

2.4V 600mW RF Power Amplifier IC for 2-Way Paging ITT1102AF

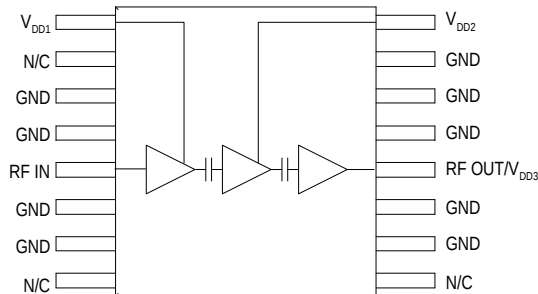
PRELIMINARY

Applications

Two-Way Paging
N-PCS

Features

- Single Positive Supply
- Class AB Bias
- 16 pin TSSOP Plastic Package
- 50 Ω Input Impedance
- Single Capacitor Output Match
- Self-Aligned MSAG[®]-Lite MESFET Process



Typical 2.4 Volt Performance

28.0 dBm Power Output
28.0 dB Power Gain
55% Power Added Efficiency
-35 dBc 2nd Harmonic
-50 dBc 3rd Harmonic

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

ELECTRICAL CHARACTERISTICS V_{DD}=2.4 V, P_{IN}=0 dBm, T_S=35 °C (Note 1), Output externally matched to 50 Ω System.

Characteristic	Symbol	Typical	Unit
Frequency Range	f	901	MHz
Output Power	P _{OUT}	28.0	dBm
Power Gain (P _{OUT} =28.0 dBm)	G _p	28.0	dB
Power Added Efficiency (P _{OUT} =28.0 dBm)	PAE	55	%
Harmonics (P _{OUT} =28.0 dBm)	2 f_o 3 f_o	-35 -50	dBc dBc
Input VSWR (P _{OUT} =28.0 dBm)	—	1.2:1	—
Thermal Resistance (Junction of 3 rd stage FET to solder point of pin 13)	R _{TH J-S}	33	°C/W
Stability (P _{IN} = -3 to +6 dBm, V _{DD} = 2.0 - 3.2V, T _S = -10 to +85 °C) Stability was verified over these operating conditions, under the load VSWR conditions present for the transmit chain, antenna, and PCB configuration used by GW Communications.	—	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.



APPLICATION INFORMATION

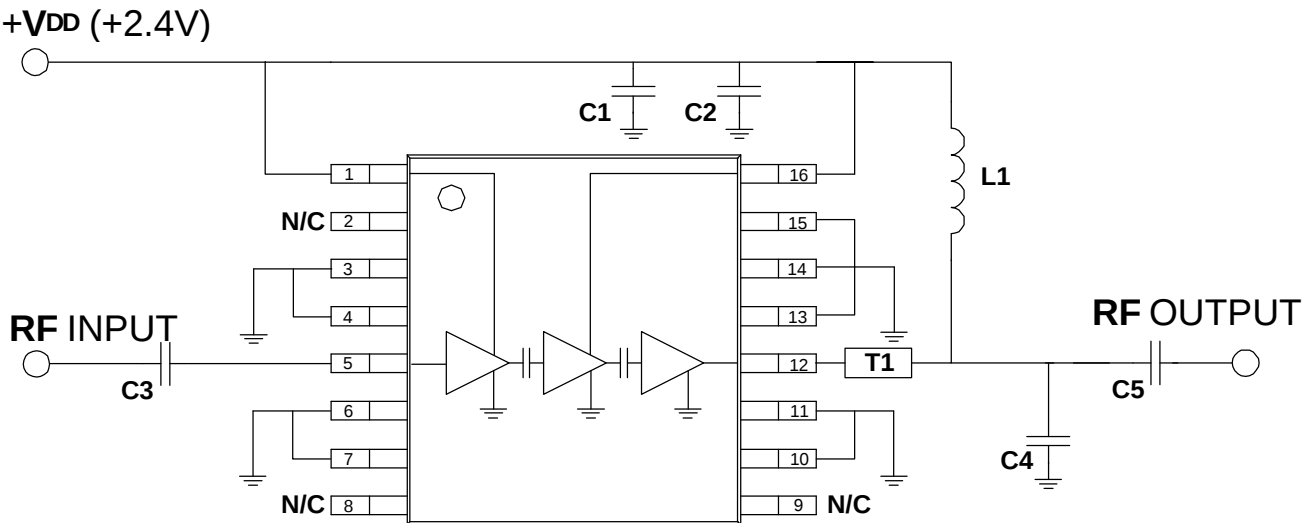


Figure 1. Evaluation Board Schematic

List of components:

- C1 = 0.1 μ F Kemet multilayer ceramic chip capacitor (C1206C104K5RAC)
- C2 = 4700 pF Kemet multilayer ceramic chip capacitor (C0805C472K5RAC)
- C4 = 6.8 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 = 0.19" 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

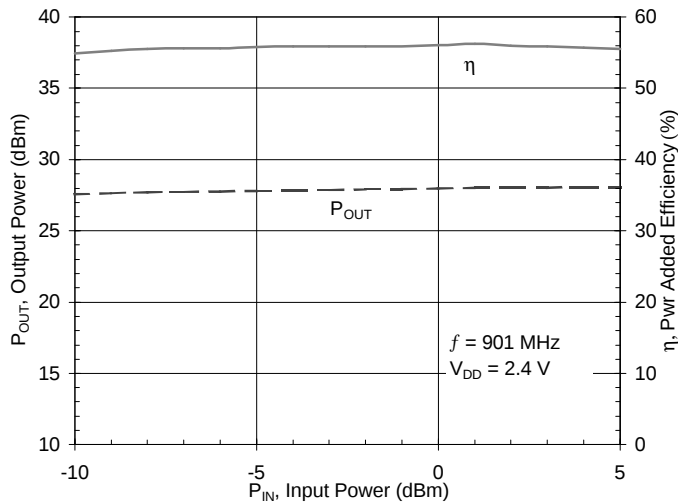


Figure 2. Output power and efficiency vs. input power

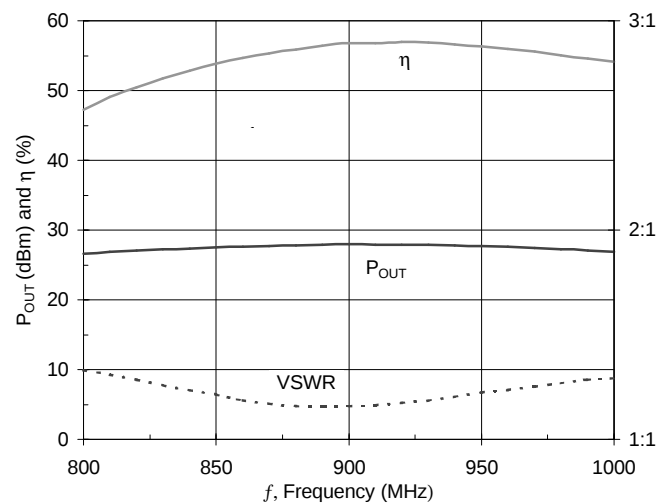


Figure 3. Output power, efficiency and input VSWR vs. frequency

