

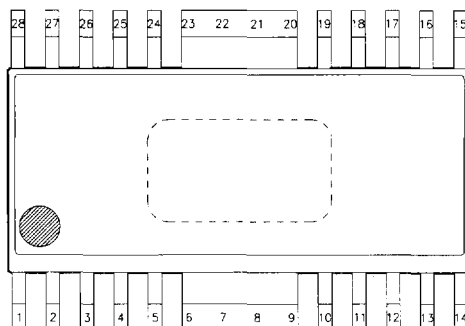
900 MHz Band GSM GaAs Power Amplifier IC

DESCRIPTION

The AWT0908X is a monolithic Power Amplifier IC suited for GSM cellular telephone Applications

FEATURES

High Output Power
High Efficiency
Single Supply
Low Harmonics
Built in Pulse Shaping
Small Size
Surface Mount Package
50 Ω Input Impedance
Low Cost



1. Maximum Ratings

Static sensitive electronic devices. Do not operate or store near strong electrostatic, fields. Take proper ESD precautions.

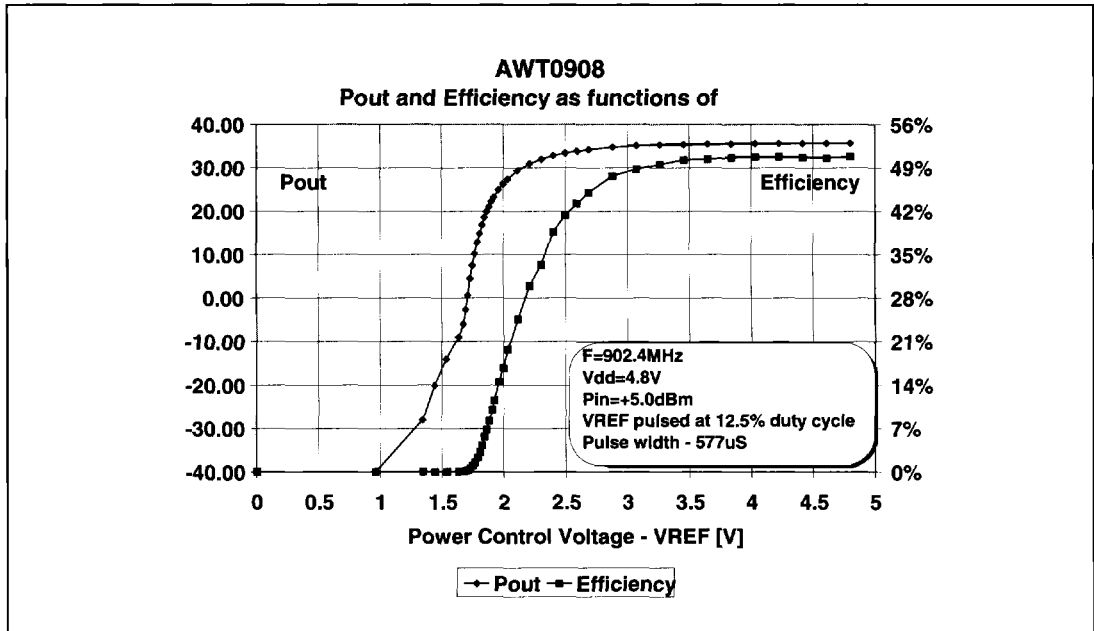
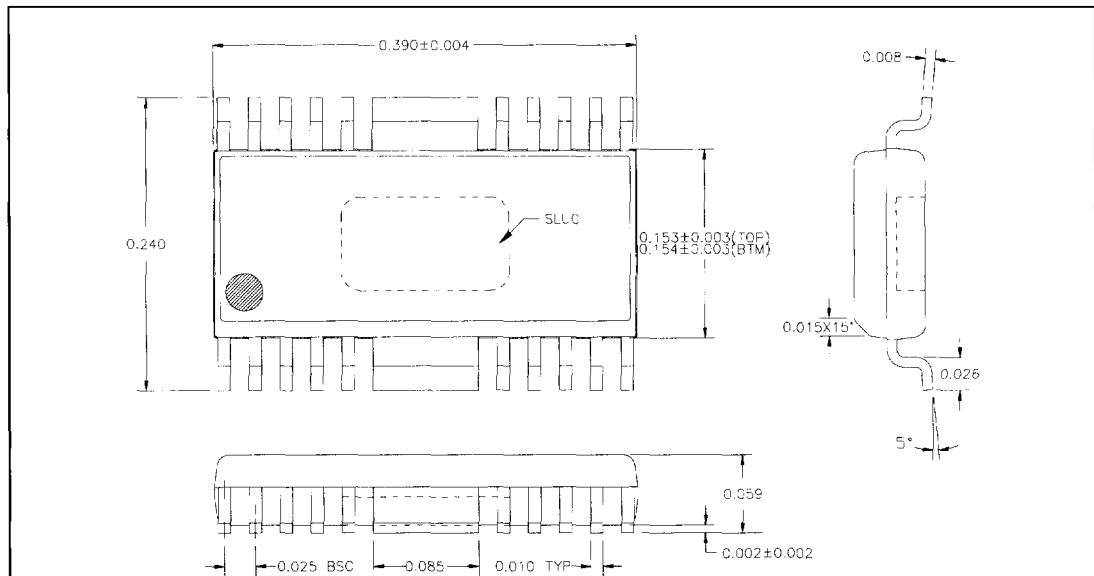
Pin	Rating	Notes
Pin 2 - RF _{IN}	+ 12 dBm max.,	
Pin 3 - V _{REF}	+ 5V max., 0 V min.	If V _{REF} is kept high and not pulsed, the amplifier may draw very high currents and permanent damage may occur.
Pin 4 - VdB	+7.5V max., 0 V min.	
Pin 5 - V _{SSIN}	N/A	Do not apply voltage to this pin. If V _{SSIN} is not between - 4V and - 4.5V (with V _{GEN} = 4.8V), the amplifier may not work properly.

