NEC

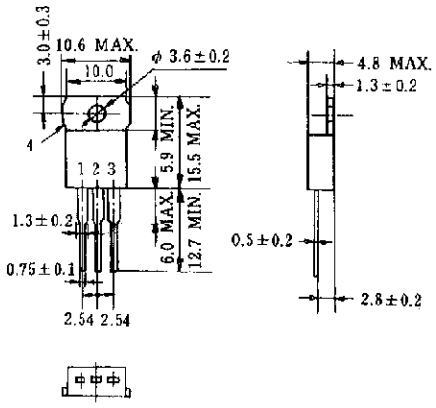
SILICON POWER TRANSISTOR
2SC2654

NPN SILICON EPITAXIAL TRANSISTOR
FOR LOW-FREQUENCY POWER AMPLIFIERS AND MID-SPEED SWITCHING

FEATURES

- Large current capacitance in small dimension: $I_{C(DC)}$ = 7 A
- Low collector saturation voltage:
  $V_{CE(sat)}$ = 0.3 V MAX. (I_C = 3.0 A)
- Ideal for use in a lamp driver
- Complementary transistor: 2SA1129

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 : —

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	100	V
Collector to emitter voltage	V_{CEO}	40	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°C)	40	W
Total power dissipation	P_T (T_a = 25°C)	1.5	W
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	−55 to +150	°C

* PW ≤ 300 μs, duty cycle ≤ 10%

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	V_{CB} = 40 V, I_E = 0			10	μA
Emitter cutoff current	I_{EBO}	V_{EB} = 5.0 V, I_C = 0			10	μA
DC current gain	h_{FE1}	V_{CE} = 1.0 V, I_C = 3 A*	40		320	
DC current gain	h_{FE2}	V_{CE} = 1.0 V, I_C = 5 A*	20			
Collector saturation voltage	$V_{CE(sat)1}$	I_C = 3.0 A, I_B = 0.1 A*			0.3	V
Base saturation voltage	$V_{BE(sat)1}$	I_C = 3.0 A, I_B = 0.1 A*			1.5	V
Collector saturation voltage	$V_{CE(sat)2}$	I_C = 5.0 A, I_B = 0.5 A*			0.6	V
Base saturation voltage	$V_{BE(sat)2}$	I_C = 5.0 A, I_B = 0.5 A*			2.0	V
Turn-on time	t_{on}	I_C = 5.0 A, I_{B1} = −I_{B2} = 0.5 A			1.0	μs
Storage time	t_{stg}	R_L = 4.0 Ω, V_{CC} ≅ 20 V			2.5	μs
Fall time	t_f	PW ≅ 50 μs, duty cycle ≤ 2 %			1.0	μs

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

h_{FE1} classification M: 40 to 80, L: 60 to 120, K: 100 to 200, J: 160 to 320

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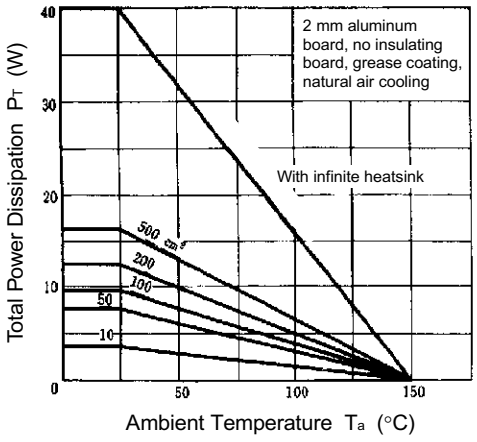
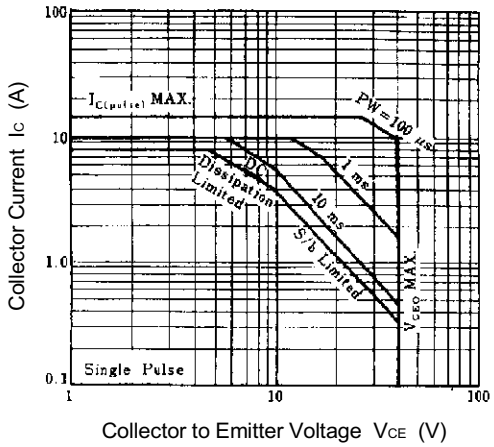
TYPICAL CHARACTERISTICS (Ta = 25°C)

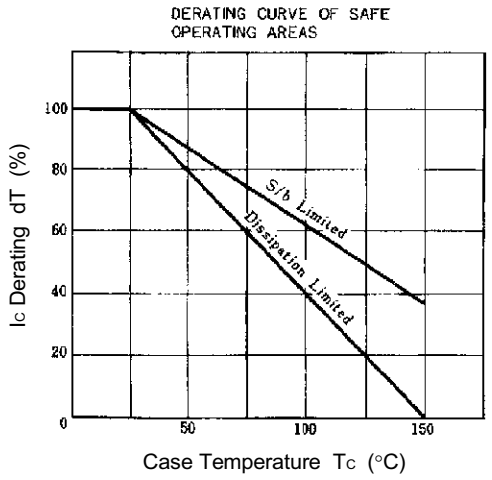
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



