

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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DATA SHEET



SILICON POWER TRANSISTOR 2SA1413-Z

PNP SILICON TRIPLE DIFFUSED TRANSISTOR

DESCRIPTION

The 2SA1413-Z is designed for High Voltage Switching, especially in Hybrid Integrated Circuits.

FEATURES

- High Voltage: $V_{CE0} = -600$ V
- High Speed: $t_f \leq 1.0$ μ s
- Complement to 2SC3632-Z

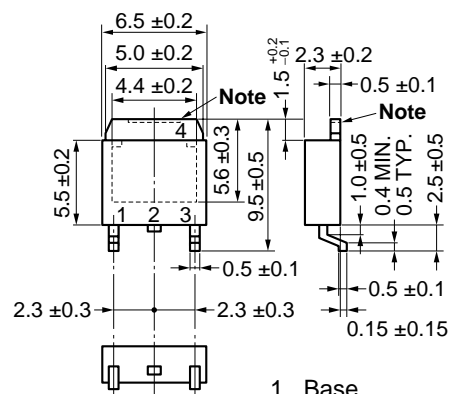
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Collector to base voltage	V_{CBO}	-600	V
Collector to emitter voltage	V_{CEO}	-600	V
Base to emitter voltage	V_{EBO}	-7	V
Collector current (DC)	$I_{C(DC)}$	-1.0	A
Collector current (pulse) ^{Note 1}	$I_{C(pulse)}$	-2.0	A
Total power dissipation ($T_A = 25^\circ\text{C}$) ^{Note 2}	P_T	2.0	W
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Notes 1. $PW \leq 10$ ms, Duty Cycle $\leq 50\%$

2. When mounted on ceramic substrate of $7.5\text{ cm}^2 \times 0.7\text{ mm}$

<R> PACKAGE DRAWING (Unit: mm)



TO-252 (MP-3Z)

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.

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ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

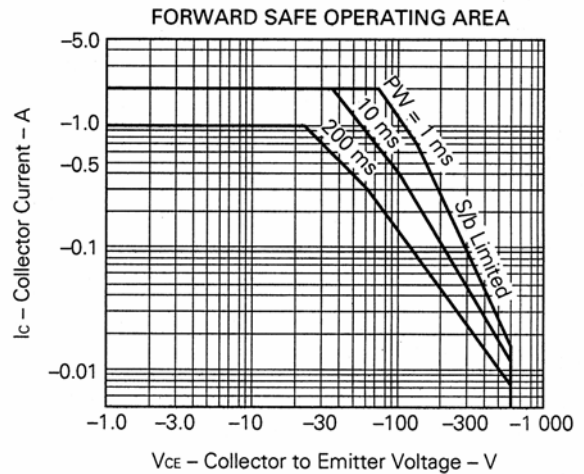
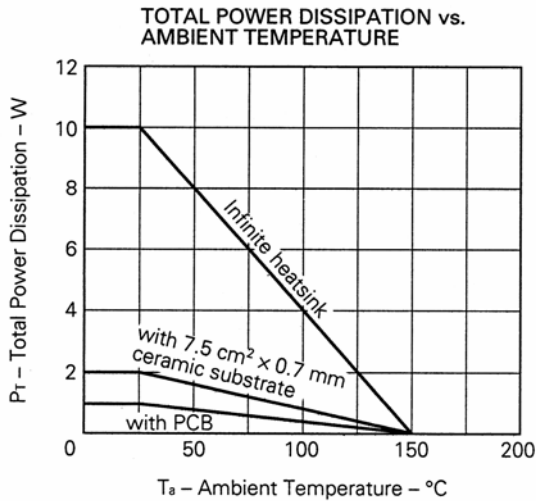
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I _{CBO}			-10	μA	V _{CB} = -600 V, I _E = 0
Emitter Cutoff Current	I _{EB0}			-10	μA	V _{EB} = -7.0 V, I _C = 0
DC Current Gain	h _{FE1} ***	30	58	120		V _{CE} = -5.0 V, I _C = -0.1 A
DC Current Gain	h _{FE2} ***	5	19			V _{CE} = -5.0 V, I _C = -0.5 A
Collector Saturation Voltage	V _{CE(sat)} ***		-0.28	-1.0	V	I _C = -0.3 A, I _B = -60 mA
Base Saturation Voltage	V _{BE(sat)} ***		-0.85	-1.2	V	I _C = -0.3 A, I _B = -60 mA
Gain Bandwidth Product	f _T		28		MHz	V _{CE} = -10 V, I _E = 50 mA
Output Capacitance	C _{ob}		42		pF	V _{CB} = -10 V, I _E = 0, f = 1.0 MHz
Turn-on Time	t _{on}		0.1	0.5	μs	I _C = -0.5 A, R _L = 500 Ω I _{B1} = -I _{B2} = -0.1 A V _{CC} = -250 V
Storage Time	t _{stg}		3.5	5.0	μs	
Fall time	t _f		0.08	0.5	μs	

