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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RENESAS

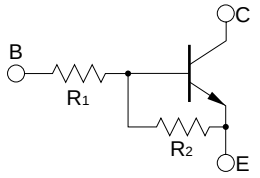
SILICON TRANSISTOR

FA1A4M

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

FEATURES

- Resistors Built-in TYPE



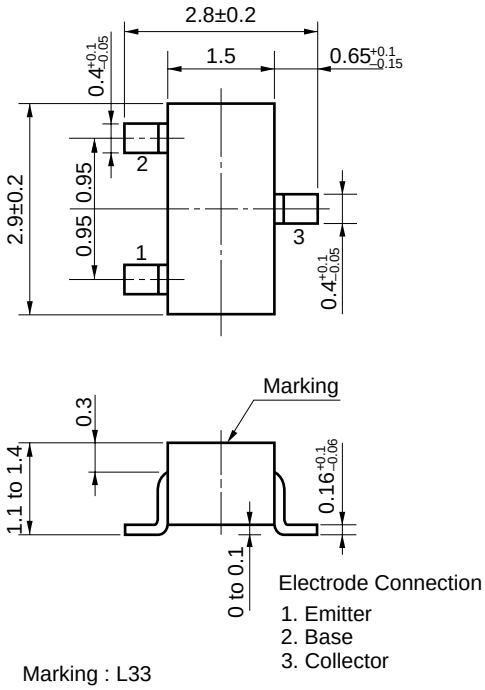
- Complementary to FN1A4M

ABSOLUTE MAXIMUM RATINGS (T_A = 25 ˚C)

Collector to Base Voltage	V_{CBO}	60	V
Collector to Emitter Voltage	V_{CEO}	50	V
Emitter to Base Voltage	V_{EBO}	10	V
Collector Current (DC)	I_C	100	mA
Collector Current (Pulse)	I_C	200	mA
Total Power Dissipation (T_A = 25 ˚C)	P_T	200	mW
Junction temperature	T_J	150	˚C
Storage Temperature Range	T_{stg}	–55 to +150	˚C

PACKAGE DIMENSIONS

in millimeters



Electrode Connection
1. Emitter
2. Base
3. Collector

Marking : L33

ELECTRICAL CHARACTERISTICS (T_A = 25 ˚C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			100	nA	V_{CB} = 50 V, I_E = 0
DC Current Gain	h_{FE1}*	35	62	100		V_{CE} = 5.0 V, I_C = 5.0 mA
DC Current Gain	h_{FE2}*	80	230			V_{CE} = 5.0 V, I_C = 50 mA
Collector Saturation Voltage	$V_{CE(sat)}$*		0.05	0.2	V	I_C = 5.0 mA, I_B = 0.25 mA
Low-Level Input Voltage	V_{IL}*		1.08	0.8	V	V_{CE} = 5.0, I_C = 100 μA
High-Level Input Voltage	V_{IH}*	3.0	1.4		V	V_{CE} = 0.2 V, I_C = 5.0 mA
Input Resistor	R_1	7.0	10	13	kΩ	
Resistor Ratio	R_1/R_2	0.9	1.0	1.1		
Turn-on Time	t_{on}		0.06	0.2	μs	V_{CC} = 5 V, V_{in} = 5 V R_L = 1 kΩ PW = 2 μs, Duty Cycle ≤ 2 %
Storage Time	t_{stg}		2.0	5.0	μs	
Turn-off Time	t_{off}		2.15	6.0	μs	

