



**TO-92 Plastic-Encapsulate Transistors**

**S9011** TRANSISTOR ( NPN )

**FEATURE**

Power dissipation

$$P_{CM} : 0.31 \text{ W (Tamb=25 )}$$

Collector current

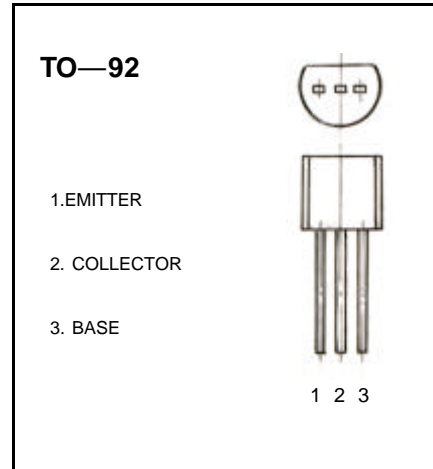
$$I_{CM} : 0.03 \text{ A}$$

Collector-base voltage

$$V_{(BR)CBO} : 30 \text{ V}$$

Operating and storage junction temperature range

$$T_j, T_{stg} : -55 \text{ to } +150$$



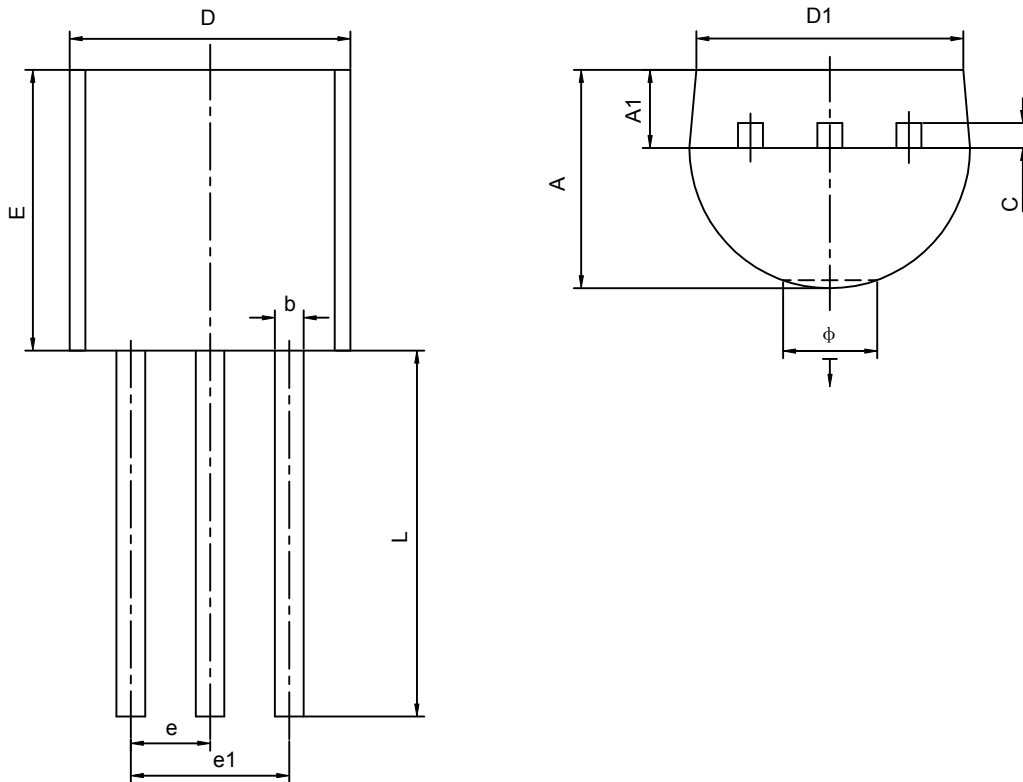
**ELECTRICAL CHARACTERISTICS ( Tamb=25 unless otherwise specified )**

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 100 \mu A, I_E = 0$	30			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 0.1 \text{ mA}, I_B = 0$	20			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 100 \mu A, I_C = 0$	4			V
Collector cut-off current	$I_{CBO}$	$V_{CB} = 16V, I_E = 0$			0.1	$\mu A$
Collector cut-off current	$I_{CBO}$	$V_{CB} = 16V, I_E = 0$			0.1	$\mu A$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 3.5V, I_C = 0$			0.1	$\mu A$
DC current gain	$h_{FE(1)}$	$V_{CE} = 5V, I_C = 1mA$	28		270	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10 \text{ mA}, I_B = 1mA$			0.3	V
Base-emitter voltage	$V_{BE(sat)}$	$I_C = 10 \text{ mA}, I_B = 1mA$			1	V
Transition frequency	$f_T$	$V_{CE} = 5V, I_C = 1mA, f = 30MHz$	150			MHz

**CLASSIFICATION OF  $h_{FE(1)}$**

Rank	D	E	F	G	H	I	J
Range	28-45	39-60	54-80	72-108	97-146	132-198	180-270

## TO-92 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.400	4.700	0.173	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270TYP		0.050TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Ö		1.600		0.063
↓	0.000	0.380	0.000	0.015