



SOLID STATE INC.

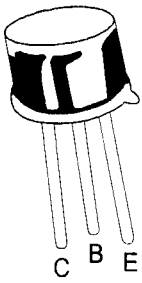
46 FARRAND STREET
BLOOMFIELD, NEW JERSEY 07003

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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 @ $T_a=25^\circ\text{C}$	P_D	600	mW
Derate Above 25°C		3.43	mW/°C
Power Dissipation @ $T_c=25^\circ\text{C}$	P_D	3.0	W
Derate Above 25°C		17.2	mW/°C
Operating And Storage Junction Temperature Range	T_J, T_{stg}	- 65 to +200	°C

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

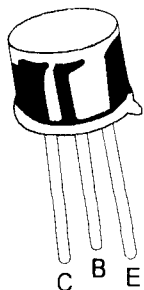
DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Voltage	$*V_{CEO}$	$I_C=10\text{mA}, I_B=0$	40			V
Collector Base Voltage	V_{CBO}	$I_C=10\mu\text{A}, I_E=0$	60			V
Emitter Base Voltage	V_{EBO}	$I_E=10\mu\text{A}, I_C=0$	5			V
Collector Cut off Current	I_{CEX}	$V_{CE}=30\text{V},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

2N2904

2N2905

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

*Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$



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

SMALL SIGNAL CHARACTERISTICS

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

SWITCHING TIME

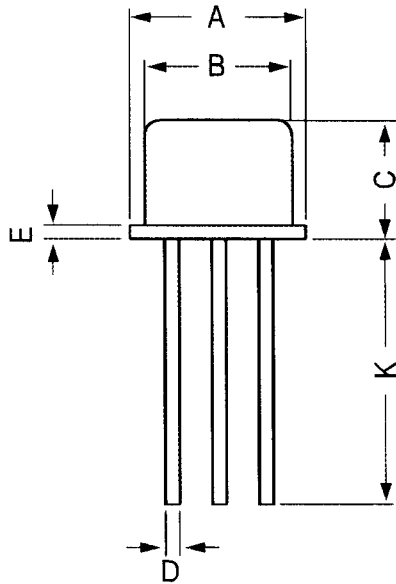
DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Delay Time	t_d	$I_C=150\text{mA}, I_{B1}=15\text{mA},$ $V_{CC}=30\text{V}$			10	ns
Rise Time	t_r				40	ns
Turn on Time	t_{on}				45	ns
Storage time	t_s	$I_C=150\text{mA}, I_{B1}=$ $I_{B2}=15\text{mA}, V_{CC}=6\text{V}$			80	ns
Fall Time	t_f				30	ns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

*Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

** f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

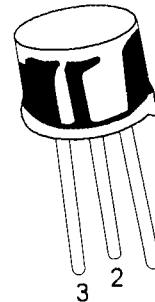
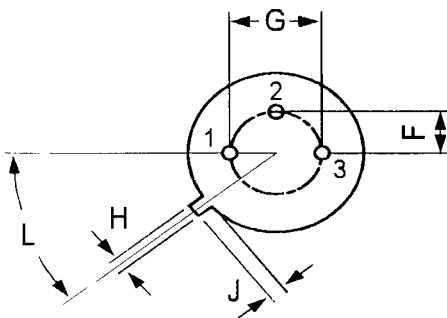
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All dimensions are in mm

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