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

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Date Published October 1995 P
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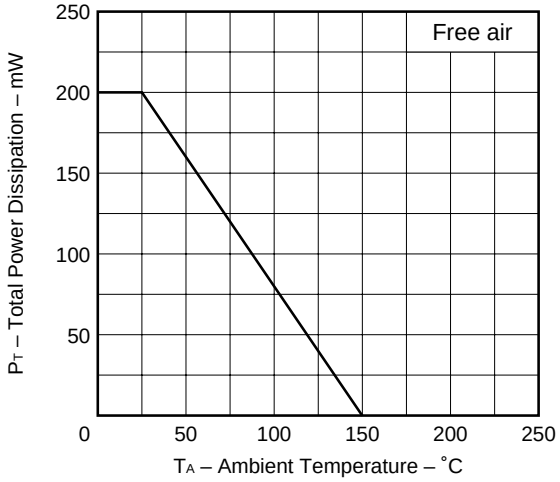
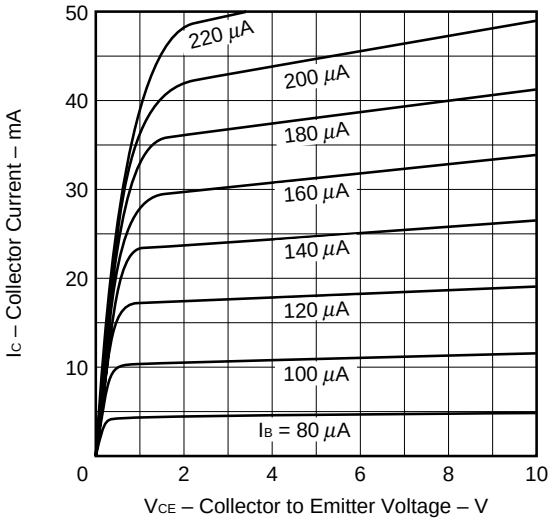
TYPICAL CHARACTERISTICS (T_A = 25 °C)

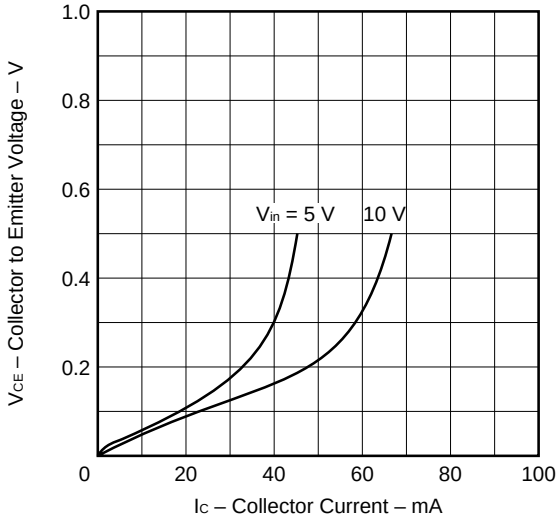
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



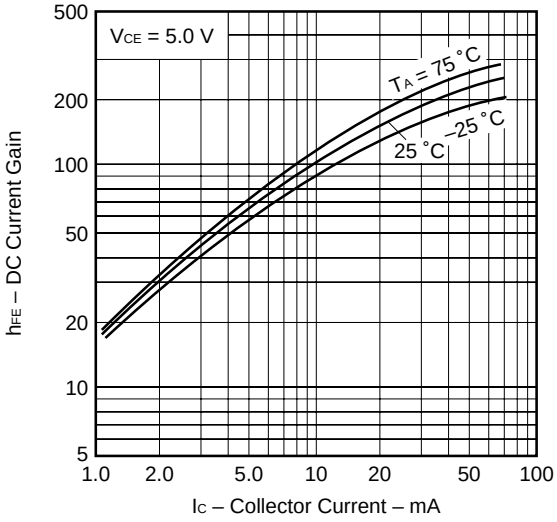
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



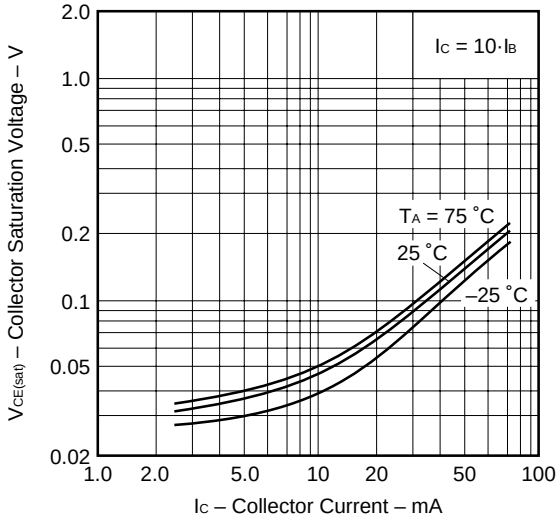
COLLECTOR TO EMITTER VOLTAGE vs. COLLECTOR CURRENT



