



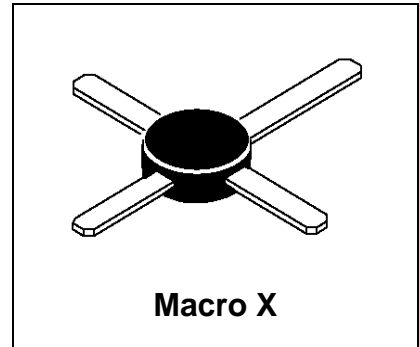
140 COMMERCE DRIVE  
MONTGOMERYVILLE, PA  
18936-1013  
PHONE: (215) 631-9840  
FAX: (215) 631-9855

**MRF951**

**RF & MICROWAVE DISCRETE  
LOW POWER TRANSISTORS**

**Features**

- Fully Implanted Base and Emitter Structure.
- High Gain, Gain at Optimum Noise Figure = 14 dB @ 1 GHz
- Low Noise Figure – 1.3dB @ 1GHz
- Ft<sub>au</sub> - 8.0 GHz @ 6v, 30mA
- Cost Effective Macro X Package



DESCRIPTION: Designed for use in high gain, low noise small-signal amplifiers.

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

Symbol	Parameter	Value	Unit
V <sub>CEO</sub>	Collector-Emitter Voltage	10	Vdc
V <sub>CBO</sub>	Collector-Base Voltage	20	Vdc
V <sub>EBO</sub>	Emitter-Base Voltage	1.5	Vdc
I <sub>C</sub>	Collector Current	100	mA

**Thermal Data**

P <sub>D</sub>	Total Device Dissipation @ TC = 75°C	.475	Watts
T <sub>stg</sub>	Storage Junction Temperature Range	-65 to +150	°C
T <sub>Jmax</sub>	Maximum Junction Temperature	150	°C

## ELECTRICAL SPECIFICATIONS (Tcase = 25°C)

## STATIC

(off)

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BVCEO	Collector-Emitter Breakdown Voltage (IC = 0.1 mA <sub>dc</sub> , IB = 0)	10	-	-	V <sub>dc</sub>
BVCBO	Collector-Base Breakdown Voltage (IC = 0.1 mA <sub>dc</sub> , IE = 0)	20	-	-	V <sub>dc</sub>
ICBO	Collector Cutoff Current (VCE = 10 V <sub>dc</sub> , VBE = 0 V <sub>dc</sub> )	-	-	0.1	μA
IEBO	Collector Cutoff Current (VCE = 1.0 V <sub>dc</sub> , VBE = 0 V <sub>dc</sub> )	-	-	0.1	μA

(on)

HFE	DC Current Gain (IC = 5.0 mA <sub>dc</sub> , VCE = 6.0 V <sub>dc</sub> )	50	-	200	-
-----	---	----	---	-----	---

## DYNAMIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
CCB	Collector-Base Capacitance (VCB = 10 V <sub>dc</sub> , IE = 0, f = 1.0 MHz)	-	.45	1.0	pF
Ftau	Current-Gain Bandwidth Product (IC = 30 mA <sub>dc</sub> , VCE = 6 V <sub>dc</sub> , f = 1.0 GHz)	-	8.0	-	GHz



MRF951

FUNCTIONAL

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
NFmin	Minimum Noise Figure (IC = 5 mAdc, VCE = 6 Vdc, f = 1 GHz)	-	1.3	-	dB
$G_{NF}$	Power Gain @ NFmin (IC = 5.0 mAdc, VCE = 6 Vdc, f = 1 GHz)	-	14	-	dB
$G_{U\max}$	Maximum Unilateral Gain (1) IC = 30 mAdc, VCE = 8 Vdc, f = 1 GHz	-	17	-	dB
$ S_{21} ^2$	Insertion Gain IC = 30 mAdc, VCE = 6 Vdc, f = 1 GHz	12	14.5	-	dB

Table 1. Common Emitter S-Parameters, @ VCE = 6 V, IC = 30 mA

f (MHz)	S11		S21		S12		S22	
	S11	$\angle \phi$	S21	$\angle \phi$	S12	$\angle \phi$	S22	$\angle \phi$
100	.45	-95	36.80	132	.02	64	.68	-38
500	.46	-170	10.20	89	.04	65	.27	-55
1000	.47	169	5.30	72	.08	66	.22	-62
1500	.48	154	3.60	58	.11	63	.22	-73
2000	.50	142	2.80	45	.15	58	.23	-86
2500	.51	132	2.30	36	.18	54	.25	-97
3000	.53	119	1.90	23	.22	47	.28	-113
3500	.55	109	1.60	12	.25	41	.30	-125
4000	.57	99	1.50	2.0	.29	35	.33	-137

