

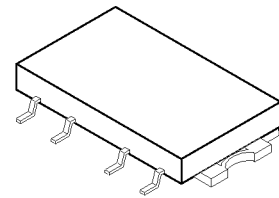
The RF Line UHF Silicon FET Power Amplifier

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

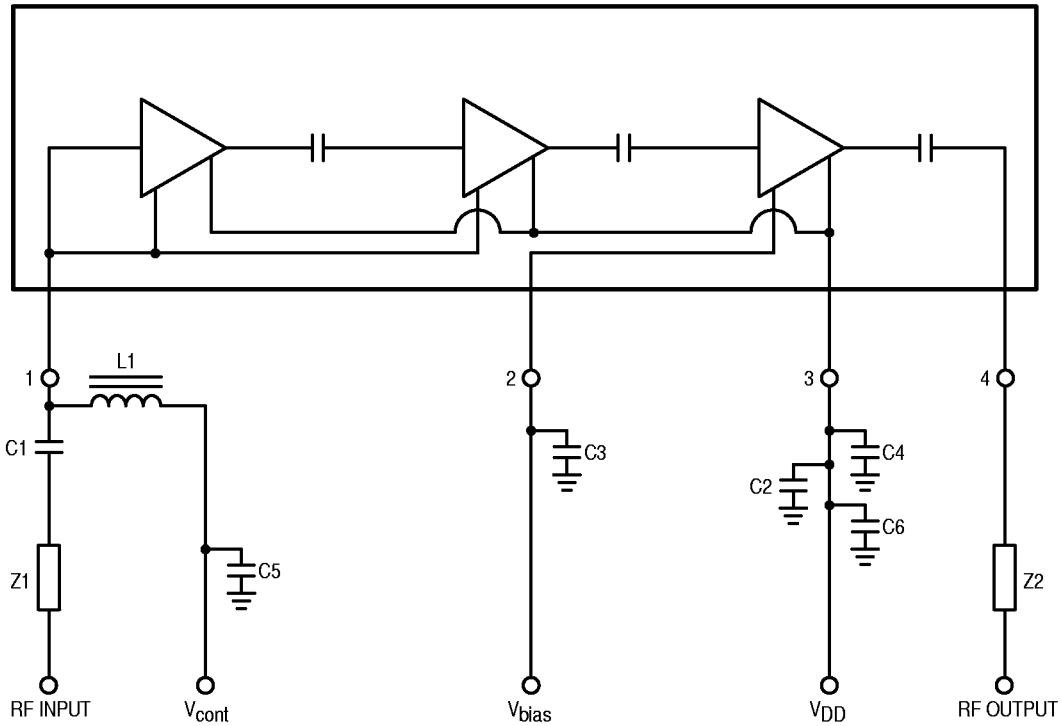
ELECTRICAL CHARACTERISTICS ($V_{DD} = 6 \text{ Vdc}$; $V_{bias} = 3 \text{ Vdc}$; $T_C = +25^\circ\text{C}$, 50Ω system, unless otherwise noted)

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

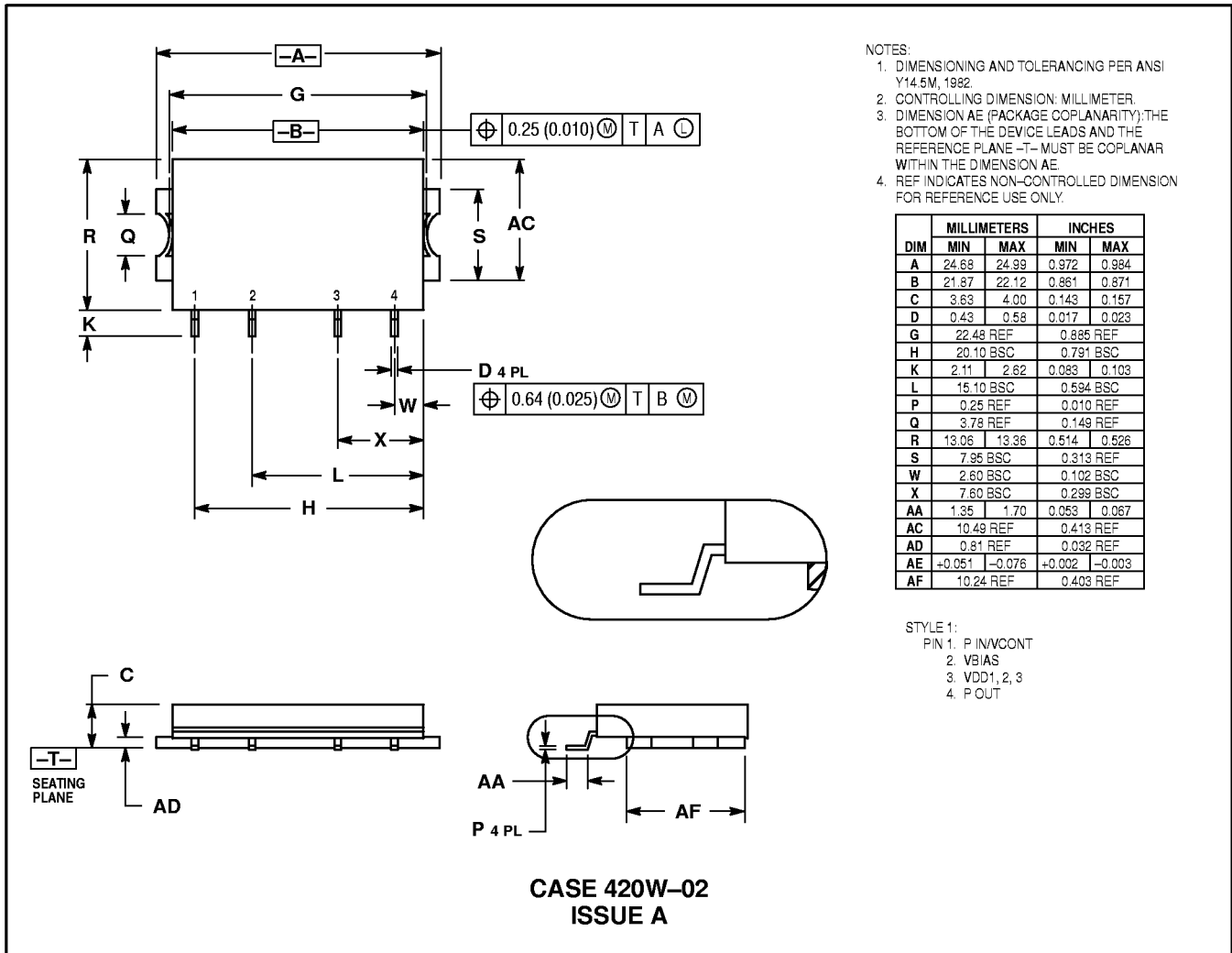
Pin 1 — RF Input Power @ 3 dBm and Control Voltage @ 0–3 Vdc
 Pin 2 — V_{bias}
 Pin 3 — V_{DD}
 Pin 4 — RF Output Power

Element Values:

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

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

PACKAGE DIMENSIONS



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