

# SILICON POWER TRANSISTOR 2SA1010

### PNP SILICON EPITAXIAL TRANSISTOR FOR HIGH-VOLTAGE HIGH-SPEED SWITCHING

The 2SA1010 is a mold power transistor developed for high-voltage high-speed switching, and is ideal for use as a driver in devices such as switching regulators, DC/DC converters, and high-frequency power amplifiers.

#### FEATURES

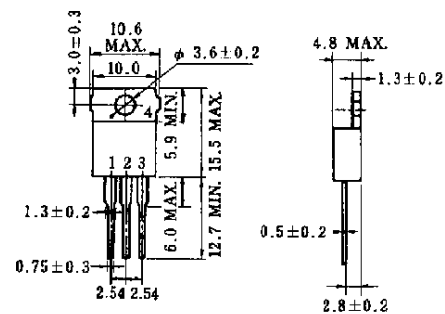
- Low collector saturation voltage
- Fast switching speed
- Complementary transistor: 2SC2334

#### ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	$V_{CBO}$	-100	V
Collector to emitter voltage	$V_{CEO}$	-100	V
Emitter to base voltage	$V_{EBO}$	-7.0	V
Collector current (DC)	$I_{C(DC)}$	-7.0	A
Collector current (pulse)	$I_{C(pulse)}^*$	-15	A
Base current (DC)	$I_{B(DC)}$	-3.5	A
Total power dissipation	$P_T (T_C = 25\text{ }^\circ\text{C})$	40	W
Total power dissipation	$P_T (T_a = 25\text{ }^\circ\text{C})$	1.5	W
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

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

#### PACKAGE DRAWING (UNIT: mm)



#### Pin Connection

1. Base
2. Collector
3. Emitter
4. Fin (Collector)

EIAJ : SC-46  
JEDEC : TO-220AB  
IEC : —

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

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

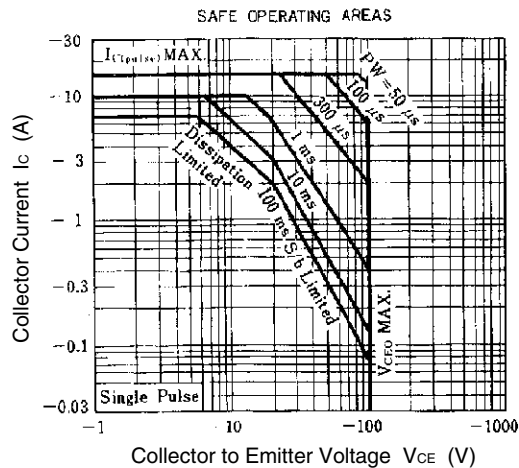
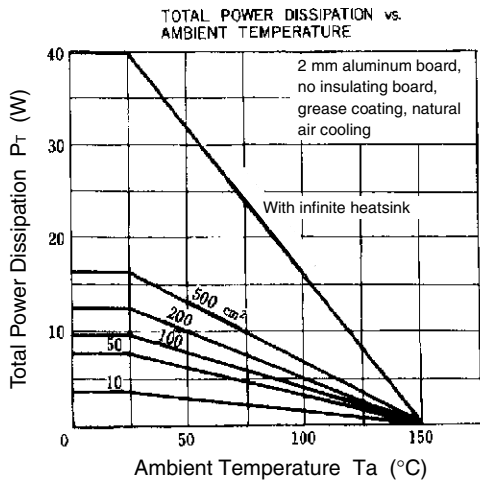
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	V <sub>CE0(SUS)</sub>	I <sub>C</sub> = -5.0 A, I <sub>B1</sub> = -0.5 A, L = 1 mH	-100			V
Collector to emitter voltage	V <sub>CEX(SUS)1</sub>	I <sub>C</sub> = -5.0 A, I <sub>B1</sub> = -I <sub>B2</sub> = -0.5 A, V <sub>BE(OFF)</sub> = 5.0 V, L = 180 μH, clamped	-100			V
Collector to emitter voltage	V <sub>CEX(SUS)2</sub>	I <sub>C</sub> = -10 A, I <sub>B1</sub> = -1.0 A, I <sub>B2</sub> = -0.5 A, V <sub>BE(OFF)</sub> = 5.0 V, L = 180 μH, clamped	-100			V
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> = -100 V, I <sub>E</sub> = 0			-10	μA
Collector cutoff current	I <sub>CER</sub>	V <sub>CE</sub> = -100 V, R <sub>BE</sub> = 51 Ω, Ta = 125 °C			-1.0	mA
Collector cutoff current	I <sub>CX1</sub>	V <sub>CE</sub> = -100 V, V <sub>BE(OFF)</sub> = 1.5 V			-10	μA
Collector cutoff current	I <sub>CX2</sub>	V <sub>CE</sub> = -100 V, V <sub>BE(OFF)</sub> = 1.5 V, Ta = 125 °C			-1.0	mA
Emitter cutoff current	I <sub>EBO</sub>	V <sub>EB</sub> = -5.0 V, I <sub>C</sub> = 0			-10	μA
DC current gain	h <sub>FE1</sub>	V <sub>CE</sub> = -5.0 V, I <sub>C</sub> = -0.5 A*	40		200	
DC current gain	h <sub>FE2</sub>	V <sub>CE</sub> = -5.0 V, I <sub>C</sub> = -3.0 A*	40		200	
DC current gain	h <sub>FE3</sub>	V <sub>CE</sub> = -5.0 V, I <sub>C</sub> = -5.0 A*	20			
Collector saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = -5.0 A, I <sub>B</sub> = -0.5 A*			-0.6	V
Base saturation voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> = -5.0 A, I <sub>B</sub> = -0.5 A*			-1.5	V
Turn-on time	t <sub>on</sub>	I <sub>C</sub> = -5.0 A, R <sub>L</sub> = 10 Ω, I <sub>B1</sub> = -I <sub>B2</sub> = -0.5 A, V <sub>CC</sub> ≅ -50 V			0.5	μs
Storage time	t <sub>stg</sub>	Refer to the test circuit.			1.5	μs
Fall time	t <sub>f</sub>				0.5	μs

