

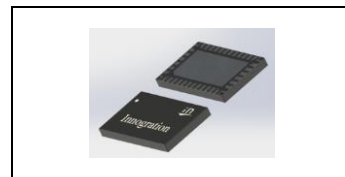


5.8-7.5GHz, 1 stage, 15W, C band 28V GaN Quasi-MMIC PA module

Description

The SMAH5875-15 is a 15-watt ,1 stage integrated Power Amplifier Module, designed for broad band saturated CW or linear back off applications, with frequencies from 5.8 to 7.5GHz. The module is partially input/Output matched and requires minimal external components, total effective size less than 1*2cm.

The module implements innovative quasi-MMIC transistor into module design, housed in cost effective 10*6mm plastic open cavity package, offers a much lower cost than traditional MMIC solutions.



$V_{ds}=28V, V_{gs}=-3.03V, I_{dq}=40mA$					
Pulsed CW or CW					
Freq(MHz)	P-1(dBm)	P-1Gain(dB)	P-3(dBm)	P-3 (W)	EFF (%)
5800	41.73	13.1	43.44	22.1	42.1
5900	41.75	14.3	43.43	22.0	44.2
6000	41.42	15.0	43.31	21.4	44.4
6500	40.22	13.6	42.43	17.5	37.5
7000	40.12	12.7	42.29	17.0	39.0
7500	40.22	13.1	42.61	18.3	42.0
7800	40.34	10.6	42.66	18.4	43.1
8000	40.37	9.0	42.56	18.1	43.7

Product Features

- Operating Frequency Range:5.8-7.5GHz (up to 8GHz if lower gain acceptable)
- Operating Drain Voltage: +28 V (Up to 32V)
- 50 Ω Input, Output partially matched
- Psat: $\geq 15W$ @28V (CW)
- Small signal gain:>13dB, Power gain:>10dB
- Efficiency:>50%
- 6x10 mm Surface Mount Package and total design less than 1x2 cm
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Applications

- C band power amplifier
- 5800MHz ISM applications



Figure 1: Pin Definition (Top View)



Pin No.	Symbol	Description
8,9,10,11	Vgs/RF In	Vgs and RF input
32,33,34,35	Vds/RF out	Vds and RF output
2,5,7,12,13,18,20,23,25,30,31,36	GND	DC/RF Ground
Others	NC	No connection
Package Base	GND	DC/RF Ground.

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	150	Vdc
Gate--Source Voltage	V_{GS}	-10 to +2	Vdc
Operating Voltage	V_{DD}	+32	Vdc
Input CW Power	RFin	35	dBm
Storage Temperature Range	T_{stg}	-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 $T_C = 25^\circ\text{C}$, 15W CW at 6GHz	$R_{\theta JC}$	TBD	°C/W

Table 3. Electrical Characteristics

Parameter	Condition	Min	Typ	Max	Unit
Frequency Range		5800		7500	MHz
Power Gain			10		dB
P_{sat}	m		42		dBm
Drain Efficiency @ P_{SAT}			40		%

Unless otherwise noted: $T_A = 25^\circ\text{C}$, $V_{DD} = 28\text{ V}$, Pulse Width=20 us, Duty cycle=10%Load Mismatch of per Section (On Test Fixture, 50 ohm system): $f = 6\text{ GHz}$

VSWR 10:1 at pulse CW Output Power @Pin=24.5dBm	No Device Degradation
---	-----------------------



