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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DATA SHEET

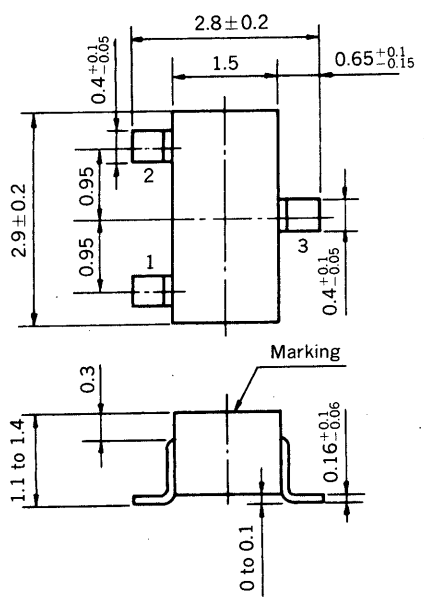
RENESAS

SILICON TRANSISTOR

FA1L4M

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

PACKAGE DIMENSIONS
in millimeters

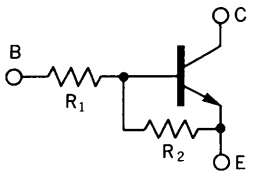


1. Emitter
2. Base
3. Collector

Marking: L31

FEATURES

- Resistors Built-in TYPE



R_1 = 47 kΩ
R_2 = 47 kΩ

- Complementary to FN1L4M

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents (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
Maximum Power Dissipation			
Total Power Dissipation at 25 °C Ambient Temperature	P_T	200	mW
Maximum Temperatures			
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	−55 to +150	°C

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}*	85	240	340		V_{CE} = 5.0 V, I_C = 5.0 mA
DC Current Gain	h_{FE2}*	95	640			V_{CE} = 5.0 V, I_C = 50 mA
Collector Saturation Voltage	$V_{CE(sat)}$*		0.04	0.2	V	I_C = 5.0 mA, I_B = 0.25 mA
Low-Level Input Voltage	V_{IL}*		1.07	0.8	V	V_{CE} = 5.0 V, I_C = 100 μA
High-Level Input Voltage	V_{IH}*	5.0	1.7		V	V_{CE} = 0.2 V, I_C = 5.0 mA
Input Resistor	R_1	32.9	47.0	61.1	kΩ	
Resistor Ratio	R_1/R_2	0.9	1.0	1.1		
Turn-on Time	t_{on}		0.27	0.7	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}		2.48	6.0	μs	

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

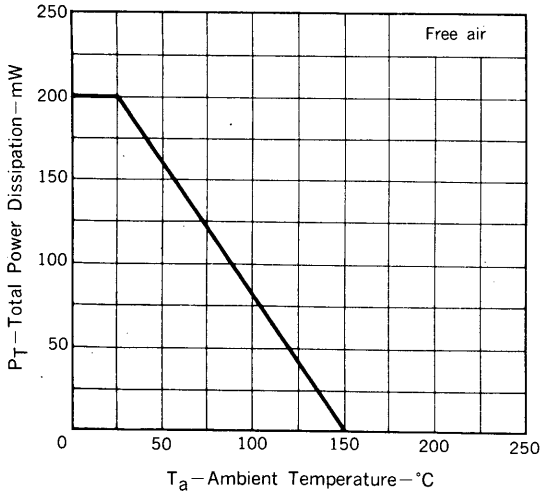
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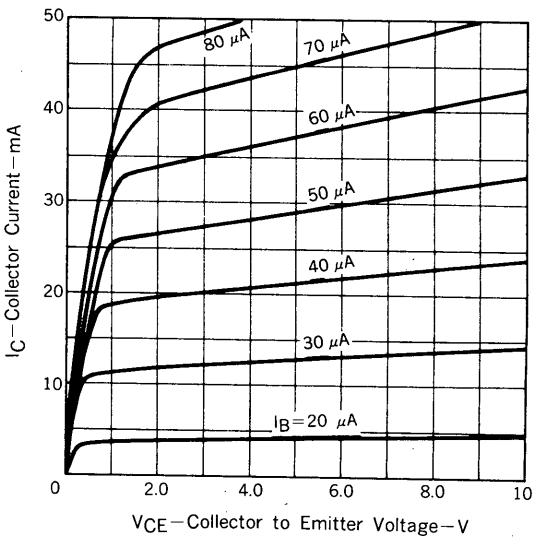
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TYPICAL CHARACTERISTICS (T_a = 25 °C)

