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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SILICON TRANSISTOR
2SC3840

NPN SILICON TRIPLE DIFFUSED TRANSISTOR
HIGH SPEED HIGH VOLTAGE SWITCHING

DESCRIPTION

The 2SC3840 is designed for use in high speed and high voltage switching.
It is suitable for switching regulators, DC-DC converters and ultrasonic appliance applications.

FEATURES

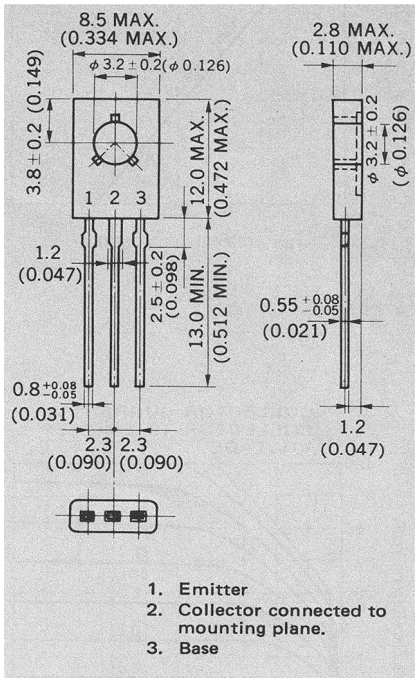
- High speed switching
- High voltage

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

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

Note PW ≤ 300 μs, Duty Cycle ≤ 10%

PACKAGE DRAWING (Unit: mm)



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ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
t_{on}	Turn-On Time		0.1	0.5	μs	I_C = 0.5 A, I_{B1} = −I_{B2} = 0.1 A R_L = 500 Ω, V_{CC} ≒ 250 V
t_{stg}	Storage Time		4.0	5.0	μs	
t_f	Fall Time		0.2	0.5	μs	
h_{FE1}**	DC Current Gain	30		120	—	V_{CE} = 5.0 V, I_C = 0.1 A
h_{FE2}**	DC Current Gain	5			—	V_{CE} = 5.0 V, I_C = 0.5 A
$V_{CE(sat)}$**	Collector Saturation Voltage			1.0	V	I_C = 0.4 A, I_B = 0.08 A
$V_{BE(sat)}$**	Base Saturation Voltage			1.2	V	I_C = 0.4 A, I_B = 0.08 A
I_{CBO}	Collector Cutoff Current			10	μA	V_{CB} = 600 V, I_E = 0
I_{EBO}	Emitter Cutoff Current			10	μA	V_{EB} = 7.0 V, I_C = 0

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

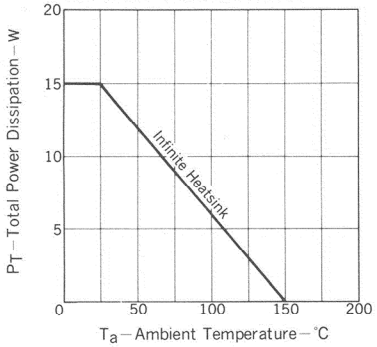
Classification of h_{FE1}

Rank	M	L	K
Range	30 to 60	40 to 80	60 to 120

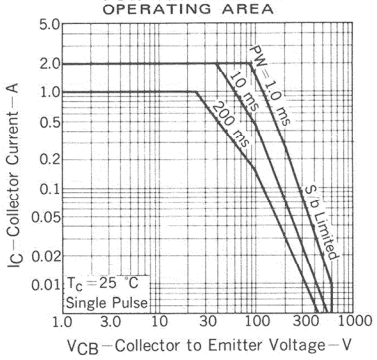
Test Conditions: V_{CE} = 5.0 V, I_C = 0.1 A

TYPICAL CHARACTERISTICS (T_a = 25 °C)

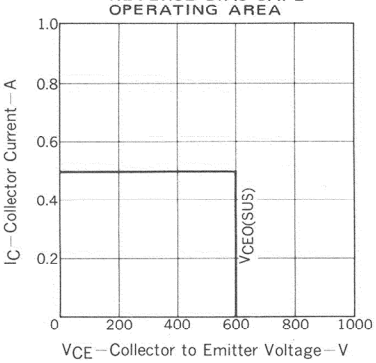
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



