

## NPN SILICON POWER TRANSISTOR 2SC2752

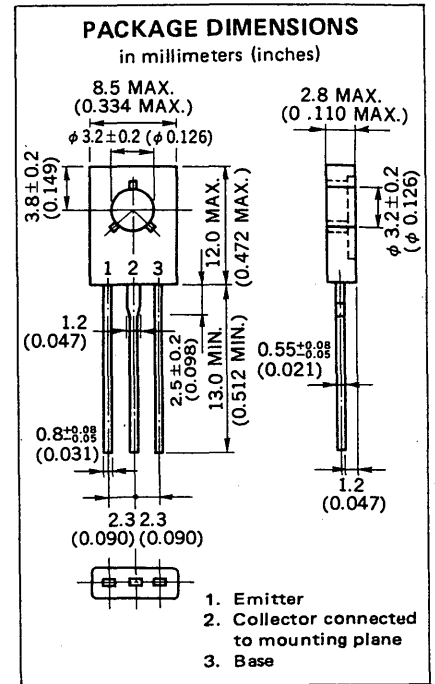
**DESCRIPTION** The 2SC2752 is suitable for Low Power Switching regulator, DC-DC converter and High Voltage Switch.

- FEATURES**
- High Breakdown Voltage.
  - Low Collector Saturation Voltage.
  - High Speed Switching.
  - Complementary to the NEC 2SA1156 PNP Transistor.

**ABSOLUTE MAXIMUM RATINGS**

<b>Maximum Temperatures</b>		
Storage Temperature	.....	-55 to +150 °C
Junction Temperature	.....	+150 °C Maximum
<b>Maximum Power Dissipations</b>		
Total Power Dissipation (T <sub>a</sub> = 25 °C)	.....	1.0 W
Total Power Dissipation (T <sub>c</sub> = 25 °C)	.....	10 W
<b>Maximum Voltages and Currents (T<sub>a</sub> = 25 °C)</b>		
V <sub>CB0</sub>	Collector to Base Voltage	..... 500 V
V <sub>CEO</sub>	Collector to Emitter Voltage	..... 400 V
V <sub>EBO</sub>	Emitter to Base Voltage	..... 7.0 V
I <sub>C(DC)</sub>	Collector Current	..... 0.5 A
I <sub>C(pulse)</sub> *	Collector Current	..... 1.0 A
I <sub>B(DC)</sub>	Base Current	..... 0.25 A

\* PW ≤ 10 ms, Duty Cycle ≤ 50 %



ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
h <sub>FE1</sub> *	DC Current Gain	20		80	—	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 0.05 A
h <sub>FE2</sub> *	DC Current Gain	10			—	V <sub>CE</sub> = 5.0 V, I <sub>C</sub> = 0.3 A
t <sub>on</sub>	Turn On Time			1.0	μs	(I <sub>C</sub> = 0.3 A, I <sub>B1</sub> = -I <sub>B2</sub> = 0.06 A, PW ≐ 50 μs R <sub>L</sub> = 500 Ω, V <sub>CC</sub> ≐ 150 V)
t <sub>stg</sub>	Storage Time			2.5	μs	
t <sub>f</sub>	Fall Time			1.0	μs	
V <sub>ECO(sus)</sub>	Collector to Emitter Sustaining Voltage	400			V	Table 1, I <sub>C</sub> = 0.3 A, I <sub>B1</sub> = 0.06 A, L = 10 mH
V <sub>CEX(sus)1</sub>	Collector to Emitter Sustaining Voltage	450			V	(Table 1, I <sub>C</sub> = 0.3 A, I <sub>B1</sub> = -I <sub>B2</sub> = 0.06 A V <sub>clamp</sub> = Rated V <sub>CEX</sub> , T <sub>a</sub> = 125 °C, L = 10 mH)
V <sub>CEX(sus)2</sub>	Collector to Emitter Sustaining Voltage	400			V	(Table 1, I <sub>C</sub> = 0.6 A, I <sub>B1</sub> = 0.2 A, I <sub>B2</sub> = -0.06 A V <sub>clamp</sub> = Rated V <sub>CEX</sub> , T <sub>a</sub> = 125 °C, L = 10 mH)
I <sub>CER</sub>	Collector Cutoff Current			1.0	mA	V <sub>CE</sub> = 400 V, R <sub>BE</sub> = 51 Ω, T <sub>a</sub> = 125 °C
I <sub>CEX1</sub>	Collector Cutoff Current			10	μA	V <sub>CE</sub> = 400 V, V <sub>BE(OFF)</sub> = -1.5 V
I <sub>CEX2</sub>	Collector Cutoff Current			1.0	mA	(V <sub>CE</sub> = 400 V, V <sub>BE(OFF)</sub> = -1.5 V, T <sub>a</sub> = 125 °C)
I <sub>EBO</sub>	Emitter Cutoff Current			10	μA	V <sub>EB</sub> = 5.0 V, I <sub>C</sub> = 0
V <sub>CE(sat)</sub> *	Collector Saturation Voltage			1.0	V	I <sub>C</sub> = 0.3 A, I <sub>B</sub> = 0.06 A
V <sub>BE(sat)</sub> *	Base Saturation Voltage			1.2	V	I <sub>C</sub> = 0.3 A, I <sub>B</sub> = 0.06 A

