

# SILICON POWER TRANSISTOR 2SC4550

# NPN SILICON EPITAXIAL TRANSISTOR FOR HIGH-SPEED SWITCHING

The 2SC4550 is a power transistor developed for high-speed switching and features low V<sub>CE(sat)</sub> and high h<sub>FE</sub>. This transistor is ideal for use in drivers such as 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**

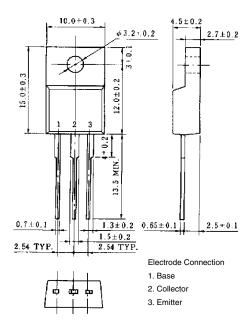
- High hre and low VcE(sat):  $hre \geq 100 \; (VcE=2 \; V, \; Ic=1.5 \; A)$   $VcE(sat) \leq 0.3 \; V \; (Ic=4 \; A, \; IB=0.2 \; A)$
- Mold package that does not require an insulating board or insulation bushing

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

Parameter	Symbol	Ratings	Unit
Collector to base voltage	Vcво	100	V
Collector to emitter voltage	VCEO	60	V
Emitter to base voltage	V <sub>EBO</sub>	7.0	V
Collector current (DC)	Ic(DC)	7.0	Α
Collector current (pulse)	IC(pulse)*	14	Α
Base current (DC)	I <sub>B(DC)</sub>	3.5	Α
Total power dissipation	P⊤ (Tc = 25°C)	30	W
Total power dissipation	P⊤ (Ta = 25°C)	2.0	W
Junction temperature	Tj	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

<sup>\*</sup> PW  $\leq$  300  $\mu$ s, duty cycle  $\leq$  10%

#### PACKAGE DRAWING (UNIT: mm)



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

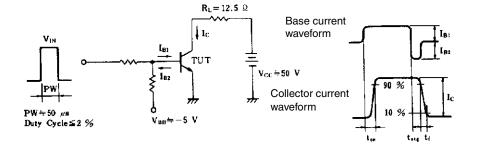
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	VCEO(SUS)	Ic = 4.0 A, I <sub>B</sub> = 0.4 A, L = 1 mH	60			V
Collector to emitter voltage	VCEX(SUS)	Ic = 4.0 A, I <sub>B1</sub> = $-I_{B2}$ = 0.4 A, V <sub>BE(OFF)</sub> = $-1.5$ V, L = 180 $\mu$ H, clamped	60			٧
Collector cutoff current	Ісво	V <sub>CB</sub> = 60 V, I <sub>E</sub> = 0			10	μΑ
Collector cutoff current	ICER	Vce = 60 V, R <sub>BE</sub> = 50 Ω, Ta = 125°C			1.0	mA
Collector cutoff current	ICEX1	Vce = 60 V, Vbe(off) = -1.5 V			10	μΑ
Collector cutoff current	ICEX2	Vce = 60 V, Vbe(OFF) = -1.5 V, Ta = 125°C			1.0	mA
Emitter cutoff current	ІЕВО	V <sub>EB</sub> = 5.0 V, I <sub>C</sub> = 0			10	μΑ
DC current gain	h <sub>FE1</sub> *	Vce = 2.0 V, Ic = 0.7 A	100			
DC current gain	hFE2*	VcE = 2.0 V, Ic = 1.5 A	100	200	400	
DC current gain	hFE3*	Vce = 2.0 V, Ic = 4.0 A	60			
Collector saturation voltage	VCE(sat)1*	Ic = 4.0 A, I <sub>B</sub> = 0.2 A			0.3	V
Collector saturation voltage	VCE(sat)2*	Ic = 6.0 A, I <sub>B</sub> = 0.3 A			0.5	V
Base saturation voltage	V <sub>BE(sat)1</sub> *	Ic = 4.0 A, I <sub>B</sub> = 0.2 A			1.2	V
Base saturation voltage	V <sub>BE(sat)2</sub> *	Ic = 6.0 A, I <sub>B</sub> = 0.3 A			1.5	V
Collector capacitance	Cob	VcB = 10 V, IE = 0, f = 1.0 MHz		100		pF
Gain bandwidth product	f⊤	Vce = 10 V, Ic = 1.0 A		150		MHz
Turn-on time	ton	Ic = 4.0 A, R <sub>L</sub> = 12.5 Ω,		0.1	0.3	μs
Storage time	tstg	$I_{B1} = -I_{B2} = 0.2 \text{ A}, \text{ Vcc} \cong 50 \text{ V}$ Refer to the test circuit.		1.0	1.5	μs
Fall time	tf	Herer to the test circuit.		0.1	0.3	μs

