



**MOTOROLA**

# MHW2821-1 MHW2821-2

## UHF Silicon FET Power Amplifiers

Designed for 12.5 V UHF power amplifier applications in industrial and commercial FM equipment operating from 806 to 950 MHz.

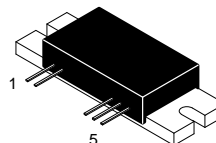
- Specified 12.5 V Characteristics:
  - RF Input Power:  $\leq 250$  mW (MHW2821-1)  
 $\leq 300$  mW (MHW2821-2)
  - RF Output Power: 20 W (MHW2821-1)  
18 W (MHW2821-2)
- LDMOS FET Technology
- Epoxy Glass Substrate Eliminates Possibility of Substrate Fracture
- 50  $\Omega$  Input/Output Impedance
- Guaranteed Stability and Ruggedness
- Cost Effective

**RF POWER AMPLIFIER**  
20 W, 806 to 870 MHz (-1 suffix)  
18 W, 890 to 950 MHz (-2 suffix)

**SEMICONDUCTOR  
TECHNICAL DATA**

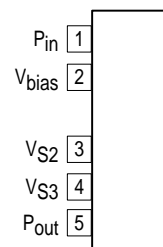
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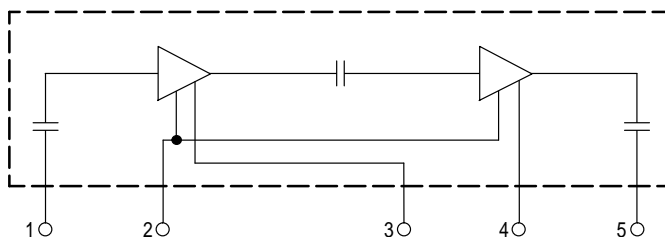
CASE 301AB

### PIN CONNECTIONS



(Top View)

### Simplified Block Diagram



This device contains 2 active transistors

### ORDERING INFORMATION

Device	Operating Temperature Range	Package
MHW2821-1	$T_A = -30$ to $100^\circ\text{C}$	Power Module
MHW2821-2		

**MAXIMUM RATINGS** (Flange Temperature = 25°C, unless otherwise noted.)

Rating	Symbol	Value	Unit
DC Supply Voltages	$V_{bias}$ , $V_{S2}$ , $V_{S3}$	12.5 16	Vdc
RF Input Power	$P_{in}$	400	mW
RF Output Power	$P_{out}$	23	W
Operating Case Temperature Range	$T_C$	-30 to 100	°C
Storage Temperature Range	$T_{stg}$	-30 to 100	°C

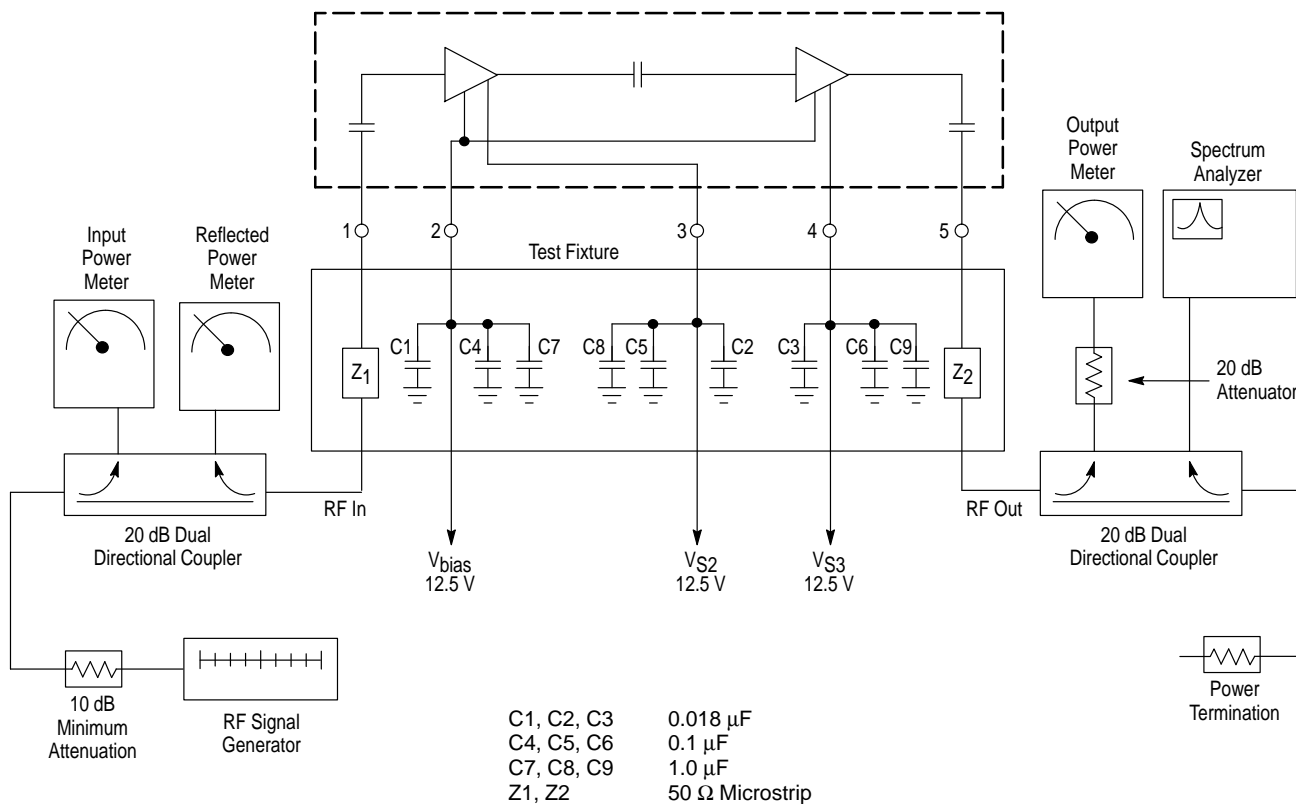
- NOTES:** 1. Meets Human Body Model (HBM)  $\leq 3000$  V.  
2. ESD data available upon request.

