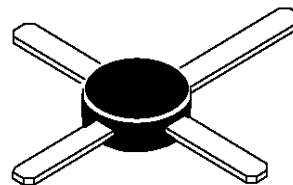


RF & MICROWAVE DISCRETE LOW POWER TRANSISTORS

Features

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



Macro X

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

ABSOLUTE MAXIMUM RATINGS (Tcase = 25°C)

Symbol	Parameter	Value	Unit
V _{CEO}	Collector-Emitter Voltage	10	Vdc
V _{CBO}	Collector-Base Voltage	20	Vdc
V _{EBO}	Emitter-Base Voltage	1.5	Vdc
I _C	Collector Current	100	mA

Thermal Data

P _D	Total Device Dissipation @ TC = 75°C	.475	Watts
T _{stg}	Storage Junction Temperature Range	-65 to +150	°C
T _{Jmax}	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 mAdc, IB = 0)	10	-	-	Vdc
BVCBO	Collector-Base Breakdown Voltage (IC = 0.1 mAdc, IE = 0)	20	-	-	Vdc
ICBO	Collector Cutoff Current (VCE = 10 Vdc, VBE = 0 Vdc)	-	-	0.1	μA
IEBO	Collector Cutoff Current (VCE = 1.0 Vdc, VBE = 0 Vdc)	-	-	0.1	μA

(on)

HFE	DC Current Gain (IC = 5.0 mAdc, VCE = 6.0 Vdc)	50	-	200	-
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DYNAMIC

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

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

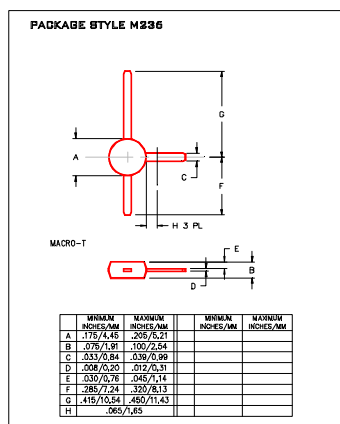
Package	Device	Type	Freq (MHz)	Pout (watts)	GPE (dB)	Efficiency (%)	GPE VCC	BVCEO	IC max (mA)
SO-8	MRF4427, R2	NPN	175	0.15	18	60	12	20	400
TO-39	2N4427	NPN	175	1	10	50	12	20	400
POWER MACRO	MRF553	NPN	175	1.5	11.5	60	12.5	16	500
POWER MACRO	MRF553T	NPN	175	1.5	11.5	50	12.5	16	500
TO-39	MRF607	NPN	175	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	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

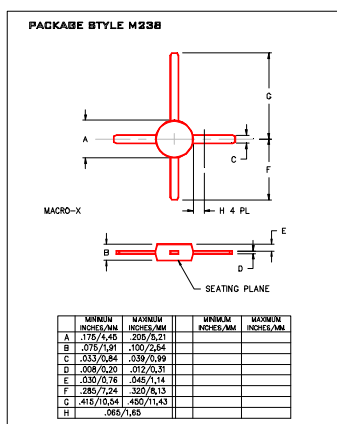
RF (Low Power PA / General Purpose) Selection Guide

RF (LNA / General Purpose) Selection Guide

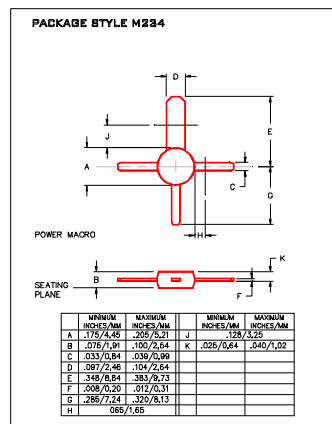
Low Cost RF Plastic Package Options



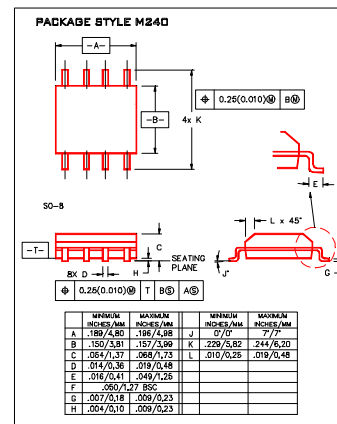
Macro T



Macro X



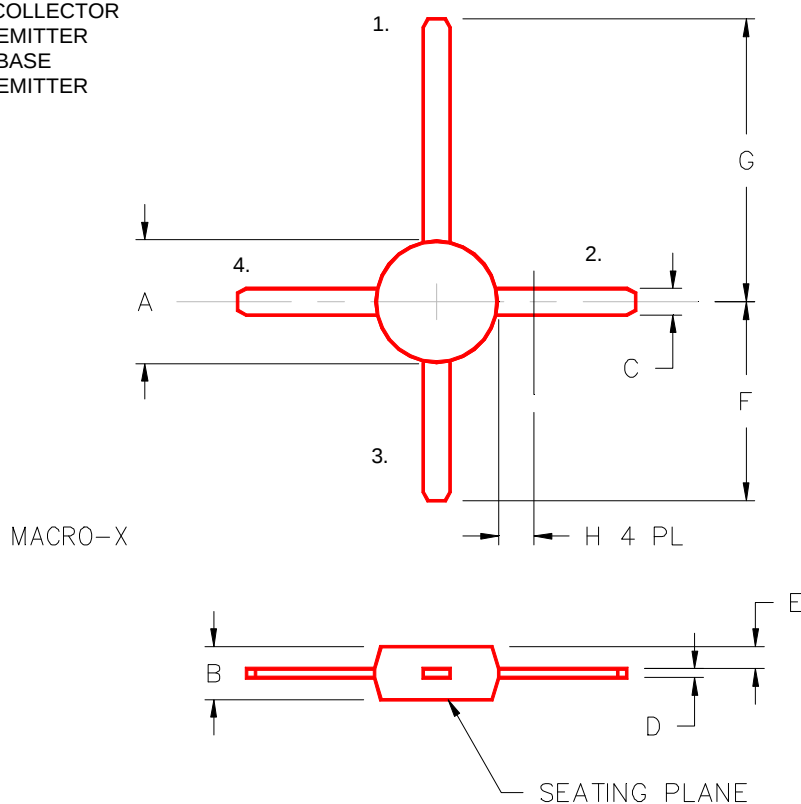
Power Macro



SO-8

PACKAGE STYLE M238

PIN 1. COLLECTOR
 2. EMITTER
 3. BASE
 4. EMITTER



	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MINIMUM INCHES/MM	MAXIMUM INCHES/MM
A	.175/4,45	.205/5,21			
B	.075/1,91	.100/2,54			
C	.033/0,84	.039/0,99			
D	.008/0,20	.012/0,31			
E	.030/0,76	.045/1,14			
F	.285/7,24	.320/8,13			
G	.415/10,54	.450/11,43			
H	.065/1,65				