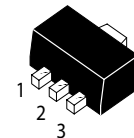


**Epitaxial Planar NPN Transistors**
 **$\text{Pb}$ -Free**
**SOT-89**

 1. BASE  
 2. COLLECTOR  
 3. EMITTER

**ABSOLUTE MAXIMUM RATINGS (Ta=25°C)**

Rating	Symbol	Limits	Unit
Collector-Base Voltage	V <sub>CB0</sub>	100	Vdc
Collector-Emitter Voltage	V <sub>CEO</sub>	80	Vdc
Emitter-Base Voltage	V <sub>EBO</sub>	5	Vdc
Collector Current	I <sub>C</sub>	1	A(DC)
	I <sub>CP</sub>	2	A (Pulse)*
Collector Power Dissipation	P <sub>C</sub>	0.5	W
Junction Temperature, Storage Temperature	T <sub>j</sub> , T <sub>stg</sub>	150, -55 to +150	°C

\* Single pulse Pw = 20ms

**ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise noted )**

Parameter	Symbol	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage(I <sub>c</sub> =100uA)	BV <sub>CB0</sub>	100	-	-	V
Collector-Emitter Breakdown Voltage(I <sub>c</sub> =1mA)	BV <sub>CEO</sub>	80	-	-	V
Emitter-Base Breakdown Voltage(I <sub>E</sub> =100uA)	BV <sub>EBO</sub>	5	-	-	V
Collector Cutoff Current(V <sub>CB</sub> =80V)	I <sub>CB0</sub>	-	-	1	uA
Emitter Cutoff Current(V <sub>EB</sub> =4V)	I <sub>EBO</sub>	-	-	1	uA

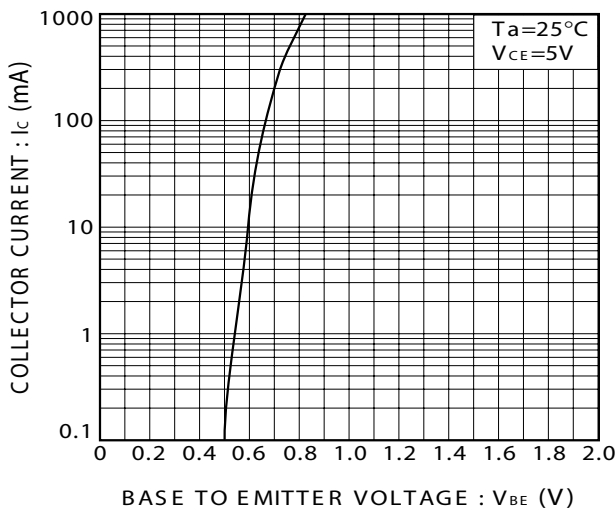
## ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise noted ) (Continued)

Parameter	Symbol	Min	Typ	Max	Unit
DC Current Gain (V <sub>CE</sub> =3V, I <sub>c</sub> =500mA)	h <sub>FE</sub>	70	-	400	-
Collector-Emitter Saturation Voltage (I <sub>c</sub> =500mA, I <sub>B</sub> =20mA)	V <sub>CE(sat)</sub>	-	-	0.4	V
Transition Frequency (V <sub>CE</sub> =10V, I <sub>c</sub> =50mA, f=100MHz)	f <sub>T</sub>	-	100	-	MHz
Output Capacitance (V <sub>CB</sub> =10V, I <sub>E</sub> =0A, f=1MHz)	C <sub>ob</sub>	-	20	-	pF

