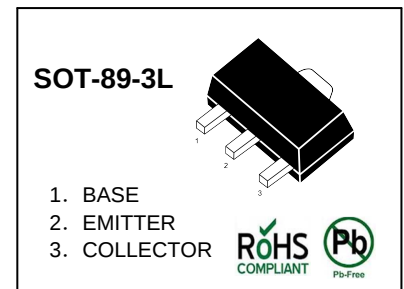


NPN Silicon Epitaxial Planar Transistor

Low frequency transistor

Marking : R CFR
S CFS



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

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	40	V
Collector Emitter Voltage	V_{CEO}	20	V
Emitter Base Voltage	V_{EBO}	6	V
Collector Current - DC Collector Current - Pulse ¹⁾	I_C I_{CP}	3 5 ¹⁾	A
Total Power Dissipation	P_{tot}	0.5 2 ²⁾	W
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{Stg}	- 55 to + 150	$^\circ\text{C}$

¹⁾ Single pulse $P_w = 10$ ms.

²⁾ Mounted on a 40 X 40 X 0.7 mm ceramic substrate.

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

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $V_{CE} = 2$ V, $I_C = 100$ mA	h_{FE}	180	-	390	-
Current Gain Group R S	h_{FE}	270	-	560	-
Collector Base Breakdown Voltage at $I_C = 50$ μA	$V_{(BR)CBO}$	40	-	-	V
Collector Emitter Breakdown Voltage at $I_C = 1$ mA	$V_{(BR)CEO}$	20	-	-	V
Emitter Base Breakdown Voltage at $I_E = 50$ μA	$V_{(BR)EBO}$	6	-	-	V
Collector Cutoff Current at $V_{CB} = 30$ V	I_{CBO}	-	-	100	nA
Emitter Cutoff Current at $V_{EB} = 5$ V	I_{EBO}	-	-	100	nA
Collector Emitter Saturation Voltage at $I_C = 2$ A, $I_B = 100$ mA	$V_{CE(sat)}$	-	-	0.5	V
Transition Frequency at $V_{CE} = 2$ V, $-I_E = 500$ mA, $f = 100$ MHz	f_T	-	290	-	MHz
Collector Output Capacitance at $V_{CE} = 10$ V, $I_E = 0$ A, $f = 1$ MHz	C_{ob}	-	25	-	pF

Typical Characteristics

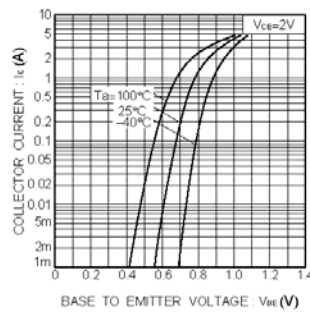


Fig.1 Grounded emitter propagation characteristics

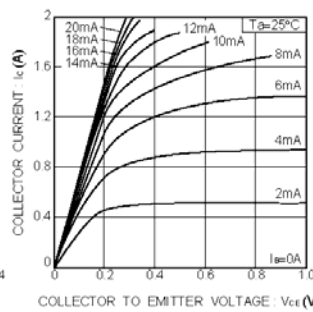


Fig.2 Grounded emitter output characteristics (I)

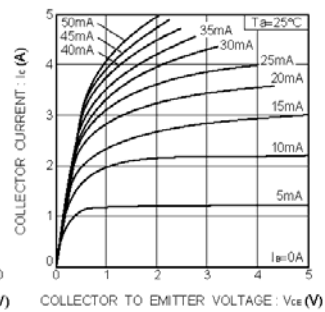


Fig.3 Grounded emitter output characteristics (II)

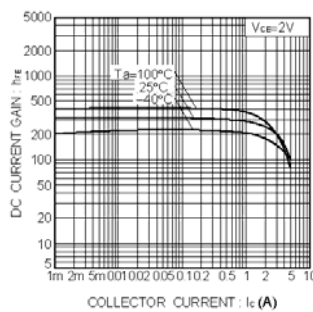


Fig.4 DC current gain vs. collector current

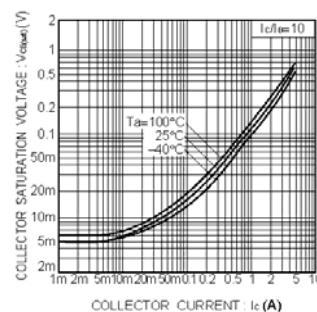


Fig.5 Collector-emitter saturation voltage vs. collector current (I)