# RF Products Microsemi

Progress Powered by Technology

## MRF951

### RF Low Power PA, LNA, and General Purpose Discrete Selector Guide

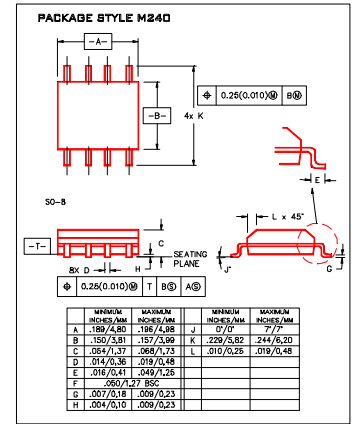
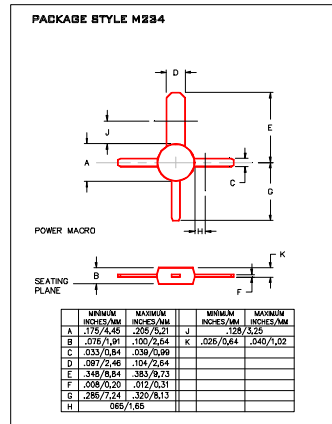
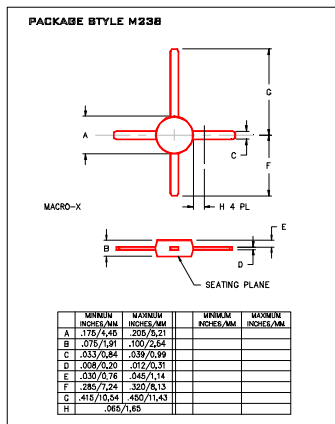
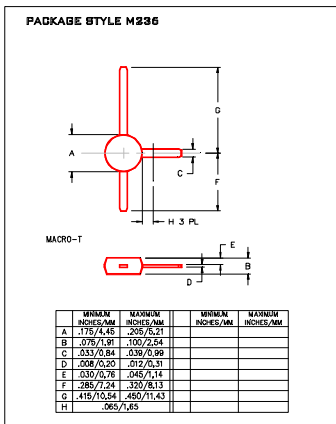
Package	Device	Type	Freq (MHz)	Pout (watts)	GPE (dB)	Efficiency (%)	GPE VCC	BVCEO	IC max (mA)
SO-8	MRF4427, R2	NPN	175	0.15	18	60	12	20	400
TO-39	2N4427	NPN	175	1	10	50	12	20	400
POWER MACRO	MRF553	NPN	175	1.5	11.5	60	12.5	16	500
POWER MACRO	MRF553T	NPN	175	1.5	11.5	50	12.5	16	500
TO-39	MRF607	NPN	175	1.75	11.5	50	12.5	16	330
TO-39	2N6255	NPN	175	3	7.8	50	12.5	18	1000
TO-72	2N5179	NPN	200		20		6	12	50
MACRO X	MRF559	NPN	512	0.5	10	65	7.5	16	150
MACRO X	MRF559	NPN	512	0.5	13	60	12.5	16	150
TO-39	2N3866A	NPN	400	1	10	45	28	30	400
SO-8	MRF3866, R1, R2	NPN	400	1	10	45	28	30	400
POWER MACRO	MRF555	NPN	470	1.5	11	50	12.5	16	400
POWER MACRO	MRF555T	NPN	470	1.5	11	50	12.5	16	400
MACRO X	MRF559	NPN	870	0.5	6.5	70	7.5	16	150
MACRO X	MRF559	NPN	870	0.5	9.5	65	12.5	16	150
SO-8	MRF8372, R1, R2	NPN	870	0.75	8	55	12.5	16	200
POWER MACRO	MRF557	NPN	870	1.5	8	55	12.5	16	400
POWER MACRO	MRF557T	NPN	870	1.5	8	55	12.5	16	400

Package	Device	Type	Freq (MHz)	NF (dB)	NF IC (mA)	NF VCE	GN (dB)	Gu Max (dB)	Ftau (MHz)	Ccb(pF)	BVCEO	IC max (mA)	
TO-39	2N5109	NPN	200	3	10	15		12	1200	3.5	20	400	
TO-39	MRF5943C	NPN	200	3.4	30	15		11.4	1000		30	400	
SO-8	MRF5943, R1, R2	NPN	200	3.4	30	15		15	1300		30	400	
TO-72	2N5179	NPN	200	4.5	1.5	6		17	900	1	12	50	
TO-72	2N2857	NPN	300	5.5	50	6		13	1600	1	18	40	
TO-39	MRF517	NPN	300	7.5	50	15		5.5	4600	3	25	150	
TO-72	MRF904	NPN	450	1.5	5	6		11	4000	1	15	30	
TO-72	2N6304	NPN	450	5	2	5		14	1400	1	15	50	
MACRO T	BFR91	NPN	500	1.9	2	5	11	16.5	5000	1	12	35	
MACRO T	BFR96	NPN	500	2	10	10		14.5	500	2.6	15	100	
SO-8	MRF5812, R1, R2	NPN	500	2	50	10		15.5	17.8	5000		15	200
MACRO X	MRF581A	NPN	500	2	50	10		14	15	5000		15	200
Macro	BFR90	NPN	500	2.4	2	10	15	18	5000	1	15	30	
TO-72	BFY90	NPN	500	2.5	2	5		20	1300		15	50	
TO-72	MRF914	NPN	500	2.5	5	10		15	4500		12	40	
MACRO X	MRF581	NPN	500	2.5	50	10		17.8	5000		16	200	
TO-39	MRF586	NPN	500	3	90	15	11	14.5	8500	2.2	17	200	
MACRO X	MRF951	NPN	1000	1.3	5	6	14	17	8000	0.45	10	100	
MACRO X	MRF571	NPN	1000	1.5	10	6	10		8000	1	10	70	
MACRO T	BFR91	NPN	1000	2.5	2	5	8	11	5000	1	12	35	
MACRO T	BFR90	NPN	1000	3	2	10	10	12.5	5000	1	15	30	
TO-39	MRF545	PNP						14	1400	2	70	400	
TO-39	MRF544	NPN						13.5	1500		70	400	

RF (Low Power PA / General Purpose) Selection Guide

RF (LNA / General Purpose) Selection Guide

### Low Cost RF Plastic Package Options



Macro T

Macro X

Power Macro

SO-8

