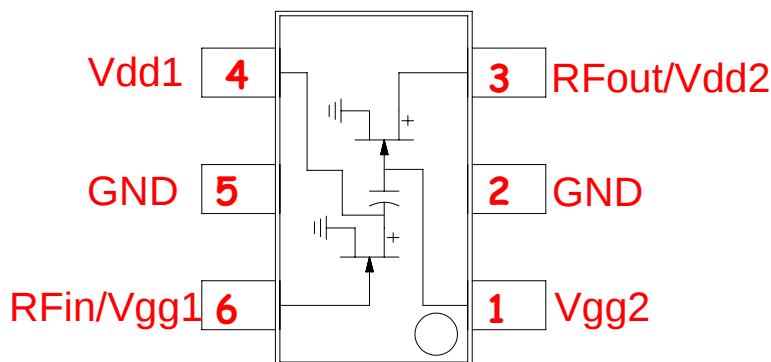


FEATURES

- 20 dB Gain – dramatically increases range of your low power bluetooth devices
- Single 3.0V positive supply – operates over a wide range of supply voltages
- Extremely small size – 6 pin SOT plastic package – 3 mm x 1.75 mm body size
- Output power easily controllable via V_{DD1}
- 45% Power Added Efficiency
- 100% Duty Cycle
- 2000 to 2900 MHz Operation
- Self-Aligned MSAG®-Lite MESFET Process



Description

The ITT2305AK is an RF power amplifier based on GaAsTEK's Self-Aligned MSAG® MESFET Process. This product is designed for use in 2.4 GHz ISM products as a booster for high power Bluetooth devices. Output power can be controlled to meet Bluetooth requirements via varying input power or the voltage on V_{DD1} .

Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
DC Supply Voltage	V_{DD}	5.5	V
RF Input Power	P_{IN}	10	mW
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-40 to +150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS $V_{DD1} = 2.5\text{ V}$, $V_{DD2} = 3\text{ V}$, $P_{IN} = +0\text{ dBm}$, Duty Cycle = 100 %, $T_A = 25^\circ\text{C}$

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range	f	2400		2500	MHz
Output Power, $f = 2450\text{ MHz}$	P_{OUT}		20		dBm
Power Added Efficiency, $f = 2450\text{ MHz}$	η		45		%
Harmonics	$2f, 3f, 4f$		-27		dBc
Input VSWR	—		1.5		:1
Off Isolation ($V_{DD} = 0\text{ V}$)	S_{21}		-25		dB
Thermal Resistance, junction to soldering point (pin 2)	R_{TH}		180		$^\circ\text{C/W}$
Load Mismatch ($V_{DD} = 5.5\text{ V}$, $V_{SWR} = 8:1$, $P_{IN} = 0\text{ dBm}$)	—	No Degradation in Power Output			
Stability ($P_{IN} = 0\text{ dBm}$, $V_{DD} = 0\text{--}5.5\text{ V}$, Load VSWR = 5:1, fixed phases)	—	All non-harmonically related outputs more than 60 dB below desired signal			