**ELECTRICAL CHARACTERISTICS** ( $V_{S2} = V_{S3} = 12.5$  Vdc;  $V_{bias} = 12.5$  Vdc;  $T_C = 25^\circ\text{C}$ , 50  $\Omega$  system, unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range MHW2821-1 MHW2821-2	BW	806 890	- -	870 950	MHz
Input Power MHW2821-1 ( $P_{out} = 20$ W) [Note] MHW2821-2 ( $P_{out} = 18$ W) [Note]	$P_{in}$	- -	- -	250 300	mW
Power Gain MHW2821-1 ( $P_{out} = 20$ W) [Note] MHW2821-2 ( $P_{out} = 18$ W) [Note]	$G_p$	19 17.9	- -	- -	dB
Efficiency (Rated $P_{out}$ )	$\eta$	35	-	-	%
Harmonics (Rated $P_{out}$ Reference) [Note]	$2f_o$ $3f_o$	- -	- -	-40 -45	dBc
Input VSWR (Rated $P_{out}$ ) [Note]	$VSWR_{in}$	-	-	3:1	-
Load Mismatch Stress ( $V_{supply} = 16$ Vdc; $P_{out} = 20$ W for MHW2821-1; $P_{out} = 18$ W for MHW2821-2; Load VSWR = 20:1, All Phase Angles at Frequency of Test) [Note]	$\psi$	No Degradation in Output Power Before and After Test			
Stability ( $V_{supply} = 10.8$ to 16 Vdc; $P_{in} = 0$ to 250 mW for MHW2821-1; $P_{in} = 0$ to 300 mW for MHW2821-2; Load VSWR = 4:1, All Phase Angles at Frequency of Test)	-	All Spurious Outputs More than 60 dB Below Desired Signal			
Quiescent Current (With No RF Applied, $V_{S2} = V_{S3} = 12.5$ Vdc; $V_{bias} = 12.5$ Vdc)	$I_{sq}$	-	-	500	mA
Leakage Current (With No RF Applied, $V_{S2} = V_{S3} = 12.5$ Vdc; $V_{bias} = 0$ Vdc)	$I_L$	-	-	0.6	mA
Bias $P_{in}$ Current (Rated $P_{out}$ ) [Note]	$I_{bias}$	-	-	3.0	mA

