

SILICON POWER TRANSISTORS 2SA1615, 1615-Z

PNP SILICON EPITAXIAL TRANSISTOR FOR HIGH-SPEED SWITCHING

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

QUALITY GRADES

- Standard
 Please refer to "Quality Grades on NEC Semiconductor Devices" (Document No. C11531E) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

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

Parameter	Symbol	Ratings	Unit
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)	$I_{C(pulse)}^*$	-15	A
Base current (DC)	$I_{B(DC)}$	-0.5	A
Total power dissipation	$P_T (T_a = 25^\circ\text{C})^{**}$	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	$^\circ\text{C}$

* $PW \leq 10$ ms, duty cycle $\leq 50\%$

** Printing board mounted

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

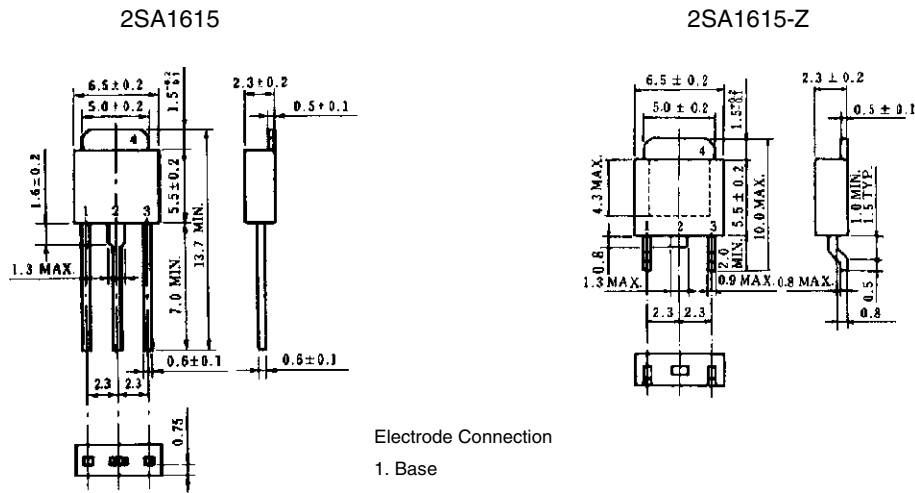
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = -20\text{ V}, I_E = 0$			-1.0	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = -8.0\text{ V}, I_C = 0$			-1.0	μA
DC current gain	h_{FE1}^*	$V_{CE} = -2.0\text{ V}, I_C = -0.5\text{ A}$	200		600	
DC current gain	h_{FE2}^*	$V_{CE} = -2.0\text{ V}, I_C = -4.0\text{ A}$	160			
Collector saturation voltage	$V_{CE(sat)}^*$	$I_C = -4.0\text{ A}, I_B = -0.05\text{ A}$		-0.2	-0.25	V
Base saturation voltage	$V_{BE(sat)}^*$	$I_C = -4.0\text{ A}, I_B = -0.05\text{ A}$		-0.9	-1.2	V
Gain bandwidth product	f_T	$V_{CE} = -5.0\text{ V}, I_E = 1.5\text{ A}$		180		MHz
Output capacity	C_{ob}	$V_{CB} = -10\text{ V}, I_E = 0, f = 1.0\text{ MHz}$		220		pF
Turn-on time	t_{on}	$I_C = -5.0\text{ A}, I_{B1} = -I_{B2} = 0.125\text{ A}, R_L = 2.0\ \Omega, V_{CC} = -10\text{ V}$		80		ns
Storage time	t_{stg}			300		ns
Fall time	t_f			60		ns

