

PNP SILICON EPITAXIAL TRANSISTOR FOR HIGH-SPEED SWITCHING

DESCRIPTION

The 2SA1615 and 1615-Z are available for the large current control in small dimension due to the low saturation and are ideal for high-efficiency DC/DC converters due to the fast switching speed.

FEATURES

- Large current capacity:
 $I_{C(DC)} = -10\text{ A}$, $I_{C(pulse)} = -15\text{ A}$
- High h_{FE} and low collector saturation voltage:
 $h_{FE} = 200\text{ MIN.}$ ($V_{CE} = -2.0\text{ V}$, $I_C = -0.5\text{ A}$)
 $V_{CE(sat)} \leq -0.25\text{ V}$ ($I_C = -4.0\text{ A}$, $I_B = -0.05\text{ A}$)

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

Collector to base voltage	V_{CBO}	-30	V
Collector to emitter voltage	V_{CEO}	-20	V
Emitter to base voltage	V_{EBO}	-10	V
Collector current (DC)	$I_{C(DC)}$	-10	A
Collector current (pulse) ^{Note 1}	$I_{C(pulse)}$	-15	A
Base current (DC)	$I_{B(DC)}$	-0.5	A
Total power dissipation ^{Note 2}	P_T ($T_A = 25^\circ\text{C}$)	1.0	W
Total power dissipation	P_T ($T_C = 25^\circ\text{C}$)	15	W
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Notes 1. $PW \leq 10\text{ ms}$, duty cycle $\leq 50\%$

2. Printing board mounted

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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

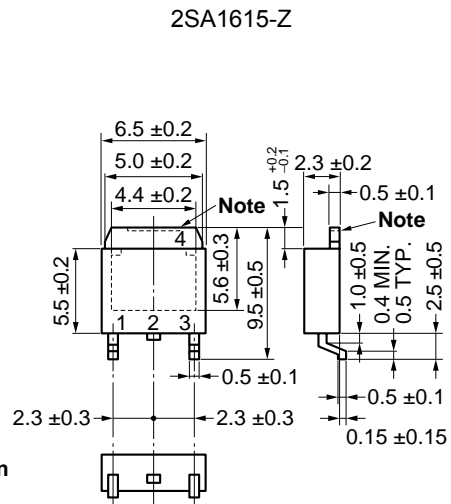
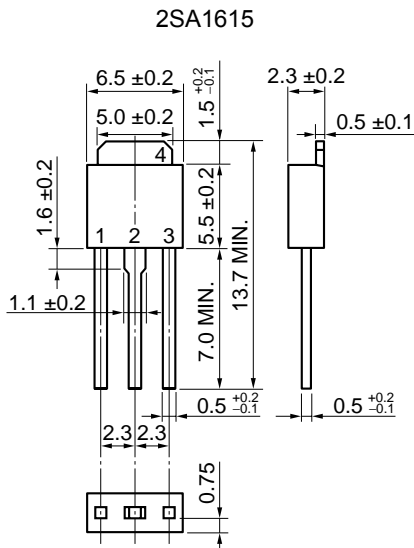
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I _{CBO}	V _{CB} = -20 V, I _E = 0			-1.0	μA
Emitter cutoff current	I _{EBO}	V _{EB} = -8.0 V, I _C = 0			-1.0	μA
DC current gain ^{Note}	h _{FE1}	V _{CE} = -2.0 V, I _C = -0.5 A	200		600	
DC current gain ^{Note}	h _{FE2}	V _{CE} = -2.0 V, I _C = -4.0 A	160			
Collector saturation voltage ^{Note}	V _{CE(sat)}	I _C = -4.0 A, I _B = -0.05 A		-0.2	-0.25	V
Base saturation voltage ^{Note}	V _{BE(sat)}	I _C = -4.0 A, I _B = -0.05 A		-0.9	-1.2	V
Gain bandwidth product	f _r	V _{CE} = -5.0 V, I _E = 1.5 A		180		MHz
Output capacity	C _{ob}	V _{CB} = -10 V, I _E = 0, f = 1.0 MHz		220		pF
Turn-on time	t _{on}	I _C = -5.0 A, I _{B1} = -I _{B2} = 0.125 A, R _L = 2.0 Ω, V _{CC} ≅ -10 V		80		ns
Storage time	t _{stg}			300		ns
Fall time	t _f			60		ns

