

SILICON POWER TRANSISTOR 2SA1744

PNP SILICON EPITAXIAL TRANSISTOR FOR HIGH-SPEED SWITCHING

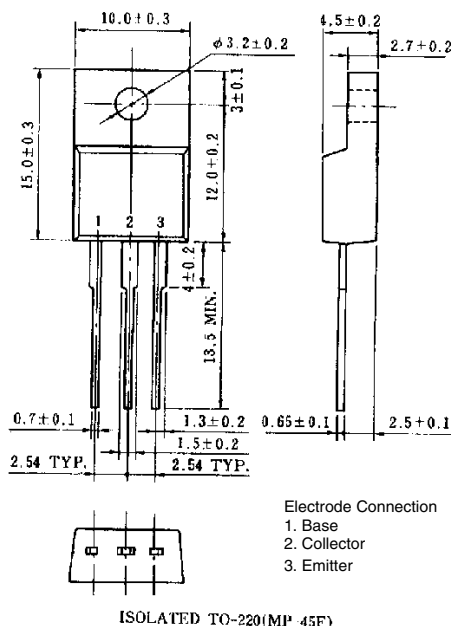
The 2SA1744 is a power transistor developed for high-speed switching and features a high h_{FE} at Low $V_{CE(sat)}$. This transistor is ideal for use as a driver in DC/DC converters and actuators.

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 $V_{CE(sat)}$:
 $h_{FE} \geq 100$ ($V_{CE} = -2\text{ V}$, $I_C = -3\text{ A}$)
 $V_{CE(sat)} \leq 0.3\text{ V}$ ($I_C = -8\text{ A}$, $I_B = -0.4\text{ A}$)
- Full-mold package that does not require an insulating board or bushing

PACKAGE DRAWING (UNIT: mm)



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)	$I_{C(DC)}$	-15	A
Collector current (pulse)	$I_{C(pulse)}^*$	-30	A
Base current (DC)	$I_{B(DC)}$	-7.5	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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ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

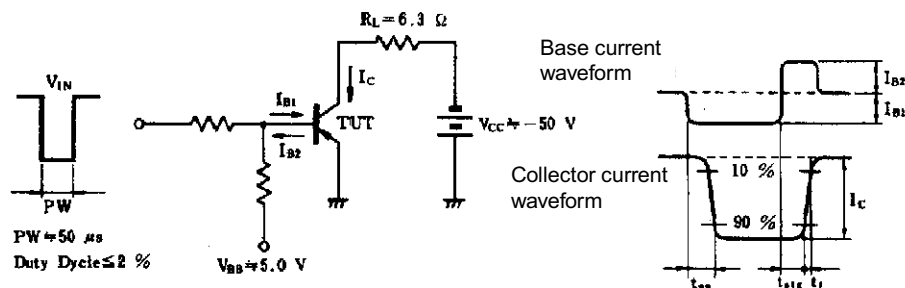
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	$V_{CE0(SUS)}$	$I_C = -8.0\text{ A}$, $I_B = -0.8\text{ A}$, $L = 1\text{ mH}$	-60			V
Collector to emitter voltage	$V_{CEX(SUS)}$	$I_C = -8.0\text{ A}$, $I_{B1} = -I_{B2} = -0.8\text{ A}$, $V_{BE(OFF)} = 1.5\text{ V}$, $L = 180\text{ }\mu\text{H}$, 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}^*	$V_{CE} = -2.0\text{ V}$, $I_C = -1.5\text{ A}$	100			
DC current gain	h_{FE2}^*	$V_{CE} = -2.0\text{ V}$, $I_C = -3.0\text{ A}$	100		400	
DC current gain	h_{FE3}^*	$V_{CE} = -2.0\text{ V}$, $I_C = -8.0\text{ A}$	60			
Collector saturation voltage	$V_{CE(sat)1}^*$	$I_C = -8.0\text{ A}$, $I_B = -0.4\text{ A}$			-0.3	V
Collector saturation voltage	$V_{CE(sat)2}^*$	$I_C = -12\text{ A}$, $I_B = -0.6\text{ A}$			-0.5	V
Base saturation voltage	$V_{BE(sat)1}^*$	$I_C = -8.0\text{ A}$, $I_B = -0.4\text{ A}$			-1.2	V
Base saturation voltage	$V_{BE(sat)2}^*$	$I_C = -12\text{ A}$, $I_B = -0.6\text{ A}$			-1.5	V
Collector capacitance	C_{ob}	$V_{CB} = -10\text{ V}$, $I_E = 0$, $f = 1.0\text{ MHz}$		300		pF
Gain bandwidth product	f_T	$V_{CE} = -10\text{ V}$, $I_C = -1.5\text{ A}$		80		MHz
Turn-on time	t_{on}	$I_C = -8.0\text{ A}$, $R_L = 6.3\text{ }\Omega$, $I_{B1} = -I_{B2} = -0.4\text{ A}$, $V_{CC} \cong -50\text{ V}$ 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 $\leq 2\%$

