

12W Power Amplifier Die (8.5 – 10.0 GHz)

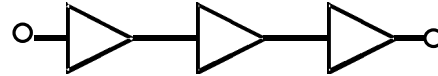
ITT338510D

ADVANCED INFORMATION

FEATURES

- Broadband Performance
- 35% Typical Power Added Efficiency
- 50 Ω Input/Output Impedance
- Self-Aligned MSAG[®] MESFET Process

Three Stage Single-ended High Power Amplifier



Description

The ITT338510D is a three stage MMIC power amplifier fabricated using GaAsTEK's mature GaAs Self-Aligned MSAG[®] MESFET Process. This product is fully matched to 50 ohms on both the input and the output.

Maximum Ratings (T_A = 25 °C unless otherwise noted)

Rating	Symbol	Value	Unit
DC Drain Supply Voltage	V _{DD}	12	Vdc
DC Gate Supply Voltage	V _{GG}	-4	Vdc
Power Dissipation (T _{BASE} = 70 °C)	P _{DISS}	-	W
RF Input Power	P _{IN}	500	mW
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-40 to +85	°C

ELECTRICAL CHARACTERISTICS V_{DD} = 10.0 V, V_{GG} = -2 V, P_{IN} = 20 dBm, T_A = 25 °C

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency	f	8.0	—	11.0	GHz
Output Power, saturated	P _{SAT}		40.7		dBm
Power Gain, saturated	G _{SAT}		23.7		dB
Gain Flatness Over Frequency	-		+/- 1.0		dB
Power Added Efficiency (P _{OUT} =P _{SAT})	PAE		35		%
Return Loss	S ₁₁		-6		dB
Harmonics	2f ₀ , 3f ₀			-20	dBc

TYPICAL CHARACTERISTICS ($V_{DD} = 10\text{ V}$, $V_{GG} = -2\text{ V}$, $P_{IN} = 17\text{ dBm}$)

