

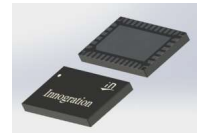


## DC-3GHz, 6W, 28V LDMOS Fully matched PA Module

### Description

The IMEH0030-6 is a 6-watt ,single stage integrated Power Amplifier Module, designed for broad band applications, with frequencies from DC to 3GHz. 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.



V<sub>ds</sub>=28V, I<sub>dq</sub>=90mA, CW

Parameter	30MHz	0.5GHz	1.0GHz	1.5GHz	2.0GHz	2.5GHz	3.0GHz	3.3GHz	Units
Linear Gain	20.6	18.1	17.0	15.6	15.6	17.1	15.5	14.9	dB
P <sub>out</sub> @P <sub>in</sub> =24.5dBm	/	9.7	8.7	7.5	7.6	9.2	6.9	6.0	W
Gain@P <sub>in</sub> =24.5dBm	/	15.4	14.9	14.2	14.3	15.1	13.9	13.3	dB
Eff@ P <sub>in</sub> =24.5dBm	/	62	44	38	37	46	37	36	%

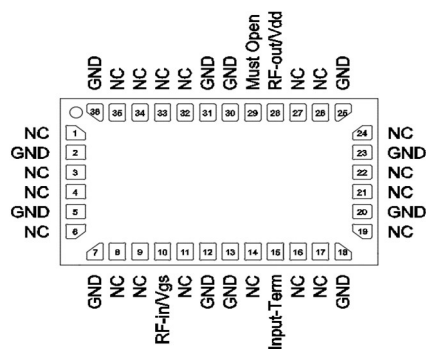
### Product Features

- Operating Frequency Range: DC-3GHz
- Operating Drain Voltage: +28 V
- 50 Ω Input/Output
- P<sub>sat</sub>: ≥6W
- Small signal gain:>14dB, Power gain:>12dB
- Minimum efficiency:>30%
- 6x10 mm Surface Mount Package
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC
- Much lower cost than GaN-based ultrawide band PA , due to LDMOS technology used

### Applications

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

### Pin Configuration and Description



Top View



Pin No.	Symbol	Description
28	RfOut/Vdd	Transistor 1, Drain Bias & RF Output
10	RFin/Vgs	Transistor 1, RF Input & Gate Bias
15	Input-Term	Transistor 1, Input 50 ohm term
29	Must Open	Keep the pin open, no GND
1,3,4,6,8,9,11,14,16,17,19,21,22,24,26,27,32-35	NC	No connection
2,5,7,12,13,16,20,23,25, 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	$V_{DSS}$	65	Vdc
Gate--Source Voltage	$V_{GS}$	-10 to +10	Vdc
Operating Voltage	$V_{DD}$	+32	Vdc
Storage Temperature Range	$T_{stg}$	-65 to +150	°C
Case Operating Temperature	$T_c$	+150	°C
Operating Junction Temperature	$T_j$	+200	°C

**Table 2. Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case $T_c=87^\circ\text{C}$ , $T_j=175^\circ\text{C}$ , DC test	$R_{\theta JC}$	3	°C/W

**Table 3. Electrical Characteristics**

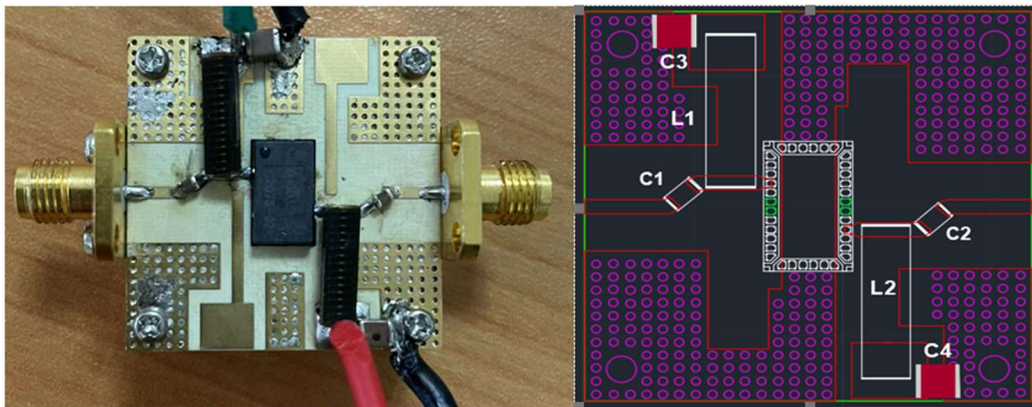
Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		30		3000	MHz
Power Gain @ Psat		12			dB
$P_{SAT}$		38			dBm
Drain Efficiency @ $P_{SAT}$		30			%

