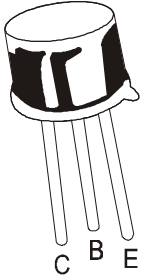


NPN SILICON PLANAR TRANSISTOR

2N2102



**TO-39
Metal Can Package**

Amplifier Transistor

ABSOLUTE MAXIMUM RATINGS

DESCRIPTION	SYMBOL	VALUE	UNIT
Collector Emitter Voltage	V_{CEO}	65	V
Collector Emitter Voltage, $R_{BE} \leq 10W$	V_{CER}	80	V
Collector Base Voltage	V_{CBO}	120	V
Emitter Base Voltage	V_{EBO}	7.0	V
Collector Current Continuous	I_C	1.0	A
Power Dissipation @ $T_a=25^\circ C$ Derate Above $25^\circ C$	P_D	1.0 5.71	mW mW/ °C
Power Dissipation @ $T_c=25^\circ C$ Derate Above $25^\circ C$	P_D	5.0 28.6	W mW/ °C
Operating and Storage Junction Temperature Range	T_j, T_{stg}	- 65 to +200	°C

THERMAL RESISTANCE

Junction to Ambient in free air	$R_{th(j-a)}$	175	°C/W
Junction to Case	$R_{th(j-c)}$	35	°C/W

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

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Voltage	V_{CER}	$I_C=1mA, R_{BE}=10 \Omega$	80			V
Collector Emitter Voltage	V_{CEO}	$I_C=1mA, I_B=0$	65			V
Collector Emitter Voltage	V_{CEX}	$I_C=100\mu A, V_{EB}=1.5V$	120			V
Collector Base Voltage	V_{CBO}	$I_C=100\mu A, I_E=0$	120			V
Emitter Base Voltage	V_{EBO}	$I_E=100\mu A, I_C=0$	7			V
Collector Cut Off Current	I_{CBO}	$V_{CB}=60V, I_E=0$			2	nA
		$V_{CB}=60V, I_E=0, T_a=150^\circ C$			2	μA
Emitter Cut Off Current	I_{EBO}	$V_{EB}=5V, I_C=0$			2	nA
DC Current Gain	h_{FE}	$I_C=0.1mA, V_{CE}=10V$	20			
		$*I_C=10mA, V_{CE}=10V$	35			
		$*I_C=10mA, V_{CE}=10V, T_a=55^\circ C$	20			
		$*I_C=150mA, V_{CE}=10V$	40		120	
		$*I_C=500mA, V_{CE}=10V$	25			
		$*I_C=1A, V_{CE}=10V$	10			

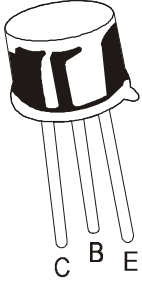
*Pulse Test: Pulse Width $\leq 300ms$, Duty Cycle $\leq 2\%$

** $R_{th(j-a)}$ is measured with the device soldered into a typical printed circuit board

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NPN SILICON PLANAR TRANSISTOR

2N2102



**TO-39
Metal Can Package**

ELECTRICAL CHARACTERISTICS (T_a=25°C unless specified otherwise)

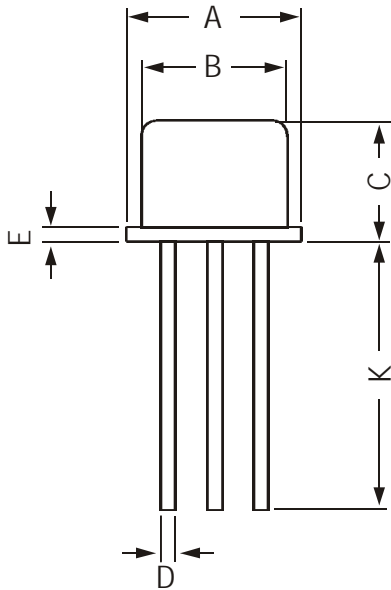
DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Saturation Voltage	*V _{CE (sat)}	I _C =150mA, I _B =15mA			0.5	V
Base Emitter Saturation Voltage	*V _{BE (sat)}	I _C =150mA, I _B =15mA			1.1	V

SMALL SIGNAL CHARACTERISTICS

Transition Frequency	f _T	I _C =50mA, V _{CE} =10V, f=20MHz	60			MHz
Output Capacitance	C _{obo}	V _{CB} =10V, I _E =0, f=1MHz			15	pF
Input Capacitance	C _{ibo}	V _{EB} =0.5V, I _C =0, f=1MHz			80	pF
Input Impedance	h _{ib}	I _C =1mA, V _{CE} =5V, f=1KHz	24		34	Ω
		I _C =5mA, V _{CE} =10V, f=1KHz	4.0		8.0	Ω
Voltage Feedback Ratio	h _{rb}	I _C =1mA, V _{CE} =5V, f=1KHz			3.0	x10 ⁻⁴
		I _C =5mA, V _{CE} =10V, f=1KHz			3.0	x10 ⁻⁴
Small Signal Current Gain	h _{fe}	I _C =1mA, V _{CE} =5V, f=1KHz	30		100	
		I _C =5mA, V _{CE} =10V, f=1KHz	35		150	
Output Impedance	h _{ob}	I _C =1mA, V _{CE} =5V, f=1KHz	0.01		0.5	μmho
		I _C =5mA, V _{CE} =10V, f=1KHz	0.01		1.0	μmho
Noise Figure	NF	I _C =300μA, V _{CE} =10V, f=1KHz, Bandwidth=1.0 Hz R _S =1kΩ			6.0	dB

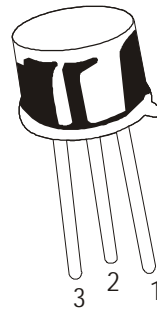
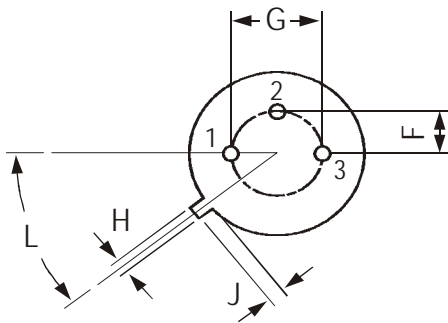
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TO-39 Metal Can Package



All dimensions are in mm

DIM	MIN	MAX
A	8.50	9.39
B	7.74	8.50
C	6.09	6.60
D	0.40	0.53
E	—	0.88
F	2.41	2.66
G	4.82	5.33
H	0.71	0.86
J	0.73	1.02
K	12.70	—
L	42 DEG	48 DEG



PIN CONFIGURATION
 1. EMITTER
 2. BASE
 3. COLLECTOR

Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-39	500 pcs/polybag	540 gm/500 pcs	3" x 7.5" x 7.5"	20K	17" x 15" x 13.5"	32K	40 kgs

Disclaimer

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