\* Pulsed / PW ≐ 350 μs, Duty Cycle ≐ 2 %

Classification of h<sub>FE1</sub>

Rank	M	L	K
Range	20 to 40	30 to 60	40 to 80

Test Conditions: V<sub>CE</sub> = 5.0 V, I<sub>C</sub> = 0.05 A

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

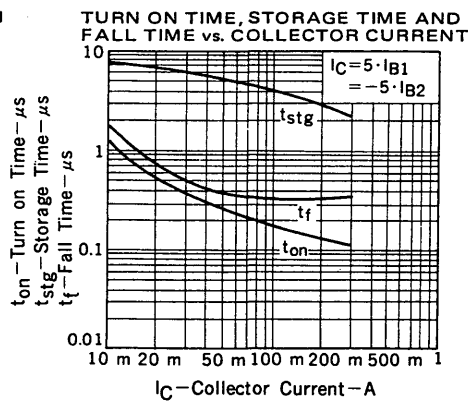
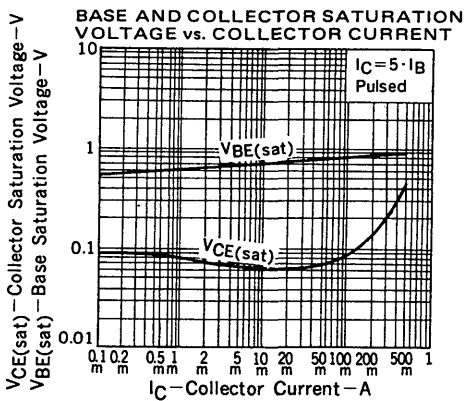
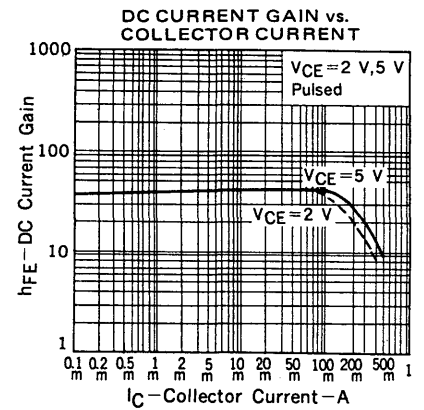
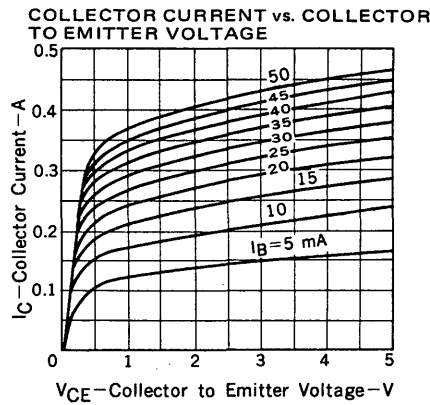
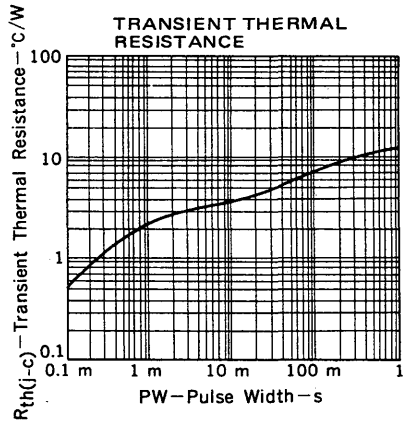
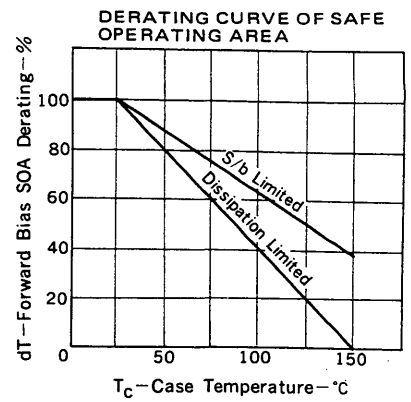
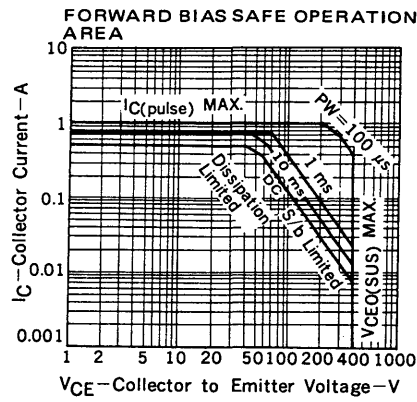
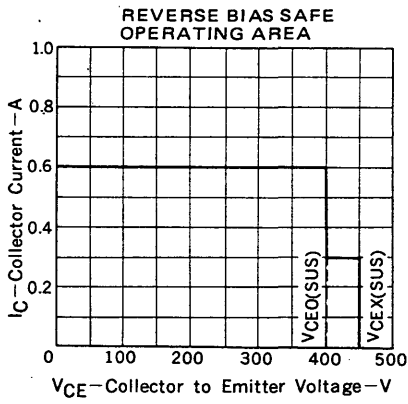


TABLE 1. — TEST CONDITIONS FOR DYNAMIC PERFORMANCE

	V <sub>CEO</sub> (SUS)	V <sub>CEX</sub> (SUS)	RESISTIVE SWITCHING
