

PNP SILICON TRIPLE DIFFUSED TRANSISTOR
MP-3

DESCRIPTION

2SA1412-Z is designed for High Voltage Switching, especially in Hybrid Integrated Circuits.

FEATURES

- High Voltage : $V_{CE0} = -400$ V
- High Speed : $t_r \leq 0.7 \mu s$
- Complement to 2SC3631-Z

QUALITY GRADE

Standard

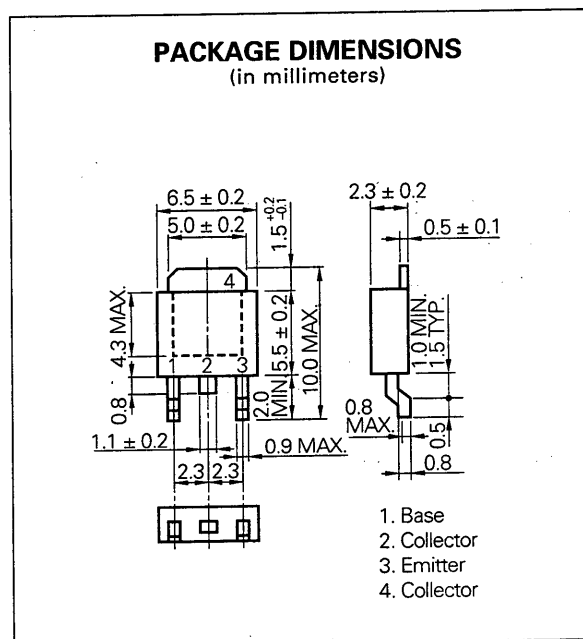
Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

ABSOLUTE MAXIMUM RATINGS ($T_a = 25$ °C)

| | | | |
|--|-----------|-------------|----|
| Collector to Base Voltage | V_{CBO} | -400 | V |
| Collector to Emitter Voltage | V_{CEO} | -400 | V |
| Emitter to Base Voltage | V_{EBO} | -7 | V |
| Collector Current (DC) | I_c | -2.0 | A |
| Collector Current (Pulse)* | I_c | -4.0 | A |
| Total Power Dissipation ($T_a = 25$ °C)** | P_T | 2.0 | W |
| Junction Temperature | T_j | 150 | °C |
| Storage Temperature | T_{stg} | -55 to +150 | °C |

* $PW \leq 10$ ms, Duty Cycle ≤ 50 %

** When mounted on ceramic substrate of $7.5 \text{ cm}^2 \times 0.7$ mm

PACKAGE DIMENSIONS
(in millimeters)

