ICP1137

2-18GHz 5W GaN PA MMIC

ICONIC RF
a MICROCHIP company

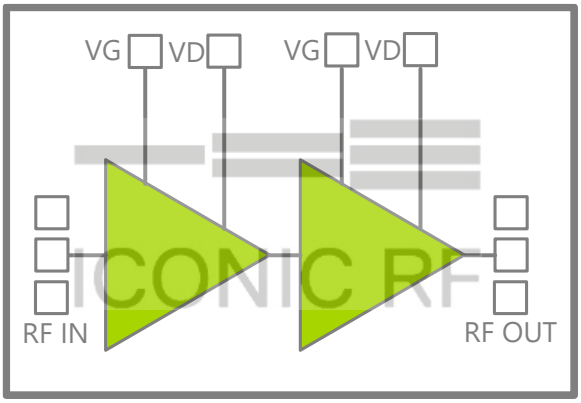
Features

- Frequency Range: 2-18GHz
- Pout: 37dBm @ 26dBm Pin
- PAE: 20 %
- Small Signal Gain: 18dB
- Bias: VD=24V IDQ=114mA
- Technology: GaN on SiC
- Lead-free and RoHS compliant
- Die Size = 4.7 mm x 3.0 mm

Applications

- Test and measurement
- Aerospace & Defense

Image



Description

ICONICRF's ICP1137 is a 2 stage MMIC power amplifier in bare die form, fabricated using GaN on SiC technology. ICP1137 operates from 2-18GHz with 37dBm output power, 20% PAE and 18dB small signal gain. ICP1137 is well suited to both commercial, test and measurement and defense applications.

Electrical Specifications

Parameter	Conditions (1)	Min	Typ	Max	Units
Frequency		2		18	GHz
Output Power @ P_{sat}	Pin=26dBm		37		dBm
PAE @ P_{sat}	Pin=26dBm		20		%
Small Signal Gain			18		dB
Input Return Loss			12		dB
Output Return Loss			10		dB

(1) Test conditions unless otherwise stated V_D=24V, I_{DQ}=114mA ,TA=25 °C, CW

Absolute Maximum Ratings

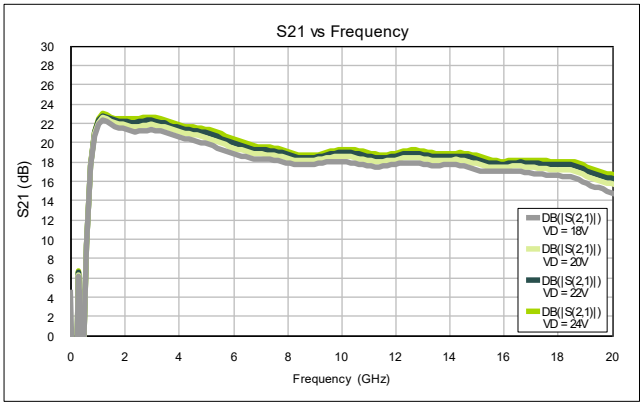
Parameter	Absolute Maximum
Drain Voltage (V_{DG})	32V
CW Input Power	+30dBm
Channel Temperature	275°C
Storage Temperature	-65°C to +150°C

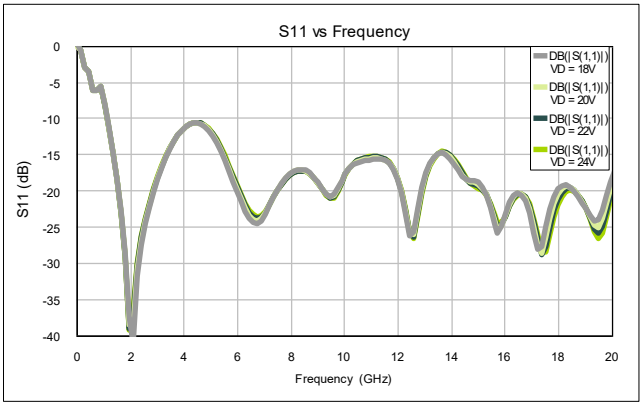
Exceeding any one or combination of these limits may cause permanent damage to this device.
ICONIC RF does not recommend sustained operation near these survivability limits.

