

NPN SILICON EPITAXIAL TRANSISTOR FOR HIGH-SPEED SWITCHING

The 2SC2517 is a mold power transistor developed for high-speed switching. This transistor is ideal for use in drivers such as switching regulators, DC/DC converters, high-frequency power amplifiers.

FEATURES

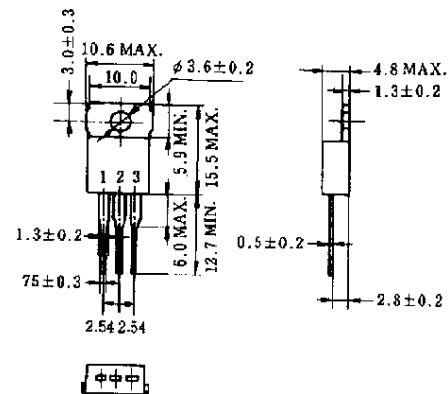
- Low collector saturation voltage:
 $V_{CE(sat)} \leq 0.6 \text{ V}$ (at $I_c = 3.0 \text{ A}$)
- Fast switching speed:
 $t_f \leq 0.5 \mu\text{s}$ (at $I_c = 3.0 \text{ A}$)
- Wide base reverse-bias SOA:
 $V_{CEX(sus)} \leq 150 \text{ V}$ (at $I_c = 3.0 \text{ A}$)

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

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	150	V
Collector to emitter voltage	V_{CEO}	100	V
Emitter to base voltage	V_{EBO}	12	V
Collector current (DC)	$I_{C(DC)}$	5.0	A
Collector current (pulse)	$I_{C(pulse)^*}$	10	A
Base current (DC)	$I_{B(DC)}$	2.5	A
Total power dissipation	P_T ($T_c = 25^\circ\text{C}$)	30	W
Total power dissipation	P_T ($T_a = 25^\circ\text{C}$)	1.5	W
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

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

PACKAGE DRAWING (UNIT: mm)



Electrode Connection

1. Base (B)
2. Collector (C)
3. Emitter (E)
4. Fin (collector)

EIAJ: SC-46
JEDEC: TO-220AB
IEC: —

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

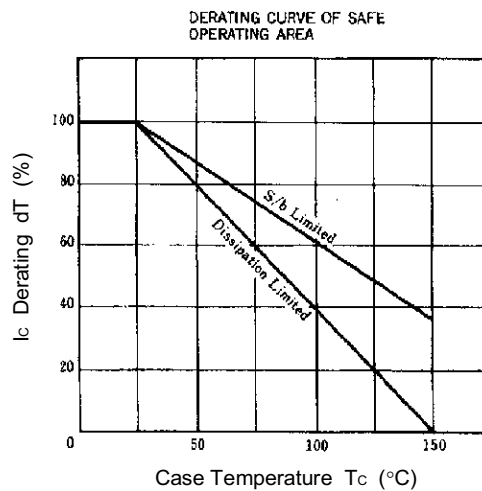
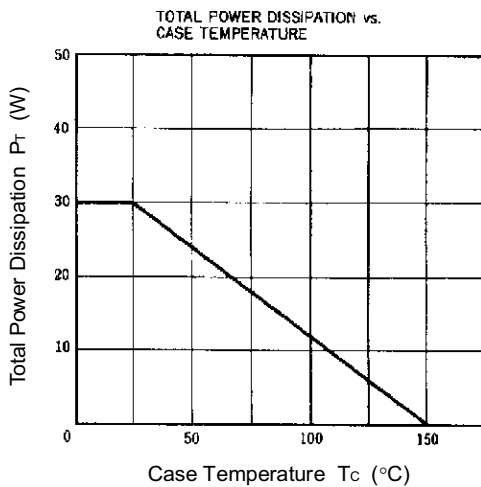
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	V _{CEQ(SUS)}	I _C = 3.0 A, I _{B1} = 0.3 A, L = 1 mH	100			V
Collector to emitter voltage	V _{CEX(SUS)1}	I _C = 3.0 A, I _{B1} = -I _{B2} = 0.3 A, V _{BE(OFF)} = -5.0 V, L = 180 μH, clamped	150			V
Collector to emitter voltage	V _{CEX(SUS)2}	I _C = 6.0 A, I _{B1} = 1.2 A, I _{B2} = -0.3 A, V _{BE(OFF)} = -5.0 V, L = 180 μH, clamped	100			V
Collector cutoff current	I _{CB0}	V _{CB} = 100 V, I _E = 0			10	μA
Collector cutoff current	I _{CER}	V _{CE} = 100 V, R _{BE} = 51 Ω, Ta = 125°C			1.0	mA
Collector cutoff current	I _{CX1}	V _{CE} = 100 V, V _{BE(OFF)} = -1.5 V			10	μA
Collector cutoff current	I _{CX2}	V _{CE} = 100 V, V _{BE(OFF)} = -1.5 V, Ta = 125°C			1.0	mA
Emitter cutoff current	I _{EB0}	V _{EB} = 10 V, I _C = 0			10	μA
DC current gain	h _{FE1}	V _{CE} = 5.0 V, I _C = 0.2 A*	40			
DC current gain	h _{FE2}	V _{CE} = 5.0 V, I _C = 2.0 A*	40		200	
Collector saturation voltage	V _{CE(sat)}	I _C = 3.0 A, I _B = 0.3 A*			0.6	V
Base saturation voltage	V _{BE(sat)}	I _C = 3.0 A, I _B = 0.3 A*			1.5	V
Turn-on time	t _{on}	I _C = 3.0 A, R _L = 17 Ω, I _{B1} = -I _{B2} = 0.3 A, V _{CC} ≅ 50 V			0.5	μs
Storage time	t _{stg}	Refer to the test circuit.			2.5	μs
Fall time	t _f				0.5	μs