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

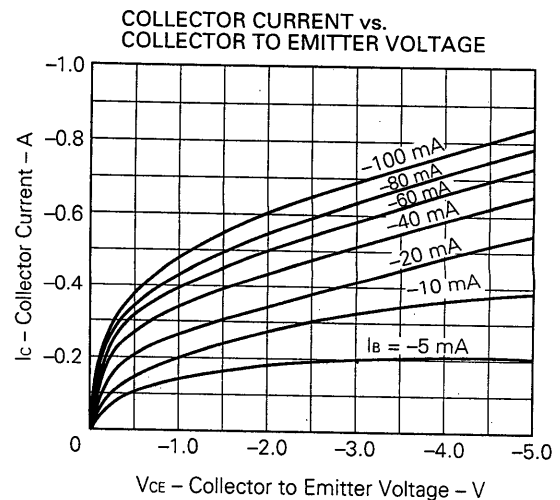
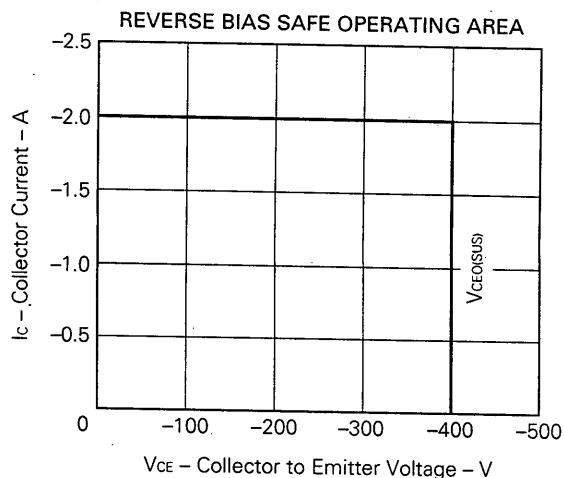
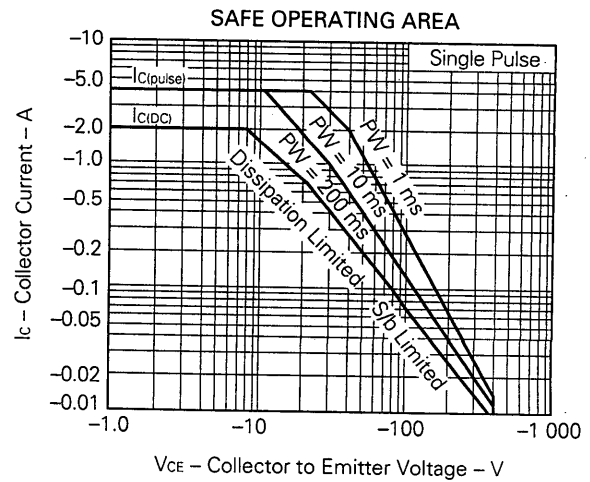
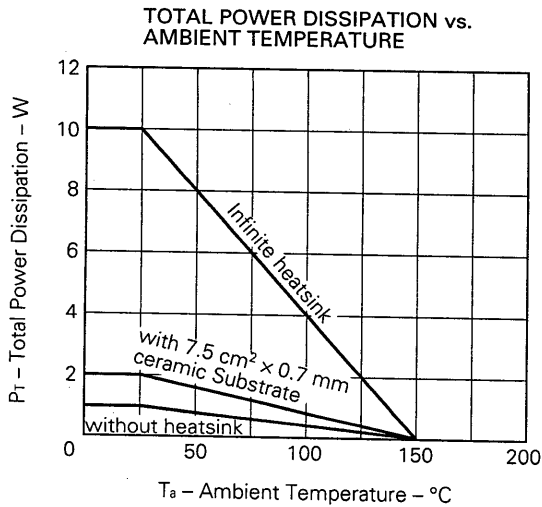
| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|------------------------------|------------------------|------|-------|------|------|---|
| Collector Cutoff Current | I _{cBO} | | | -10 | μA | V _{CB} = -400 V, I _E = 0 |
| Emitter Cutoff Current | I _{EBO} | | | -10 | μA | V _{EB} = -5.0 V, I _C = 0 |
| DC Current Gain | h _{FE1} * | 40 | 60 | 120 | | V _{CE} = -5.0 V, I _C = -0.1 A |
| DC Current Gain | h _{FE2} * | 10 | 22 | | | V _{CE} = -5.0 V, I _C = -1.0 A |
| Collector Saturation Voltage | V _{CE(sat)} * | | -0.25 | -0.5 | V | I _C = -0.5 A, I _B = -0.1 A |
| Base Saturation Voltage | V _{BE(sat)} * | | -0.85 | -1.2 | V | I _C = -0.5 A, I _B = -0.1 A |
| Gain Bandwidth Product | f _T | | 40 | | MHz | V _{CE} = -10 V, I _E = -100 mA |
| Output Capacitance | C _{ob} | | 30 | | pF | V _{CB} = -10 V, I _E = 0, f = 1.0 MHz |
| Turn-on Time | t _{on} | | 0.03 | 0.5 | μs | I _C = -1.0 A, R _L = 150 Ω I _{B1} = -I _{B2} = -0.2 A, V _{CC} = -150 V |
| Storage Time | t _{stg} | | 1.4 | 2.0 | μs | |
| Fall time | t _r | | 0.1 | 0.7 | μs | |

