

New Jersey Semi-Conductor Products, Inc.

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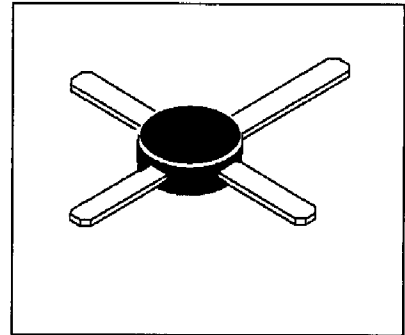
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MRF581/MRF581A

**RF & MICROWAVE DISCRETE
 LOW POWER TRANSISTORS**

Features

- Low Noise - 2.5 dB @ 500 MHz
- High Gain, Gain at Optimum Noise Figure = 15.5 dB @ 500 MHz
- Ft_{au} - 5.0 GHz @ 10v, 75mA
- Cost Effective MacroX Package



DESCRIPTION: Designed for high current, low power, low noise, amplifiers up to 1.0 GHz.

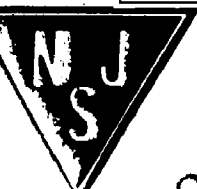
ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	MRF581	MRF581A	Unit
V _{CEO}	Collector-Emitter Voltage	18	15	Vdc
V _{CBO}	Collector-Base Voltage	30		Vdc
V _{EBO}	Emitter-Base Voltage	2.5		Vdc
I _c	Collector Current	200		mA

Thermal Data

P _D	Total Device Dissipation @ TC = 50°C Derate above 50°C	2.5 25	Watts mW/°C
P _D	Total Device Dissipation @ TC = 25°C Derate above 25°C	1.25 10	Watts mW/°C
T _{stg}	Storage Junction Temperature Range	-65 to +150	°C
T _{Jmax}	Maximum Junction Temperature	150	°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.



Quality Semi-Conductors

MRF581/MRF581A

ELECTRICAL SPECIFICATIONS (T_{case} = 25°C)

STATIC (off)

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BVCEO	Collector-Emitter Breakdown Voltage (I _C = 5.0 mA _{dc} , I _B = 0)	MRF581 MRF581A	18 15	-	-	V _{dc}
BVCBO	Collector-Base Breakdown Voltage (I _C = 1.0 mA _{dc} , I _E = 0)		30	-	-	V _{dc}
BVEBO	Emitter-Base Breakdown Voltage (I _E = 0.1 mA _{dc} , I _C = 0)		2.5	-	-	V _{dc}
ICBO	Collector Cutoff Current (V _{CE} = 15 V _{dc} , V _{BE} = 0 V _{dc})		-	-	0.1	mA
IEBO	Collector Cutoff Current (V _{CE} = 2.0 V _{dc} , V _{BE} = 0 V _{dc})		-	-	0.1	mA

(on)

HFE	DC Current Gain (I _C = 50 mA _{dc} , V _{CE} = 5.0 V _{dc})	MRF581 MRF581A	50 90	-	200 250	-
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DYNAMIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
COB	Output Capacitance (V _{CB} = 10 V _{dc} , I _E = 0, f = 1.0 MHz)	-	2.0	3.0	pF
F _{tau}	Current-Gain Bandwidth Product (I _C = 75 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 GHz)	-	5.0	-	GHz

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FUNCTIONAL

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
NFmin	Minimum Noise Figure (IC = 50 mAdc, VCE = 10 Vdc, f = 0.5 GHz)		2.5 2.0	3.0 3.0	dB
G_{NF}	Power Gain @ NFmin (IC = 50 mAdc, VCE = 10 Vdc, f = 0.5 GHz)	13	15.5		dB
$G_{U\ max}$	Maximum Unilateral Gain (1) IC = 50 mAdc, VCE = 10 Vdc, f = 500 MHz	-	17.8	-	dB
MSG	Maximum Stable Gain IC = 50 mAdc, VCE = 10 Vdc, f = 500 MHz	-	20	-	dB
$ S_{21} ^2$	Insertion Gain IC = 50 mAdc, VCE = 10 Vdc, f = 500 MHz	14	15	-	dB

Table 1. Common Emitter S-Parameters, @ VCE = 10 V, IC = 50 mA

f (MHz)	S11		S21		S12		S22	
	S11	$\angle \phi$	S21	$\angle \phi$	S12	$\angle \phi$	S22	$\angle \phi$
100	.610	-137	23.8	116	.026	46	.522	-78
200	.659	-161	13.2	98	.033	47	.351	-106
300	.671	-171	9.0	89	.040	51	.304	-120
400	.675	-178	6.8	83	.047	55	.292	-128
500	.677	176	5.5	77	.055	58	.293	-132
600	.678	172	4.6	72	.064	61	.299	-134
700	.677	168	4.0	68	.073	62	.306	-135
800	.679	184	3.5	64	.082	63	.314	-136
900	.678	160	3.1	60	.092	64	.322	-138
1000	.682	156	2.8	56	.102	65	.311	-139