The RF Line

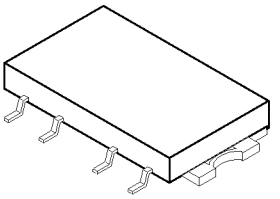
UHF Silicon FET Power Amplifier

The MHW2905 is designed specifically for the Pan European digital 2 watt, GSM handheld radio. This device is capable of wide power range control, operates from a 6 volt supply and requires only 2 mW of RF input power.

- Specified 6 Volt Characteristics:
  RF Input Power: 2 mW (3 dBm)
  RF Output Power: 3.2 W
  Power Gain: 32 dB Min
  Harmonics: –40 dBc Max @ 2 f_o
- Low Control Current
- 50 Ω Input/Output Impedances
- Guaranteed Stability and Ruggedness

MHW2905

3.2 W
890–915 MHz
RF POWER AMPLIFIER



CASE 420W–02, STYLE 1

MAXIMUM RATINGS (Flange Temperature = 25°C)

Rating	Symbol	Value	Unit
DC Supply Voltage	V_{DD}	9	Vdc
DC Supply Voltage (No RF Applied, No Bias)	V_{DD}	10	Vdc
DC Bias Voltage	V_{bias}	3.3	Vdc
DC Bias Current	I_{bias}	20	mA
DC Control Voltage	V_{cont}	3.8	Vdc
RF Input Power	P_{in}	4	mW
RF Output Power (V_{DD} = 9 V)	P_{out}	4	W
Operating Case Temperature Range	T_C	–30 to +80	°C
Storage Temperature Range	T_{stg}	–30 to +100	°C