Reference Circuit of Test Fixture Assembly Diagram

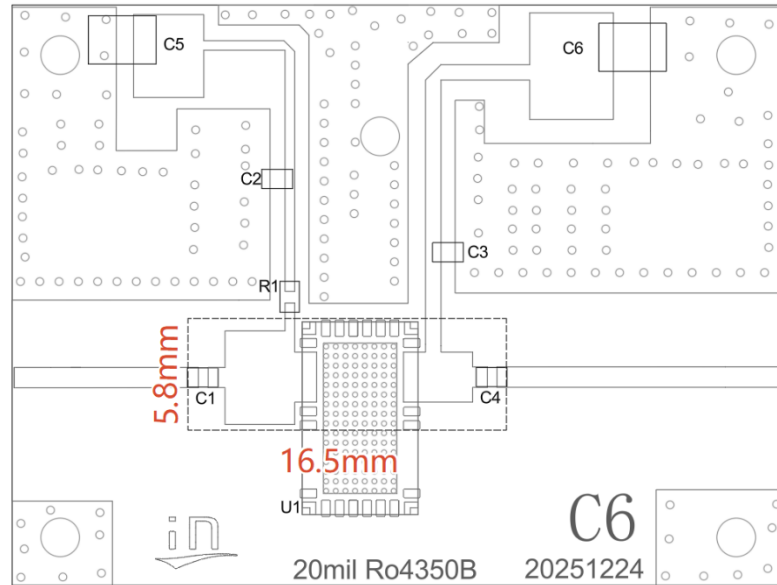


Figure 1. Test Circuit Component Layout

Component	Value	Description
U1	STAH5875-15	PA (10*6mm)
C1、C2、C3、C4	1.8pF	0603
C5、C6	10uF	1206
R1	10 Ω	0603



TYPICAL CHARACTERISTICS

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

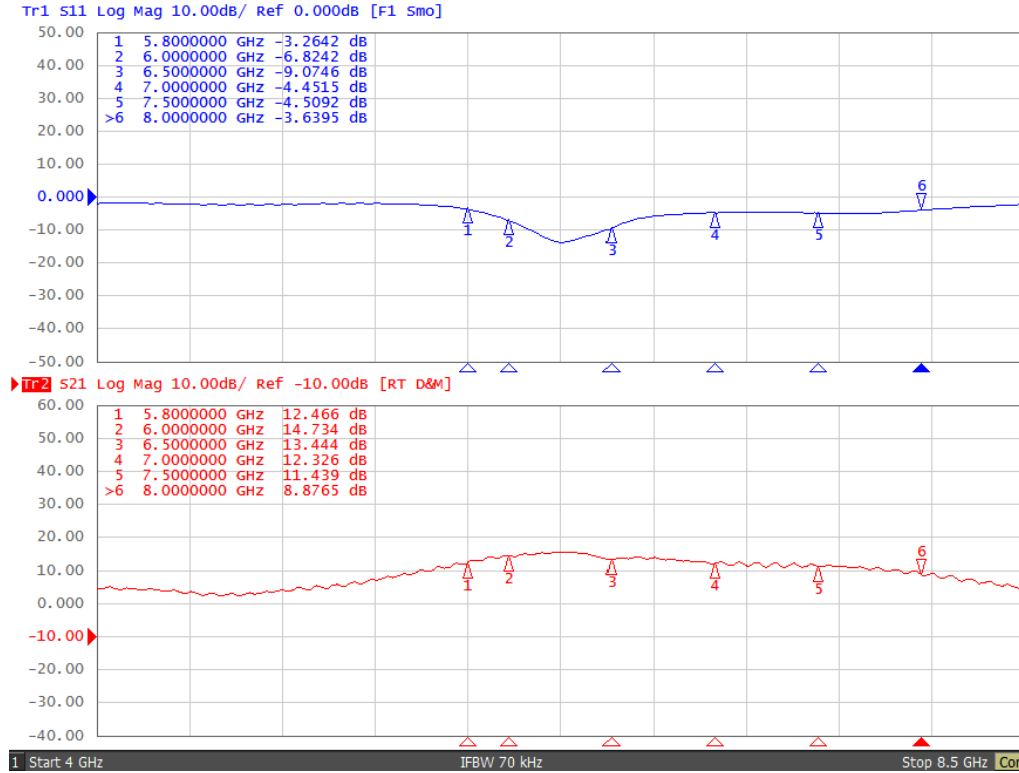
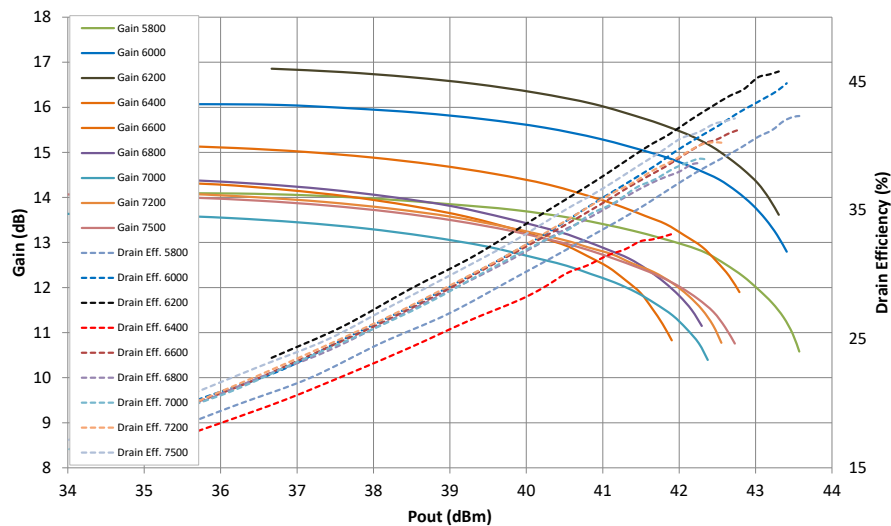
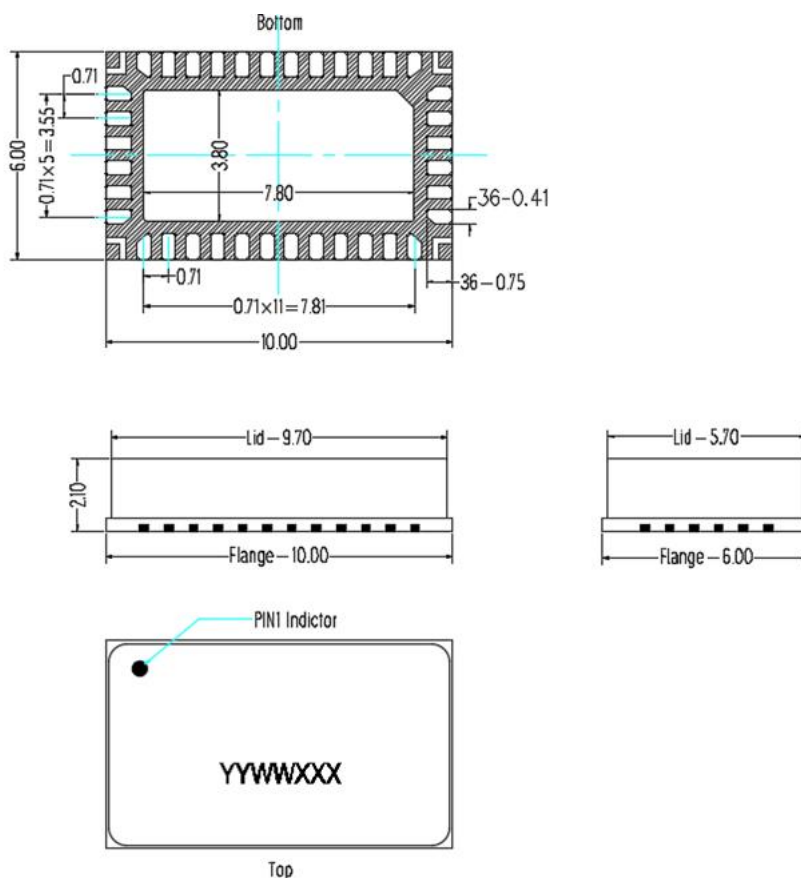


