

To our customers,

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## Old Company Name in Catalogs and Other Documents

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On April 1<sup>st</sup>, 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 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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

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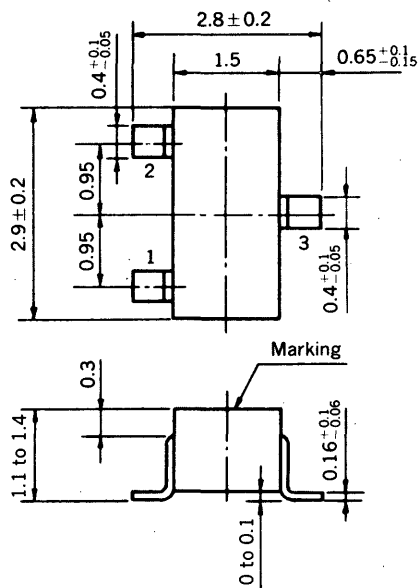
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MEDIUM SPEED SWITCHING  
RESISTOR BUILT-IN TYPE NPN TRANSISTOR  
MINI MOLD

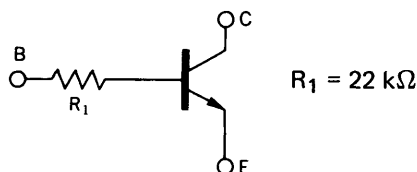
PACKAGE DIMENSIONS  
in millimeters



- 1. Emitter
- 2. Base
- 3. Collector

FEATURES

- Resistor Built-in TYPE



- Complementary to FN1F4Z

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents ( $T_a = 25^\circ\text{C}$ )

Collector to Base Voltage	$V_{CB0}$	60	V
Collector to Emitter Voltage	$V_{CEO}$	50	V
Emitter to Base Voltage	$V_{EBO}$	5	V
Collector Current (DC)	$I_C$	100	mA
Collector Current (Pulse)	$I_C$	200	mA

Maximum Power Dissipation

Total Power Dissipation at $25^\circ\text{C}$ Ambient Temperature	$P_T$	200	mW
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Maximum Temperatures

Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	$I_{CB0}$			100	nA	$V_{CB} = 50\text{ V}, I_E = 0$
DC Current Gain	$h_{FE1}^*$	135	330	600		$V_{CE} = 5.0\text{ V}, I_C = 5.0\text{ mA}$
DC Current Gain	$h_{FE2}^*$	100	290			$V_{CE} = 5.0\text{ V}, I_C = 50\text{ mA}$
Collector Saturation Voltage	$V_{CE(sat)}^*$		0.04	0.2	V	$I_C = 5.0\text{ mA}, I_B = 0.25\text{ mA}$
Low-Level Input Voltage	$V_{IL}^*$		0.55	0.5	V	$V_{CE} = 5.0\text{ V}, I_C = 100\ \mu\text{A}$
High-Level Input Voltage	$V_{IH}^*$	3.0	1.05		V	$V_{CE} = 0.2\text{ V}, I_C = 5.0\text{ mA}$
Input Resistor	$R_1$	15.4	22	28.6	$k\Omega$	
Turn-on Time	$t_{on}$			0.2	$\mu\text{s}$	$V_{CC} = 5\text{ V}, V_{in} = 5\text{ V}$
Storage Time	$t_{stg}$			5.0	$\mu\text{s}$	$R_L = 1\text{ k}\Omega$
Turn-off Time	$t_{off}$			6.0	$\mu\text{s}$	$PW = 2\ \mu\text{s}, \text{Duty Cycle} \leq 2\%$

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

$h_{FE}$  Classification

Marking	L64	L65	L66
$h_{FE1}$	135 to 270	200 to 400	300 to 600

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