Pin	Rating	Notes
Pin 10 V_{SSOUT}	N/A	Do not apply voltage to these pin
Pin 11, Pin 12	N/A	Do not apply voltage to these pins.
Pin 13 - V_{GEN}	+7.5 V max. 0 V min.	V_{GEN} must be turned on before any of the drain supplies.
Pin 16 - D2	+7.5 V max., 0 V min.	
Pin 19 - D3B	+7.5 V max., 0 V min.	
Pin 24- D3A	+7.5 V max., 0 V min.	
Pin 27 - D1	+7.5 V max., 0 V min.	

2. ELECTRICAL CHARACTERISTICS:

(Pin $\leq +7$ dBm, $V_{DS} = +4.8V_{DC}$, $V_{GEN} = +4.8 V_{DC}$, Pulsed @ 577 μ S/12.5% Duty Cycle, $T_c = 25^\circ C$, 50 Ω Input & 50 Ω external output match)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	PARAMETER
Frequency	f_o	880		915	MHz
Power Output @ $V_{REF} < 3.7$ V	P_{out}		35		dBm
Power Added Efficiency	PAE		50		%
Harmonics (@ 35 dBm)	$2f_o$ $3rd$		- 38 - 28		dBc
Stability: - 80 dBc, all spurious outputs relative to desired signal			6:1		VSWR load, all phase angles, ($P_{OUT} \leq 35dBm$) $V_{DS} = +4.8.0V$, $Z_s = 50 \Omega$
Input Return Loss	R_{min}		12		dB
Isolation			- 40		dBm
DC/DC Converter Current	I_{GEN}		5.5		mA
Pulse Control	I_{REF}			2	mA
Operating Range	T_c	- 20		+ 70	$^\circ C$

3. DATA4. Case Outline and Pin Description

Pin	Signal	Description
1	GND	RF and DC Ground
2	RF _{IN}	RF power input, DC blocked
3	V _{REF}	Output Power control, Should be set to level that corresponds to the desired output power Pulse control voltage (V _{REF} , 0 to 4 V)
4	V _{DB}	Bias circuit Supply (+ 4.8 V, 5 ma)
5	V _{SS_IN}	Negative Supply (-4.5V) generated by the dc/dc converter
6,7,8,9	GND	RF and DC Ground (The “Batwing”)
10	V _{SS_OUT}	The output of the dc/dc converter providing the negative voltage
11,12		Pump capacitor (C5) which is part of the dc/dc converter circuit.
13	V _{GEN}	DC/DC converter positive supply
14	GND	AC and DC ground for the dc/dc converter .If possible should be grounded through a separate via hole .
15	GND	RF and DC ground.
16	V _{D2}	The open drain of the second amplifier stage
17	GND	RF and DC Ground
18	N/C	Not Connected
19	V _{D3B}	3rd stage drain supply (4.8V) and RF out
20,21,22,23	GND	RF and DC ground (the “BATWING”)
24	V _{D3A}	3rd stage drain supply (4.8V) and RF out
25	N/C	Not Connected
26	GND	RF and DC ground
27	V _{D1}	1st stage drain supply (4.8V)
28	GND	RF and DC Ground

5. Recommended Operating Procedure on the Evaluation Board

Power Up

- Begin by setting all power supplies to zero volts.
- Make sure that the input RF power is turned off.
- Turn on V_{GEN} (Pin 13) to + 4.8V
- Check the voltage @ V_{SS_IN} (pin 5) to see if it is between -4.5 V and - 4.0V if voltage is not ,check the pin alignment.
- Turn on V_{D1}(Pin 27), V_{D2}(Pin 16), V_{D3}(Pins 19 and 24) and V_{DB} (Pin 4) which are tied together on the fixture, and set to + 4.8V. Little drain current should be flowing at this time (I_{DD} < 5 mA).
- Turn RF on and adjust input power to 5 dBm.
- Turn V_{REF} on using the pulsed scheme of GSM. Adjust Pulse V_{REF} to desired output power (< = 35 dBm). No lower than 0 V and no higher than +3.7 V. Use an oscilloscope to measure V_{REF} on the V_{REF} package pin (3) rather than using the display of the pulse generator. The reason for that is that the pulse generator may have a 50Ω output impedance while the impedance of V_{REF} pin is high. This causes the voltage on V_{REF} pin to be almost twice as high as the readout on the pulse generator.

Power Down

To power down the device follow the above procedure in reverse order .

6. AWT0908 TEST CIRCUIT

