

The RF Line

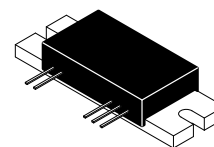
UHF Silicon FET Power Amplifiers

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: ≤ 250 mW (MHW2821-1)
 ≤ 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 Ω 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 Ω 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})	η	35	—	%
Harmonics (Rated P_{out} Reference) (1)	$2f_0$ $3f_0$	— —	– 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)	ψ	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} .

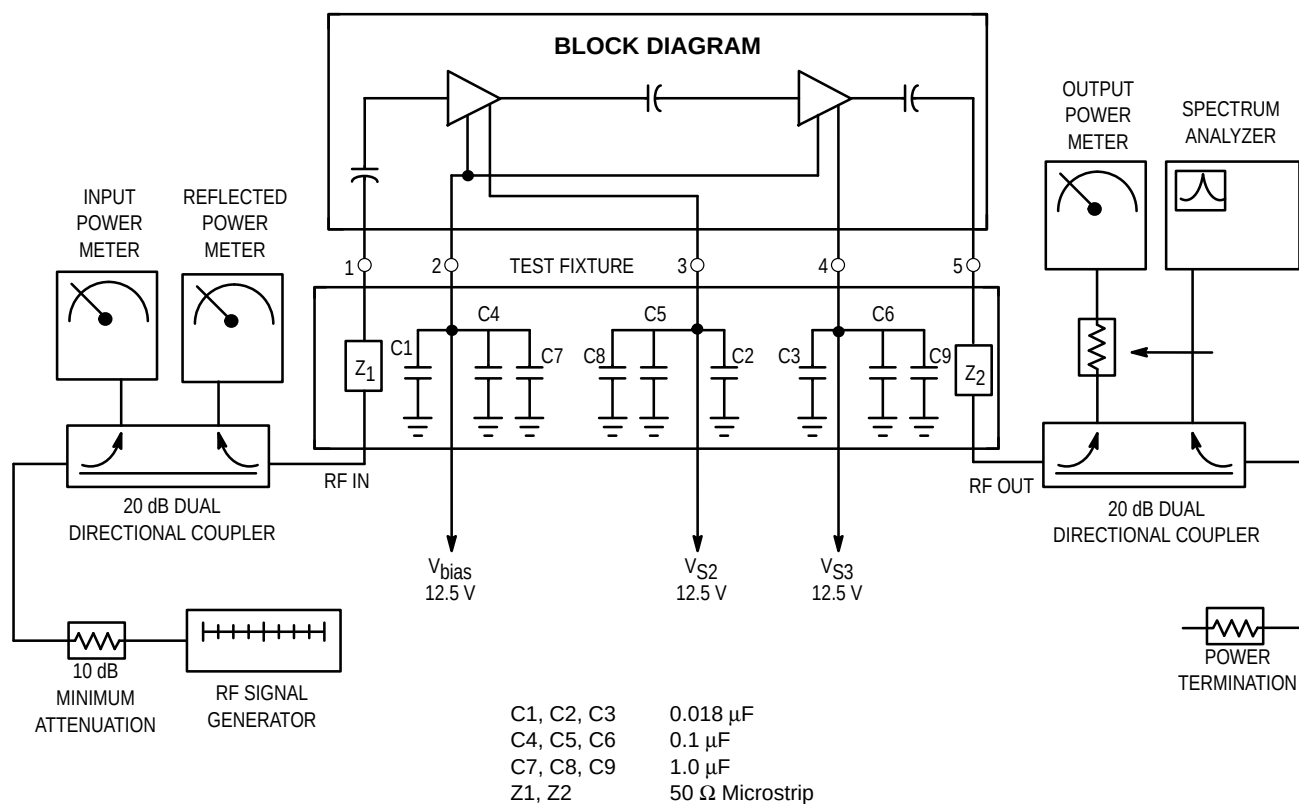


Figure 1. Test Circuit Diagram

TYPICAL CHARACTERISTICS (MHW2821-1)

