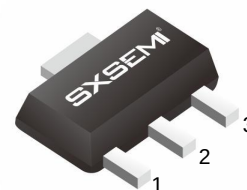


FEATURES

- Excellent current-to-gain characteristics
- Low collector saturation voltage $V_{CE(sat)}$
 $V_{CE(sat)}=0.5V(max)$ for $I_C/I_B=2A/0.1A$

SOT-89-3L



1. BASE
2. COLLECTOR
3. EMITTER

MARKING:CFR;CFS

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

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	40	V
V_{CEO}	Collector-Emitter Voltage	20	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current -Continuous	3	A
P_C	Collector Power Dissipation	500	mW
T_J, T_{stg}	Operation Junction and Storage Temperature Range	-55~150	$^{\circ}C$

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

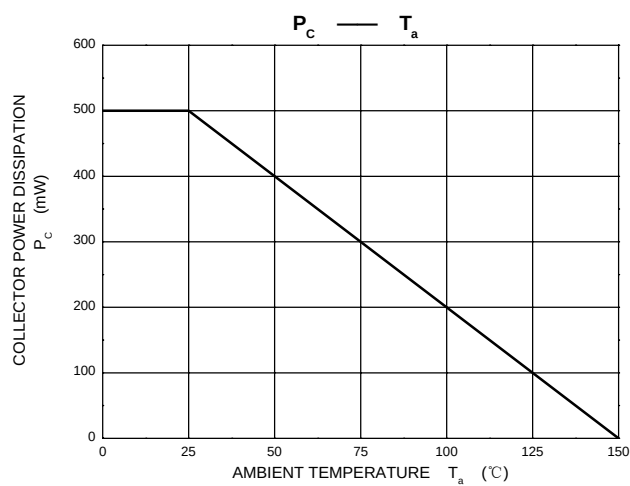
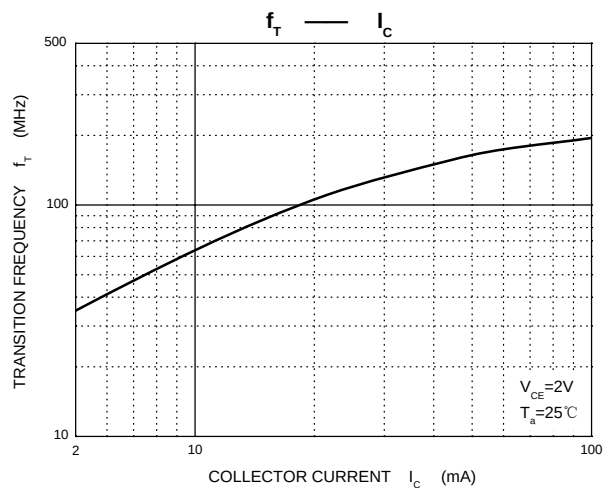
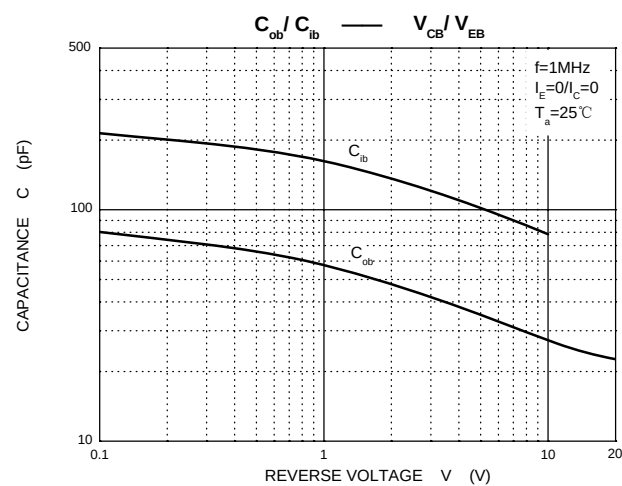
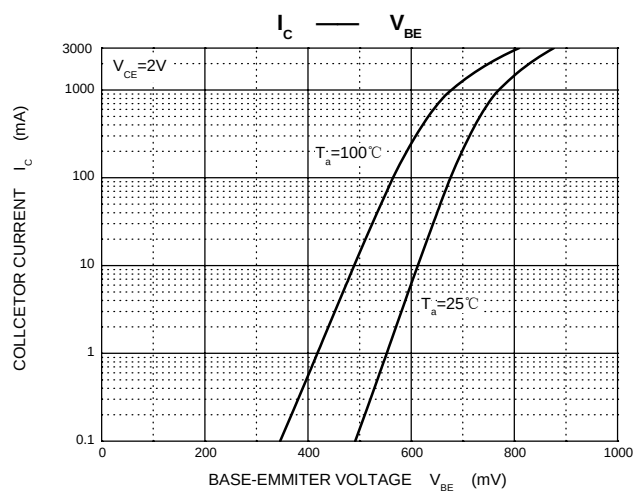
