

# SILICON POWER TRANSISTOR 2SD1481

### NPN SILICON EPITAXIAL TRANSISTOR (DARLINGTON CONNECTION) FOR LOW-FREQUENCY POWER AMPLIFIERS AND LOW-SPEED SWITCHING

#### FEATURES

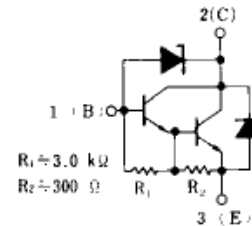
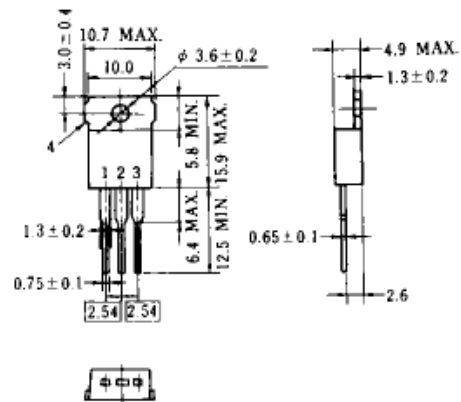
- On-chip C-to-B Zener diode for surge voltage absorption
- Low collector saturation voltage:  $V_{CE(SAT)} = 1.5 \text{ V MAX.}$  (at 1 A)
- Ideal for use in a direct drive from IC to the devices such as OA and FA equipment and motor solenoid relay printer head drivers

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

Parameter	Symbol	Ratings	Unit
Collector to base voltage	$V_{CBO}$	$60 \pm 10$	V
Collector to emitter voltage	$V_{CEO}$	$60 \pm 10$	V
Emitter to base voltage	$V_{EBO}$	7.0	V
Collector current	$I_{C(DC)}$	2.0	A
Collector current	$I_{C(pulse)}^*$	4.0	A
Base current	$I_{B(DC)}$	0.2	A
Total power dissipation	$P_T (T_c = 25^\circ\text{C})$	15	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
2. Collector
3. Emitter
4. Fin (collector)

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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

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

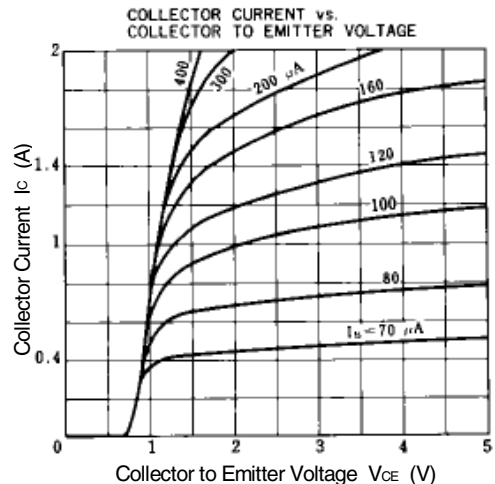
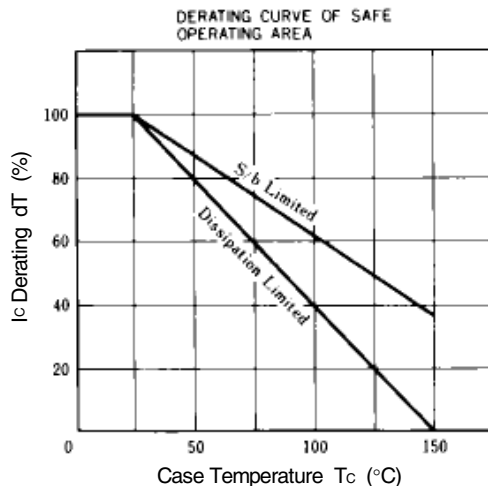
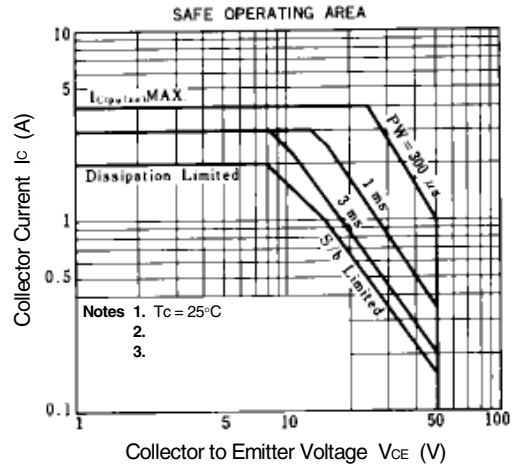
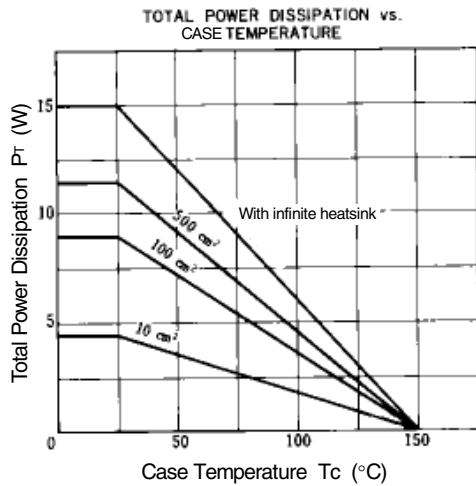
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = 40\text{ V}, I_E = 0$			1.0	$\mu\text{A}$
DC current gain	$h_{FE1}$	$V_{CE} = 2.0\text{ V}, I_C = 1.0\text{ A}^*$	2,000		20,000	
DC current gain	$h_{FE2}$	$V_{CE} = 2.0\text{ V}, I_C = 3.0\text{ A}^*$	500			
Collector saturation voltage	$V_{CE(sat)}$	$I_C = 1.0\text{ A}, I_B = 1.0\text{ mA}^*$			1.5	V
Base saturation voltage	$V_{BE(sat)}$	$I_C = 1.0\text{ A}, I_B = 1.0\text{ mA}^*$			2.0	V
Turn-on time	$t_{on}$	$I_C = 1.0\text{ A}, I_{B1} = -I_{B2} = 10\text{ mA}$ $R_L = 50\ \Omega, V_{CC} \cong 50\text{ V}$ Refer to the test circuit.		0.5		$\mu\text{s}$
Storage time	$t_{stg}$			2.0		$\mu\text{s}$
Fall time	$t_f$			1.0		$\mu\text{s}$

