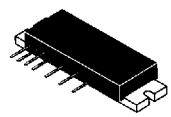
The RF Line
UHF Power Amplifier

MHW704-1
MHW704-2

3.0 W
440 to 470 MHz
UHF POWER
AMPLIFIER

Designed for 6.0 V UHF power amplifier applications in industrial and commercial equipment, primarily hand portable radios.

- Specified 6.0 Volt Characteristics:
  - Bandwidth:
    - MHW704–1: 400–440 MHz
    - MHW704–2: 440–470 MHz
  - RF Input Power — 1.0 mW (0 dBm)
  - RF Output Power — 3.0 W
  - Minimum Gain ($V_{Control}$ = 6.0 V) = 34.8 dB
  - Harmonics — –40 dBc Max @ 2 f_o
- 50 Ω Input/Output Impedances
- Guaranteed Stability and Ruggedness
- Epoxy Glass PCB Construction Gives Consistent Performance and Reliability



CASE 301J–04, STYLE 1

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
DC Supply Voltage (Pins 2, 4, 5, 6)	$V_{s1,2,3,4}$	7.5	Vdc
DC Control Voltage (Pin 3)	V_{cont}	6.0	Vdc
RF Input Power	P_{in}	3.0	mW
RF Output Power ($V_{s1} = V_{s2} = V_{s3} = V_{s4}$ = 7.5 Vdc)	P_{out}	4.5	W
Operating Case Temperature Range	T_C	–25 to +100	°C
Storage Temperature Range	T_{stg}	–25 to +100	°C

ELECTRICAL CHARACTERISTICS ($V_{s1} = V_{s2} = V_{s3} = V_{s4}$ = 6.0 Vdc (Pins 2, 4, 5, 6); T_C = +25°C, 50 ohm system)

Characteristic		Symbol	Min	Max	Unit
Frequency Range	MHW704–1 MHW704–2	BW	400 440	440 470	MHz
Power Gain (P_{out} = 3.0 W; V_{cont} = 6.0 V)		G_p	34.8	—	dB
Control Voltage (P_{in} = 1.0 mW; P_{out} = 3.0 W) (1)		V_{cont}	—	6.0	Vdc
Efficiency (P_{in} = 1.0 mW; P_{out} = 3.0 W) (1)	MHW704–1 MHW704–2	η	37 38	— —	%
Harmonics (P_{out} = 3.0 W; P_{in} = 1.0 mW) (1)	2 f_o	—	—	–40	dBc
Input VSWR (P_{out} = 3.0 W; P_{in} = 1.0 mW) (1)		$VSWR_{in}$	—	2.0:1	—
Load Mismatch ($V_{s1} = V_{s2} = V_{s3} = V_{s4}$ = 7.5 Vdc; Load VSWR = 10:1, All Phase Angles At Frequency of Test; P_{out} = 4.0 W; P_{in} = 3.0 mW) (1)		ψ	No Degradation in Power Output		
Stability (P_{in} = 1.0 to 3.0 mW; $V_{s1} = V_{s2} = V_{s3} = V_{s4}$ = 5.0 to 7.5 Vdc; P_{out} = 100 mW to 4.0 W; Load VSWR = 6:1 (MHW704–1); Load VSWR = 8:1, (MHW704–2) All Phase Angles At Frequency of Test) (1)		—	All Spurious Outputs More Than 60 dB Below Desired Signal		
Control Current (P_{out} = 3.0 W; P_{in} = 1.0 mW) (1)		I_{cont}	—	80	mA
Quiescent Current (P_{in} = 0 mW; V_{cont} = 0 Vdc)		I_Q	—	150	mA
Leakage Current ($V_{s1} = V_{s2} = V_{cont}$ = 0 Vdc; $V_{s3} = V_{s4}$ = 7.5 Vdc; P_{in} = 0 mW)		I_L	—	0.2	mA

(1) Adjust V_{Cont} for specified P_{out}.

