To our customers,

Old Company Name in Catalogs and Other Documents

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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 POWER TRANSISTOR

Phase-out/Discontinued

2SC2885, 2946, 2946(1)

NPN SILICON EPITAXIAL TRANSISTOR FOR HIGH-VOLTAGE HIGH-SPEED SWITCHING

The 2SC2885, 2946, and 2946(1) are high-voltage high-speed switching power transistors featuring a small package (MP-3) which is suitable for high-density mounting. These transistors are ideal for drivers in DC/DC converters and switching regulators.

There are three types of transistors selectable according to the reliability requirments: 2SC2946 and 2946(1) for industrial use, 2SC2885 for general use. The 2SC2946(1) is produced with leads so as to enable mounting directly in a hybrid IC.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Collector to Base Voltage	V_{CBO}	330	V
Collector to Emitter Voltage	V_{CEO}	200	V
Emitter to Base Voltage	V_{EBO}	7.0	V
Collector Current (DC)	$I_{C(DC)}$	2.0	A
Collector Current (pulse) Note	$I_{C(pulse)}$	4.0	A
Base Current (DC)	$I_{C(DC)}$	1.0	A
Total Power Dissipation	P_T(T_C = 25°C)	15	W
Total Power Dissipation	P_T(T_A = 25°C)	600	mW
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	−55 to +150	°C

Note PW ≤ 300 μs, Duty Cycle ≤ 10%

Document No. D16135EJ3V0DS00 (3rd edition)
Date Published July 2006 NS CP(K)
Printed in Japan

The mark <R> shows major revised points.
The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

ELECTRICAL CHARACTERISTICS (T_A = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to emitter voltage	$V_{CEO(SUS)}$	I_C = 1.0 A, I_B = 0.1 A, L = 500 μH*	200			V
Collector to emitter voltage	$V_{CEX(SUS)}$	I_C = 1.0 A, I_{B1} = $-I_{B2}$ = 0.1 A* Ta = 125°C, L = 180 μH, clamped	200			V
Collector cutoff current	I_{CBO}	V_{CB} = 250 V, I_E = 0			10	μA
Collector cutoff current	I_{CEX1}	V_{CE} = 250 V, $V_{BE(OFF)}$ = –1.5 V			10	μA
Collector cutoff current	I_{CEX2}	V_{CE} = 250 V, $V_{BE(OFF)}$ = –1.5 V, Ta = 125°C			1.0	mA
Emitter cutoff current	I_{EBO}	V_{EB} = 5.0 V, I_C = 0			1.0	μA
DC current gain	h_{FE1}	V_{CE} = 5.0 V, I_C = 0.1 A*	20	60	160	
	h_{FE2}	V_{CE} = 5.0 V, I_C = 1.0 A*	15			
Collector saturation voltage	$V_{CE(sat)}$	I_C = 1.0 A, I_B = 0.1 A*			1.0	V
Base saturation voltage	$V_{BE(sat)}$	I_C = 1.0 A, I_B = 0.1 A*			1.5	V
Turn-on time	t_{on}	I_C = 1.0 A, R_L = 100 Ω I_{B1} = $-I_{B2}$ = 0.1 A, V_{CC} ≅ 100 V Refer to the test circuit.			1.0	μs
Storage time	t_{stg}				2.0	μs
Fall time	t_f				1.0	μs

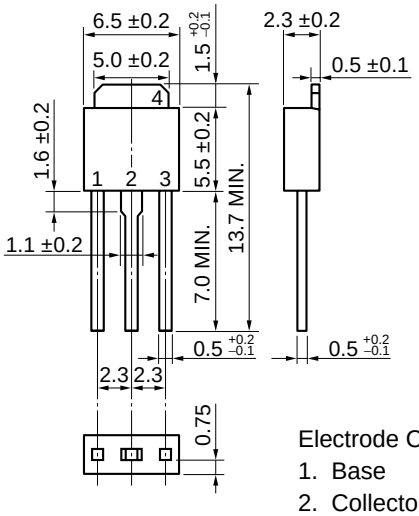
* Pulse test PW ≤ 350 μs, duty cycle ≤ 2%

