

## NTE154 Silicon NPN Transistor High Voltage Video Output

**Description:**

The NTE154 is a silicon NPN transistor in a TO39 type package designed for use as a video output to drive a color CRT.

**Features:**

- High Voltage:  $V_{CEO} = 300V$  Min @  $I_C = 5mA$
- Low Capacitance:  $C_{ob} = 3pF$  Max @  $V_{CB} = 20V$
- High Frequency:  $f_t = 50MHz$  Min @  $I_C = 15mA$
- High Power Dissipation:  $P_D = 7W$  @  $T_C = +25^\circ C$

**Absolute Maximum Ratings:** (Note 1)

Collector to Base Voltage, $V_{CBO}$ .....	300V
Collector to Emitter Voltage (Note 2), $V_{CEO}$ .....	300V
Emitter to Base Voltage, $V_{EBO}$ .....	7V
Total Power Dissipation (Note 3, Note 4), $P_D$	
$T_C = +25^\circ C$ .....	7W
$T_A = +25^\circ C$ .....	1W
Operating Junction Temperature, $T_{opr}$ .....	+200°C
Storage Temperature Range, $T_{stg}$ .....	-65° to +200°C
Lead Temperature (During Soldering, 60sec), $T_L$ .....	+300°C

Note 1. These ratings are limiting values above which the serviceability of this device may be impaired.

Note 2. This rating refers to a high current point where collector to emitter voltage is lowest.

Note 3. These ratings are steady state limits.

Note 4. These ratings give a maximum junction temperature of +200°C and junction to case thermal resistance of +25°C/W (derating factor of 40mW/°C); junction to ambient thermal resistance of +175°C/W (derating factor of 5.71mW/°C).

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}, I_E = 0$	300	–	–	V
Emitter Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}, I_C = 0$	7	–	–	V
Collector Cutoff Current	$I_{CBO}$	$I_E = 0, V_{CB} = 200\text{V}$	–	1.0	100	nA
		$I_E = 0, V_{CB} = 200\text{V}, T_A = +125^\circ\text{C}$	–	0.2	5.0	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$I_C = 0, V_{EB} = 6\text{V}$	–	1.0	100	nA
DC Current Gain	$h_{FE}$	$I_C = 1\text{mA}, V_{CE} = 20\text{V}$	20	50	–	
		$I_C = 10\text{mA}, V_{CE} = 20\text{V}, \text{Note 5}$	40	100	–	
		$I_C = 30\text{mA}, V_{CE} = 20\text{V}, \text{Note 5}$	40	100	–	
Collector Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 5\text{mA}, I_B = 0, \text{Note 2, Note 5}$	300	–	–	V
Base Emitter Saturating Voltage	$V_{BE(sat)}$	$I_C = 20\text{mA}, I_B = 2\text{mA}, \text{Note 5}$	–	0.74	0.85	V
Collector Emitter Saturating Voltage	$V_{CE(sat)}$	$I_C = 20\text{mA}, I_B = 2\text{mA}, \text{Note 5}$	–	0.35	1.0	V
High Frequency Current Gain	$h_{fe}$	$I_C = 15\text{mA}, V_{CE} = 150\text{V}, f = 20\text{MHz}$	2.5	4.0	–	
		$I_C = 3\text{mA}, V_{CE} = 270\text{V}, f = 20\text{MHz}$	2.0	2.5	–	
		$I_C = 30\text{mA}, V_{CE} = 30\text{V}, f = 20\text{MHz}, R_L = 9\text{k}\Omega$	2.0	4.0	–	
Collector Base Capacitance	$C_{cb}$	$I_E = 0, V_{CB} = 20\text{V}$	–	2.5	3.0	pF
Emitter Base Capacitance	$C_{eb}$	$I_C = 0, V_{EB} = 500\text{mV}$	–	45	70	pF

Note 2. This rating refers to a high current point where collector to emitter voltage is lowest.

Note 5. Pulse Conditions: Length =  $300\mu\text{s}$ , Duty Cycle = 1%.

