

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 $t_r < 0.7\text{ }\mu\text{s}$
- Complement to 2SA1412-Z

QUALITY GRADE

Standard

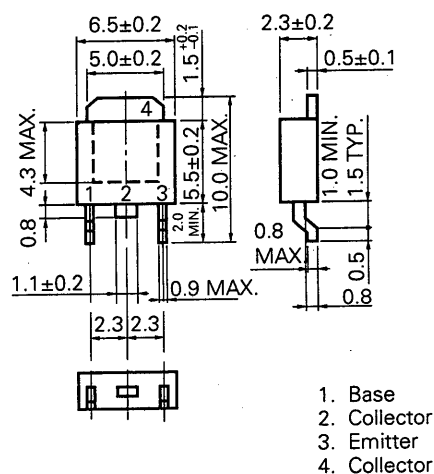
Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

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

Collector to Base Voltage	V_{CBO}	500	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 ($T_a = 25\text{ }^\circ\text{C}$)**	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 ($T_a = 25^\circ\text{C}$)

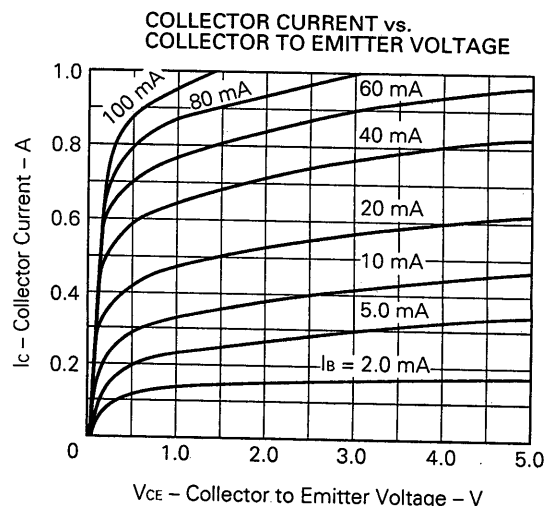
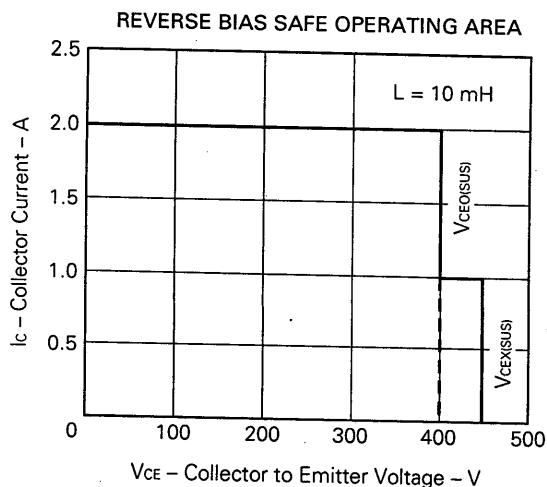
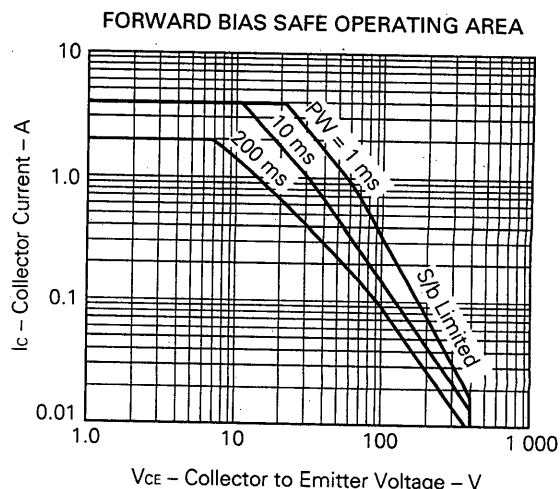
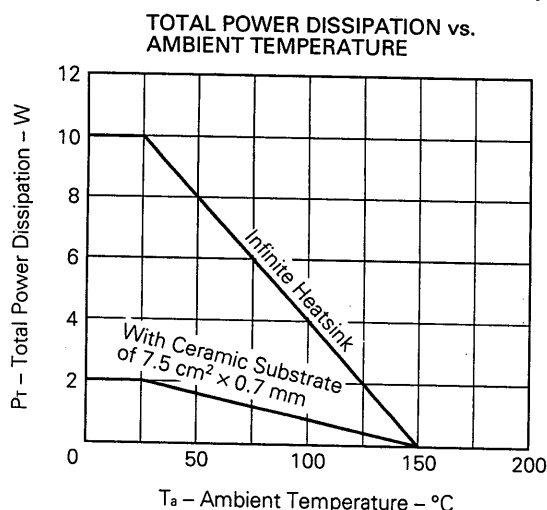
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			10	μA	$V_{CB} = 400\text{ V}, I_E = 0$
Emitter Cutoff Current	I_{EBO}			10	μA	$V_{EB} = 5.0\text{ V}, I_C = 0$
DC Current Gain	h_{FE1}^*	40	60	120		$V_{CE} = 5.0\text{ V}, I_C = 100\text{ mA}$
DC Current Gain	h_{FE2}^*	6	14			$V_{CE} = 5.0\text{ V}, I_C = 1.0\text{ A}$
Collector Saturation Voltage	$V_{CE(sat)}^*$		0.35	1.0	V	$I_C = 1.0\text{ A}, I_B = 0.2\text{ A}$
Base Saturation Voltage	$V_{BE(sat)}^*$		1.0	1.5	V	$I_C = 1.0\text{ A}, I_B = 0.2\text{ A}$
Gain Bandwidth Product	f_T		50		MHz	$V_{CE} = 10\text{ V}, I_E = -100\text{ mA}$
Output Capacitance	C_{ob}		20		pF	$V_{CB} = 10\text{ V}, I_E = 0, f = 1.0\text{ MHz}$
Turn-on Time	t_{on}		0.03	0.5	μs	$I_C = 1.0\text{ A}, R_L = 150\ \Omega$ $I_{B1} = -I_{B2} = 0.2\text{ A}$ $V_{CC} = 150\text{ V}$
Storage Time	t_{stg}		1.5	2.0	μs	
Fall Time	t_f		0.1	0.7	μs	