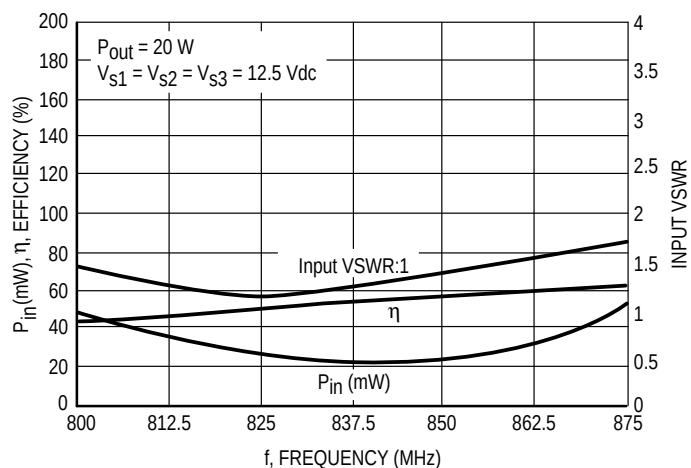


Figure 2. Input Power, Efficiency and VSWR versus Frequency

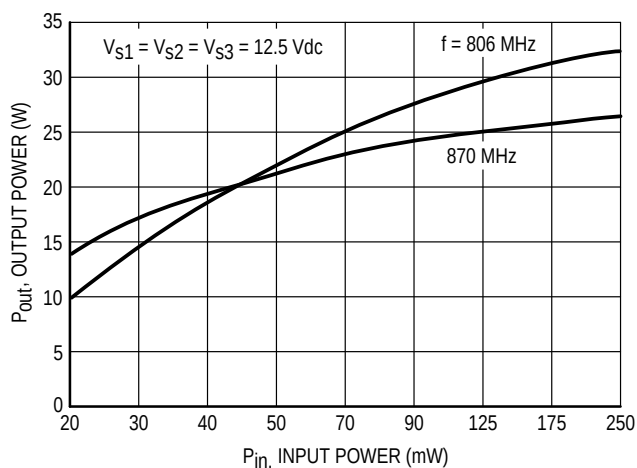


Figure 3. Output Power versus Input Power

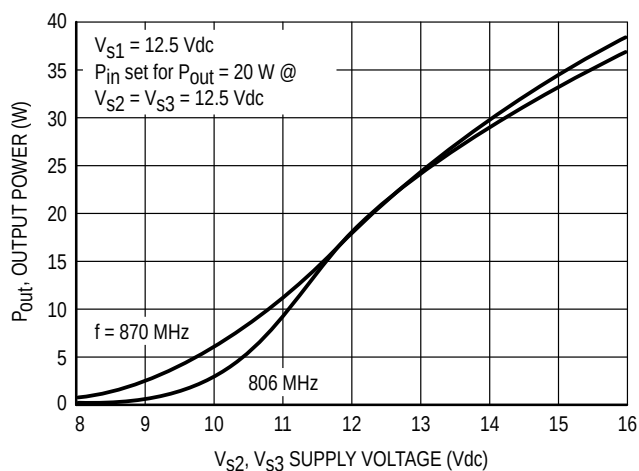


Figure 4. Output Power versus Supply Voltage

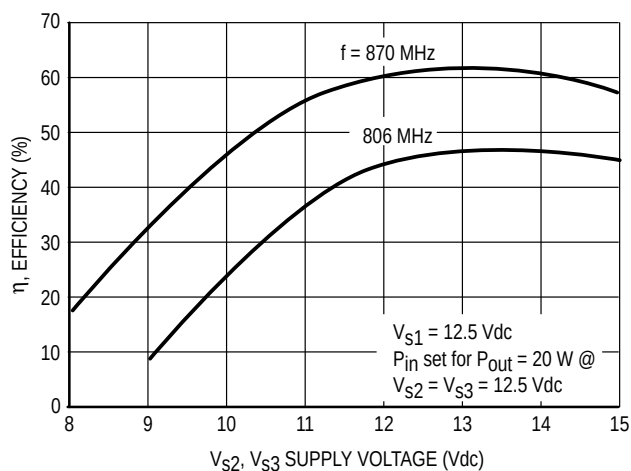


Figure 5. Efficiency versus Supply Voltage

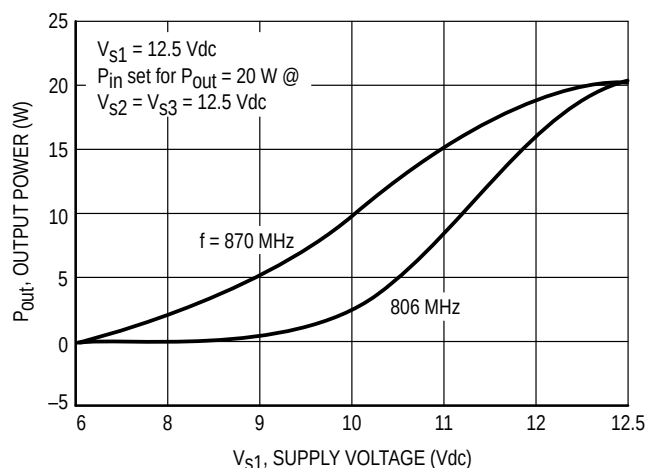


Figure 6. Output Power versus Supply Voltage to First Stage (V_{s1})

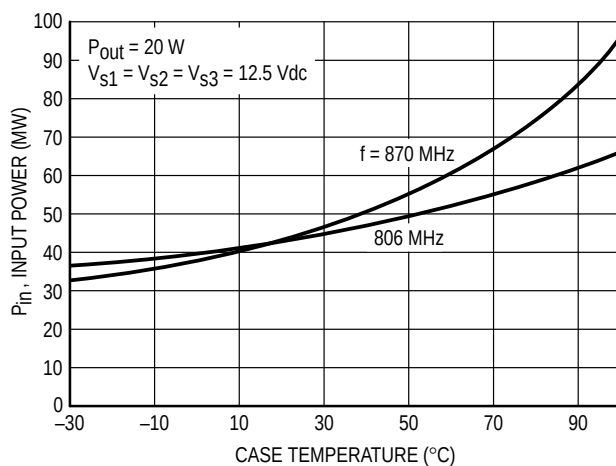


Figure 7. Input Power versus Case Temperature

TYPICAL CHARACTERISTICS (MHW2821-2)