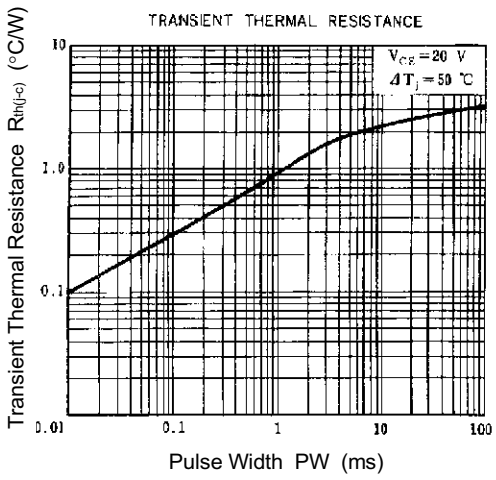
SAFE OPERATING AREAS



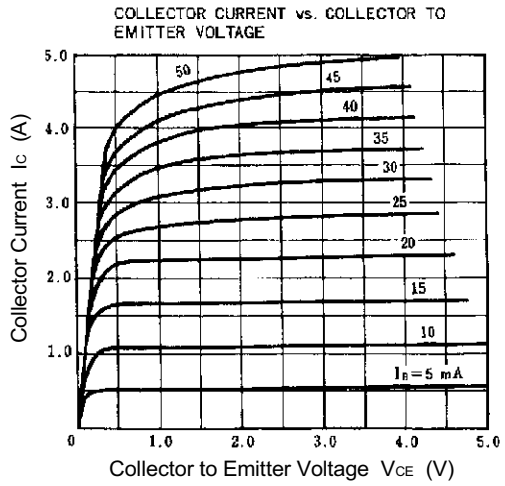
DERATING CURVE OF SAFE OPERATING AREAS



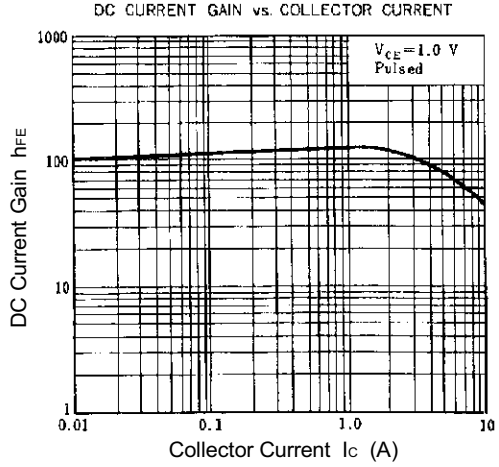
TRANSIENT THERMAL RESISTANCE

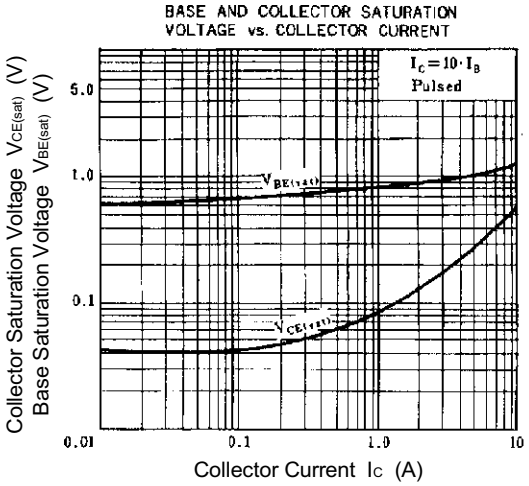


COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE

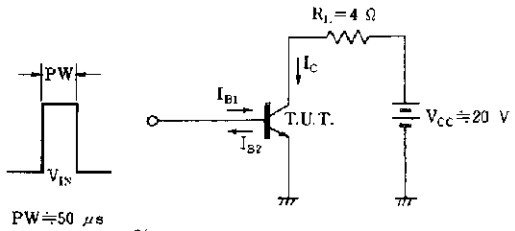


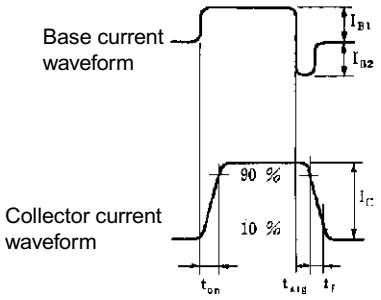
DC CURRENT GAIN vs. COLLECTOR CURRENT





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





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