Figure 3. Power Gain and, efficiency Vs Pout @ Different Frequency



Package Dimensions

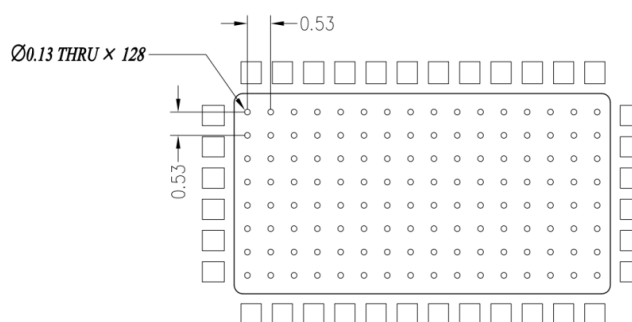
10*6 Plastic Package



Notes:

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

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
2026/8/11	Rev 1.0	Preliminary Datasheet Creation

Application data based on HJ-26-08

Disclaimers

Specifications are subject to change without notice. Innogrations believes the information contained within this data sheet to be accurate and reliable. However, no responsibility is assumed by Innogrations for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Innogrations . Innogrations makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose. “Typical” parameters are the average values expected by Innogrations in large quantities and are provided for information purposes only. These values can and do vary in different applications and actual performance can vary over time. All operating parameters should be validated by customer’s technical experts for each application. Innogrations products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life, in applications in which the failure of the Innogrations product could result in personal injury or death or in applications for planning, construction, maintenance or direct operation of a nuclear facility. For any concerns or questions related to terms or conditions, pls check with Innogrations and authorized distributors

Copyright © by Innogrations (Suzhou) Co.,Ltd.