

2.4V 0.5W RF Power Amplifier IC for DECT ITT1202AF

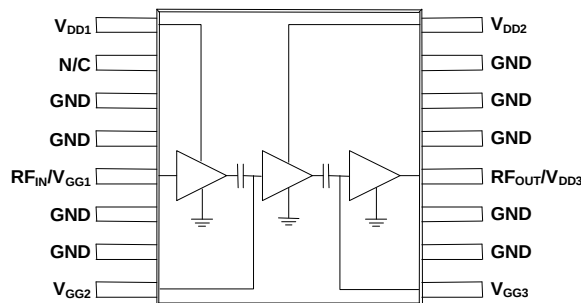
PRELIMINARY

Applications

DECT
PCS
Personal Wireless Telephony (PWT)
Cordless PBX
Radio/Wireless Local Loop (RLL/WLL)

Features

- Single Positive Supply
- >50% Power Added Efficiency down to 1.5V!
- 100% Duty Cycle
- 1.2:1 Input VSWR
- 1800 to 2000 MHz Operation
- 16 Pin TSSOP Plastic Package
- 1.0V to 3.6V Operation Accommodates All Battery Conditions
- Self-Aligned MSAG®-Lite MESFET Process



2.4 V
53% PAE
100% Duty Cycle

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

Rating	Symbol	Value	Unit
DC Supply Voltage (Pins 1, 12, 16)	V _{DD}	4.5	Vdc
RF Input Power	P _{IN}	3	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_A = 25 °C, Output externally matched to 50 Ω

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range	<i>f</i>	1880		1930	MHz
Output Power, <i>f</i> = 1900 MHz	P _{OUT}		27		dBm
Power Gain	G _P		27		dB
Gain Slope, <i>f</i> = 1930 to 1880 MHz	—		0.009		dB/MHz
Power Added Efficiency, <i>f</i> = 1900 MHz	η		53		%
Drain Current	I _{DD}		390		mA
Harmonics	2 <i>f</i> _o 3 <i>f</i> _o		-40 -38		dBc dBc
Input VSWR (V _{DD} = 0.0 V)	—		1.2:1		—
Off Isolation (V _{DD} = 0 V)	—	40			dB
Thermal Resistance (Junction of 3 rd stage FET to solder point of pin 13)	R _{TH J-S}			51	°C/W
Load Mismatch (V _{DD} = 4.5 V, VSWR = 8:1, P _{IN} = 0 dBm)	—	No Degradation in Power Output			
Stability (P _{IN} = 0 dBm, V _{DD} = 0-4.5 V, T _S = -40 to +85 °C, Load VSWR = 5:1)	—	All non-harmonically related outputs more than 60 dB below desired signal			

