The RF Line

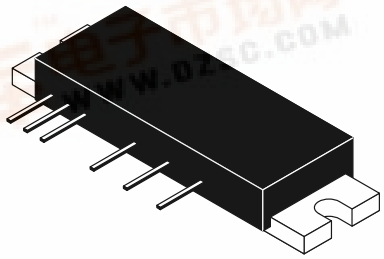
UHF Silicon FET Power Amplifier

Designed for 7.5 volt UHF power amplifier applications in industrial and commercial equipment primarily for hand portable radios.

- Specified 7.5 Volt Characteristics:
  RF Input Power: 1 mW (0 dBm)
  RF Output Power: 7 W
  Minimum Gain (V_{cont} = 7 V): 38.5 dB
  Harmonics: –35 dBc Max @ 2 f_o
- Provides Wideband Performance
- Meets European Transient Specification (ETS 300 113)
- Epoxy Glass PCB Construction Gives Consistent Performance and Reliability
- 50 Ω Input/Output Impedances
- Guaranteed Stability and Ruggedness

MHW2707A1

7 W
400–470 MHz
UHF POWER AMPLIFIER



CASE 301AL–01, STYLE 1

MAXIMUM RATINGS (Flange Temperature = 25°C)

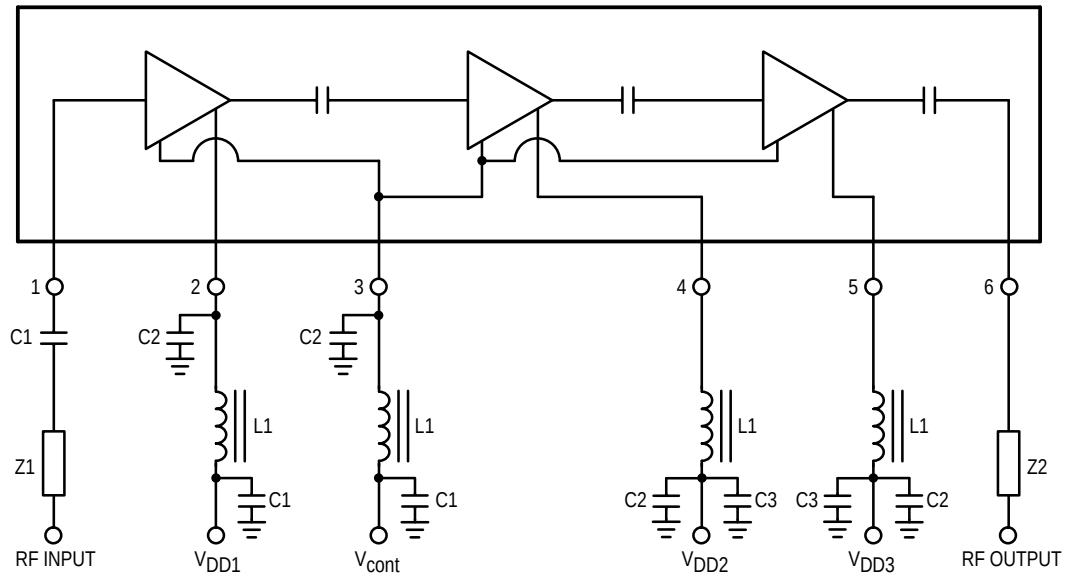
Rating	Symbol	Value	Unit
DC Supply Voltage (Pins 2, 4, 5)	$V_{DD1, 2, 3}$	9	Vdc
DC Control Voltage (Pin 3)	V_{cont}	7	Vdc
RF Input Power	P_{in}	2	mW
RF Output Power ($V_{DD1, 2, 3}$ = 9 V)	P_{out}	9	W
Operating Case Temperature Range	T_C	–30 to +80	°C
Storage Temperature Range	T_{stg}	–30 to +80	°C

