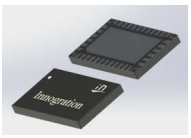
0.1-6.2GHz, 10W, 28V GaN Fully matched PA Module



Description

The GMAH0162-10 is a 10-watt ,single stage integrated Power Amplifier Module, designed for broad band applications, with frequencies from 100MHz to 6.2GHz. The module is 50 Ω input/output matched and requires minimal external components.

The module implements distributed power amplifier in form of multi chips, housed in cost effective plastic open cavity package, offers a much lower cost than traditional MMIC solutions.

Vds=28V, Idq=50mA, CW

Parameter	0.1GHz	1.0GHz	2.0GHz	3.0GHz	4.0GHz	5.0GHz	6.0GHz	6.2GHz	Units
Linear Gain	9.4	9.4	9.9	10.2	9.6	10.0	10.7	11.0	dB
Gain@Pin=33dBm	7.3	7.3	7.8	8.0	7.5	7.5	7.6	7.6	dB
Pout@Pin=33dBm	10.6	10.6	11.9	12.5	11.2	11.1	11.5	11.5	W
PAE@Pin=33dBm	60	49	48	43	33	34	36	37	%

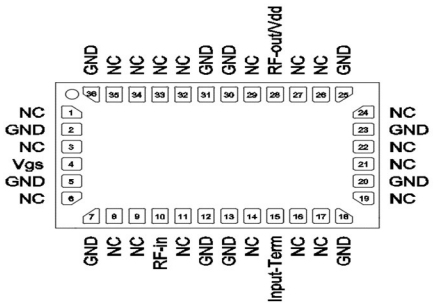
Product Features

- Operating Frequency Range: 0.1-6.2GHz (Up to 6.6GHz for Psat>8W)
- Operating Drain Voltage: +28 V (Up to 32V)
- 50 Ω Input/Output
- Psat: ⩾40dBm @28V
- Small signal gain:>9dB, Power gain:>7dB @Pin=33dBm
- Minimum efficiency:>25%
- 6x10 mm Surface Mount Package
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Applications

- Ultra Broadband Amplifiers
- Fiber Drivers
- Test Instrumentation
- EMC Amplifier Drivers
- 2-way Radios

Pin Configuration and Description



Pin No.	Symbol	Description
28	RFout/Vdd	Transistor 1, Drain Bias & RF Output
10	RFin	Transistor 1, RF Input
4	Vgs	Transistor 1, Gate Bias

15	Input-Term	Transistor 1, Input 50 ohm term
Others	NC	No connection
2,5,7,12, 13,18,20,23,25, 30, 31,36 Package Base	GND	DC/RF Ground. Must be soldered to EVB ground plane over array of vias for thermal and RF performance. Solder voids under Pkg Base will result in excessive junction temperatures causing permanent damage.

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	150	Vdc
Gate--Source Voltage	V_{GS}	-10 to +2	Vdc
Operating Voltage	V_{DD}	+36	Vdc
Input CW Power	RFin	35	dBm
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature	T_J	+225	°C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case, FEA T_C= 25°C, DC test	$R_{\theta JC}$	5	°C/W

Table 3. Electrical Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		100		6200	MHz
Power Gain @ Psat		6	7		dB
P_{SAT}	3dB compression		40		dBm
Drain Efficiency @ P_{SAT}		25			%
Unless otherwise noted: TA = 25°C, V_{DD} =28 V, Pulse Width=100 us, Duty cycle=10%					

Load Mismatch of per Section (On Test Fixture, 50 ohm system): V_{DD} =28 V, I_{DQ} =50 mA, f = 3.5 GHz