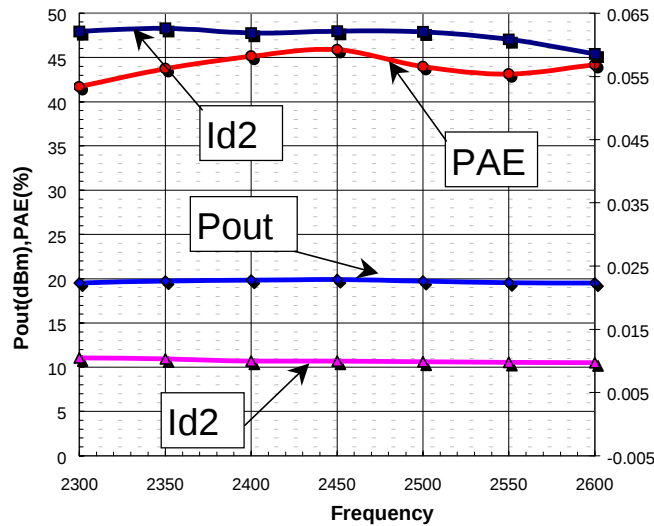


Figure 1. Output Power, Drain Currents and Efficiency vs. Frequency

$V_{DD2}=3V$, $V_{DD1}=2.5V$, $P_{IN}=0dBm$

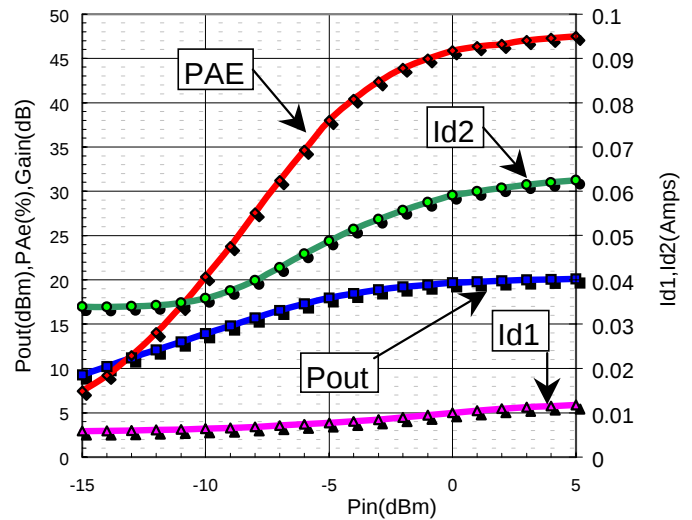


Figure 2. Output Power, Drain Currents and Efficiency vs. Input Power

$V_{DD2}=3V$, $f=2450MHz$, $V_{DD1}=2.5V$

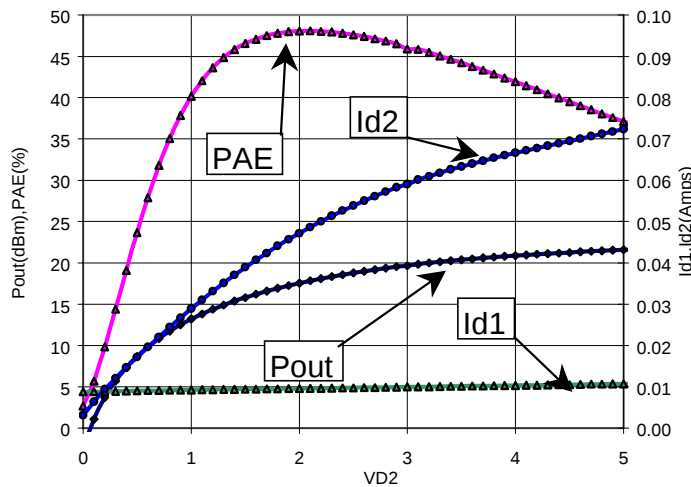


Figure 3. Output Power, Drain Currents and Efficiency vs. Supply Voltage

$P_{IN}=0dBm$, $f=2450MHz$, $V_{DD1}=2.5V$

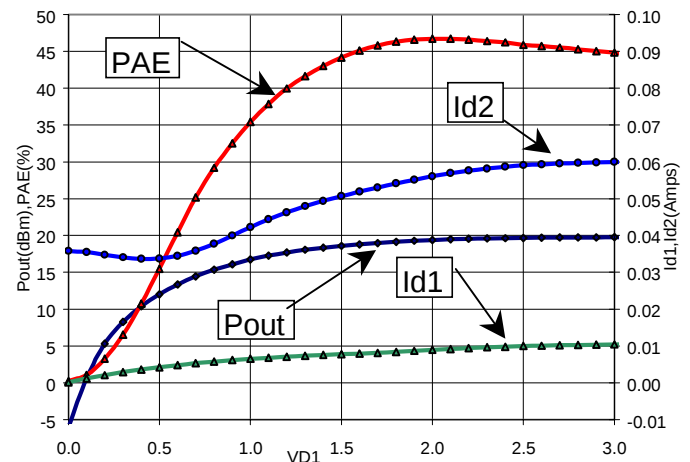


Figure 4 Output Power, Drain Currents and Efficiency vs. V_{DD1} for Power Control

$P_{IN}=0dBm$, $f=2450MHz$, $V_{DD2}=3V$

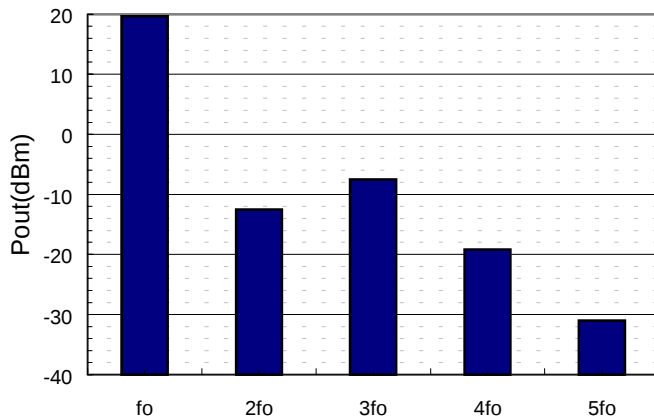


Figure 5. Harmonics

$P_{IN}=0\text{dBm}$, $f_0=2450\text{MHz}$, $V_{DD1}=2.5\text{V}$, $V_{DD2}=3\text{V}$