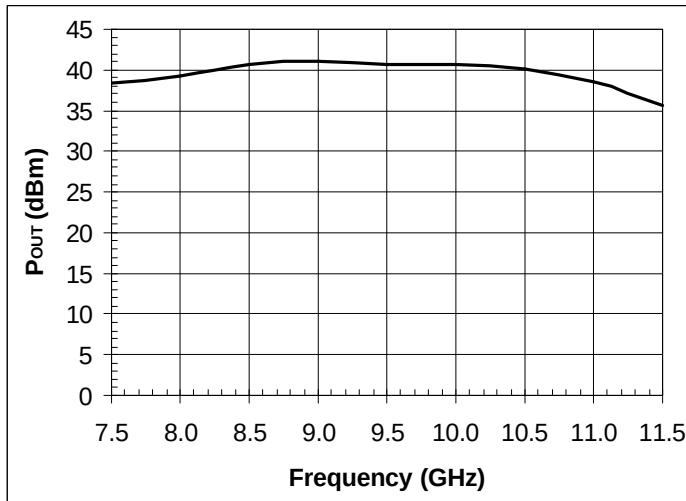


Figure 1. Output Power vs. Frequency

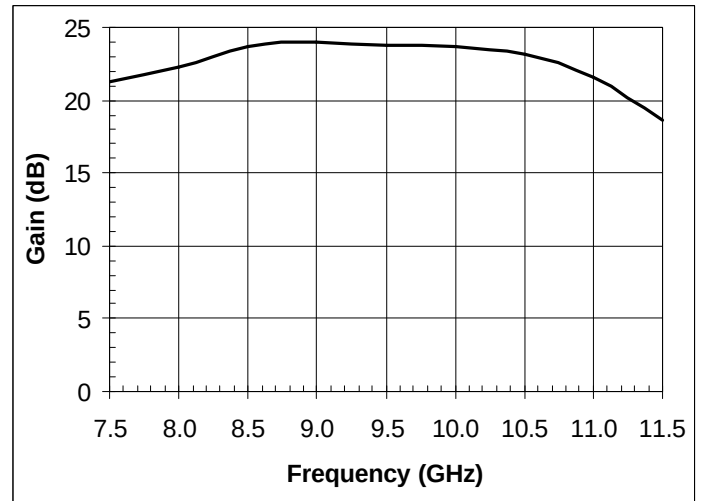


Figure 2. Gain vs. Frequency

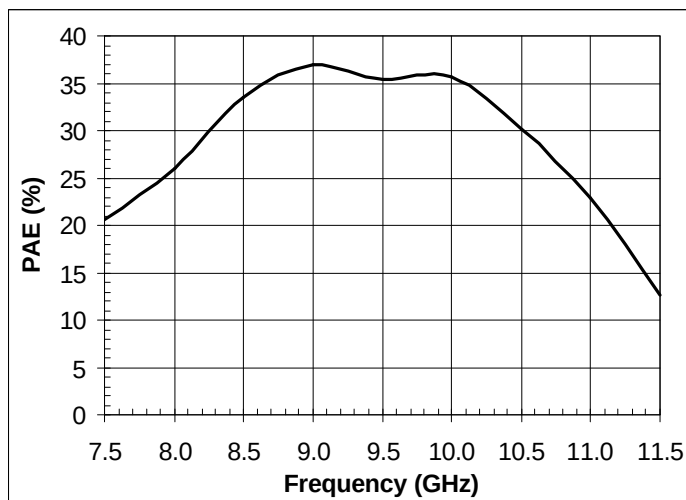


Figure 3. Power Added Efficiency vs. Frequency

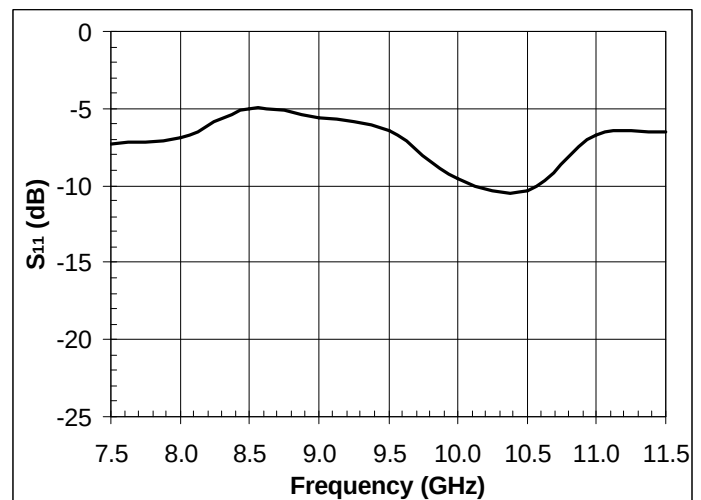
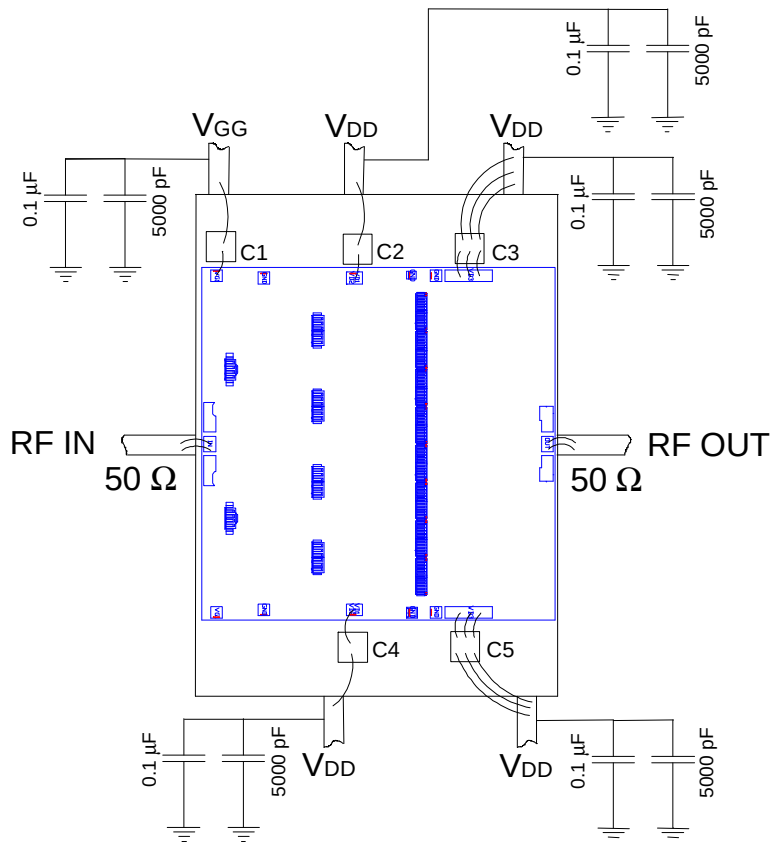


Figure 4. Input Return Loss vs. Frequency

APPLICATION INFORMATION



List of components:

C1 thru C5 = 100pF single layer ceramic chip capacitor

Assembly:

Chip dimensions: 4.6 mm x 4.6 mm, .003" thickness.

Die attach: Use AuSn (80/20) 1 mil. preform solder. Limit time @ 300 °C to less than 5 minutes.

Wirebonding: Bond @ 160 °C using standard ball or thermal compression wedge bond techniques. For DC pad connections, use either ball or wedge bonds. For best RF performance, use wedge bonds of shortest length, although ball bonds are also acceptable.

Biasing:

1. User must apply negative bias to V_{GG} before applying positive bias to V_{DD} to prevent damage to amplifier.

Figure 5. Recommended bonding diagram for pedestal mount