VSWR 10:1 at P3dB pulse CW Output Power	No Device Degradation

Reference Circuit of Test Fixture Assembly Diagram

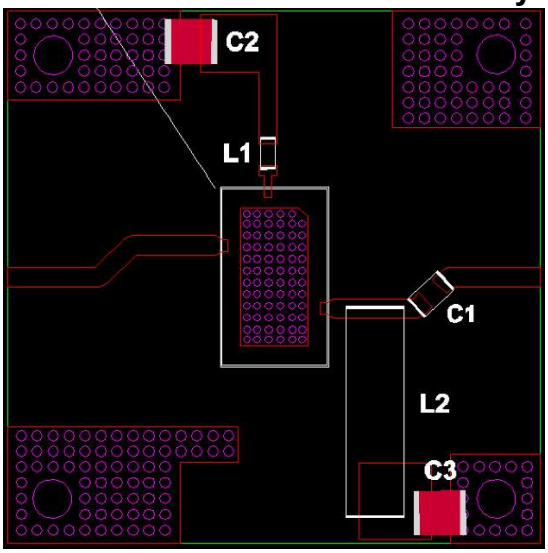


Figure 1. Test Circuit Component Layout

		Part NO.	Vendor
L1	100 nH Inductor(0603)	LQW18CNR10K00D	muRata
C1	50V 1uF Chip Capacitor	GRM21BR71H105KA12L	muRata
C2,C3	10uF 100V Chip Capacitor	C5750X7S2A106M230KB	TDK
L2	1.3uH 4.2A Inductor	4310LC-132KEC	Coilcraft
PCB	RO4350B,20mil,er=3.48		

TYPICAL CHARACTERISTICS

Figure 2. Network analyzer output S11/S21 (Pin=0dBm)

