

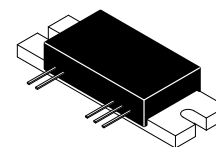
## The RF Line UHF Silicon FET Power Amplifiers

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

- Specified 12.5 Volt 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

**MHW2821-1**  
**MHW2821-2**

**-1: 20 W, 806-870 MHz**  
**-2: 18 W, 890-950 MHz**  
**RF POWER AMPLIFIER**



CASE 301AB-02, STYLE 1

### MAXIMUM RATINGS (Flange Temperature = 25°C)

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

### 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	Max	Unit
Frequency Range	BW	806 890	870 950	MHz
Input Power ( $P_{out} = 20$ W) (1) ( $P_{out} = 18$ W) (1)	$P_{in}$	— —	250 300	mW
Power Gain ( $P_{out} = 20$ W) (1) ( $P_{out} = 18$ W) (1)	$G_p$	19 17.9	— —	dB
Efficiency (Rated $P_{out}$ )	$\eta$	35	—	%
Harmonics (Rated $P_{out}$ Reference) (1)	$2f_o$ $3f_o$	— —	-40 -45	dBc
Input VSWR (Rated $P_{out}$ ) (1)	VSWR $_{in}$	—	3:1	dB

(1) Adjust  $P_{in}$  for specified  $P_{out}$ .

(continued)

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

Characteristic	Symbol	Min	Max	Unit
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) (1)	$\psi$	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 $P_{out}$ ) (1)	$I_{bias}$	—	0.8	mA

(1) Adjust  $P_{in}$  for specified  $P_{out}$ .

