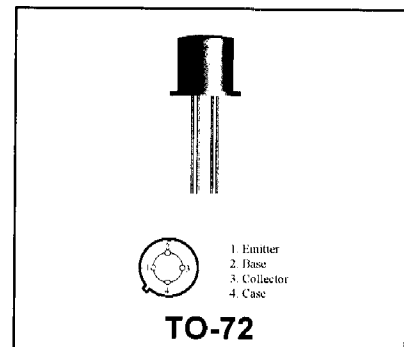


**MRF914**

**RF & MICROWAVE DISCRETE  
 LOW POWER TRANSISTORS**

**Features**

- Silicon NPN, High Frequency Transistor
- High Power Gain -  $G_{max} = 15 \text{ dB (typ) @ } f = 500 \text{ MHz}$
- Low Noise Figure:  $NF = 2.5 \text{ dB (typ) @ } f = 500 \text{ MHz}$
- High  $F_T - 4.5 \text{ GHz (typ) @ } I_C = 20 \text{ mA}$



**DESCRIPTION:**

Designed primarily for use in High Gain, low noise general purpose amplifiers. Also excellent for high speed switching applications.

**ABSOLUTE MAXIMUM RATINGS (T<sub>case</sub> = 25°C)**

Symbol	Parameter	Value	Unit
$V_{CEO}$	Collector-Emitter Voltage	12	Vdc
$V_{CBO}$	Collector-Base Voltage	20	Vdc
$V_{EBO}$	Emitter-Base Voltage	3.0	Vdc
$I_C$	Collector Current	40	mA

**Thermal Data**

$P_D$	Total Device Dissipation @ $T_A = 25^\circ\text{C}$	200	mWatts
	Derate above $25^\circ\text{C}$	1.6	mW/°C

**ELECTRICAL SPECIFICATIONS (T<sub>case</sub> = 25°C)**



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

**MRF914****STATIC (off)**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$BV_{CEO}$	Collector-Emitter Breakdown Voltage ( $I_C = 1.0 \text{ mA}_{dc}$ , $I_B = 0$ )	12	-	-	Vdc
$BV_{CBO}$	Collector-Base Breakdown Voltage ( $I_C = 0.1 \text{ mA}_{dc}$ , $I_E = 0$ )	20	-	-	Vdc
$BV_{EBO}$	Emitter-Base Breakdown Voltage ( $I_E = 0.1 \text{ mA}_{dc}$ , $I_C = 0$ )	3.0	-	-	Vdc
$I_{CBO}$	Collector Cutoff Current ( $V_{CE} = 15 \text{ Vdc}$ , $I_E = 0 \text{ Vdc}$ )	-	-	50	nA

**STATIC (on)**

HFE	DC Current Gain ( $I_C = 20 \text{ mA}_{dc}$ , $V_{CE} = 10 \text{ Vdc}$ )	30	-	200	-
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**DYNAMIC**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$f_T$	Current-Gain - Bandwidth Product ( $I_C = 20 \text{ mA}_{dc}$ , $V_{CE} = 10 \text{ Vdc}$ , $f = .5 \text{ GHz}$ )	-	4.5	-	GHz
$C_{CB}$	Junction Capacitance ( $V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $f = 1 \text{ MHz}$ )	-	0.7	-	pF

# MRF914

## FUNCTIONAL

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
MAG	Maximum Available Gain (IC = 20 mAdc, VCE = 10 Vdc, f = 500 MHz)	-	12	-	dB
$S_{ 21 }^2$	Insertion Gain (IC = 20 mAdc, VCE = 10 Vdc, f = 500 MHz)	10	11	-	dB
NF	Noise Figure (IC = 5.0 mAdc, VCE = 10 Vdc, f = 500 MHz)	-	2.5	-	dB
$G_{MAX}$	Maximum Available Power Gain (IC = 20 mAdc, VCE = 10 Vdc, f = 500 MHz)	-	15	-	dB

Table 1. Common Emitter S-Parameters, @ VCE = 10 V, IC = 20 mA

f (MHz)	S11		S21		S12		S22	
	S11	$\angle \phi$	S21	$\angle \phi$	S12	$\angle \phi$	S22	$\angle \phi$
100	.45	-36	15.6	115	.03	75	.67	-20
200	.32	-38	8.7	101	.05	78	.55	-19
300	.26	-36	6.3	91	.08	76	.54	-17
400	.24	-36	4.6	86	.1	74	.52	-22
500	.22	-39	3.8	84	.12	75	.48	-23
600	.21	-40	3.4	78	.15	71	.48	-26
700	.19	-44	3.0	72	.17	68	.47	-29
800	.18	-48	2.5	68	.19	65	.46	-35
900	.18	-58	2.4	69	.20	67	.44	-40
1000	.18	-65	2.4	62	.23	63	.45	-42