

PNP SILICON TRIPLE DIFFUSED TRANSISTOR
MP-3

DESCRIPTION

2SA1412-Z is designed for High Voltage Switching, especially in Hybrid Integrated Circuits.

FEATURES

- High Voltage : $V_{CE0} = -400$ V
- High Speed : $t_r \leq 0.7 \mu s$
- Complement to 2SC3631-Z

QUALITY GRADE

Standard

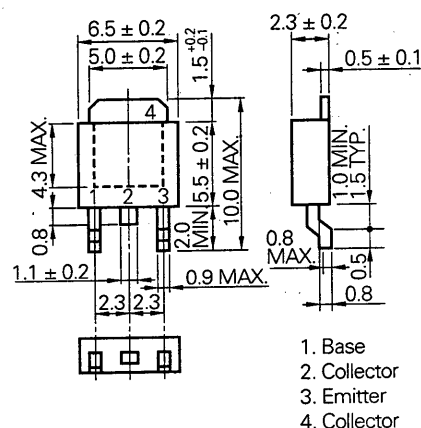
Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

ABSOLUTE MAXIMUM RATINGS ($T_a = 25$ °C)

Collector to Base Voltage	V_{CBO}	-400	V
Collector to Emitter Voltage	V_{CEO}	-400	V
Emitter to Base Voltage	V_{EBO}	-7	V
Collector Current (DC)	I_c	-2.0	A
Collector Current (Pulse)*	I_c	-4.0	A
Total Power Dissipation ($T_a = 25$ °C)**	P_T	2.0	W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	-55 to +150	°C

* $PW \leq 10$ ms, Duty Cycle ≤ 50 %

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

PACKAGE DIMENSIONS
(in millimeters)

