

2SA778(K), 2SA778A(K)

Silicon PNP Epitaxial

REJ03G0628-0300

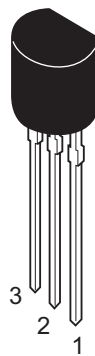
Rev.3.00

Jul 30, 2007

Application

High voltage medium speed switching

Outline

RENESAS Package code: PRSS0003DA-A
(Package name: TO-92 (1))

1. Emitter
2. Collector
3. Base

Absolute Maximum Ratings

(Ta = 25°C)

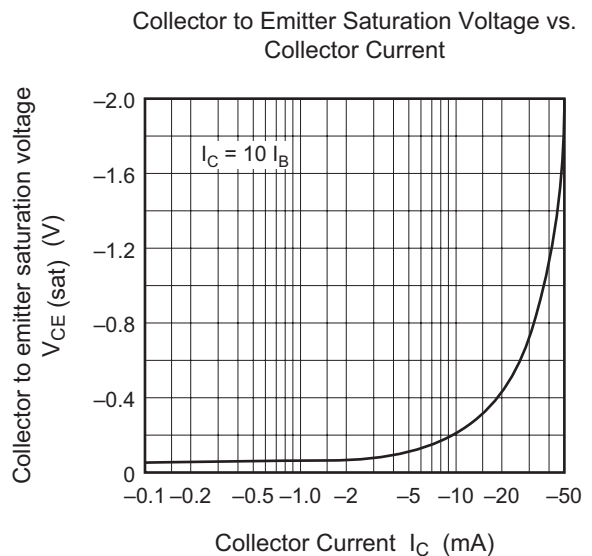
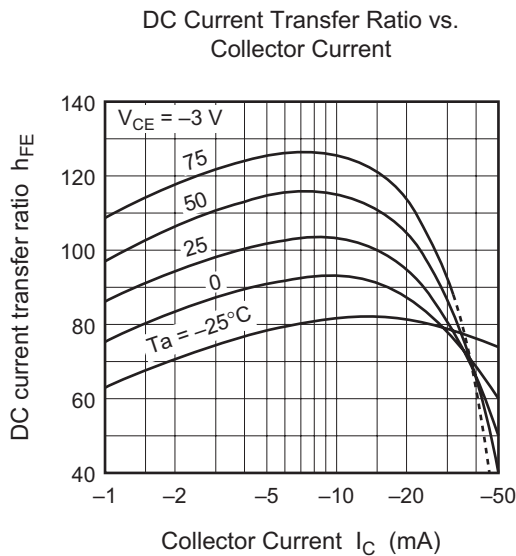
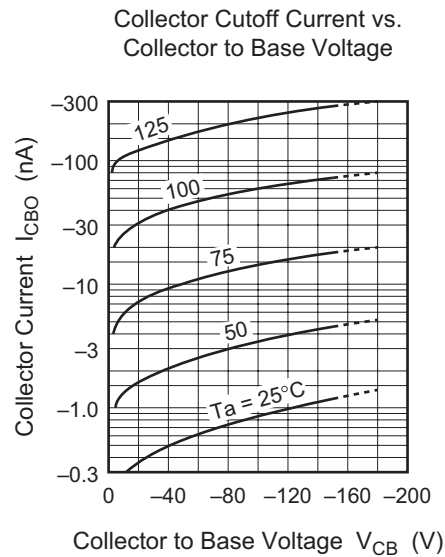
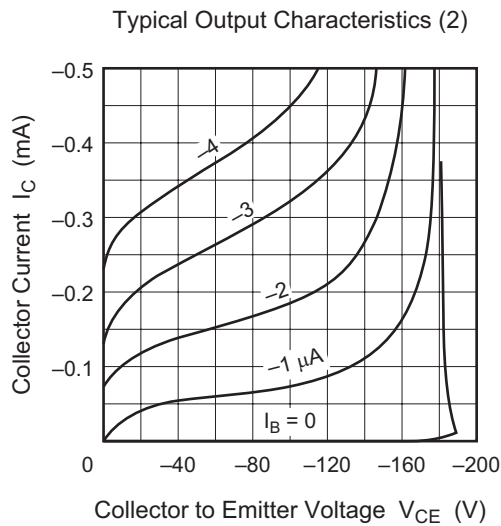
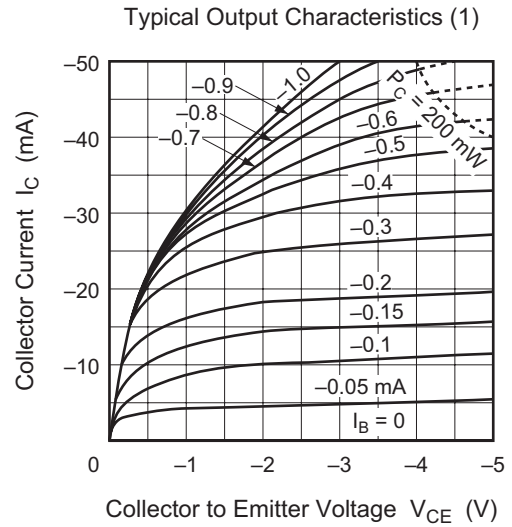
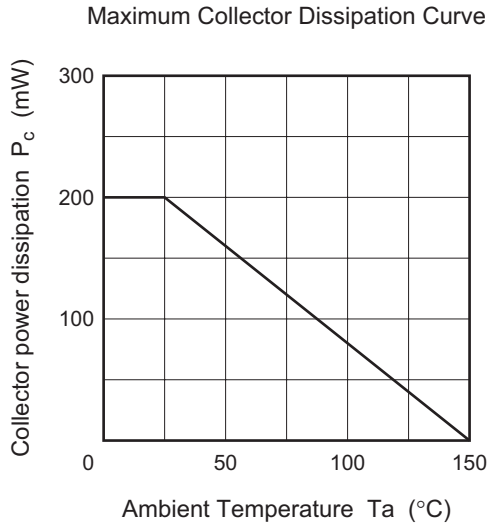
| Item | Symbol | 2SA778(K) | 2SA778A(K) | Unit |
|------------------------------|-----------|-------------|-------------|------|
| Collector to base voltage | V_{CBO} | -150 | -180 | V |
| Collector to emitter voltage | V_{CEO} | -150 | -180 | V |
| Emitter to base voltage | V_{EBO} | -5 | -5 | V |
| Collector current | I_C | -50 | -50 | mA |
| Collector power dissipation | P_C | 200 | 200 | mW |
| Junction temperature | T_j | 150 | 150 | °C |
| Storage temperature | T_{stg} | -55 to +150 | -55 to +150 | °C |

