

## NTE291 (NPN) & NTE292 (PNP) Silicon Complementary Transistors Medium Power Amp, Switch

### **Description:**

The NTE291 (NPN) and NTE292 (PNP) are General-Purpose Medium-Power silicon complementary transistors in a TO220 type package designed for switching and amplifier applications. They are especially designed for series and shunt regulators and as a driver and output stage of high-fidelity amplifiers.

### **Features:**

- Low Saturation Voltage

### **Absolute Maximum Ratings:**

Collector-to-Base Voltage, $V_{CBO}$ .....	130V
Collector-to-Emitter Voltage ( $R_{BB} = 100\Omega$ , $V_{BB} = 0$ ), $V_{CEX}$ .....	130V
Collector-to-Emitter Voltage, $V_{CEO}$ .....	120V
Emitter-to-Base Voltage, $V_{EBO}$ .....	5V
Continuous Collector Current ( $T_C \leq +106^\circ\text{C}$ ), $I_C$ .....	4A
Continuous Base Current ( $T_C \leq +130^\circ\text{C}$ ), $I_B$ .....	2A
Power Dissipation, $P_D$	
$T_C = +100^\circ\text{C}$ .....	16W
Derate Linearly Above $T_C = +100^\circ\text{C}$ .....	0.32W/ $^\circ\text{C}$
$T_C = +25^\circ\text{C}$ .....	40W
Derate Linearly Above $T_C = +25^\circ\text{C}$ .....	0.32W/ $^\circ\text{C}$
$T_A = +25^\circ\text{C}$ .....	1.8W
Derate Linearly Above $T_A = +25^\circ\text{C}$ .....	0.0144W/ $^\circ\text{C}$
Operating Temperature Range, $T_{opr}$ .....	$-65^\circ$ to $+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+150^\circ\text{C}$
Lead Temperature (During Soldering), $T_L$	
At distance $\geq 1/8$ in. (3.17mm) from case for 10s Max .....	$+235^\circ\text{C}$
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	3.125 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....	70 $^\circ\text{C}/\text{W}$

Note 1. NTE292MCP is a matched complementary pair containing 1 each of NTE291 (NPN) and NTE292 (PNP).

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector Cutoff Current	$I_{CEO}$	$V_{CE} = 60\text{V}, I_B = 0$	–	–	1	mA
Collector Cutoff Current	$I_{CER}$	$R_{BE} = 100\Omega, V_{CE} = 120\text{V}$	–	–	0.1	mA
		$R_{BE} = 100\Omega, V_{CE} = 120\text{V}, T_C = +100^\circ\text{C}$	–	–	2	mA
Collector Cutoff Current	$I_{CEX}$	$V_{CE} = 120\text{V}, V_{BE} = -1.5\text{V}$	–	–	0.1	mA
		$V_{CE} = 120\text{V}, V_{BE} = -1.5\text{V}, T_C = +100^\circ\text{C}$	–	–	2	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{BE} = -5\text{V}, I_C = 0$	–	–	1	mA
Collector-to-Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 0.1\text{A}, I_B = 0, \text{Note 1}$	120	–	–	V
Collector-to-Emitter Sustaining Voltage	$V_{CER(sus)}$	$R_{BE} = 100\Omega, I_C = 0.1\text{A}, \text{Note 2}$	130	–	–	V
DC Forward Current	$h_{FE}$	$V_{CE} = 4\text{V}, I_C = 1.5\text{A}, \text{Note 1}$	15	–	150	
		$V_{CE} = 2.5\text{V}, I_C = 4\text{A}, \text{Note 1}$	2	–	–	
Base-to-Emitter Voltage	$V_{BE}$	$V_{CE} = 4\text{V}, I_C = 1.5\text{A}, \text{Note 1}$	–	–	2	V
		$V_{CE} = 2.5\text{V}, I_C = 4\text{A}, \text{Note 1}$	–	–	3.5	V
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1.5\text{A}, I_B = 0.15\text{A}, \text{Note 1}$	–	–	1.2	V
		$I_C = 4\text{A}, I_B = 2\text{A}, \text{Note 1}$	–	–	2.5	V
Small Signal Forward Current Transfer Ratio	$h_{fe}$	$V_{CE} = 4\text{V}, I_C = 0.5\text{A}, f = 50\text{kHz}$	20	–	–	
Gain Bandwidth Product	$f_T$	$V_{CE} = 4\text{V}, I_C = 0.5\text{A}$	4	–	–	MHz
Small Signal Forward Current Transfer Ratio	$ h_{fe} $	$V_{CE} = 4\text{V}, I_C = 0.5\text{A}, f = 50\text{kHz}$	4	–	–	
Collector-to-Base Capacitance	$C_{obo}$	$V_{CB} = 10\text{V}, I_C = 0, f = 1\text{MHz}$	–	–	250	pF

Note 1. Pulsed: Pulse Duration = 300 $\mu\text{s}$ , Duty Factor = 0.018.

Note 2. **CAUTION:** The sustaining voltage ( $V_{CER(sus)}$ ) **MUST NOT** be measured on a curve tracer.