**NOTE:** Adjust  $P_{in}$  for specified  $P_{out}$ .

Figure 1. Test Circuit Diagram

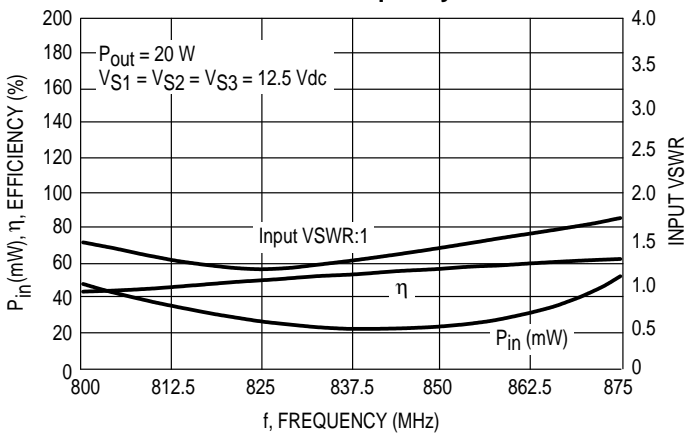


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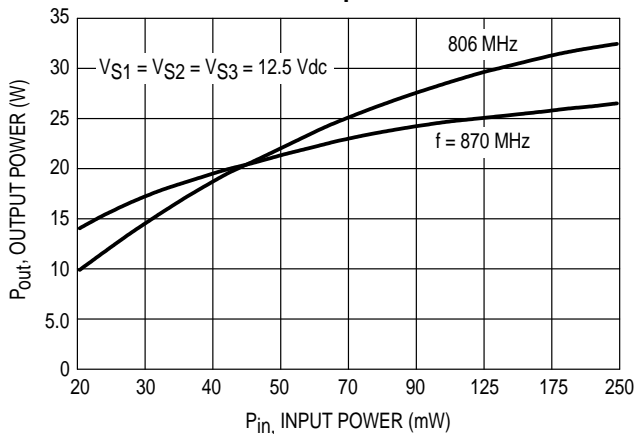
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TYPICAL CHARACTERISTICS (MHW2821-1)

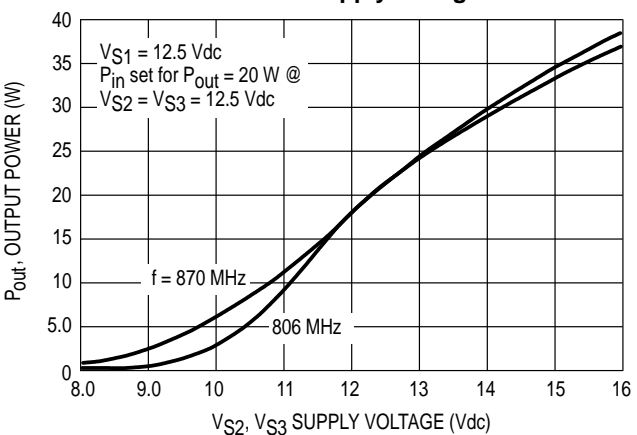
**Figure 2. Input Power, Efficiency and VSWR versus Frequency**



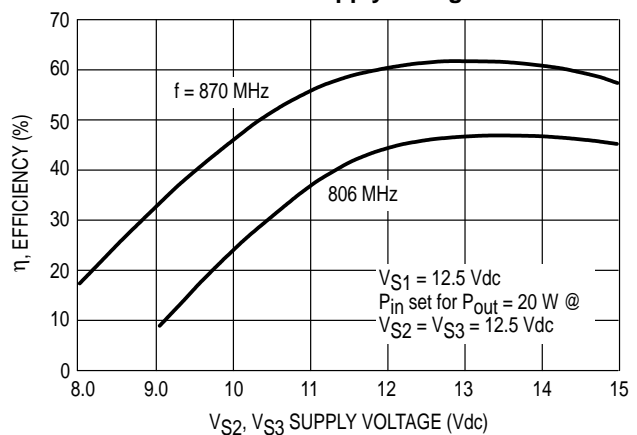
**Figure 3. Output Power versus Input Power**



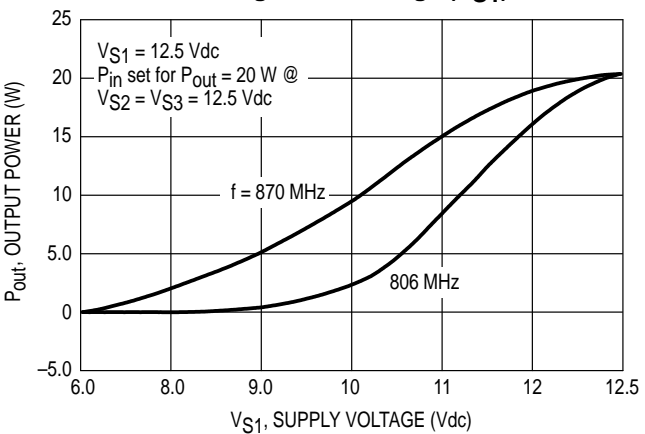
**Figure 4. Output Power versus Supply Voltage**



