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MOTOROLA

MHW2821-1
MHW2821-2

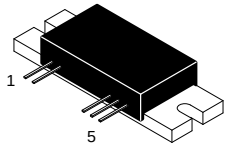
UHF Silicon FET Power Amplifiers

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: ≤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

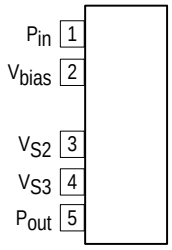
RF POWER AMPLIFIER
20 W, 806 to 870 MHz (–1 suffix)
18 W, 890 to 950 MHz (–2 suffix)

SEMICONDUCTOR TECHNICAL DATA



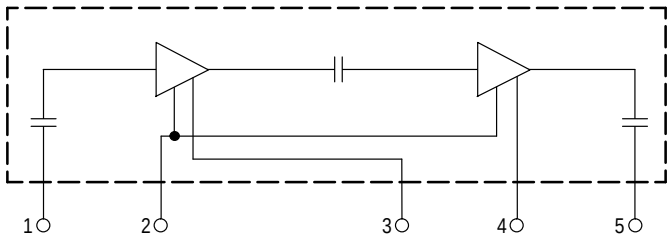
CASE 301AB

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°C	Power Module
MHW2821–2		

Rev 2

ARCHIVE INFORMATION

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) ≤3000 V.
2. ESD data available upon request.

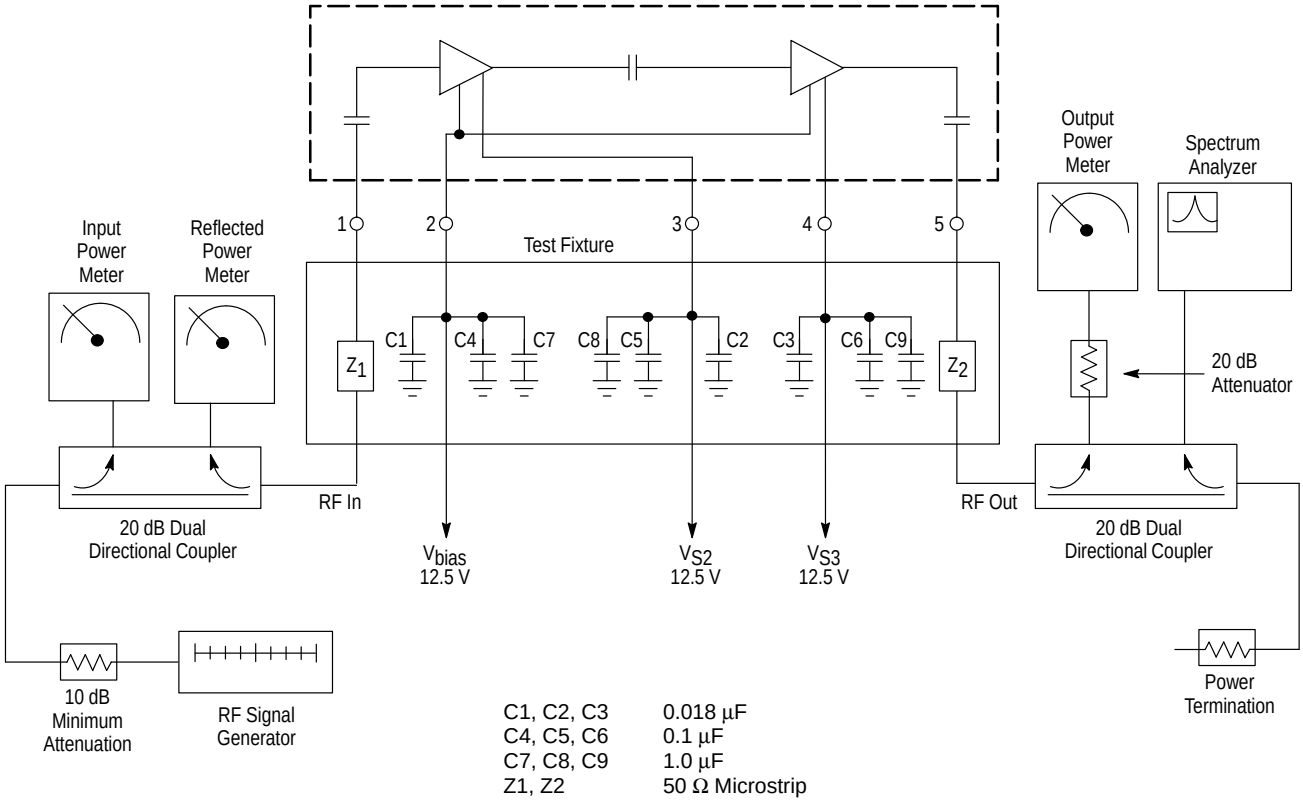
ELECTRICAL CHARACTERISTICS (V_{S2} = V_{S3} = 12.5 Vdc; V_{bias} = 12.5 Vdc; T_C = 25°C, 50 Ω system, unless otherwise noted.)