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

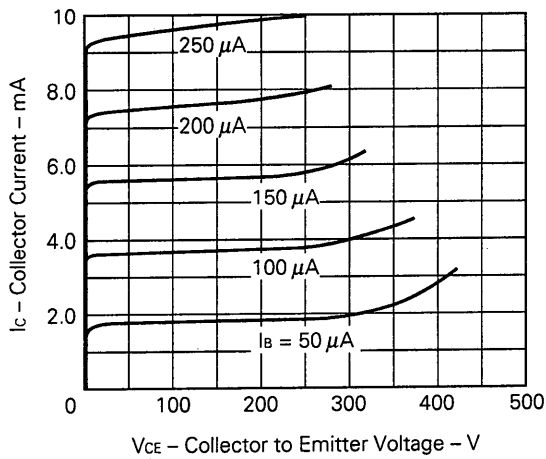
h_{FE} Classification

MARKING	L	K
h_{FE}	40 to 80	60 to 120

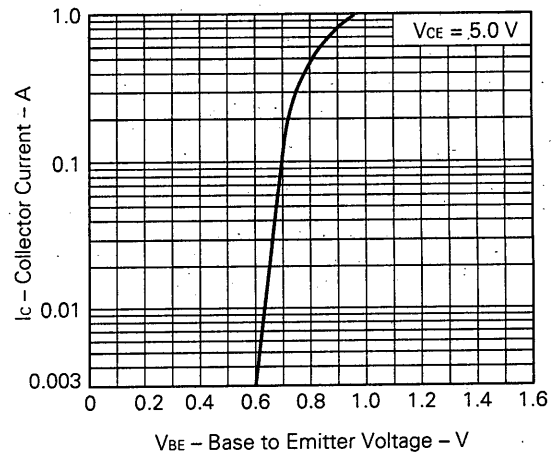
TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



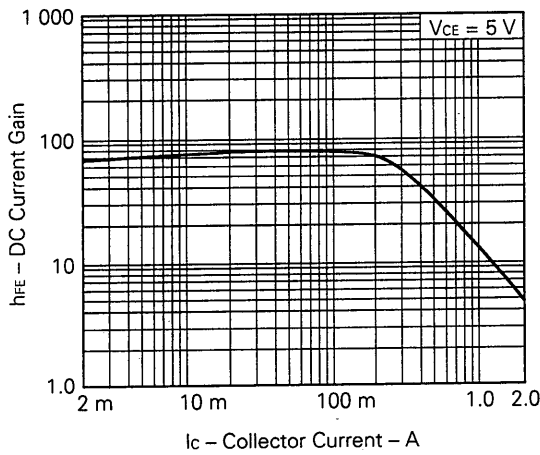
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



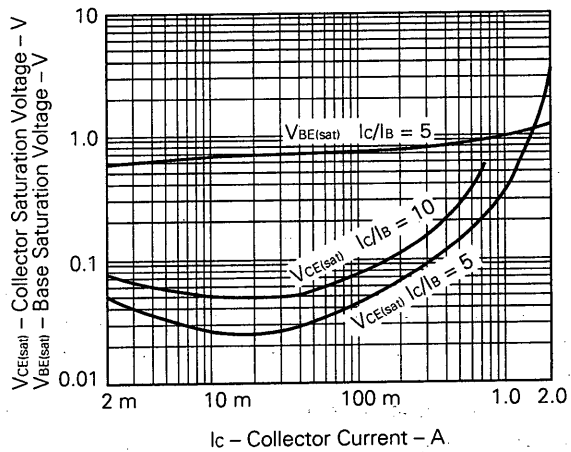
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



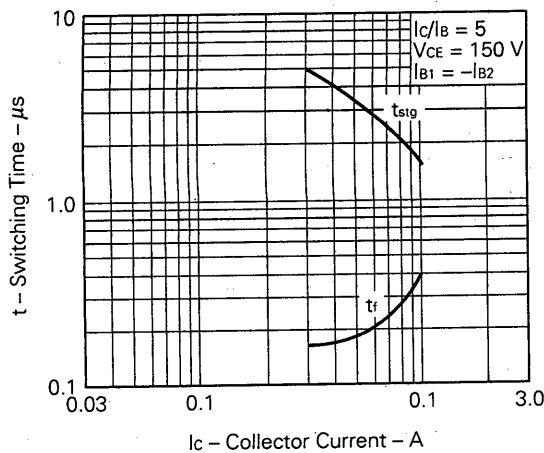
DC CURRENT GAIN vs.
COLLECTOR CURRENT



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

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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.