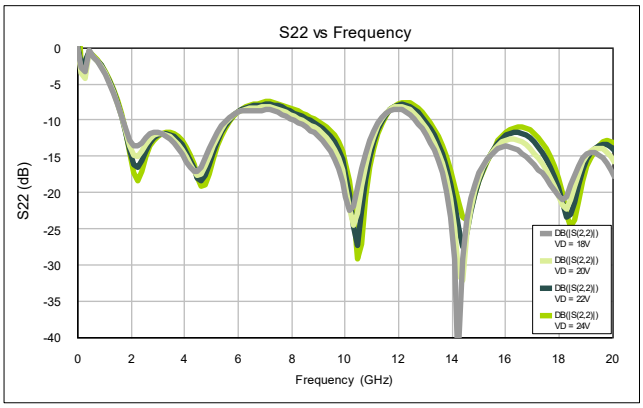
Ordering Information

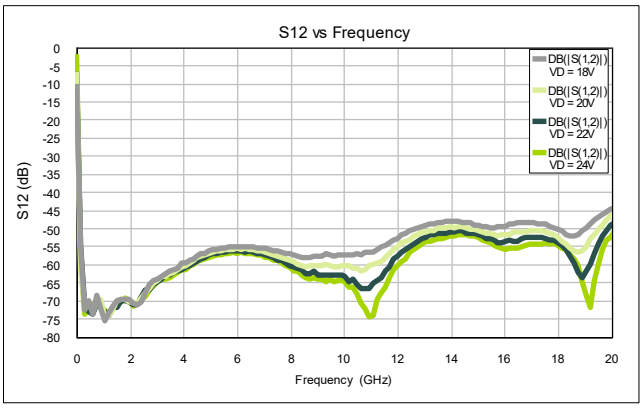
Part No.	Description
ICP1137-1-101I	Bare Die on expander ring
ICP1137-1-110I	Bare die in Gel-Pack trays
ICP1137-1-501U	Evaluation Board with SMA connectors

Typical Small Signal Data CW vs VD| Test conditions unless otherwise stated I_{DQ}=114mA ,TA=25 °C, CW

