

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

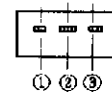
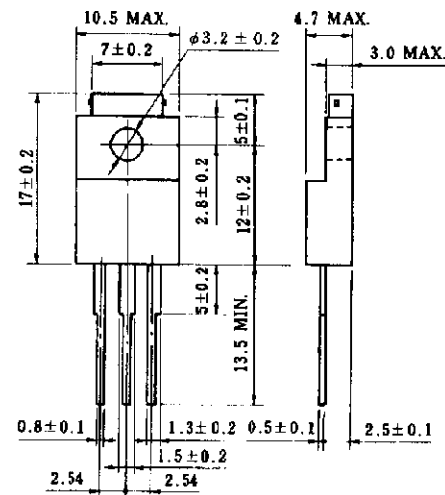
- Mold package that does not require an insulating board or insulation bushing
- On-chip C to B constant voltage diode for surge voltage absorption
- On-chip C to E reverse diode
- Fast switching speed

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

| Parameter | Symbol | Ratings | Unit |
|------------------------------|----------------------------------------|-------------|------|
| Collector to base voltage | V _{CBO} | 60 ± 10 | V |
| Collector to emitter voltage | V _{CEO} | 60 ± 10 | V |
| Emitter to base voltage | V _{EBO} | 8.0 | V |
| Collector current (DC) | I _{C(DC)} | ±5.0 | A |
| Collector current (pulse) | I _{C(pulse)*} | ±10 | A |
| Base current (DC) | I _{B(DC)} | 0.5 | A |
| Total power dissipation | P _T (T _c = 25°C) | 20 | W |
| Total power dissipation | P _T (T _a = 25°C) | 2.0 | W |
| Junction temperature | T _j | 150 | °C |
| Storage temperature | T _{stg} | -55 to +150 | °C |

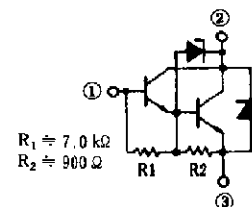
* PW ≤ 10 ms, duty cycle ≤ 50%

PACKAGE DRAWING (UNIT: mm)



Electrode Connection

1. Base
2. Collector
3. Emitter



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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