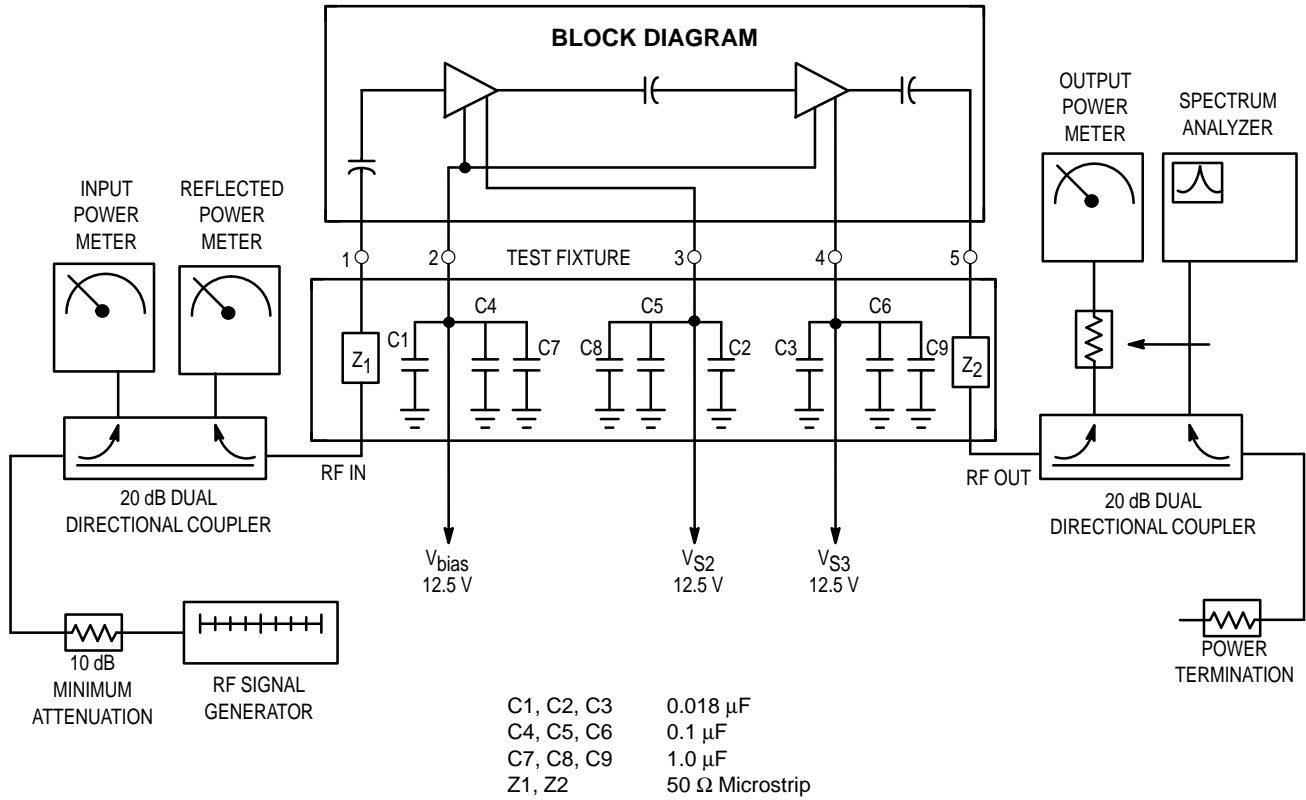
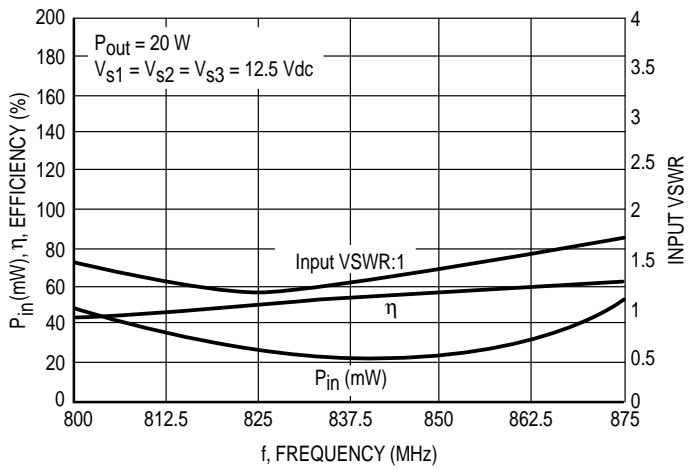
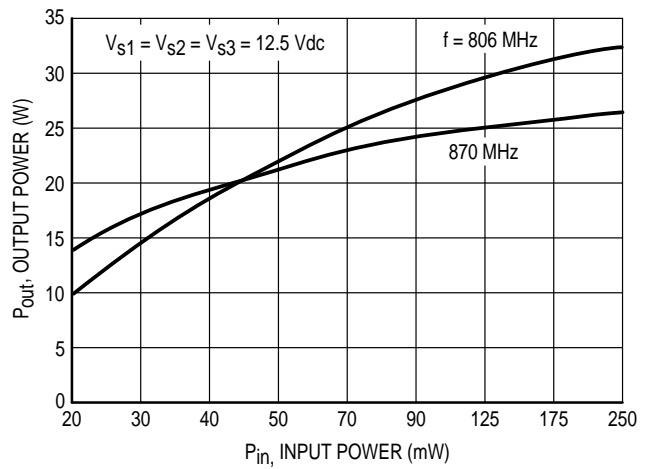


Figure 1. Test Circuit Diagram

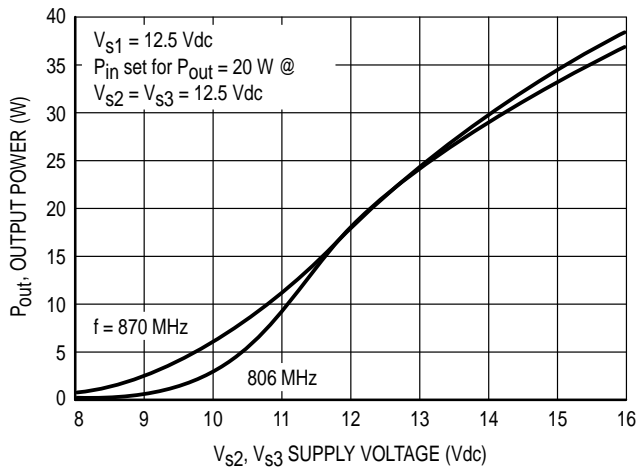
## TYPICAL CHARACTERISTICS (MHW2821-1)