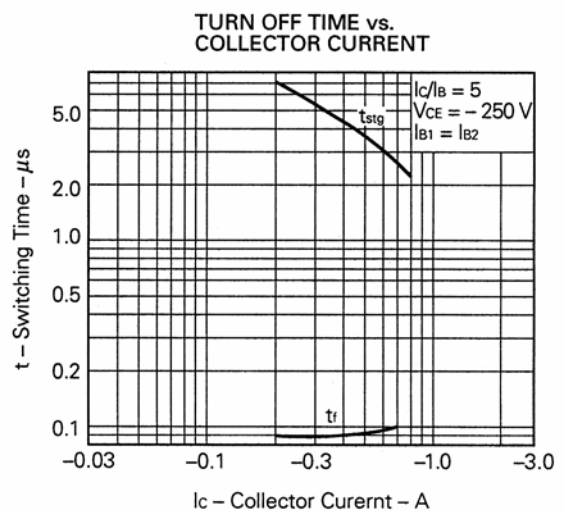
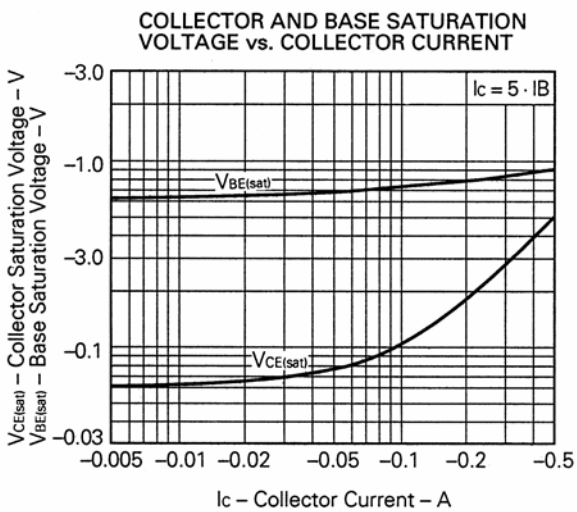
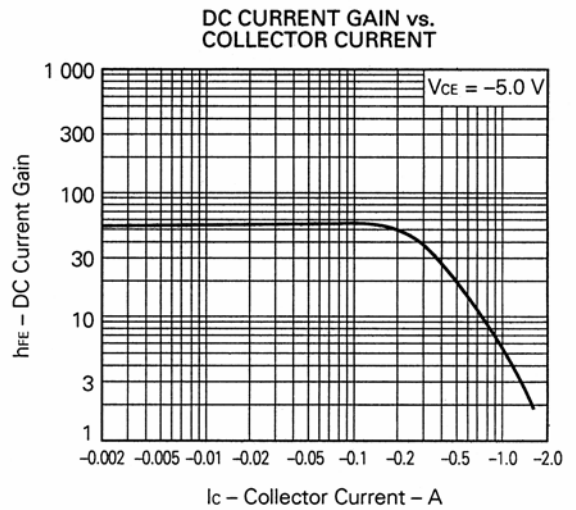
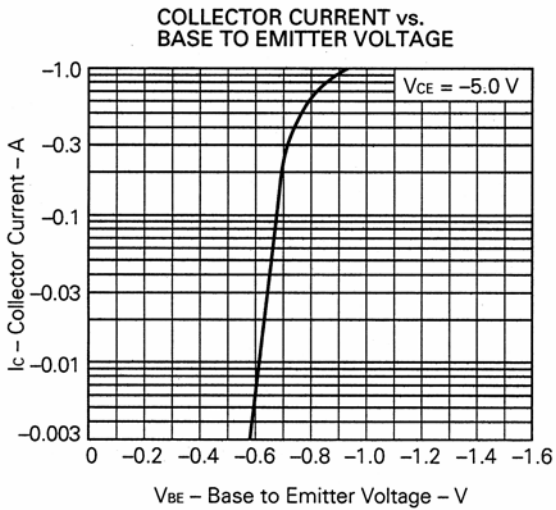
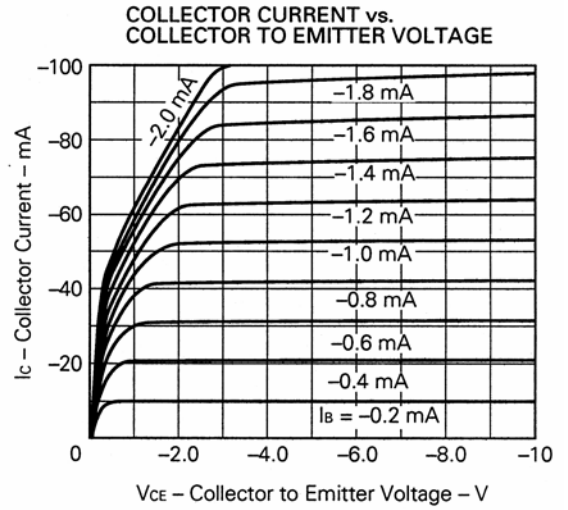
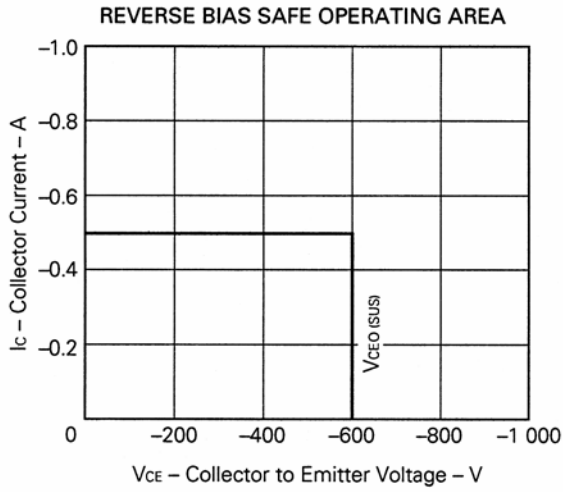
*** Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 2 %

