

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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NPN SILICON EPITAXIAL TRANSISTOR

DESCRIPTION

The 2SC3518-Z is designed for Audio Frequency Amplifier and Switching, especially in Hybrid Integrated Circuits.

FEATURES

- High DC Current Gain  $h_{FE} = 100$  to 400
- Low  $V_{CE(sat)}$ :  $V_{CE(sat)} = 0.09$  V TYP.
- Complement to 2SA1385-Z

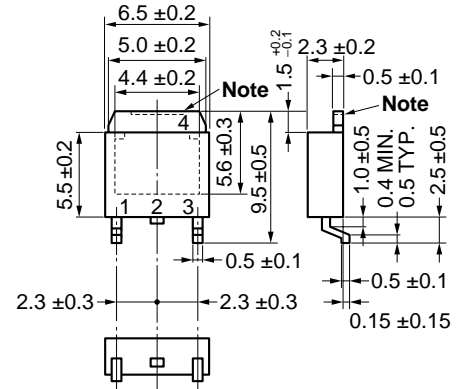
ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

Collector to Base Voltage	$V_{CBO}$	60	V
Collector to Emitter Voltage	$V_{CEO}$	60	V
Emitter to Base Voltage	$V_{EBO}$	7	V
Collector Current (DC)	$I_{C(DC)}$	5	A
Collector Current (pulse) <sup>Note 1</sup>	$I_{C(pulse)}$	7	A
Total Power Dissipation ( $T_A = 25^\circ\text{C}$ ) <sup>Note 2</sup>	$P_T$	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  $7.5\text{ cm}^2 \times 0.7$  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<sub>a</sub> = 25 °C)**