h_{FE} CLASSIFICATION

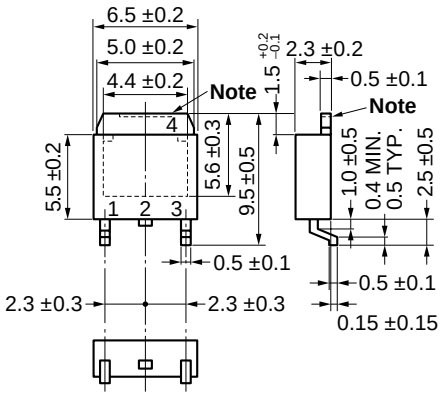
Marking	N	M	L	K
h_{FE1}	20 to 50	30 to 70	50 to 100	80 to 160

<R> PACKAGE DRAWING (UNIT: mm)

2SC2885, 2SC2946



2SC2946(1)

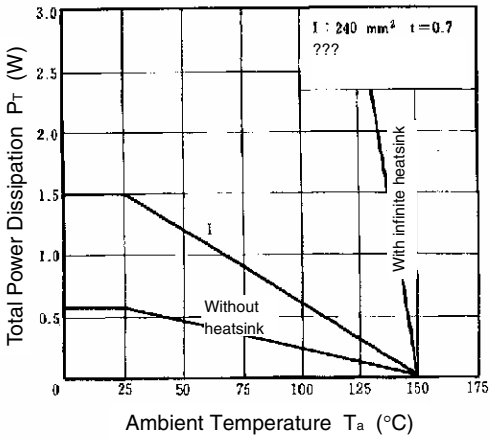


Electrode Connection
1. Base
2. Collector
3. Emitter
4. Collector Fin

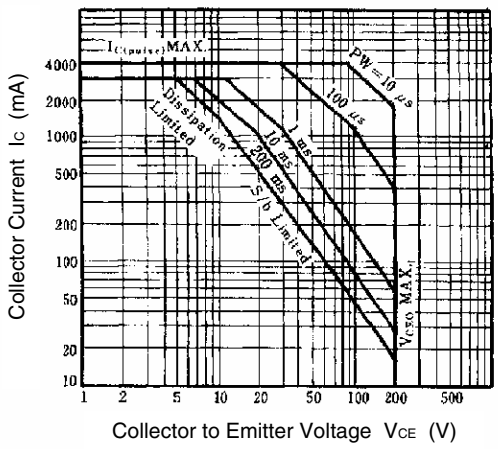
Note The depth of notch at the top of the fin is from 0 to 0.2 mm.

TYPICAL CHARACTERISTICS (T_A = 25°C)

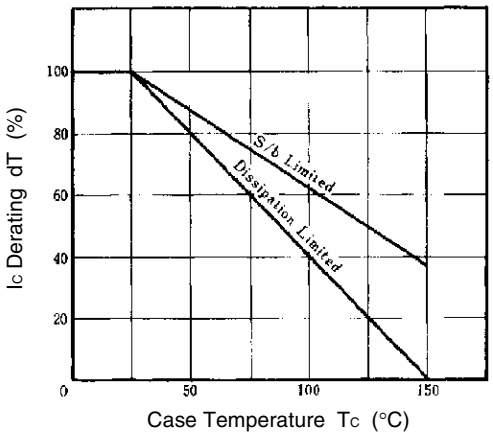
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