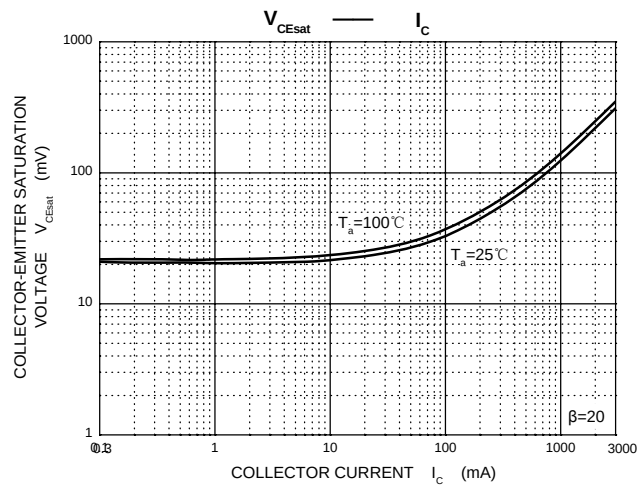
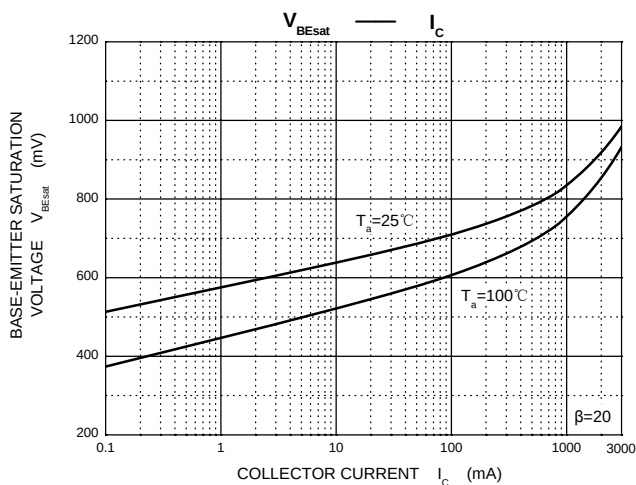
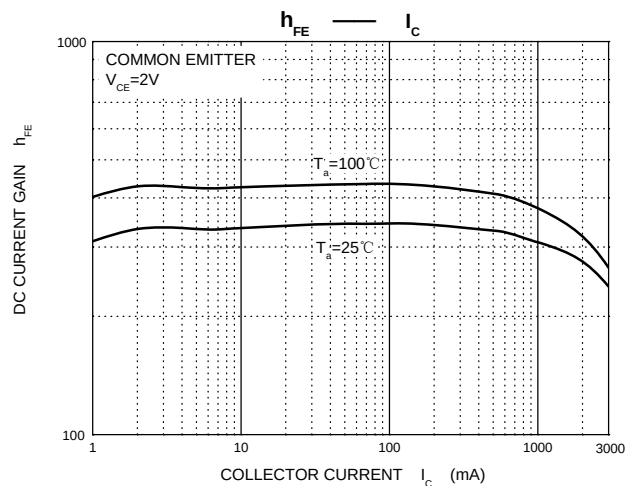
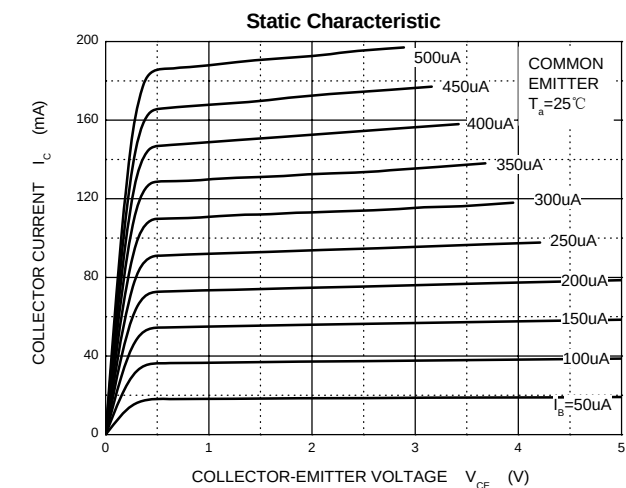
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 50\mu A, I_E = 0$	40			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1mA, I_B = 0$	20			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 50\mu A, I_C = 0$	6			V
Collector cut-off current	I_{CBO}	$V_{CB} = 30V, I_E = 0$			0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5V, I_C = 0$			0.1	μA
DC current gain	h_{FE}^*	$V_{CE} = 2V, I_C = 100mA$	180		560	
Collector-emitter saturation voltage	$V_{CE(sat)}^*$	$I_C = 2A, I_B = 100mA$			0.5	V
Transition frequency	f_T^*	$V_{CE} = 2V, I_C = 500mA$ $f = 100MHz$		290		MHz
Collector output capacitance	C_{ob}	$V_{CB} = 10V, I_E = 0, f = 1MHz$		25		pF

