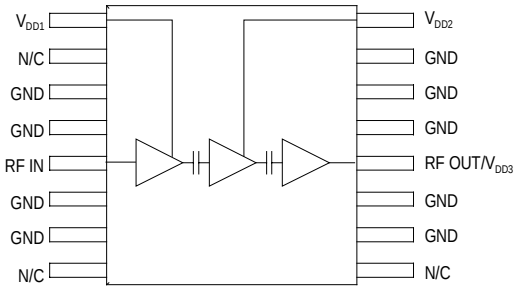
3.6V 1.2W RF Power Amplifier IC for N-PCS/ISM900

Applications

Two-Way Paging
Wireless Modems
Cordless Telephones
Telemetry
900 MHz ISM

Features

- Single Positive Supply
- 16 Pin TSSOP Plastic Package
- Class AB Bias
- 800 - 1000 MHz Operation
- 50Ω Input Impedance
- Single Capacitor Output Match
- Self-Aligned MSAG®-Lite MESFET Process
- Guaranteed Stability and Ruggedness



Typical 3.6 Volt Performance

30.8 dBm Power Output
30.8 dB Power Gain
60% Drain Efficiency (output stage FET)
45% Power Added Efficiency
-36 dBc 2nd Harmonic
-54 dBc 3rd Harmonic

ELECTRICAL CHARACTERISTICS

V_{DD}=3.6 V, P_{IN}=0 dBm, T_S=40 °C (Note 1), Output externally matched to 50 Ω System.

Characteristic	Symbol	Min	Typical	Max	Unit
Frequency Range	f	900		942	MHz
Output Power, f = 900 MHz	P_{OUT}	30.4	30.9	31.5	dBm
Power Added Efficiency , f = 900 MHz	η	40	45		%
Harmonics	$2f_o$ $3f_o$		–36 –54	-31 -40	dBc dBc
Input VSWR	—		1.4:1	2.0:1	—
Thermal Resistance (Junction of 3rd stage FET to solder point of pin 13)	$R_{TH\ J\text{-}S}$		47		°C/W
Load Mismatch (V_{DD} = 4.6 V, P_{IN} = +3 dBm, VSWR = 8:1)	—		No Degradation in Power Output		
Stability (P_{IN} = -15 to +3 dBm, V_{DD} = 3.6, 4.6 V, T_S = -40 to +100 °C, Load VSWR = 8:1)	—		All non-harmonically related outputs more than 60 dB below desired signal		

Note 1: T_S is the temperature measured at the soldering point of pin 13, mounted on 60 mil GETEK evaluation board in a free air condition with ambient room temperature T_A=25 °C. The electrical data presented herein was taken with the evaluation board shown in Figures 1 and 6, under room temperature conditions and CW operation, unless otherwise specified.

Specifications subject to change without notice.

901753 G

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MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

Rating	Symbol	Value	Unit
DC Supply Voltage (Pins 1, 12, 16)	V_{DD}	5	Vdc
RF Input Power	P_{IN}	4	mW
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-40 to +150	°C