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})	η	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]	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}) [Note]	I_{bias}	–	–	3.0	mA

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

ARCHIVE INFORMATION

Figure 1. Test Circuit Diagram



C1, C2, C3	0.018 µF
C4, C5, C6	0.1 µF
C7, C8, C9	1.0 µF
Z1, Z2	50 Ω Microstrip

ARCHIVE INFORMATION

TYPICAL CHARACTERISTICS (MHW2821–1)

Figure 2. Input Power, Efficiency and VSWR versus Frequency

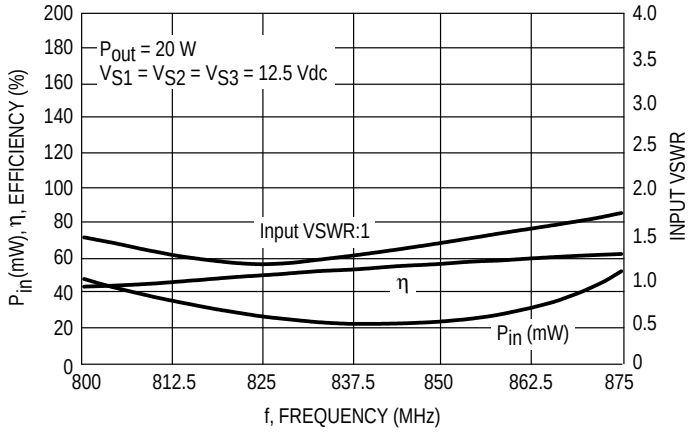


Figure 3. Output Power versus Input Power

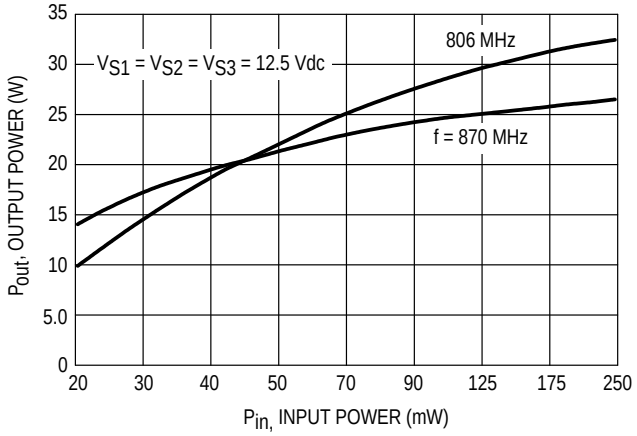


Figure 4. Output Power versus Supply Voltage

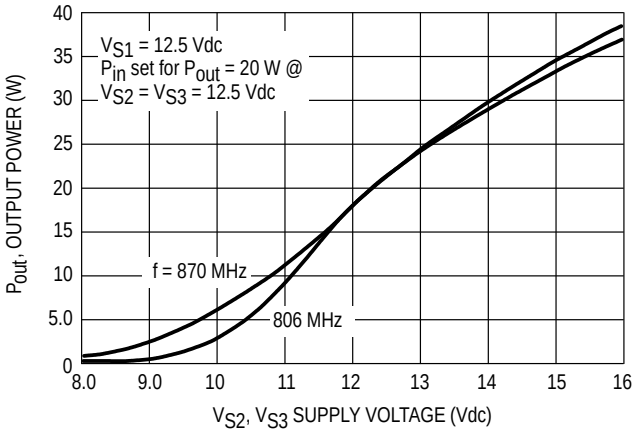


Figure 5. Efficiency versus Supply Voltage

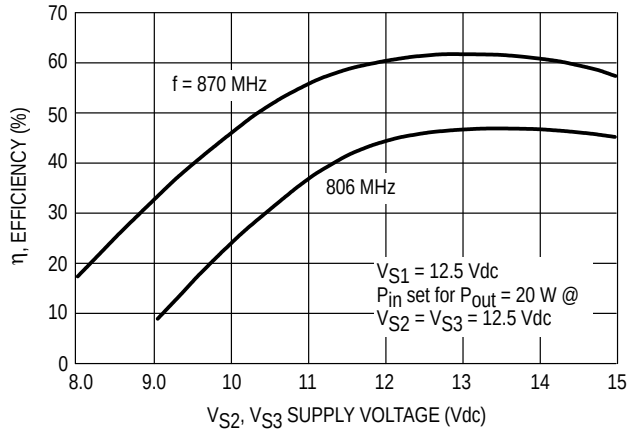


Figure 6. Output Power versus Supply Voltage to First Stage (V_{S1})