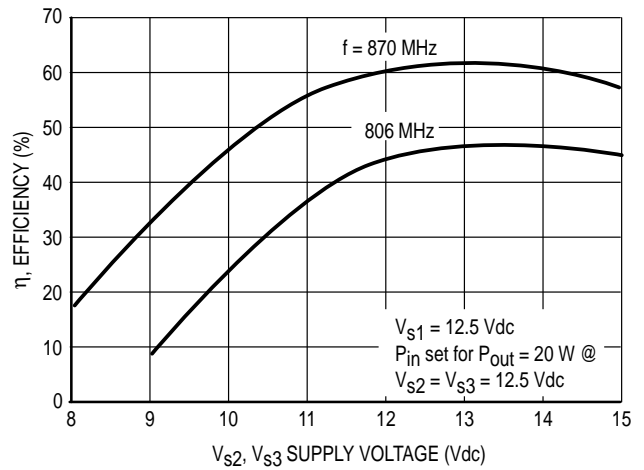
**Figure 2. Input Power, Efficiency and VSWR versus Frequency**



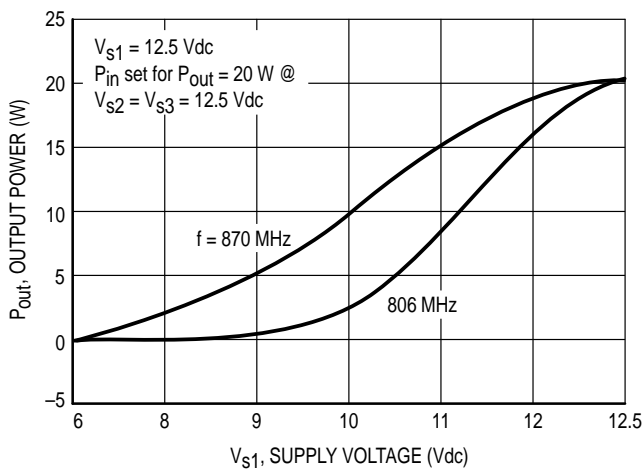
**Figure 3. Output Power versus Input Power**



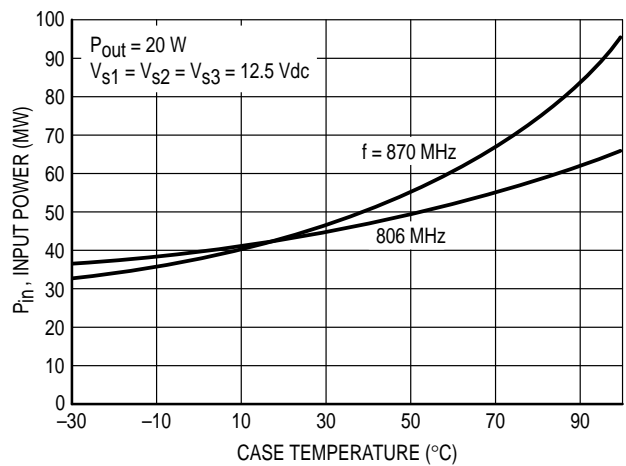
**Figure 4. Output Power versus Supply Voltage**



