

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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NPN SILICON TRIPLE DIFFUSED TRANSISTOR

DESCRIPTION

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

FEATURES

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

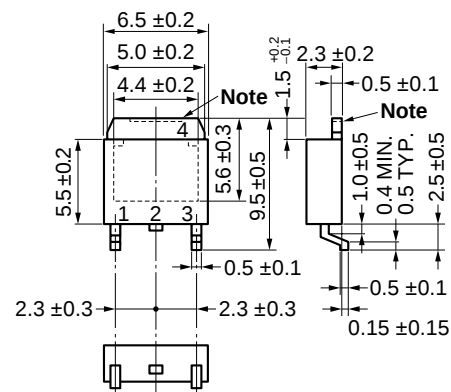
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

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)	$I_{C(DC)}$	2.0	A
Collector Current (pulse) ^{Note 1}	$I_{C(pulse)}$	4.0	A
Total Power Dissipation ($T_A = 25^\circ\text{C}$) ^{Note 2}	P_T	2.0	W
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Notes 1. $PW \leq 10\text{ ms}$, Duty Cycle $\leq 50\%$

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

<R> PACKAGE DRAWING (Unit: mm)



TO-252 (MP-3Z)

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

Note The depth of notch at the top of the fin is from 0 to 0.2 mm.

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

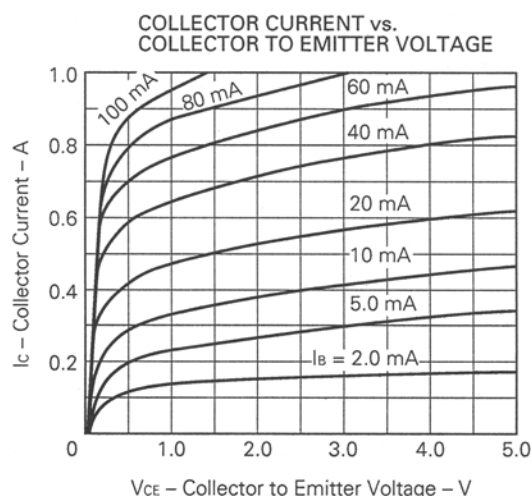
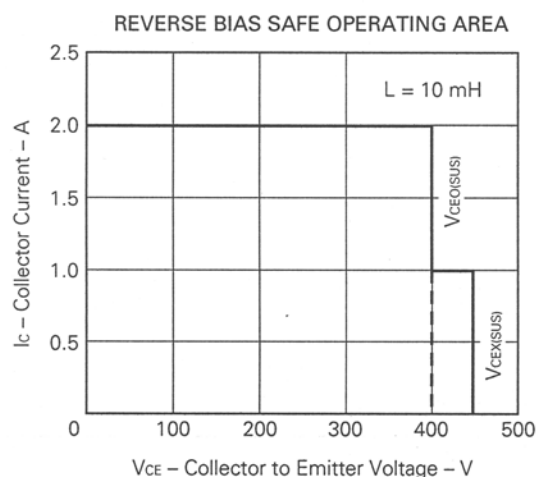
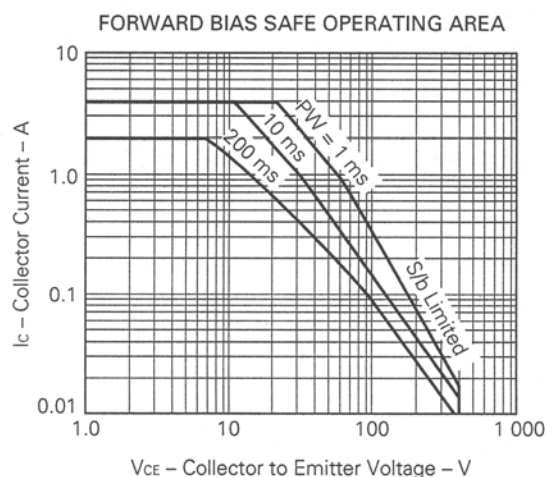
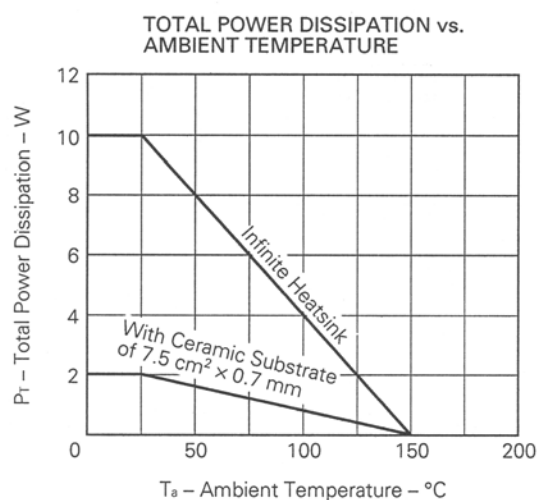
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			10	μA	$V_{CB} = 400\text{ V}, I_E = 0$
Emitter Cutoff Current	I_{EBO}			10	μA	$V_{EB} = 5.0\text{ V}, I_C = 0$
DC Current Gain	h_{FE1}^*	40	60	120		$V_{CE} = 5.0\text{ V}, I_C = 100\text{ mA}$
DC Current Gain	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 $\leq 2\%$

