ICPB1020 | Discrete Power GaN HEMT 100 Watt

ICONIC RF

Features

- Frequency Range DC-14GHz
- 50dBm Nominal P_{3dB}
- Maximum PAE at 6GHz of 65%
- 16dB Linear Gain at 6GHz
- Drain Bias 28V
- Technology: 0.25µm GaN on SiC
- Lead-free and RoHS compliant
- Chip Dimensions: 0.82 x 4.56 x 0.10mm

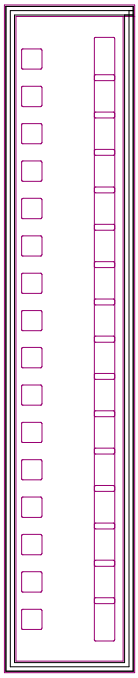
Applications

- Aerospace & Defense
- Broadband Wireless

Description

The ICPB1020 is a 0.25µm GaN SiC 20mm discrete HEMT that operates from DC-14GHz. The design is optimized for power and efficiency using field plate technology.

Image



RF Performance | Test Conditions unless otherwise stated | T_A=25°C, V_D=28V, Pulse Width 100uS, Duty Cycle=10%

Parameter	Units	Typical			
Frequency	GHz	3	6	8	10
Output Power P_{3dB}	dB	50	50	50	50
Bias Current	mA	400	400	400	400
PAE @ P_{3dB}	%	60	60	57	54
Gain @ P_{3dB}	dB	19	13	11	9

Recommended operating conditions

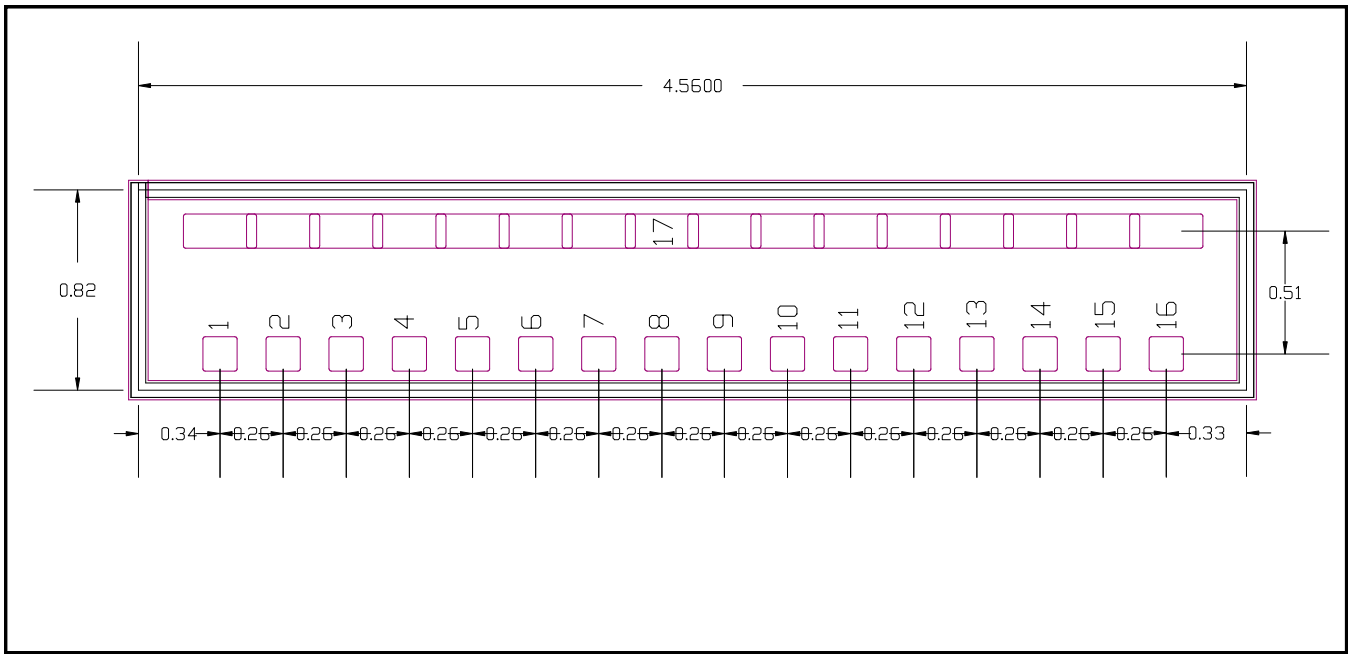
Parameter	Value
Drain Voltage (V_{DG})	12-32 V
Drain Quiescent Current (I_D)	1A
Drain current RF Drive (I_D)	1.6A
Gate Voltage (V_G)	-3V
Power Dissipation (CW)	54W
Channel Temperature (Max)	225°C

Absolute Maximum Ratings

Parameter	Absolute Maximum
Drain to Gate Voltage (V_{DG})	100 V
Gate Voltage Range (V_G)	-10V to 0V
Gate Current (I_G)	-20 to 56mA
Power Dissipation (CW)	70W
CW Input Power	+40dBm
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.

Mechanical Drawing



Bond Pads

Pad Number	Description	Dimensions (mm)
1-6	Gate	0.150 x 0.150
17	Drain	2.19 x 0.150
Die Backside	Source	4.195 x 0.824

Bias-Up Procedure

1. Set V_G=-5V
2. Set V_D to 28V
3. Adjust V_G positive until ID quiescent is 1A
4. Limit I_D to 8A
5. Apply RF Signal

Bias-down Procedure

1. Turn off RF
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 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 1.5mil 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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