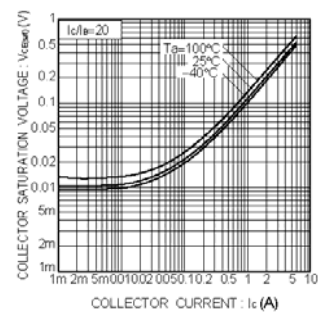


Fig.6 Collector-emitter saturation voltage vs. collector current (II)

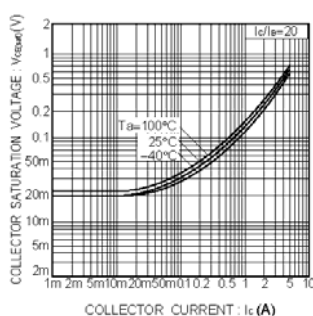


Fig.7 Collector-emitter saturation voltage vs. collector current (III)

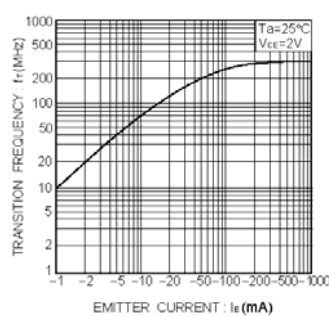


Fig.8 Gain bandwidth product vs. emitter current

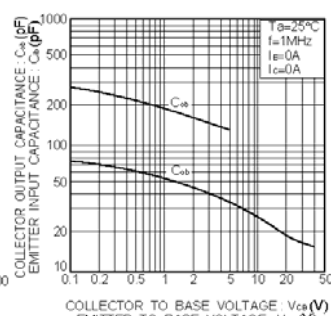
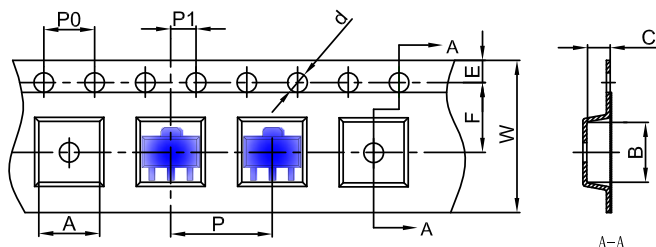


Fig.9 Collector output capacitance vs. collector-base voltage
Emitter input capacitance vs. emitter-base voltage

