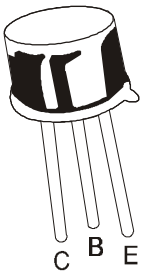
NPN SILICON PLANAR TRANSISTOR

2N3019 / 2N3020

TO-39
Metal Can Package



General Transistor

ABSOLUTE MAXIMUM RATINGS

DESCRIPTION	SYMBOL	VALUE	UNIT
Collector Emitter Voltage	V_{CEO}	80	V
Collector Base Voltage	V_{CBO}	140	V
Emitter Base Voltage	V_{EBO}	7.0	V
Collector Current Continuous	I_C	1.0	A
Power Dissipation at T_a=25ºC Derate Above 25ºC	P_D	0.8 4.6	W mW/ ºC
Power Dissipation at 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

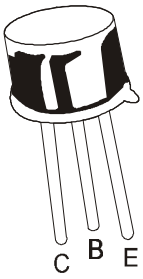
Junction to Case	$R_{th\ (j-c)}$	16.5	ºC/W
Junction to Ambient in free air	$R_{th\ (j-a)}$	89.5	ºC/W

ELECTRICAL CHARACTERISTICS (T_a=25ºC unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Voltage	V_{CEO}	I_C=1mA, I_B=0	80			V
Collector Base Voltage	V_{CBO}	I_C=100µA, I_E=0	140			V
Emitter Base Voltage	V_{EBO}	I_E=100µA, I_C=0	7.0			V
Collector Cut Off Current	I_{CBO}	V_{CB}=90V, I_E=0			10	nA
		V_{CB}=90V, I_E=0, T_a=150ºC			10	µA
Emitter Cut Off Current	I_{EBO}	V_{EB}=5V, I_C=0			10	nA
			2N3019		2N3020	
DC Current Gain	*h_{FE}	I_C=0.1mA, V_{CE}=10V	>50		30 - 100	
		I_C=10mA, V_{CE}=10V	>90		40 - 120	
		I_C=150mA, V_{CE}=10V	100 - 300		40 - 120	
		I_C=150mA, V_{CE}=10V, T_c= -55ºC	>40		-	
		I_C=500mA, V_{CE}=10V	>50		30 - 100	
		I_C=1A, V_{CE}=10V	>15		>15	
			MIN	TYP	MAX	UNIT
Collector Emitter Saturation Voltage	*$V_{CE\ (sat)}$	I_C=150mA, I_B=15mA			0.2	V
		I_C=500mA, I_B=50mA			0.5	V
Base Emitter Saturation Voltage	*$V_{BE\ (sat)}$	I_C=150mA, I_B=15mA			1.1	V

***Pulse Test: Pulse Width ≤ 300ms, Duty Cycle ≤ 1%**

2N3019_20Rev_1 040406E



TO-39
Metal Can Package

ELECTRICAL CHARACTERISTICS (T_a=25ºC unless specified otherwise)

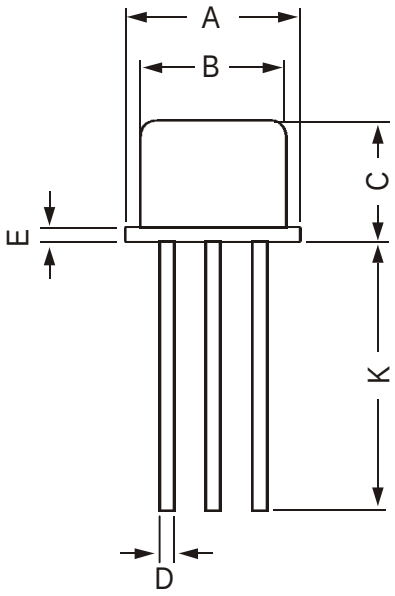
SMALL SIGNAL CHARACTERISTICS

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Output Capacitance	C_{ob}	V_{CB}=10V, I_E=0, f=1MHz			12	pF
Input Capacitance	C_{ib}	V_{EB}=0.5V, I_C=0, f=1MHz			60	pF
Small Signal Current Gain	h_{fe}	I_C=1mA, V_{CE}=5V, f=1KHz				
		2N3019	80		400	
		2N3020	30		200	
Collector Bise Time Constant	rb'C_C	I_E=10mA, V_{CB}=10V, f=79.8MHz			400	ps
Noise Figure	NF	I_C=100µA, V_{CE}=10V, R_S=1KΩ, f=1.0KHz **2N3019**			4.0	dB

`

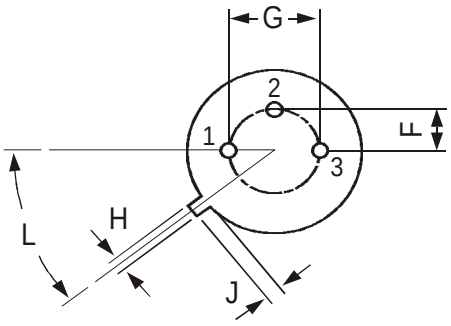
2N3019_20Rev_1 040406E

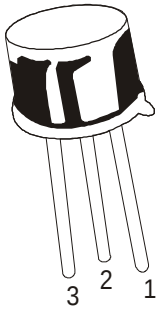
TO-39 Metal Can Package



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

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.

2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

2N3019_20Rev_1 040406E

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

CDIL is a registered Trademark of
Continental Device India Limited
C-120 Naraina Industrial Area, New Delhi 110 028, India.
Telephone + 91-11-2579 6150, 4141 1112 Fax + 91-11-2579 5290, 4141 1119
email@cdil.com www.cdilsemi.com

2N3019_20Rev_1 040406E