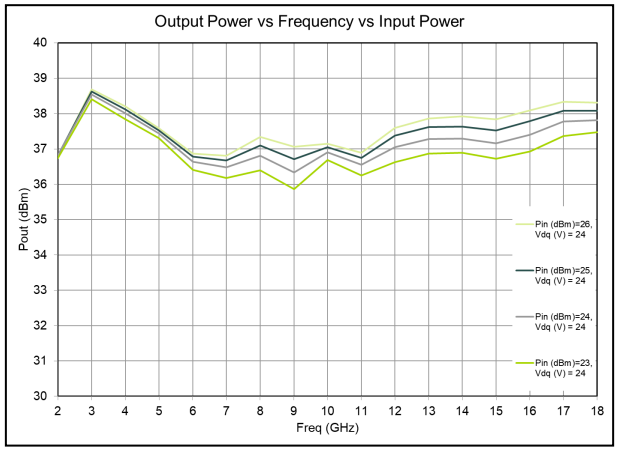


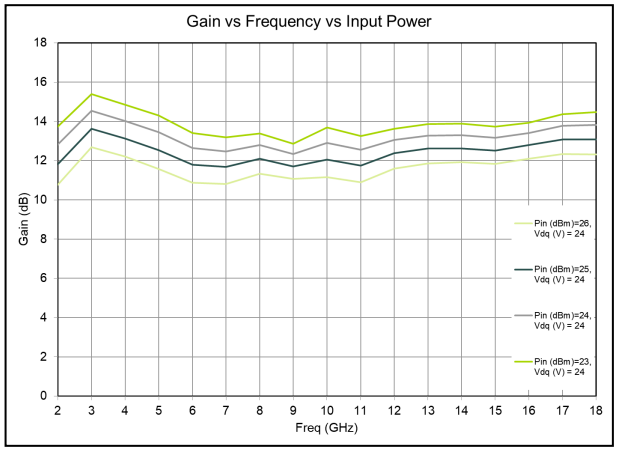


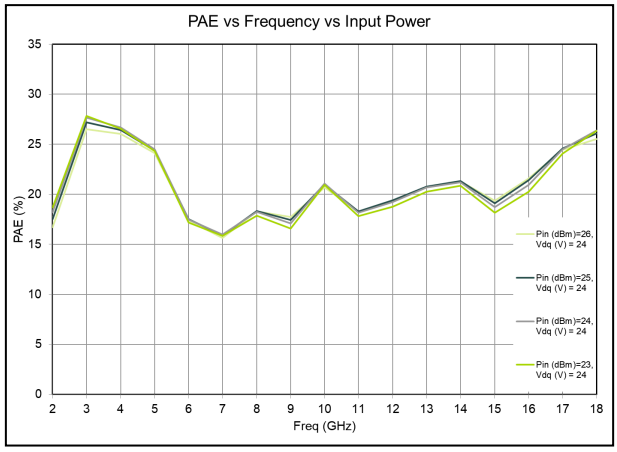


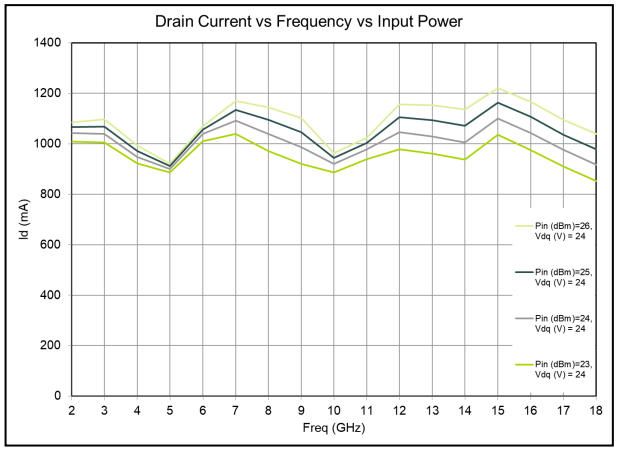


Typical Large Signal Data CW 24V | Test conditions unless otherwise stated V_D=24V, I_{DQ}=114mA ,TA=25 °C, CW









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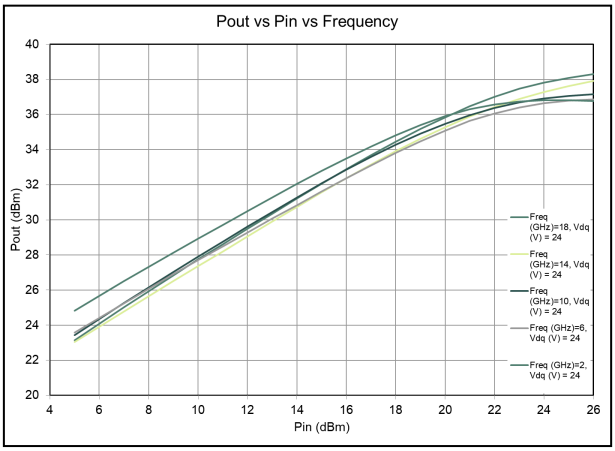
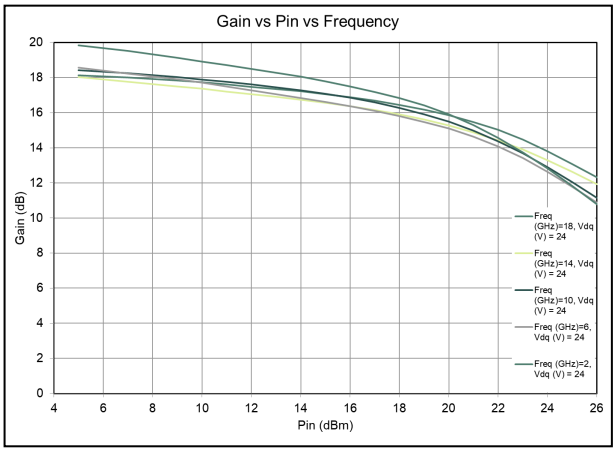
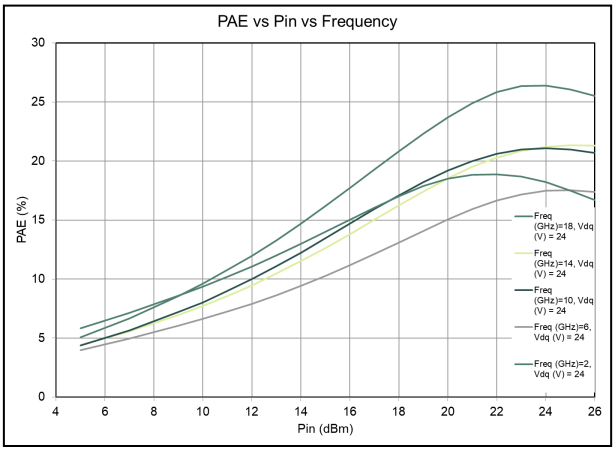
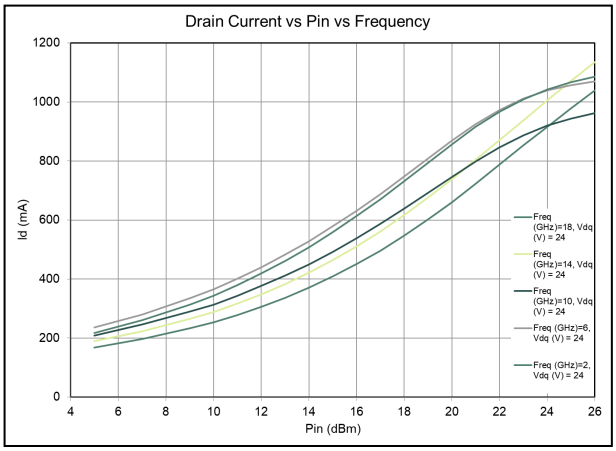
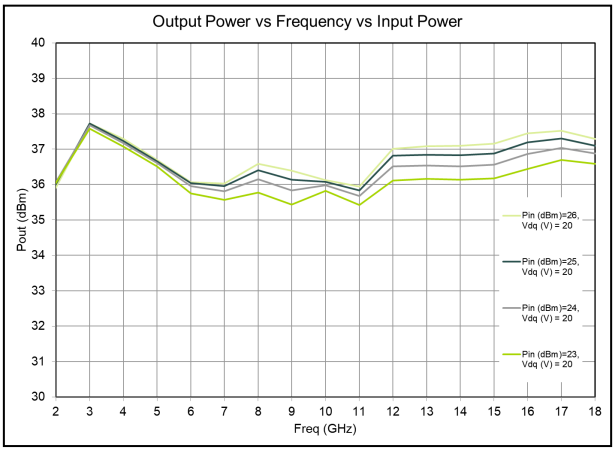