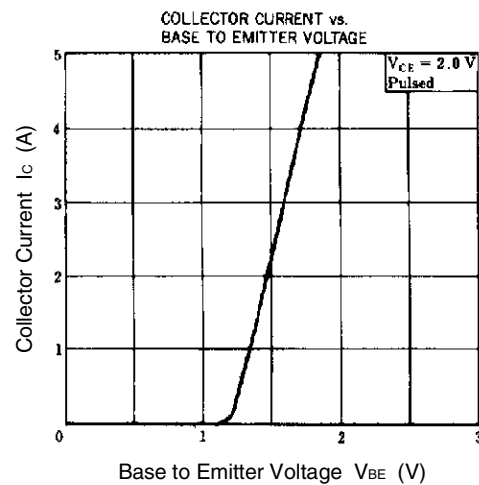
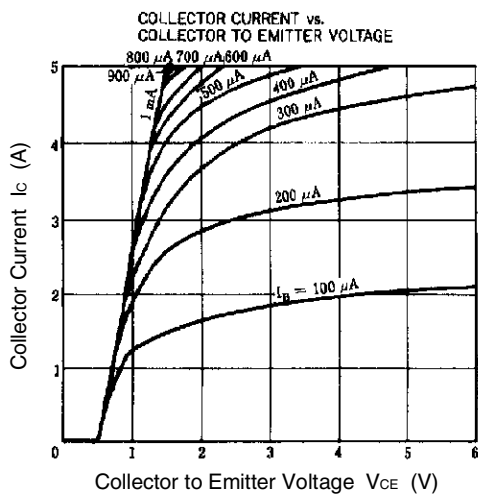
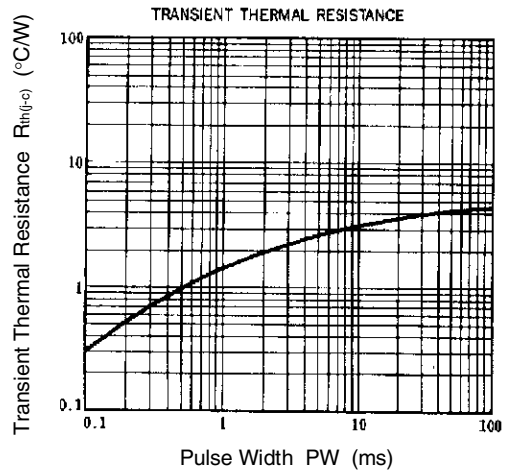
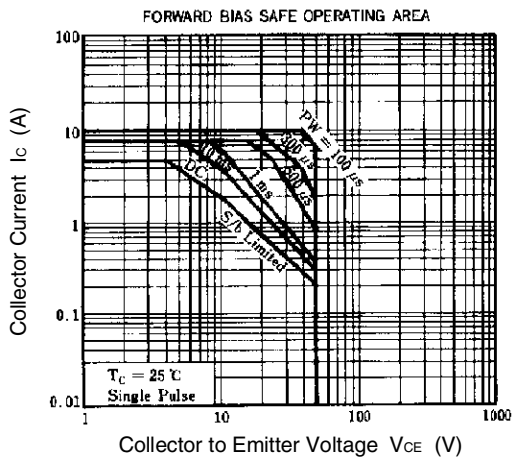
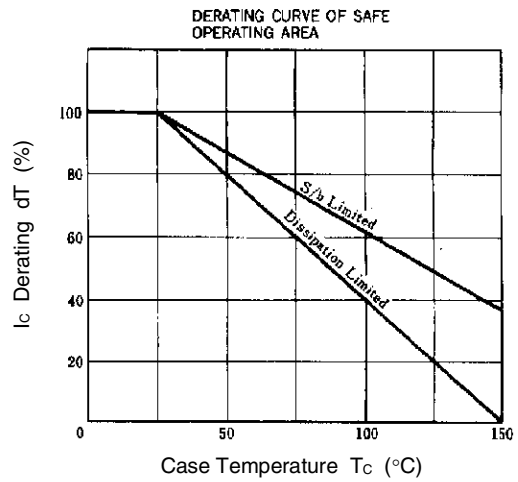
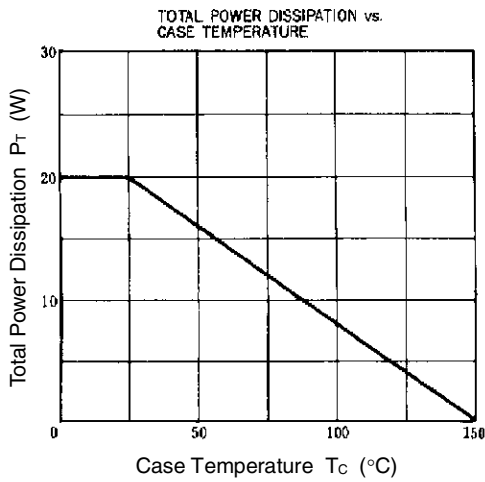
| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------|-------|------|--------|---------------|
| Collector cutoff current | I_{CBO} | $V_{CB} = 40\text{ V}, I_E = 0$ | | | 0.5 | μA |
| 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 | | μs |
| Storage time | t_{stg} | | | 2.5 | | μs |
| Fall time | t_f | | | 0.6 | | μs |