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

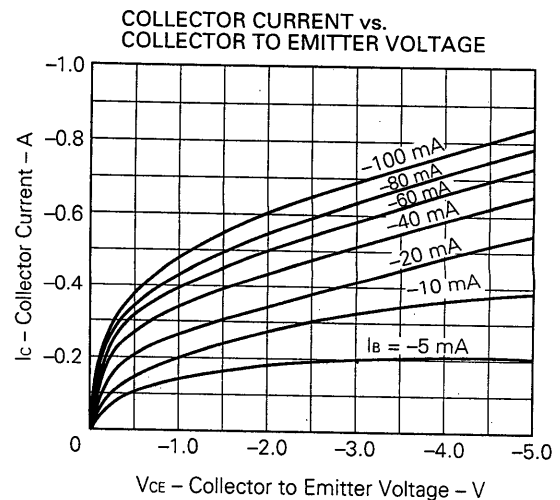
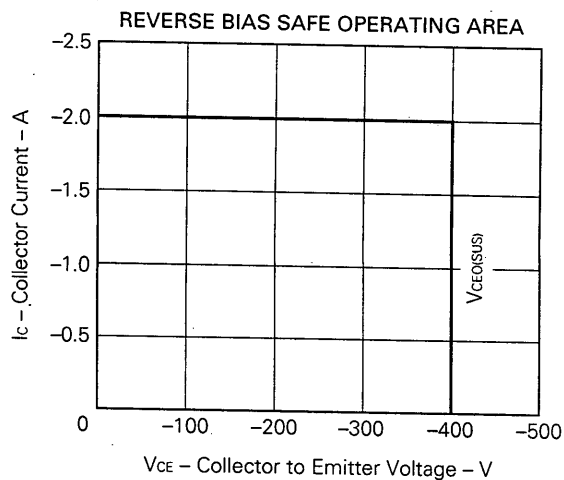
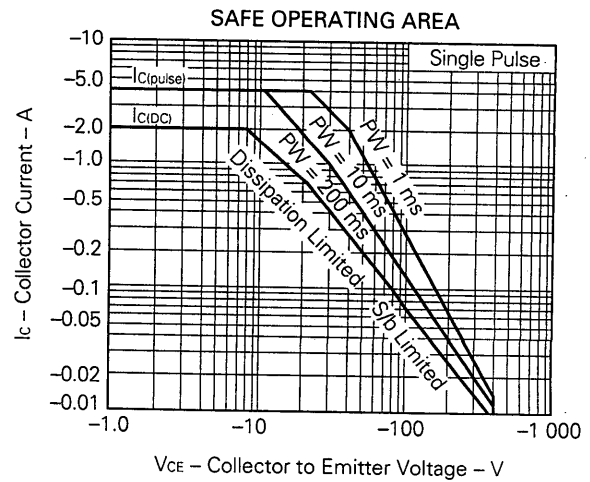
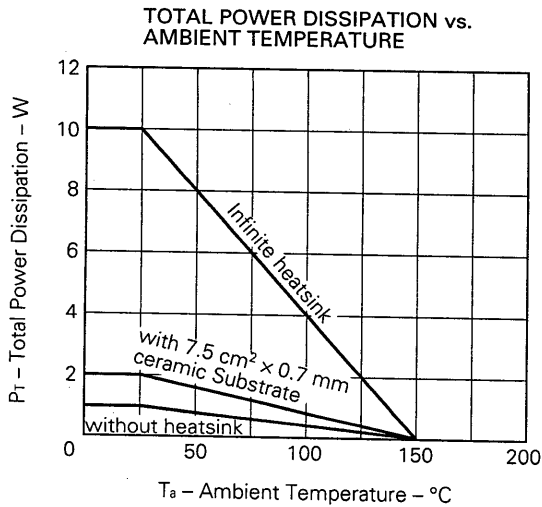
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I _{cBO}			-10	μA	V _{CB} = -400 V, I _E = 0
Emitter Cutoff Current	I _{EBO}			-10	μA	V _{EB} = -5.0 V, I _C = 0
DC Current Gain	h _{FE1} *	40	60	120		V _{CE} = -5.0 V, I _C = -0.1 A
DC Current Gain	h _{FE2} *	10	22			V _{CE} = -5.0 V, I _C = -1.0 A
Collector Saturation Voltage	V _{CE(sat)} *		-0.25	-0.5	V	I _C = -0.5 A, I _B = -0.1 A
Base Saturation Voltage	V _{BE(sat)} *		-0.85	-1.2	V	I _C = -0.5 A, I _B = -0.1 A
Gain Bandwidth Product	f _T		40		MHz	V _{CE} = -10 V, I _E = -100 mA
Output Capacitance	C _{ob}		30		pF	V _{CB} = -10 V, I _E = 0, f = 1.0 MHz
Turn-on Time	t _{on}		0.03	0.5	μs	I _C = -1.0 A, R _L = 150 Ω I _{B1} = -I _{B2} = -0.2 A, V _{CC} = -150 V
Storage Time	t _{stg}		1.4	2.0	μs	
Fall time	t _r		0.1	0.7	μs	

