

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

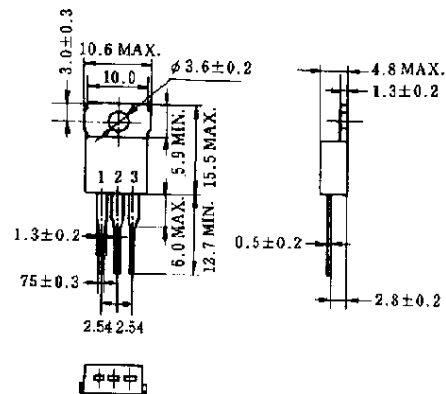
- Low collector saturation voltage:
 $V_{CE(sat)} \leq 0.6 \text{ V}$ (at $I_C = 3.0 \text{ A}$)
- Fast switching speed:
 $t_f \leq 0.5 \mu\text{s}$ (at $I_C = 3.0 \text{ A}$)
- Wide base reverse-bias SOA:
 $V_{CEX(SUS)} \leq 150 \text{ V}$ (at $I_C = 3.0 \text{ A}$)

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)

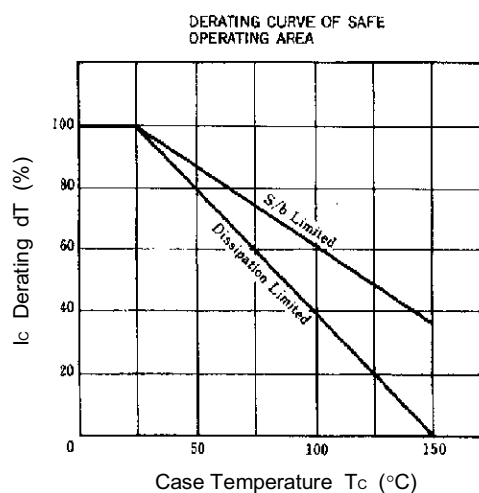
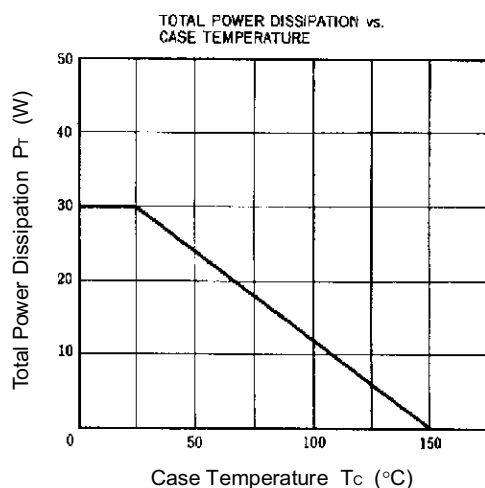
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	$V_{CEQ(SUS)}$	$I_C = 3.0\text{ A}$, $I_{B1} = 0.3\text{ A}$, $L = 1\text{ mH}$	100			V
Collector to emitter voltage	$V_{CEX(SUS)1}$	$I_C = 3.0\text{ A}$, $I_{B1} = -I_{B2} = 0.3\text{ A}$, $V_{BE(OFF)} = -5.0\text{ V}$, $L = 180\text{ }\mu\text{H}$, clamped	150			V
Collector to emitter voltage	$V_{CEX(SUS)2}$	$I_C = 6.0\text{ A}$, $I_{B1} = 1.2\text{ A}$, $I_{B2} = -0.3\text{ A}$, $V_{BE(OFF)} = -5.0\text{ V}$, $L = 180\text{ }\mu\text{H}$, clamped	100			V
Collector cutoff current	I_{CBO}	$V_{CB} = 100\text{ V}$, $I_E = 0$			10	μA
Collector cutoff current	I_{CER}	$V_{CE} = 100\text{ V}$, $R_{BE} = 51\text{ }\Omega$, $T_a = 125^\circ\text{C}$			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}	$V_{EB} = 10\text{ V}$, $I_C = 0$			10	μA
DC current gain	h_{FE1}	$V_{CE} = 5.0\text{ V}$, $I_C = 0.2\text{ A}^*$	40			
DC current gain	h_{FE2}	$V_{CE} = 5.0\text{ V}$, $I_C = 2.0\text{ A}^*$	40		200	
Collector saturation voltage	$V_{CE(sat)}$	$I_C = 3.0\text{ A}$, $I_B = 0.3\text{ A}^*$			0.6	V
Base saturation voltage	$V_{BE(sat)}$	$I_C = 3.0\text{ A}$, $I_B = 0.3\text{ A}^*$			1.5	V
Turn-on time	t_{on}	$I_C = 3.0\text{ A}$, $R_L = 17\text{ }\Omega$, $I_{B1} = -I_{B2} = 0.3\text{ A}$, $V_{CC} \cong 50\text{ V}$ Refer to the test circuit.			0.5	μs
Storage time	t_{stg}				2.5	μs
Fall time	t_f				0.5	μs

