

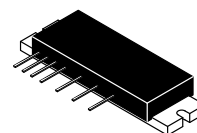
The RF Line UHF Power Amplifier

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 ($V_{\text{Control}} = 6.0 \text{ V}$) = 34.8 dB
 - Harmonics — -40 dBc Max @ $2 f_0$
- 50 Ω Input/Output Impedances
- Guaranteed Stability and Ruggedness
- Epoxy Glass PCB Construction Gives Consistent Performance and Reliability

MHW704-1
MHW704-2

3.0 W
440 to 470 MHz
UHF POWER
AMPLIFIER



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 ($V_{S1} = V_{S2} = V_{S3} = V_{S4} = 7.5 \text{ Vdc}$)	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 ($V_{S1} = V_{S2} = V_{S3} = V_{S4} = 6.0 \text{ Vdc}$ (Pins 2, 4, 5, 6); $T_C = +25^\circ\text{C}$, 50 ohm system)

Characteristic	Symbol	Min	Max	Unit
Frequency Range MHW704-1 MHW704-2	BW	400 440	440 470	MHz
Power Gain ($P_{\text{out}} = 3.0 \text{ W}$; $V_{\text{cont}} = 6.0 \text{ V}$)	G_p	34.8	—	dB
Control Voltage ($P_{\text{in}} = 1.0 \text{ mW}$; $P_{\text{out}} = 3.0 \text{ W}$) (1)	V_{cont}	—	6.0	Vdc
Efficiency ($P_{\text{in}} = 1.0 \text{ mW}$; $P_{\text{out}} = 3.0 \text{ W}$) (1) MHW704-1 MHW704-2	η	37 38	—	%
Harmonics ($P_{\text{out}} = 3.0 \text{ W}$; $P_{\text{in}} = 1.0 \text{ mW}$) (1) $2 f_0$	—	—	-40	dBc
Input VSWR ($P_{\text{out}} = 3.0 \text{ W}$; $P_{\text{in}} = 1.0 \text{ mW}$) (1)	$V_{\text{SWR}_{\text{in}}}$	—	2.0:1	—
Load Mismatch ($V_{S1} = V_{S2} = V_{S3} = V_{S4} = 7.5 \text{ Vdc}$; Load VSWR = 10:1, All Phase Angles At Frequency of Test; $P_{\text{out}} = 4.0 \text{ W}$; $P_{\text{in}} = 3.0 \text{ mW}$) (1)	ψ	No Degradation in Power Output		
Stability ($P_{\text{in}} = 1.0$ to 3.0 mW ; $V_{S1} = V_{S2} = V_{S3} = V_{S4} = 5.0$ to 7.5 Vdc ; $P_{\text{out}} = 100 \text{ mW}$ 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 ($P_{\text{out}} = 3.0 \text{ W}$; $P_{\text{in}} = 1.0 \text{ mW}$) (1)	I_{cont}	—	80	mA
Quiescent Current ($P_{\text{in}} = 0 \text{ mW}$; $V_{\text{cont}} = 0 \text{ Vdc}$)	I_Q	—	150	mA
Leakage Current ($V_{S1} = V_{S2} = V_{\text{cont}} = 0 \text{ Vdc}$; $V_{S3} = V_{S4} = 7.5 \text{ Vdc}$; $P_{\text{in}} = 0 \text{ mW}$)	I_L	—	0.2	mA

