

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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Phase-out/Discontinued

HIGH SPEED SWITCHING
NPN SILICON EPITAXIAL TRANSISTOR

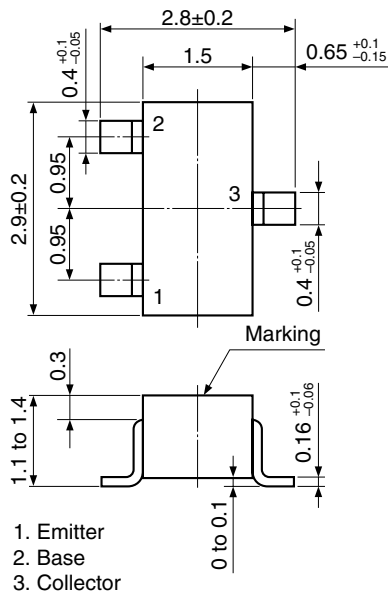
<R> FEATURES

- High-speed switching
- Low collector saturation voltage
- High gain bandwidth product
- Low collector capacitance
- Can be used complementary to the 2SA1462.
- Package: 3-pin Mini Mold (SC-59)

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

| | | | |
|------------------------------|------------------|-------------|----|
| Collector to Base Voltage | V _{CB0} | 40 | V |
| Collector to Emitter Voltage | V _{CES} | 40 | V |
| | V _{CEO} | 15 | V |
| Emitter to Base Voltage | V _{EBO} | 5.0 | V |
| Collector Current | I _c | 200 | mA |
| Total Power Dissipation | P _T | 200 | mW |
| Junction Temperature | T _j | 150 | °C |
| Storage Temperature | T _{stg} | -55 to +150 | °C |

PACKAGE DRAWING (Unit: mm)



ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

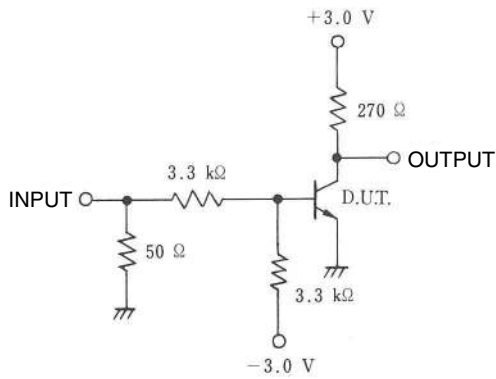
| CHARACTERISTIC | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|------------------------------|----------------------|---|------|------|------|------|
| Collector Cut-off Current | I _{cBO} | V _{CB} = 20 V, I _E = 0 A | | | 0.1 | μA |
| Emitter Cut-off Current | I _{eBO} | V _{EB} = 3.0 V, I _c = 0 A | | | 0.1 | μA |
| DC Current Gain | h _{FE} | V _{CE} = 1.0 V, I _c = 10 mA | 40 | 90 | 200 | |
| Collector Saturation Voltage | V _{CE(sat)} | I _c = 10 mA, I _B = 1.0 mA | | 0.15 | 0.25 | V |
| Base Saturation Voltage | V _{BE(sat)} | I _c = 10 mA, I _B = 1.0 mA | | 0.80 | 0.85 | V |
| Gain Bandwidth Product | f _r | V _{CE} = 10 V, I _E = -10 mA | 500 | 750 | | MHz |
| Collector Capacitance | C _{ob} | V _{CB} = 5.0 V, I _E = 0 A, f = 1.0 MHz | | 1.8 | 4.0 | pF |
| Turn-on Time | t _{on} | (When t _{stg} , I _{B1} = -I _{B2} = 10 mA) See Test Circuits | | 8.0 | 12 | ns |
| Storage Time | t _{stg} | | | 6.0 | 13 | ns |
| Turn-off Time | t _{off} | | | 12 | 18 | ns |

