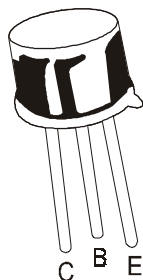


NPN SILICON PLANAR EPITAXIAL TRANSISTORS

2N1613



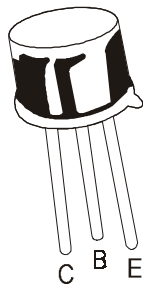
TO-39
Metal Can Package

ABSOLUTE MAXIMUM RATINGS (Ta=25°C unless specified otherwise)

DESCRIPTION	SYMBOL	VALUE	UNITS
Collector Emitter Voltage (RBE≤10Ω)	V _{CER}	50	V
Collector Base Voltage	V _{CBO}	75	V
Emitter Base Voltage	V _{EBO}	7.0	V
Collector Current Continuous	I _C	500	mA
Power Dissipation @ Ta=25°C	P _D	800	mW
Derate Above 25°C		4.57	mW/°C
Power Dissipation@ Tc=25°C	P _D	3	W
Derate Above 25°C		17.15	mW/°C
Operating And Storage Junction Temperature Range	T _j , T _{stg}	-65 to +200	°C
THERMAL RESISTANCE			
Junction to Ambient	R _{th(j-a)}	218.7	°C/W
Junction to Case	R _{th(j-c)}	58.3	°C/W

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

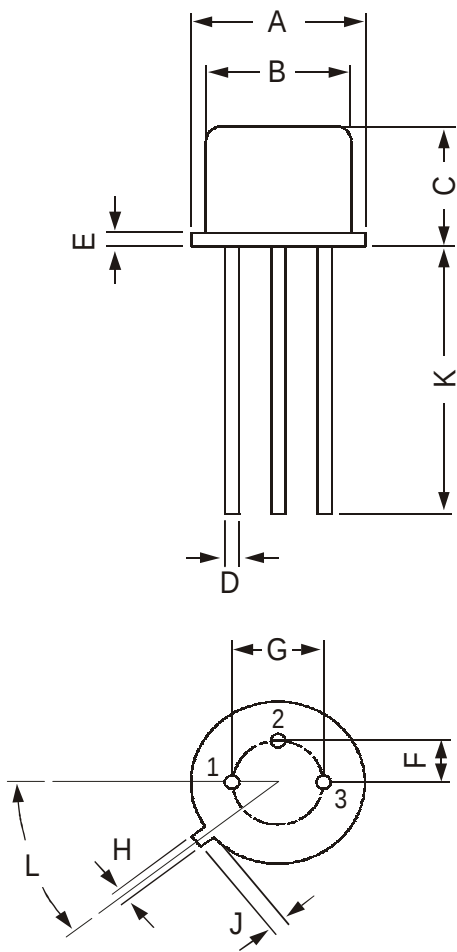
DESCRIPTION	SYMBOL	MIN	TYP	MAX	UNITS
Collector Emitter Breakdown Voltage	V _{CER(sus)} * I _C =100mA, R _{BE} ≤10Ω	50			V
Collector Base Breakdown Voltage	BV _{CBO} I _C =100μA, I _E =0	75			V
Emitter Base Breakdown Voltage	BV _{EBO} I _E =100μA, I _C =0	7			V
Collector Leakage Current	I _{CBO} V _{CB} =60V, I _E =0			10	nA
				10	μA
Emitter Leakage Current	I _{EBO} V _{EB} =5V, I _C =0			10	nA
Collector Emitter Saturation Voltage	V _{CE(Sat)} * I _C =150mA, I _B =15mA		0.3	1.5	V
Base Emitter Saturation Voltage	V _{BE(Sat)} * I _C =150mA, I _B =15mA		0.78	1.3	V
DC Current Gain	h _{FE} * I _C =0.1mA, V _{CE} =10V	20	35		
	I _C =10mA, V _{CE} =10V	35	50		
	I _C =150mA, V _{CE} =10V	40	80	120	
	I _C =500mA, V _{CE} =10V	20	30		
	I _C =10mA, V _{CE} =10V T _a =-55°C	20			



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

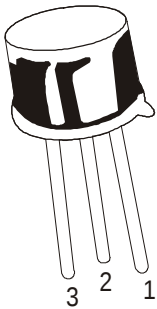
DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNITS
<u>SMALL SIGNAL CHARACTERISTICS</u>						
Small Signal Current Gain	$ h_{fe} $	$I_C=1\text{mA}, V_{CE}=5\text{V}, f=1\text{kHz}$	30		100	
		$I_C=5\text{mA}, V_{CE}=10\text{V}, f=1\text{kHz}$	35		150	
Input Impedance	h_{ib}	$I_C=1\text{mA}, V_{CB}=5\text{V}, f=1\text{kHz}$	24		34	Ω
		$I_C=5\text{mA}, V_{CE}=10\text{V}, f=1\text{kHz}$	4.0		8.0	Ω
Voltage Feedback Ratio	h_{rb}	$I_C=1\text{mA}, V_{CE}=5\text{V}, f=1.0\text{kHz}$			3.0	$\times 10^{-4}$
		$I_C=5\text{mA}, V_{CE}=10\text{V}, f=1\text{kHz}$			3.0	$\times 10^{-4}$
Output Admittance	h_{ob}	$I_C=1\text{mA}, V_{CE}=5\text{V}, f=1\text{kHz}$	0.05		0.5	μmho
		$I_C=5\text{mA}, V_{CE}=10\text{V}, f=1\text{kHz}$	0.05		0.5	μmho
Current Gain Bandwidth Product	f_T^*	$I_C=50\text{mA}, V_{CE}=10\text{V}, f=20\text{MHz}$	60			MHz
Output Capacitance	C_{ob}	$V_{CB}=10\text{V}, I_E=0, f=100\text{kHz}$		10	25	pF
Input Capacitance	C_{ib}	$V_{EB}=0.5\text{V}, I_C=0, f=100\text{kHz}$		50	80	pF
Noise Figure	NF	$I_C=300\mu\text{A}, V_{CE}=10\text{V}, R_S=510\Omega, f=1\text{kHz}$			12	dB
*Pulse Test: Pulse Length $\leq 300\mu\text{s}$, Duty Cycle $\leq 1.0\%$						

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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