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

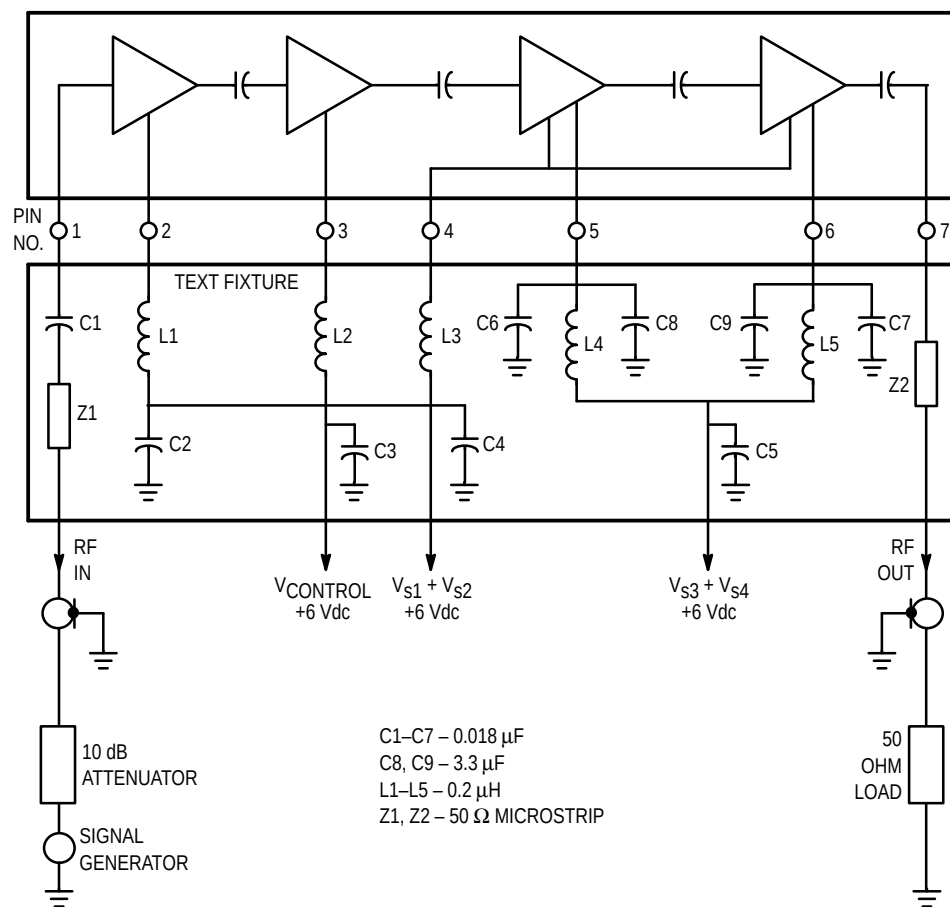


Figure 1. UHF Power Amplifier Test System Diagram

TYPICAL CHARACTERISTICS **MHW704-2**

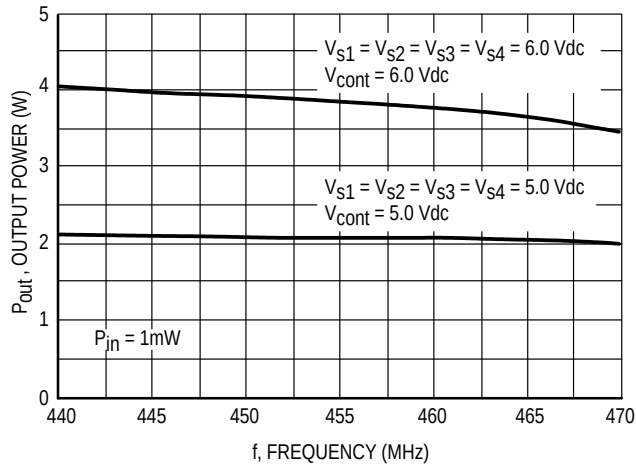


Figure 2. Output Power versus Frequency

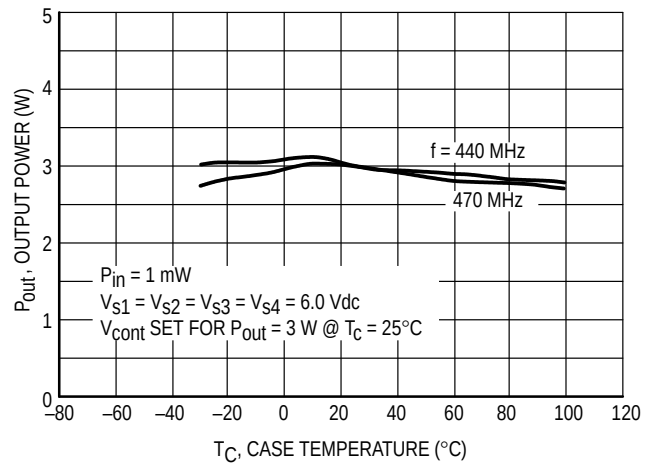


Figure 3. Output Power versus Case Temperature

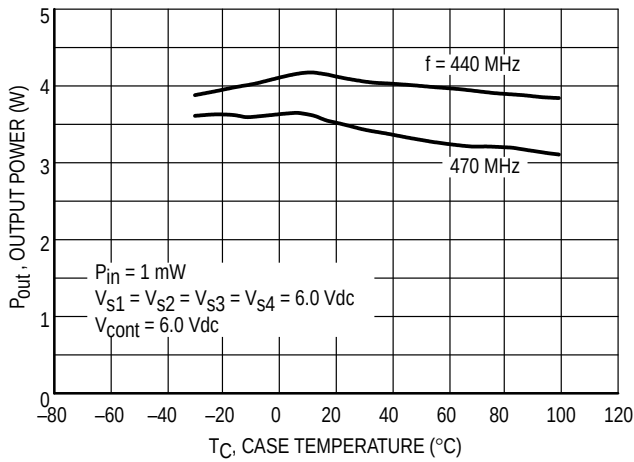


