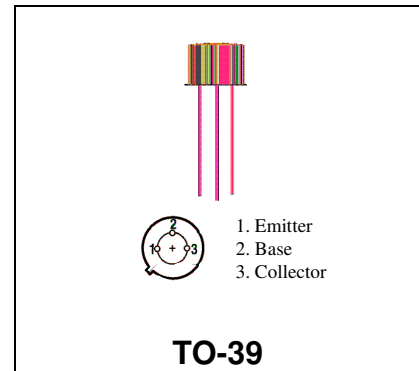


**RF & MICROWAVE DISCRETE
LOW POWER TRANSISTORS**
Features

- Silicon NPN, To-39 packaged VHF/UHF Transistor
- $G_{pe} = 10 \text{ dB (typ) @ 60 mA, 300 MHz}$
- 3 GHz Current-Gain Bandwidth Product @ 60mA
- Broadband Noise Figure = 7.5 dB @ 50mA, 300 MHz


DESCRIPTION:

The MRF517 is a silicon NPN transistor, designed for VHF and UHF equipment. Applications include low noise broadband amplifier; pre-driver, driver, and output stages.

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

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-Emitter Voltage	20	Vdc
V_{CBO}	Collector-Base Voltage	35	Vdc
V_{EBO}	Emitter-Base Voltage	3.0	Vdc
I_C	Collector Current	150	mA

Thermal Data

P_D	Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	2.5 0.02	Watts mW/ °C
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ELECTRICAL SPECIFICATIONS (T_{case} = 25°C)

STATIC (off)

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
BV _{CER}	Collector-Emitter Breakdown Voltage (I _C = 5.0 mA _{dc} , R _{BE} = 330 ohms)	25	-	-	V _{dc}
BV _{CEO}	Collector-Emitter Breakdown Voltage (I _C =5.0 mA _{dc} , I _B =0)	20	-	-	V _{dc}
BV _{CBO}	Collector-Base Breakdown Voltage (I _C = 100 μA _{dc} , I _E = 0)	30	-	-	V _{dc}
BV _{EBO}	Emitter-Base Breakdown Voltage (I _E = 100 μA _{dc} , I _C = 0)	3.0	-	-	V _{dc}
I _{CEO}	Collector Cutoff Current (V _{CE} = 15 V _{dc} , I _B = 0)	-	-	100	μA _{dc}

(on)

H _{FE}	DC Current Gain (I _C = 60 mA _{dc} , V _{CE} = 10 V _{dc})	50	-	150	-
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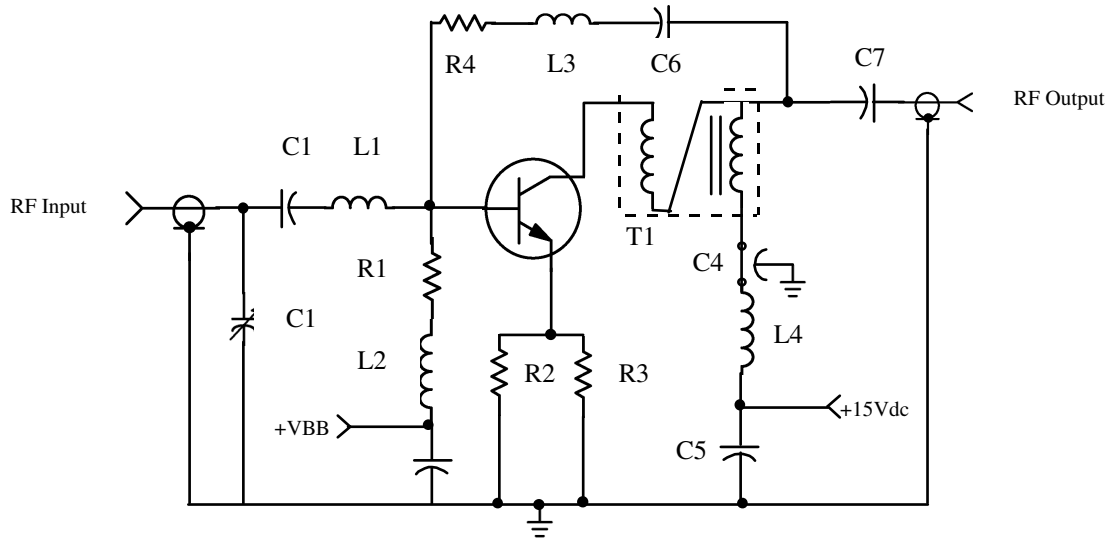
DYNAMIC

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
f _T	Current-Gain - Bandwidth Product (I _C = 60 mA _{dc} , V _{CE} = 15 V _{dc} , f = 200 MHz)	3	4	-	GHz
C _{ob}	Output Capacitance (V _{CB} = 15 V _{dc} , I _E = 0, f = 1.0 MHz)	-	3.0	4.5	pF

FUNCTIONAL

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
NF	Broadband Noise Figure (I _C = 50 mA _{dc} , V _{CE} = 15V _{dc} , f = 300 MHz)	-	-	7.5	dB
G _{pe}	Common Emitter Amplifier Power Gain (V _{CE} = 15 V _{dc} , I _C = 60 mA _{dc} , f = 300MHz)	9	10	-	dB