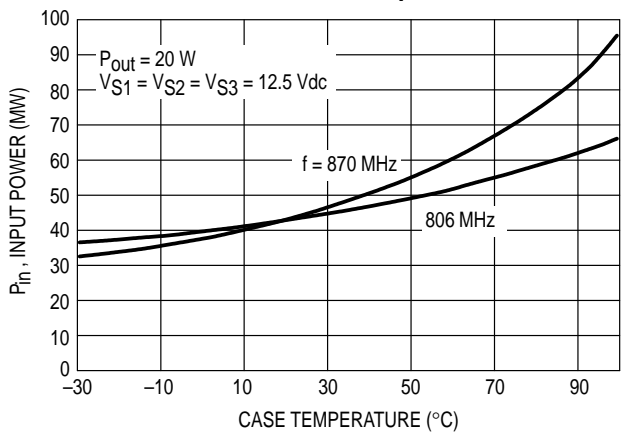
**Figure 5. Efficiency versus Supply Voltage**



**Figure 6. Output Power versus Supply Voltage to First Stage ( $V_{S1}$ )**



**Figure 7. Input Power versus Case Temperature**



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TYPICAL CHARACTERISTICS (MHW2821-2)

Figure 8.  $P_{in}$  VSWR, and Efficiency versus Frequency

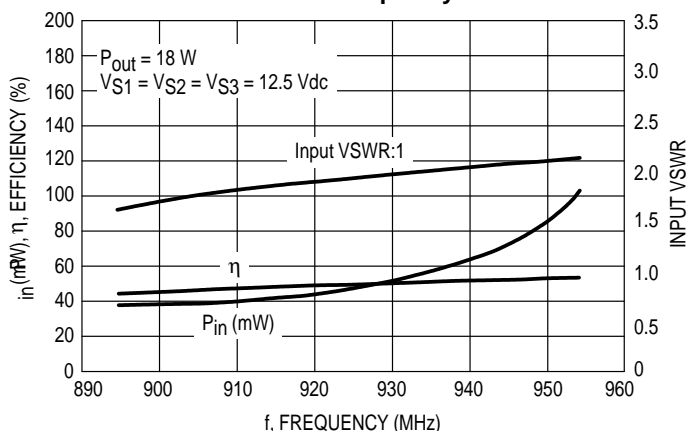


Figure 9. Output Power versus Input Power

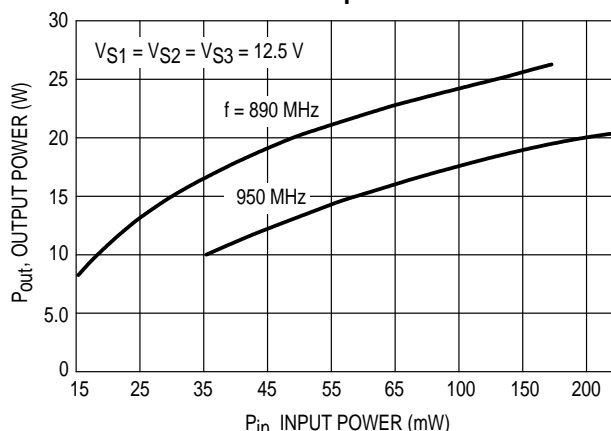


Figure 10.  $P_{out}$  versus Supply Voltage

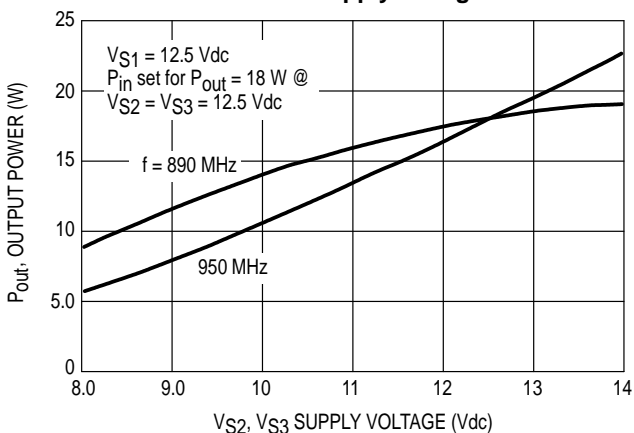
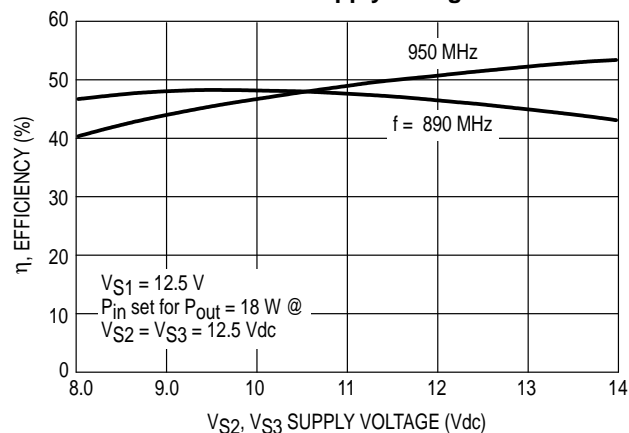