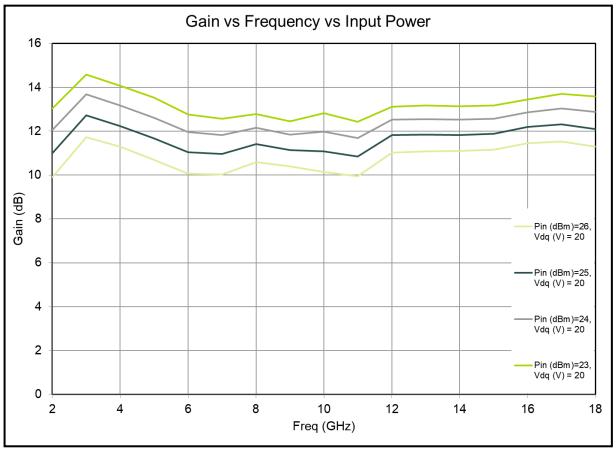


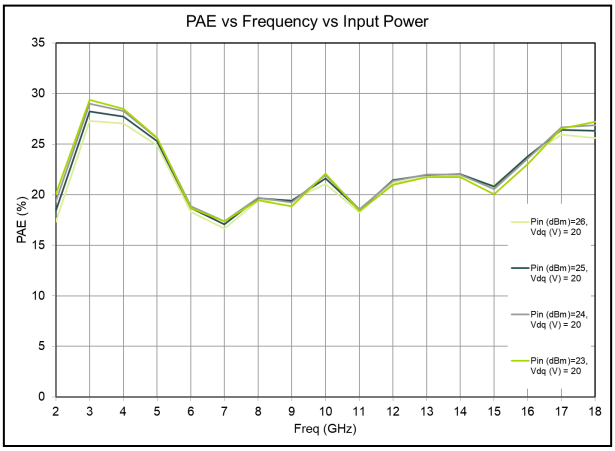


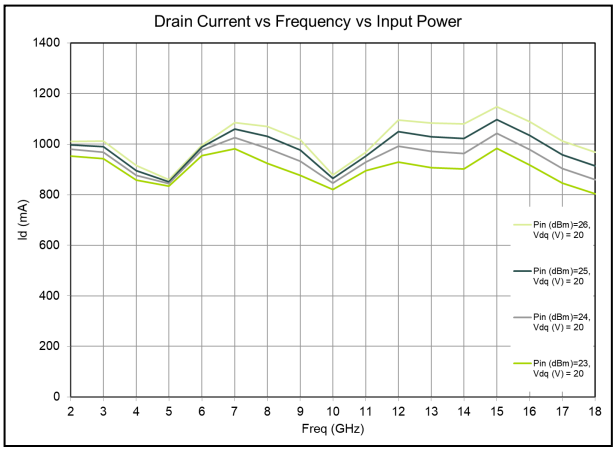


Typical Large Signal Data CW 20V | Test conditions unless otherwise stated V_D=20V, I_{DQ}=114mA ,TA=25 °C, CW