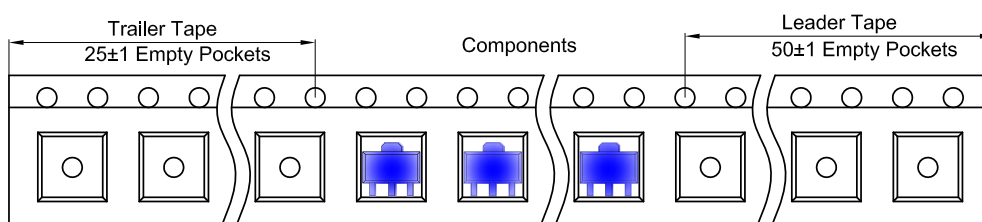
SOT-89-3L Tape and Reel

SOT-89-3L Embossed Carrier Tape

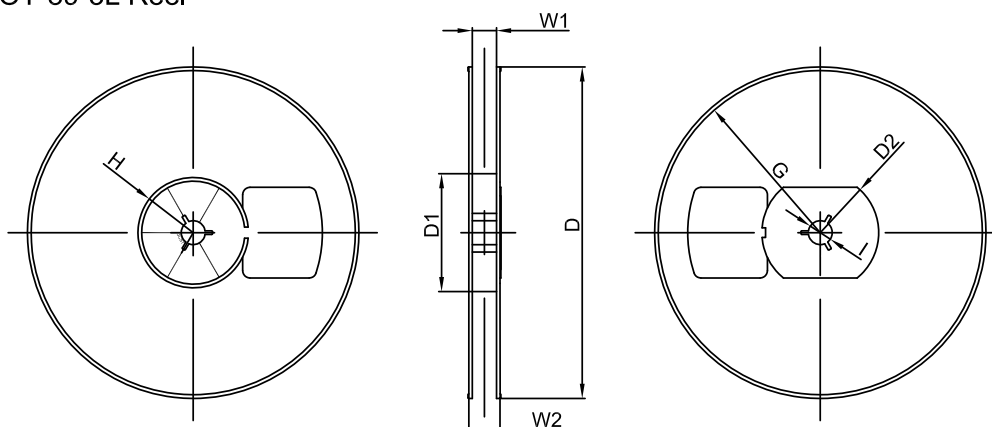


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-89-3L	4.85	4.45	1.85	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

SOT-89-3L Tape Leader and Trailer

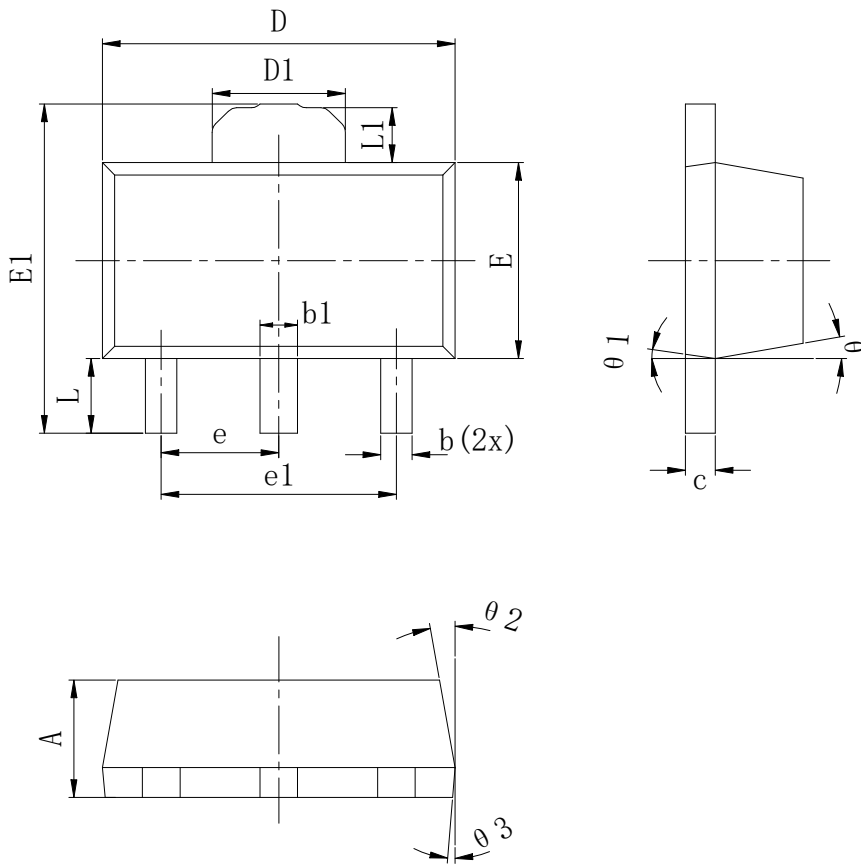


SOT-89-3L Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø180.00	60.00	R32.00	R86.50	R30.00	Ø13.00	13.20	16.50

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
1000 pcs	7 inch	10,000 pcs	203×203×195	40,000 pcs	438×438×220	



SYMBOL	MILLIMETER		
	MIN	TYP.	MAX
A	1.400	1.500	1.600
b	0.320	0.400	0.520
b1	0.400	0.480	0.580
c	0.350	0.381	0.440
D	4.400	4.500	4.600
D1	1.700REF		
E	2.400	2.500	2.600
E1	4.050	4.200	4.350
e	1.500TYP.		
e1	3.000TYP.		
L	0.800	0.950	1.200
L1	0.700REF		
theta	10° REF		
theta 1	8° REF		
theta 2	10° REF		
theta 3	5° REF		

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