* Pulse test $PW \leq 350\ \mu\text{s}$, duty cycle $\leq 2\%$

h_{FE} CLASSIFICATION

Marking	L	K
h_{FE2}	200 to 400	300 to 600

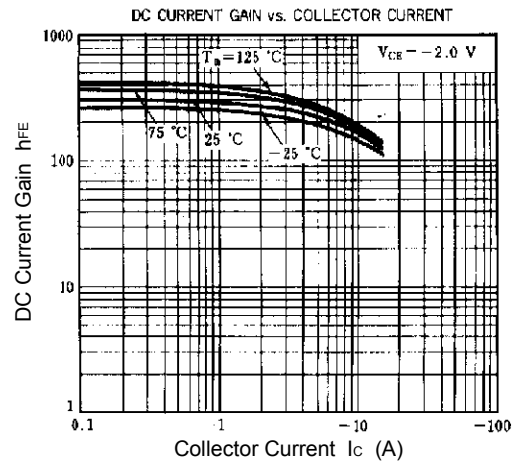
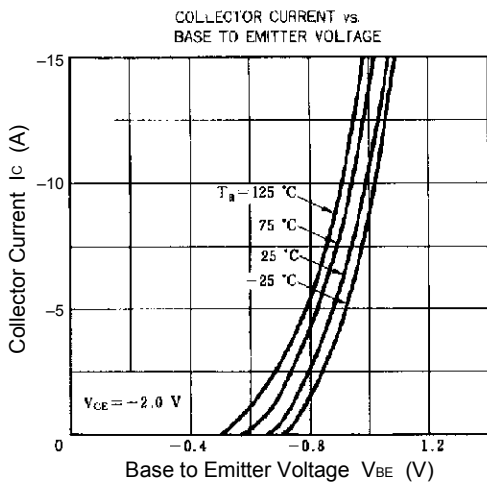
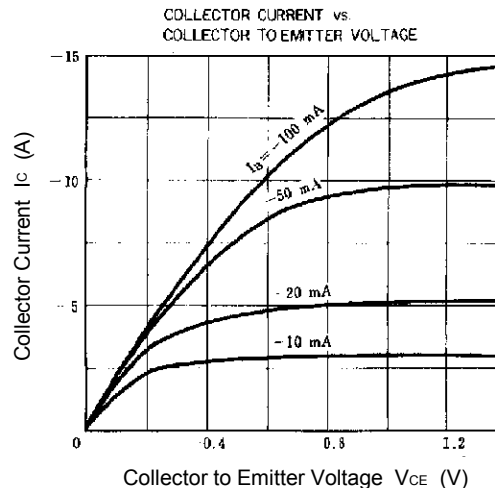
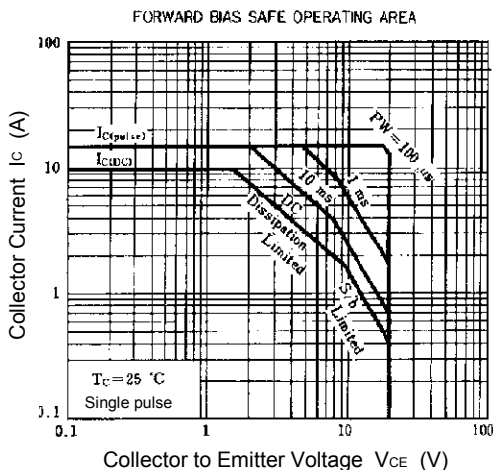
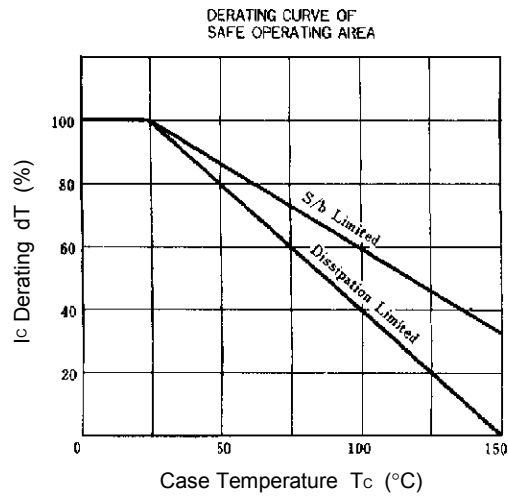
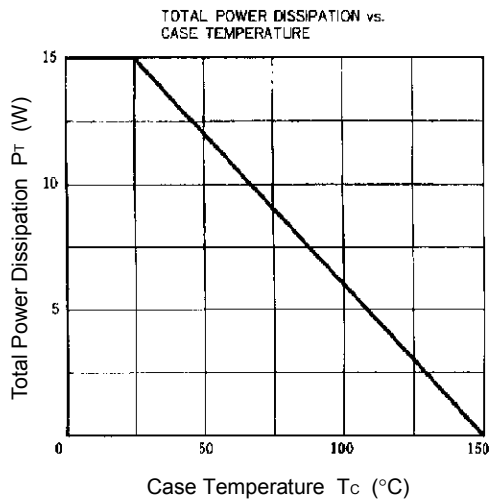
PACKAGE DRAWING (UNIT: mm)

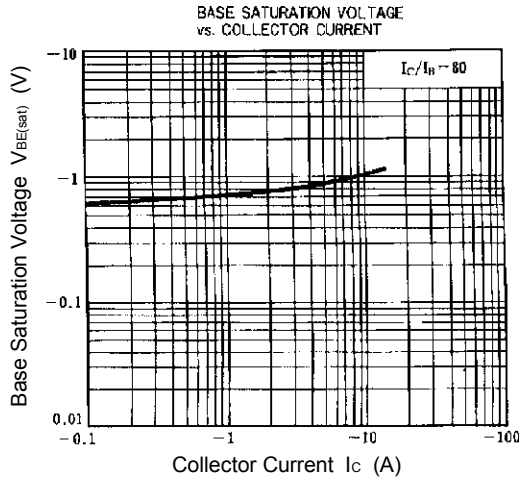
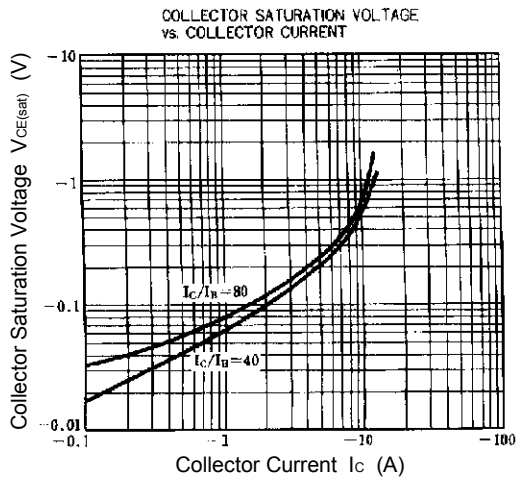


Electrode Connection

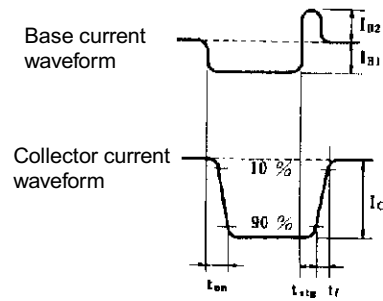
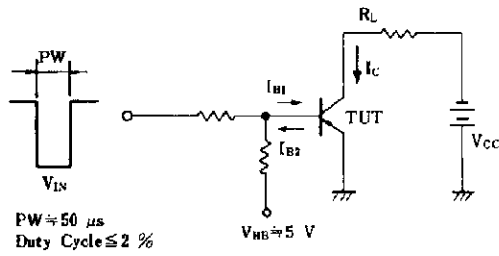
- 1. Base
- 2. Collector
- 3. Emitter
- 4. Collector (fin)

TYPICAL CHARACTERISTICS (Ta = 25 °C)





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



[MEMO]

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