

# DARLINGTON POWER TRANSISTOR 2SC4351

## NPN SILICON EPITAXIAL TRANSISTOR (DARLINGTON CONNECTION) FOR HIGH-SPEED SWITCHING

The 2SC4351 is a high-speed Darlington power transistor. This transistor is ideal for high-precision control such as PWM control for pulse motors or brushless motor of OA and FA equipment.

### FEATURES

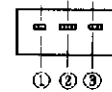
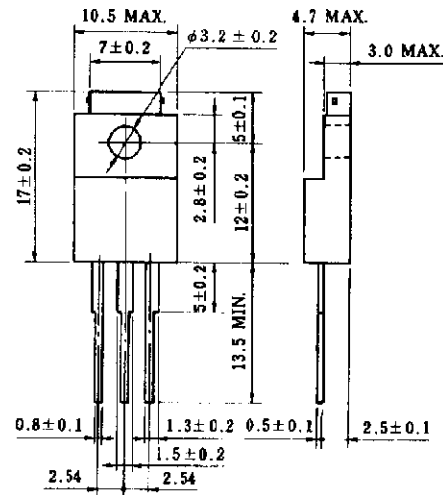
- Mold package that does not require an insulating board or insulation bushing
- On-chip C to B constant voltage diode for surge voltage absorption
- On-chip C to E reverse diode
- Fast switching speed

### ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V <sub>CB0</sub>	60 ± 10	V
Collector to emitter voltage	V <sub>CEO</sub>	60 ± 10	V
Emitter to base voltage	V <sub>EBO</sub>	8.0	V
Collector current (DC)	I <sub>C(DC)</sub>	±5.0	A
Collector current (pulse)	I <sub>C(pulse)*</sub>	±10	A
Base current (DC)	I <sub>B(DC)</sub>	0.5	A
Total power dissipation	P <sub>T</sub> (T <sub>c</sub> = 25°C)	20	W
Total power dissipation	P <sub>T</sub> (T <sub>a</sub> = 25°C)	2.0	W
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