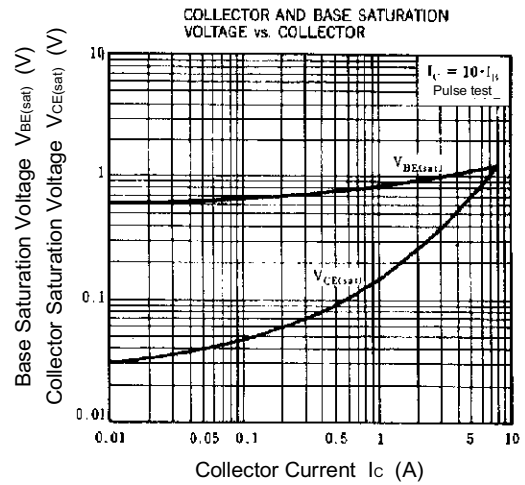
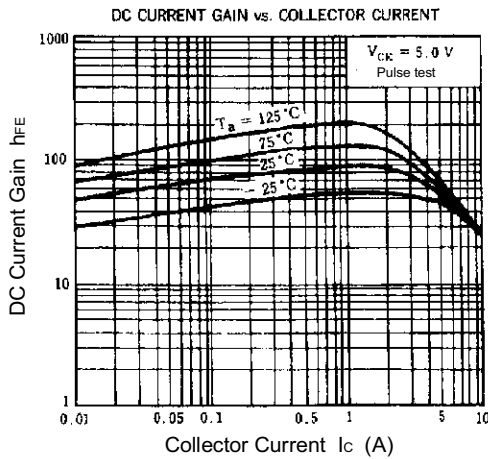
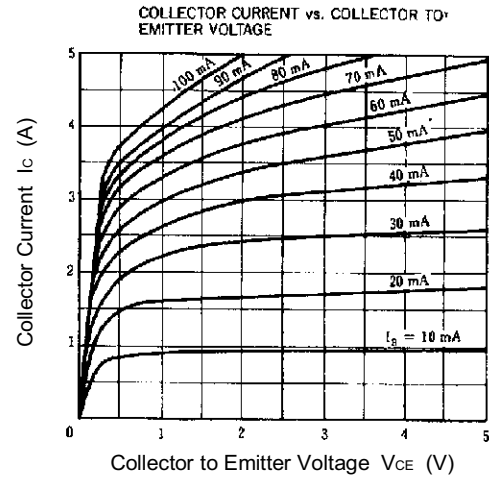
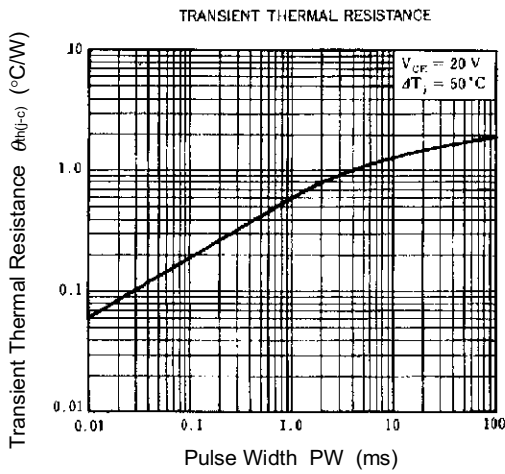
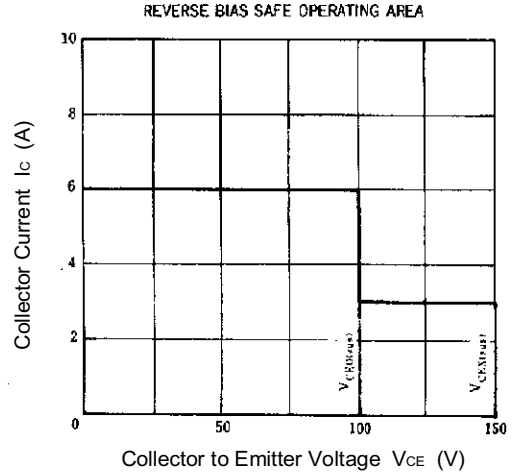
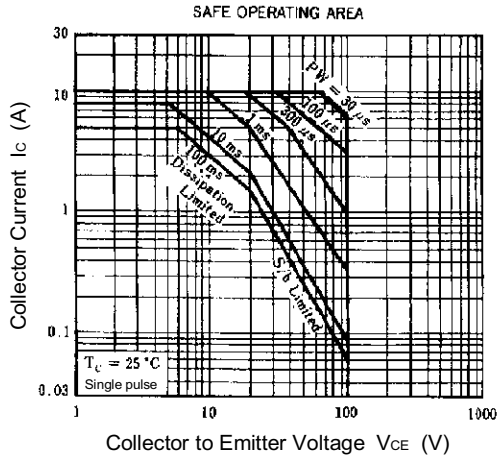
* Pulse test PW ≤ 350 μs, duty cycle ≤ 2%

