

PNP SILICON EPITAXIAL TRANSISTOR FOR HIGH-SPEED SWITCHING

The 2SA1847 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, this transistor features a package that can be auto-mounted in radial taping specifications, thus contributing to mounting cost reduction.

FEATURES

- Auto-mount possible in radial taping specifications
- Resin-molded insulation type package with power rating of 1.8 W in stand-alone conditions
- High h_{FE} and low $V_{CE(sat)}$:
 $V_{CE(sat)} = -0.3 \text{ V MAX. @ } I_C = -6.0 \text{ V, } I_B = -0.3 \text{ A}$
 $h_{FE} \geq 100 \quad @ V_{CE} = -2.0 \text{ V, } I_C = -2.0 \text{ A}$
- Fast switching speed

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector to base voltage	V_{CBO}		-150	V
Collector to emitter voltage	V_{CEO}		-100	V
Emitter to base voltage	V_{EBO}		-7.0	V
Collector current (DC)	$I_{C(DC)}$		-10	A
Collector current (pulse)	$I_{C(pulse)}$	$PW \leq 300 \mu s, \text{ duty cycle} \leq 2\%$	-20	A
Base current (DC)	$I_{B(DC)}$		-6.0	A
Total power dissipation	P_T	$T_a = 25^\circ\text{C}$	1.8	W
Junction temperature	T_j		150	$^\circ\text{C}$
Storage temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

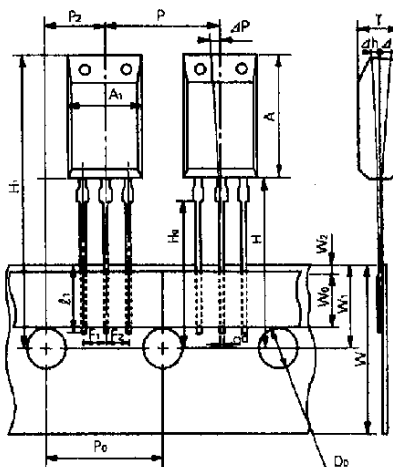
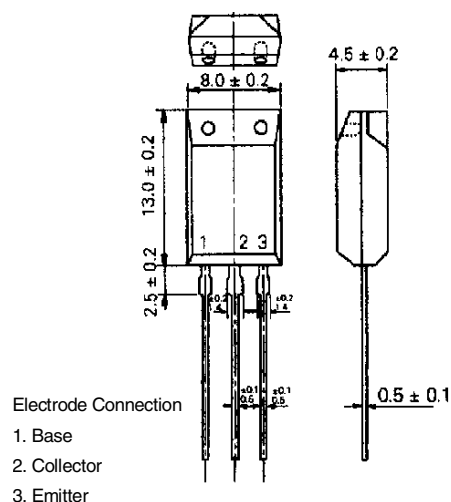
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = -100\text{ V}$, $I_E = 0$			-10	μA
Collector cutoff current	I_{CER}	$V_{CE} = -100\text{ V}$, $R_{EB} = 50\ \Omega$ $T_a = 125^\circ\text{C}$			-1.0	mA
Collector cutoff current	I_{CEX1}	$V_{CE} = -100\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$			-10	μA
Collector cutoff current	I_{CEX2}	$V_{CE} = -100\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$ $T_a = 125^\circ\text{C}$			-1.0	mA
Emitter cutoff current	I_{EBO}	$V_{EB} = -5.0\text{ V}$, $I_C = 0$			-10	μA
DC current gain	h_{FE1}^*	$V_{CE} = -2.0\text{ V}$, $I_C = -0.5\text{ A}$	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
Gain bandwidth product	f_T	$V_{CE} = -10\text{ V}$, $I_C = -0.5\text{ A}$		150		MHz
Collector capacitance	C_{ob}	$V_{CB} = -10\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$		250		pF
Turn-on time	t_{on}	$I_C = -6.0\text{ A}$ $I_{B1} = -I_{B2} = -0.3\text{ A}$ $R_L = 8.3\ \Omega$, $V_{CC} = -50\text{ V}$			0.3	μs
Storage time	t_{stg}				1.5	μs
Fall time	t_f				0.4	μs