Specifications Subject to Change Without Notice

902247 --, February 1999



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TYPICAL CHARACTERISTICS

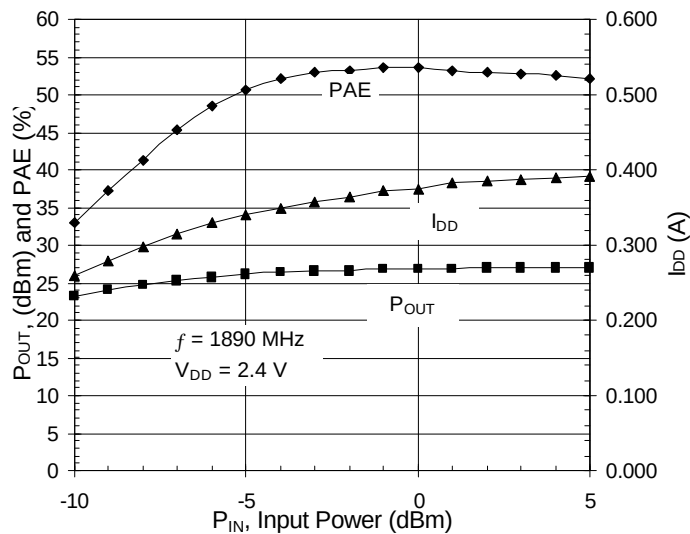


Figure 1. Output power, Drain Current and Efficiency Vs. Input Power

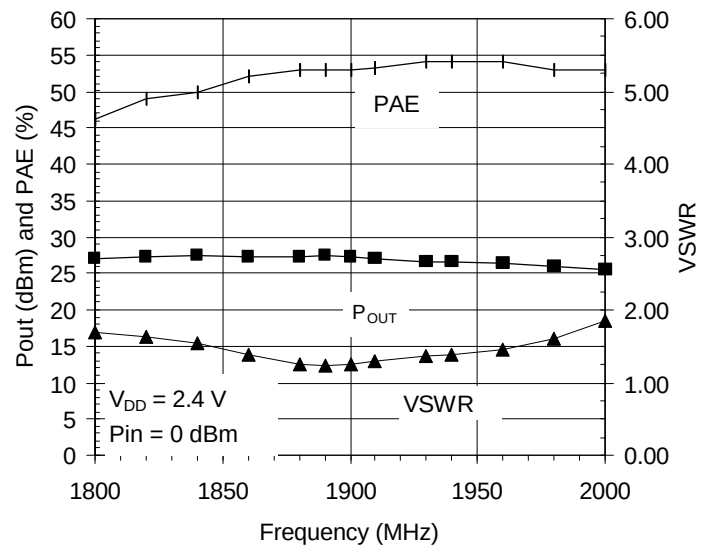


Figure 2. Output Power, Efficiency, and VSWR Vs. Frequency

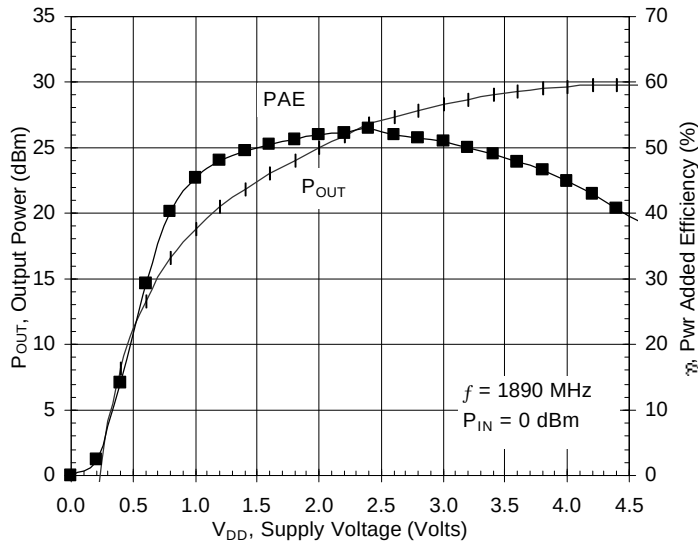


Figure 3. Output power and Efficiency vs. Supply Voltage

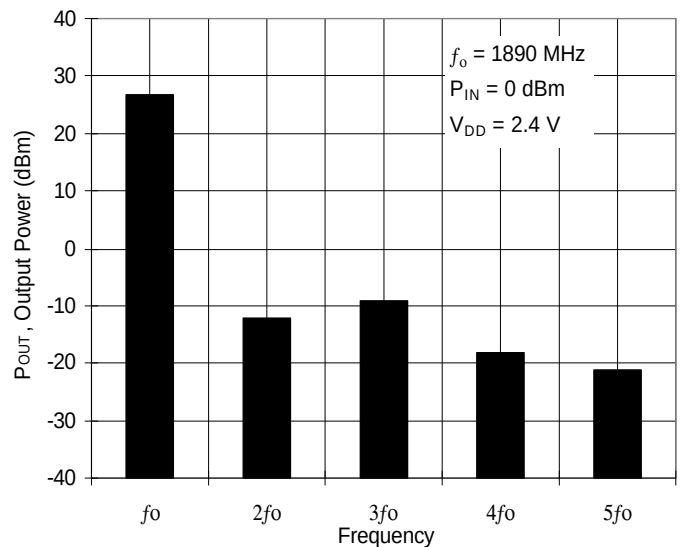


Figure 4. Harmonics

APPLICATION INFORMATION

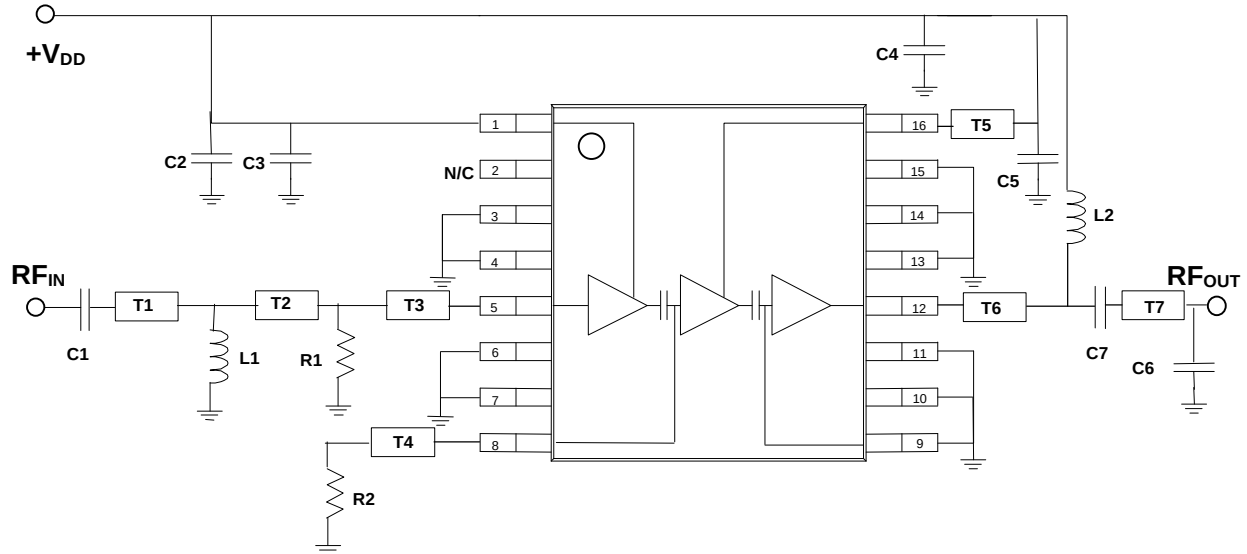


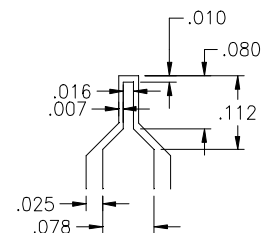
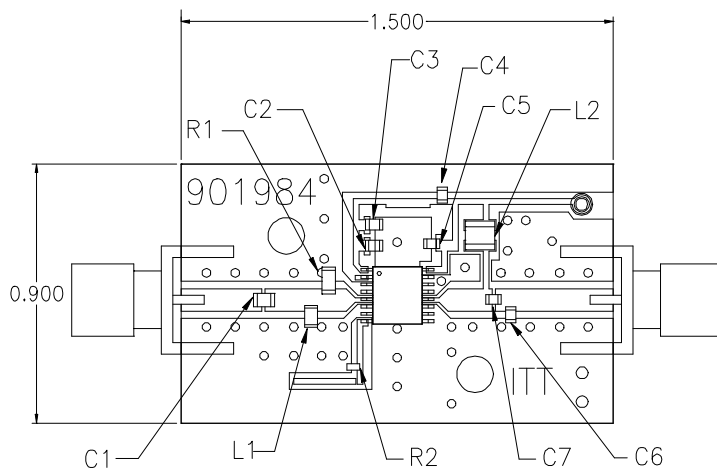
Figure 5. Evaluation Board Schematic

List of components:

C1 = 1.0 pF multilayer ceramic chip capacitor
C2 = C4 = C5 = 10 pF multilayer ceramic chip capacitor
C3 = 100 pF multilayer ceramic chip capacitor
C6 = C7 = 2.2 pF multilayer ceramic chip capacitor
L1 = 2.7 nH chip inductor
L2 = 27 nH chip inductor
R1 = 300 Ω chip resistor
R2 = 2.2 Ω chip resistor

Transmission Lines (Grounded Coplanar Waveguide)

T1 = 0.160" 50 Ω
T2 = 0.065" 50 Ω
T3 = 0.115" 50 Ω
T4 = 0.160" 75 Ω
T5 = 0.090" 75 Ω
T6 = 0.205" 50 Ω
T7 = 0.060" 50 Ω
60 mil GETEK Board



50 Ω lead transition

Figure 6. Component layout and printed circuit drawing for evaluation board (units in inches)