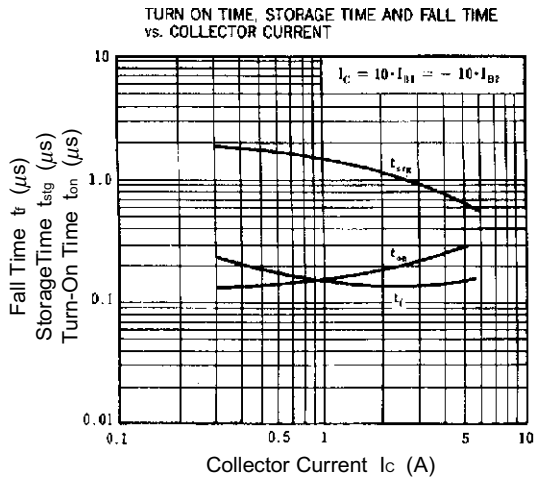
h_{FE2} CLASSIFICATION

Marking	M	L	K
h _{FE2}	40 to 80	60 to 120	100 to 200

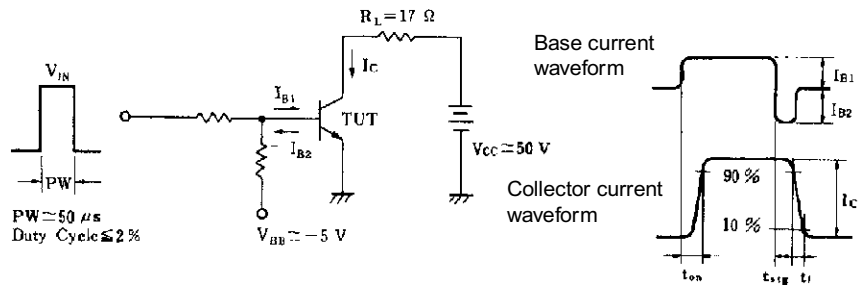
TYPICAL CHARACTERISTICS (Ta = 25°C)







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



[MEMO]

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