

To our customers,

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## Old Company Name in Catalogs and Other Documents

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

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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

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NPN SILICON POWER TRANSISTOR

DESCRIPTION

The 2SD882 is NPN silicon transistor suited for the output stage of 3 watts audio amplifier, voltage regulator, DC-DC converter and relay driver.

FEATURES

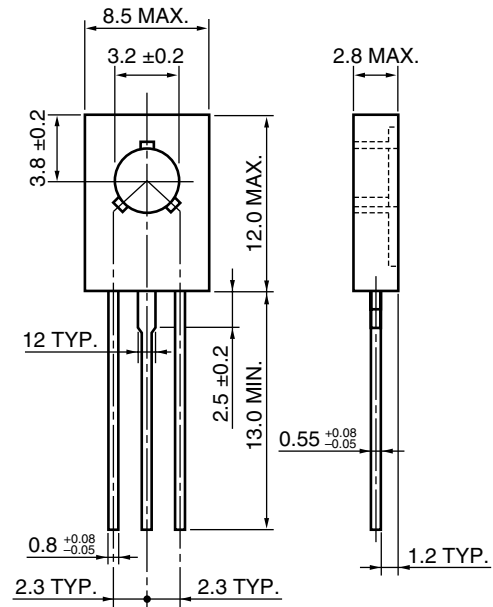
- Low saturation voltage  
 $V_{CE(sat)} = 0.5 \text{ V MAX.}$  ( $I_C = -2 \text{ A}$ ,  $I_B = 0.2 \text{ A}$ )
- Excellent  $h_{FE}$  linearity and high  $h_{FE}$   
 $h_{FE} = 60 \text{ to } 400$  ( $V_{CE} = 2 \text{ V}$ ,  $I_C = 1 \text{ A}$ )
- Less cramping space required due to small and thin package and reducing the trouble for attachment to a radiator.  
No insulator bushing required.

ABSOLUTE MAXIMUM RATINGS

|  |               |
|--|---------------|
| Maximum Temperature  |               |
| Storage Temperature  | -55 to +150°C |
| Junction Temperature                                       | 150°C Maximum |
| Maximum Power Dissipations                                 |               |
| Total Power Dissipation ( $T_A = 25^\circ\text{C}$ )       | 1.0 W         |
| Total Power Dissipation ( $T_C = 25^\circ\text{C}$ )       | 10 W          |
| Maximum Voltages and Currents ( $T_A = 25^\circ\text{C}$ ) |               |
| $V_{CBO}$ Collector to Base Voltage                        | 40 V          |
| $V_{CEO}$ Collector to Emitter Voltage                     | 30 V          |
| $V_{EBO}$ Emitter to Base Voltage                          | 5.0 V         |
| $I_{C(DC)}$ Collector Current (DC)                         | 3.0 A         |
| $I_{C(pulse)}$ <sup>Note</sup> Collector Current (pulse)   | 7.0 A         |

**Note** Pulse Test  $PW \leq 350 \mu\text{s}$ , Duty Cycle  $\leq 2\%$

★ PACKAGE DRAWING (Unit: mm)



- 1: Emitter
- 2: Collector: connected to mounting plane
- 3: Base

ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

| CHARACTERISTIC               | SYMBOL        | TEST CONDITIONS  | MIN. | TYP. | MAX. | UNIT          |
|------------------------------|---------------|--|------|------|------|---------------|
| DC Current Gain              | $h_{FE1}$     | $V_{CE} = 2.0 \text{ V}$ , $I_C = 20 \text{ mA}$ <sup>Note</sup> | 30   | 150  |      |               |
| DC Current Gain              | $h_{FE2}$     | $V_{CE} = 2.0 \text{ V}$ , $I_C = 1.0 \text{ A}$ <sup>Note</sup> | 60   | 160  | 400  |               |
| Gain Bandwidth Product       | $f_T$         | $V_{CE} = 5.0 \text{ V}$ , $I_C = 0.1 \text{ A}$                 |      | 90   |      | MHz           |
| Output Capacitance           | $C_{ob}$      | $V_{CB} = 10 \text{ V}$ , $I_E = 0$ , $f = 1.0 \text{ MHz}$      |      | 45   |      | pF            |
| Collector Cutoff Current     | $I_{CBO}$     | $V_{CB} = 30 \text{ V}$ , $I_E = 0 \text{ A}$                    |      |      | 1.0  | $\mu\text{A}$ |
| Emitter Cutoff Current       | $I_{EBO}$     | $V_{EB} = 3.0 \text{ V}$ , $I_C = 0 \text{ A}$                   |      |      | 1.0  | $\mu\text{A}$ |
| Collector Saturation Voltage | $V_{CE(sat)}$ | $I_C = 2.0 \text{ A}$ , $I_B = 0.2 \text{ A}$ <sup>Note</sup>    |      | 0.3  | 0.5  | V             |
| Base Saturation Voltage      | $V_{BE(sat)}$ | $I_C = 2.0 \text{ A}$ , $I_B = 0.2 \text{ A}$ <sup>Note</sup>    |      | 1.0  | 2.0  | V             |

