

## NTE2023 Integrated Circuit General Purpose, High Current 7-Segment Display Driver

**Description:**

The NTE2023 is a general purpose high current transistor array in a 16-Lead DIP type package comprised of seven high current silicon NPN transistor on a common monolithic substrate. It is connected in a common-collector configuration.

**Absolute Maximum Ratings:**

Power Dissipation (Any One Transistor),  $P_D$  ..... 500mW  
 Operating Ambient Temperature Range,  $T_{opr}$  .....  $-40^\circ$  to  $+85^\circ\text{C}$

**Individual Transistor Ratings:**

Collector-Emitter Voltage,  $V_{CEO}$  ..... 16V  
 Collector-Base Voltage,  $V_{CBO}$  ..... 20V  
 Collector-Substrate Voltage,  $V_{CIO}$  ..... 20V  
 Emitter-Base Voltage,  $V_{EBO}$  ..... 5V  
 Collector Current,  $I_C$  ..... 200mA  
 Base Current,  $I_B$  ..... 20mA

Note 1. The collector of each transistor in the NTE2023 is isolated from the substrate by an integral diode. The substrate must be connected to a voltage which is more negative than any collector voltage so as to maintain isolation between transistors, and to provide normal transistor action. Undesired coupling between transistors is avoided by maintaining the substrate (5) at either DC or signal (AC) ground. An appropriate bypass capacitor can be used to establish a signal ground.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C = 500\mu\text{A}$	20	80	-	V
Collector-Substrate Breakdown Voltage	$V_{(BR)CIE}$	$I_{CI} = 500\mu\text{A}$	20	80	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$	16	40	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_C = 500\mu\text{A}$	5	7	-	V
Forward Current Transfer Ratio	$h_{FE}$	$V_{CE} = 0.5\text{V}, I_C = 30\text{mA}$	30	80	-	
		$V_{CE} = 0.8\text{V}, I_C = 50\text{mA}$	40	85	-	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 30\text{mA}$	–	0.75	1	V
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 30\text{mA}$	–	0.13	0.5	V
		$I_C = 50\text{mA}$	–	0.2	0.7	V
Collector Cutoff Current	$I_{CEO}$	$V_{CE} = 10\text{V}$	–	–	10	$\mu\text{A}$
	$I_{CBO}$	$V_{CB} = 10\text{V}$	–	–	1	$\mu\text{A}$

**Pin Connection Diagram**