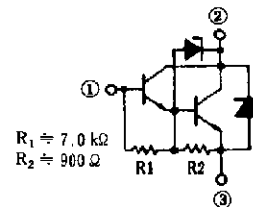
\* PW ≤ 10 ms, duty cycle ≤ 50%

### PACKAGE DRAWING (UNIT: mm)



Electrode Connection

1. Base
2. Collector
3. Emitter



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

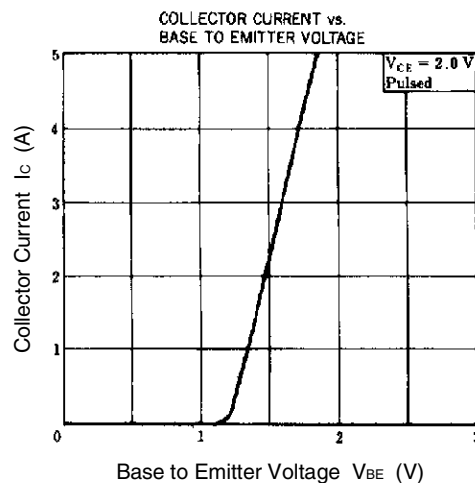
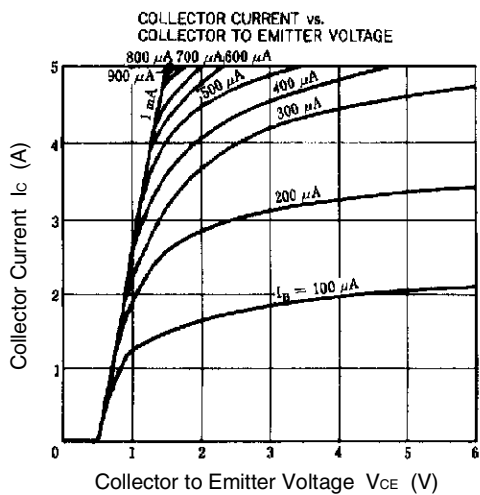
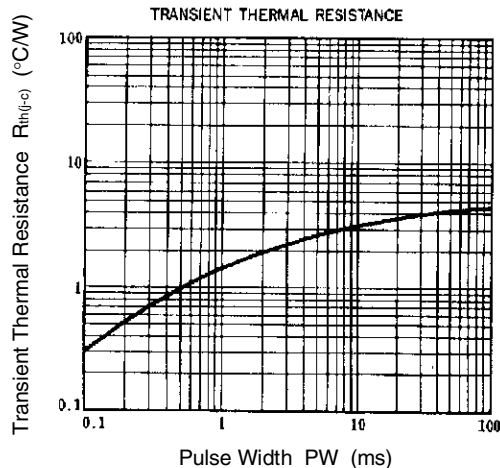
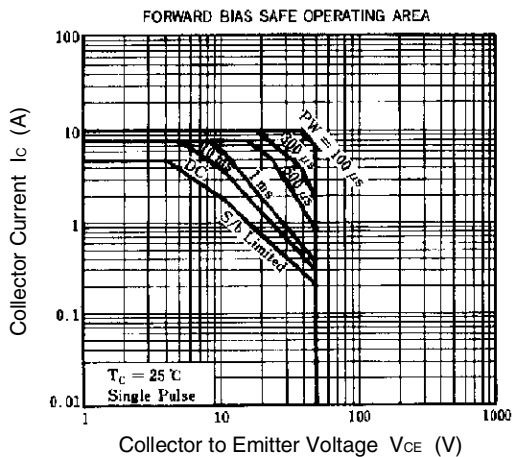
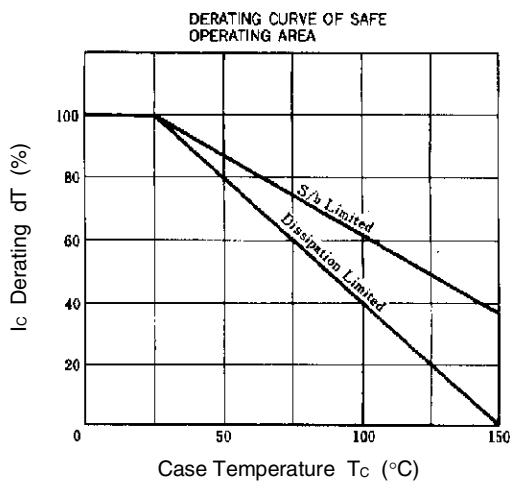
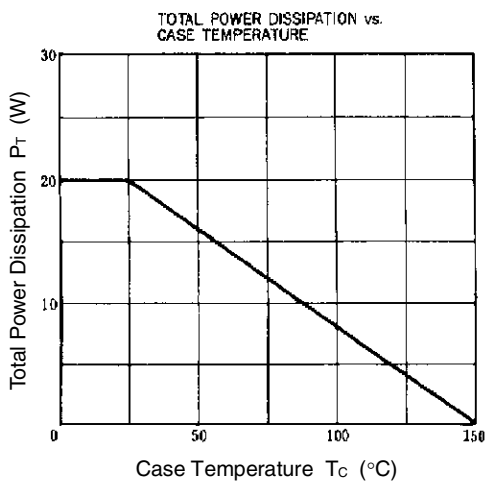
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = 40\text{ V}, I_E = 0$			0.5	$\mu\text{A}$
DC current gain	$h_{FE1}^*$	$V_{CE} = 2.0\text{ V}, I_C = 2.0\text{ A}$	2,000		20,000	
DC current gain	$h_{FE2}^*$	$V_{CE} = 2.0\text{ V}, I_C = 4.0\text{ A}$	500			
Collector saturation voltage	$V_{CE(sat)}^*$	$I_C = 2.0\text{ A}, I_B = 2.0\text{ mA}$			1.5	V
Base saturation voltage	$V_{BE(sat)}^*$	$I_C = 2.0\text{ A}, I_B = 2.0\text{ mA}$			2.0	V
Turn-on time	$t_{on}$	$I_C = 2.0\text{ A}, I_{B1} = -I_{B2} = 2.0\text{ mA},$ $R_L = 25\ \Omega, V_{CC} \cong 50\text{ V}$ Refer to the test circuit.		0.7		$\mu\text{s}$
Storage time	$t_{stg}$			2.5		$\mu\text{s}$
Fall time	$t_f$			0.6		$\mu\text{s}$

