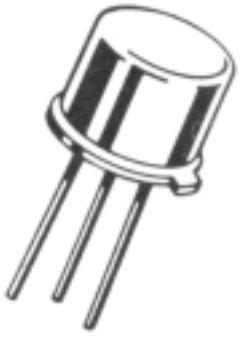
2N5109
Silicon NPN Transistor
Broadband RF Amplifier

Description:

The 2N5109 is a silicon NPN transistor in a TO39 type package designed specifically for broadband applications requiring good linearity. Usable as a high frequency current mode switch to 200mA.



C B E

Features:

- Low Noise Figure: NF = 3.0dB Typ @ f = 200MHz
- High Current-Gain Bandwidth Product: f_T = 1200MHz Min @ I_C = 50mA

Absolute Maximum Ratings:

Collector-Emitter Voltage, V_{CEO}	20V
Collector-Base Voltage, V_{CBO}	40V
Emitter-Base Voltage, V_{EBO}	3V
Continuous Collector Current, I_C	400mA
Continuous Base Current, I_B	400mA
Total Device Dissipation (T_C = +75°C, Note 1), P_D	2.5W
Derate above +25°C	20mW/°C
Storage Temperature Range, T_{stg}	-65° to +200°C

Note 1. Total Device Dissipation at T_A = +25°C is 1W.

Electrical Characteristics: (T_C = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Saturation Voltage	$V_{CEO(sus)}$	I_C = 5mA, I_B = 0	20	-	-	V
	$V_{CER(sus)}$	I_C = 5mA, R_{BE} = 10 Ohm, Note 2	40	-	-	V
Collector Cutoff Current	I_{CEO}	V_{CE} = 15V, I_B = 0	-	-	20	µA
	I_{CEX}	V_{CE} = 15V, V_{BE} = -1.5V, T_C = +150°C	-	-	5	mA
		V_{CE} = 15V, V_{BE} = -1.5V	-	-	5	mA
Emitter Cutoff Current	I_{EBO}	V_{BE} = 3V, I_C = 0	-	-	100	µA
ON Characteristics						
DC Current Gain	h_{FE}	V_{CE} = 5V, I_C = 360mA	5	-	-	
		V_{CE} = 15V, I_C = 50mA	40	-	120	
Dynamic Characteristics						
Current-Gain Bandwidth Product	f_T	I_C = 50mA, V_{CE} = 15V, f = 200MHz	1200	-	-	MHz
Collector-Base Capacitance	C_{cb}	V_{CB} = 15V, I_E = 0, f = 1MHz	-	1.8	3.5	pF
Noise Figure	NF	I_C = 10mA, V_{CE} = 15V, f = 200MHz	-	3	-	dB
Functional Test						
Common-Emitter Amplifier Voltage Gain	G_{VE}	I_C = 50mA, V_{CC} = 15V, f = 50 to 216MHz	11	-	-	dB
Power Input	P_{in}	I_C = 50mA, V_{CC} = 15V, R_S = 50 Ohm, P_{out} = 1.26mW, f = 200MHz	-	-	0.1	mW

Note 1. Pulsed through a 25mH inductor; 50% Duty Cycle.