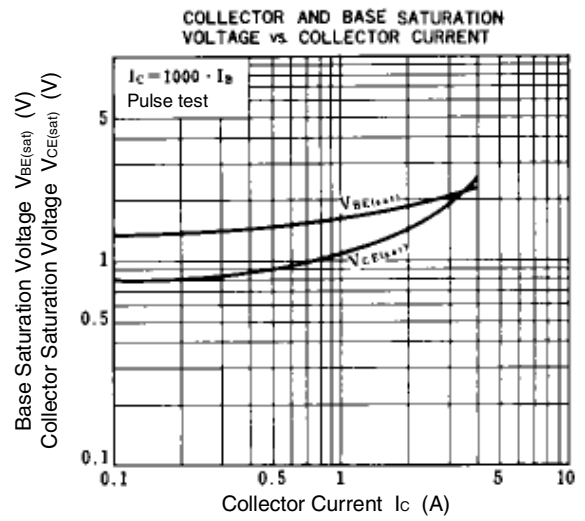
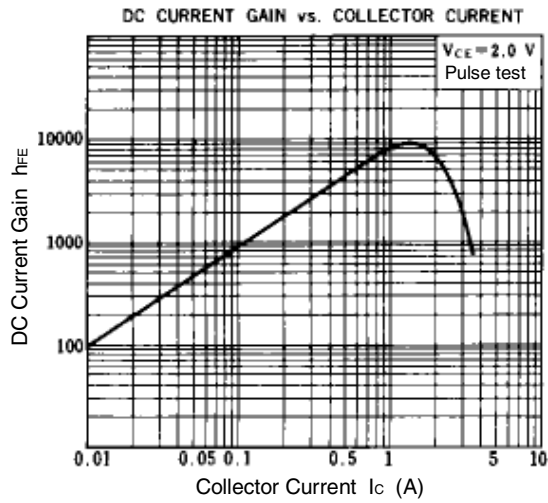
\* Pulse test  $PW \leq 350\ \mu\text{s}$ , duty cycle  $\leq 2\%$

**$h_{FE}$  CLASSIFICATION**

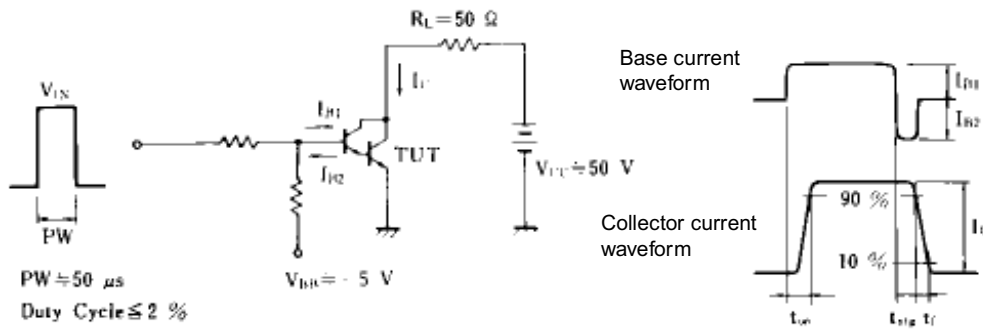
Marking	M	L	K
$h_{FE1}$	2,000 to 5,000	4,000 to 10,000	8,000 to 20,000

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





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



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