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## NTE2409 Silicon PNP Transistor General Purpose Amp, Surface Mount (Compl to NTE2408)

### Description:

The NTE2409 is a silicon PNP general purpose transistor in a SOT-23 type surface mount package designed for use in driver stages of audio amplifiers in thick and thin-film hybrid circuits.

### Absolute Maximum Ratings:

Collector-Base Voltage, $V_{CBO}$ .....	80V
Collector-Emitter Voltage, $V_{CEX}$ .....	80V
Collector-Emitter Voltage, $V_{CEO}$ .....	65V
Emitter-Base Voltage, $V_{EBO}$ .....	5V
Collector Current, $I_C$	
Continuous .....	100mA
Peak .....	200mA
Peak Emitter Current, $I_{EM}$ .....	200mA
Peak Base Current, $I_{BM}$ .....	200mA
Total Power Dissipation ( $T_A = +60^\circ\text{C}$ , Note 1), $P_{tot}$ .....	200mW
Junction Temperature, $T_J$ .....	+150°C
Storage Temperature Range, $T_{stg}$ .....	-65 ° to +150°C
Thermal Resistance, Junction-to-Tab, $R_{thJT}$ .....	60K/W
Thermal Resistance, Tab-to-Soldering Points, $R_{thTS}$ .....	280K/W
Thermal Resistance, Soldering Points-to-Ambient (Note 1), $R_{thSA}$ .....	90K/W

Note 1. Mounted on a ceramic substrate .314 (8mm) x .393 (10mm) x .027 (0.7mm).

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 30\text{V}, I_E = 0$	-	1	15	nA
		$V_{CB} = 30\text{V}, I_E = 0, T_J = +150^\circ\text{C}$	-	-	4	$\mu\text{A}$
Base-Emitter Voltage	$V_{BE}$	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$ , Note 2	600	650	750	mV
		$V_{CE} = 5\text{V}, I_C = 10\text{mA}$ , Note 2	-	-	820	mV
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}$ , Note 3	-	75	300	mV
		$I_C = 100\text{mA}, I_B = 5\text{mA}$ , Note 3	-	250	650	mV

Note 2.  $V_{BE}$  decreases by about 2mV/K with increasing temperature.

Note 3.  $V_{BE(sat)}$  decreases by about 1.7mV with increasing temperature.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{mA}, I_B = 0.5\text{mA}, \text{Note 3}$	-	700	-	mV
		$I_C = 100\text{mA}, I_B = 5\text{mA}, \text{Note 3}$	-	850	-	mV
DC Current Gain	$h_{FE}$	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$	220	-	475	
Transition Frequency	$f_T$	$V_{CE} = 5\text{V}, I_C = 10\text{mA}, f = 35\text{MHz}$	-	150	-	MHz
Collector Capacitance	$C_c$	$V_{CB} = 10\text{V}, I_E = I_e = 0, f = 1\text{MHz}$	-	4.5	-	pF
Small-Signal Current Gain	$h_{fe}$	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$	75	-	900	
Noise Figure	NF	$V_{CE} = 5\text{V}, I_C = 200\mu\text{A}, f = 1\text{kHz}, B = 200\text{Hz}, R_S = 2\text{k}\Omega$	-	2	10	dB

Note 3.  $V_{BE(sat)}$  decreases by about 1.7mV with increasing temperature.