TEST CIRCUIT SCHEMATIC



- | | | | |
|-----------|---------------------------|--------|--|
| C1: | 1.0-10 pF Johanson | L4: | VK200 |
| C2, 6, 7: | 0.002 uF Ceramic | T1: | 16:1 Bifilar Wound, #20 AWG
Enameled Wire, Wound on
1041T060-4C4 Core. |
| C3, 5: | 0.1 uF 50 Vdc Tantalum | R1: | 4.7K, 1/4 W, 10% |
| C4: | 1000 pF Button | R2, 3: | 27 ohm, 1/4 W, 5% |
| L1: | 1 Turn, #20 AWG | R4: | 270 ohm, 1/4 W, 5% |
| L2: | 5.6 uH Molded Choke | | |
| L3: | 4 Turns, #20 AWG, 1/4" ID | | |

Figure 1. 40 to 330 MHz Broadband Test Schematic

MRF517

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

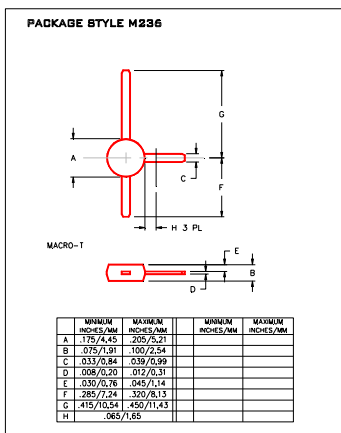
Package	Device	Type	GPE Freq (MHz)	Pout (watts)	GPE (dB)	Efficiency (%)	GPE VCC	BVCEO	IC max (mA)
SO-8	MRF4427, R2	NPN	175	0.15	18	60	12	20	400
TO-39	2N4427	NPN	175	1	10	50	12	20	400
POWER MACRO	MRF553	NPN	175	1.5	11.5	60	12.5	16	500
POWER MACRO	MRF553T	NPN	175	1.5	11.5	50	12.5	16	500
TO-39	MRF607	NPN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

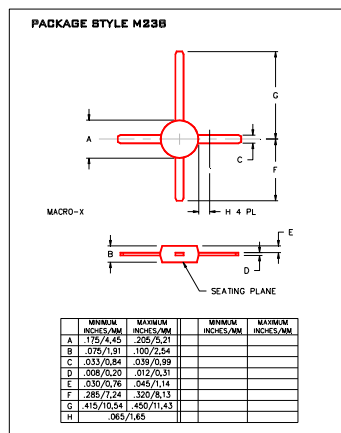
RF (Low Power PA / General Purpose) Selection Guide

RF (LNA / General Purpose) Selection Guide

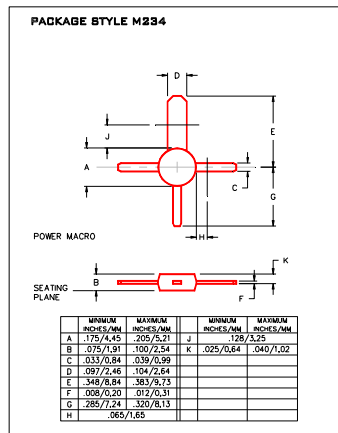
Low Cost RF Plastic Package Options



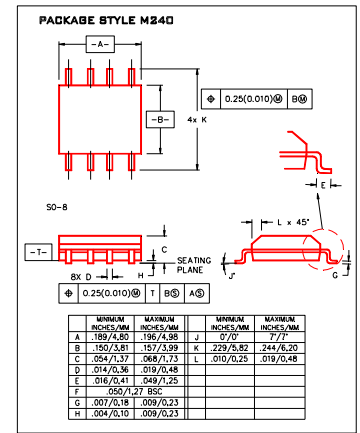
Macro T



Macro X

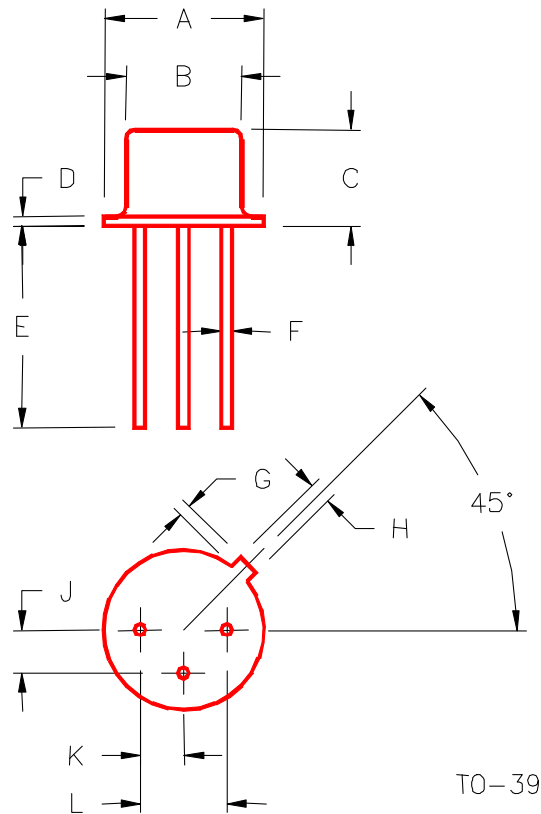


Power Macro



SO-8

PACKAGE STYLE M246



	MINIMUM INCHES/MM	MAXIMUM INCHES/MM		MINIMUM INCHES/MM	MAXIMUM INCHES/MM
A	.350/8,89	.370/9,40	J	.095/2,41	.105/2,67
B	.315/8,00	.335/8,51	K	.095/2,41	.105/2,67
C	.240/6,10	.260/6,60	L	.190/4,83	.210/5,33
D	.015/0,38	.045/1,14			
E	.500/12,70				
F	.016/0,41	.019/0,48			
G	.029/0,74	.040/1,02			
H	.028/0,71	.034/0,86			