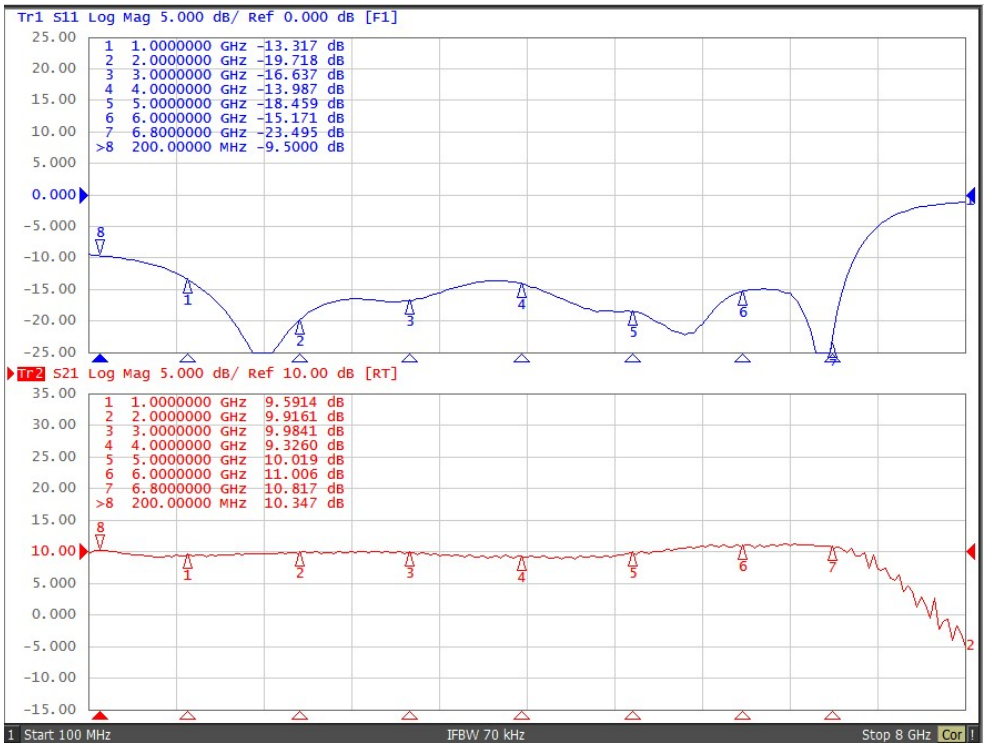
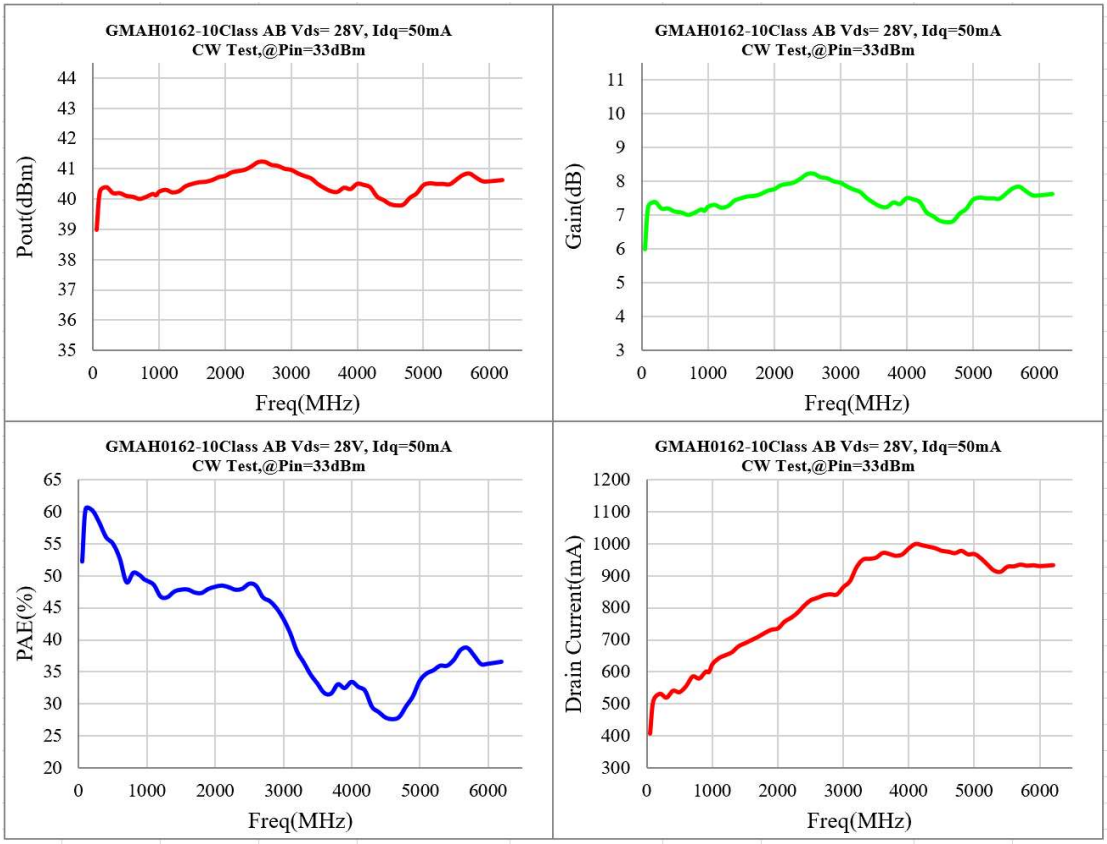
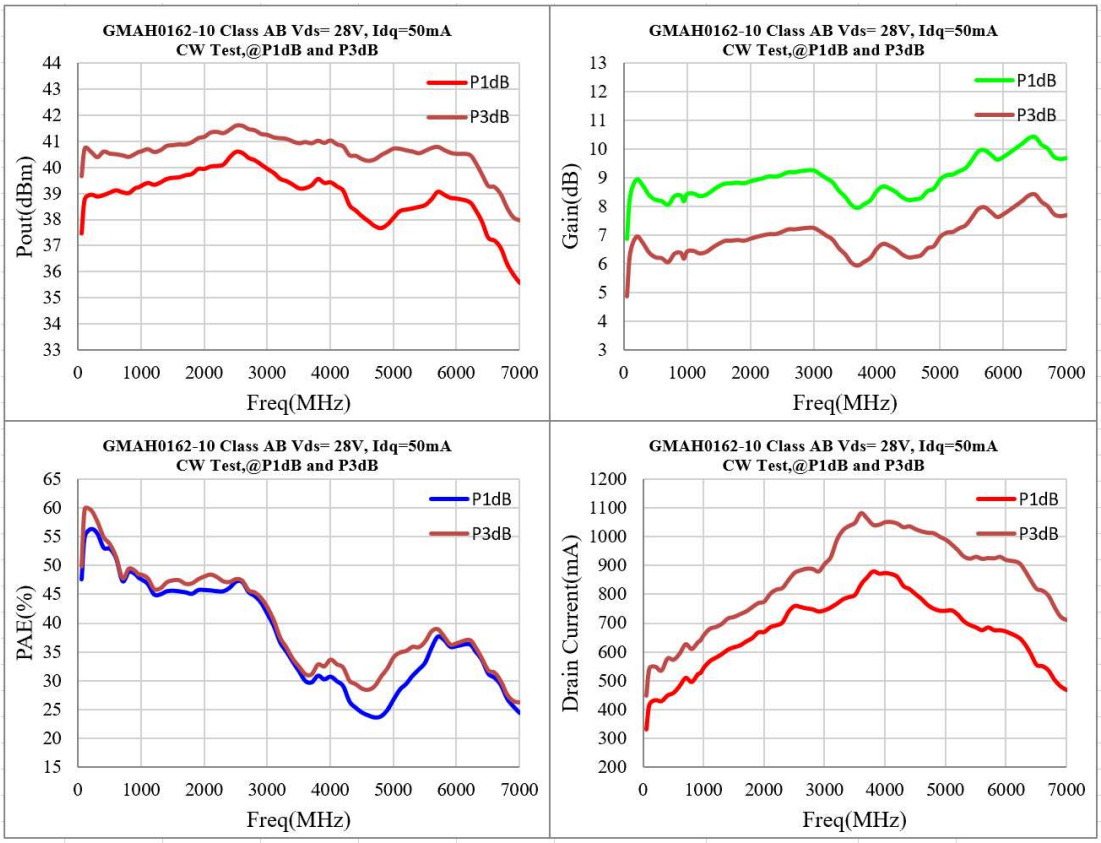


