DATA SHEET

NEC

SILICON TRANSISTOR
2SC3631-Z

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_{CEO} = 400 V
- High Speed t_f < 0.7 μs
- 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.

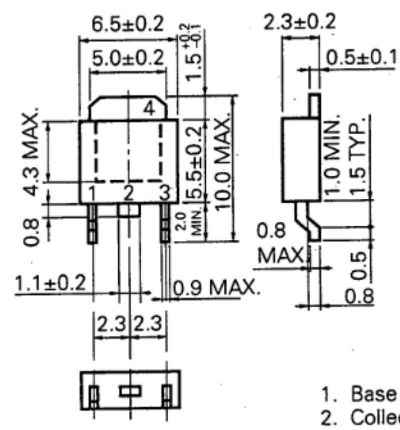
ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

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 °C)**	P_T	2.0	W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

* PW ≦ 10 ms, Duty Cycle ≦ 50 %

** When mounted on ceramic substrate of 7.5 cm^2 × 0.7 mm

PACKAGE DIMENSIONS
(in millimeters)



1. Base
2. Collector
3. Emitter
4. Collector

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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 = 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
Storage Time	t_{stg}		1.5	2.0	μs	I_{B1} = $-I_{B2}$ = 0.2 A
Fall Time	t_f		0.1	0.7	μs	V_{CC} = 150 V

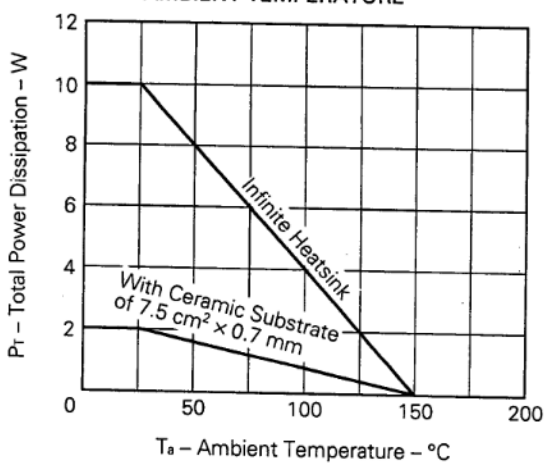
* Pulsed: PW ≦ 350 μs, Duty Cycle ≦ 2 %

h_{FE} Classification

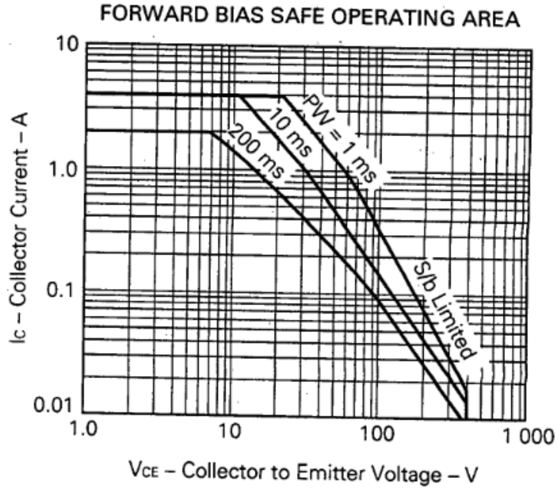
MARKING	L	K
h_{FE}	40 to 80	60 to 120

TYPICAL CHARACTERISTICS (T_a = 25 °C)

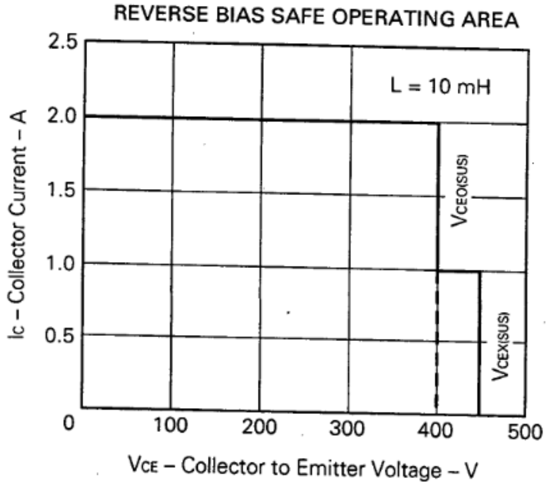
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