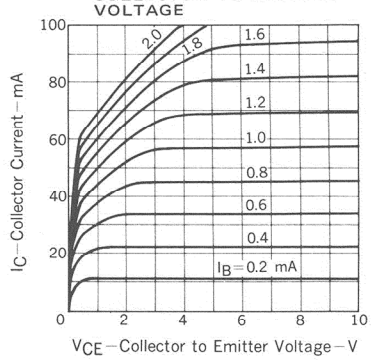
FORWARD BIAS SAFE OPERATING AREA



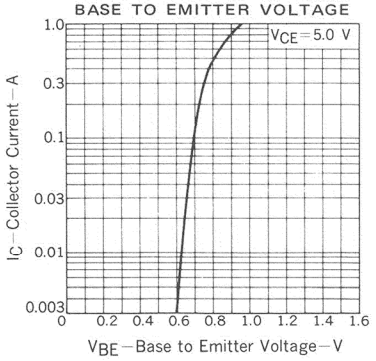
REVERSE BIAS SAFE OPERATING AREA



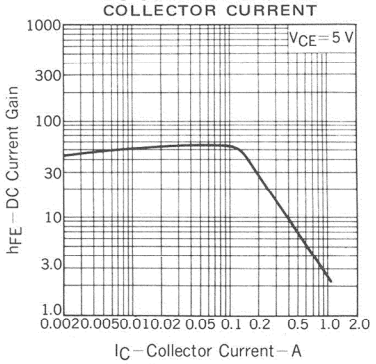
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



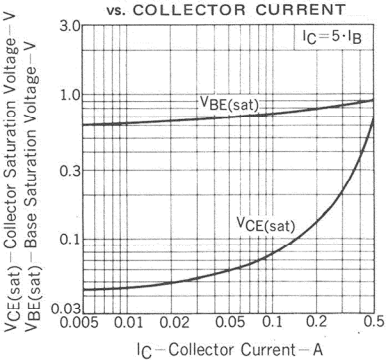
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



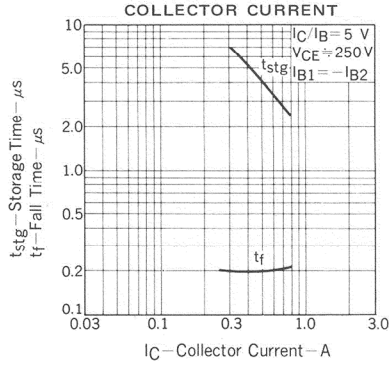
DC CURRENT GAIN vs. COLLECTOR CURRENT



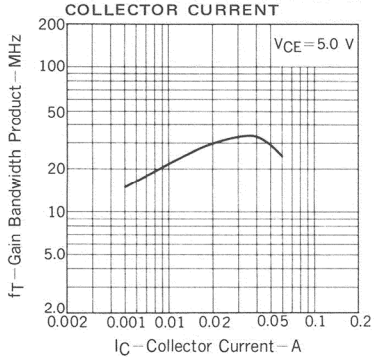
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



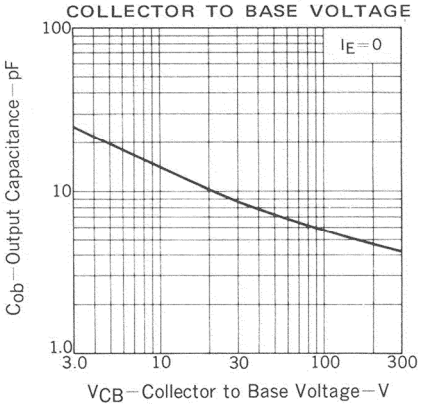
TURN OFF TIME vs. COLLECTOR CURRENT



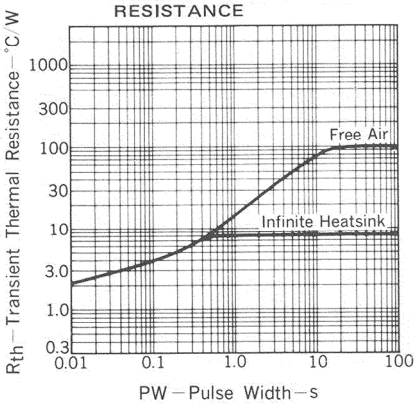
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



OUTPUT CAPACITANCE vs.
COLLECTOR TO BASE VOLTAGE



TRANSIENT THERMAL
RESISTANCE



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