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

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

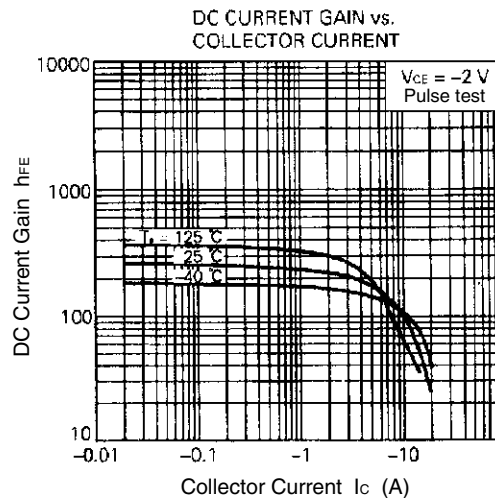
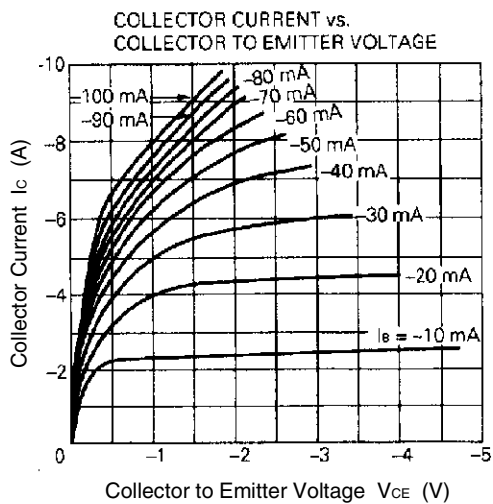
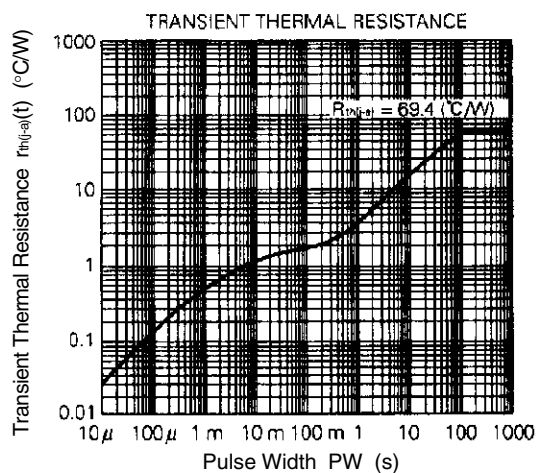
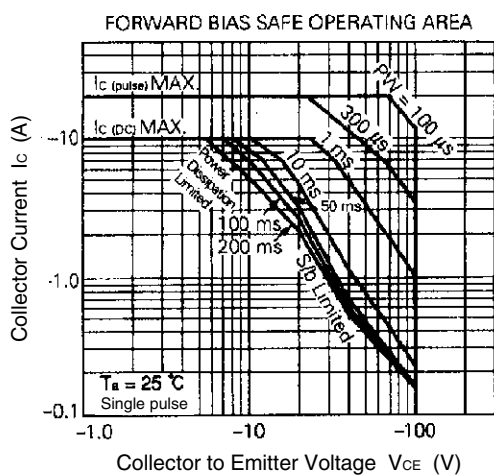
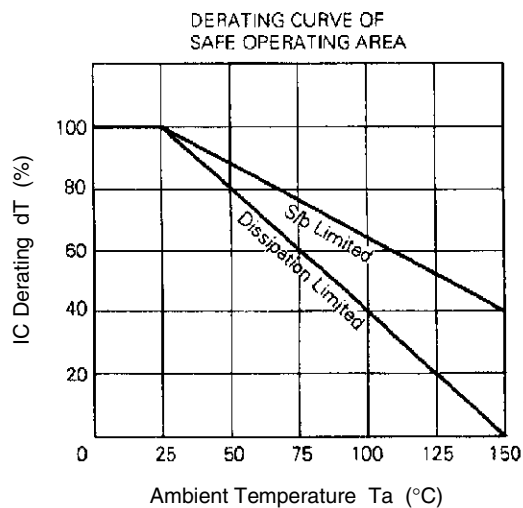
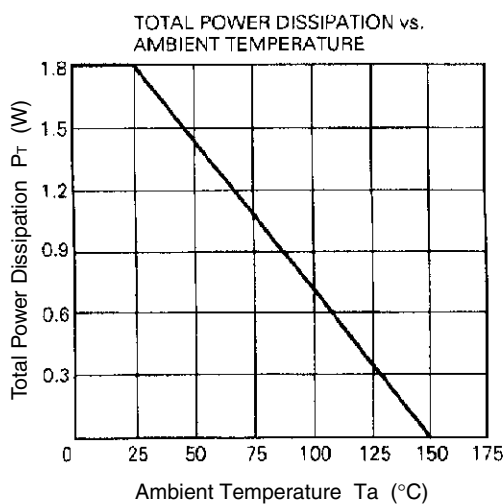
PACKAGE DRAWING (UNIT: mm)