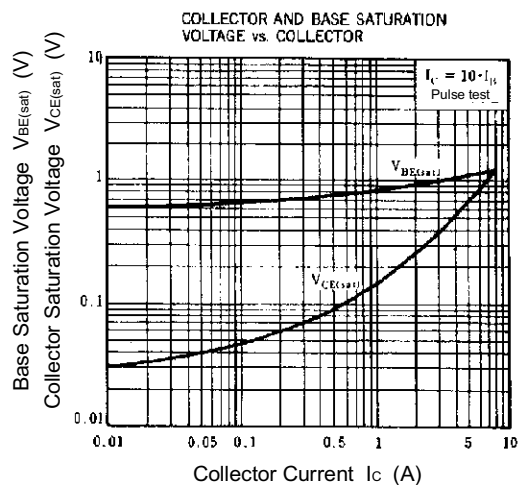
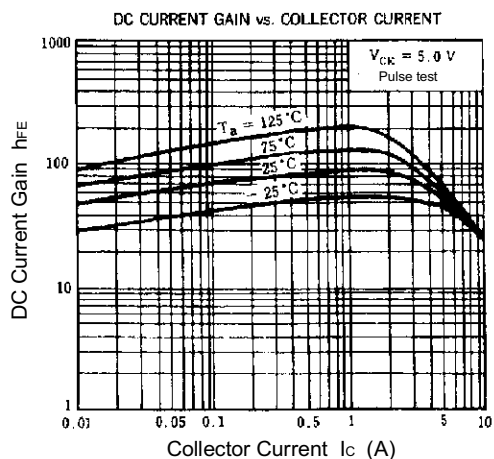
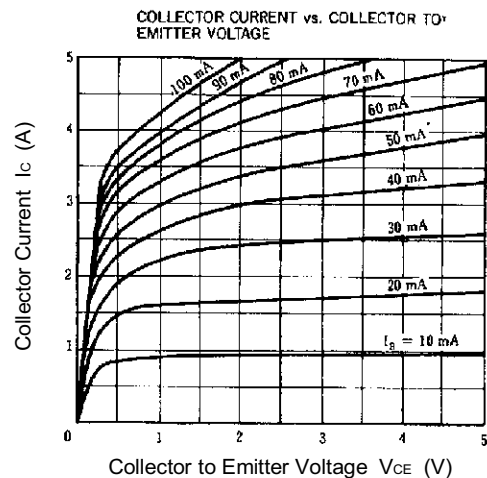
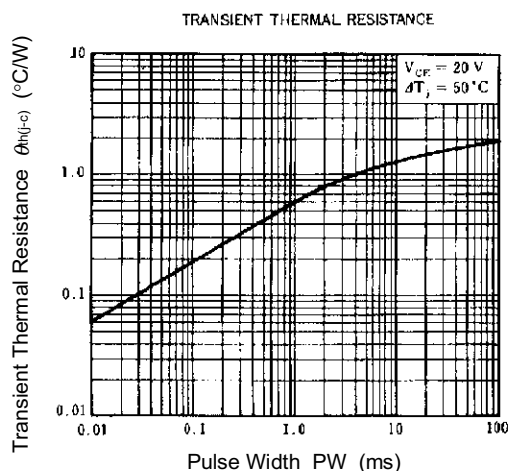
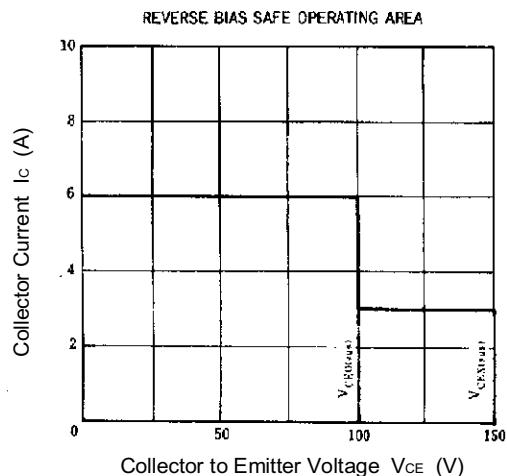
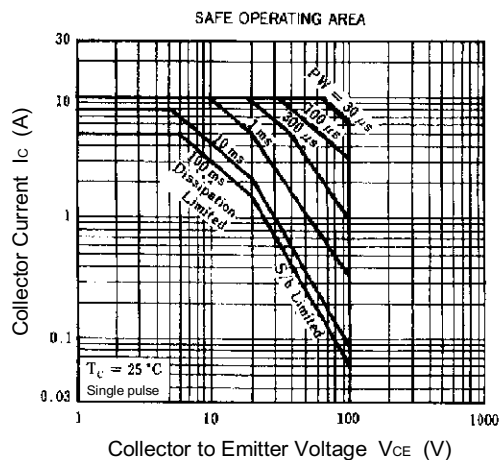
* Pulse test $PW \leq 350\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