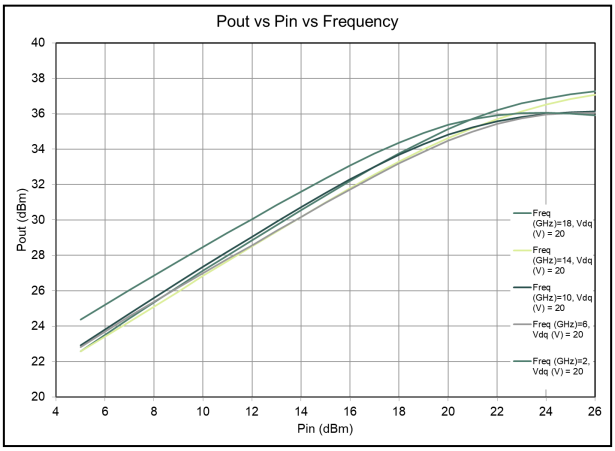


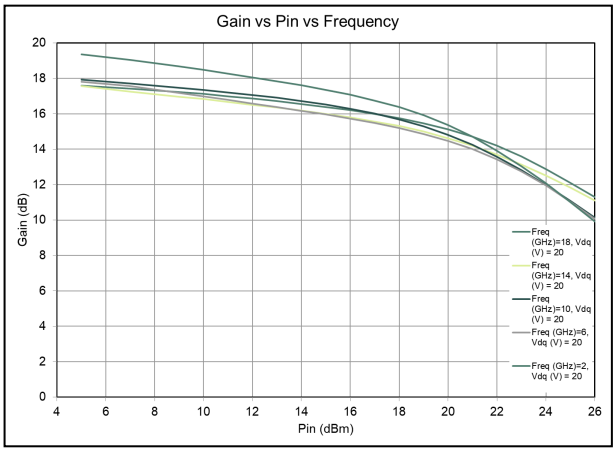


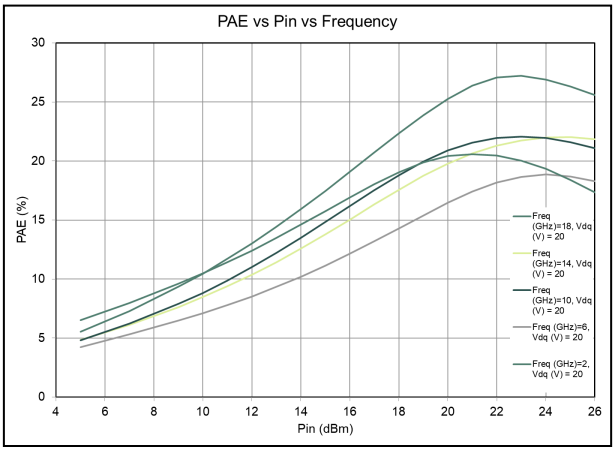


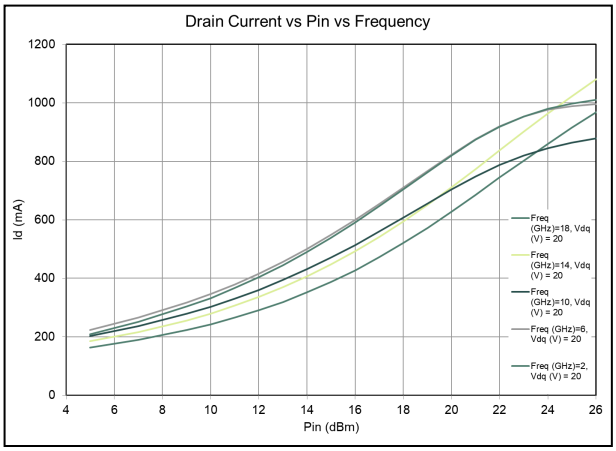


Typical Large Signal Data CW 20V | Test conditions unless otherwise stated V_D=20V, I_{DQ}=114mA ,TA=25 °C, CW

