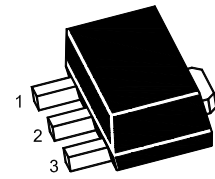


## NPN SILICON EPITAXIAL MEDIUM POWER TRANSISTOR



1.Base  
2.Collector  
3.Emitter

SOT-89

### Absolute Maximum Ratings ( $T_a = 25\text{ }^\circ\text{C}$ )

Parameter	Symbol	Value	Unit
Collector Base Voltage	$V_{CBO}$	40	V
Collector Emitter Voltage	$V_{CEO}$	32	V
Emitter Base Voltage	$V_{EBO}$	5	V
Collector Current - DC	$I_C$	1	A
Collector Current - Pulse <sup>1)</sup>	$I_{CP}$	2	A
Total Power Dissipation	$P_{tot}$	0.5 2 <sup>2)</sup>	W
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{Stg}$	- 55 to + 150	$^\circ\text{C}$

<sup>1)</sup> Single pulse, PW = 100 ms.

<sup>2)</sup> When mounted on a 40 X 40 X 0.7 mm ceramic board.

### Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit	
DC Current Gain at $V_{CE} = 3\text{ V}$ , $I_C = 100\text{ mA}$ Current Gain Group	P	$h_{FE}$	82	-	180	-
	Q	$h_{FE}$	120	-	270	-
	R	$h_{FE}$	180	-	390	-
Collector Base Breakdown Voltage at $I_C = 50\text{ }\mu\text{A}$	$V_{(BR)CBO}$	40	-	-	V	
Collector Emitter Breakdown Voltage at $I_C = 1\text{ mA}$	$V_{(BR)CEO}$	32	-	-	V	
Emitter Base Breakdown Voltage at $I_E = 50\text{ }\mu\text{A}$	$V_{(BR)EBO}$	5	-	-	V	
Collector Cutoff Current at $V_{CB} = 20\text{ V}$	$I_{CBO}$	-	-	0.5	$\mu\text{A}$	
Emitter Cutoff Current at $V_{EB} = 4\text{ V}$	$I_{EBO}$	-	-	0.5	$\mu\text{A}$	
Collector Emitter Saturation Voltage at $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$	$V_{CE(sat)}$	-	-	0.4	V	
Transition Frequency at $-I_E = 50\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $f = 100\text{ MHz}$	$f_T$	-	150	-	MHz	
Output Capacitance at $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$	$C_{ob}$	-	15	-	pF	

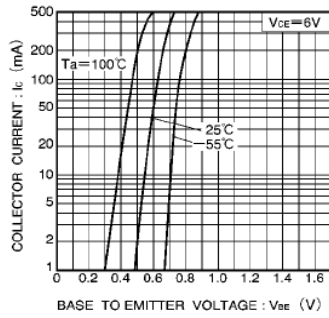


Fig.1 Grounded emitter propagation characteristics

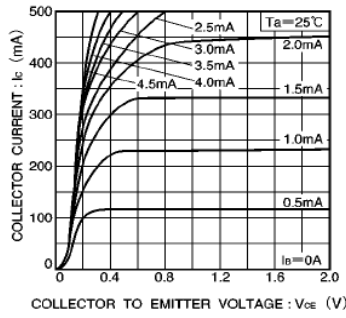


Fig.2 Grounded emitter output characteristics

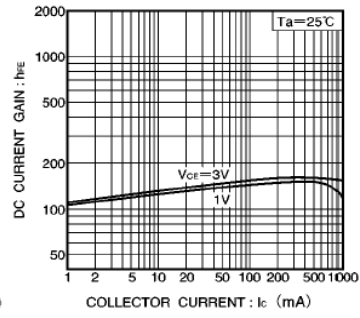


Fig.3 DC current gain vs. collector current ( I )

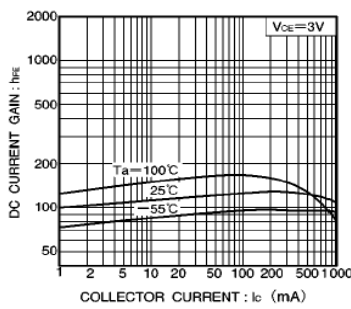


Fig.4 DC current gain vs. collector current ( II )

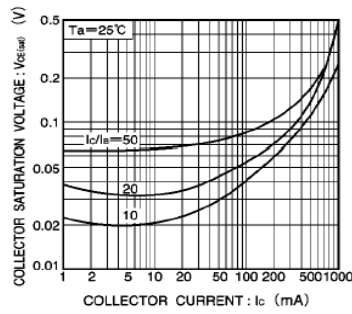


Fig.5 Collector-emitter saturation voltage vs. collector current ( I )

