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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° 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	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5\text{V}, I_C = 0$	–	–	10	μA
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	μs
Storage Time	t_{stg}		–	–	2.5	μs
Fall Time	t_f		–	–	0.3	μs

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