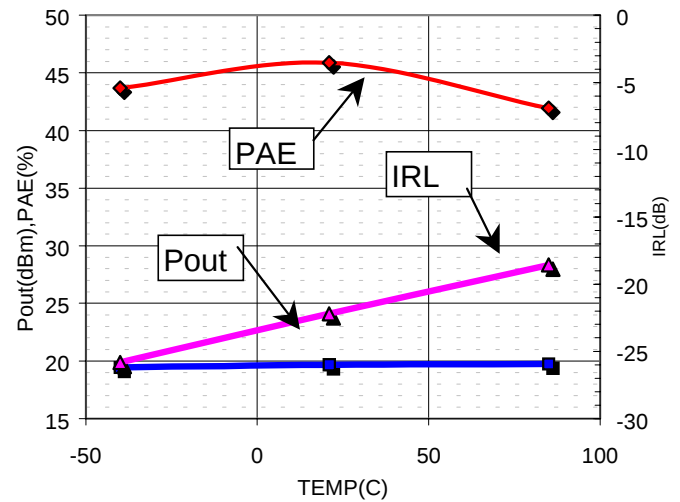


Figure 6. Output Power, Input return Loss and Efficiency vs. Temperature

$P_{IN}=0\text{dBm}$, $f=2450\text{MHz}$, $V_{DD1}=2.5\text{V}$, $V_{DD2}=3\text{V}$

MECHANICAL DATA:

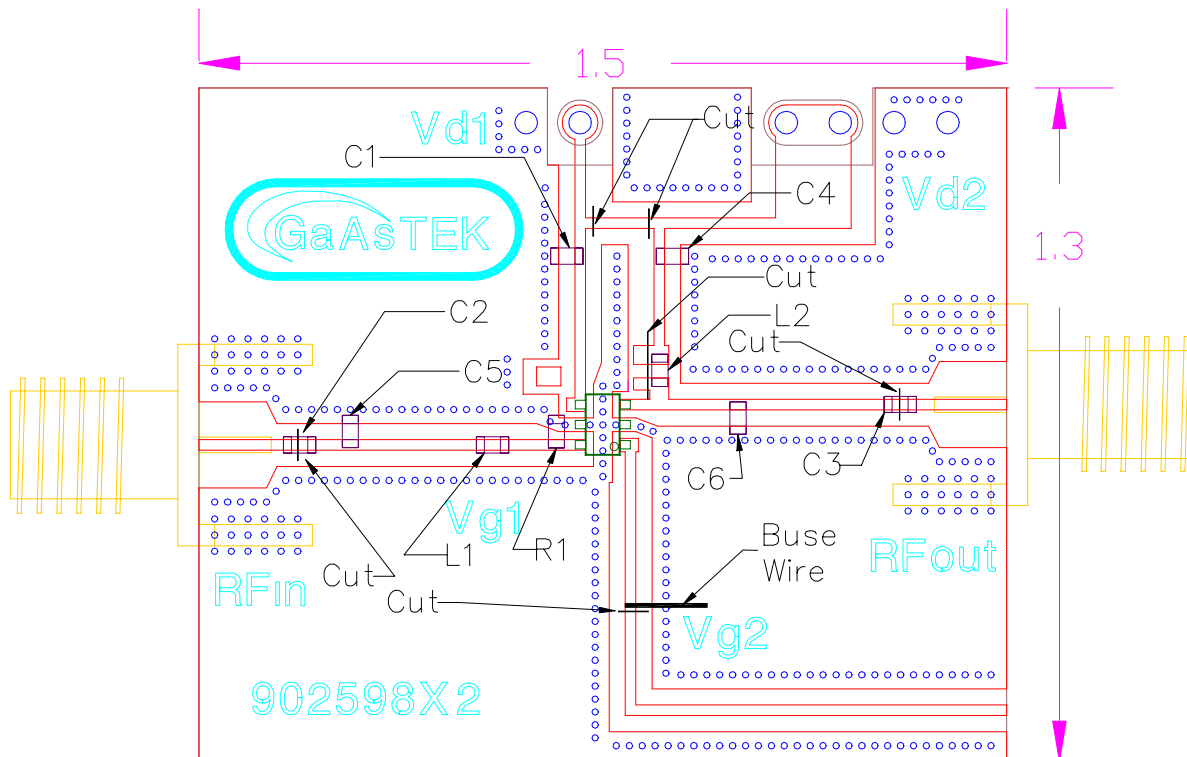


Figure 7. Component layout and printed circuit drawing for evaluation board.