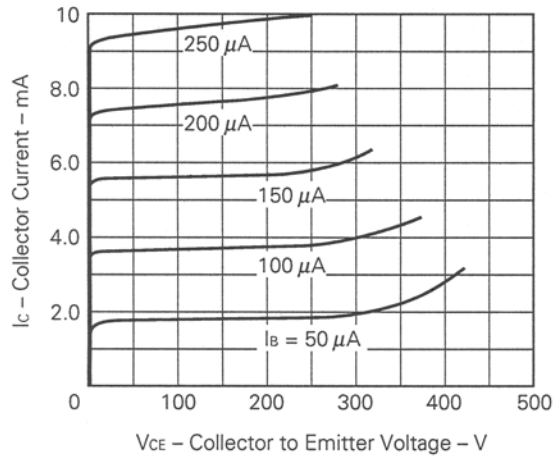
h_{FE} Classification

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

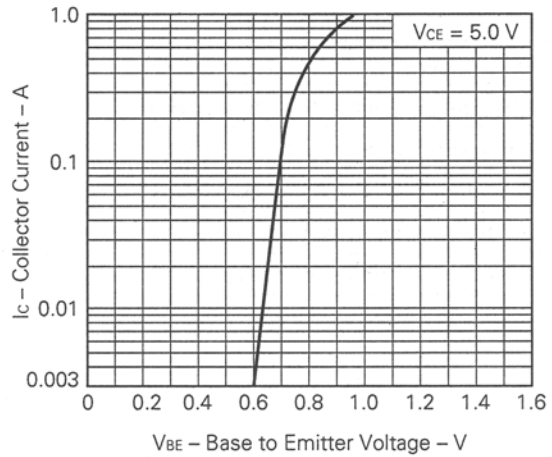
TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)



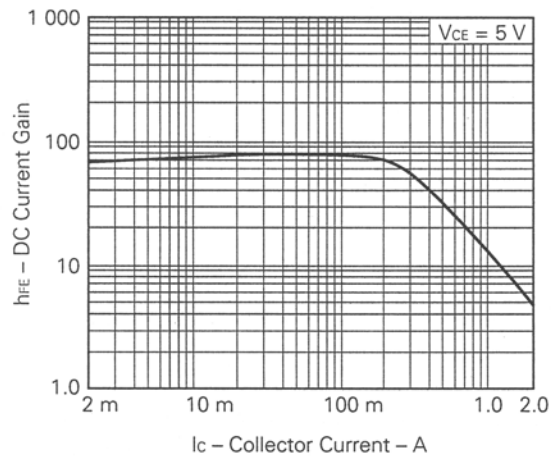
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



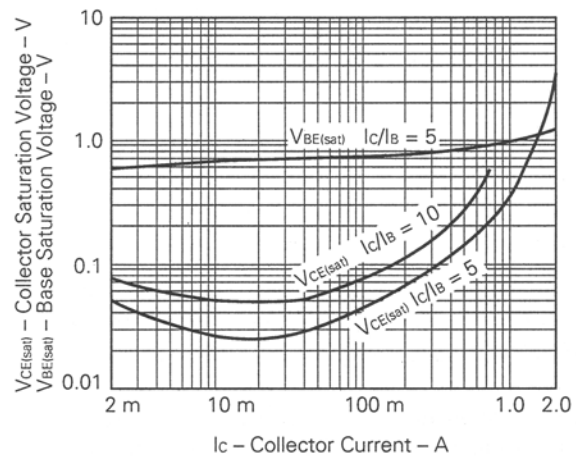
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



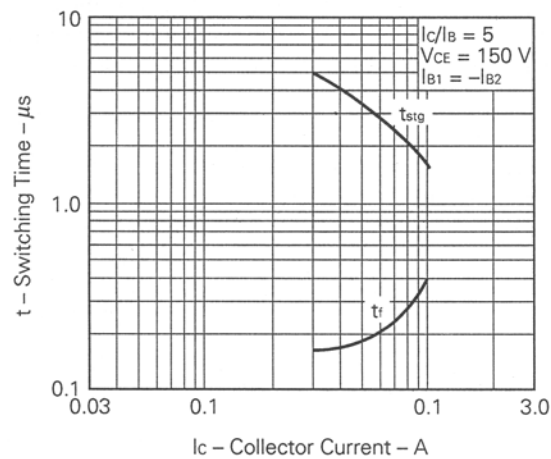
DC CURRENT GAIN vs.
COLLECTOR CURRENT



COLLECTOR AND BASE SATURATION VOLTAGE
vs. COLLECTOR CURRENT



TURN-OFF TIME vs.
COLLECTOR CURRENT



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