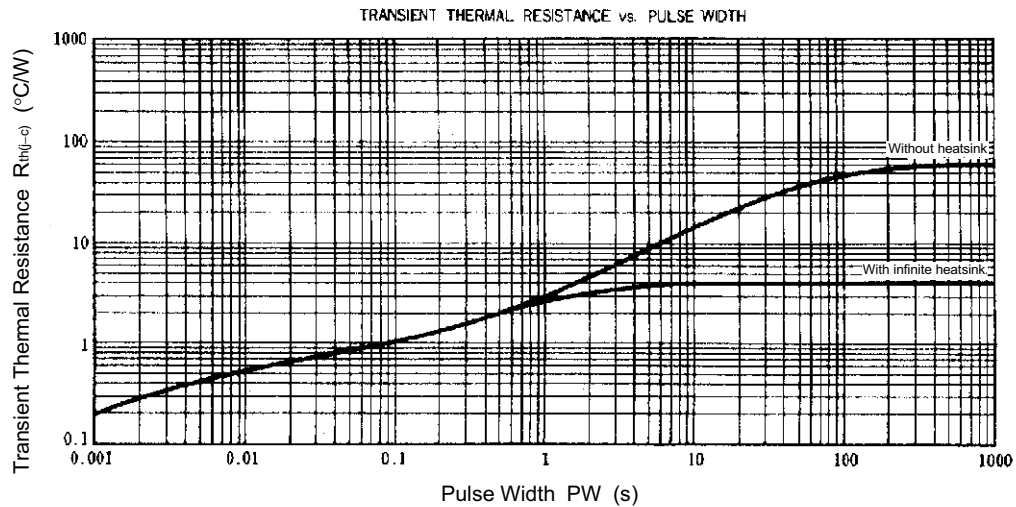
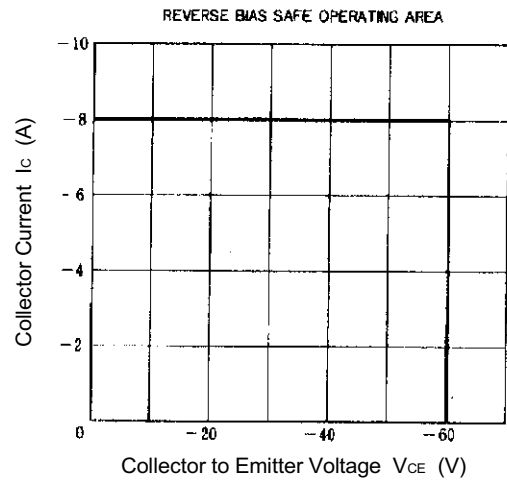
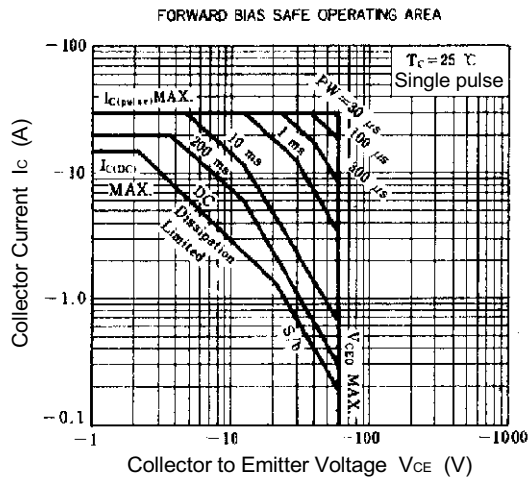