APPLICATION INFORMATION

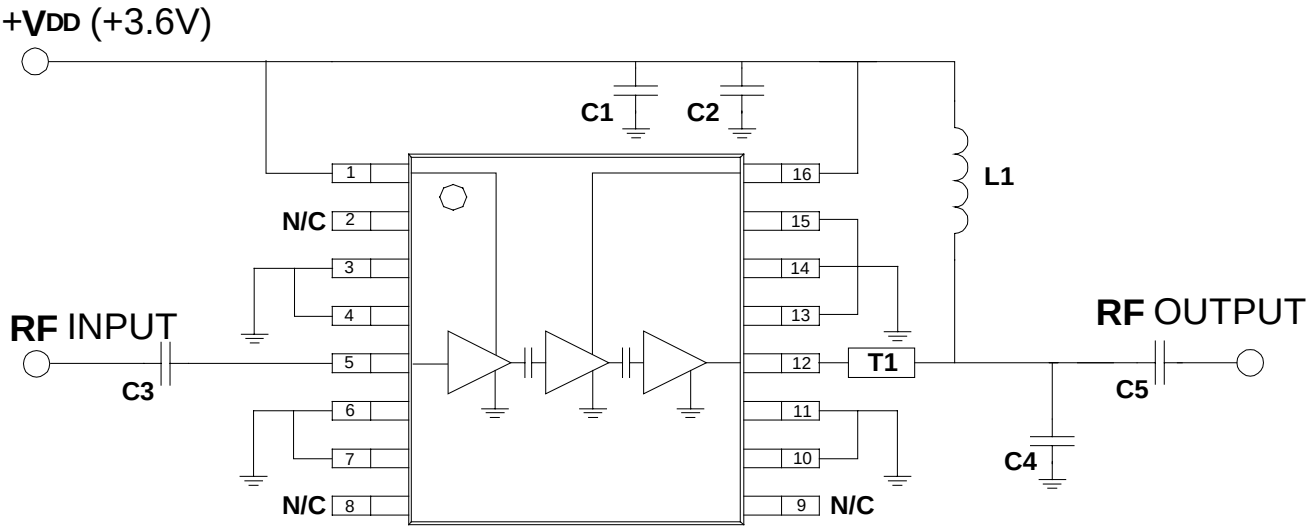

Figure 1. Evaluation Board Schematic

List of components:
C1 = 0.1µF Kemet multilayer ceramic chip capacitor (C1206C104K5RAC)
C2 = 4700 pF Kemet multilayer ceramic chip capacitor (C0805C472K5RAC)
C4 = 7.5 pF DLI multilayer ceramic chip capacitor (C11AH7R5B5TXL)
C3 = C5 = 100 pF DLI multilayer ceramic chip capacitor (DC Block; C11AH101K5TXL)
L1 = 39 nH Coilcraft chip inductor (1008CS.390XMBB)
T1 = 0.13" of 50 Ω grounded coplanar waveguide (60 mil GETEK board)

Component layout and printed circuit board drawing for RF IC evaluation board are shown in Figure 6.