ELECTRICAL CHARACTERISTICS ($V_{DD1} = V_{DD2} = V_{DD3} = 7.5$ Vdc (Pins 2, 4, 5); $T_C = +25°C$, 50 ohm system unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
Frequency Range	BW	400	470	MHz
Control Voltage (P_{out} = 7 W; P_{in} = 1 mW) (1)	V_{cont}	0	7	Vdc
Quiescent Current ($V_{DD1} = V_{DD2} = V_{DD3}$ = 7.5 Vdc; P_{in} = 0 mW, V_{cont} = 0 Vdc)	—	—	1	mA
Power Gain (P_{out} = 7 W, V_{cont} = 7 Vdc)	G_p	38.5	—	dB
Efficiency (P_{out} = 7 W; P_{in} = 1 mW) (1)	η	45	—	%
Harmonics (P_{out} = 7 W; P_{in} = 1 mW) (1) 2 f_o	—	—	–35	dBc
Input VSWR (P_{out} = 7 W; P_{in} = 1 mW, 50 Ω Ref.) (1)	$VSWR_{in}$	—	3	—
Control Current ($V_{DD1} = V_{DD2} = V_{DD3}$ = 7.5 Vdc; P_{in} = 1 mW) (1)	I_{cont}	—	2	mA
Load Mismatch Stress ($V_{DD1} = V_{DD2} = V_{DD3}$ = 9 Vdc; P_{in} = 2 mW; P_{out} = 9 W; Load VSWR = 10:1, All Phase Angles at Frequency of Test) (1)	ψ	No Degradation in Output Power Before & After Test		
Stability (P_{in} = 1–2 mW; $V_{DD1} = V_{DD2} = V_{DD3}$ = 6–9 Vdc; P_{out} = between 0.1 mW and 9 W; Load VSWR = 8:1, All Phase Angles at Frequency of Test) (1)	—	All Spurious Outputs More Than 60 dB Below Desired Signal		

(1) Adjust V_{cont} for Specified P_{out}.

MHW2707A1 CIRCUIT BLOCK DIAGRAM



Pin Designations:

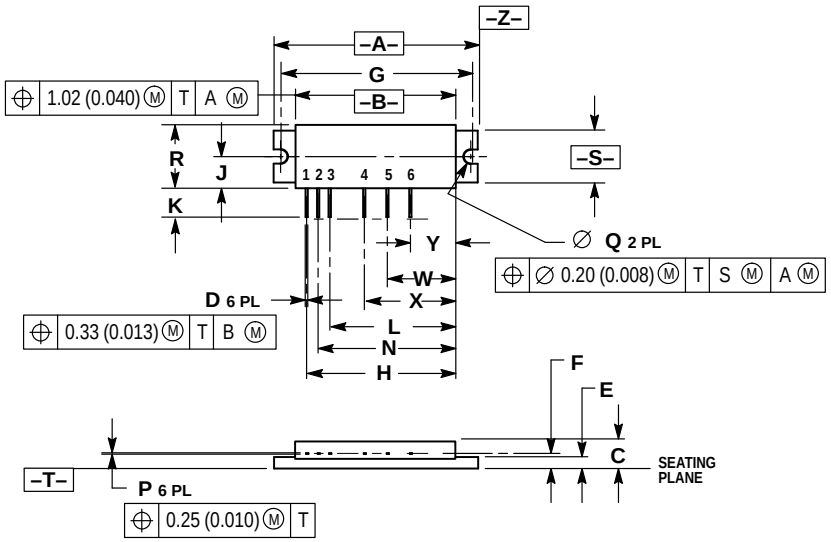
Pin 1 — RF Input Power (0 dBm)
Pin 2 — V_{DD1} (7.5 Vdc)
Pin 3 — V_{cont} (0 – 7 Vdc)
Pin 4 — V_{DD2} (7.5 Vdc)
Pin 5 — V_{DD3} (7.5 Vdc)
Pin 6 — RF OUT (7 Watts nom.)

Element Values:

C1 = 0.018 μF
C2 = 0.1 μF
C3 = 3.3 μF
L1 = 0.22 μH CHOKE
Z1 = Z2 = 50 Ω Microstrip Line

Figure 1. UHF Power Module Test Circuit Schematic and Device Block Diagram

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.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	1.760	1.780	44.70	45.21
B	1.370	1.390	34.80	35.31
C	0.245	0.265	6.22	6.73
D	0.017	0.023	0.43	0.58
E	0.080	0.100	2.03	2.54
F	0.132 BSC		3.35 BSC	
G	1.650 BSC		41.91 BSC	
H	1.290 BSC		32.77 BSC	
J	0.266	0.280	6.76	7.11
K	0.230	0.300	5.84	7.62
L	1.090 BSC		27.69 BSC	
N	1.190 BSC		30.25 BSC	
P	0.010 REF		0.25 REF	
Q	0.118	0.132	3.00	3.35
R	0.535	0.555	13.59	14.10
S	0.445	0.465	11.30	11.81
V	0.590 BSC		14.99 BSC	
X	0.790 BSC		20.07 BSC	
X	0.390 BSC		9.91 BSC	

STYLE 1:
PIN 1. RF INPUT
2. VDD1
3. VCONT
4. VDD2
5. VDD3
6. RF OUTPUT
CASE: GROUND

CASE 301AL–01
ISSUE O

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