				1.5	$\mu\text{s}$
Fall time	$t_f$				0.3	$\mu\text{s}$

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

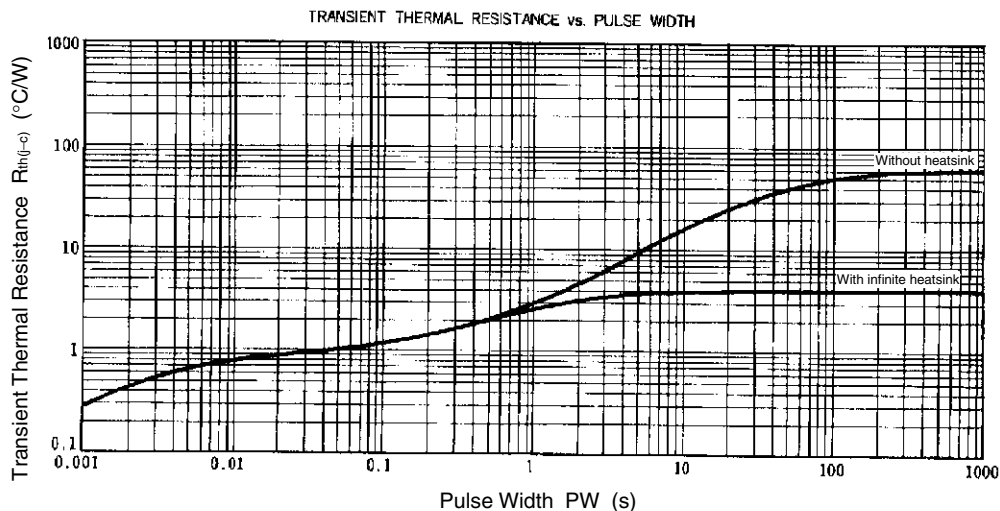
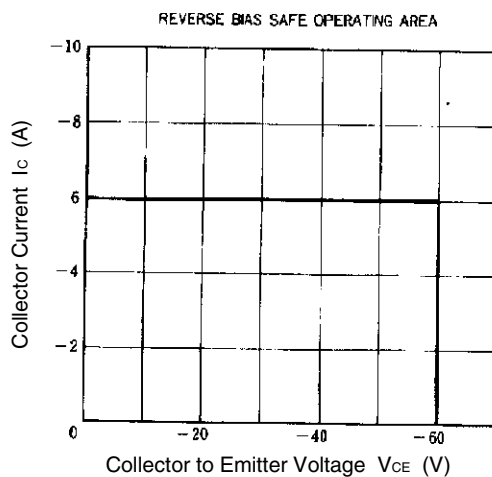
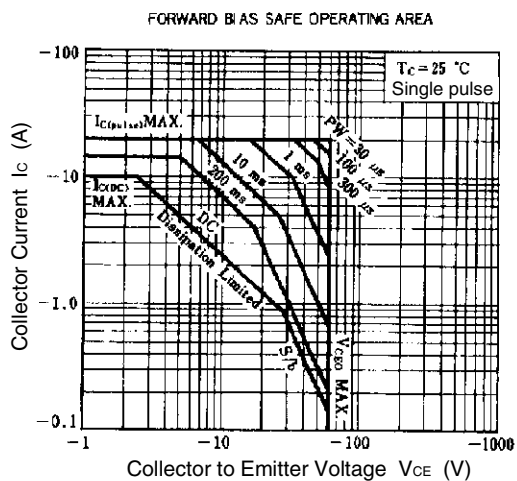
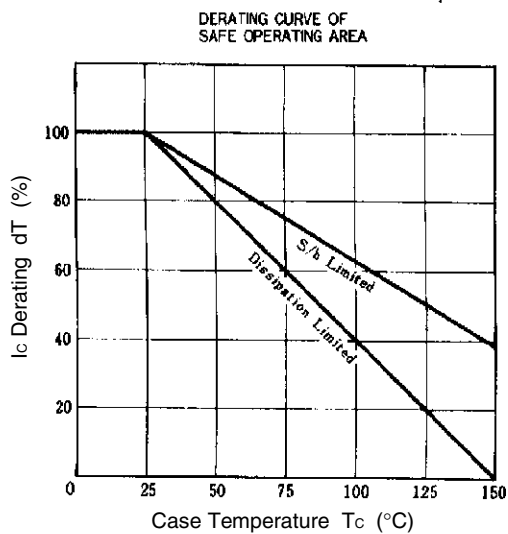
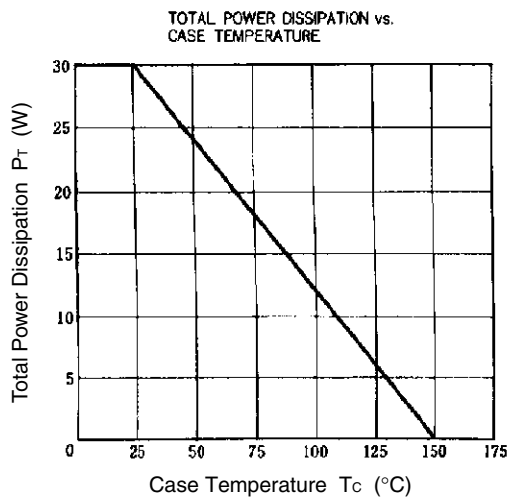
**$h_{FE}$  CLASSIFICATION**