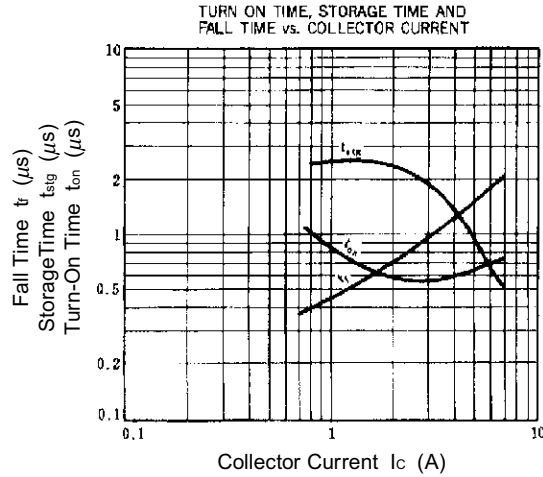
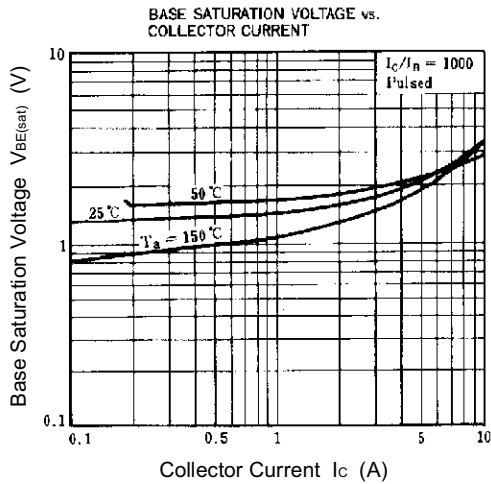
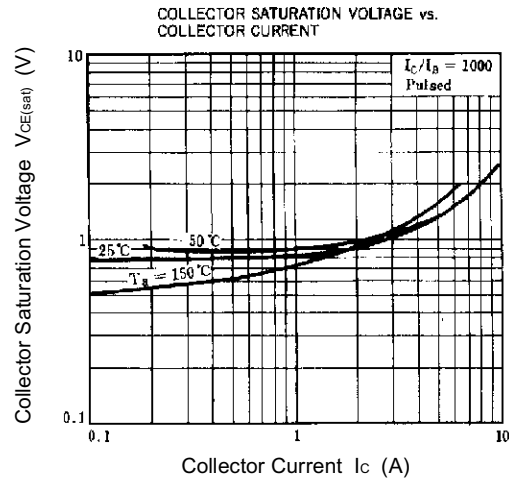
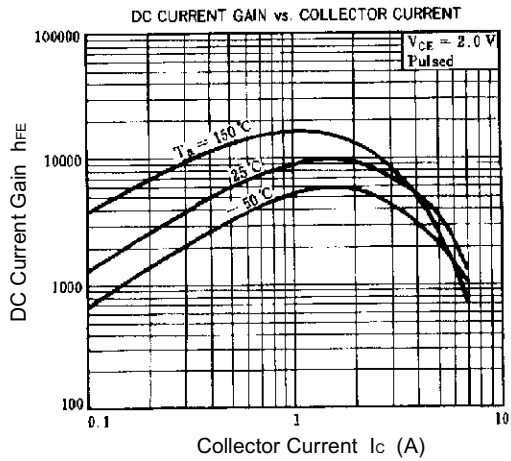
* Pulse test $PW \leq 350\ \mu\text{s}$, duty cycle $\leq 2\%$

h_{FE} CLASSIFICATION

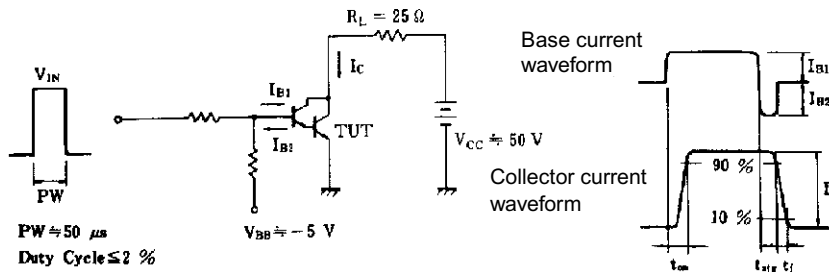
| Marking | M | L | K |
|-----------|----------------|-----------------|-----------------|
| h_{FE1} | 2,000 to 5,000 | 4,000 to 10,000 | 8,000 to 20,000 |

TYPICAL CHARACTERISTICS (Ta = 25°C)





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



[MEMO]

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