APPLICATION INFORMATION:

List of Components:

C1=100pF Dielectric Labs 300-213
C2=C3=100pF 0603 Murata
C4=4700pF 0603 Murata GRM36X7R472K25AB
C5=1.5pF 0603 Dielectric Labs CO6CF0R5B50U
C6=0.5pF 0805 Dielectric Labs
R1=210Ohm 0603 DigiKey P210HCT-ND
L1=2.7nH 0603 CoilCraft TRS2356CT-ND
L2=22nH 0603 CoilCraft 0603CS-22NXJBB

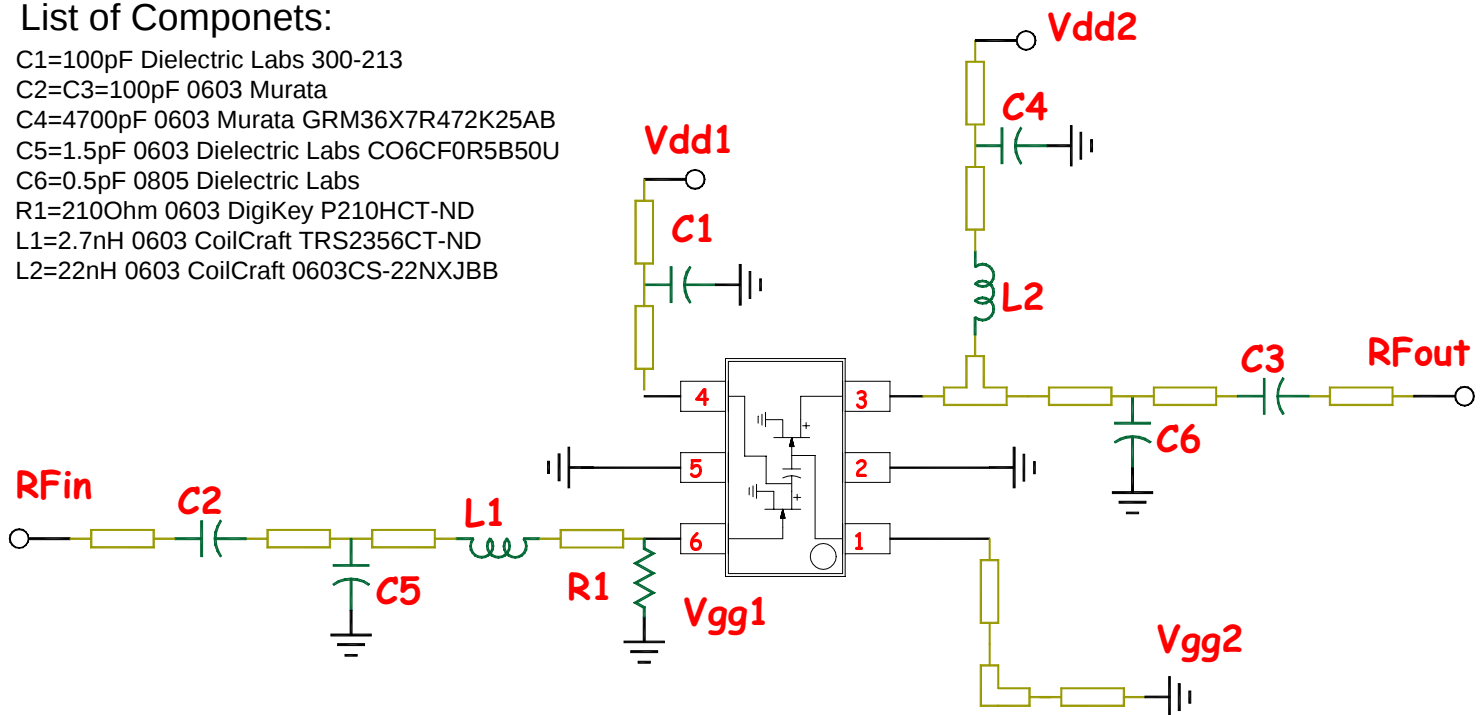


Figure 8. Evaluation Board Schematic