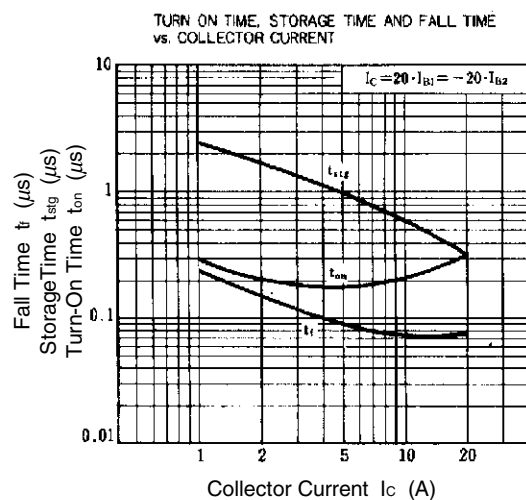
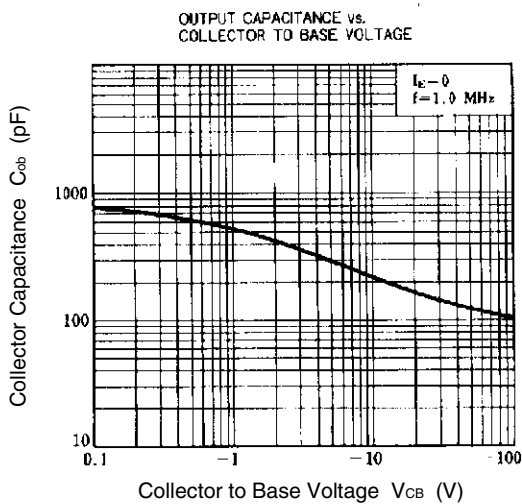
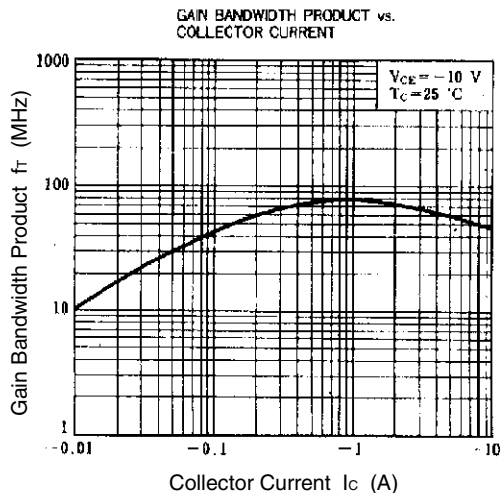
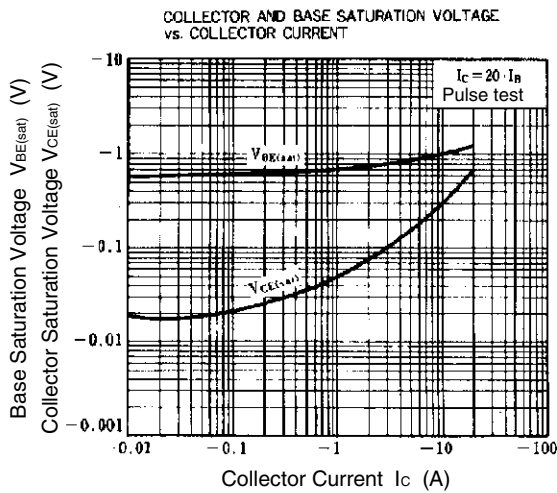
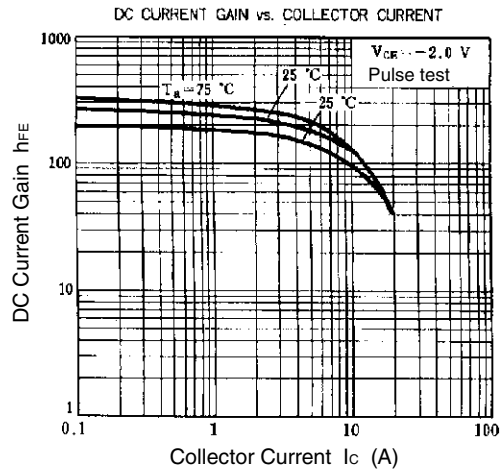
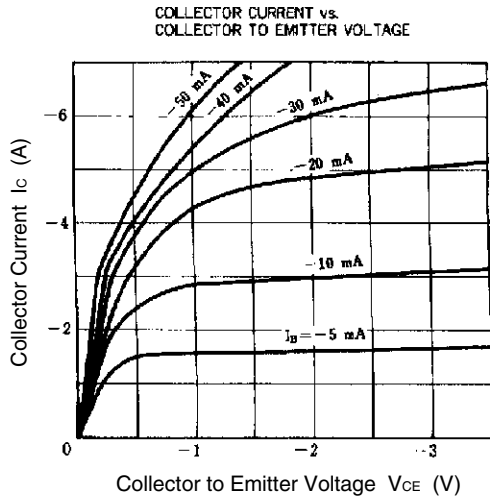
Marking	M	L	K
$h_{FE2}$	100 to 200	150 to 300	200 to 400

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



TYPICAL CHARACTERISTICS (Ta = 25°C)





[MEMO]

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