**Note** Pulse Test:  $PW \leq 350 \mu\text{s}$ , Duty Cycle  $\leq 2\%$

CLASSIFICATION OF  $h_{FE}$

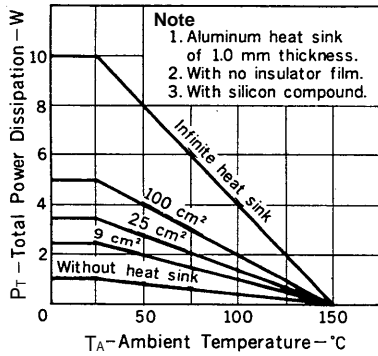
| Rank  | R         | Q          | P          | E          |
|-------|-----------|------------|------------|------------|
| Range | 60 to 120 | 100 to 200 | 160 to 320 | 200 to 400 |

**Remark** Test Conditions:  $V_{CE} = 2.0 \text{ V}$ ,  $I_C = 1.0 \text{ A}$

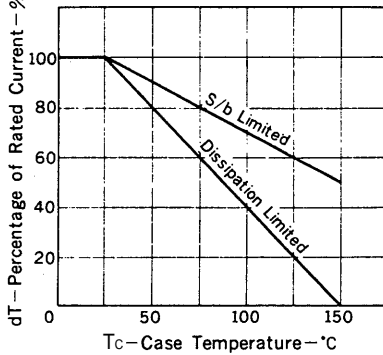
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TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

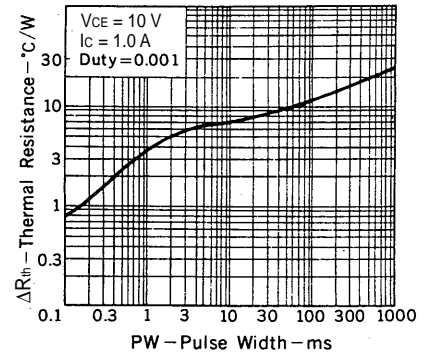
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



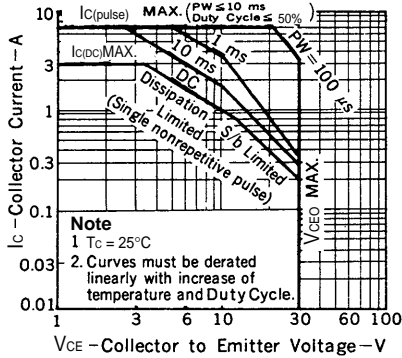
DERATING CURVES FOR ALL TYPES



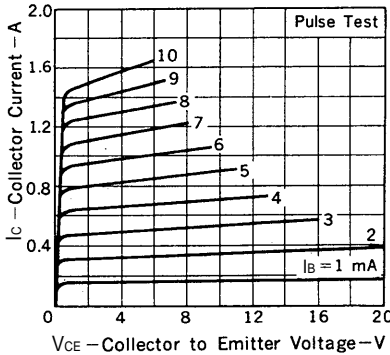
THERMAL RESISTANCE vs. PULSE WIDTH



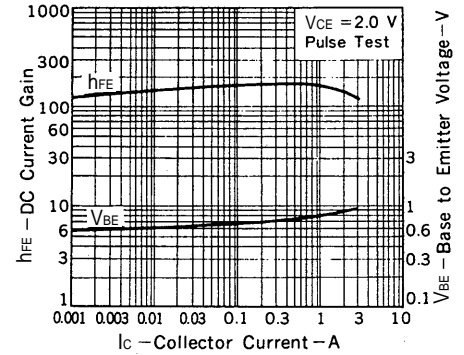
SAFE OPERATING AREAS



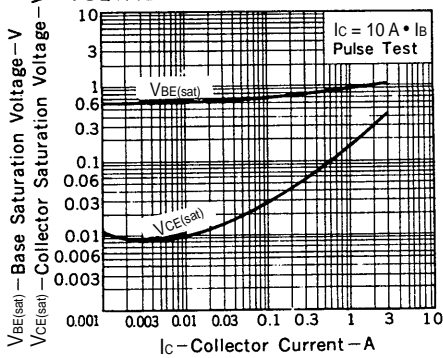
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



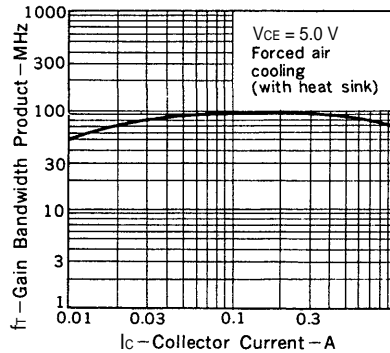
DC CURRENT GAIN, BASE TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



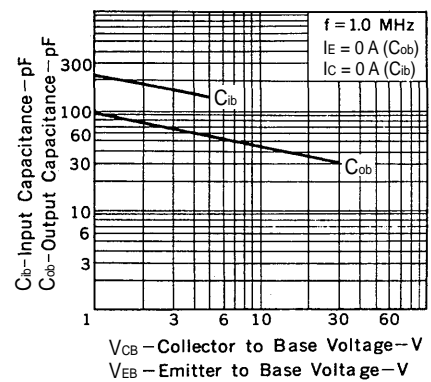
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



INPUT AND OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



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