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

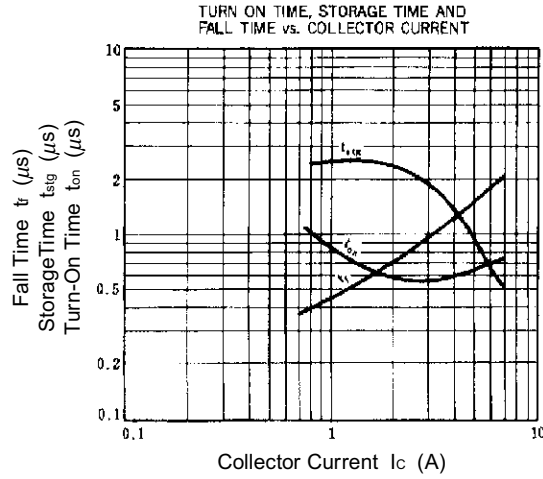
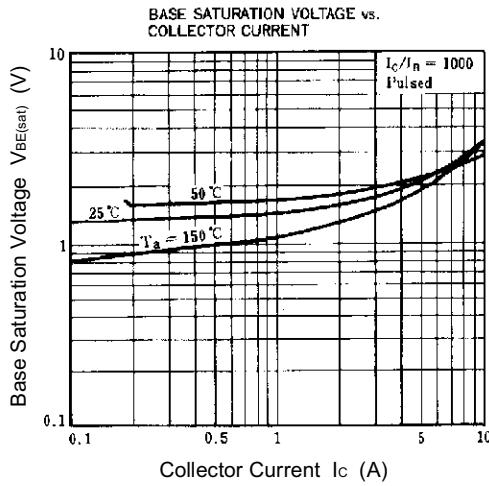
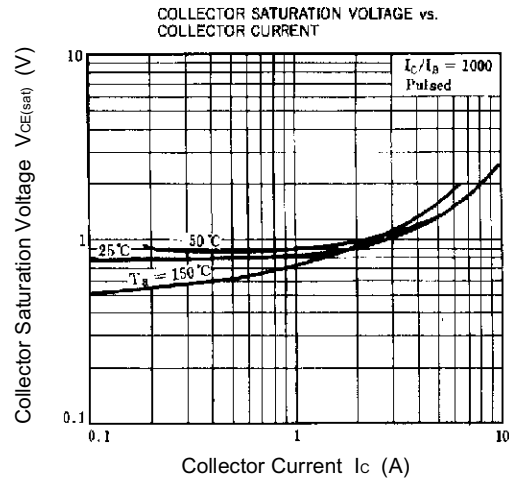
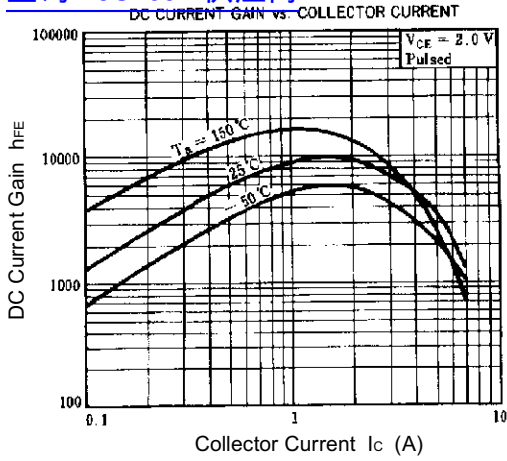
**$h_{FE}$  CLASSIFICATION**

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

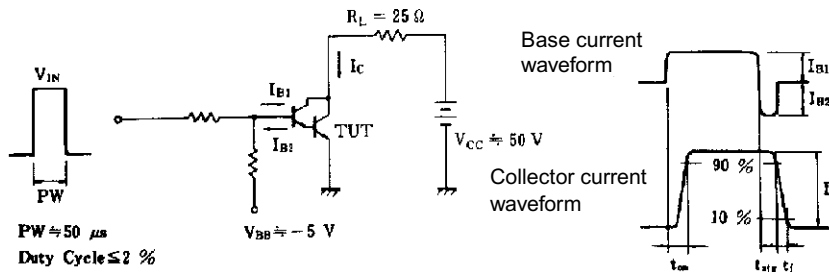
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**TYPICAL CHARACTERISTICS (Ta = 25°C)**



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



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