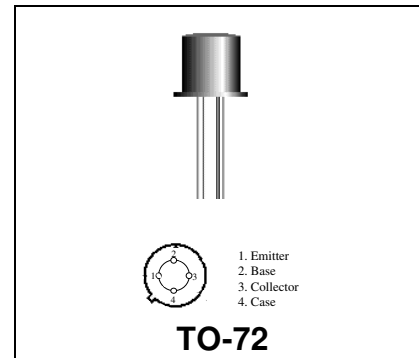


**RF & MICROWAVE DISCRETE  
LOW POWER TRANSISTORS**

**Features**

- Silicon NPN, TO-72 packaged VHF/UHF Transistor
- Low Noise, NF = 4.5 dB (max) @ 200 MHz
- High Current-Gain-Bandwidth Product 1.4 Ghz (typ) @ 10 mAdc
- Characterized with S-Parameters



**DESCRIPTION:**

The 2N5179 is a Silicon NPN transistor, designed for VHF and UHF equipment. It is ideal for pre-driver, low noise amplifier, and oscillator applications.

**ABSOLUTE MAXIMUM RATINGS (Tcase = 25°C)**

Symbol	Parameter	Value	Unit
V <sub>CEO</sub>	Collector-Emitter Voltage	12	Vdc
V <sub>CBO</sub>	Collector-Base Voltage	20	Vdc
V <sub>EBO</sub>	Emitter-Base Voltage	2.5	Vdc
I <sub>C</sub>	Collector Current	50	mA

**Thermal Data**

P <sub>D</sub>	Total Device Dissipation @ T <sub>A</sub> = 25°C Derate above 25°C	300 1.71	mW mW/°C
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**ELECTRICAL SPECIFICATIONS (T<sub>case</sub> = 25°C)**
**STATIC**
**(off)**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BVCEO	Collector-Emitter Sustaining Voltage (I <sub>C</sub> = 3.0 mA <sub>dc</sub> , I <sub>B</sub> = 0)	12	-	-	V <sub>dc</sub>
BVCBO	Collector-Base Breakdown Voltage (I <sub>C</sub> =1.0 mA <sub>dc</sub> , I <sub>E</sub> =0)	20	-	-	V <sub>dc</sub>
BVEBO	Emitter Base Breakdown Voltage (I <sub>E</sub> = 0.01 mA <sub>dc</sub> , I <sub>C</sub> = 0)	2.5	-	-	V <sub>dc</sub>
ICBO	Collector Cutoff Current (V <sub>CB</sub> = 15 V <sub>dc</sub> , I <sub>E</sub> = 0)	-	-	.02	mA

**(on)**

HFE	DC Current Gain (I <sub>C</sub> = 3.0 mA <sub>dc</sub> , V <sub>CE</sub> = 1.0 V <sub>dc</sub> )	25	-	250	-
VBE(sat)	Base-Emitter Saturation Voltage (I <sub>C</sub> = 10 mA <sub>dc</sub> , I <sub>B</sub> = 1.0 mA <sub>dc</sub> )	-	-	1.0	V <sub>dc</sub>
VCE(sat)	Collector-Emitter Saturation Voltage (I <sub>C</sub> = 10 mA <sub>dc</sub> , I <sub>B</sub> = 1.0 mA <sub>dc</sub> )	-	-	0.4	V <sub>dc</sub>

**DYNAMIC**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
f <sub>T</sub>	Current-Gain - Bandwidth Product (I <sub>C</sub> = 5.0 mA <sub>dc</sub> , V <sub>CE</sub> = 6 V <sub>dc</sub> , f = 100 MHz)	900	1500	-	MHz
CCB	Collector-base Capacitance (V <sub>CB</sub> = 10 V <sub>dc</sub> , I <sub>E</sub> = 0, f = 1.0 MHz)	-	-	1.0	pF

**FUNCTIONAL**

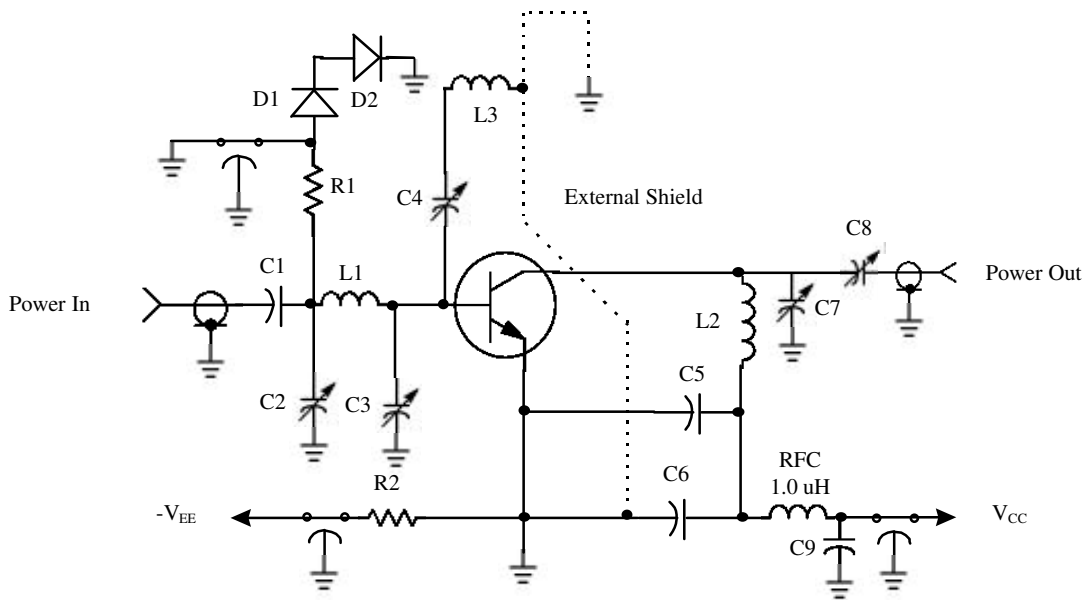
Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
NF	Noise Figure (figure 1)	I <sub>C</sub> = 1.5 mA <sub>dc</sub> , V <sub>CE</sub> = 6.0 V <sub>dc</sub> , f = 200 MHz	-	-	4.5	dB
GPE	Common-Emitter Amplifier Power Gain (figure 1)	I <sub>C</sub> = 1.5 mA <sub>dc</sub> , V <sub>CE</sub> = 6.0 V <sub>dc</sub> , f = 200 MHz	20	-	-	dB