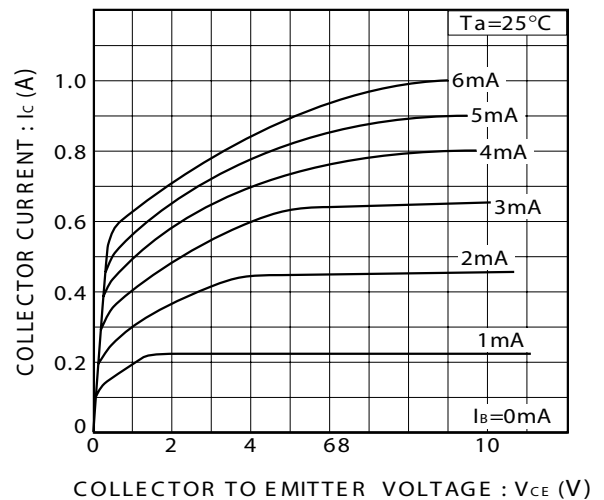
## CLASSIFICATION OF h<sub>FE</sub>

Marking	Z0	ZY	ZG
Rank	0	Y	GR
Range	70-140	120-240	200-400

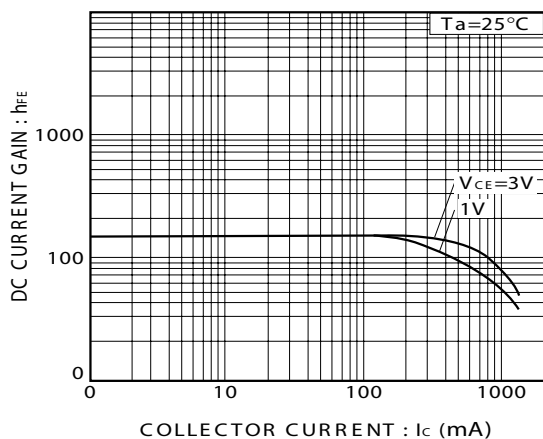
## ELECTRICAL CHARACTERISTIC CURVES



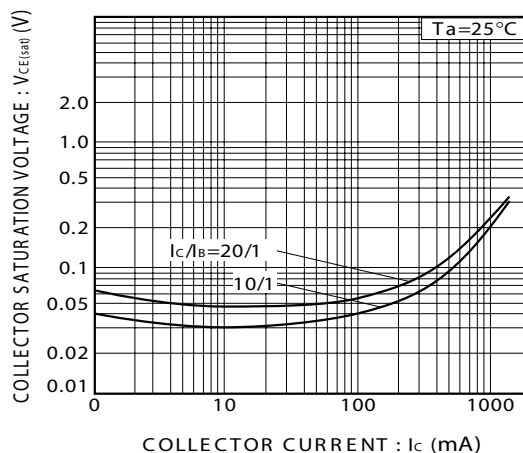
**FIG.1 Grounded Emitter Propagation Characteristics**



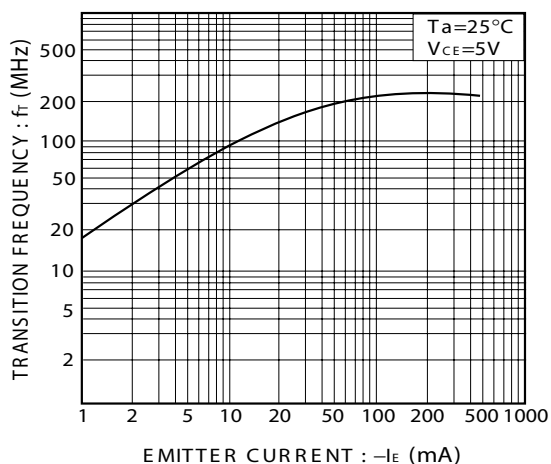
**FIG.2 Grounded Emitter Output Characteristics**



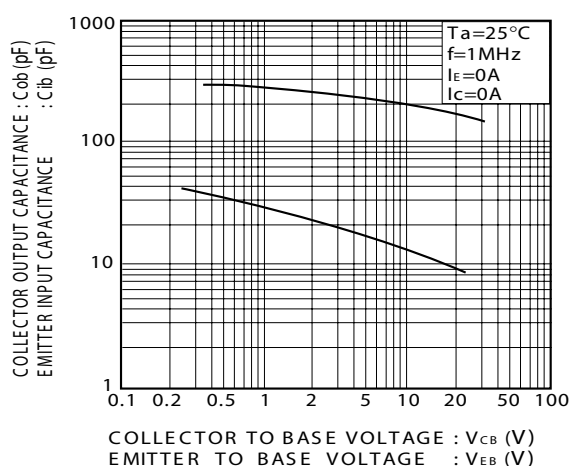
**FIG.3 DC Current Gain vs. Collector Current**



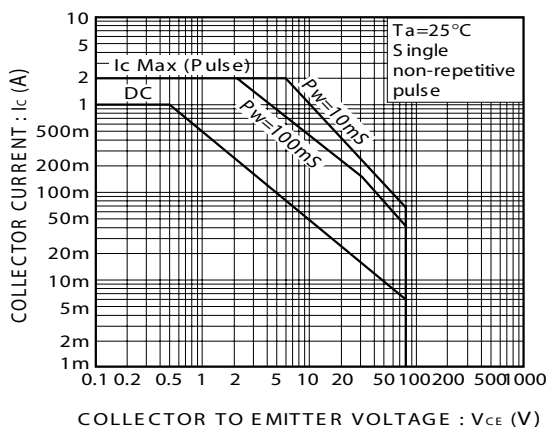
**FIG.4 Collector-Emitter Saturation Voltage vs. Collector Current**



**FIG.5 Gain Bandwidth Product vs. Emitter Current**



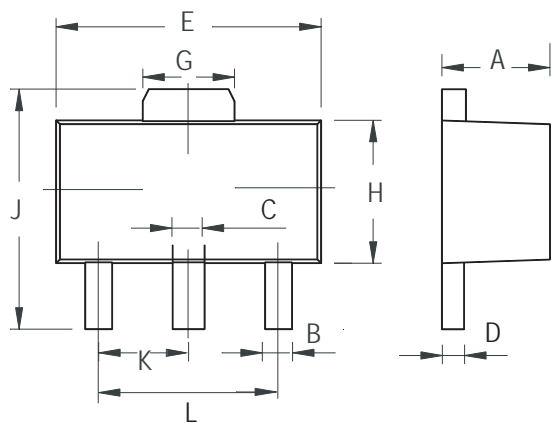
**FIG.6 Collector Output Capacitance vs. Collector-Base Voltage  
Emitter Input Capacitance vs. Emitter-Base Voltage**



**FIG.7 Safe Operating Area**

## SOT-89 Outline Dimensions

unit:mm



SOT-89		
Dim	Min	Max
A	1.400	1.600
B	0.320	0.520
C	0.360	0.560
D	0.350	0.440
E	4.400	4.600
G	1.400	1.800
H	2.300	2.600
J	3.940	4.250
K	1.500TYP	
L	2.900	3.100