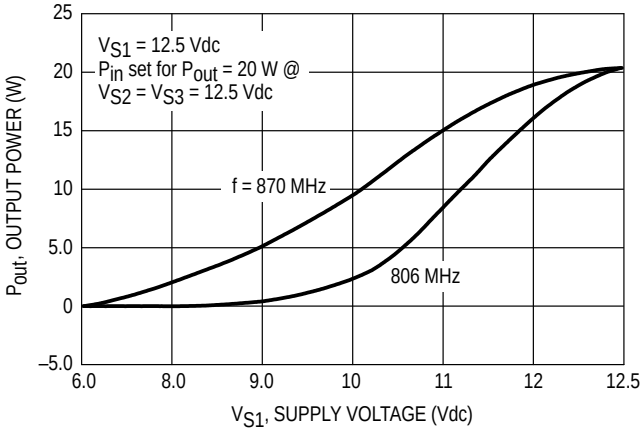
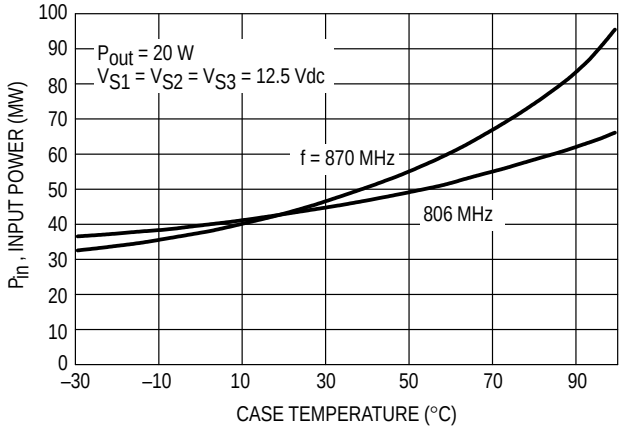


Figure 7. Input Power versus Case Temperature



ARCHIVE INFORMATION

TYPICAL CHARACTERISTICS (MHW2821–2)