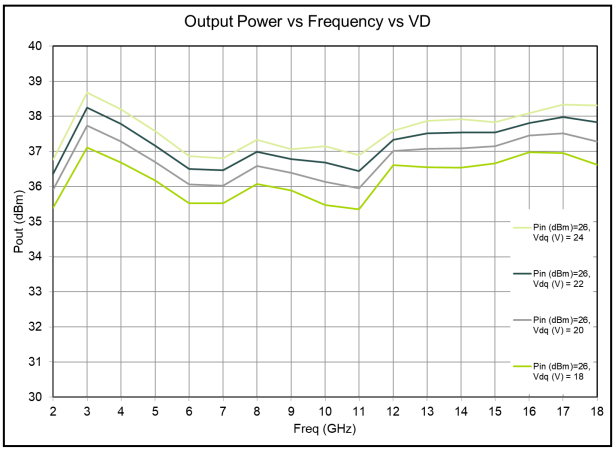


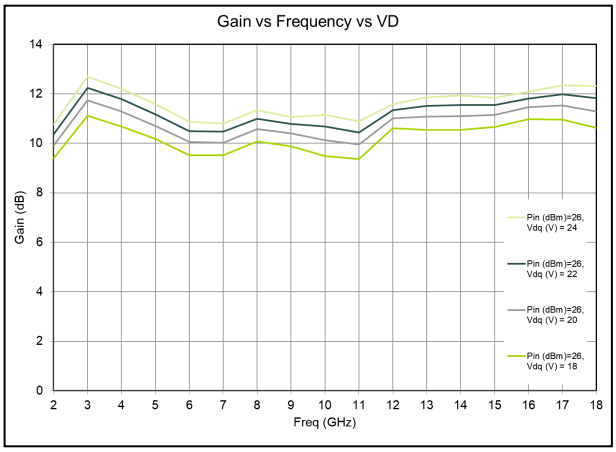


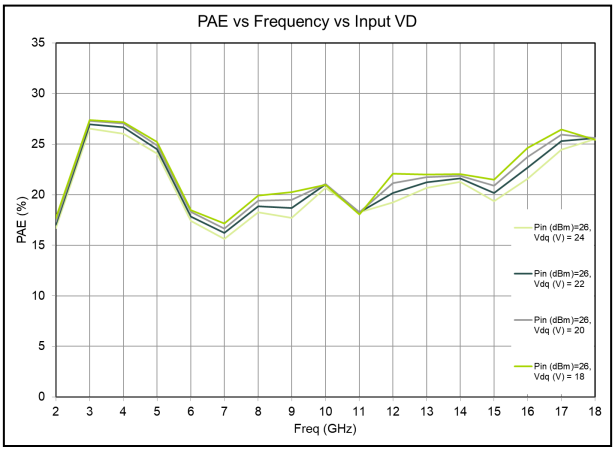


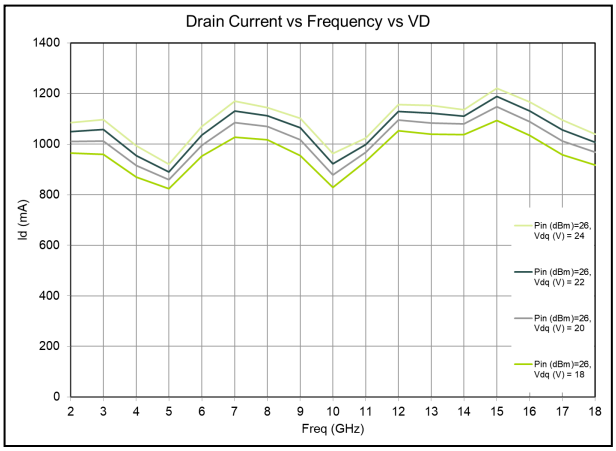


Typical Large Signal Data CW vs VD| Test conditions unless otherwise stated I_{DQ}=114mA ,TA=25 °C, CW