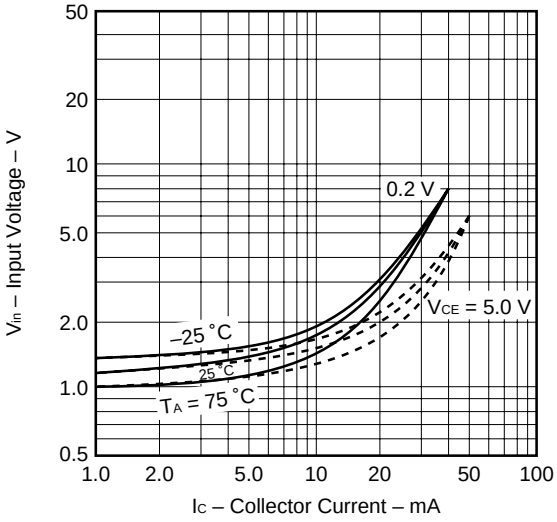
DC CURRENT GAIN vs. COLLECTOR CURRENT



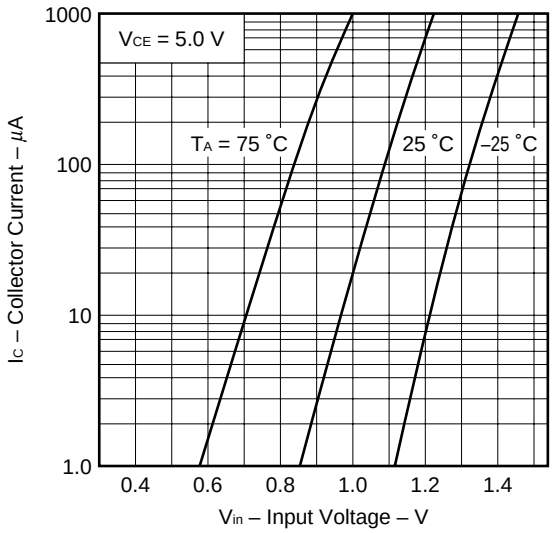
COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



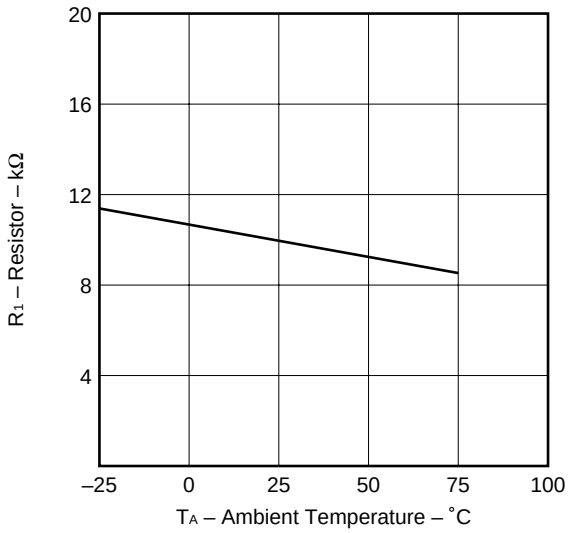
INPUT VOLTAGE vs. COLLECTOR CURRENT



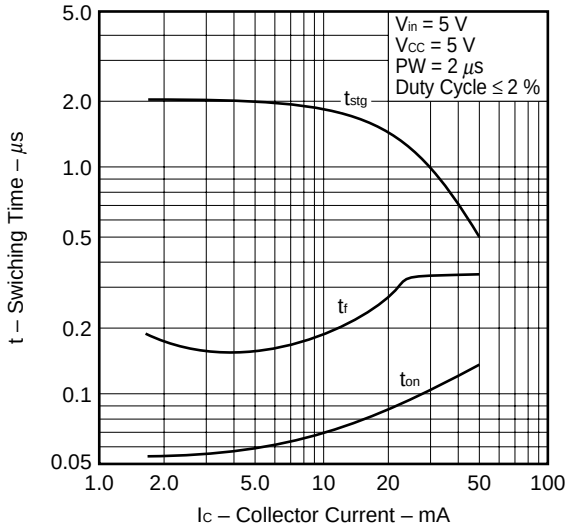
COLLECTOR CURRENT vs.
INPUT VOLTAGE



RESISTOR vs.
AMBIENT TEMPERATURE



SWITCHING TIME vs.
COLLECTOR CURRENT



REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system	TEI-1202
Quality grade on NEC semiconductor devices	IEI-1209
Semiconductor device mounting technology manual	IEI-1207
Guide to quality assurance for semiconductor devices	MEI-1202
Semiconductor selection guide	MF-1134

[MEMO]