h_{FE} Classification

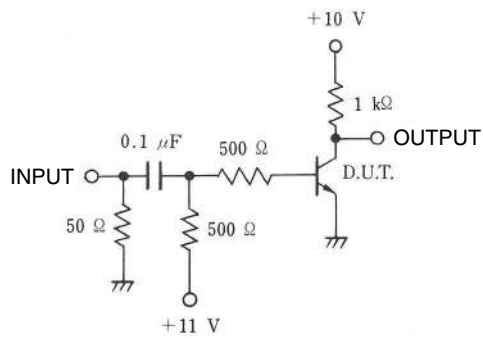
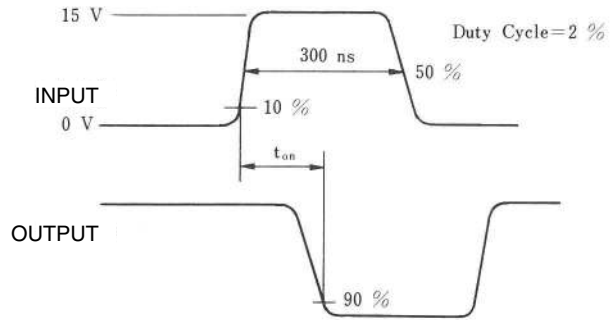
| Marking | B33 | B34 | B35 |
|-----------------|----------|-----------|------------|
| h _{FE} | 40 to 80 | 60 to 120 | 100 to 200 |

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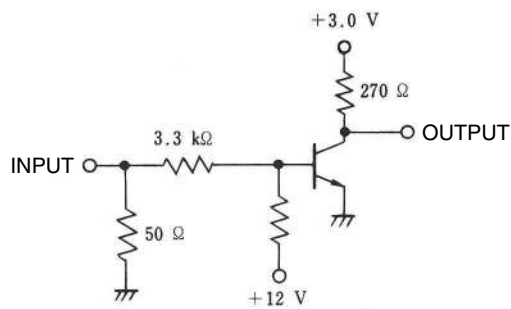
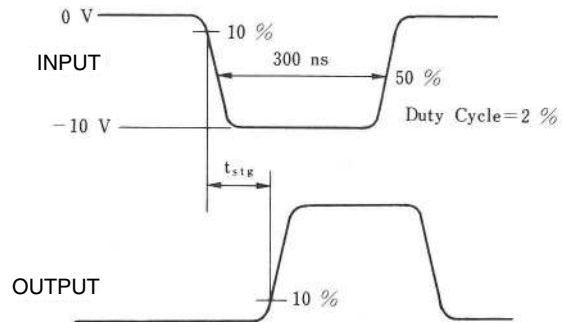
SWITCHING TIME TEST CIRCUITS



