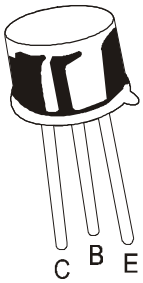
PNP SILICON PLANAR SWITCHING TRANSISTORS

2N2904 2N2905



TO-39
Metal Can Package

General Purpose Transistor

ABSOLUTE MAXIMUM RATINGS

DESCRIPTION	SYMBOL	VALUE	UNIT
Collector Emitter Voltage	V_{CEO}	40	V
Collector Base Voltage	V_{CBO}	60	V
Emitter Base Voltage	V_{EBO}	5	V
Collector Current Continuous	I_C	600	mA
Power Dissipation @ T_a=25ºC Derate Above 25ºC	P_D	600 3.43	mW mW/ ºC
Power Dissipation @ T_c=25ºC Derate Above 25ºC	P_D	3.0 17.2	W mW/ ºC
Operating And Storage Junction Temperature Range	T_j, T_{stg}	- 65 to +200	ºC

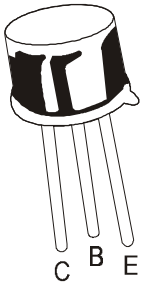
ELECTRICAL CHARACTERISTICS (T_a=25ºC unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Voltage	*V_{CEO}	I_C=10mA, I_B=0	40			V
Collector Base Voltage	V_{CBO}	I_C=10µA, I_E=0	60			V
Emitter Base Voltage	V_{EBO}	I_E=10µA, I_C=0	5			V
Collector Cut Off Current	I_{CEX}	V_{CE}=30V, V_{BE}=0.5V			50	nA
Collector Cut Off Current	I_{CBO}	V_{CB}=50V, I_E=0			20	nA
		V_{CB}=50V, I_E=0, T_a=150ºC			20	µA
Base Current	I_B	V_{CE}=30V, V_{BE}=0.5V			50	nA

			2N2904		2N2905	
DC Current Gain	h_{FE}	I_C=0.1mA, V_{CE}=10V	>20		>35	
		I_C=1mA, V_{CE}=10V	>25		>50	
		I_C=10mA, V_{CE}=10V	>35		>75	
		*I_C=150mA, V_{CE}=10V	40 - 120		100 - 300	
		*I_C=500mA, V_{CE}=10V	>20		>30	

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

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ELECTRICAL CHARACTERISTICS (T_a=25ºC unless specified otherwise)

SMALL SIGNAL CHARACTERISTICS

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Saturation Voltage	$*V_{CE\ (sat)}$	I_C=150mA, I_B=15mA			0.4	V
		I_C=500mA, I_B=50mA			1.6	V
Base Emitter Saturation Voltage	$*V_{BE\ (sat)}$	I_C=150mA, I_B=15mA			1.3	V
		I_C=500mA, I_B=50mA			2.6	V
Transition Frequency	$**f_T$	I_C=50mA, V_{CE}=20V, f=100MHz	200			MHz
Output Capacitance	C_{obo}	V_{CB}=10V, I_E=0, f=100KHz			8.0	pF
Input Capacitance	C_{ibo}	V_{BE}=2V, I_C=0, f=100KHz			30	pF

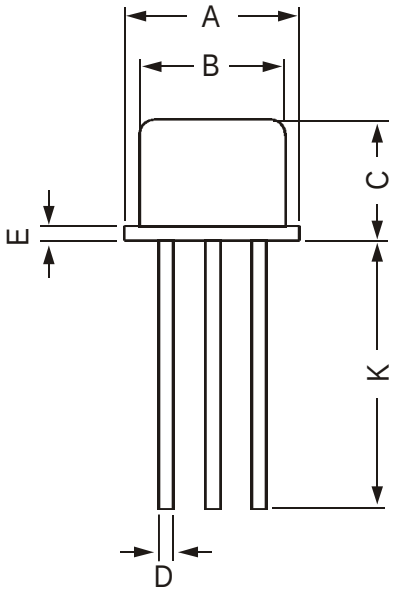
SWITCHING TIME

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Delay Time	t_d	I_C=150mA, I_{B1}=15mA, V_{CC}=30V			10	ns
Rise Time	t_r				40	ns
Turn On Time	t_{on}				45	ns
Storage Time	t_s	I_C=150mA, I_{B1}= I_{B2}=15mA, V_{CC}=6V			80	ns
Fall Time	t_f				30	ns
Turn Off Time	t_{off}				100	ns

***Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%**
**** f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.**

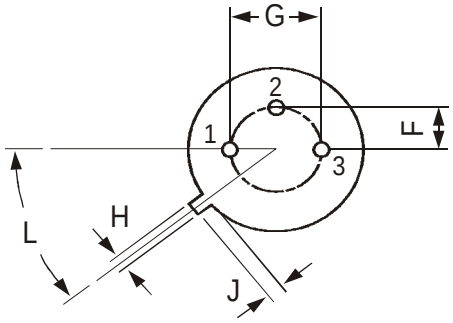
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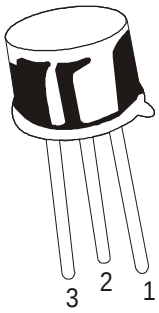
TO-39 Metal Can Package



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

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

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

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