

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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SILICON POWER TRANSISTORS

NTA1069, NTA1069A

HIGH SPEED HIGH CURRENT SWITCHING
PNP SILICON EPITAXIAL TRANSISTOR

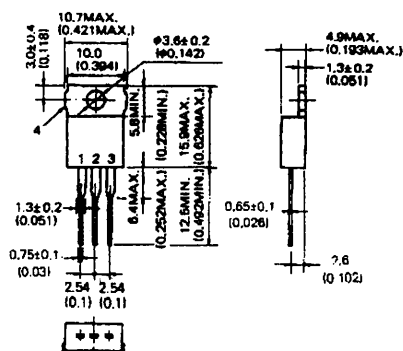
Industrial Use

DESCRIPTION

Suitable for switching regulator, DC-DC converter and ultrasonic appliance applications.

PACKAGE DIMENSIONS

in millimeters (inches)



FEATURES

- High speed switching.
- Low collector saturation voltage.
- Specified of reverse biased SOA with inductive loads.

ABSOLUTE MAXIMUM RATINGS

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

		NTA1069	NTA1069A	
Collector to Emitter Voltage	V_{CEX}	-80	-80	V
Collector to Emitter Sustaining Voltage	$V_{CEO(SUS)}$	-60	-80	V
Collector to Emitter Sustaining Voltage	$V_{CEX(SUS)}$	-60	-80	V
Emitter to Base Voltage	V_{EBO}	-12	-12	V
Continuous Collector Current	$I_C(DC)$	-5.0	-5.0	A
Peak Collector Current	$I_C(\text{pulse})^*$	-10	-10	A
Continuous Base Current	$I_B(DC)$	-2.5	-2.5	A

Maximum Power Dissipations

Total Power Dissipation	$P_T(T_c=25^\circ\text{C})$	50	W
Total Power Dissipation	$P_T(T_a=25^\circ\text{C})$	2.0	W

Maximum Temperatures

Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$
Lead Temperature			
1/8 inch from case for 10 seconds	T_L	260	$^\circ\text{C}$

Thermal Resistances

Junction to Case	$R_{th(j-c)}$	2.5	$^\circ\text{C/W}$
Junction to Ambient	$R_{th(j-a)}$	62.5	$^\circ\text{C/W}$

* Pulsed PW $\leq 300\mu\text{s}$, duty cycle $\leq 10\%$

ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise noted.) NTA1069 / NTA1069A

