To our customers,

## Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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RENESAS

# DARLINGTON POWER TRANSISTOR
# 2SD1296

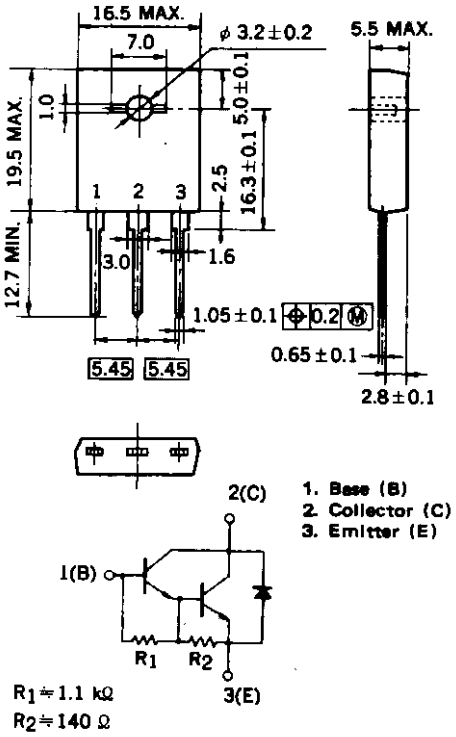
## LOW FREQUENCY AMPLIFIER AND HIGH CURRENT SWITCHING NPN SILICON EPITAXIAL DARLINGTON TRANSISTOR INDUSTRIAL USE

### DESCRIPTION

Suitable for pulse motor driver and solenoid driver applications.

### PACKAGE DIMENSIONS

in millimeters




$R_1 \fallingdotseq 1.1$ kΩ
$R_2 \fallingdotseq 140$ Ω

### FEATURES

- Operates from IC without predriver.
- Low collector saturation voltage.
- High DC current gain.

### ABSOLUTE MAXIMUM RATINGS

| | | | |
|---|---|---|---|
| Maximum Voltages and Currents ($T_a$ = 25 °C) | | | |
| Collector to Base Voltage | $V_{CBO}$ | 150 | V |
| Collector to Emitter Voltage | $V_{CEO}$ | 100 | V |
| Collector to Emitter Voltage | $V_{CEO(sus)}$ | 80 | V |
| Emitter to Base Voltage | $V_{EBO}$ | 8.0 | V |
| Continuous Collector Current | $I_{C(DC)}$ | ±15 | A |
| Peak Collector Current | $I_{C(peak)}$* | ±30 | A |
| Continuous Base Current | $I_{B(DC)}$ | 1.5 | A |
| Maximum Power Dissipations | | | |
| Total Power Dissipation ($T_a$ = 25 °C) | $P_T$ | 3.0 | W |
| Total Power Dissipation ($T_c$ = 25 °C) | $P_T$ | 100 | W |
| Maximum Temperatures | | | |
| Junction Temperature | $T_j$ | 150 | °C |
| Storage Temperature | $T_{stg}$ | −55 to +150 | °C |

* Pulse Test; PW ≦ 300 μs, Duty Cycle ≦ 10 %

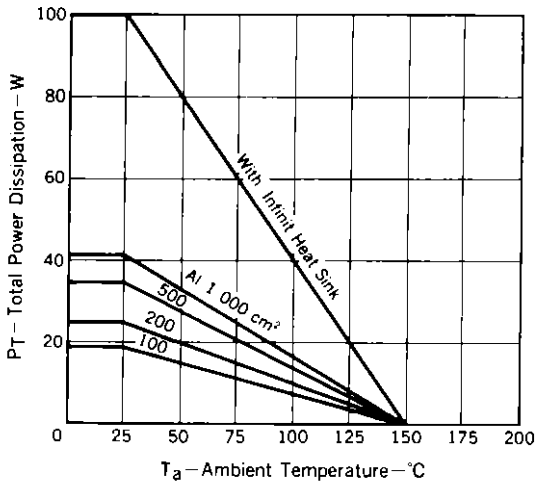
### ELECTRICAL CHARACTERISTICS ($T_a$ = 25 °C)

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| Collector Cutoff Current | $I_{CBO}$ | | | 10 | μA | $V_{CB}$ = 100 V, $I_E$ = 0 |
| DC Current Gain | $h_{FE}$ | 1000 | 3500 | 30000 | | $V_{CE}$ = 2.0 V, $I_C$ = 15 A * |
| Collector Saturation Voltage | $V_{CE(sat)}$ | | 1.1 | 1.5 | V | $I_C$ = 15 A, $I_B$ = 30 mA * |
| Base Saturation Voltage | $V_{BE(sat)}$ | | 1.8 | 2.2 | V | |
| Turn on Time | $t_{on}$ | | 1 | | μs | $I_C$ = 15 A, $I_{B1}$ = −$I_{B2}$ = 30 mA, $R_L$ = 4 Ω, $V_{CC}$ ≒ 60 V |
| Storage Time | $t_{stg}$ | | 5 | | μs | |
| Fall Time | $t_f$ | | 2 | | μs | |