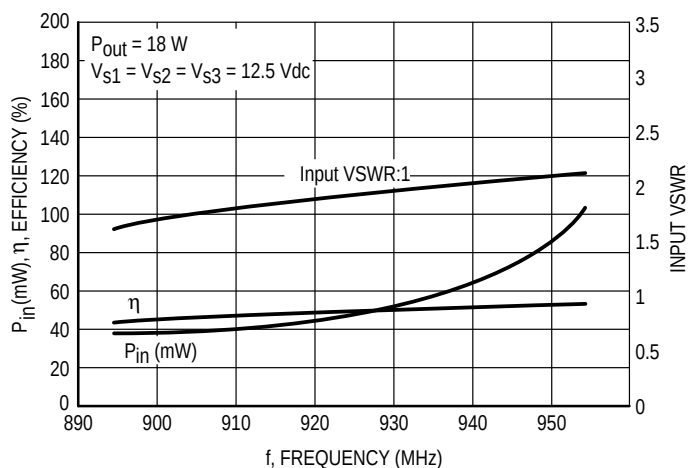


Figure 8. P_{in} VSWR, and Efficiency versus Frequency

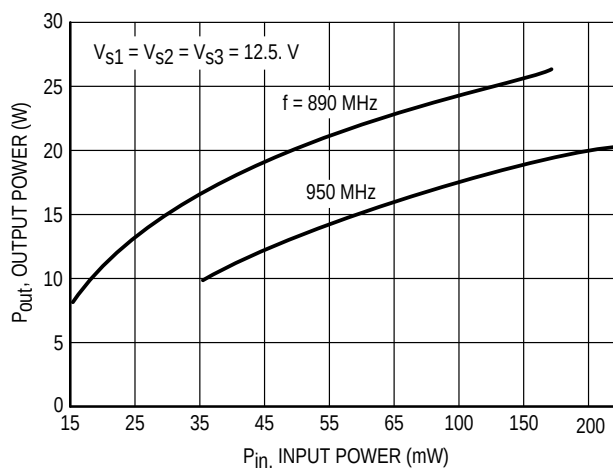


Figure 9. Output Power versus Input Power

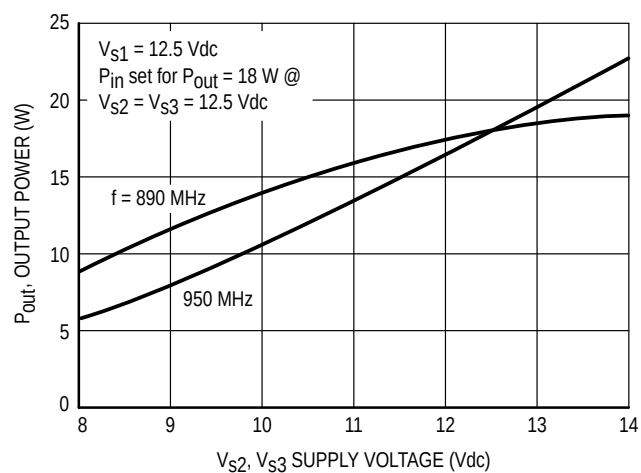


Figure 10. P_{out} versus Supply Voltage

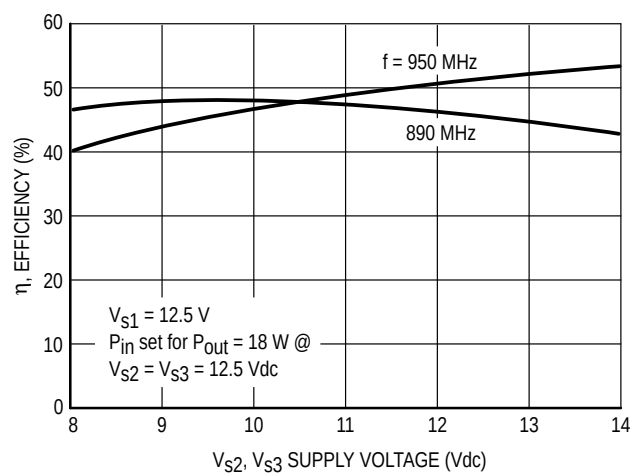
