



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

## 2N5210

### Silicon NPN Transistor Audio Amplifier, Switch TO-92 Type Package

**Absolute Maximum Ratings:**

Collector–Emitter Voltage, $V_{CEO}$ .....	50V
Collector–Base Voltage, $V_{CBO}$ .....	50V
Emitter–Base Voltage, $V_{EBO}$ .....	4V
Continuous Collector Current, $I_C$ .....	50mA
Total Device Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_D$ .....	625mW
Derate Above $25^\circ\text{C}$ .....	5.0mW/ $^\circ\text{C}$
Total Device Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ .....	1.5W
Derate Above $25^\circ\text{C}$ .....	12mW/ $^\circ\text{C}$
Operating Junction Temperature Range, $T_J$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	83.3 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction–to–Ambient, $R_{thJA}$ .....	200 $^\circ\text{C}/\text{W}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_B = 0$	50	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 0.1\text{mA}, I_E = 0$	50	–	–	V
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 35\text{V}, I_E = 0$	–	–	50	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 3\text{V}, I_C = 0$	–	–	50	nA
<b>ON Characteristics</b>						
DC Current Gain	$h_{FE}$	$V_{CE} = 5\text{V}, I_C = 100\mu\text{A}$	200	–	600	
		$V_{CE} = 5\text{V}, I_C = 1\text{mA}$	250	–	–	
		$V_{CE} = 5\text{V}, I_C = 10\text{mA}, \text{Note 1}$	250	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 1\text{mA}$	–	–	0.7	V
Base–Emitter ON Voltage	$V_{BE(on)}$	$I_C = 1\text{mA}, V_{CE} = 5\text{V}$	–	–	0.85	V

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

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Small-Signal Characteristics</b>						
Current Gain-Bandwidth Product	$f_T$	$I_C = 500\mu\text{A}, V_{CE} = 5\text{V}, f = 20\text{MHz}$	30	-	-	MHz
Collector-Base Capacitance	$C_{cb}$	$V_{CB} = 5\text{V}, I_E = 0, f = 1\text{MHz}$	-	-	4	pF
Small-Signal Current Gain	$h_{fe}$	$I_C = 1\text{mA}, V_{CE} = 5\text{V}, f = 1\text{kHz}$	250	-	900	
Noise Figure	NF	$I_C = 20\mu\text{A}, V_{CE} = 5\text{V}, f = 1\text{kHz}, R_S = 22\text{k}\Omega, f = 1\text{kHz}$	-	-	2	dB
		$I_C = 20\mu\text{A}, V_{CE} = 5\text{V}, f = 1\text{kHz}, R_S = 10\text{k}\Omega, f = 1\text{kHz}$	-	-	3	dB

