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

NTE128 (NPN) & NTE129 (PNP)
Silicon Complementary Transistors
Audio Output, Video, Driver

Description:
The NTE128 (NPN) and NTE129 (PNP) are silicon complementary transistors in a TO39 type package designed primarily for amplifier and switching applications. These devices features high breakdown voltages, low leakage currents, low capacity, and a beta useful over an extremely wide current range.

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}	80V
Collector–Base Voltage, V_{CBO}	
NTE128	140V
NTE129	80V
Emitter–Base Voltage, V_{EBO}	
NTE128	7V
NTE129	5V
Continuous Collector Current, I_C	1A
Total Device Dissipation (T_A = +25°C), P_D	
NTE128	0.8W
Derate Above 25°C	4.6mW/°C
NTE129	1.25W
Derate Above 25°C	7.15mW/°C
Total Device Dissipation (T_C = +25°C), P_D	
NTE128	5W
Derate Above 25°C	28.6mW/°C
NTE129	7W
Derate Above 25°C	40mW/°C
Operating Junction Temperature Range, T_J	–65° to +200°C
Storage Temperature Range, T_{stg}	–65° to +200°C
Thermal Resistance, Junction–to–Case, R_{thJC}	
NTE128	16.5°C/W
NTE129	20°C/W
Thermal Resistance, Junction–to–Ambient, R_{thJA}	
NTE128	89.5°C/W
NTE129	140°C/W
Lead Temperature (During Soldering, 1/16" from case, 60sec max), T_L	+300°C

Note 1. NTE129MCP is a matched complementary pair containing 1 each of NTE128 (NPN) and NTE129 (PNP).

Electrical Characteristics: (T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Breakdown Voltage NTE128	$V_{(BR)CEO}$	I_C = 30mA, I_B = 0	80	–	–	V
NTE129		I_C = 10mA	80	–	–	V
Collector–Base Breakdown Voltage NTE128	$V_{(BR)CBO}$	I_C = 100μA, I_E = 0	140	–	–	V
NTE129		I_C = 10μA	80	–	–	V
Emitter–Base Breakdown Voltage NTE128	$V_{(BR)EBO}$	I_E = 100μA, I_C = 0	7	–	–	V
NTE129		I_E = 10μA	5	–	–	V
Collector Cutoff Current NTE128	I_{CBO}	V_{CB} = 90V, I_E = 0	–	–	0.01	μA
		V_{CB} = 90V, I_E = 0, T_A = +150°C	–	–	10	μA
NTE129		V_{CB} = 60V	–	–	50	nA
		V_{CB} = 60V, T_A = +150°C	–	–	50	μA
Emitter Cutoff Current NTE128	I_{EBO}	V_{BE} = 5V, I_C = 0	–	–	0.010	μA
NTE129		V_{BE} = 5V	–	–	10	μA
ON Characteristics (Note 2)						
DC Current Gain NTE128	h_{FE}	I_C = 0.1mA, V_{CE} = 10V	50	–	–	
		I_C = 10mA, V_{CE} = 10V	90	–	–	
		I_C = 150mA, V_{CE} = 10V	100	–	300	
		I_C = 150mA, V_{CE} = 10V, T_C = –55°C	40	–	–	
		I_C = 500mA, V_{CE} = 10V	50	–	–	
		I_C = 1.0A, V_{CE} = 10V	15	–	–	
NTE129		I_C = 100μA, V_{CE} = 5V	75	–	–	
		I_C = 100mA, V_{CE} = 5V	100	–	300	
		I_C = 100mA, V_{CE} = 5V, T_C = –55°C	40	–	–	
		I_C = 500mA, V_{CE} = 5V	70	–	–	
		I_C = 1.0A, V_{CE} = 5V	25	–	–	
Collector–Emitter Saturation Voltage NTE128	$V_{CE(sat)}$	I_C = 150mA, I_B = 15mA	–	–	0.2	V
		I_C = 500mA, I_B = 50mA	–	–	0.5	V
NTE129		I_C = 150mA, I_B = 15mA	–	–	0.15	V
		I_C = 500mA, I_B = 50mA	–	–	0.5	V
Base–Emitter Saturation Voltage NTE128	$V_{BE(sat)}$	I_C = 150mA, I_B = 15mA	–	–	1.1	V
NTE129			–	–	0.9	V
Base–Emitter ON Voltage (NTE129 Only)	$V_{BE(on)}$	I_C = 500mA, V_{CE} = 500mV	–	–	1.1	V

Note 2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 1%.

Electrical Characteristics (Cont'd): T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Small–Signal Characteristics						
Current–Gain – Bandwidth Product (NTE128 Only)	f_T	I_C = 50mA, V_{CE} = 10V, f = 20MHz	100	–	400	MHz
Output Capacitance NTE128	C_{obo}	V_{CB} = 10V, I_E = 0, f = 1MHz	–	–	12	pF
NTE129		V_{CE} = 10V, f = 1MHz	–	–	20	pF
Input Capacitance NTE128	C_{ibo}	V_{BE} = 500mV, I_C = 0, f = 1MHz	–	–	60	pF
NTE129		V_{EB} = 500mV, f = 1MHz	–	–	110	pF
Small–Signal Current Gain NTE128	h_{fe}	I_C = 1mA, V_{CE} = 5V, f = 1kHz	80	–	400	
NTE129		I_C = 50mA, V_{CE} = 10V, f = 100MHz	1	–	4	
Collector–Base Time Constant (NTE128 Only)	$rb'C_c$	I_E = 10mA, V_{CB} = 10V, f = 79.8MHz	–	–	400	ps
Noise Figure (NTE128 Only)	NF	I_C = 100μA, V_{CE} = 10V, R_S = 1kΩ, f = 1kHz	–	–	4	dB
Switching Characteristics (NTE129 Only)						
Storage Time	t_s	I_C = 500mA, I_{B1} = I_{B2} = 50mA	–	–	350	ns
Turn–On Time	t_{on}	I_C = 500mA, I_{B1} = 50mA	–	–	100	ns
Fall Time	t_f	I_C = 500mA, I_{B1} = I_{B2} = 50mA	–	–	50	ns