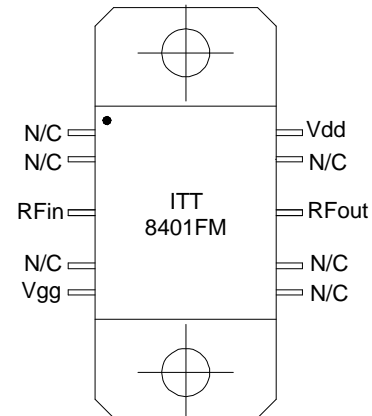


5W GaAs Power Amplifier (6.0 – 9.0 GHz) ITT8401FM

ADVANCED INFORMATION

FEATURES

- Broadband Performance
- High Linear Power (P1dB): 35 dBm typical
- High Power Added Efficiency: 30% typical at P1dB
- High Linear Gain: 20 dB typical
- 50 Ω Input/Output Impedance
- Self-Aligned MSAG[®] MESFET Process
- Unconditionally stable



DESCRIPTION

The ITT8401FM is a two stage MMIC power amplifier fabricated on GaAsTEK's mature GaAs Self-Aligned MSAG[®] MESFET Process. This product is fully matched to 50 ohms on both the input and the output and can be used as either a driver or an output stage amplifier. Although it can be used for several different applications, it is ideally suited for VSAT and ISM applications.

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

Rating	Symbol	Value	Unit
DC Drain Supply Voltage	V _{DD}	12V	Vdc
DC Gate Supply Voltage	V _{GG}	-4V	Vdc
RF Input Power	P _{IN}	500	mW
Junction Temperature	T _J	+175	°C
Storage Temperature	T _{STG}	-40 to +175	°C

ELECTRICAL CHARACTERISTICS V_{DD}=10.0 V, I_{DQ}=900 mA, P_{IN}=23 dBm, T_A=25 °C

Characteristic	Symbol	Typical	Unit
Frequency	<i>f</i>	6.0 to 9.0	GHz
Load Power	P _{OUT}	37	dBm
Power Gain	G _P	12	dB
Power Gain Variation Over Frequency		± 0.5	dB
Power Added Efficiency (P _{OUT} =34 dBm)		35	%
Drain Current (P _{OUT} =37 dBm)	I _{DS}	1400	mA
Gate Bias Voltage (No RF Input)	V _{GG}	-1.9	V
Gate Current (P _{OUT} =34 dBm)	I _{GG}		mA
Input VSWR		2:1	
Harmonics (f _o =5.5 GHz, P _{OUT} =34 dBm)	2f _o 3f _o	TBS TBS	dBc dBc
Thermal Resistance (Junction of 2 nd stage FET to T _{FLANGE} , Note 1)	R _{TH}	TBS	°C/W
Noise Figure		TBS	dB
Third-Order Intercept Point (I _{DQ} =525 mA)	TOI	TBS	dBm
Stability (P _{IN} = 10 to 27 dBm, V _{DD} =3 to 10 V, Load VSWR = 3:1)	—	All non-harmonically related outputs more than 70 dB below desired signal	

Note 1: The second stage FET determines the overall thermal performance. Therefore, when performing thermal calculations, the dissipated power needs only to be calculated for the amplifier's 2nd stage.