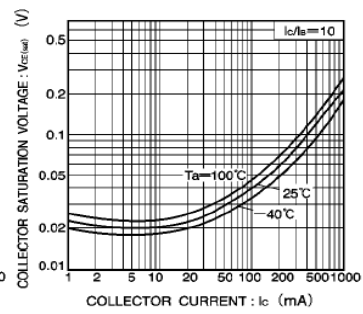


Fig.6 Collector-emitter saturation voltage vs. collector current ( II )

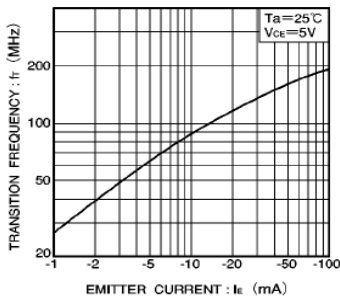


Fig.7 Gain bandwidth product vs. emitter current

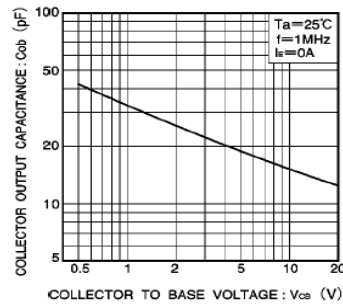


Fig.8 Collector output capacitance vs. collector-base voltage

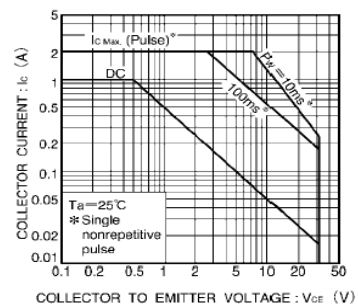


Fig.9 Safe operating area (2SD1664)

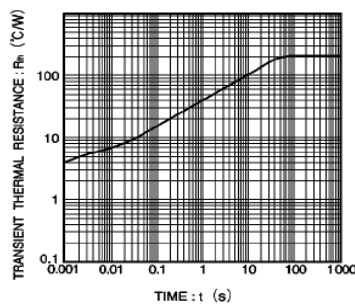
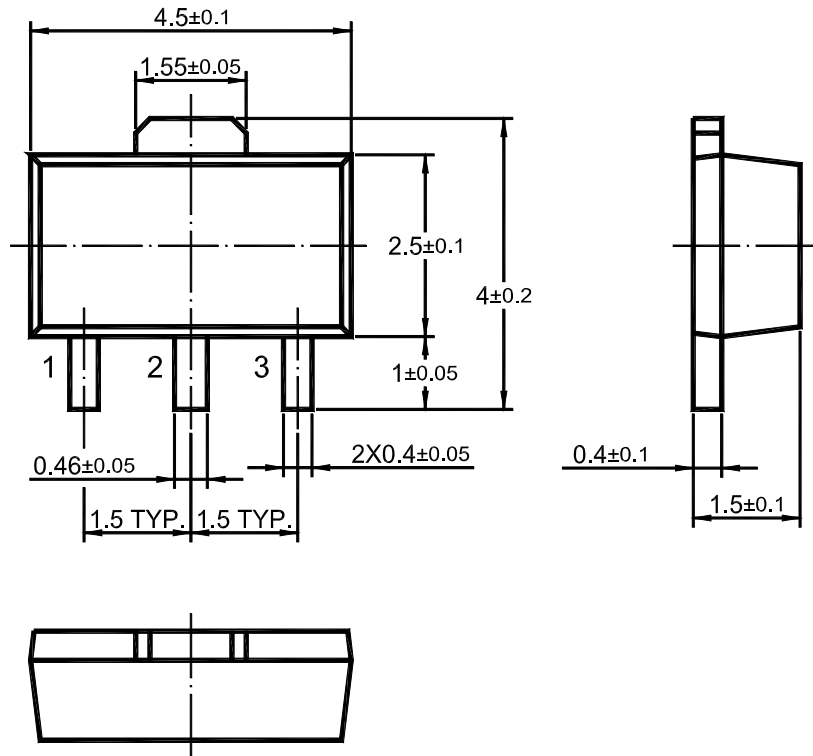


Fig.10 Transient thermal resistance (2SD1664)

SOT-89 PACKAGE OUTLINE



Dimensions in mm