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NTE106 Silicon PNP Transistor Switching Transistor

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}	15V
Collector–Base Voltage, V_{CBO}	15V
Emitter–Base Voltage, V_{EBO}	4.5V
Continuous Collector Current, I_C	200mA
Total Device Dissipation ($T_A = +25^\circ\text{C}$), P_D	0.36W
Derate Above 25°C	2.06mW/ $^\circ\text{C}$
Total Device Dissipation ($T_C = +25^\circ\text{C}$), P_D	1.2W
Derate Above 25°C	6.9mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-65° to $+200^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+200^\circ\text{C}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 3\text{mA}$, $I_B = 0$, Note 1	15	–	–	V
	$V_{(BR)CES}$	$I_C = 100\mu\text{A}$, $V_{BE} = 0$	15	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}$, $I_E = 0$	15	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}$, $I_C = 0$	4.5	5.9	–	V
Collector Cutoff Current	I_{CES}	$V_{CE} = 8\text{V}$, $V_{BE} = 0$	–	–	10	nA
		$V_{CE} = 8\text{V}$, $V_{BE} = 0$, $T_A = +125^\circ\text{C}$	–	–	5	μA
Base Current	I_B	$V_{CE} = 8\text{V}$, $V_{BE} = 0$	–	–	1	nA
ON Characteristics						
DC Current Gain	h_{FE}	$I_C = 1\text{mA}$, $V_{CE} = 500\text{mV}$	35	–	–	
		$I_C = 10\text{mA}$, $V_{CE} = 300\text{mV}$	50	–	120	
		$I_C = 10\text{mA}$, $V_{CE} = 300\text{mV}$, $T_A = -55^\circ\text{C}$	20	–	–	
		$I_C = 50\text{mA}$, $V_{CE} = 1\text{V}$, Note 1	40	–	–	

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, 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
ON Characteristics (Cont'd)						
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1\text{mA}, I_B = 0.1\text{mA}$	–	–	0.15	V
		$I_C = 10\text{mA}, I_B = 1\text{mA}$	–	–	0.18	V
		$I_C = 50\text{mA}, I_B = 5\text{mA}$, Note 1	–	–	0.6	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 1\text{mA}, I_B = 0.1\text{mA}$	–	0.7	0.8	V
		$I_C = 10\text{mA}, I_B = 1\text{mA}$	0.75	0.86	0.90	V
		$I_C = 50\text{mA}, I_B = 5\text{mA}$, Note 1	–	1.1	1.5	V
Small–Signal Characteristics						
Current Gain–Bandwidth Product	f_T	$I_C = 10\text{mA}, V_{CE} = 10\text{V}, f = 100\text{MHz}$	850	1100	–	MHz
Output Capacitance	C_{obo}	$V_{CB} = 5\text{V}, I_E = 0, f = 140\text{kHz}$	–	2.0	3.0	pF
Input Capacitance	C_{ibo}	$V_{BE} = 500\text{mV}, I_C = 0, f = 140\text{kHz}$	–	2.0	3.5	pF
Switching Characteristics						
Turn–On Time	t_{on}	$V_{CC} = 1.5\text{V}, V_{BE} = 0, I_C = 10\text{mA}, I_{B1} = 1\text{mA}$	–	10	15	ns
Delay Time	t_d		–	5	10	ns
Rise Time	t_r		–	5	15	ns
Turn–Off Time	t_{off}	$V_{CC} = 1.5\text{V}, I_C = 10\text{mA}, I_{B1} = I_{B2} = 1\text{mA}$	–	16	20	ns
Storage Time	t_s		–	17	20	ns
Fall Time	t_f		–	8	10	ns
Storage Time	t_s	$I_C = 10\text{mA}, I_{B1} = 10\text{mA}, I_{B2} = 10\text{mA}$	–	–	20	ns

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

Note 2. f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