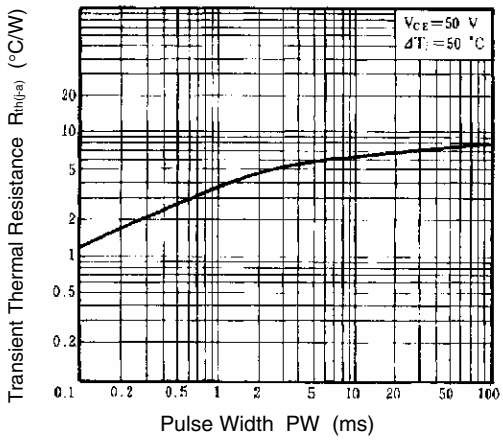
FORWARD BIAS SAFE OPERATING AREA



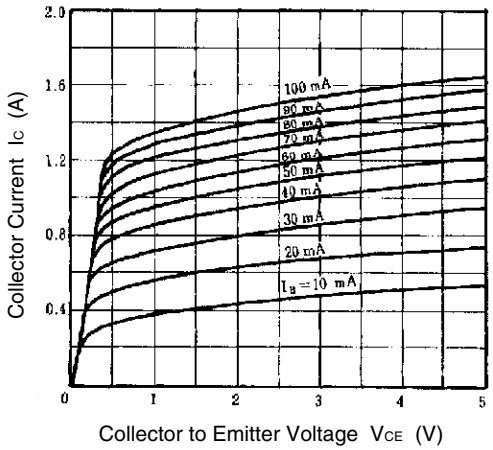
DERATING CURVE OF SAFE OPERATING AREA



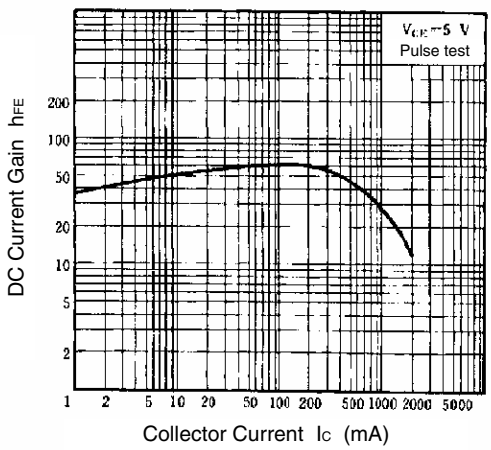
TRANSIENT THERMAL RESISTANCE



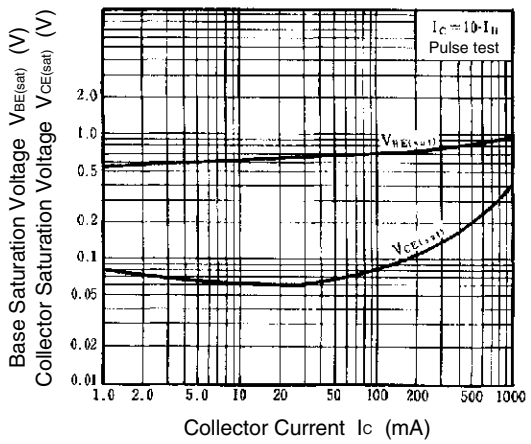
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



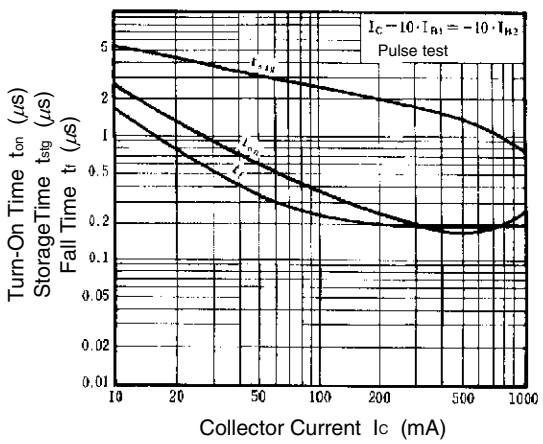
DC CURRENT GAIN vs. COLLECTOR CURRENT



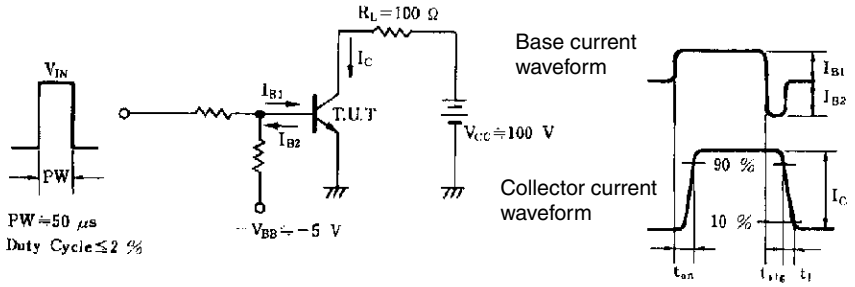
COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



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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