

MRF501
MRF502

The RF Line

NPN SILICON HIGH-FREQUENCY TRANSISTORS

... designed primarily for use in high-gain, low-noise amplifier, oscillator, and mixer applications. Can also be used in UHF converter applications.

- High Current-Gain – Bandwidth Product –
 $f_T = 1.2 \text{ GHz (Typ) @ } I_C = 5.0 \text{ mAdc}$
- Low Noise Figure –
 $NF = 4.0 \text{ dB (Typ) @ } f = 200 \text{ MHz}$

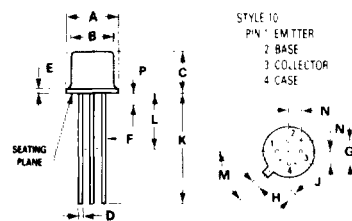
HIGH FREQUENCY
TRANSISTORS

NPN SILICON



MAXIMUM RATINGS

Rating	Symbol	MRF501	MRF502	Unit
Collector-Emitter Voltage	V_{CE0}	15		Vdc
Collector-Base Voltage	V_{CB0}	25	35	Vdc
Emitter-Base Voltage	V_{EB0}	3.5		Vdc
Collector Current	I_C	50		mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	200	1.14	mW mW/°C
Storage Temperature Range	T_{stg}	-65 to +200		°C



NOTE: ALL RULES AND NOTES ASSOCIATED WITH TO-72 OUTLINE SHALL APPLY.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.31	5.84	0.209	0.230
B	4.52	4.95	0.178	0.195
C	4.32	5.33	0.170	0.210
D	0.41	0.53	0.016	0.021
E	—	0.76	—	0.030
F	0.41	0.48	0.016	0.019
G	254 BSC		0.100 BSC	
H	0.91	1.12	0.036	0.046
J	0.71	1.22	0.028	0.048
K	12.70	—	0.500	—
L	6.35	—	0.250	—
M	45 BSC		45 BSC	
N	1.27 BSC		0.050 BSC	
P	—	1.27	—	0.050

CASE 20-03
TO-206AF
(TO-72)

MRF501, MRF502

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I _C = 3.0 mA, I _B = 0)	V _{(BR)CEO}	15	—	—	Vdc
Collector-Base Breakdown Voltage (I _C = 1.0 μA, I _E = 0)	V _{(BR)CBO}	25 35	—	—	Vdc
Emitter-Base Breakdown Voltage (I _E = 1.0 μA, I _C = 0)	V _{(BR)EBO}	3.5	—	—	Vdc
Collector Cutoff Current (V _{CB} = 1.0 Vdc, I _E = 0)	I _{CBO}	—	—	50 20	nAdc
ON CHARACTERISTICS					
DC Current Gain (I _C = 1.0 mA, V _{CE} = 6.0 Vdc)	h _{FE}	30 40	—	250 170	
DYNAMIC CHARACTERISTICS					
Current Gain -- Bandwidth Product (I _C = 5.0 mA, V _{CE} = 6.0 Vdc, f = 100 MHz)	f _T	600 800	1000 1200	—	MHz
Collector-Base Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 0.1 to 1.0 MHz)	C _{cb}	—	0.6	—	pF
Collector-Base Time Constant (I _E = 2.0 mA, V _{CB} = 6.0 Vdc, f = 31.8 MHz)	r _p 'C _c	—	8.0	—	ps
Noise Figure (Figure 1) (I _C = 1.5 mA, V _{CE} = 6.0 Vdc, R _S = 50 ohms, f = 200 MHz)	NF	—	4.5 4.0	—	dB
FUNCTIONAL TEST					
Common-Emitter Amplifier Power Gain (Figure 1) (V _{CC} = 6.0 Vdc, I _C = 5.0 mA, f = 200 MHz)	G _{pe}	—	15 17	—	dB

FIGURE 1 — 200 MHz AMPLIFIER POWER GAIN AND NOISE FIGURE CIRCUIT