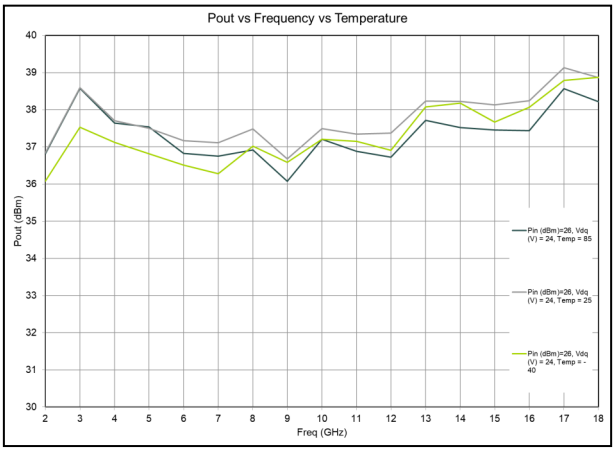


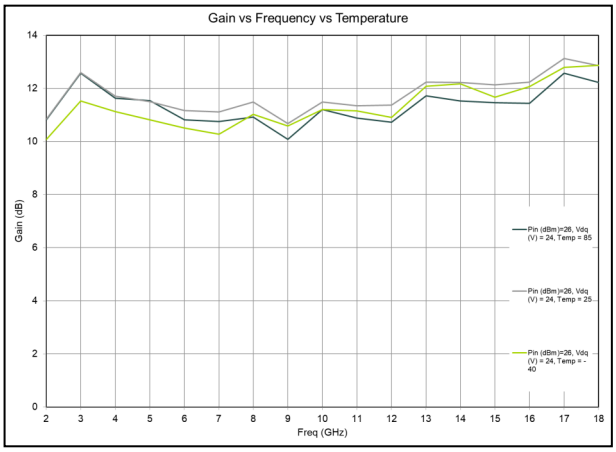


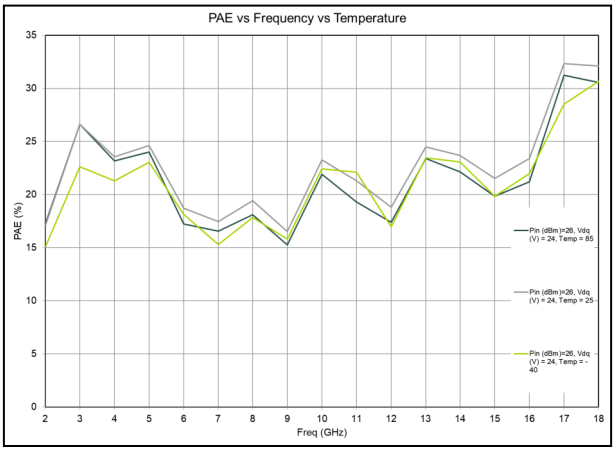


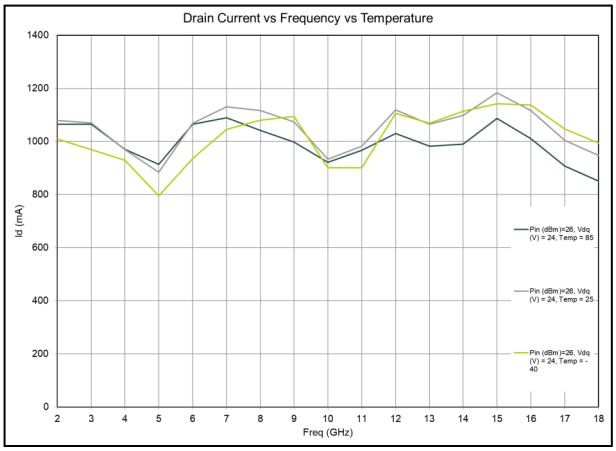


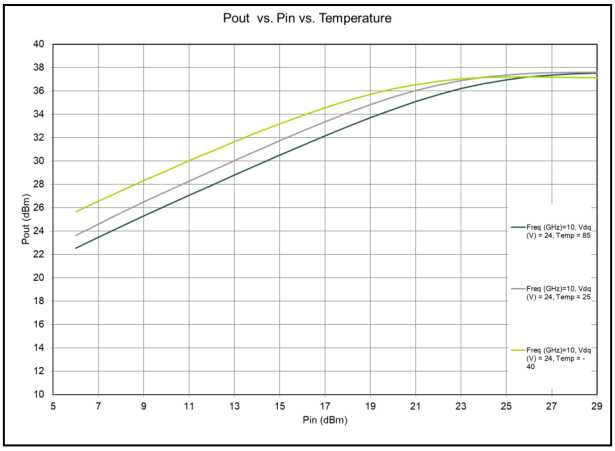
Typical Large Signal Data CW vs Temperature| Test conditions unless otherwise stated I_{DQ}=114mA ,TA=25 °C, CW

