



ELECTRONICS, INC.

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

## NTE2581 Silicon NPN Transistor High Speed Switching Regulator

### Features:

- High Breakdown Voltage and High Reliability
- Fast Switching Speed
- Wide ASO

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

Collector–Base Voltage, $V_{CBO}$ .....	500V
Collector–Emitter Voltage, $V_{CEO}$ .....	400V
Emitter–Base Voltage, $V_{EBO}$ .....	7V
Collector Current, $I_C$	
Continuous .....	12A
Pulsed (Note 1) .....	25A
Base Current, $I_B$ .....	4A
Collector Dissipation, $P_C$	
$T_A = +25^\circ\text{C}$ .....	1.75W
$T_C = +25^\circ\text{C}$ .....	70W
Operating Junction Temperature, $T_J$ .....	$+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ\text{C}$

Note 1. Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 10\%$ .

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 400\text{V}, I_E = 0$	–	–	10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5\text{V}, I_C = 0$	–	–	10	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = 5\text{V}, I_C = 1.6\text{A}$	20	–	40	
		$V_{CE} = 5\text{V}, I_C = 8\text{A}$	10	–	–	
		$V_{CE} = 5\text{V}, I_C = 10\text{mA}$	10	–	–	
Current Gain–Bandwidth Product	$f_T$	$V_{CE} = 10\text{V}, I_C = 1.6\text{A}$	–	20	–	MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, f = 1\text{MHz}$	–	160	–	pF
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 8\text{A}, I_B = 1.6\text{A}$	–	–	0.8	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 8\text{A}, I_B = 1.6\text{A}$	–	–	1.5	V

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 1\text{mA}, I_E = 0$	500	–	–	V
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 10\text{mA}, R_{BE} = \infty$	400	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 1\text{mA}, I_C = 0$	7	–	–	V
Collector–Emitter Sustaining Voltage	$V_{CEX(sus)}$	$I_C = 6\text{A}, I_{B1} = 0.6\text{A}, I_{B2} = -2.4\text{A}, L = 500\mu\text{H}, \text{Clamped}$	400	–	–	V
Turn–On Time	$t_{on}$	$I_C = 10\text{A}, I_{B1} = 2\text{A}, I_{B2} = -4\text{A}, R_L = 20\Omega, V_{CC} = 200\text{V}, \text{Note 2}$	–	–	0.5	$\mu\text{s}$
Storage Time	$t_{stg}$		–	–	2.5	$\mu\text{s}$
Fall Time	$t_f$		–	–	0.3	$\mu\text{s}$

Note 2. Pulse Width =  $20\mu\text{s}$ , Duty Cycle  $\leq 1\%$ .

