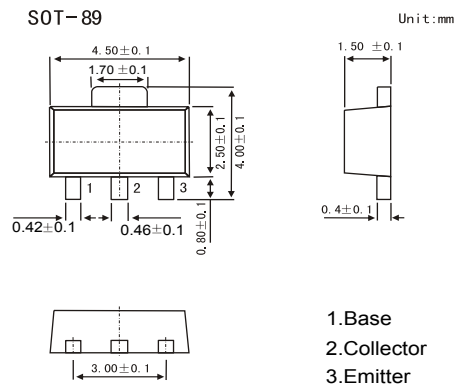
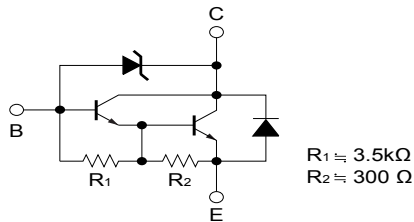


## SOT-89 NPN Transistors

### Features

- Built-in zener diode between collector and base.
- Zener diode has low dispersion.
- Darlington connection for high DC current gain.
- Built-in resistor between base and emitter.
- Marking: DM



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

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	$V_{CBO}$	80	V
Collector - Emitter Voltage	$V_{CEO}$	80	
Emitter - Base Voltage	$V_{EBO}$	6	
Collector Current - Continuous	$I_C$	2	A
Collector Current - Pulse	$I_{CP}$	3	
Collector Power Dissipation (Note.1)	$P_C$	0.5	W
		2	
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to 150	

Note. 1: Single pulse  $P_w=10\text{ms}$ ,  $Duty=1/2$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	$V_{CBO}$	$I_C = 100\mu\text{A}$ , $I_E = 0$	80			V
Collector- emitter breakdown voltage	$V_{CEO}$	$I_C = 1\text{mA}$ , $I_B = 0$	80			
Emitter - base breakdown voltage	$V_{EBO}$	$I_E = 100\mu\text{A}$ , $I_C = 0$	6			
Collector-base cut-off current	$I_{CBO}$	$V_{CB} = 70\text{V}$ , $I_E = 0$			10	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 5\text{V}$ , $I_C = 0$			3	mA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 1\text{A}$ , $I_B = 1\text{mA}$			1.5	V
DC current gain	$h_{FE}$	$V_{CE} = 2\text{V}$ , $I_C = 1\text{A}$	1000		10000	
Collector output capacitance	$C_{ob}$	$V_{CB} = 10\text{V}$ , $I_E = 0$ , $f = 1\text{MHz}$		25		pF
Transition frequency	$f_T$	$V_{CE} = 5\text{V}$ , $I_E = -100\text{mA}$ , $f = 30\text{MHz}$		80		MHz

## Typical Characteristic

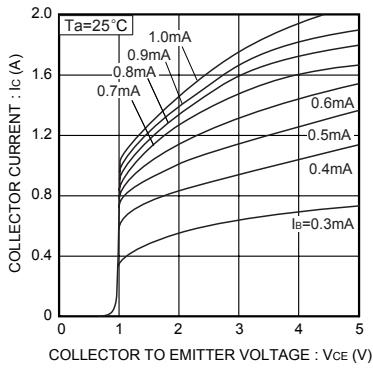


Fig.1 Grounded emitter output characteristics

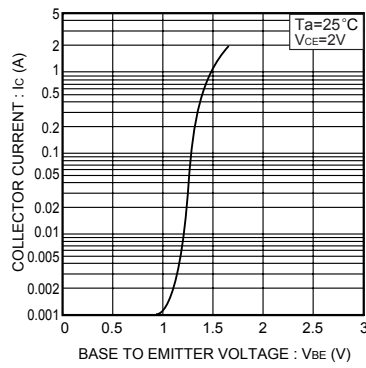


Fig.2 Grounded emitter propagation characteristics

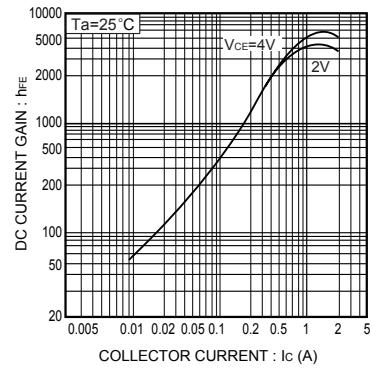


Fig.3 DC current gain vs. collector current

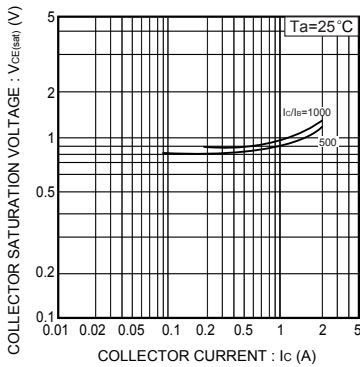


Fig.4 Collector-emitter saturation voltage vs. collector current

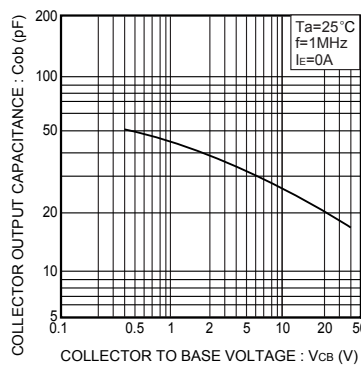


Fig.5 Collector output capacitance vs. collector-base voltage

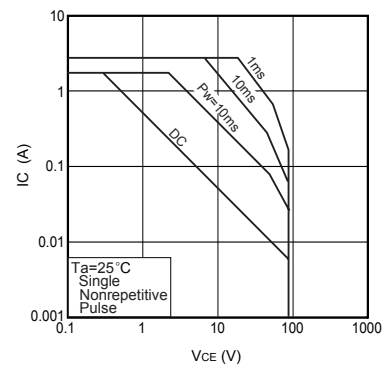


Fig.6 Safe operating area