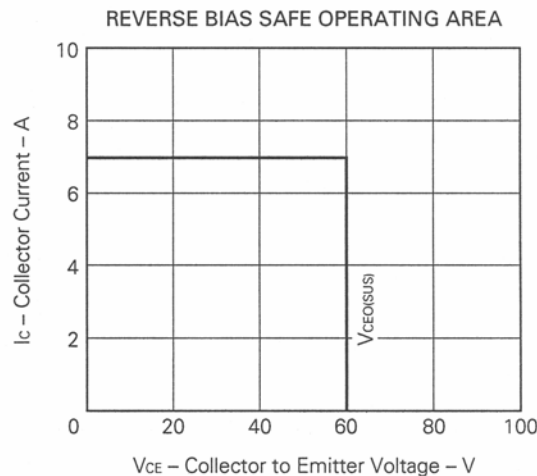
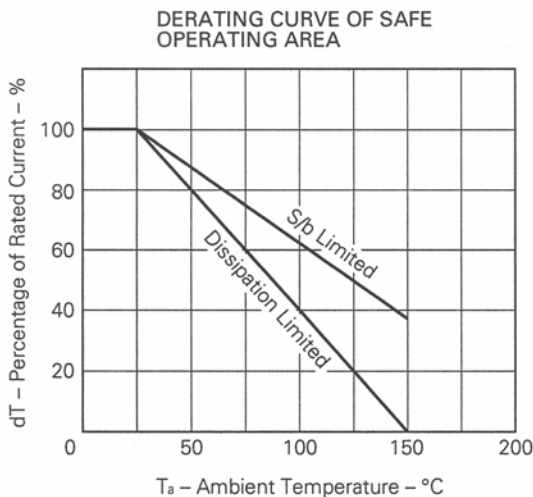
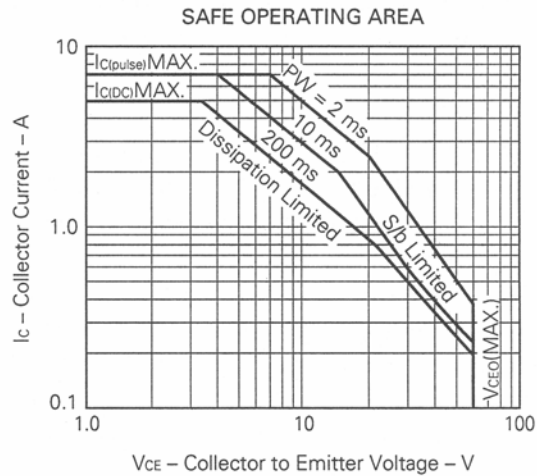
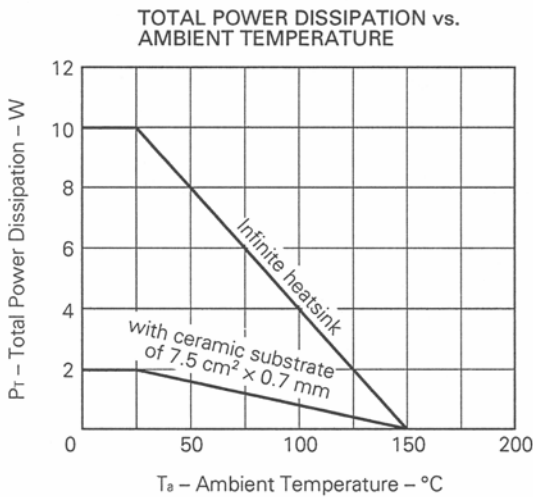
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I <sub>CBO</sub>			10	μA	V <sub>CB</sub> = 50 V, I <sub>E</sub> = 0
Emitter Cutoff Current	I <sub>EB0</sub>			10	μA	V <sub>EB</sub> = 7.0 V, I <sub>C</sub> = 0
DC Current Gain	h <sub>FE1</sub> *	100		400		V <sub>CE</sub> = 1.0 V, I <sub>C</sub> = 2.0 A
DC Current Gain	h <sub>FE2</sub> *	50				V <sub>CE</sub> = 1.0 V, I <sub>C</sub> = 5.0 A
Collector Saturation Voltage	V <sub>CE(sat)</sub> *			0.3	V	I <sub>C</sub> = 2.0 A, I <sub>B</sub> = 0.2 A
Base Saturation Voltage	V <sub>BE(sat)</sub> *			1.2	V	I <sub>C</sub> = 2.0 A, I <sub>B</sub> = 0.2 A
Gain Bandwidth Product	f <sub>T</sub> *		120		MHz	V <sub>CE</sub> = 10 V, I <sub>E</sub> = 500 mA
Turn-on Time	t <sub>on</sub>		0.07	1.0	μs	I <sub>C</sub> = 2.0 A, V <sub>CC</sub> = 10 V
Storage Time	t <sub>stg</sub>		0.8	2.5	μs	R <sub>L</sub> = 5.0 Ω
Fall Time	t <sub>f</sub>		0.12	1.0	μs	I <sub>B1</sub> = -I <sub>B2</sub> = 0.2 A

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

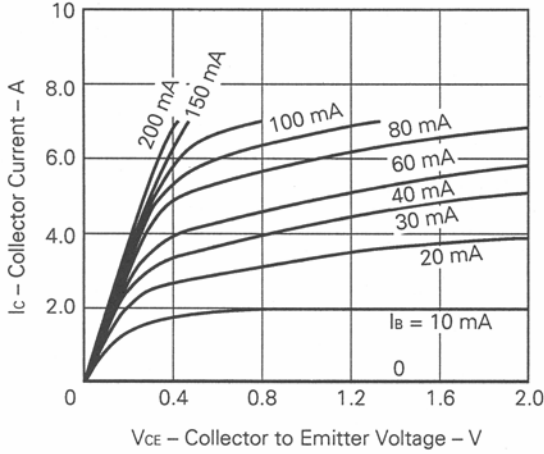
**h<sub>FE</sub> Classification**

MARKING	M	L	K
h <sub>FE1</sub>	100 to 200	160 to 320	200 to 400

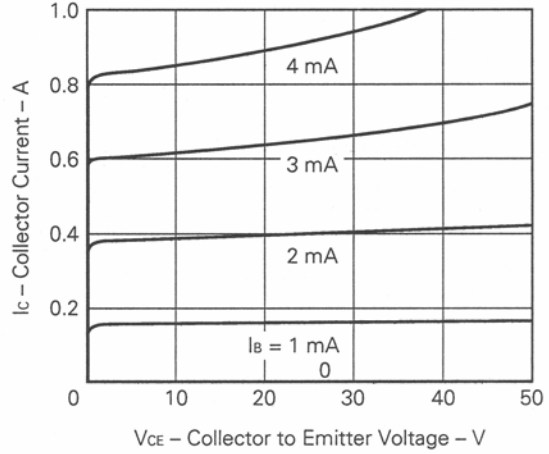
**TYPICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**