Electrical Characteristics

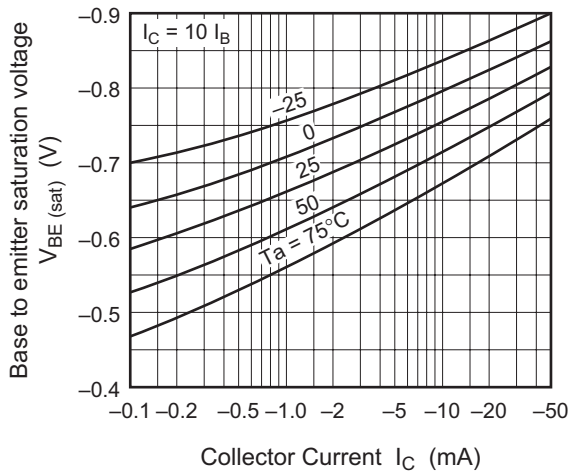
(Ta = 25°C)

| Item | Symbol | 2SA778(K) | | | 2SA778A(K) | | | Unit | Test conditions |
|---|---------------|-----------|-------|------|------------|-------|------|---------|---|
| | | Min | Typ | Max | Min | Typ | Max | | |
| Collector to base breakdown voltage | $V_{(BR)CBO}$ | -150 | — | — | -180 | — | — | V | $I_C = -50 \mu A, I_E = 0$ |
| Collector to emitter breakdown voltage | $V_{(BR)CER}$ | -150 | — | — | -180 | — | — | V | $I_C = -50 \mu A, R_{BE} = 30 k\Omega$ |
| Collector cutoff current | I_{CBO} | — | — | -1.0 | — | — | — | μA | $V_{CB} = -100 V, I_E = 0$ |
| | | — | — | — | — | — | -1.0 | μA | $V_{CB} = -150 V, I_E = 0$ |
| Emitter cutoff current | I_{EBO} | — | — | -1.0 | — | — | -1.0 | μA | $V_{EB} = -5 V, I_C = 0$ |
| DC current transfer ratio | h_{FE} | 30 | 100 | — | 40 | 100 | 200 | | $V_{CE} = -3 V, I_E = -15 mA$ |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | — | -0.3 | -1.0 | — | -0.3 | -1.0 | V | $I_C = -15 mA, I_B = -1 mA$ |
| Base to emitter saturation voltage | $V_{BE(sat)}$ | — | -0.77 | -1.0 | — | -0.77 | -1.0 | V | $I_C = -15 mA, I_B = -1 mA$ |
| Collector output capacitance | C_{ob} | — | — | 10 | — | — | 10 | pF | $V_{CB} = -10 V, I_E = 0, f = 1 MHz$ |
| Gain bandwidth product | f_T | — | 50 | — | — | 50 | — | MHz | $V_{CE} = -3 V, I_C = -15 mA$ |
| Turn on time | t_{on} | — | 135 | — | — | 135 | — | ns | $V_{CC} = -10.3 V$ |
| Turn off time | t_{off} | — | 1.7 | — | — | 1.7 | — | μs | $I_C = 10 I_{B1} = -10 I_{B2} = -10 mA$ |
| Storage time | t_{stg} | — | — | 1.0 | — | — | 1.0 | μs | $V_{CC} = -10 V, I_C = -17 mA, I_{B1} = -1 mA, I_{B2} = -12 mA$ |