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

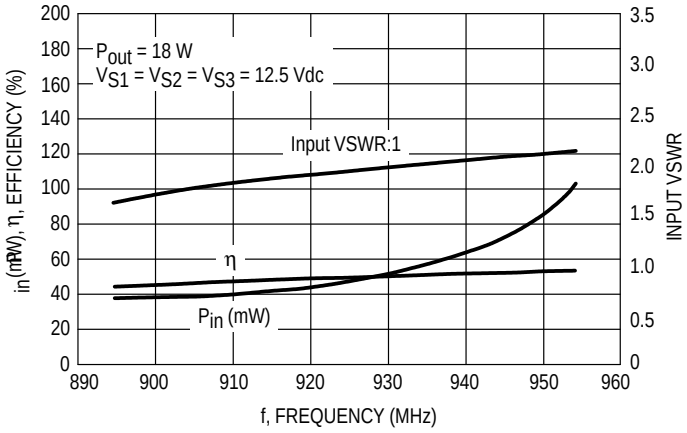


Figure 9. Output Power versus Input Power

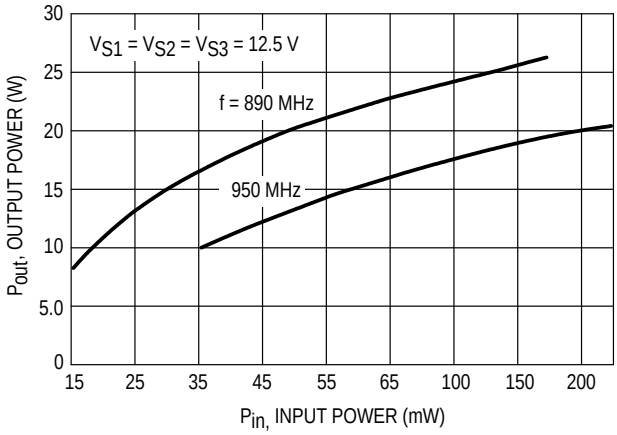


Figure 10. P_{out} versus Supply Voltage

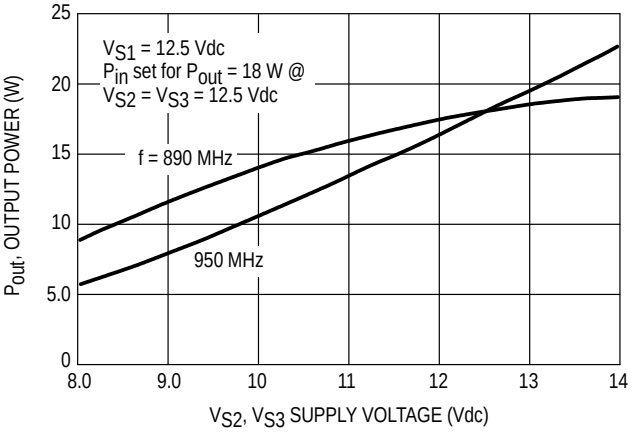
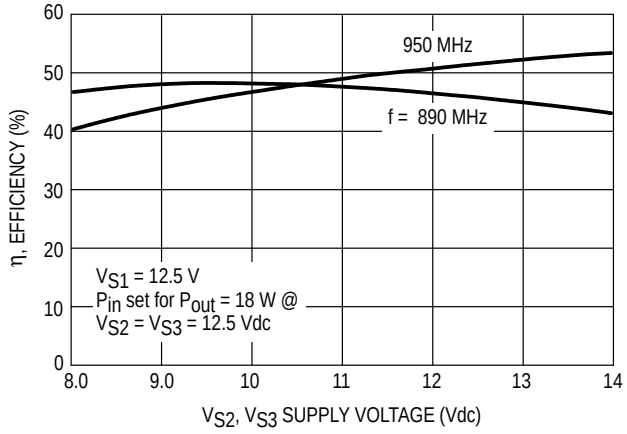
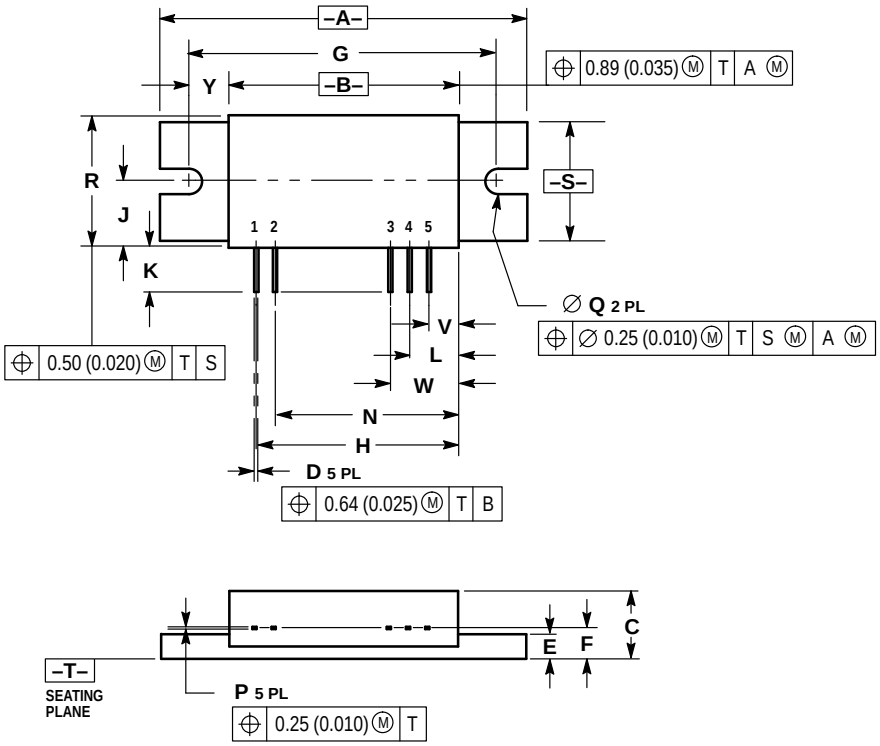


Figure 11. Efficiency versus Supply Voltage



OUTLINE DIMENSIONS

POWER MODULE
CASE 301AB–02
ISSUE H



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.

	INCHES		MILLIMETERS	
DIM	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	

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