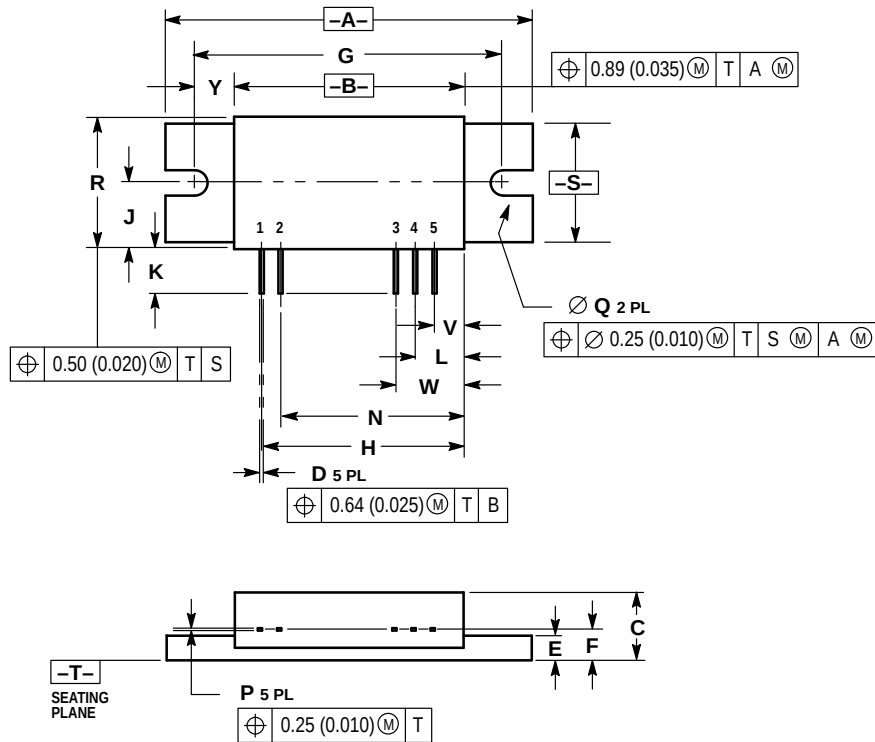


Figure 11. Efficiency versus Supply Voltage

PACKAGE DIMENSIONS



- NOTES:
- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 - CONTROLLING DIMENSION: INCH.
 - DIMENSION F TO CENTER OF LEADS.
 - 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