TYPICAL CHARACTERISTICS

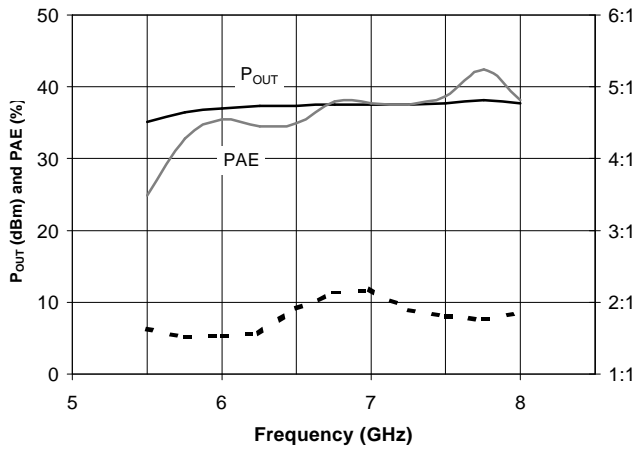


Figure 1. Output power, efficiency, and input VSWR vs. frequency

Conditions for Figure 1:
 $V_{DD} = 10V$, $V_{GG} = -1.8V$, $P_{IN} = 22$ dBm

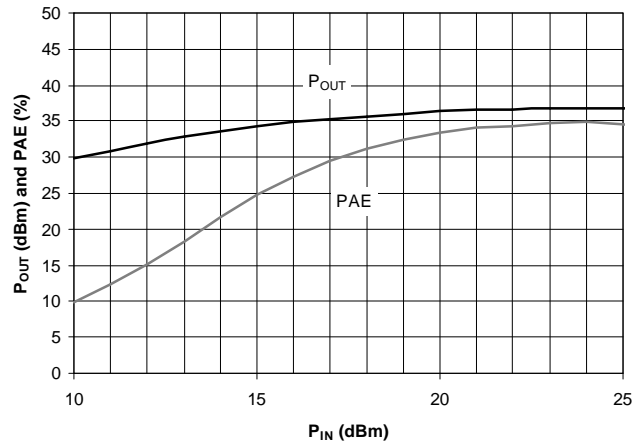


Figure 2. Output power and efficiency vs. input power

Conditions for Figure 2:
 $V_{DD} = 10V$, $V_{GG} = -1.8V$, $f = 6.5$ GHz

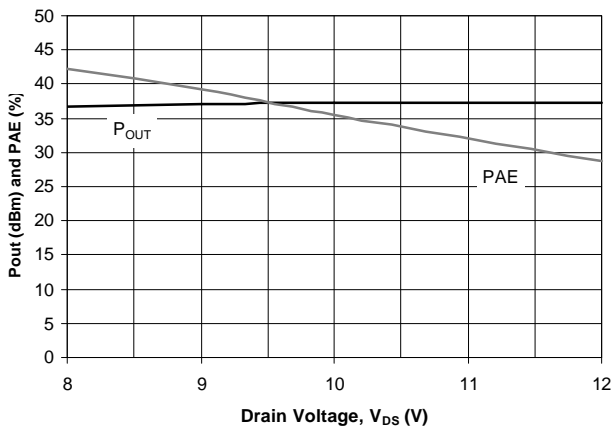


Figure 3. Output power and efficiency vs. supply voltage

Conditions for Figure 3:
 $V_{GG} = -1.8V$, $P_{IN} = 22$ dBm, $f = 6.5$ GHz

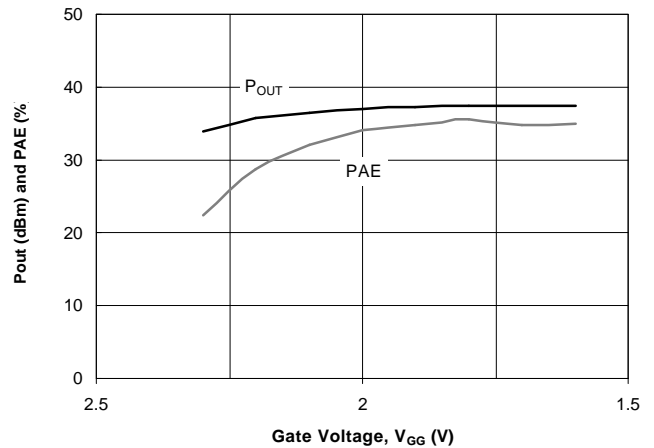


Figure 4. Output power and efficiency vs. gate voltage

Conditions for Figure 4:
 $V_{DD} = 10V$, $f = 6.5$ GHz, $P_{IN} = 22$ dBm