INPUT CONDITIONS	<p>PW Varied to Attain I<sub>C</sub> = 10 A</p>	<p>PW Varied to Attain I<sub>C</sub> = 10 A Duty Cycle ≤ 2% Q<sub>1</sub> = 2SA959</p>	
CIRCUIT VALUES	<p>L<sub>coil</sub> = 10 mH, V<sub>CC</sub> = 10 V                      R<sub>coil</sub> ≤ 0.5 Ω                      V<sub>clamp</sub> (Unclamped)</p>	<p>L<sub>coil</sub> = 10 mH, V<sub>CC</sub> = 20 V                      R<sub>coil</sub> ≤ 0.5 Ω                      V<sub>clamp</sub> = Rated V<sub>CEX</sub> Value</p>	<p>R<sub>L</sub> = 500 Ω, V<sub>CC</sub> ≈ 150 V</p>
TEST CIRCUITS	<p>INDUCTIVE TEST CIRCUIT</p>	<p>OUTPUT WAVEFORM</p> <p>t<sub>1</sub> Adjust to Obtain I<sub>C</sub></p> $t_1 = \frac{L_{coil} (I_C \text{ pk})}{V_{CC}}$ $t_2 = \frac{L_{coil} (I_C \text{ pk})}{V_{clamp}}$	<p>RESISTIVE TEST CIRCUIT</p>