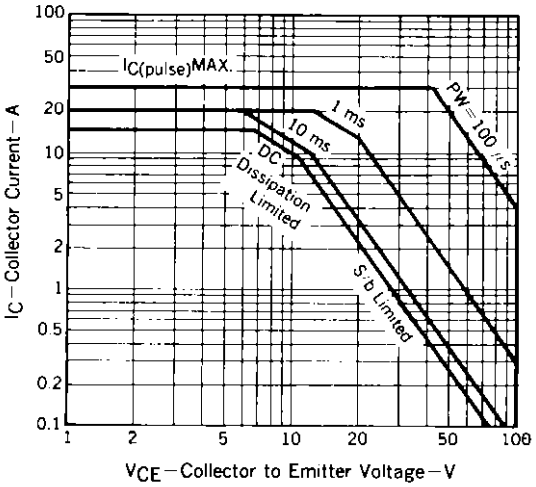
* Pulse Test; PW ≦ 350 μs, Duty Cycle ≦ 2 %

## TYPICAL CHARACTERISTICS ($T_a$ = 25 °C)

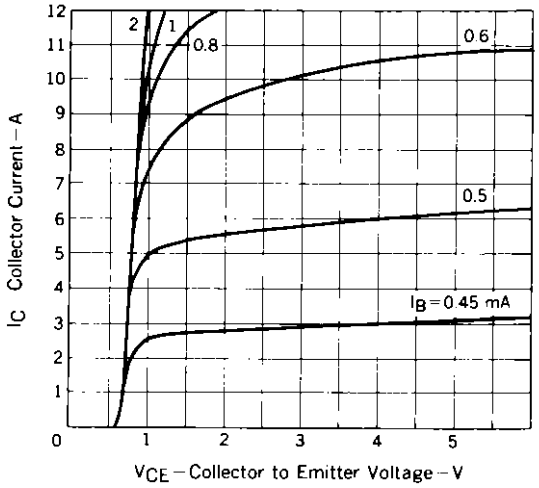
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



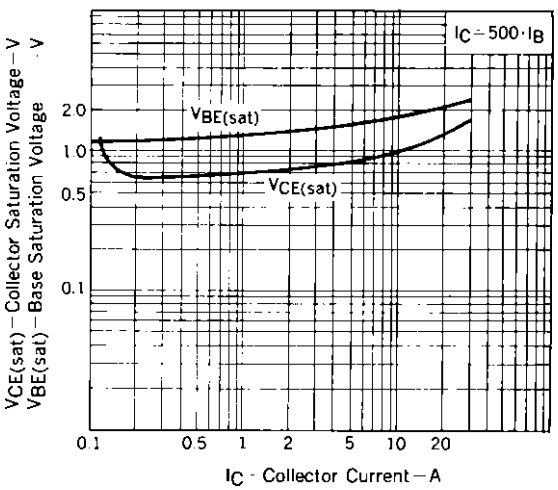

SAFE OPERATING AREAS



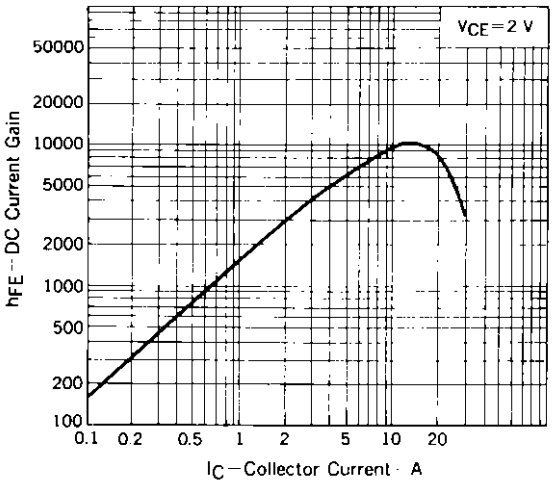

COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



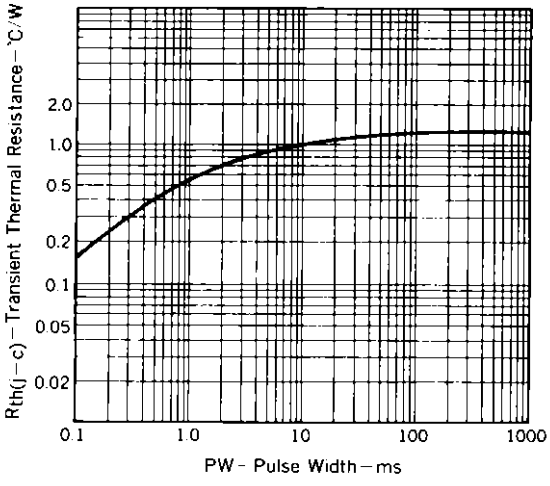

BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT




DC CURRENT GAIN vs. COLLECTOR CURRENT




TRANSIENT THERMAL RESISTANCE





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