**Figure 5. Efficiency versus Supply Voltage**

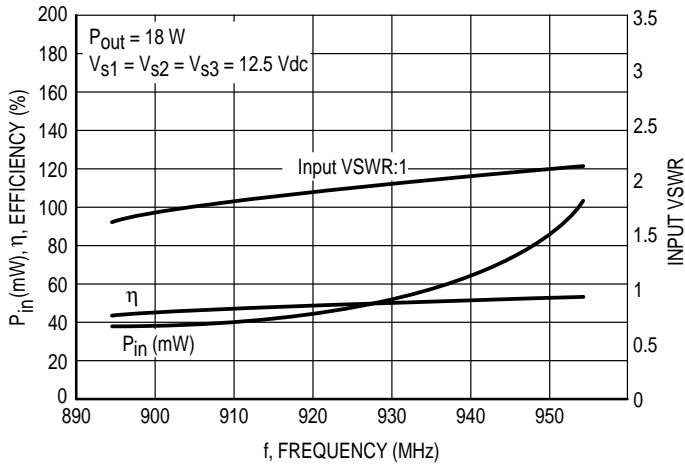


**Figure 6. Output Power versus Supply Voltage to First Stage ( $V_{s1}$ )**

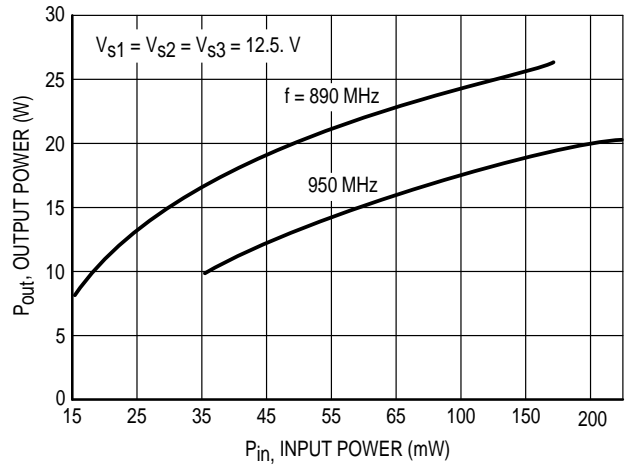


**Figure 7. Input Power versus Case Temperature**

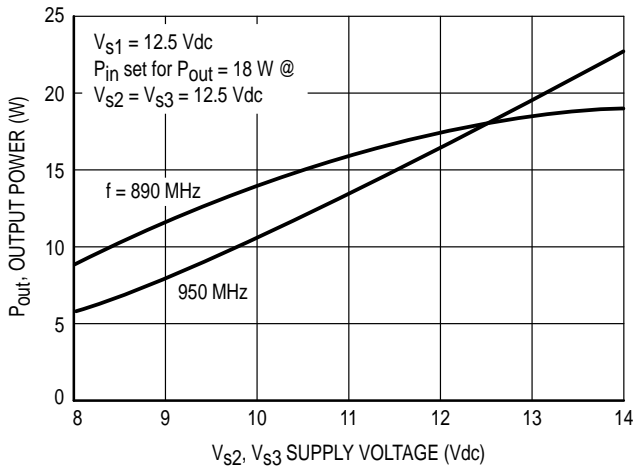
## TYPICAL CHARACTERISTICS (MHW2821-2)



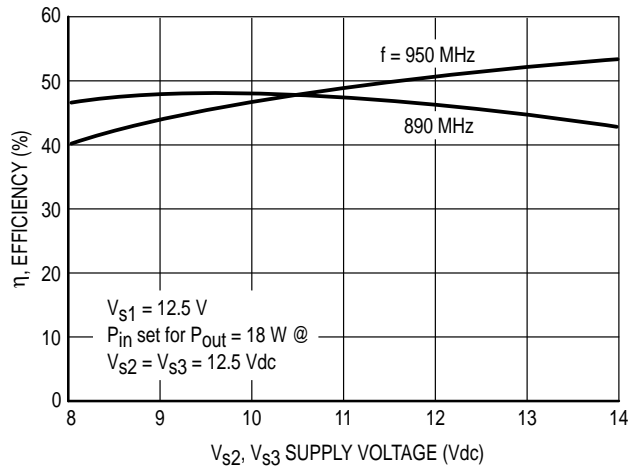
**Figure 8.  $P_{in}$  VSWR, and Efficiency versus Frequency**



