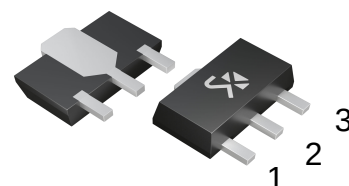


NPN Silicon Epitaxial Planar Transistor

SOT-89



1base 2collector 3emitter

MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	40	V
V_{CEO}	Collector-Emitter Voltage	32	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current - DC	1.0	A
I_{CP}	Collector Current - Pulse ¹⁾	2.0	A
P_{tot}	Total Power Dissipation	0.5 2 ²⁾	W
T_j	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55-150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_{amb}=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=50\mu\text{A}$, $I_E=0$	40			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1\text{mA}$, $I_B=0$	32			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=50\mu\text{A}$, $I_C=0$	5			V
Collector cut-off current	I_{CBO}	$V_{CB}=20\text{V}$, $I_E=0$			0.5	μA
Collector cut-off current	I_{EBO}	$V_{EB}=4\text{V}$, $I_C=0$			0.5	μA
DC current gain	h_{FE}	$V_{CE}=3\text{V}$, $I_C=100\text{mA}$ P	82		180	
		$V_{CE}=3\text{V}$, $I_C=100\text{mA}$ Q	120		270	
		$V_{CE}=3\text{V}$, $I_C=100\text{mA}$ R	180		390	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=500\text{mA}$, $I_B=50\text{mA}$			0.5	V
Transition frequency	f_T	$V_{CE}=5\text{V}$, $I_E=-50\text{mA}$, $f=30\text{MHz}$		150		MHz
output capacitance	C_{Ob}	$V_{CE}=10\text{V}$, $I_E=0\text{mA}$, $f=1.0\text{MHz}$		15		pF

Typical Characteristics

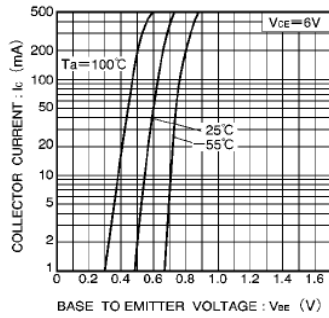


Fig.1 Grounded emitter propagation characteristics

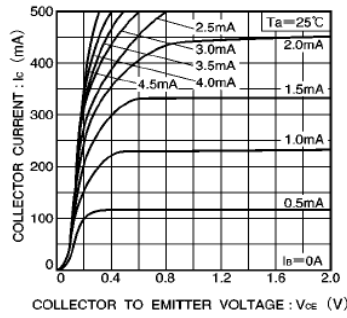


Fig.2 Grounded emitter output characteristics

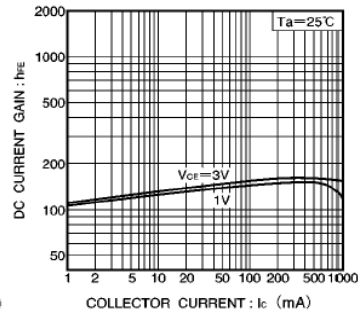


Fig.3 DC current gain vs. collector current (I)

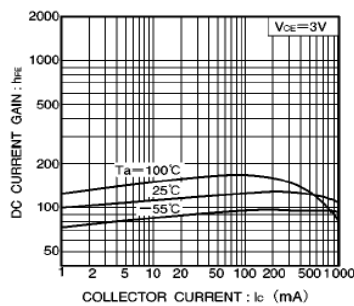


Fig.4 DC current gain vs. collector current (II)

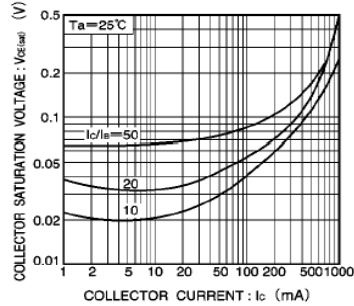


Fig.5 Collector-emitter saturation voltage vs. collector current (I)

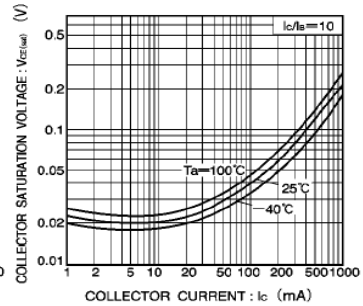


Fig.6 Collector-emitter saturation voltage vs. collector current (II)