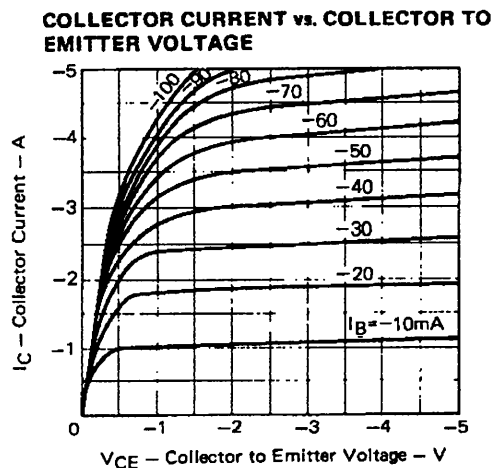
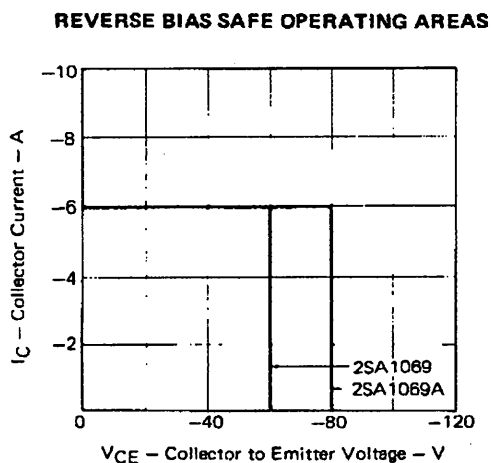
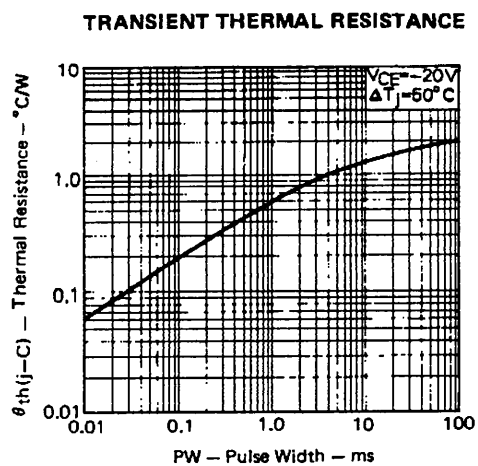
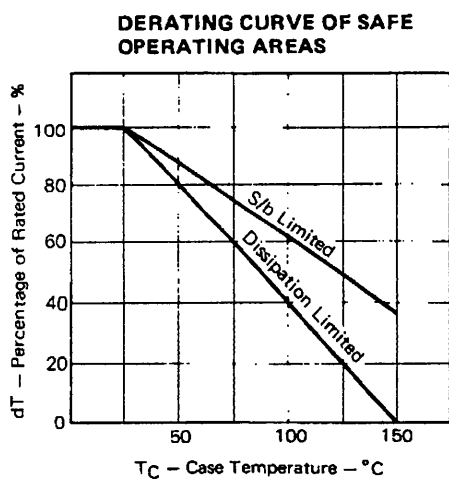
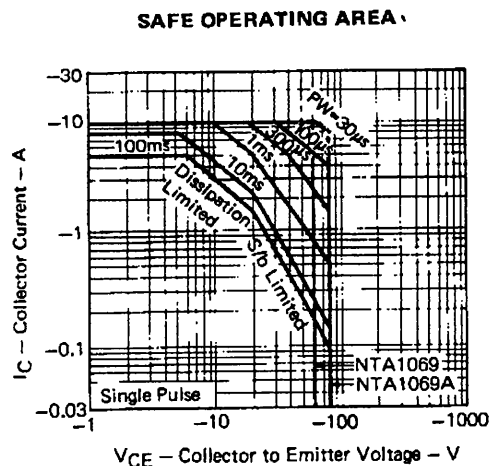
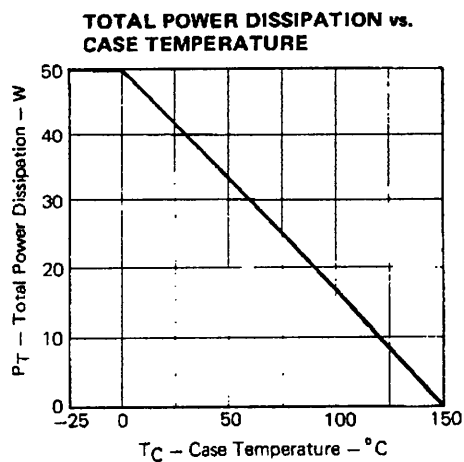
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector to Emitter Sustaining Voltage	V _{CEO(SUS)}	-60/-80			V	I _C =-1.0A, I _B =-0.10A, L=1mH
	V _{CEX(SUS)1}	-60/-80			V	I _C =-3.0A, I _{B1} =-I _{B2} =-0.3A, V _{BE(OFF)} =5V, L=180μH *1 Ta=125°C
	V _{CEX(SUS)2}	-60/-80			V	I _C =-6.0A, I _{B1} =-0.6A, I _{B2} =0.3A, V _{BE(OFF)} =5V, L=180μH *2 Ta=125°C
Collector Cutoff Current	I _{CEX1}			-10	μA	V _{CE} =-60/-80V, V _{BE(OFF)} =1.5V
	I _{CEX2}			-1.0	mA	V _{CE} =-60/-80V, V _{BE(OFF)} =1.5V Ta=125°C
	I _{CER}			-1.0	mA	V _{CE} =-60/-80V, R _{BE} =51Ω, Ta=125°C
Emitter Cutoff Current	I _{EBO}			-10	μA	V _{EB} =-5.0V, I _C =0
Second Breakdown Collector Current	I _{S/B}	-1.5			A	V _{CE} =-20V, t=1sec, T _c =25°C
Second Breakdown Energy	E _{S/B}	180			μJ	I _C =-3.0A, I _{B1} =-0.3A, V _{BE(OFF)} =5V, R _{BB} =50Ω, L=40μH
DC Current Gain	h _{FE1}	40				V _{CE} =-5.0V, I _C =-0.3A *3
	h _{FE2}	40		200		V _{CE} =-5.0V, I _C =-3.0A *3
Collector Saturation Voltage	V _{CE(sat)}			-0.6	V	I _C =-3.0A, I _B =-0.3A *3
Base Saturation Voltage	V _{BE(sat)}			-1.5	V	
Gain Bandwidth Product	f _T	20			MHz	V _{CE} =-10V, I _C =-50mA, f=3MHz
Output Capacitance	C _{ob}			200	pF	V _{CB} =-10V, I _E =0, f=1MHz
Turn On Time	t _{on}			0.5	μs	I _C =-3.0A, I _{B1} =-I _{B2} =-0.3A V _{BE(OFF)} =5.0V, R _L =17Ω V _{CC} ≈-50V
Storage Time	t _{stg}			1.5	μs	
Fall Time	t _f			0.5	μs	