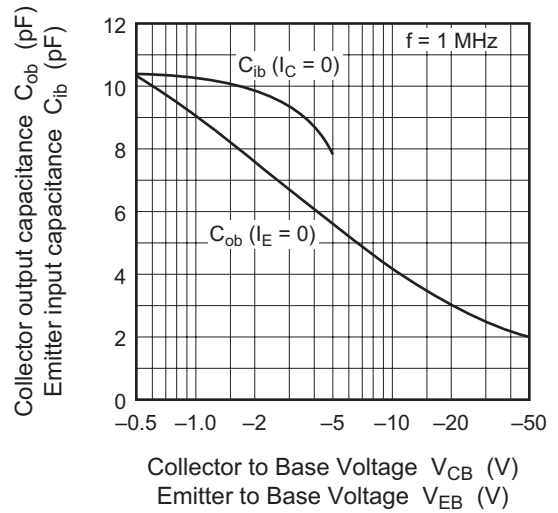
Main Characteristics



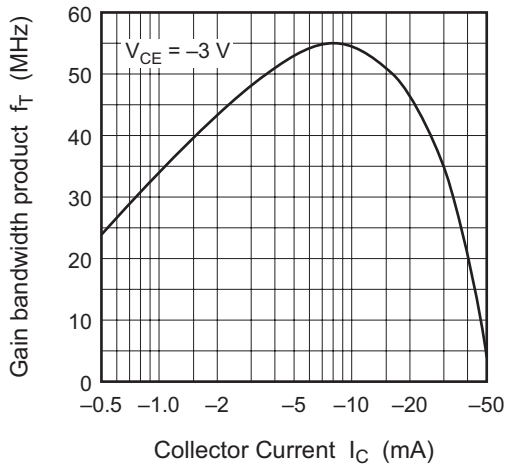
Base to Emitter Saturation Voltage vs. Collector Current



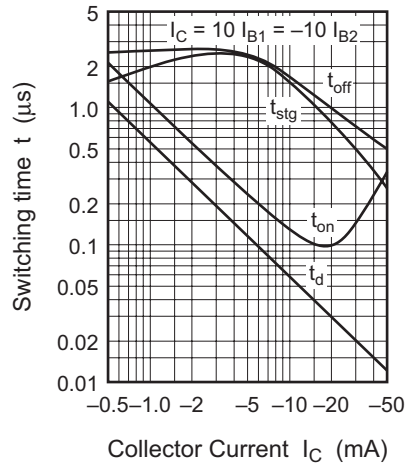
Input and Output Capacitance vs. Voltage



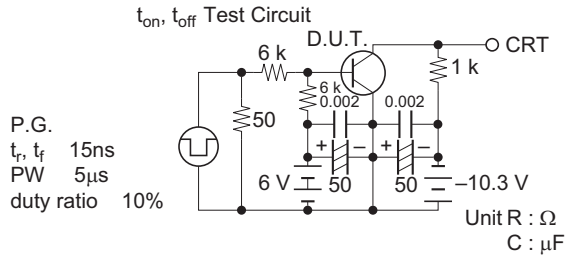
Gain Bandwidth Product vs. Collector Current