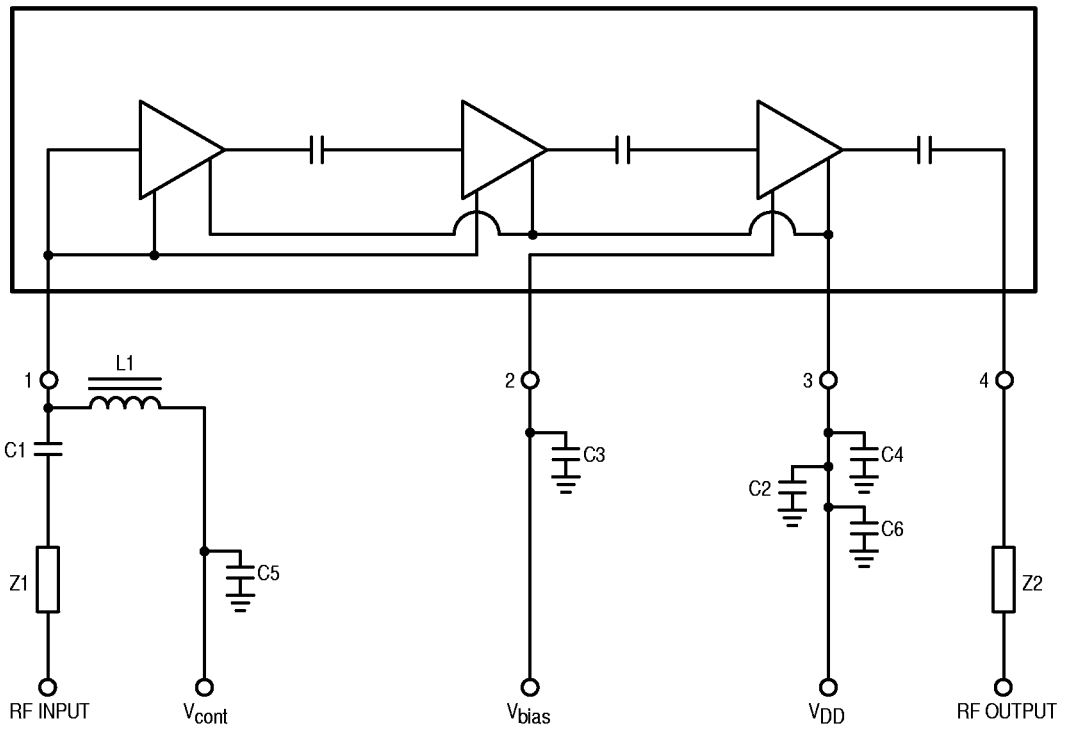
ELECTRICAL CHARACTERISTICS (V_{DD} = 6 Vdc; V_{bias} = 3 Vdc; T_C = +25°C, 50 Ω system, unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
Frequency Range	BW	890	915	MHz
Power Gain (P_{out} = 3.2 W, P_{in} = 2 mW) (1)(2)	G_p	32	—	dB
Control Current (P_{out} = 3.2 W; P_{in} = 2 mW) (1)(2)	I_{cont}	—	0.2	mA
Leakage Current (P_{in} = 0 mW, V_{cont} = 0 Vdc; V_{bias} = 0 Vdc; V_{DD} = 9 Vdc)	I_L	—	50	μA
Efficiency (P_{out} = 3.2 W; P_{in} = 2 mW) (1)(2)	η	40	—	%
Input VSWR (P_{out} = 3.2 W; P_{in} = 2 mW) (1)(2)	$VSWR_{in}$	—	2.2:1	—
Harmonics (P_{out} = 3.2 W; P_{in} = 2 mW) (1)(2) 2 f_o 3 f_o	—	— —	–40 –50	dBc
Noise Power (In 100 kHz Bandwidth, 20 MHz above f_o; T_C = +25°C to +100°C; P_{out} = 0.3–3.2 W; P_{in} = 2 mW; V_{DD} = 5–9 Vdc) (1)(2)	P_N	—	–85	dBm
Isolation (P_{in} = 2 mW; V_{cont} = 0 Vdc; V_{bias} = 0 Vdc; V_{DD} = 6 Vdc)	—	—	–36	dBm
3.0 dB V_{cont} Bandwith (P_{in} = 2 mW, P_{out} = 0.03–3.2 W) (1)(2)	—	1.0	—	MHz
Load Mismatch Stress (V_{DD} = 9 Vdc; P_{in} = 2 mW; P_{out} = 3.2 W; Load VSWR = 10:1, All Phase Angles at Frequency of Test) (1)(2)	ψ	No Degradation in Output Power Before & After Test		
Stability (P_{in} = 2–4 mW; P_{out} = 0.3–3.5 W; V_{DD} = 5–9 Vdc; Load VSWR = 6:1, Source VSWR = 3:1, All Phase Angles at Frequency of Test) (1)(2)	—	All Spurious Outputs More Than 60 dB Below Desired Signal		
Output Power (P_{in} = 2 mW, V_{cont} = 1.5 Vdc; f = 902 MHz) (1)(2)	P_{out}	–9	5	dBm
Saturated Output Power (P_{in} = 2 mW, V_{cont} = 3.0 Vdc)	P_{sat}	35.3	—	dBm

(1) Adjust V_{cont} (0–3.0 Vdc) for specified P_{out}; Duty Cycle = 12.5%, Period = 4.6 ms.

(2) V_{bias} not to be adjusted to set P_{out}. Acceptable to switch V_{bias} to achieve GSM time mask.

MHW2905 CIRCUIT BLOCK DIAGRAM



Pin Designations:

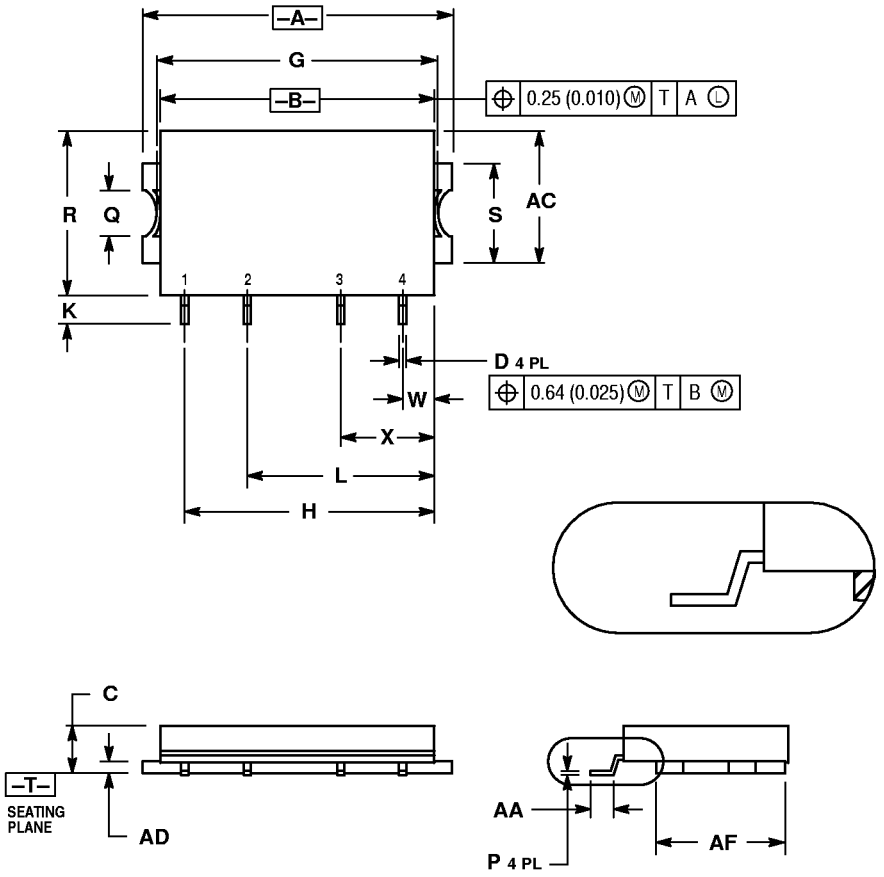
Pin 1 — RF Input Power @ 3 dBm and Control Voltage @ 0–3 Vdc
Pin 2 — V_{bias}
Pin 3 — V_{DD}
Pin 4 — RF Output Power

Element Values:

C1, C5 — 39 pF
C2 — 0.018 μF
C3, C4 — 0.1 μF
C6 — 10 μF
L1 — 0.12 μH Choke
Z1, Z2 — 50 Ω Microstrip Line

Figure 1. UHF Power Module Test Circuit Schematic and Device Block Diagram

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION AE (PACKAGE COPLANARITY):THE BOTTOM OF THE DEVICE LEADS AND THE REFERENCE PLANE –T– MUST BE COPLANAR WITHIN THE DIMENSION AE.
4. REF INDICATES NON–CONTROLLED DIMENSION FOR REFERENCE USE ONLY.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	24.68	24.99	0.972	0.984
B	21.87	22.12	0.861	0.871
C	3.63	4.00	0.143	0.157
D	0.43	0.58	0.017	0.023
G	22.48 REF		0.885 REF	
H	20.10 BSC		0.791 BSC	
K	2.11	2.62	0.083	0.103
L	15.10 BSC		0.594 BSC	
P	0.25 REF		0.010 REF	
Q	3.78 REF		0.149 REF	
R	13.06	13.36	0.514	0.526
S	7.95 BSC		0.313 REF	
W	2.60 BSC		0.102 BSC	
X	7.60 BSC		0.299 BSC	
AA	1.35	1.70	0.053	0.067
AC	10.49 REF		0.413 REF	
AD	0.81 REF		0.032 REF	
AE	+0.051	–0.076	+0.002	–0.003
AF	10.24 REF		0.403 REF	

STYLE 1:
PIN 1. P IN/VCONT
2. VBIAS
3. VDD1, 2, 3
4. P OUT

CASE 420W–02
ISSUE A

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