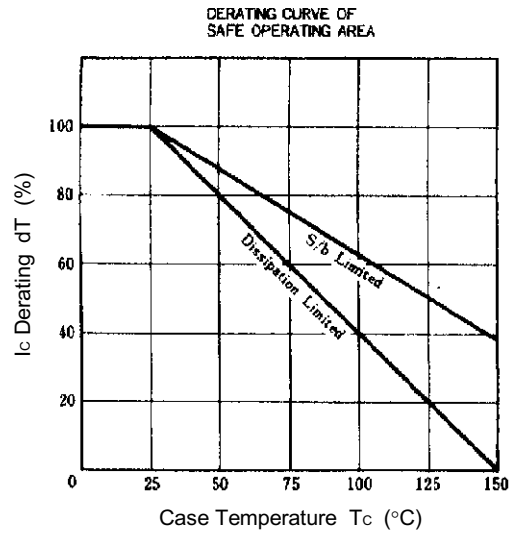
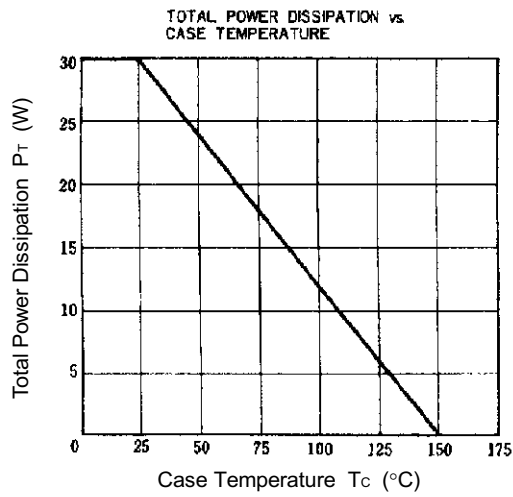
h_{FE} CLASSIFICATION

