



ELECTRONICS, INC.
 44 FARRAND STREET
 BLOOMFIELD, NJ 07003
 (973) 748-5089
<http://www.nteinc.com>

2N2102 Silicon NPN Transistor General Purpose Amplifier and Switch TO-39 Type Package

Description:

The 2N2102 is a silicon NPN transistor in a TO39 type package intended for a wide variety of small-signal and medium power applications in military and industrial equipment.

Absolute Maximum Ratings:

Collector-Base Voltage ($I_E = 0$), V_{CBO}	120V
Collector-Emitter Voltage ($I_B = 0$), V_{CEO}	65V
Collector-Emitter Voltage ($R_{BE} \leq 10\Omega$), V_{CER}	80V
Emitter-Base Voltage ($I_C = 0$), V_{EBO}	7V
Collector Current, I_C	1A
Total Device Dissipation, P_D	
$T_A \leq +25^\circ C$	1W
$T_C \leq +25^\circ C$	5W
Operating Junction Temperature, T_J	+175°C
Storage Temperature Range, T_{stg}	-65° to +175°C
Thermal Resistance, Junction-to-Case, R_{thJC}	+30°C/W
Thermal Resistance, Junction-to-Ambient, R_{thJA}	+150°C/W

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector Cutoff Current	I_{CBO}	$V_{CB} = 60V$	-	-	2	nA
		$T_C = +150^\circ C$	-	-	2	μA
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 5V$	-	-	5	nA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 100\mu A, I_E = 0$	120	-	-	V
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 30mA, I_B = 0$, Note 1	65	-	-	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 150mA, I_B = 15mA$, Note 1	-	-	0.5	V
Base-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 150mA, I_B = 15mA$, Note 1	-	-	1.1	V

Note 1. Pulse Test: Pulse Width + 300 μs , Duty Cycle \leq 1%.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
DC Current Gain	h_{FE}	$V_{CE} = 10\text{V}$, Note 1	$I_C = 10\mu\text{A}$	10	-	-	
			$I_C = 100\mu\text{A}$	20	-	-	
			$I_C = 10\text{mA}$	35	-	-	
			$I_C = 150\text{mA}$	40	-	120	
			$I_C = 500\text{mA}$	25	-	-	
			$I_C = 1\text{A}$	10	-	-	
High Frequency Current Gain	h_{fe}	$I_C = 50\text{mA}$, $V_{CE} = 10\text{V}$, $f = 20\text{MHz}$, Note 1	-	6	-		
Noise Figure	NF	$I_C = 300\mu\text{A}$, $V_{CE} = 10\text{V}$, $f = 1\text{KHz}$, $\text{BW} = 1\text{Hz}$, $R_g = 510\Omega$	-	-	8	dB	
Collector-Base Capacitance	C_{CBO}	$I_E = 0$, $V_{CB} = 10\text{V}$, $f = 1\text{MHz}$	-	-	15	pF	
Emitter-Base Capacitance	C_{EBO}	$I_C = 0$, $V_{EB} = 500\text{mV}$, $f = 1\text{MHz}$	-	-	80	pF	

Note 1. Pulse Test: Pulse Width + $300\mu\text{s}$, Duty Cycle $\leq 1\%$.