*Pulse test: $t_p \leq 300\mu S, \delta \leq 0.02$.

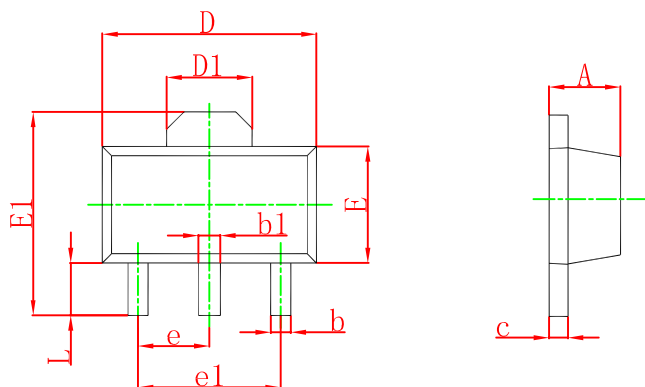
CLASSIFICATION OF h_{FE}

Rank	R	S
Range	180-390	270-560
Marking	CFR	CFS

Typical Characteristics

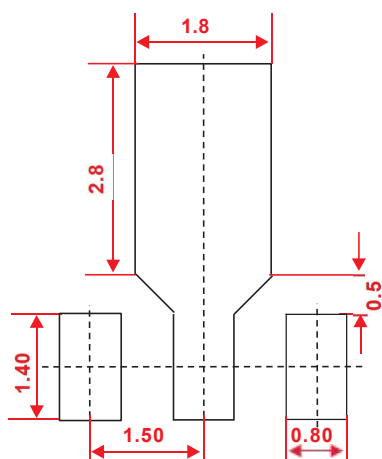


SOT-89-3L Package Outline Dimensions



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-89-3L 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.