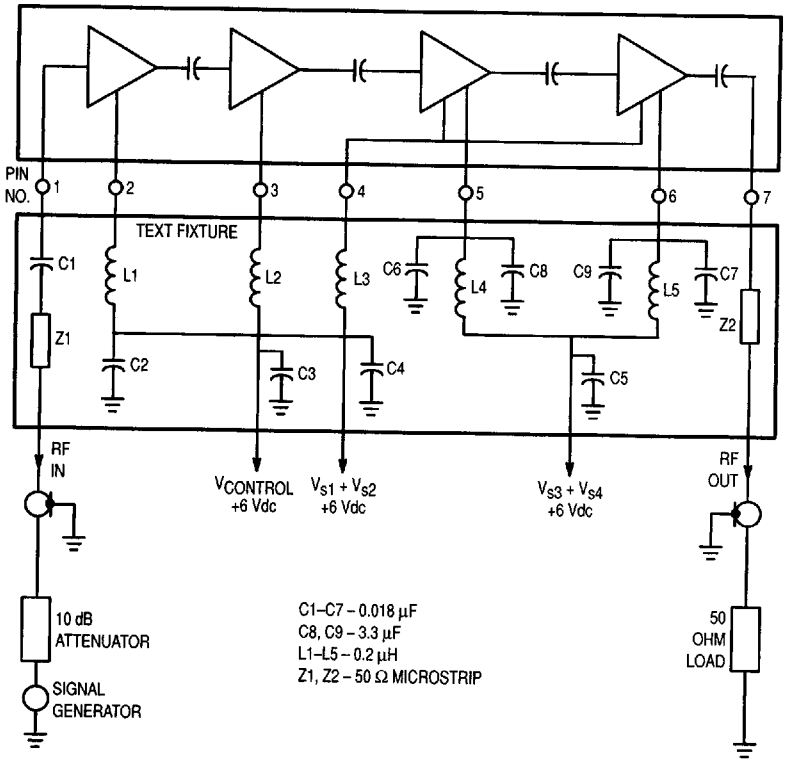


Figure 1. UHF Power Amplifier Test System Diagram

TYPICAL CHARACTERISTICS
MHW704–2

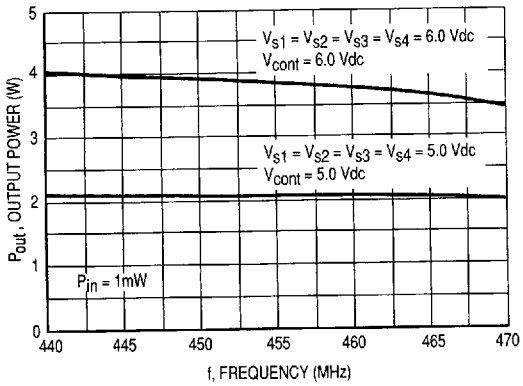


Figure 2. Output Power versus Frequency

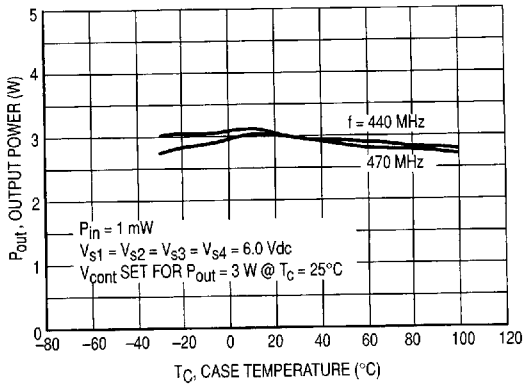


Figure 3. Output Power versus Case Temperature

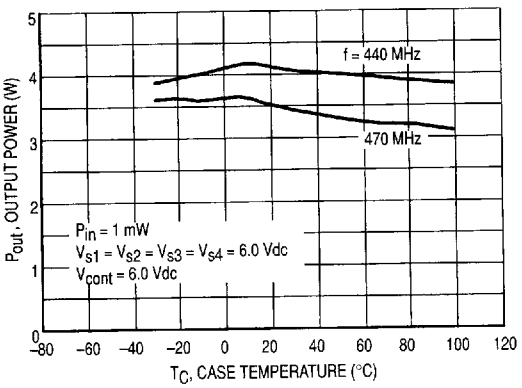


Figure 4. Output Power versus Case Temperature at Maximum Control Voltage

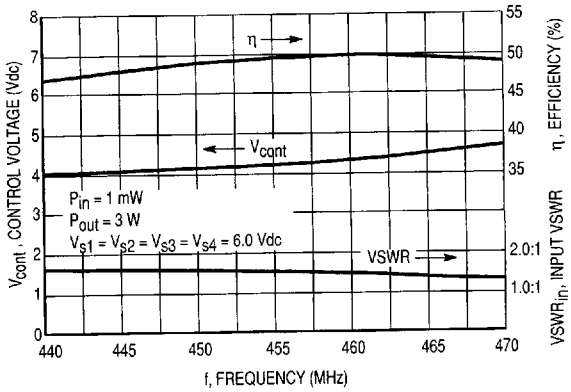


Figure 5. Control Voltage, Efficiency and VSWR versus Frequency

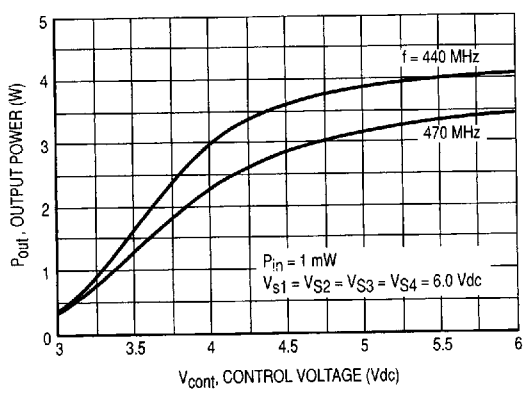


Figure 6. Output Power versus Control Voltage