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

h_{FE} CLASSIFICATION

Marking	L	K
h _{FE2}	200 to 400	300 to 600

<R> **PACKAGE DRAWINGS (UNIT: mm)**

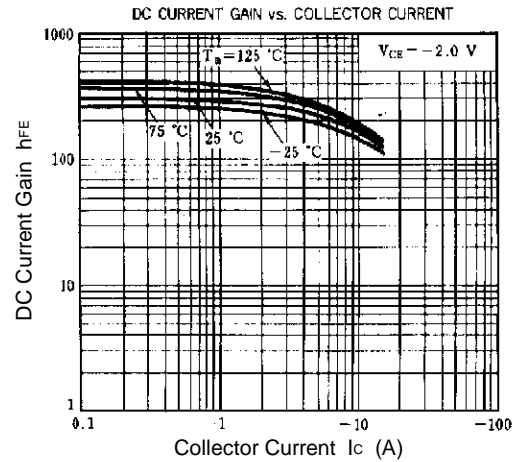
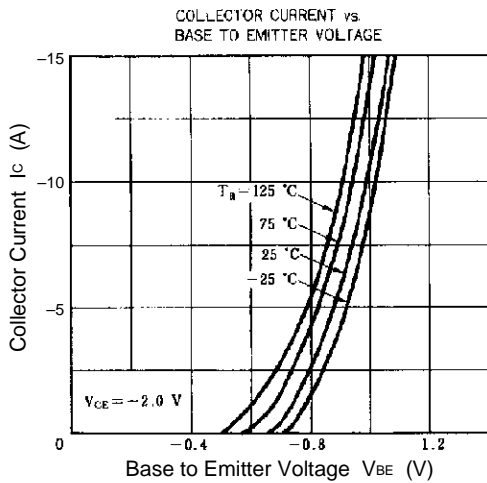
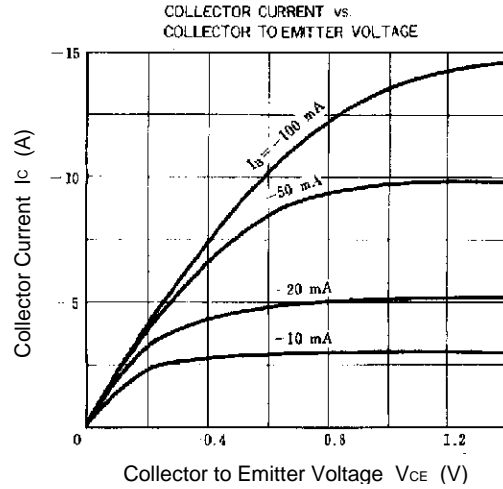
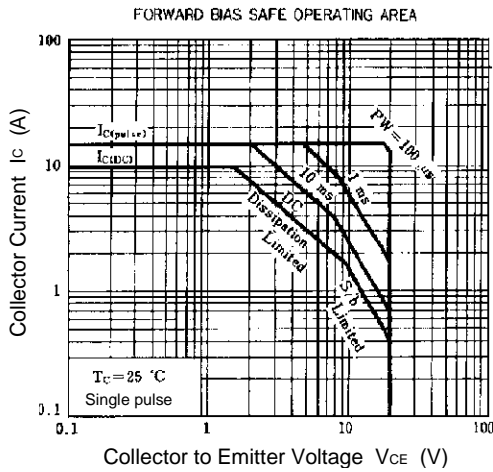
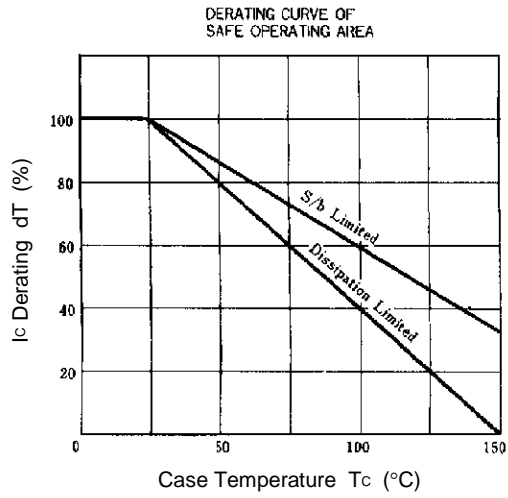
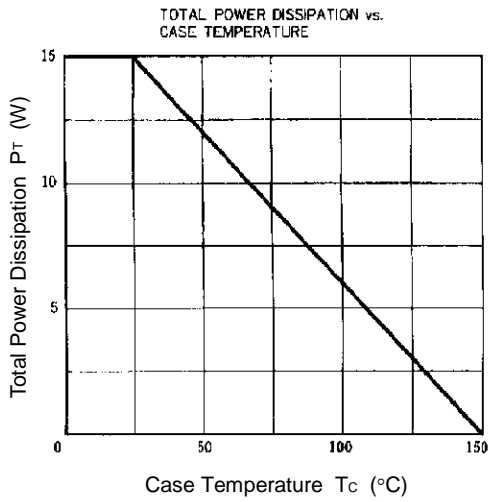