Unless otherwise noted:  $T_A = 25^\circ\text{C}$ ,  $V_{DD} = 28\text{ V}$ , Pulse Width=100 us, Duty cycle=10%

**Load Mismatch of per Section (On Test Fixture, 50 ohm system):**  $V_{DD} = 28\text{ V}$ ,  $I_{DQ} = 90\text{ mA}$ ,  $f = 1.6\text{ GHz}$

VSWR 10:1 at Psat pulse CW Output Power	No Device Degradation
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## Reference Circuit of Test Fixture Assembly Diagram



		Part NO.	Vendor
C3,C4	10uF 100V chip Capacitor	C5750X7S2A106M230KB	TDK
C1,C2	50V 1uF Chip Capacitor	GRM21BR71H105KA12L	muRata
L1,L2	1.3 uH 4.2A Inductor	4310LC-132KEC	Coilcraft
PCB	RO4350B,20mil,Er=3.48		

## TYPICAL CHARACTERISTICS

Figure 1. Network analyzer output S11/S21 (Pin=0dBm)

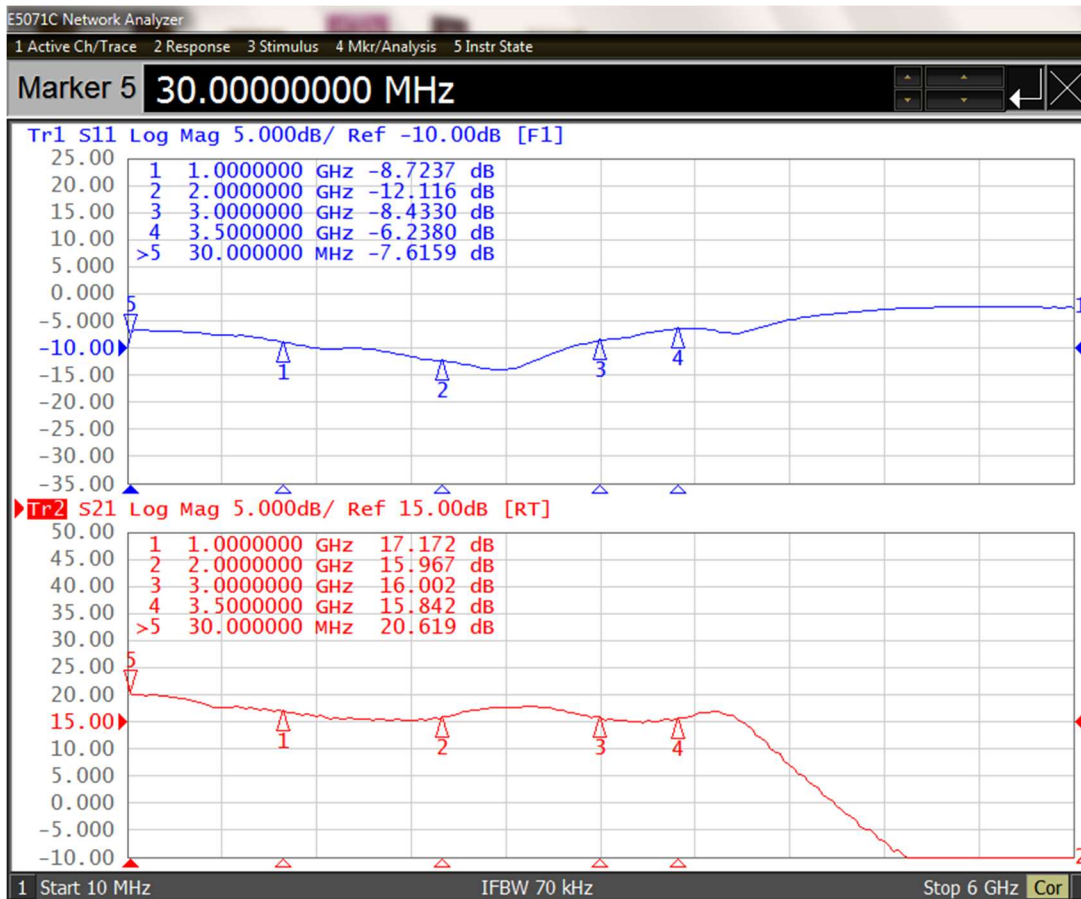
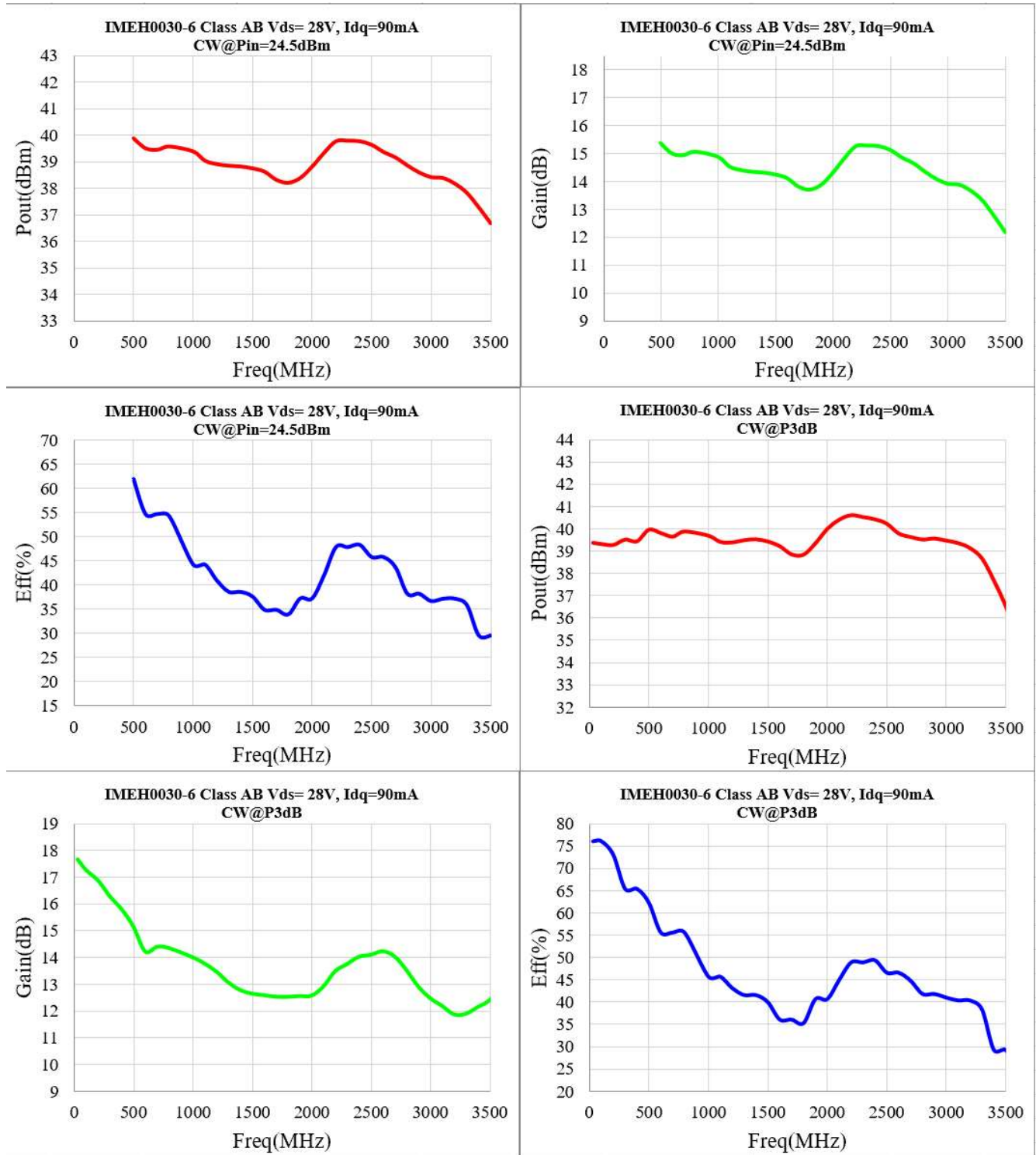


