

NPN SILICON TRIPLE DIFFUSED TRANSISTOR
MP-3

DESCRIPTION

2SC3631-Z is designed for High Voltage Switching, especially in Hybrid Integrated Circuits.

FEATURES

- High Voltage $V_{CE0} = 400\text{ V}$
- High Speed $t_r < 0.7\ \mu\text{s}$
- Complement to 2SA1412-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.

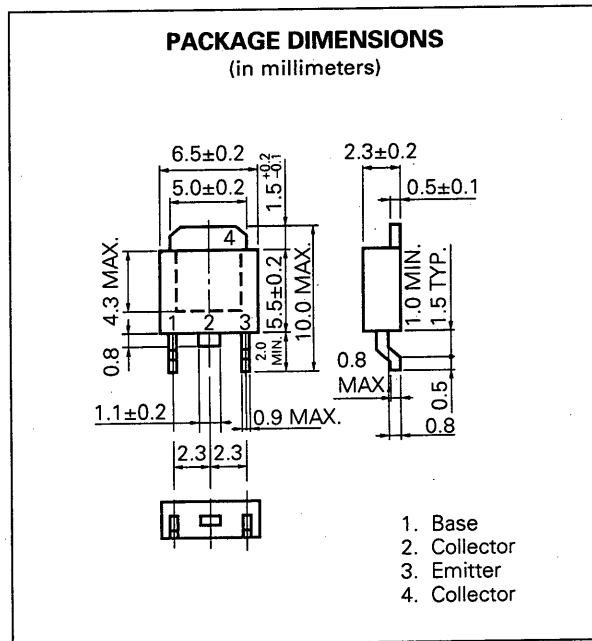
ABSOLUTE MAXIMUM RATINGS ($T_a = 25\text{ }^\circ\text{C}$)

| | | | |
|--|-----------|-------------|------------------|
| Collector to Base Voltage | V_{CB0} | 500 | V |
| Collector to Emitter Voltage | V_{CE0} | 400 | V |
| Emitter to Base Voltage | V_{EB0} | 7 | V |
| Collector Current (DC) | I_c | 2.0 | A |
| Collector Current (Pulse)* | I_c | 4.0 | A |
| Total Power Dissipation ($T_a = 25\text{ }^\circ\text{C}$)** | P_T | 2.0 | W |
| Junction Temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

* $PW \leq 10\text{ ms}$, Duty Cycle $\leq 50\%$

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

PACKAGE DIMENSIONS
(in millimeters)



ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

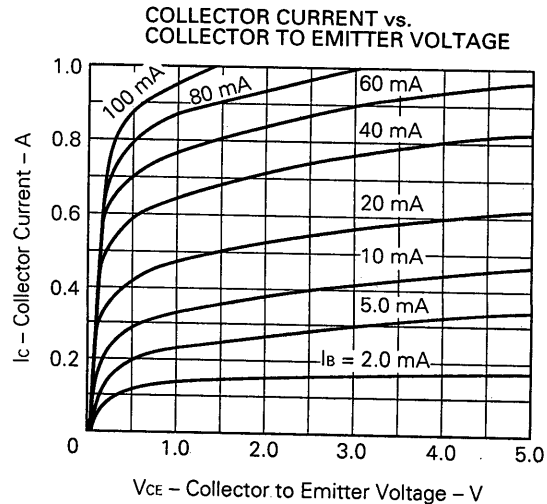
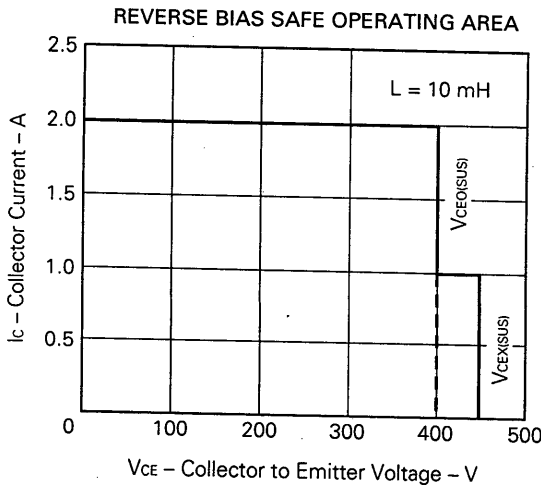
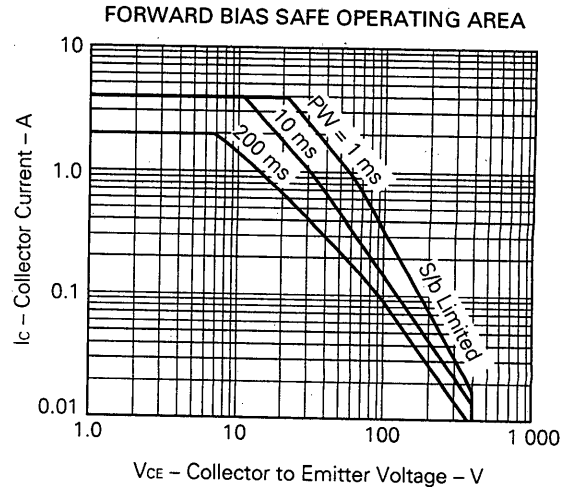
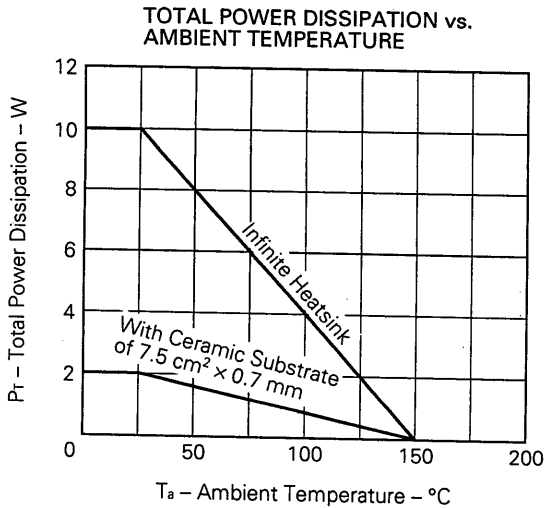
| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|------------------------------|------------------------|------|------|------|------|---|
| Collector Cutoff Current | I _{CBO} | | | 10 | μA | V _{CB} = 400 V, I _E = 0 |
| Emitter Cutoff Current | I _{EB0} | | | 10 | μA | V _{EB} = 5.0 V, I _C = 0 |
| DC Current Gain | h _{FE1} * | 40 | 60 | 120 | | V _{CE} = 5.0 V, I _C = 100 mA |
| DC Current Gain | h _{FE2} * | 6 | 14 | | | V _{CE} = 5.0 V, I _C = 1.0 A |
| Collector Saturation Voltage | V _{CE(sat)} * | | 0.35 | 1.0 | V | I _C = 1.0 A, I _B = 0.2 A |
| Base Saturation Voltage | V _{BE(sat)} * | | 1.0 | 1.5 | V | I _C = 1.0 A, I _B = 0.2 A |
| Gain Bandwidth Product | f _T | | 50 | | MHz | V _{CE} = 10 V, I _E = -100 mA |
| Output Capacitance | C _{ob} | | 20 | | 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} | | 1.5 | 2.0 | μs | |
| Fall Time | t _f | | 0.1 | 0.7 | μs | |