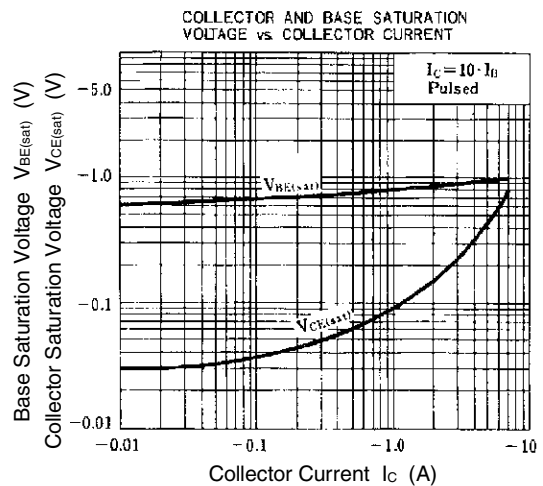
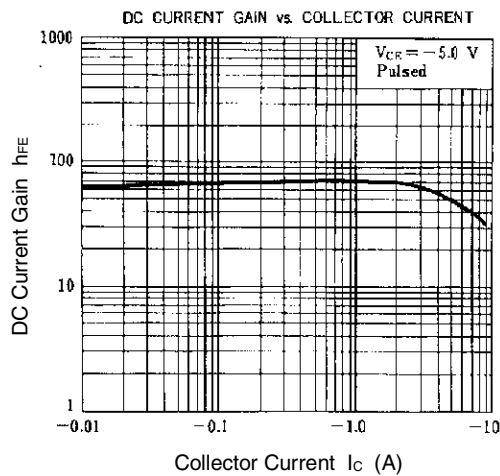
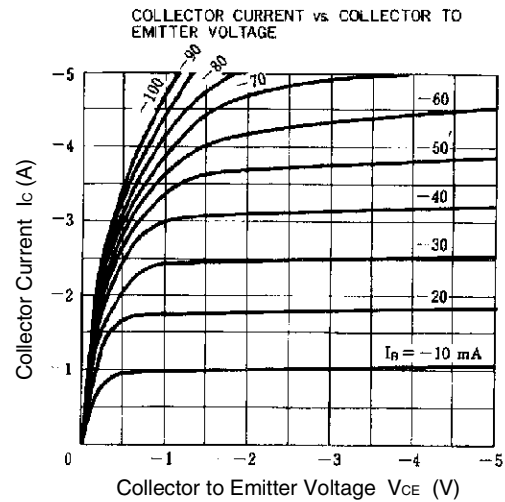
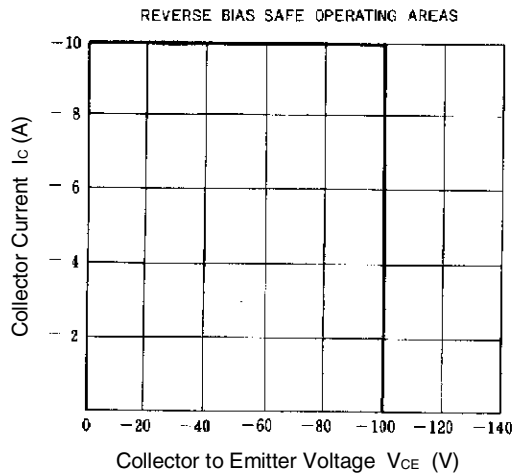
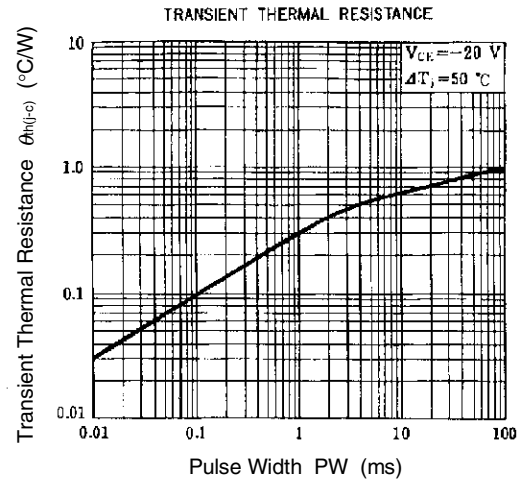
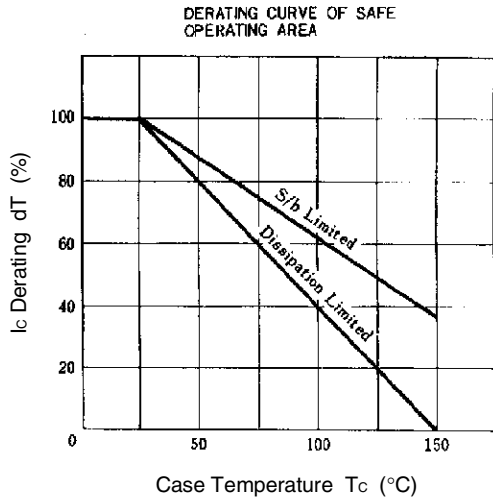
\* Pulse test PW ≤ 350 μs, duty cycle ≤ 2%