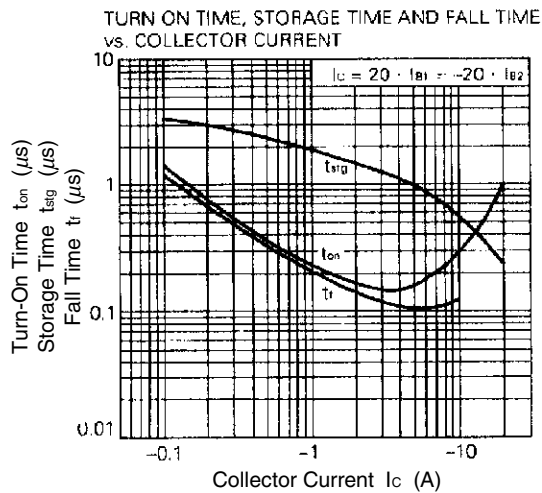
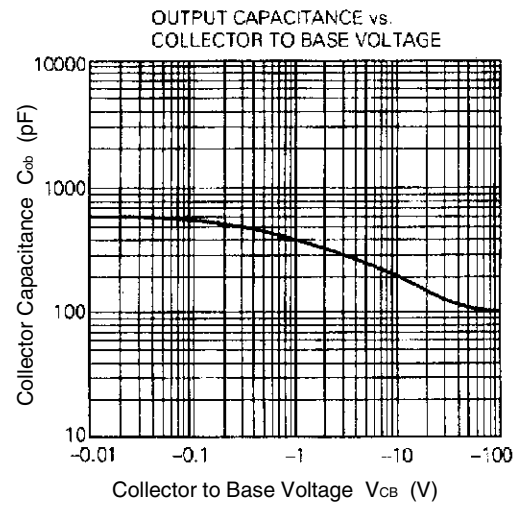
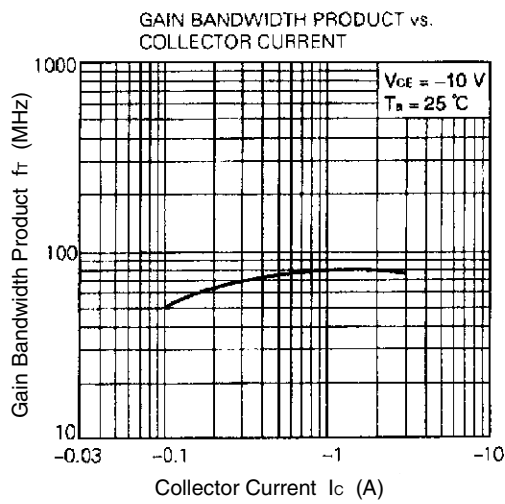
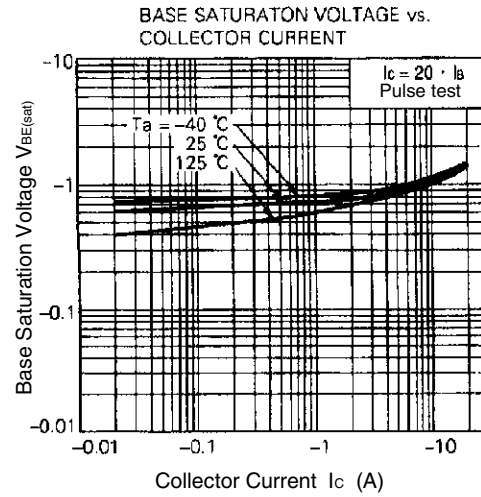
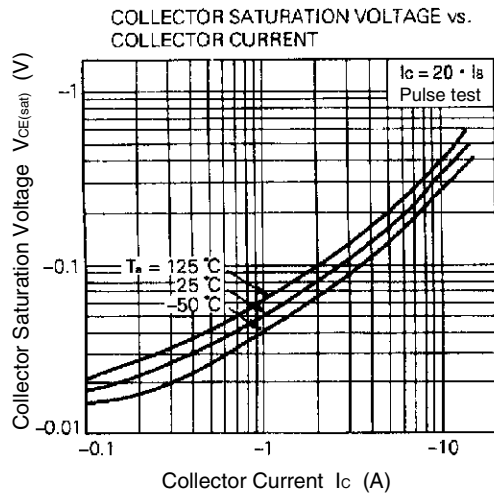
TAPING SPECIFICATION