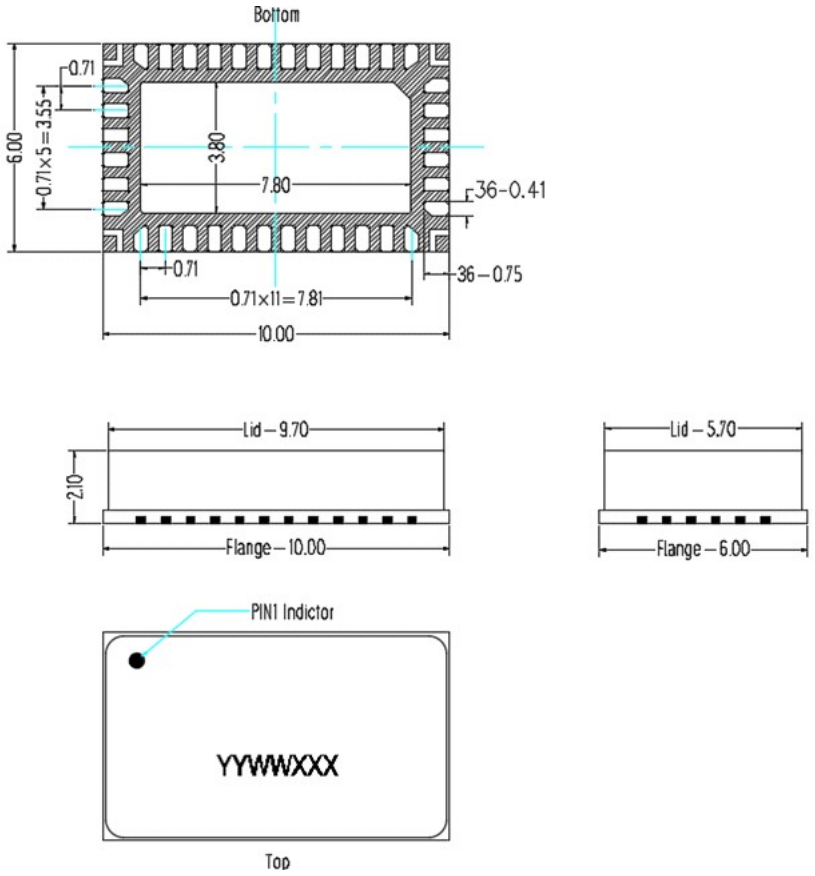
Figure 3. Power Gain and, efficiency and Pout @Pin=33dBm, P1dB, P3dB vs. Frequency





Package Dimensions

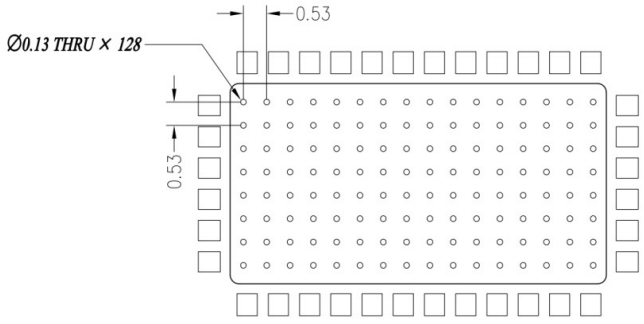
10*6 Plastic Package



Notes:

1. All dimensions are in mm;
2. The tolerances unless specified are ±0.2mm.

Mounting Footprint Pattern



Notes:

1. All dimensions are in mm;
2. Vias are required under the backside paddle of this device for proper RF/DC grounding and thermal dissipation. ALL vias are PTH to ground.

Revision history

Table 6. Document revision history

Date	Revision	Datasheet Status
2023/3/3	Rev 1.0	Production Datasheet

Application data based on ZHH-23-03

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