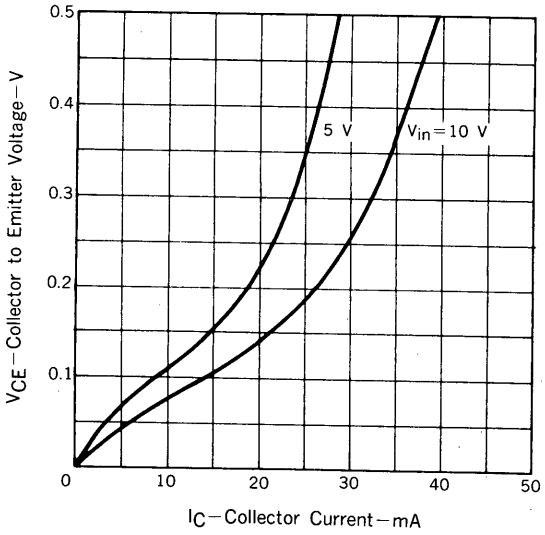
TOTAL POWER DISSIPATION vs.
AMBIENT TEMPERATURE



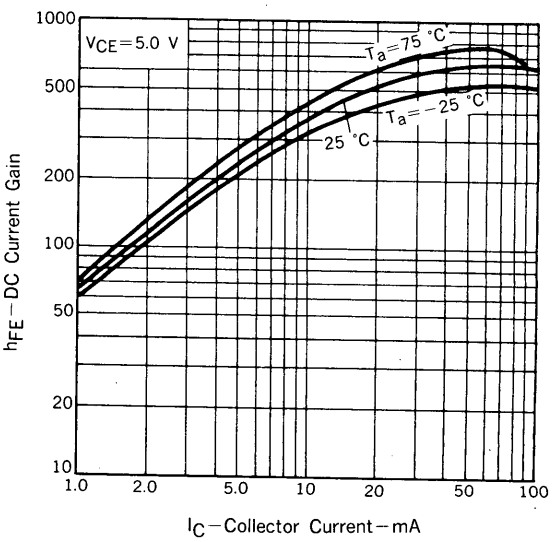
COLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE



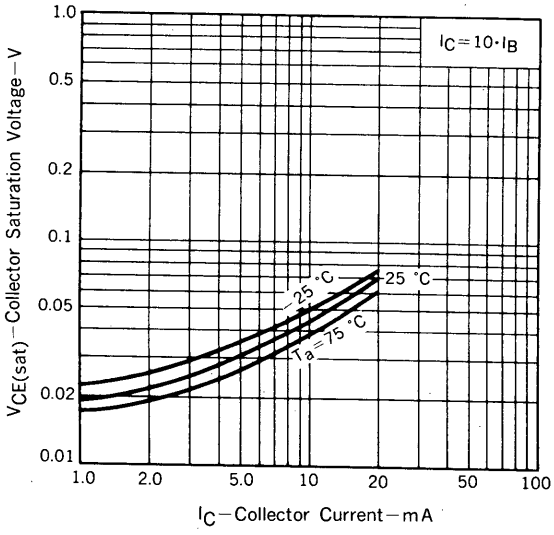
COLLECTOR TO EMITTER VOLTAGE vs.
COLLECTOR CURRENT