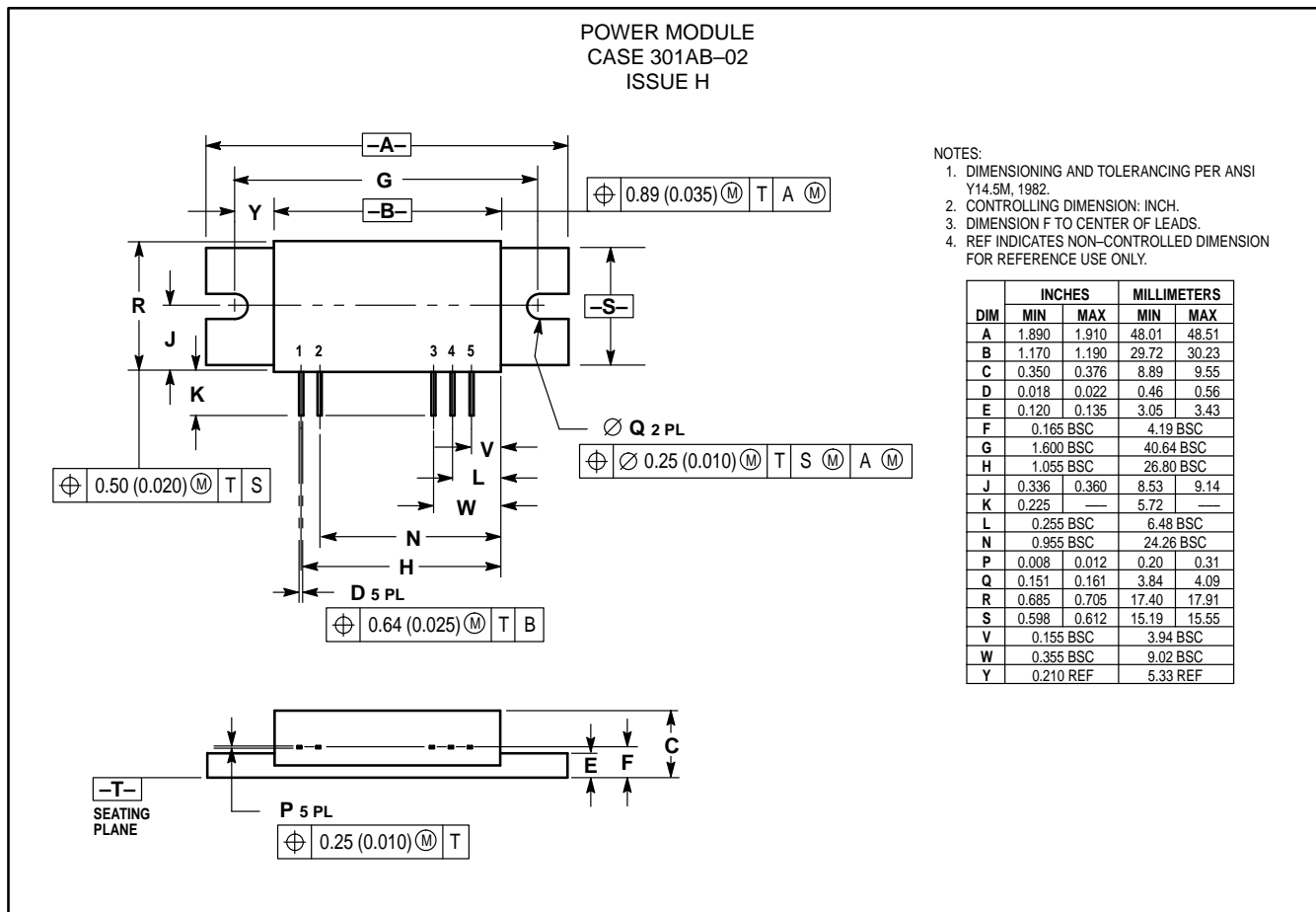
Figure 11. Efficiency versus Supply Voltage



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