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2N3906

PNP SMALL SIGNAL GENERAL PURPOSE AMPLIFIER AND SWITCH

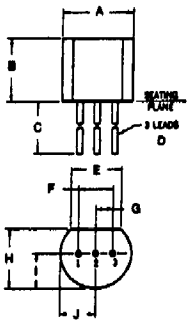
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	40	Vdc
Collector-Base Voltage	V_{CB}	40	Vdc
Emitter-Base Voltage	V_{EB}	5.0	Vdc
Collector Current	I_C	200	mAdc
Total Device Dissipation @ T_A = 25°C	P_D	350	mW
Derate above 25°C		2.73	mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	θ_{JA}	0.357	°C/mW

PHYSICAL DIMENSIONS



DIM.	INCHES MIN.	INCHES TYP.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS TYP.	MILLIMETERS MAX.
A	.175		.205	4.45		5.20
B	.170		.210	4.32		5.33
C	.500			12.70		
D	.016		.019	0.406		0.483
E	.135			.343		
F		.100			2.54	
G		.050			1.27	
H	.125		.165	3.18		4.19
I	.080		.105	2.03		2.67
J	.080		.105	2.03		2.67

NOTES: See table for dimensions in inches and millimeters
Leads are tin-plated copper
Package material is transfer molded thermosetting plastic
Package weight is 0.25 grams

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Fig. No.	Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Base Breakdown Voltage (I_C = 10 µAdc, I_E = 0)		BV_{CBO}	40	-	Vdc
Collector-Emitter Breakdown Voltage (1) (I_C = 1.0 mAdc, I_B = 0)		BV_{CEO}	40	-	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 µAdc, I_C = 0)		BV_{EBO}	5.0	-	Vdc
Collector Cutoff Current (V_{CE} = 30 Vdc, $V_{BE(off)}$ = 3.0 Vdc)		I_{CEX}	-	50	nAdc
Base Cutoff Current (V_{CE} = 30 Vdc, $V_{BE(off)}$ = 3.0 Vdc)		I_{BL}	-	50	nAdc
ON CHARACTERISTICS					
DC Current Gain (1) (I_C = 0.1 mAdc, V_{CE} = 1.0 Vdc)	15	h_{FE}	60	-	-
(I_C = 1.0 mAdc, V_{CE} = 1.0 Vdc)			80	-	
(I_C = 10 mAdc, V_{CE} = 1.0 Vdc)			100	300	
(I_C = 50 mAdc, V_{CE} = 1.0 Vdc)			60	-	
(I_C = 100 mAdc, V_{CE} = 1.0 Vdc)			30	-	
Collector-Emitter Saturation Voltage (1) (I_C = 10 mAdc, I_B = 1.0 mAdc)	16, 17	$V_{CE(sat)}$	-	0.25	Vdc
(I_C = 50 mAdc, I_B = 5.0 mAdc)			-	0.4	
Base-Emitter Saturation Voltage (1) (I_C = 10 mAdc, I_B = 1.0 mAdc)	17	$V_{BE(sat)}$	0.65	0.85	Vdc
(I_C = 50 mAdc, I_B = 5.0 mAdc)			-	0.95	

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

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SMALL-SIGNAL CHARACTERISTICS

Current-Gain—Bandwidth Product (I_C = 10 mAdc, V_{CE} = 20 Vdc, f = 100 MHz)		f_T	250	-	MHz
Output Capacitance (V_{CB} = 5.0 Vdc, I_E = 0, f = 100 kHz)	3	C_{ob}	-	4.5	pF
Input Capacitance (V_{BE} = 0.5 Vdc, I_C = 0, f = 100 kHz)	3	C_{ib}	-	10	pF
Input Impedance (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	13	h_{ie}	2.0	12	k ohms
Voltage Feedback Ratio (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	14	h_{re}	1.0	10	X 10^{-4}
Small-Signal Current Gain (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	11	h_{fe}	100	400	-
Output Admittance (I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	13	h_{oe}	3.0	60	μmhos
Noise Figure (I_C = 100 μAdc, V_{CE} = 5.0 Vdc, R_S = 1.0 k ohm, f = 10 Hz to 15.7 kHz)	9, 10	NF	- -	5.0 4.0	dB

SWITCHING CHARACTERISTICS

Delay Time	(V_{CC} = 3.0 Vdc, $V_{BE(off)}$ = 0.5 Vdc,	1, 5	t_d	-	35	ns
Rise Time	I_C = 10 mAdc, I_{B1} = 1.0 mAdc)	1, 5, 6	t_r	-	35	ns
Storage Time	(V_{CC} = 3.0 Vdc, I_C = 10 mAdc,	2, 7	t_s	- -	225	ns
Fall Time	I_{B1} = I_{B2} = 1.0 mAdc)	2, 8	t_f	- -	75	ns

(1) Pulse Test: Pulse Width = 300 μs, Duty Cycle = 2.0%.

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