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 DARLINGTON POWER TRANSISTOR
NTD412

LOW FREQUENCY AMPLIFIER AND LOW SPEED SWITCHING NPN SILICON EPITAXIAL MESA DARLINGTON TRANSISTOR

Industrial Use

DESCRIPTION

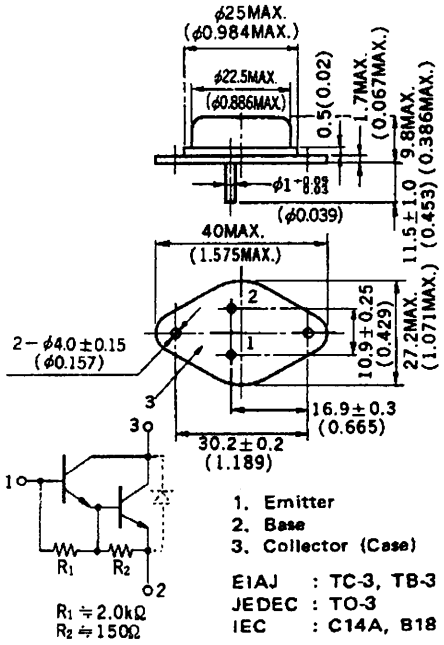
Suitable for hummer driver, pulse motor driver and relay driver applications.

FEATURES

- Operates from IC without predriver.
- Low collector saturation voltage.

PACKAGE DIMENSIONS

in millimeters (inches)



1. Emitter
2. Base
3. Collector (Case)

EIAJ : TC-3, TB-3
JEDEC : TO-3
IEC : C14A, B18

$R_1 \fallingdotseq 2.0k\Omega$
$R_2 \fallingdotseq 150\Omega$

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents (Ta = 25°C)			
Collector to Base Voltage	V_{CBO}	150	V
Collector to Emitter Voltage	$V_{CER(sus)}$	100	V
	$V_{CEX(sus)}$	100	V
	$V_{CEO(sus)}$	100	V
Emitter to Base Voltage	V_{EBO}	10	V
Continuous Collector Current	$I_{C(DC)}$	15	A
Peak Collector Current	$I_{C(pulse)}$*	20	A
Continuous Base Current	$I_{B(DC)}$	1.5	A
Maximum Power Dissipation			
Total Power Dissipation (Ta = 25°C)	P_T	5	W
(Tc = 25°C)	P_T	150	W
Maximum Temperatures			
Junction Temperature	T_j	200	°C
Storage Temperature	T_{stg}	−65 to +200	°C
Lead Temperature			
1/8 inch from case for 10 seconds	T_L	260	°C
Thermal Resistance			
Junction to Ambient	$R_{th(j-a)}$	35	°C/W
Junction to Case	$R_{th(j-c)}$	1.17	°C/W

* Pulsed PW ≦ 10 ms, duty cycle ≦ 50%

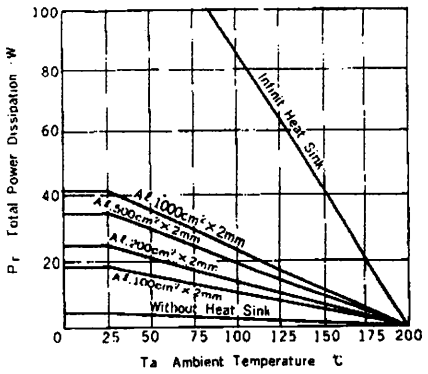
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector to Emitter Sustaining Voltage	$V_{CEO(sus)}$	100			V	I_C=0.2A, I_B=0
	$V_{CER(sus)}$	100			V	I_C=0.2A, R_{BE}=100Ω
	$V_{CEX(sus)}$	100			V	I_C=0.2A, I_B=−I_B=20mA
Collector Cutoff Current	I_{CBO}			100	μA	V_{CB}=100V, I_E=0
				1.0	mA	V_{CB}=100V, I_E=0, T_C=125°C
Collector Cutoff Current	I_{CEO}			100	μA	V_{CE}=50V, I_B=0
Emitter Cutoff Current	I_{EBO}			4.7	mA	V_{EB}=5.0V, I_C=0
DC Current Gain	h_{FE}	1000	4000	15000		V_{CE}=2.0V, I_C=15A*
Collector Saturation Voltage	$V_{CE(sat)}$			1.5	V	I_C=15A, I_B=30mA*
Base Saturation Voltage	$V_{BE(sat)}$			2.0	V	

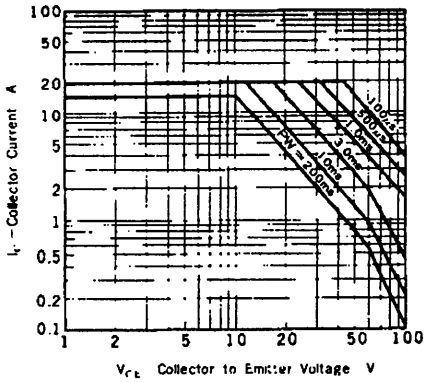
* Pulsed PW ≦ 350 μs, duty cycle ≦ 2%

TYPICAL CHARACTERISTICS (Ta = 25°C)

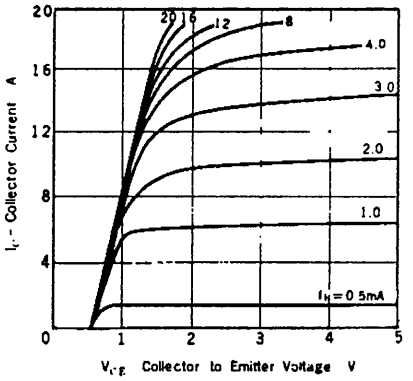
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



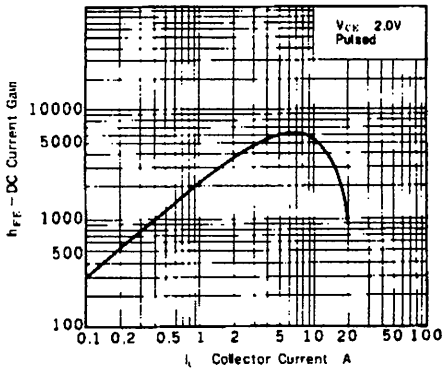
SAFE OPERATING AREA



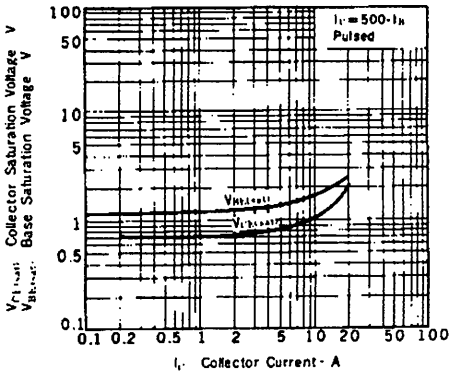
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



DC CURRENT GAIN vs. COLLECTOR CURRENT



BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



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