TYPICAL CHARACTERISTICS

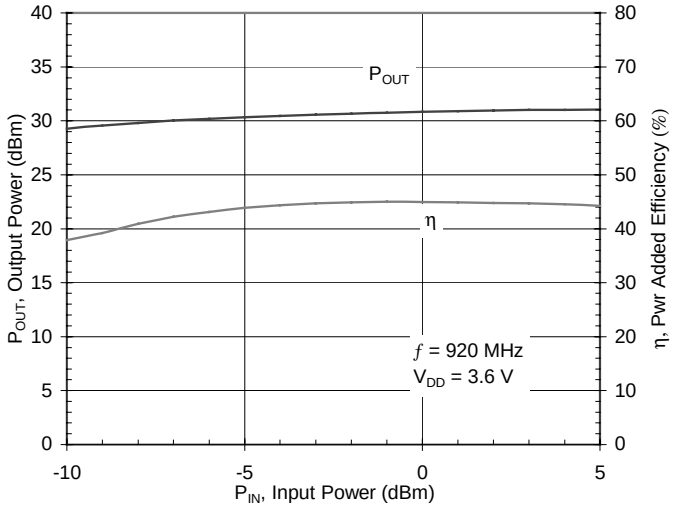

Figure 2. Output power and efficiency vs. input power

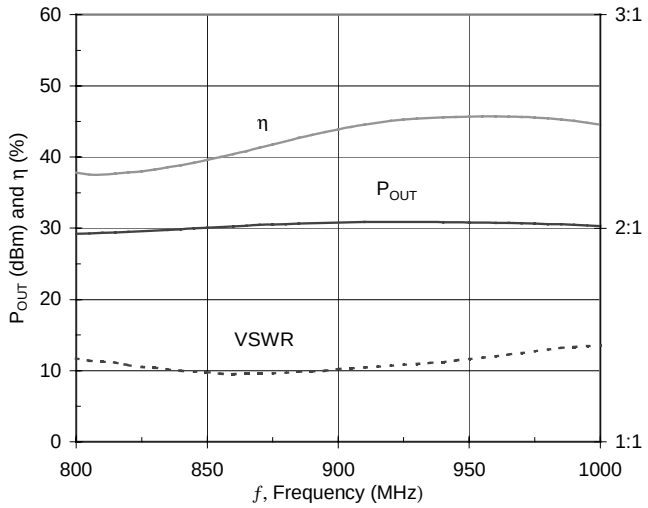

Figure 3. Output power, efficiency and input VSWR vs . frequency

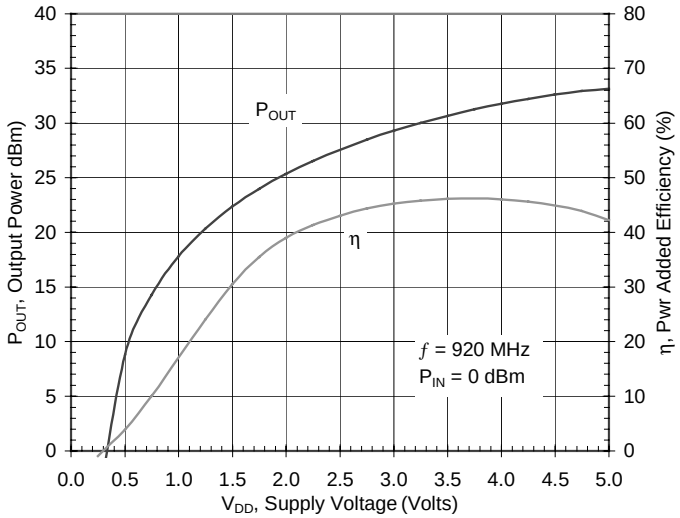

Figure 4. Output power and efficiency vs. supply voltage

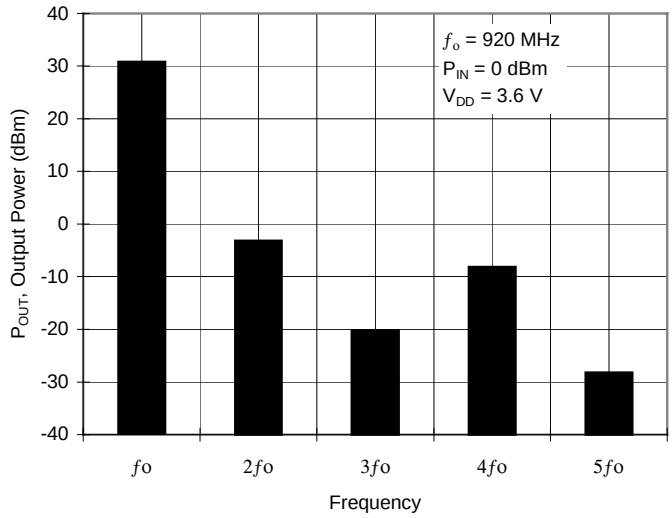

Figure 5. Harmonics

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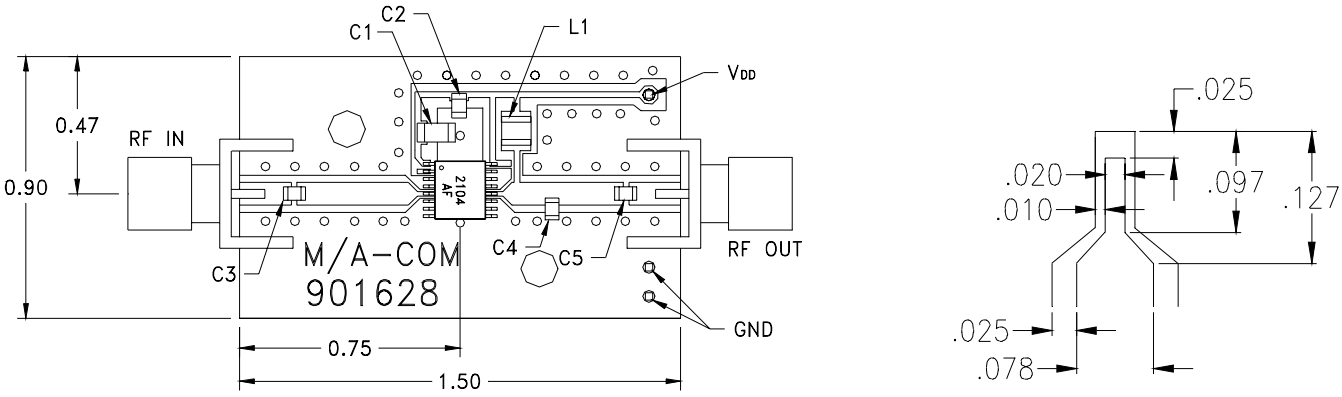
MECHANICAL DATA



Top view **50Ω lead transition**

Figure 6. Component layout and printed circuit drawing for evaluation board

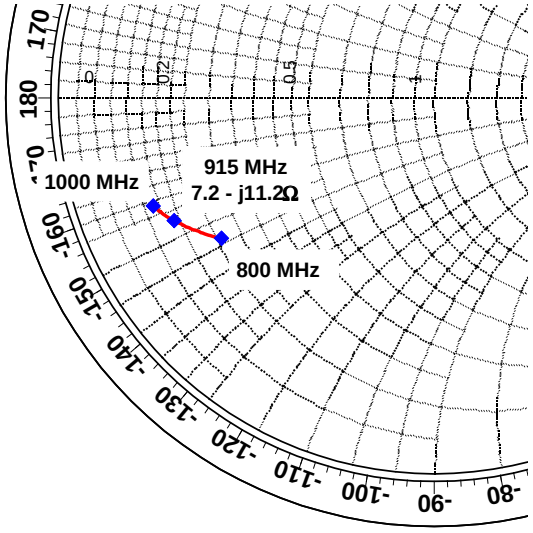


Figure 7. Output match impedance (as seen from pin 12)

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