Figure 4. Output Power versus Case Temperature at Maximum Control Voltage

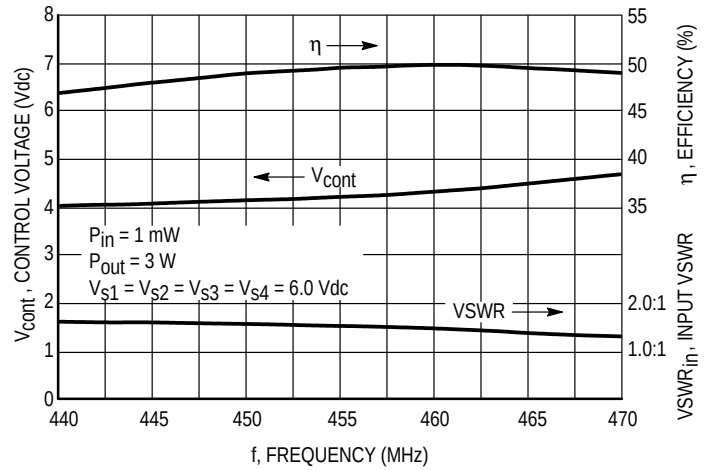


Figure 5. Control Voltage, Efficiency and VSWR versus Frequency

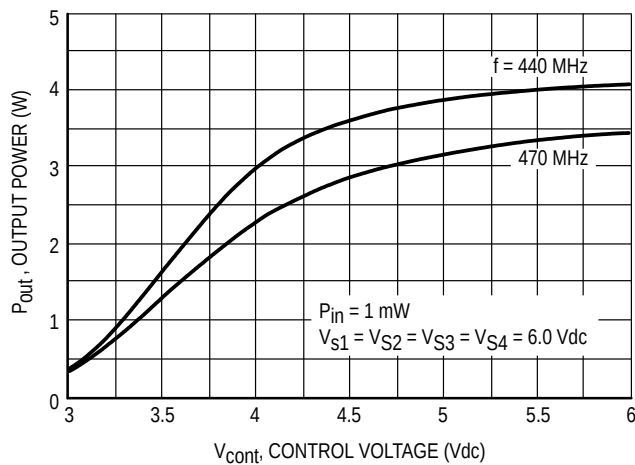
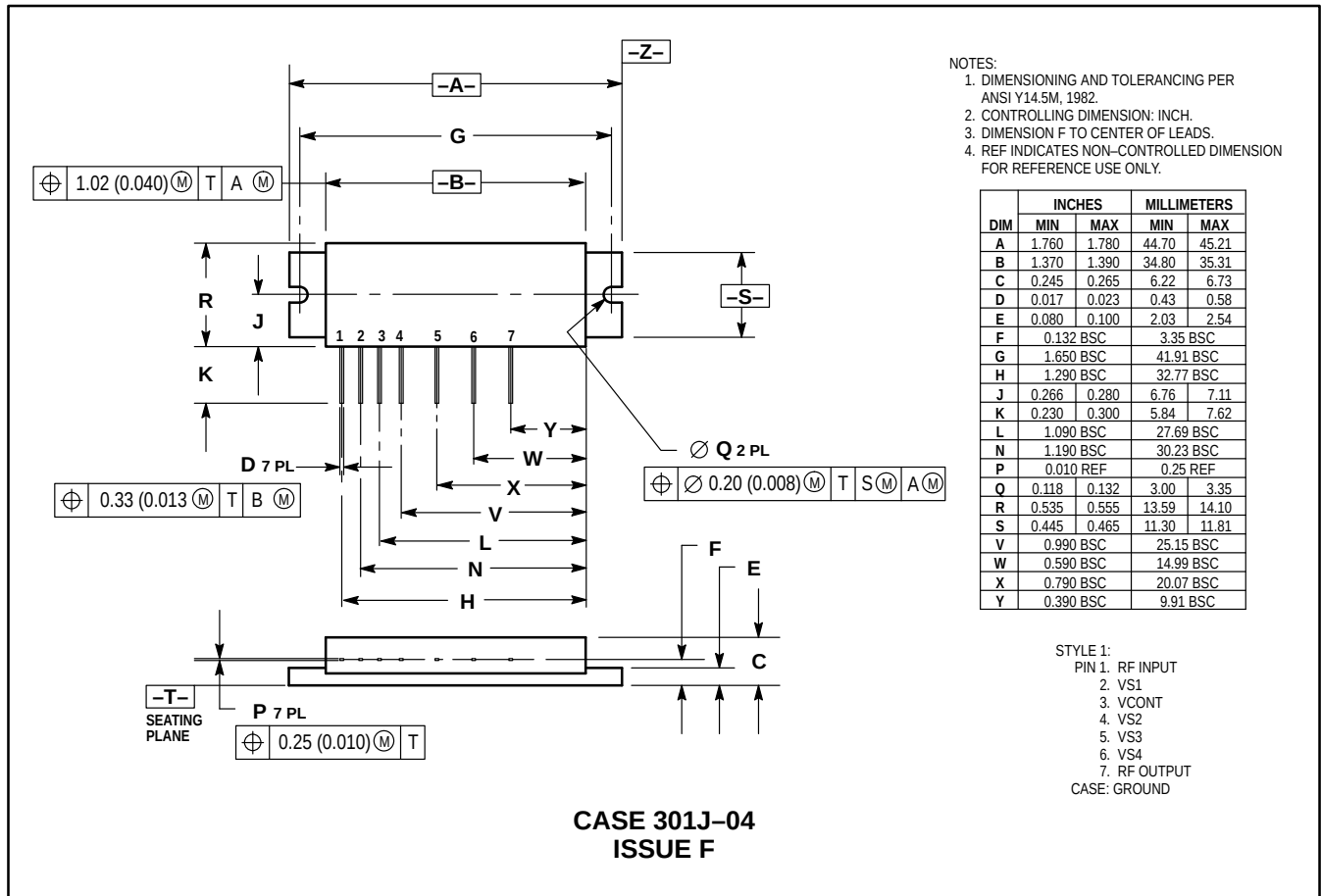


Figure 6. Output Power versus Control Voltage

PACKAGE DIMENSIONS



Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

How to reach us:

USA / EUROPE: Motorola Literature Distribution;
 P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,
 6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

MFAX: RMFAX0@email.sps.mot.com - TOUCHTONE (602) 244-6609
INTERNET: http://Design-NET.com

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
 51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298



MHW704/D