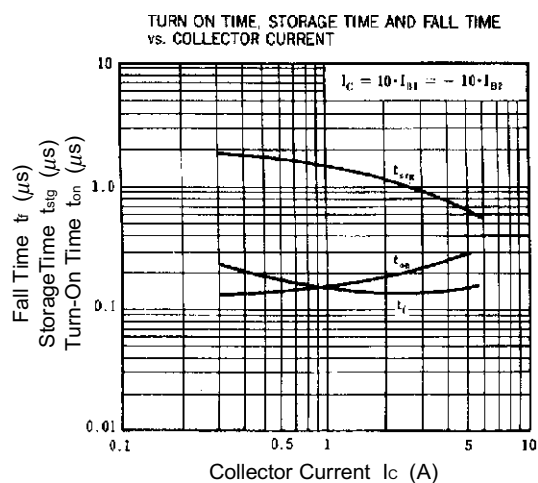
h_{FE2} CLASSIFICATION

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

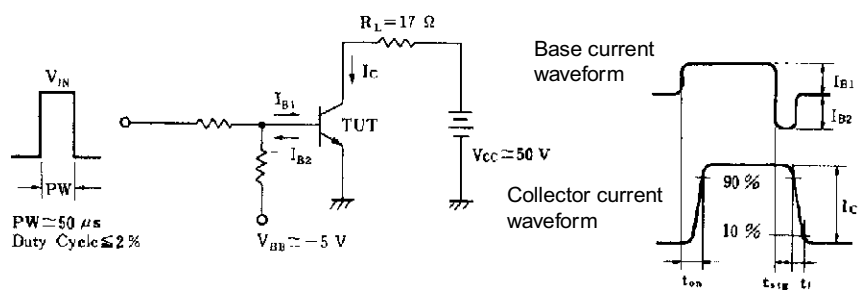
TYPICAL CHARACTERISTICS (Ta = 25°C)







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



[MEMO]

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