## FUNCTIONAL (CONT)

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
$GU_{MAX}$	Maximum Unilateral Gain (1)	$I_C = 5 \text{ mAdc}$ , $V_{CE} = 6.0 \text{ Vdc}$ , $f = 200 \text{ MHz}$	-	17	-	dB
MAG	Maximum Available Gain	$I_C = 5 \text{ mAdc}$ , $V_{CE} = 6.0 \text{ Vdc}$ , $f = 200 \text{ MHz}$	-	18	-	dB
$ S_{21} ^2$	Insertion Gain	$I_C = 5 \text{ mAdc}$ , $V_{CE} = 6.0 \text{ Vdc}$ , $f = 200 \text{ MHz}$	-	12	-	dB

Note: 1. Maximum Unilateral Gain =  $|S_{21}|^2 / (1 - |S_{11}|^2)(1 - |S_{22}|^2)$

## TEST CIRCUIT SCHEMATIC



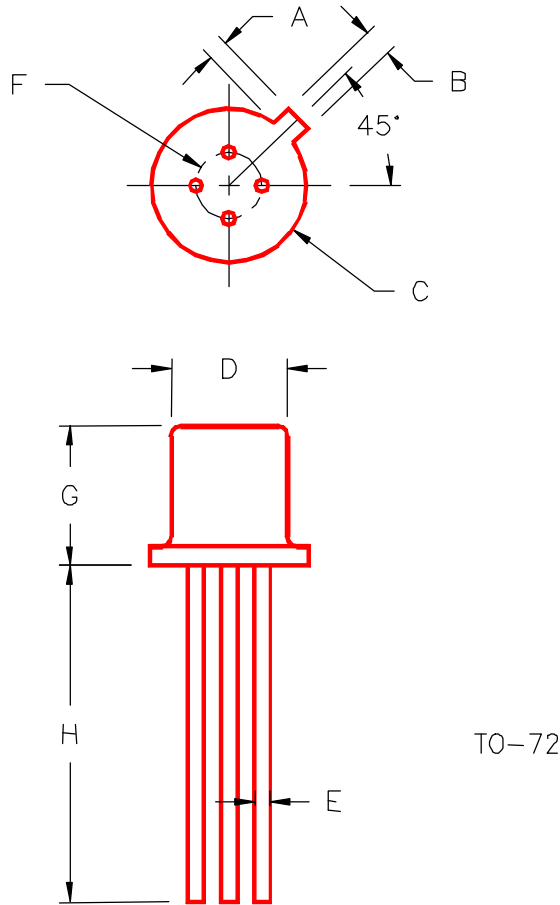
C1:	0.02 uF	R2:	10 K
C2:	3.0-35 pF	L1:	1 3/4 turn, #18 AWG
C3, C7, C8:	2.0-10 pF		0.5" L, 0.5" Dia.
C4:	1.0-5.0 pF	L2:	2 turn, #16 AWG
C5, C9:	0.1 uF		0.5" L, 0.5" Dia.
C6:	0.001 uF	L3:	2 turn, #13 AWG
Cbypass:	1200 pF		0.25" L, 0.5" Dia. Position 1/4
R1:	91 ohm		from L2

Figure 1. 200 MHz Amplifier for Power Gain and Noise Figure specifications.

**Table 1. Common Emitter S-Parameters, @ VCE = 6 V, IC = 5 mA**

f (MHz)	S11		S21		S12		S22	
	S11	$\angle \phi$	S21	$\angle \phi$	S12	$\angle \phi$	S22	$\angle \phi$
100	.471	-90	6.78	122	.023	64	.844	-51
200	.314	-145	4.20	100	.034	58	.780	-93
300	.230	156	2.76	91	.043	65	.768	-134
400	.171	108	2.17	86	.056	63	.756	-177
500	.168	54	1.86	79	.062	62	.741	140
600	.149	-9	1.53	71	.069	66	.740	98
700	.137	-72	1.31	67	.073	71	.739	54
800	.119	-129	1.18	64	.092	74	.744	8
900	.153	-174	1.13	58	.101	68	.742	-38
1000	.171	122	.979	49	.106	71	.749	-82

PACKAGE STYLE M244



TO-72

	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MINIMUM INCHES/MM	MAXIMUM INCHES/MM
A	.020/0,51	.048/1,22			
B	.036/0,91	.046/1,17			
C	.209/5,31	.230/5,84			
D	.178/4,52	.195/4,95			
E	.016/0,41	.020/0,51			
F	.100/2,54				
G	.170/4,32	.210/5,33			
H	.500/12,70				