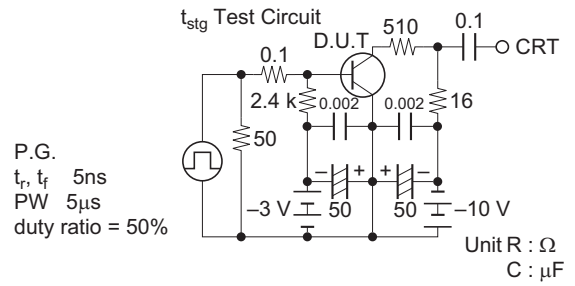
Switching Time vs. Collector Current



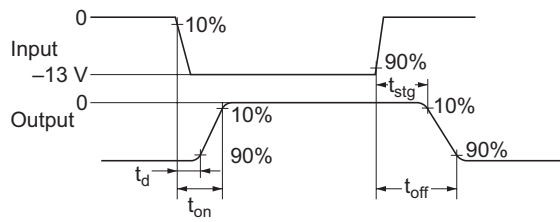
Switching Time Test Circuit



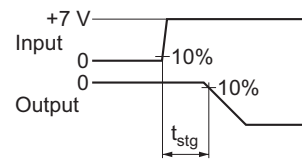
Switching Time Test Circuit



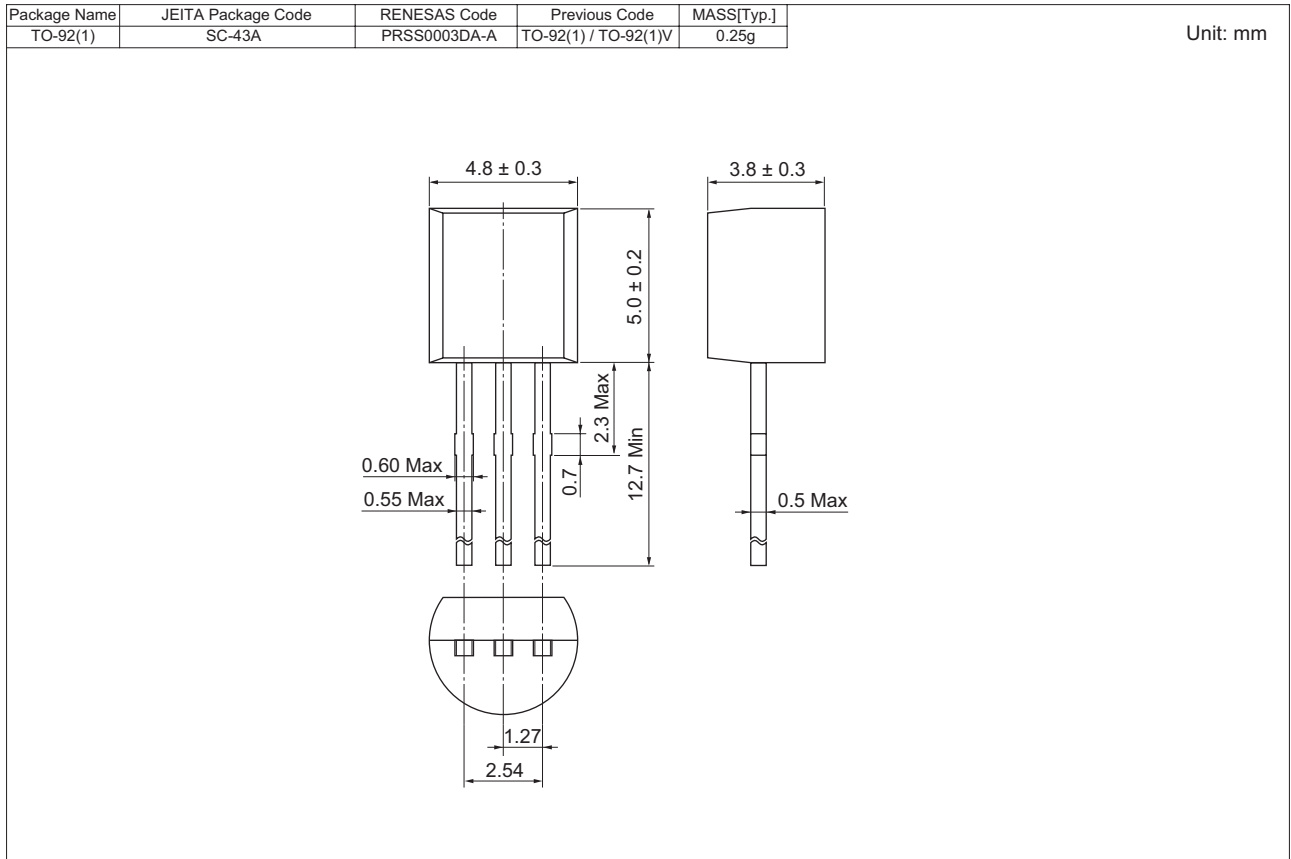
Response Waveform



Response Waveform



Package Dimensions



Ordering Information

| Part No. | Quantity | Shipping Container |
|-------------------------|----------|-------------------------|
| 2SA778KTZ 2SA778AKTZ | 2500 | Hold Box, Radial Taping |

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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