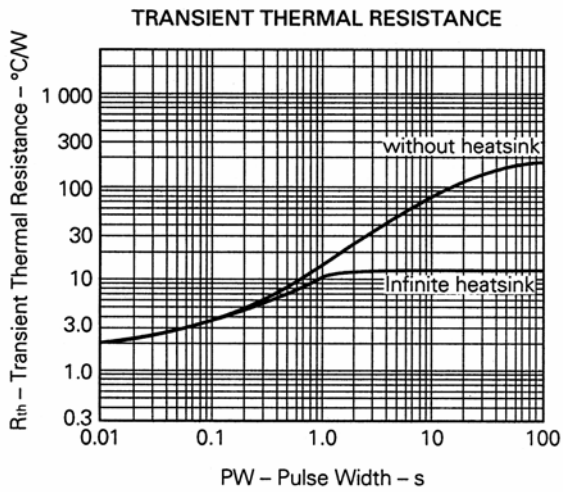
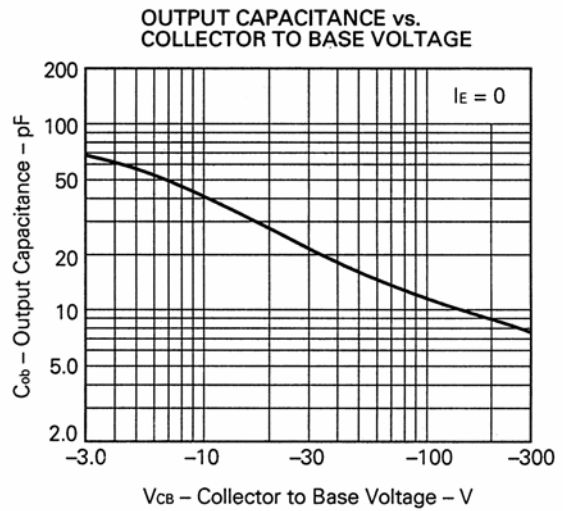
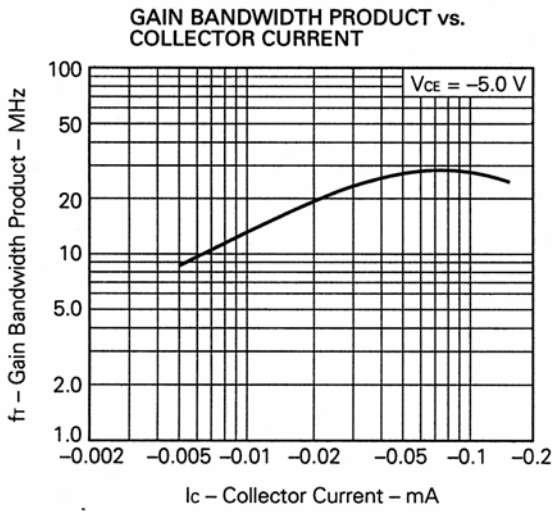
h_{FE} Classification

MARKING	M	L	K
h _{FE1}	30 to 60	40 to 80	60 to 120

TYPICAL CHARACTERISTICS (T_a = 25 °C)







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