

# NPN SILICON HIGH FREQUENCY TRANSISTOR

## DESCRIPTION:

The **2N5109** is a High Frequency Transistor for General Purpose Amplifier Applications.

## MAXIMUM RATINGS

$I_C$	400 mA
$V_{CE}$	20 V
$P_{DISS}$	1.0 W @ $T_A = 25^\circ C$ 2.5 W @ $T_C = 75^\circ C$

**PACKAGE STYLE TO-39**

SYMBOL	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
$\phi a$	0.190	0.210	4.83	5.33
A	0.240	0.260	6.10	6.60
$\phi b$	0.016	0.021	0.406	0.533
$\phi b_2$	0.016	0.019	0.406	0.483
$\phi D$	0.350	0.370	8.89	9.40
$\phi D_1$	0.315	0.335	8.00	8.51
h	0.009	0.125	0.229	3.18
j	0.028	0.034	0.711	0.864
k	0.029	0.040	0.737	1.02
l	0.500		12.70	
$l_1$		0.050		1.27
$l_2$	0.250		6.35	
P	0.100		2.54	
Q				
a	45° NOMINAL			
$\beta$	90° NOMINAL			

1 = Emitter    2 = Base  
3 = Collector

## CHARACTERISTICS $T_A = 25^\circ C$

SYMBOL	TEST CONDITIONS			MINIMUM	TYPICAL	MAXIMUM	UNITS
$BV_{CEO}$	$I_C = 5.0 \text{ mA}$			20			V
$BV_{CER}$	$I_C = 5.0 \text{ mA}$	$R_{BE} = 10\Omega$		40			V
$BV_{CBO}$	$I_C = 100 \mu A$			40			V
$I_{CEX}$	$V_{CE} = 35 \text{ V}$	$V_{BE} = -1.50 \text{ V}$				5.0	mA
	$V_{CE} = 15 \text{ V}$	$V_{BE} = -1.50 \text{ V}$					$T_C = 150^\circ C$
$I_{CEO}$	$V_{CE} = 15 \text{ V}$					20	$\mu A$
$I_{EBO}$	$V_{EB} = 3.0 \text{ V}$					100	$\mu A$
$h_{FE}$	$V_{CE} = 15 \text{ V}$	$I_C = 50 \text{ mA}$		40		220	---
	$V_{CE} = 5.0 \text{ V}$	$I_C = 360 \text{ mA}$		5.0			
$V_{CE(SAT)}$	$I_C = 100 \text{ mA}$	$I_B = 10 \text{ mA}$				0.5	V
$f_t$	$V_{CE} = 15 \text{ V}$	$I_C = 50 \text{ mA}$	$f = 200 \text{ MHz}$	1200			MHz
$C_{OB}$	$V_{CB} = 15 \text{ V}$					3.5	pF
$N_F$	$V_{CE} = 15 \text{ V}$ $I_C = 10 \text{ mA}$ $R_G = 50 \Omega$ $f = 200 \text{ MHz}$				3.0		dB
$G_{ve}$	$V_{CC} = 15 \text{ V}$ $I_C = 50 \text{ mA}$ $f = 50 \text{ to } 216 \text{ MHz}$			1.1			dB
$P_{in}$	$V_{CC} = 15 \text{ V}$ $I_C = 50 \text{ mA}$ $R_S = 50 \Omega$ $f = 200 \text{ MHz}$					0.1	W