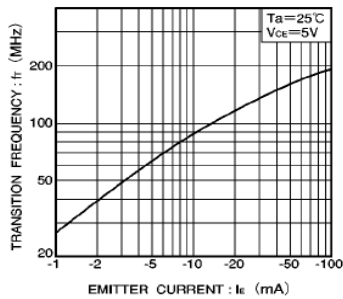


Fig.7 Gain bandwidth product vs. emitter current

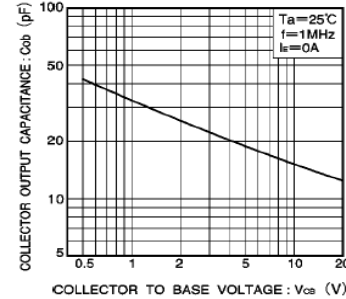


Fig.8 Collector output capacitance vs. collector-base voltage

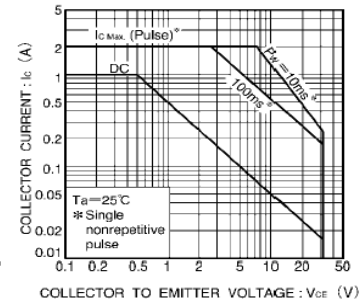


Fig.9 Safe operating area (2SD1664)

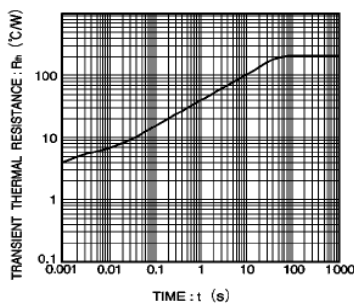


Fig.10 Transient thermal resistance (2SD1664)

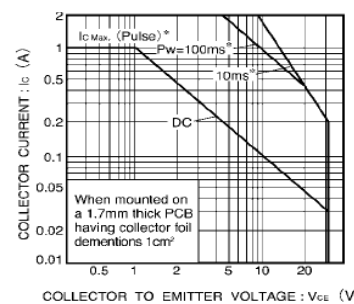


Fig.11 Safe operating area (2SD1858)

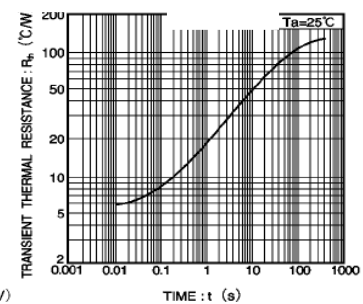
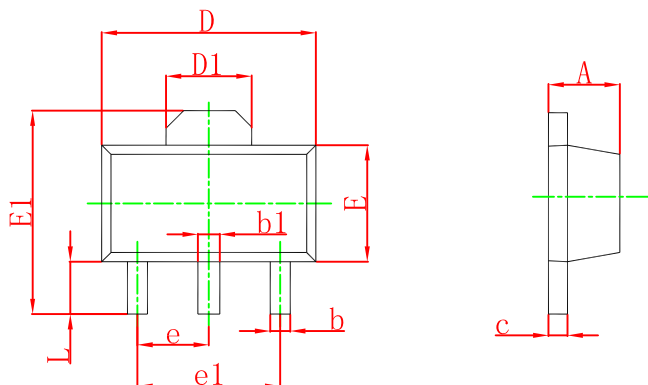


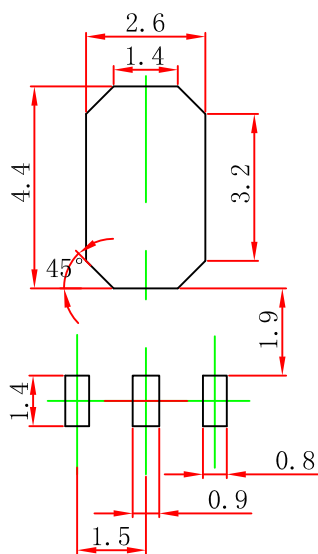
Fig.12 Transient thermal resistance (2SD1858)

SOT-89 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

SOT-89 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.