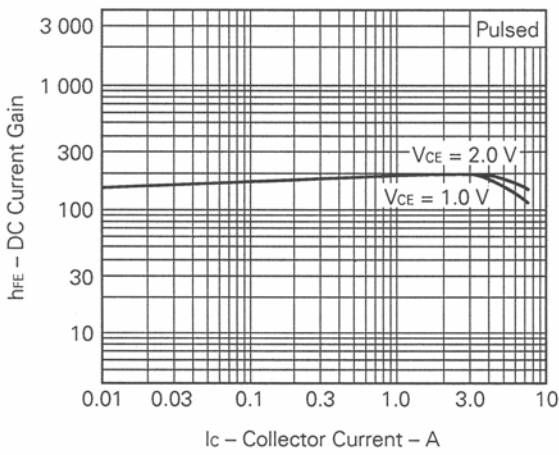
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



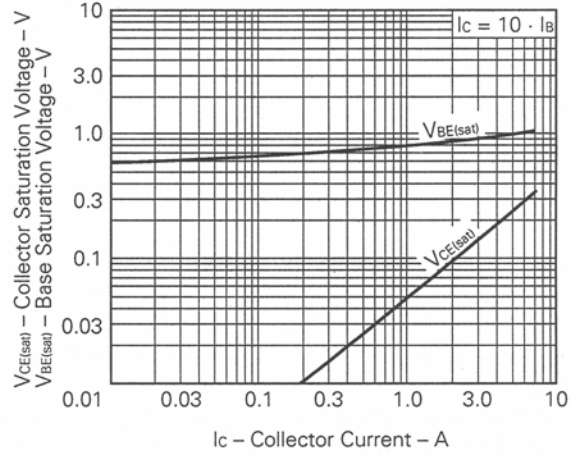
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



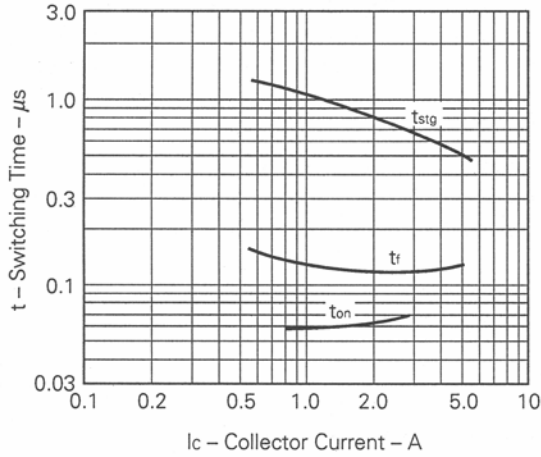
DC CURRENT GAIN vs. COLLECTOR CURRENT



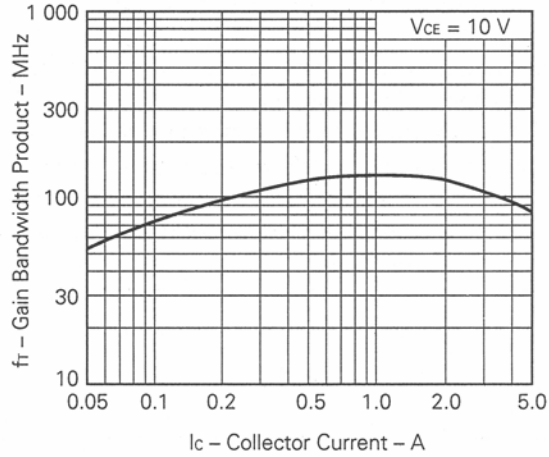
COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



SWITCHING TIME vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



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