



ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748-5089
<http://www.nteinc.com>

PN3645

Silicon PNP Transistor

Audio Amplifier, Switch

TO-92 Type Package

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$, Note 1 unless otherwise specified)

Collector-Emitter Voltage, V_{CEO}	60V
Collector-Base Voltage, V_{CBO}	60V
Emitter-Base Voltage, V_{EBO}	5V
Continuous Collector Current, I_C	800mA
Total Device Dissipation ($T_A = 25^\circ\text{C}$), P_D	625mW
Derate Above 25°C	5mW/ $^\circ\text{C}$
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 $^\circ\text{C/W}$

Note 1. These ratings are limiting values above which the serviceability of any semiconductor device may be impaired and are based on a maximum junction temperature of $+150^\circ\text{C}$.

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	$V_{(BR)CEO}$	$I_C = 10\text{mA}$, $I_B = 0$, Note 2	60	–	–	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}$, $I_E = 0$	60	–	–	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$, $I_C = 0$	5	–	–	V
Collector Cutoff Current	I_{CES}	$V_{CB} = 50\text{V}$, $I_E = 0$	–	–	35	nA
		$V_{CB} = 50\text{V}$, $I_E = 0$, $T_A = +65^\circ\text{C}$	–	–	2	μA
Base Cutoff Current	I_{BL}	$V_{CE} = 50\text{V}$, $I_C = 0$	–	–	35	nA
ON Characteristics (Note 2)						
DC Current Gain	h_{FE}	$V_{CE} = 10\text{V}$, $I_C = 0.1\text{mA}$	40	–	–	
		$V_{CE} = 10\text{V}$, $I_C = 1\text{mA}$	80	–	–	
		$V_{CE} = 10\text{V}$, $I_C = 10\text{mA}$	100	–	–	
		$V_{CE} = 10\text{V}$, $I_C = 150\text{mA}$	100	–	300	
		$V_{CE} = 2\text{V}$, $I_C = 300\text{mA}$	20	–	–	
		$V_{CE} = 1\text{V}$, $I_C = 50\text{mA}$	80	–	240	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 50\text{mA}$, $I_B = 2.5\text{mA}$	–	–	0.25	V
		$I_C = 150\text{mA}$, $I_B = 15\text{mA}$	–	–	0.4	V

Note 2. 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) (Note 2)						
Base-Emitter Saturation Voltage	V _{BE(sat)}	I _C = 50mA, I _B = 2.5mA	–	–	1.0	V
		I _C = 150mA, I _B = 15mA	–	–	1.3	V
Small Signal Characteristics						
Output Capacitance	C _{ob}	V _{CB} = 10V, f = 140kHz	–	–	8	pF
Input Capacitance	C _{ib}	V _{BE} = 0.5V, f = 140kHz	–	–	35	pF
Small-Signal Current Gain	h _{fe}	I _C = 20mA, V _{CE} = 20V, f = 100MHz	2.0	–	–	
Switching Characteristics						
Turn-On Time	t _{on}	V _{CC} = 30V, I _C = 300mA, I _{B1} = 30mA	–	–	40	ns
Delay Time	t _d		–	–	25	ns
Rise Time	t _r		–	–	35	ns
Turn-Off Time	t _{off}	V _{CC} = 30V, I _C = 300mA, I _{B1} = I _{B2} = 30mA	–	–	100	ns
Storage Time	t _s		–	–	70	ns
Fall Time	t _f		–	–	50	ns

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