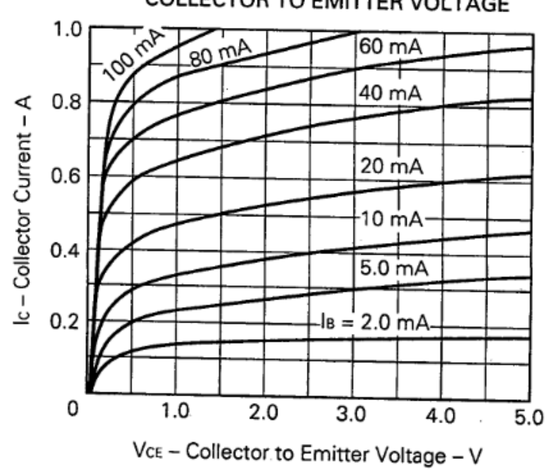
FORWARD BIAS SAFE OPERATING AREA



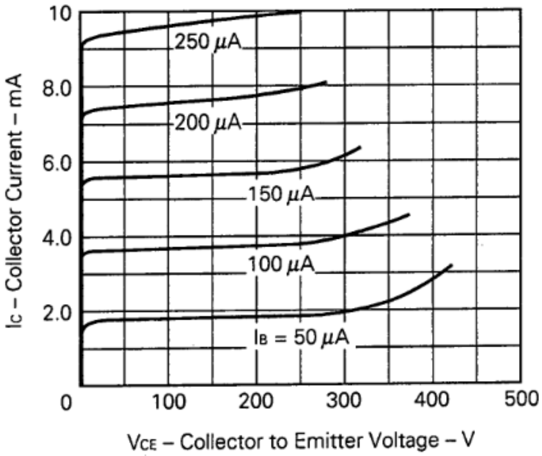
REVERSE BIAS SAFE OPERATING AREA



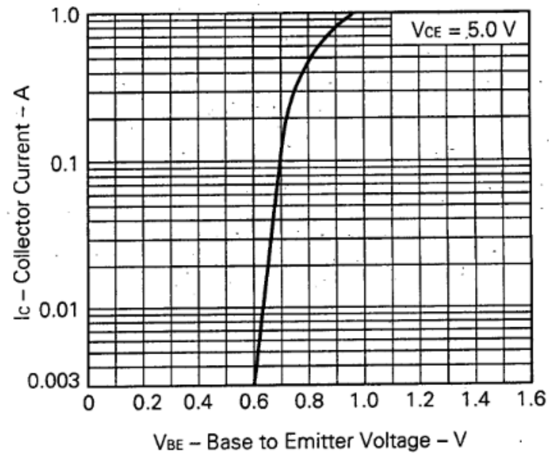
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



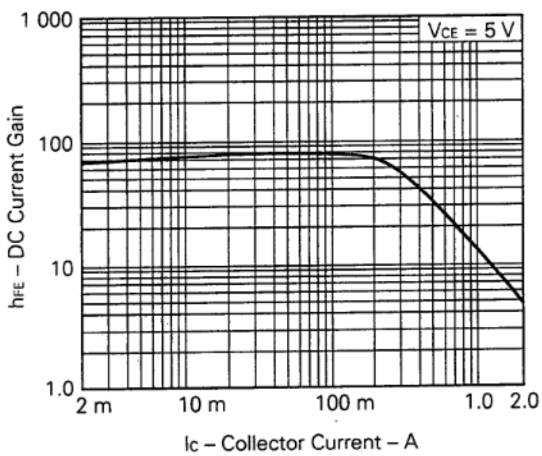
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



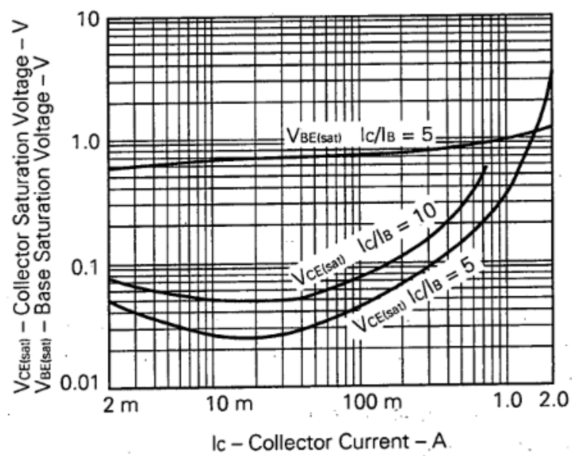
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



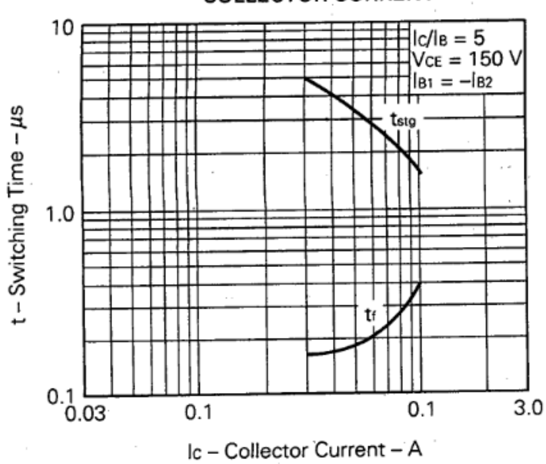
DC CURRENT GAIN vs.
COLLECTOR CURRENT



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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