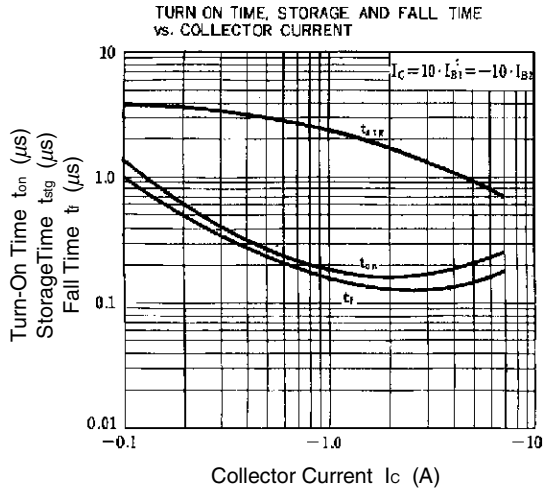
**h<sub>FE</sub> CLASSIFICATION**

Marking	M	L	K
h <sub>FE2</sub>	40 to 80	60 to 120	100 to 200

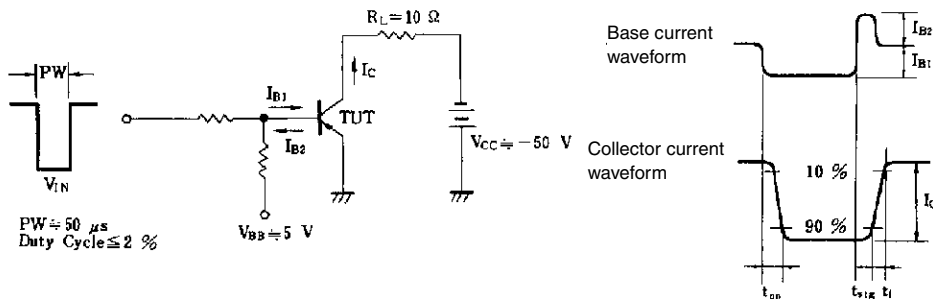
**TYPICAL CHARACTERISTICS (Ta = 25°C)**







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



[MEMO]

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