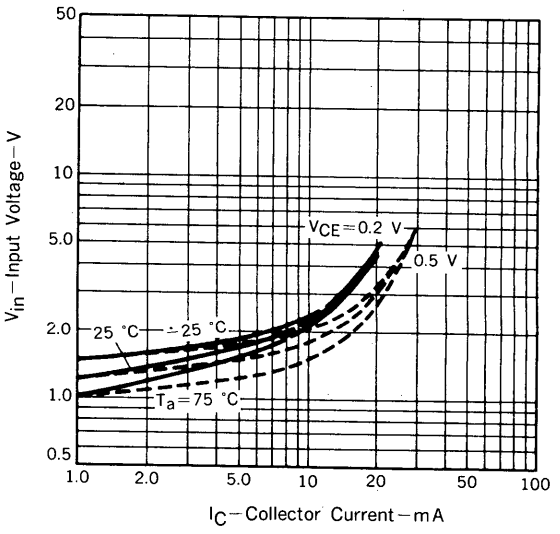
DC CURRENT GAIN vs.
COLLECTOR CURRENT



COLLECTOR SATURATION VOLTAGE vs.
COLLECTOR CURRENT

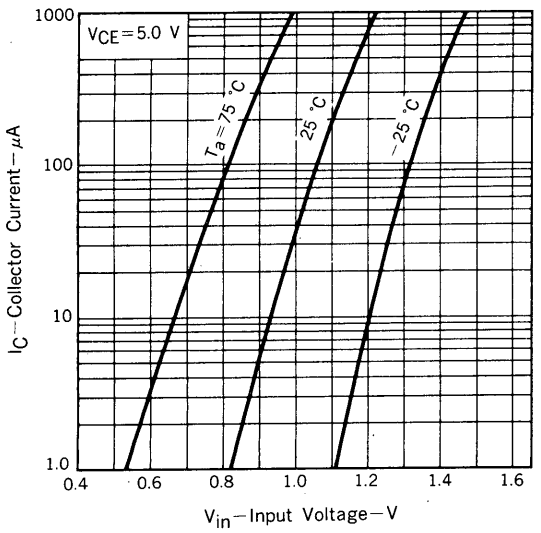


INPUT VOLTAGE vs.
COLLECTOR CURRENT

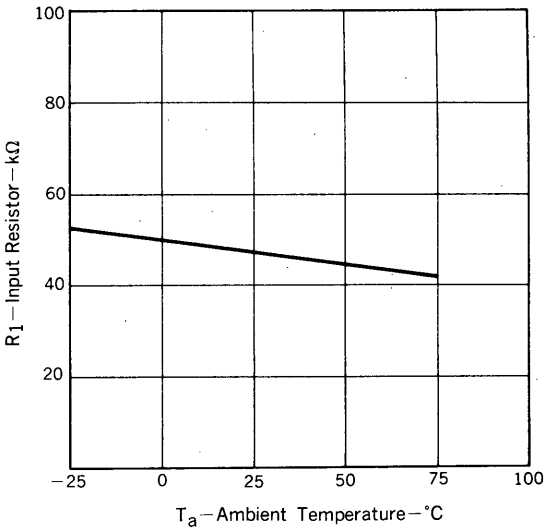


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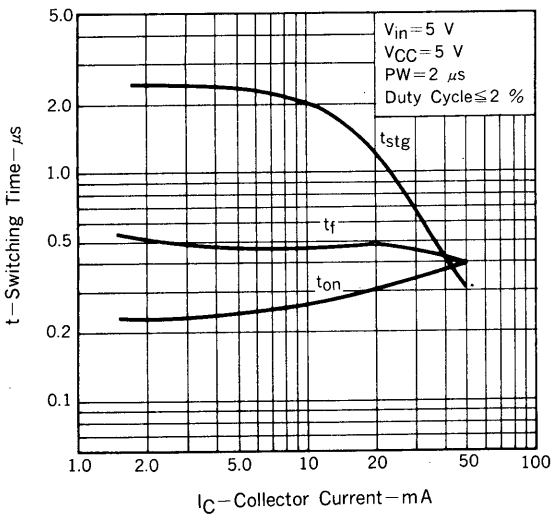
COLLECTOR CURRENT vs.
INPUT VOLTAGE



RESISTOR vs.
AMBIENT TEMPERATURE



SWITCHING TIME vs.
COLLECTOR CURRENT



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