**Figure 9. Output Power versus Input Power**

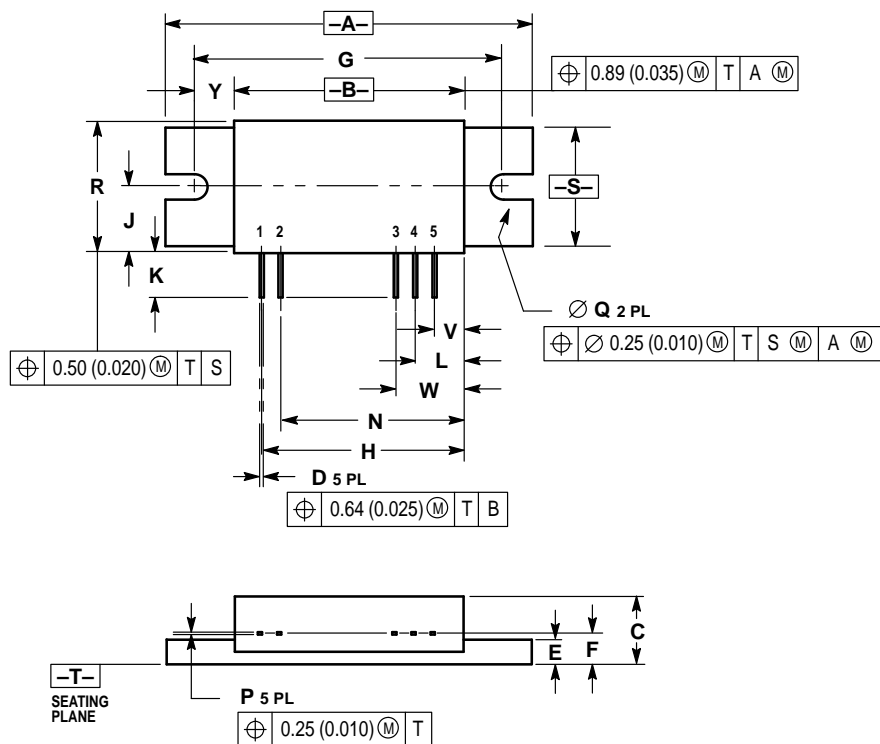


**Figure 10.  $P_{out}$  versus Supply Voltage**



**Figure 11. Efficiency versus Supply Voltage**

# PACKAGE DIMENSIONS




- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION F TO CENTER OF LEADS.
  4. REF INDICATES NON-CONTROLLED DIMENSION FOR REFERENCE USE ONLY.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.890	1.910	48.01	48.51
B	1.170	1.190	29.72	30.23
C	0.350	0.376	8.89	9.55
D	0.018	0.022	0.46	0.56
E	0.120	0.135	3.05	3.43
F	0.165 BSC		4.19 BSC	
G	1.600 BSC		40.64 BSC	
H	1.055 BSC		26.80 BSC	
J	0.336	0.360	8.53	9.14
K	0.225	—	5.72	—
L	0.255 BSC		6.48 BSC	
N	0.955 BSC		24.26 BSC	
P	0.008	0.012	0.20	0.31
Q	0.151	0.161	3.84	4.09
R	0.685	0.705	17.40	17.91
S	0.598	0.612	15.19	15.55
V	0.155 BSC		3.94 BSC	
W	0.355 BSC		9.02 BSC	
Y	0.210 REF		5.33 REF	

- STYLE 1:  
 PIN 1: RF INPUT  
 2. +DC (BIAS)  
 3. +DC (SUPPLY)  
 4. +DC (SUPPLY)  
 5. RF OUTPUT  
 CASE: GROUND

CASE 301AB-02  
 ISSUE F

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MHW2821/D