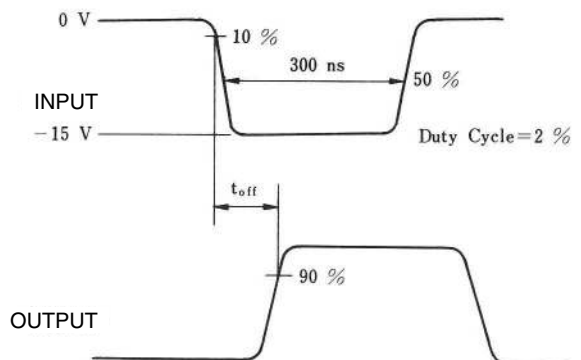
t_{on} SWITCHING



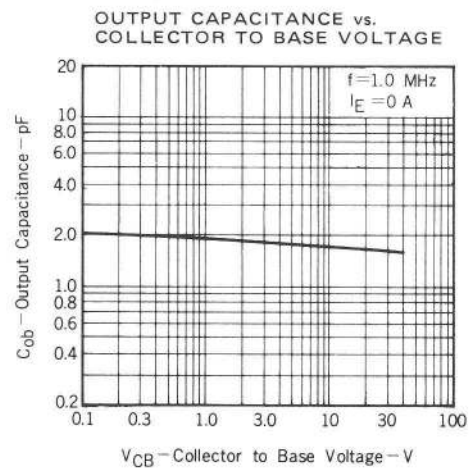
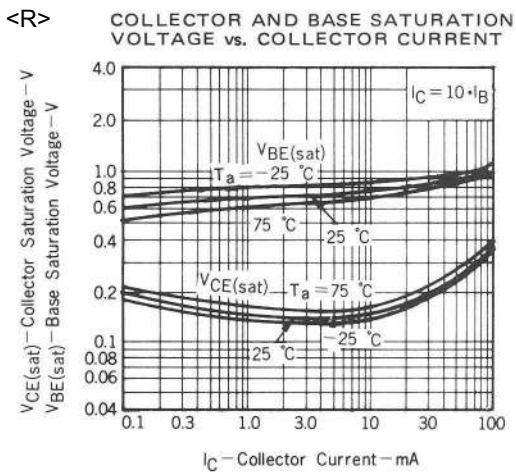
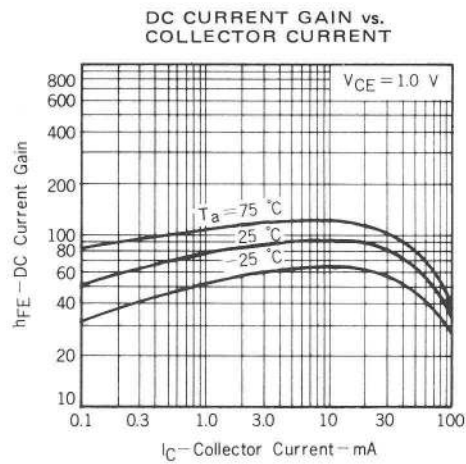
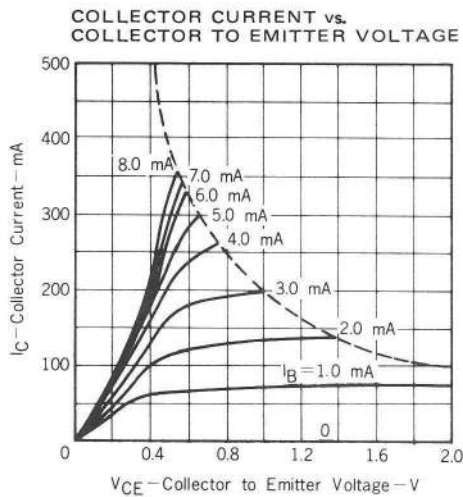
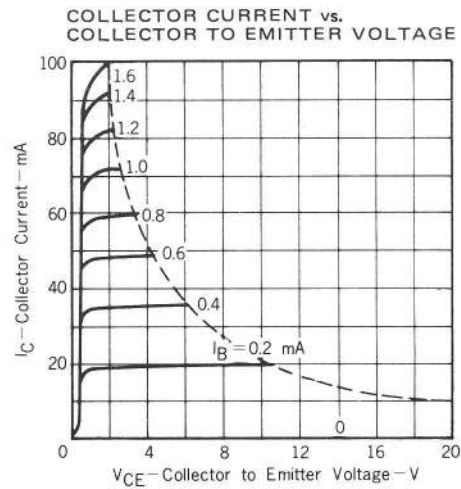
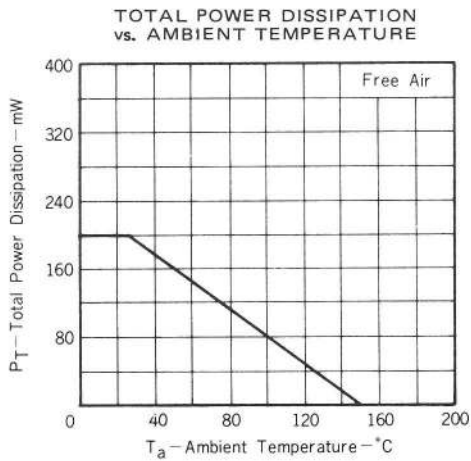
t_{stg} SWITCHING

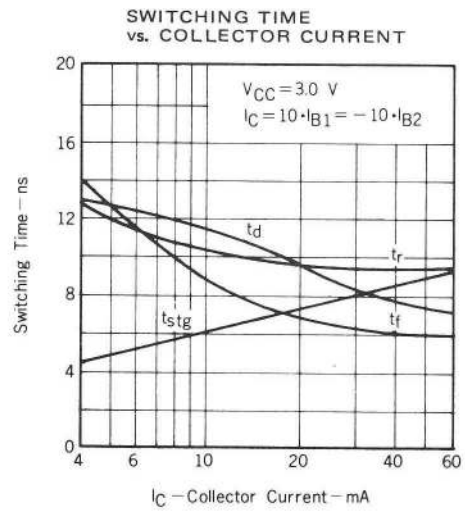
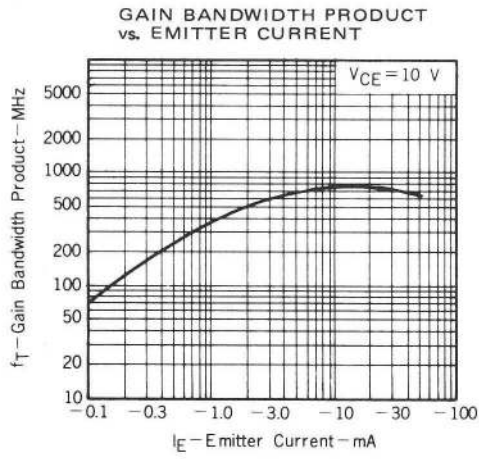


t_{off} SWITCHING



TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)





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