<sup>\*</sup> Pulse test PW  $\leq$  350  $\mu$ s, duty cycle  $\leq$  2%

#### **hfe CLASSIFICATION**

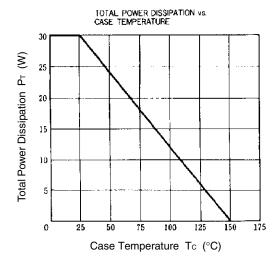
Marking	М	L	K
h <sub>FE2</sub>	100 to 200	150 to 300	200 to 400

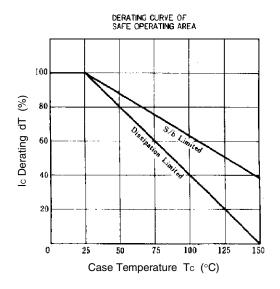
## SWITCHING TIME (ton, tstg, tf) TEST CIRCUIT

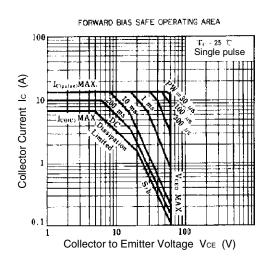


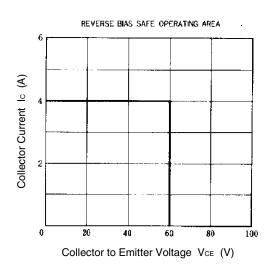


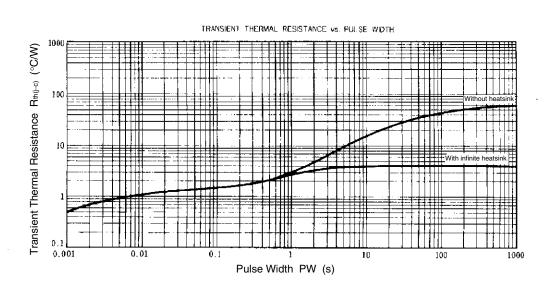
### TYPICAL CHARACTERISTICS (Ta = 25°C)



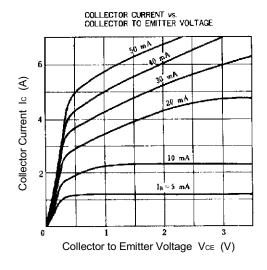


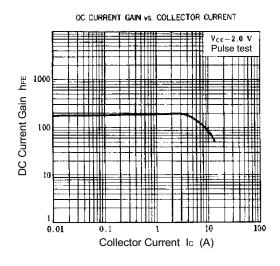


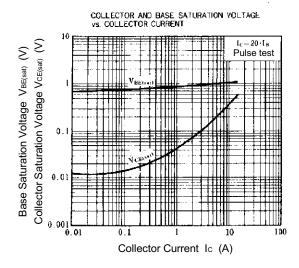


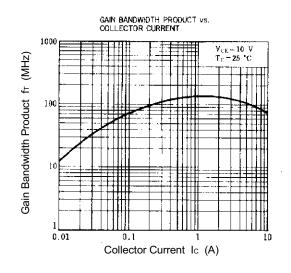


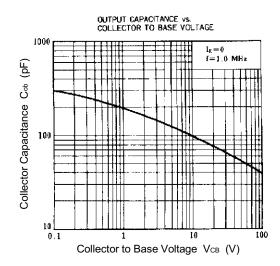
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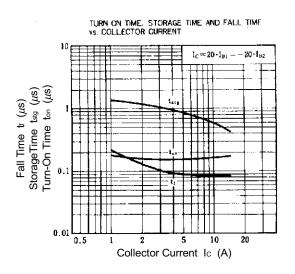














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