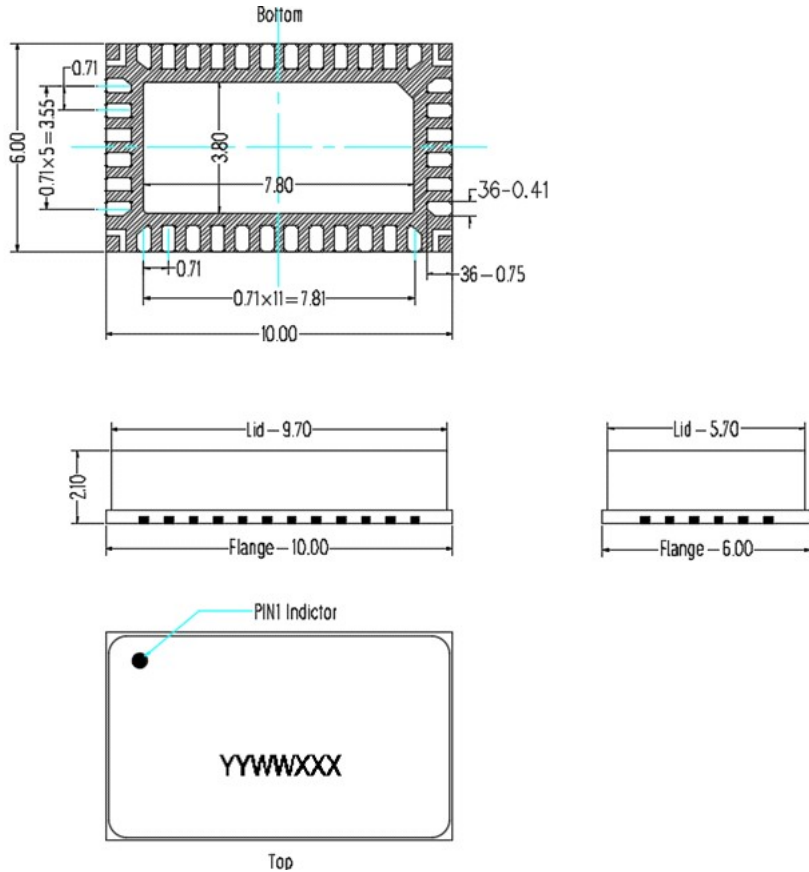


Figure. Power Gain and, efficiency and Pout @Pin=24.5dBm ,and P3dB vs. Frequency



## Package Dimensions

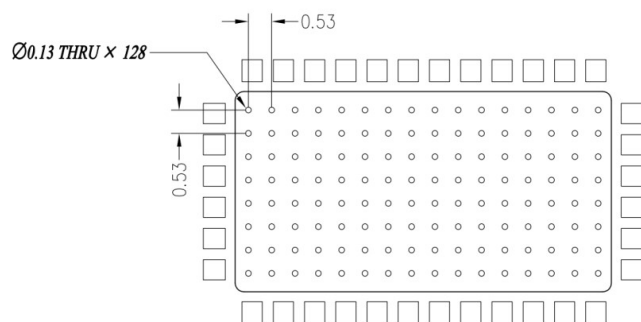
### 10\*6 Plastic Package



#### Notes:

1. All dimensions are in mm;
2. The tolerances unless specified are  $\pm 0.2$ mm.

## 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
2022/12/9	Rev 1.0	Production Datasheet
2023/1/31	Rev 1.1	Modify the pin definition, highlight Pin 29 must be open

Application data based on ZHH-22-04

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