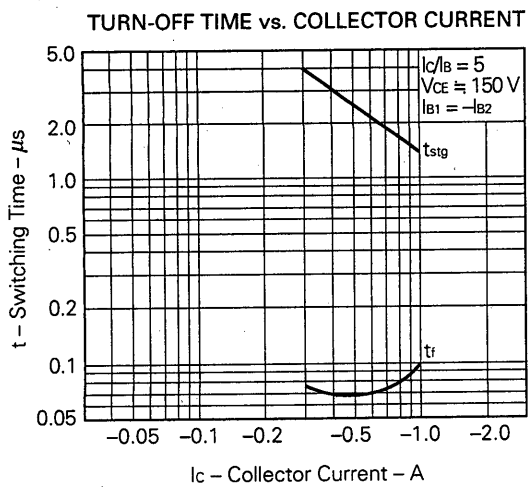
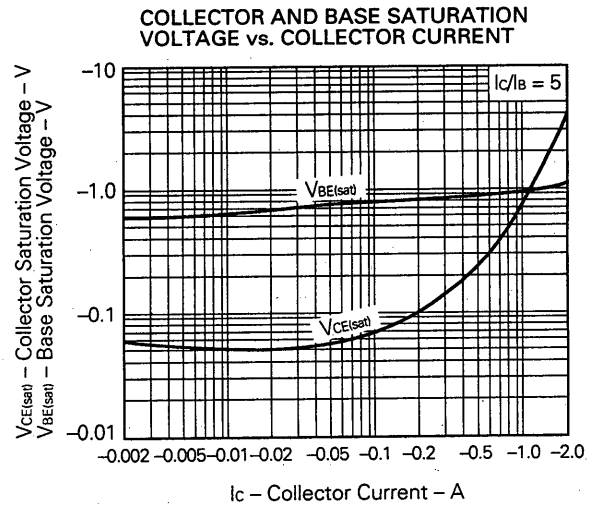
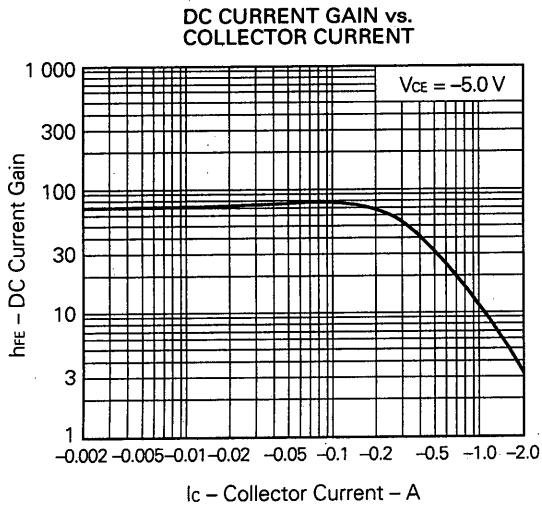
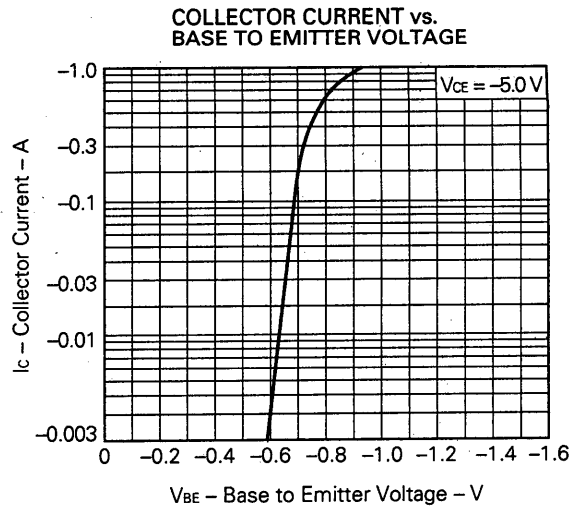
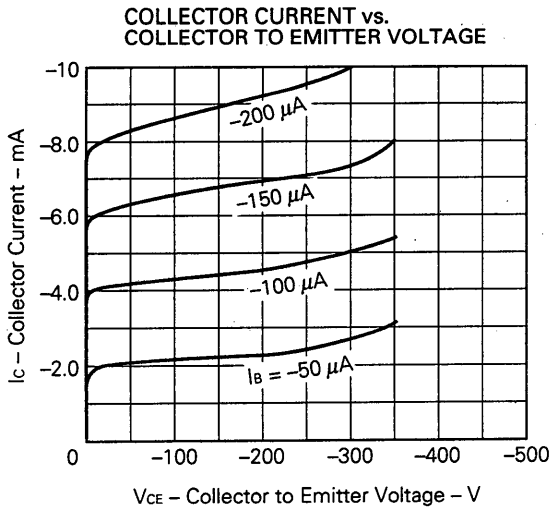
* Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 2 %

h_{FE} Classification

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

TYPICAL CHARACTERISTICS (T_a = 25 °C)





Reference

Application note name	No.
Quality control of NEC semiconductors devices.	TEI-1202
Quality control guide of semiconductors devices.	MEI-1202
Assembly manual of semiconductors devices.	IEI-1207
Design of Push-Pull Type Switching Regulators (Basic).	TEB-1002
Design of Push-Pull Type Switching Regulators (Applications).	TEB-1003
Optimum Base Drive Conditions of Switching Power Transistors.	TEB-1014

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Application examples recommended by NEC Corporation.

Standard: Computer, Office equipment, Communication equipment, Test and Measurement equipment, Machine tools, Industrial robots, Audio and Visual equipment, Other consumer products, etc.

Special: Automotive and Transportation equipment, Traffic control systems, Antidisaster systems, Anticrime systems, etc.