

**RF & MICROWAVE DISCRETE  
LOW POWER TRANSISTORS**

**Features**

- Low Cost SO-8 Plastic Surface Mount Package.
- S-Parameter Characterization
- Tape and Reel Packaging Options Available
- Low Voltage Version of MRF3866
- Maximum Available Gain – 20dB(typ) @ 200MHz



R1 suffix–Tape and Reel, 500 units  
R2 suffix–Tape and Reel, 2500 units

**DESCRIPTION:** Designed for general-purpose RF amplifier applications, such as; pre-drivers, Oscillators, etc.

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

Symbol	Parameter	Value	Unit
V <sub>CEO</sub>	Collector-Emitter Voltage	20	Vdc
V <sub>CBO</sub>	Collector-Base Voltage	40	Vdc
V <sub>EBO</sub>	Emitter-Base Voltage	2.0	Vdc
I <sub>C</sub>	Collector Current	400	mA

**Thermal Data**

P <sub>D</sub>	Total Device Dissipation @ TC = 25°C Derate above 25°C	1.5 12.5	Watts mW/ °C
T <sub>stg</sub>	Storage Temperature	-65 to + 150	°C
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	125	°C/W

**ELECTRICAL SPECIFICATIONS (Tcase = 25°C)**
**STATIC**
**(off)**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BVCEO	Collector-Emitter Breakdown Voltage (IC = 5.0 mA <sub>dc</sub> , IB = 0)	20	-	-	V <sub>dc</sub>
BVCBO	Collector-Base Breakdown Voltage (IC = 0.1 mA <sub>dc</sub> , IE = 0)	40	-	-	V <sub>dc</sub>
BVEBO	Emitter-Base Breakdown Voltage (IE = 0.1 mA <sub>dc</sub> , IC = 0)	2.0	-	-	V <sub>dc</sub>
ICEO	Collector Cutoff Current (VCE = 20 V <sub>dc</sub> , VBE = 0 V <sub>dc</sub> )	-	-	.02	mA

**(on)**

HFE	DC Current Gain (IC = 100 mA <sub>dc</sub> , VCE = 5 V <sub>dc</sub> ) (IC = 360 mA <sub>dc</sub> , VCE = 5 V <sub>dc</sub> )	10 5.0	- -	200 -	
VCE(sat)	Collector-Emitter Saturation Voltage (IC = 100 mA <sub>dc</sub> , IB = 20 mA)		60	-	mV <sub>dc</sub>

**DYNAMIC**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
F <sub>tau</sub>	Current-Gain Bandwidth Product (IC = 50 mA <sub>dc</sub> , VCE = 12 V <sub>dc</sub> , f = 200 MHz)	-	1.3	-	GHz
C <sub>ob</sub>	Output Capacitance (VCB = 12 V <sub>dc</sub> , IE = 0, f = 1.0 MHz)	-	-	3.4	GHz

**FUNCTIONAL**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$G_{U \max}$	Maximum Unilateral Gain IC = 50 mAdc, VCE = 12 Vdc, f = 200 MHz	16	18	-	dB
MAG	Maximum Available Gain IC = 50 mAdc, VCE = 12 Vdc, f = 200 MHz	18	20	-	dB
$ S_{21} ^2$	Insertion Gain (calculated) IC = 50 mAdc, VCE = 12 Vdc, f = 200 MHz	12	14	-	dB

Table 1. Common Emitter S-Parameters, @ VCE = 12 V, IC = 50 mA

f (MHz)	S11		S21		S12		S22	
	S11	$\angle \phi$	S21	$\angle \phi$	S12	$\angle \phi$	S22	$\angle \phi$
50	.672	-145	20.15	112	.021	45	.447	-59
100	.721	-163	10.78	96	.026	44	.271	-67
200	.743	-174	5.37	85	.037	54	.199	-72
500	.768	170	2.18	63	.070	59	.264	-86
750	.775	161	1.53	48	.096	62	.356	-98
1000	.778	152	1.07	36	.122	65	.437	-109

# MRF4427, R1, R2

## 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	GNF (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	15	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	15	17.8	5000		16	200
TO-39	MRF586	NPN	500	3	90	15	11	14.5	4500	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