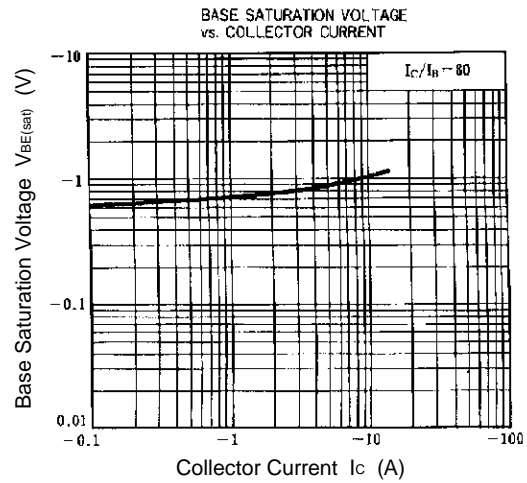
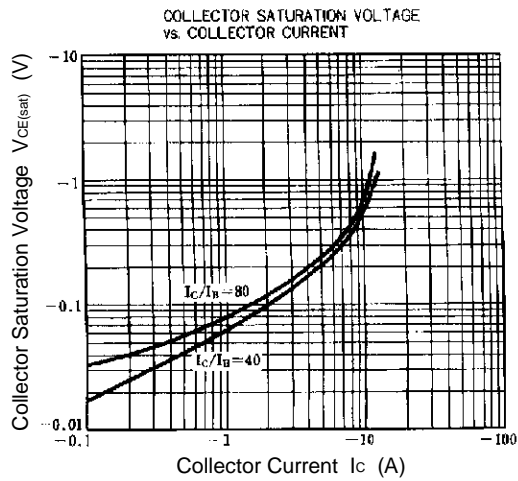
Electrode Connection

- 1. Base
- 2. Collector
- 3. Emitter
- 4. Collector (fin)

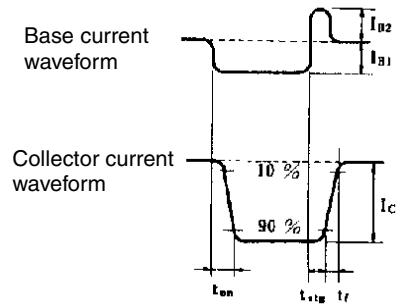
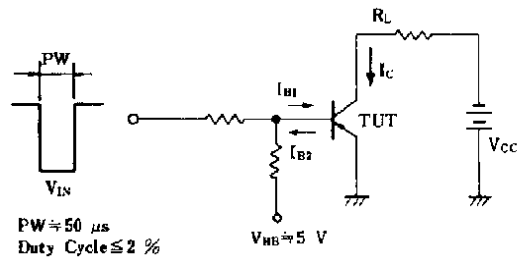
Note The depth of notch at the top of the fin is from 0 to 0.2 mm.

TYPICAL CHARACTERISTICS (T_A = 25°C)





SWITCHING TIME (t_{on} , t_{stg} , t_f) TEST CIRCUIT



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