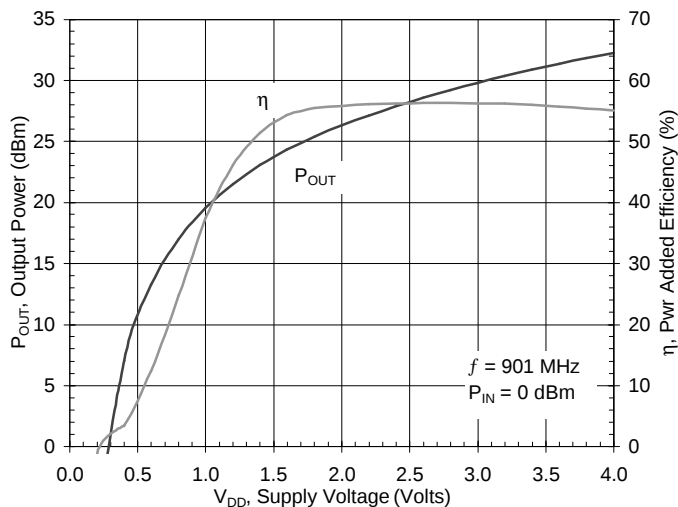


Figure 4. Output power and efficiency vs. supply voltage

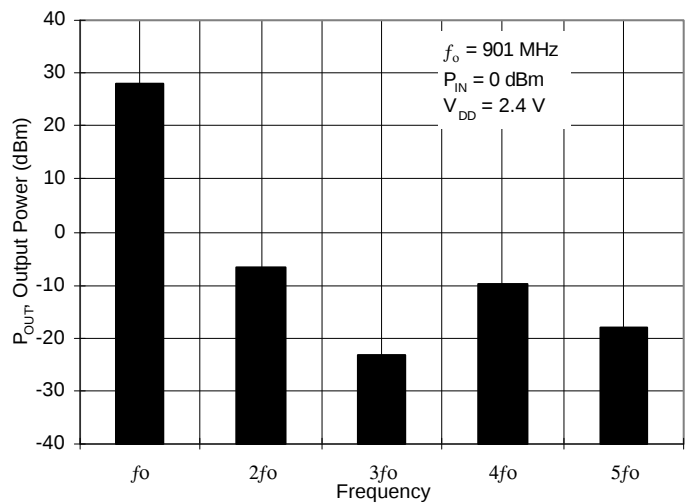
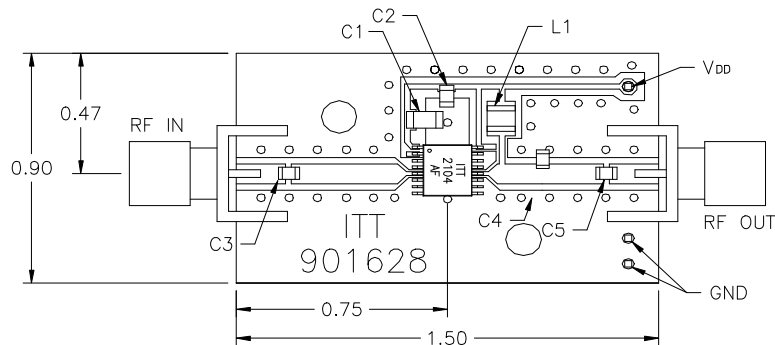
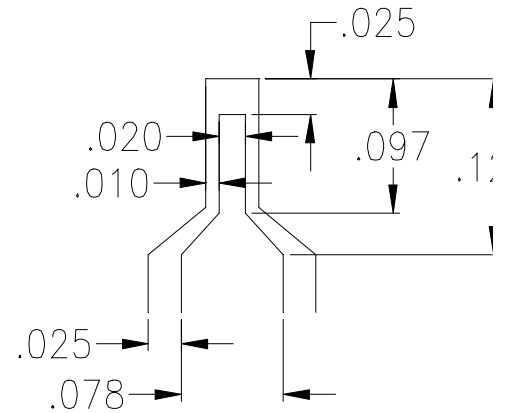


Figure 5. Harmonics

MECHANICAL DATA



Top view



50Ω lead transition

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

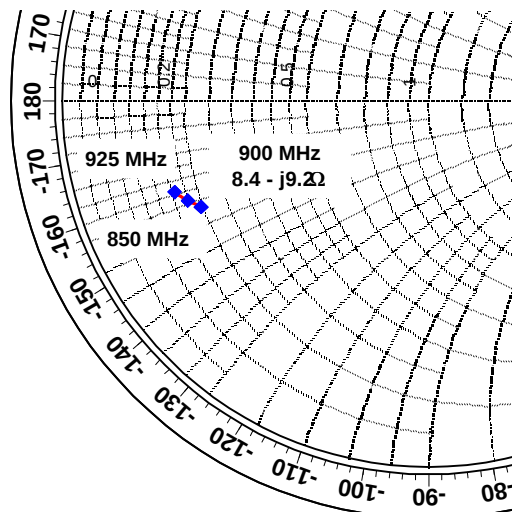


Figure 7. Output match impedance (as seen from pin 12)