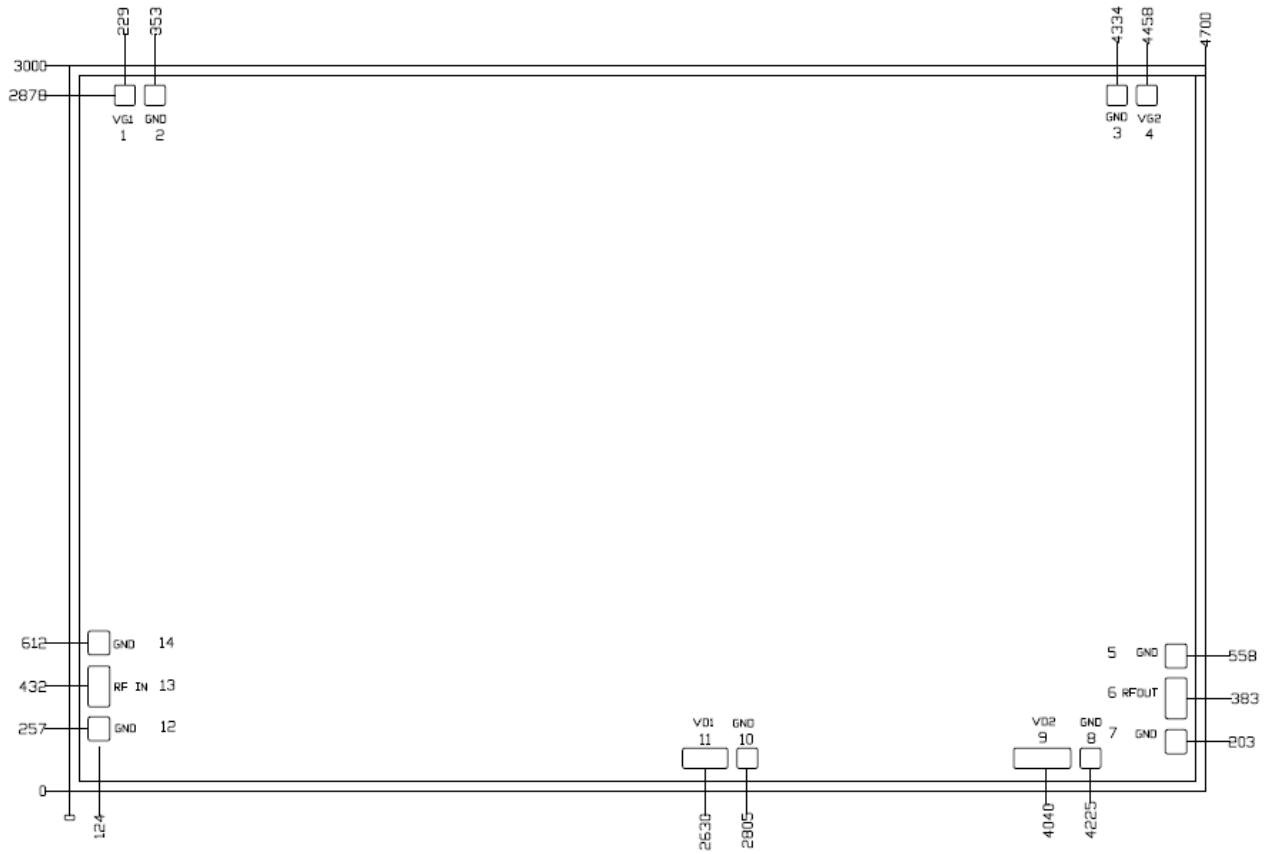












Units: um
Thickness: 100um
Backside is RF and DC ground

Pad No	Pad Size	Function	Description
1	86x86	VG1	First stage gate bias, decoupling and bypass caps required.
2,3	86x86	GND	Ground
4	86x86	VG2	Second stage gate bias, decoupling and bypass caps required.
6	69x169	RFOUT	50 ohm RF input, DC blocked
5,7,8	86x86	Ground	Ground
9	86x236	VD2	Second stage drain voltage, decoupling and bypass caps required,.
10	86x86	GND	Ground
11	86x186	VD1	First stage drain voltage, decoupling and bypass caps required
13	69x169	RFIN	50 ohm RF input, DC blocked
12,14	86x86	Ground	Ground

Bias-Up Procedure

1. Set V_G=-5V
2. Set V_D to 24V
3. Adjust V_G positive until I_D quiescent is 114mA (Approximately –1.8V)
4. Limit I_D to 2A
5. Apply RF Signal

Bias-down Procedure

1. Turn off R_F
2. Turn off V_D, allow drain capacitor to discharge
3. Turn off V_G.

Assembly Guidance

Die attach of component using adhesive

- Vacuum collets are preferred method of pickup
- Silver sintered epoxy or eutectic is recommended

Interconnect assembly Notes

- Ball Bonding is preferred technique
- Force, time and ultrasonic parameters are critical
- Aluminum wire bonding is not recommended
- Bond Wire diameter of 1mil is recommended

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

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