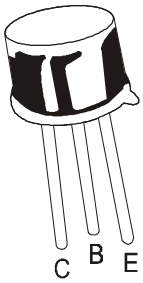
NPN SILICON PLANAR TRANSISTOR

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=25ºC Derate Above 25ºC	P_D	1.0 5.71	mW mW/ ºC
Power Dissipation @ T_c=25ºC Derate Above 25ºC	P_D	5.0 28.6	W mW/ ºC
Operating and Storage Junction Temperature Range	T_j, T_{stg}	- 65 to +200	ºC

THERMAL RESISTANCE

Junction to Ambient in free air	$^{**}R_{th\ (j-a)}$	175	ºC/W
Junction to Case	$R_{th\ (j-c)}$	35	ºC/W

ELECTRICAL CHARACTERISTICS (T_a=25ºC unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Voltage	V_{CER}	I_C=1mA, R_{BE}=10 Ω	80			V
Collector Emitter Voltage	V_{CEO}	I_C=1mA, I_B=0	65			V
Collector Emitter Voltage	V_{CEX}	I_C=100µA, V_{EB}=1.5V	120			V
Collector Base Voltage	V_{CBO}	I_C=100µA, I_E=0	120			V
Emitter Base Voltage	V_{EBO}	I_E=100µA, 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=150ºC			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=55ºC	20			
		*I_C=150mA, V_{CE}=10V	40		120	
		*I_C=500mA, V_{CE}=10V	25			
		*I_C=1A, V_{CE}=10V	10			

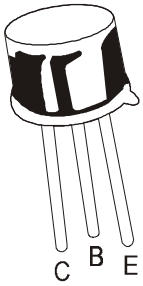
***Pulse Test: Pulse Width ≤ 300ms, Duty Cycle ≤ 2%**

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

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NPN SILICON PLANAR TRANSISTOR

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ELECTRICAL CHARACTERISTICS (T_a=25ºC unless specified otherwise)

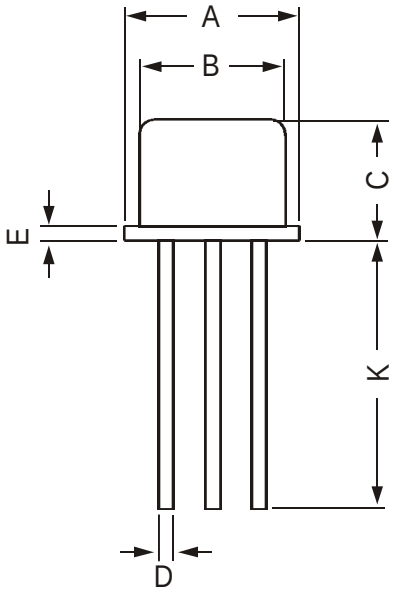
DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Saturation Voltage	$*V_{CE\ (sat)}$	I_C=150mA, I_B=15mA			0.5	V
Base Emitter Saturation Voltage	$*V_{BE\ (sat)}$	I_C=150mA, I_B=15mA			1.1	V

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

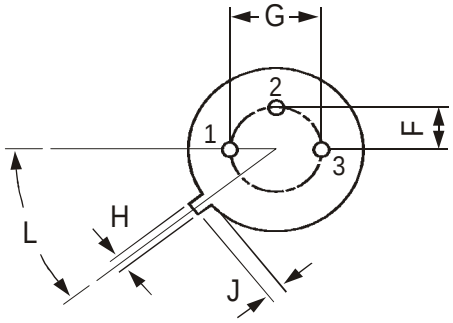
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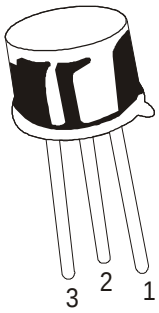
TO-39 Metal Can Package



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

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Metal Can Package

Disclaimer

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