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NTE188 (NPN) & NTE189 (PNP) Silicon Complementary Transistors High Voltage Amplifier & Driver

Description:

The NTE188 (NPN) and NTE189 (PNP) are complementary silicon transistors in a TO202N type package designed for general purpose, high voltage amplifier and driver applications.

Features:

- High Collector–Emitter Breakdown Voltage: $V_{(BR)CEO} = 80V @ I_C = 1mA$
- High Power Dissipation: $P_D = 10W @ T_C = +25^{\circ}C$

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}	80V
Collector–Base Voltage, V_{CB}	80V
Emitter–Base Voltage, V_{EB}	4V
Continuous Collector Current, I_C	2A
Total Power Dissipation ($T_A = +25^{\circ}C$), P_D	1W
Derate Above $25^{\circ}C$	8mW/ $^{\circ}C$
Total Power Dissipation ($T_C = +25^{\circ}C$), P_D	10W
Derate Above $25^{\circ}C$	80mW/ $^{\circ}C$
Operating Junction Temperature Range, T_J	-55° to $+150^{\circ}C$
Storage Temperature Range, T_{stg}	-55° to $+150^{\circ}C$
Thermal Resistance, Junction–to–Ambient (Note 1), R_{thJA}	125 $^{\circ}C/W$
Thermal Resistance, Junction–to–Case, R_{thJC}	12.5 $^{\circ}C/W$

Note 1. R_{thJA} is measured with the device soldered into a typical printed circuit board.

Electrical Characteristics: ($T_A = +25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1mA, I_B = 0, \text{Note 2}$	80	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100\mu A, I_C = 0$	4	–	–	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 80V, I_E = 0$	–	–	100	nA
NTE188			–	–	100	nA
NTE189		$V_{CB} = 60V, I_E = 0$	–	–	100	nA

Note 2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Electrical Characteristics (Cont'd): ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics (Note 3)						
DC Current Gain NTE188 NTE189	h_{FE}	$I_C = 50\text{mA}, V_{CE} = 1\text{V}$	60	110	–	
		$I_C = 250\text{mA}, V_{CE} = 1\text{V}$	30	65	–	
		$I_C = 50\text{mA}, V_{CE} = 1\text{V}$	–	33	–	
		$I_C = 50\text{mA}, V_{CE} = 1\text{V}$	80	160	–	
		$I_C = 50\text{mA}, V_{CE} = 1\text{V}$	50	130	–	
		$I_C = 50\text{mA}, V_{CE} = 1\text{V}$	–	8	–	
Collector–Emitter Saturation Voltage NTE188 NTE189	$V_{CE(sat)}$	$I_C = 250\text{mA}, I_B = 10\text{mA}$	–	0.18	0.4	V
		$I_C = 250\text{mA}, I_B = 25\text{mA}$	–	0.1	–	V
		$I_C = 250\text{mA}, I_B = 10\text{mA}$	–	0.22	0.5	V
		$I_C = 250\text{mA}, I_B = 25\text{mA}$	–	0.15	–	V
Base–Emitter ON Voltage NTE188 NTE189	$V_{BE(on)}$	$I_C = 250\text{mA}, V_{CE} = 5\text{V}$	–	0.76	1.2	V
			–	0.78	1.2	V
Small–Signal Characteristics						
Current Gain–Bandwidth Product NTE188 NTE189	f_T	$I_C = 250\text{mA}, V_{CE} = 5\text{V}, f = 100\text{MHz},$ Note 2	50	150	–	MHz
			50	100	–	MHz
Output Capacitance NTE188 NTE189	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0, f = 100\text{MHz}$	–	6	12	pF
			–	10	15	pF

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