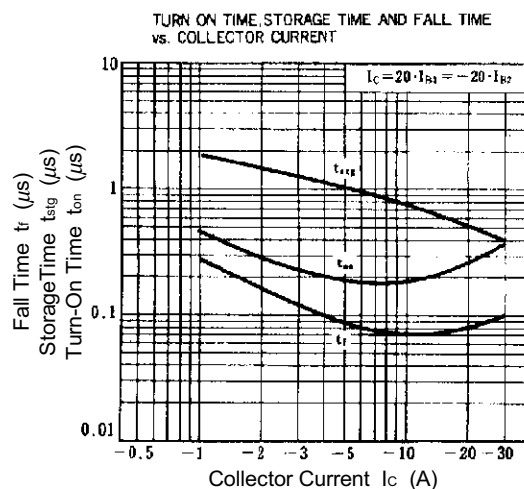
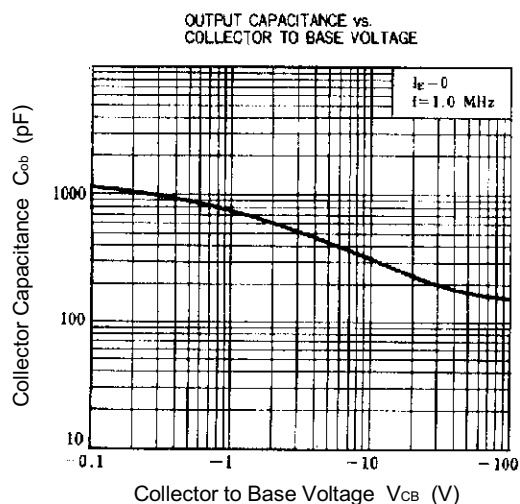
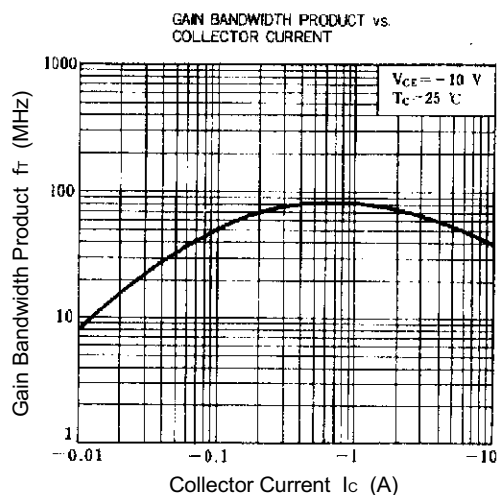
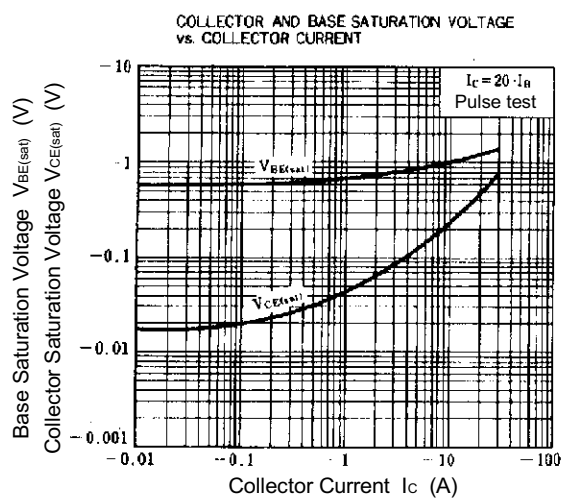
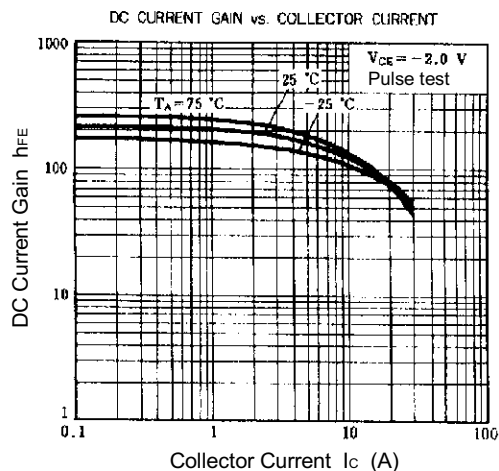
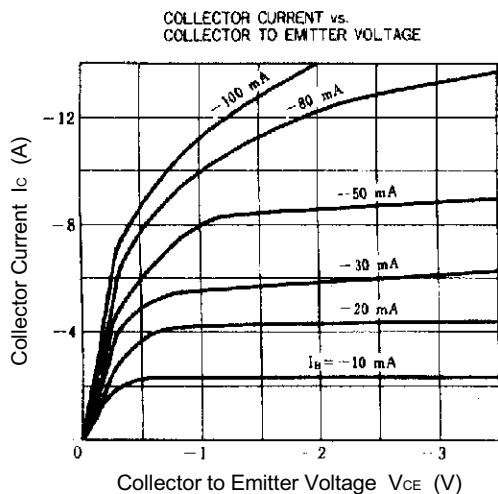
Marking	M	L	K
h_{FE2}	100 to 200	150 to 300	200 to 400

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



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





[MEMO]

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