

NTE46

Silicon NPN Transistor

Darlington, General Purpose Amplifier, Preamp, Driver

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CES}	100V
Collector–Base Voltage, V_{CBO}	100V
Emitter–Base Voltage, V_{EBO}	12V
Continuous Collector Current, I_C	500mA
Total Device Dissipation ($T_A = +25^\circ\text{C}$), P_D	625mW
Derate Above 25°C	5mW/ $^\circ\text{C}$
Total Device Dissipation ($T_C = +25^\circ\text{C}$), P_D	1.5W
Derate Above 25°C	12mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$
Thermal Resistance, Junction to Case, $R_{\theta JC}$	83.3 $^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient, $R_{\theta JA}$	200 $^\circ\text{C/W}$

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	$V_{(BR)CES}$	$I_C = 100\mu\text{A}$, $V_{BE} = 0$	100	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}$, $I_E = 0$	100	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$, $I_C = 0$	12	–	–	V
Collector Cutoff Voltage	I_{CBO}	$V_{CB} = 80\text{V}$, $I_E = 0$	–	–	100	nA
	I_{CES}	$V_{CE} = 80\text{V}$, $V_{BE} = 0$	–	–	500	nA
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 10\text{V}$, $I_C = 0$	–	–	100	nA

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics (Note 1)						
DC Current Gain	h_{FE}	$I_C = 10\text{mA}, V_{CE} = 5\text{V}$	10,000	–	–	
		$I_C = 100\text{mA}, V_{CE} = 5\text{V}$	10,000	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(\text{sat})}$	$I_C = 10\text{mA}, I_B = 0.01\text{mA}$	–	0.7	1.2	V
		$I_C = 100\text{mA}, I_B = 0.1\text{mA}$	–	0.8	1.5	V
Base–Emitter ON Voltage	$V_{BE(\text{on})}$	$I_C = 100\text{mA}, V_{CE} = 5\text{V}$	–	1.4	2.0	V
Small–Signal Characteristics						
Current Gain–Bandwidth Product	f_T	$I_C = 10\text{mA}, V_{CE} = 5\text{V},$ $f = 100\text{MHz}, \text{Note 2}$	125	200	–	MHz
Output Capacitance	C_{obo}	$V_{CB} = 10\text{V}, I_E = 0, f = 100\text{kHz}$	–	5.0	8.0	pF

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

Note 2. $f_T = h_{fe} \bullet f_{\text{test}}$