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

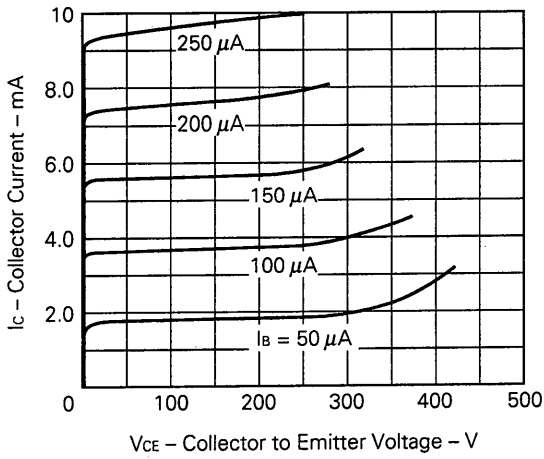
h_{FE} Classification

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

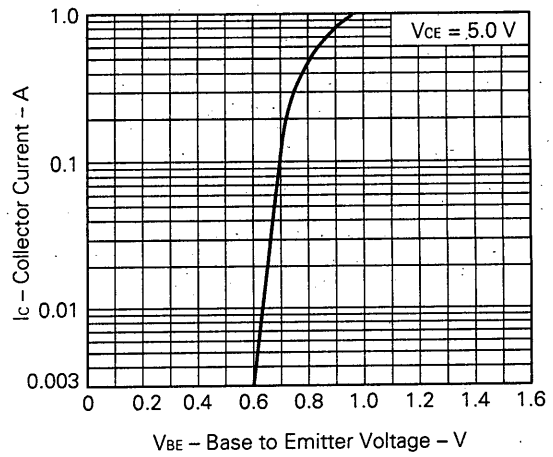
TYPICAL CHARACTERISTICS (T_a = 25 °C)



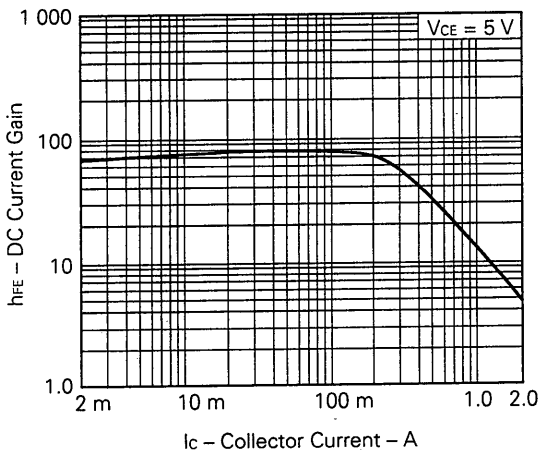
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



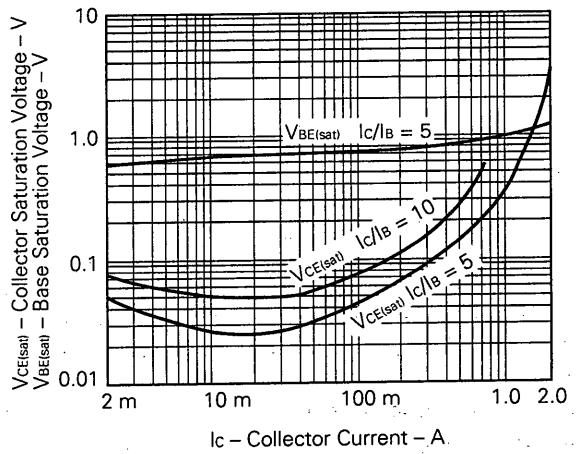
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



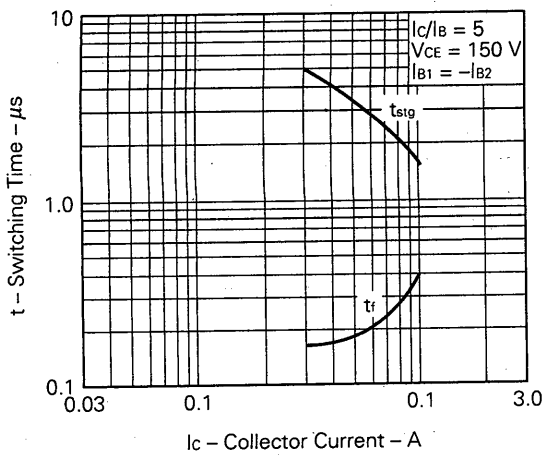
DC CURRENT GAIN vs. COLLECTOR CURRENT



COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



TURN-OFF TIME vs. COLLECTOR CURRENT



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 |

No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Corporation. NEC Corporation assumes no responsibility for any errors which may appear in this document.

NEC Corporation does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from use of a device described herein or any other liability arising from use of such device. No license, either express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Corporation or others.

The devices listed in this document are not suitable for use in aerospace equipment, submarine cables, nuclear reactor control systems and life support systems. If customers intend to use NEC devices for above applications or they intend to use "Standard" quality grade NEC devices for applications not intended by NEC, please contact our sales people in advance.

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.

This datasheet has been download from:

www.datasheetcatalog.com

Datasheets for electronics components.