



NTE2357 (NPN) & NTE2358 (PNP) Silicon Complementary Transistors Digital ^{w/2} Built-In 22k Bias Resistors

Features:

- Built-In Bias Resistor ($R_1 = 22k\Omega$, $R_2 = 22k\Omega$)
- Small-Sized Package (TO92 type)

Applications:

- Switching Circuit
- Inverter
- Interface Circuit
- Driver

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

Collector to Base Voltage, V_{CBO}	50V
Collector to Emitter Voltage, V_{CEO}	50V
Emitter to Base Voltage, V_{EBO}	10V
Collector Current, I_C	
Continuous	100mA
Peak	200mA
Collector Dissipation, P_C	300mW
Operating Junction Temperature, T_J	+150°C
Storage Temperature Range, T_{stg}	-55° to +160°C

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector Cutoff Current	I_{CBO}	$V_{CB} = 40V$, $I_E = 0$	–	–	0.1	μA
	I_{CEO}	$V_{CE} = 40V$, $I_B = 0$	–	–	0.5	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5V$, $I_C = 0$	70	113	150	μA
DC Current Gain	h_{FE}	$V_{CE} = 5V$, $I_C = 5mA$	50	–	–	
Gain Band-width Product NTE2357	f_T	$V_{CE} = 10V$, $I_C = 5mA$	–	250	–	MHz
NTE2358			–	200	–	MHz
Output Capacitance NTE2357	C_{ob}	$V_{CB} = 10V$, $f = 1MHz$	–	3.7	–	pF
NTE2358			–	5.5	–	pF

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}$, $I_B = 0.5\text{mA}$	–	0.1	0.3	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}$, $I_E = 0$	50	–	–	V
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 100\mu\text{A}$, $R_{BE} = \infty$	50	–	–	V
Input OFF Voltage	$V_{I(off)}$	$V_{CE} = 5\text{V}$, $I_C = 100\mu\text{A}$	0.8	1.1	1.5	V
Input ON Voltage	$V_{I(on)}$	$V_{CE} = 200\text{mV}$, $I_C = 5\text{mA}$	1.0	1.9	3.0	V
Input Resistance	R_1		15	22	29	$k\Omega$
Input Resistance Ratio	R_1/R_2		0.9	1.0	1.1	

Schematic Diagram