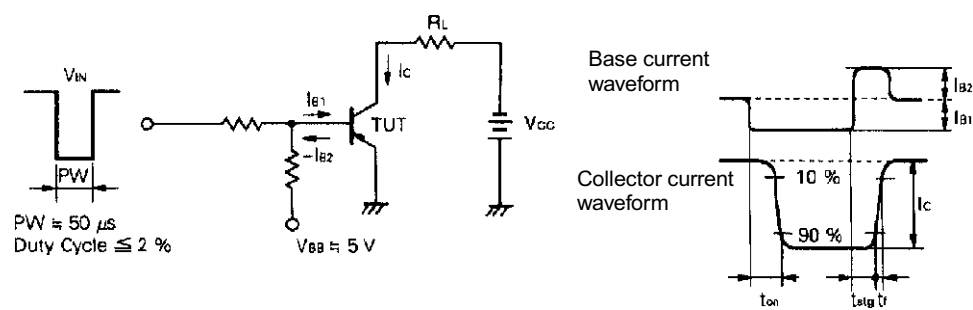
A_1	8.0 ± 0.2
A	13.0 ± 0.2
D_0	$\phi 4.0 \pm 0.2$
d	0.5 ± 0.1
F_1	$2.5^{+0.4}_{-0.1}$
F_2	$2.5^{+0.4}_{-0.1}$
H	20.0 MAX.
H_0	16.0 ± 0.5
H_1	32.2 MAX.
Δh	0 ± 1.0
ℓ_1	2.5 MIN.
P	12.7 ± 1.0
P_0	12.7 ± 0.3
P_2	6.35 ± 0.5
ΔP	0 ± 1.3
T	4.5 ± 0.2
W	$18.0^{+1.0}_{-0.5}$
W_0	5.0 MIN.
W_1	9.0 ± 0.5
W_2	0.7 MIN.

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





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



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