*1 V_{CE} clamped V_{clamp} = -60/-80V

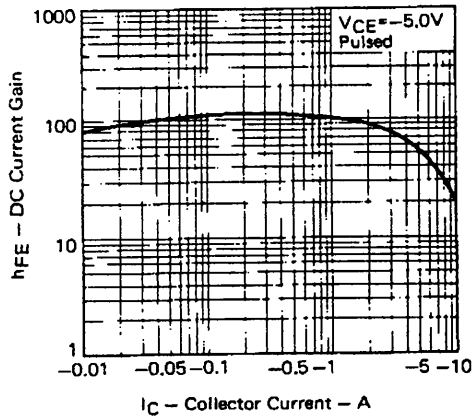
*2 V_{CE} clamped V_{clamp} = -60/-80V

*3 Pulsed PW ≤ 350μs, duty cycle ≤ 2%

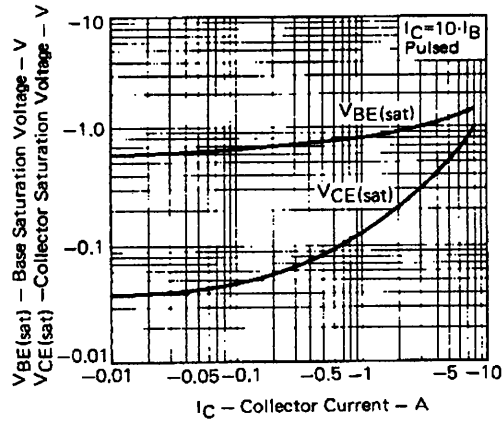
TYPICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)



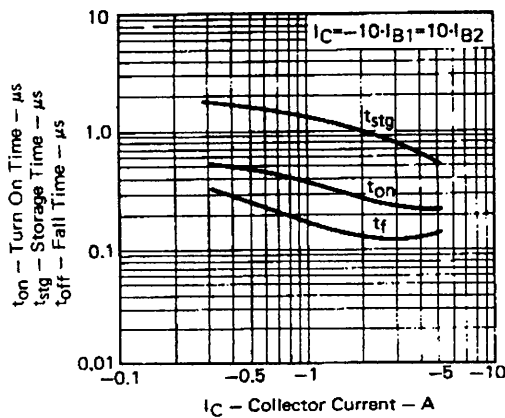
DC CURRENT GAIN vs. COLLECTOR CURRENT



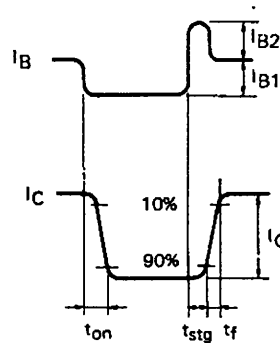
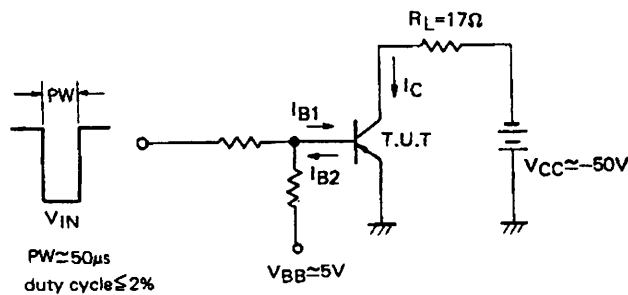
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



TURN ON TIME, STORAGE TIME AND FALL TIME vs. COLLECTOR CURRENT



SWITCHING TIME (t_{on} , t_{stg} , t_f) TEST CIRCUIT



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