



ELECTRONICS, INC.
 44 FARRAND STREET
 BLOOMFIELD, NJ 07003
 (973) 748-5089

NTE256 Silicon NPN Transistor Darlington ^w/Damper Diode

Description:

The NTE256 is a silicon epitaxial planer NPN Darlington transistor in a TO218 type package with an integrated Base–Emitter speed–up diode. This device is particularly suitable for use as an output stage in high power, fast switching applications.

Absolute Maximum Ratings:

Collector–Base Voltage ($I_E = 0$), V_{CBO}	600V
Collector–Emitter Voltage ($I_B = 0$), V_{CEO}	400V
Emitter–Base Voltage ($I_C = 0$), V_{EBO}	10V
Collector Current, I_C	
Continuous	28A
Peak ($t_p = 10ms$)	35A
Base Current, I_B	6A
Total Power Dissipation ($T_C \leq +25^\circ C$), P_{tot}	150W
Operating Junction Temperature, T_J	+175°C
Storage Temperature Range, T_{stg}	–65° to + 175°C
Thermal Resistance, Junction–to–Case, R_{thJC}	1.0°C/W

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector Cutoff Current	I_{CEO}	$V_{CEO} = 400V, I_B = 0$	–	–	1	mA
	I_{CEV}	$V_{CE} = 600V, V_{BE} = 1.5V, \text{Note 1}$	–	–	100	µA
		$V_{CE} = 600V, V_{BE} = 1.5V, T_C = +100^\circ C, \text{Note 1}$	–	–	2	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 2V, I_C = 0, \text{Note 1}$	–	–	175	mA
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 100mA, \text{Note 1}$	400	–	–	V
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10A, I_B = 0.5A$	–	–	2.0	V
		$I_C = 18A, I_B = 1.8A$	–	–	2.5	V
		$I_C = 22A, I_B = 2.2A$	–	–	3.0	V
		$I_C = 28A, I_B = 5.6A$	–	–	5.0	V

Note 1. Pulsed: Pulse Width = 300µs, Duty Cycle = 1.5%.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10\text{A}, I_B = 0.5\text{A}$, Note 1	–	–	2.5	V
		$I_C = 18\text{A}, I_B = 1.8\text{A}$, Note 1	–	–	3.0	V
		$I_C = 22\text{A}, I_B = 2.2\text{A}$, Note 1	–	–	3.3	V
DC Current Gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 10\text{A}$	30	–	–	
		$V_{CE} = 5\text{V}, I_C = 18\text{A}$	20	–	–	
Diode Forward Voltage	V_F	$I_F = 22\text{A}$	–	–	4	V
Resistive Switching Times						
Turn–On Time	t_{on}	$V_{CC} = 250\text{V}, I_C = 10\text{A}, I_{B1} = 0.5\text{A},$ $V_{BE(off)} = -5\text{V}$	–	0.35	0.6	μs
Storage Time	t_s		–	0.8	1.5	μs
Fall Time	t_f		–	0.25	0.6	μs
Inductive Switching Times						
Storage Time	t_s	$V_{Clamp} = 250\text{V}, I_C = 10\text{A}, I_{B1} = 0.5\text{A},$ $V_{BE(off)} = -5\text{V}$	–	0.8	1.5	μs
Fall Time	t_f		–	0.08	0.5	μs
Storage Time	t_s	$V_{Clamp} = 250\text{V}, I_C = 20\text{A}, I_{B1} = 2\text{A},$ $V_{BE(off)} = -5\text{V}$	–	0.8	1.5	μs
Fall Time	t_f		–	0.35	0.7	μs

Note 1. Pulsed: Pulse Width = $300\mu\text{s}$, Duty Cycle = 1.5%.