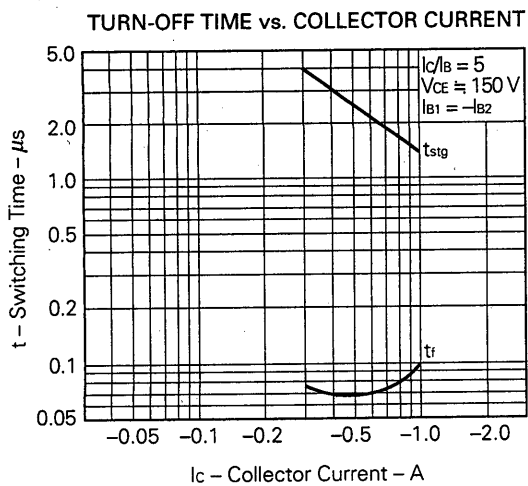
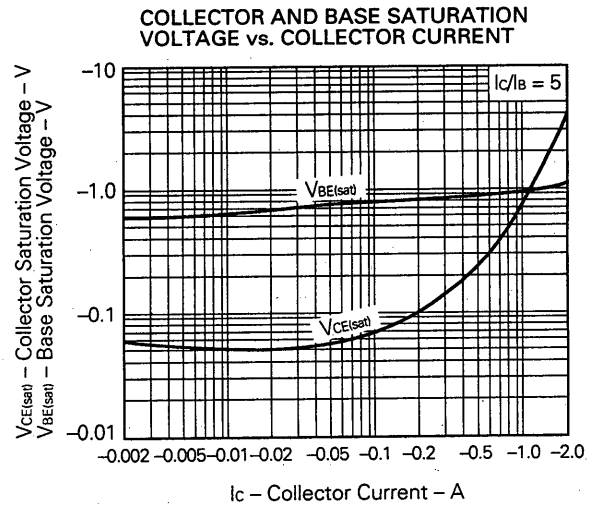
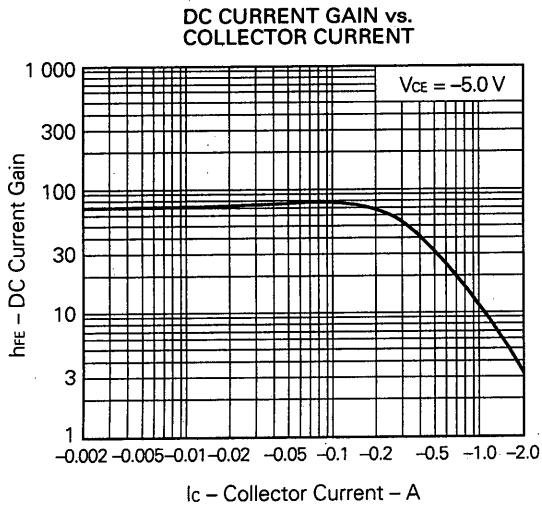
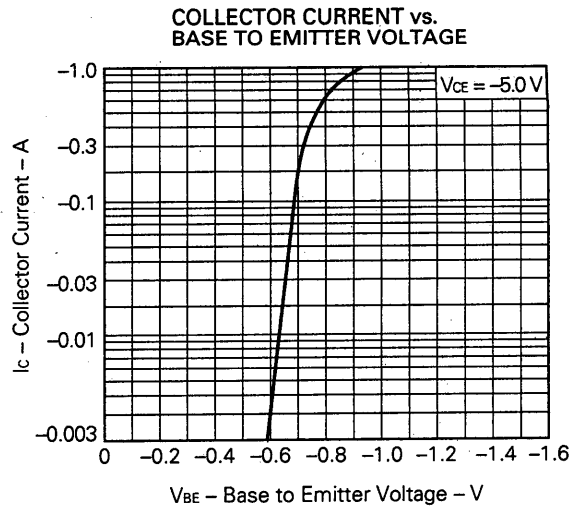
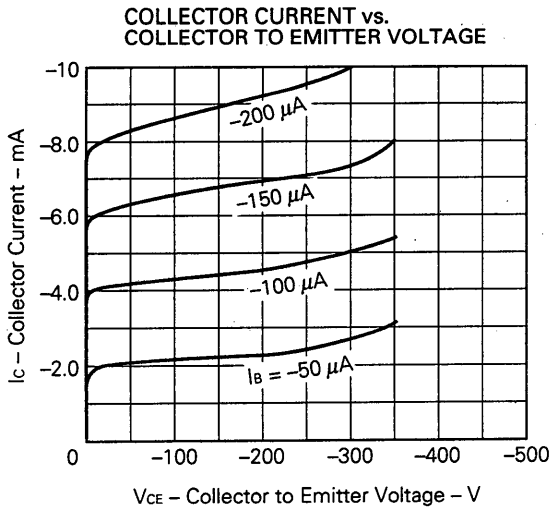
* Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 2 %

h_{FE} Classification

| MARKING | L | K |
|------------------|----------|-----------|
| h _{FE1} | 40 to 80 | 60 to 120 |

TYPICAL CHARACTERISTICS (T_a = 25 °C)





Reference

| Application note name | No. |
|---|----------|
| Quality control of NEC semiconductors devices. | TEI-1202 |
| Quality control guide of semiconductors devices. | MEI-1202 |
| Assembly manual of semiconductors devices. | IEI-1207 |
| Design of Push-Pull Type Switching Regulators (Basic). | TEB-1002 |
| Design of Push-Pull Type Switching Regulators (Applications). | TEB-1003 |
| Optimum Base Drive Conditions of Switching Power Transistors. | TEB-1014 |

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Application examples recommended by NEC Corporation.

Standard: Computer, Office equipment, Communication equipment, Test and Measurement equipment, Machine tools, Industrial robots, Audio and Visual equipment, Other consumer products, etc.

Special: Automotive and Transportation equipment, Traffic control systems, Antidisaster systems, Anticrime systems, etc.