



## GaN HEMT 28V, 30W, C band General purpose RF Power Transistor

### Description

The XTAH78030C6 is a 30W GaN HEMT, designed for multiple applications, within 6-8GHz.

The transistor is available in a highly cost effective 10\*6mm, surface mount, QFN package with 100% production test to ensure the quality and consistency.

It can be used in CW, Pulse and any other modulation modes.

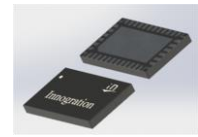
There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.

- Typical 7.2-7.8GHz broadband performance with device soldered

VDS = 28V, IDQ = 30mA, VGS=-2.6V, CW and Pulsed CW (10us 10%)

Signal	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
Pulsed CW	44	25	44	11.5	45.2	33	49
CW	43	20	40	11	44.8	30	45

### XTAH78030C6



### Applications

- C band power amplifier
- ISM/RF Energy power amplifier

### Important Note: Proper Biasing Sequence for GaN HEMT Transistors

#### Turning the device ON

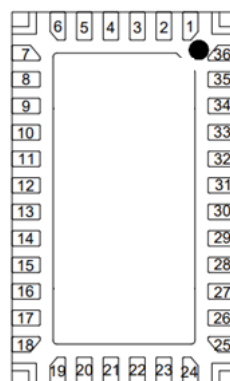
1. Set VGS to the pinch--off (VP) voltage, typically -5 V
2. Turn on VDS to nominal supply voltage
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

#### Turning the device OFF

1. Turn RF power off
2. Reduce VGS down to VP, typically -5 V
3. Reduce VDS down to 0 V
4. Turn off VGS

Figure 1: Pin Connection definition

Transparent top view (Backside grounding for source)



Pin No.	Symbol	Description
8,9,10,11,14,15,16,17	RF IN/Vgs	RF Input, Vgs bias
26,27,28,29,32,33,34,35	RF OUT/VDD	RFOutput, Drain bias
Rest Pins and Package Base	GND	DC/RF Ground. Must be soldered directly to heatsink or copper coin for CW application.



**Table 1. Maximum Ratings**

Rating	Symbol	Value	Unit
Drain--Source Voltage	$V_{DSS}$	+150	Vdc
Gate--Source Voltage	$V_{GS}$	-8 to +0.5	Vdc
Operating Voltage	$V_{DD}$	36	Vdc
Maximum gate current	$I_{gs}$	7.5	mA
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 by FEA $T_C = 85^\circ\text{C}$ , at $P_{diss} = 30\text{W}$	$R_{\theta JC}$	2.5	°C /W

**Table 3. Electrical Characteristics (TA = 25°C unless otherwise noted)**

**DC Characteristics (main path, measured on wafer prior to packaging)**

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = -8\text{V}$ ; $I_{DS} = 7.5\text{mA}$	$V_{DSS}$		200		V
Gate Threshold Voltage	$V_{DS} = 10\text{V}$ , $I_D = 7.5\text{mA}$	$V_{GS(th)}$	-4		-2	V
Gate Quiescent Voltage	$V_{DS} = 28\text{V}$ , $I_{DS} = 30\text{mA}$ , Measured in Functional Test	$V_{GS(Q)}$		-2.4		V

**Ruggedness Characteristics**

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	8GHz, $P_{out} = 3\text{W}$ Pulsed CW All phase, No device damages	VSWR		10:1		

## Typical performance

**Figure 2: Network analyzer output S11/S21**

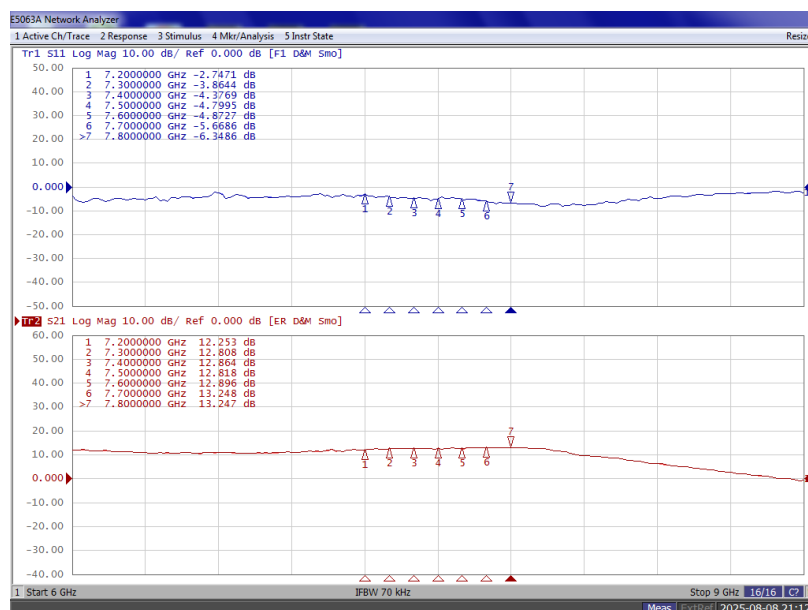


Figure 3: Picture of application board

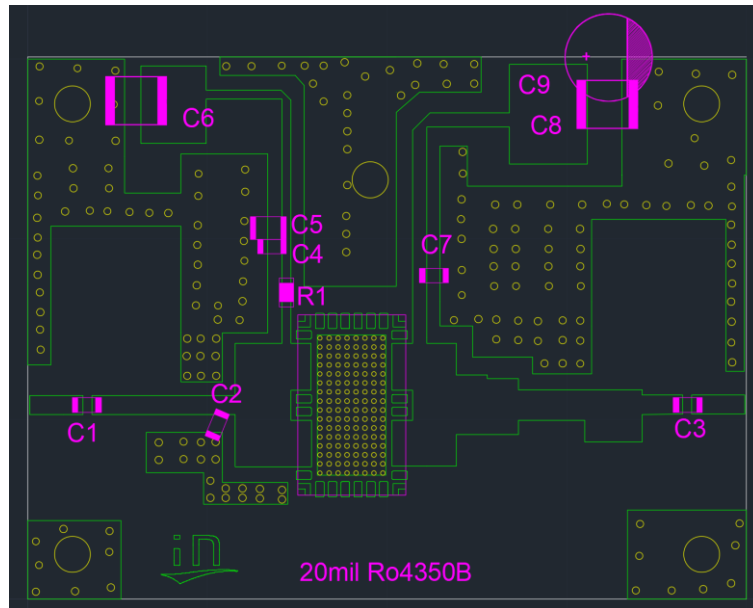
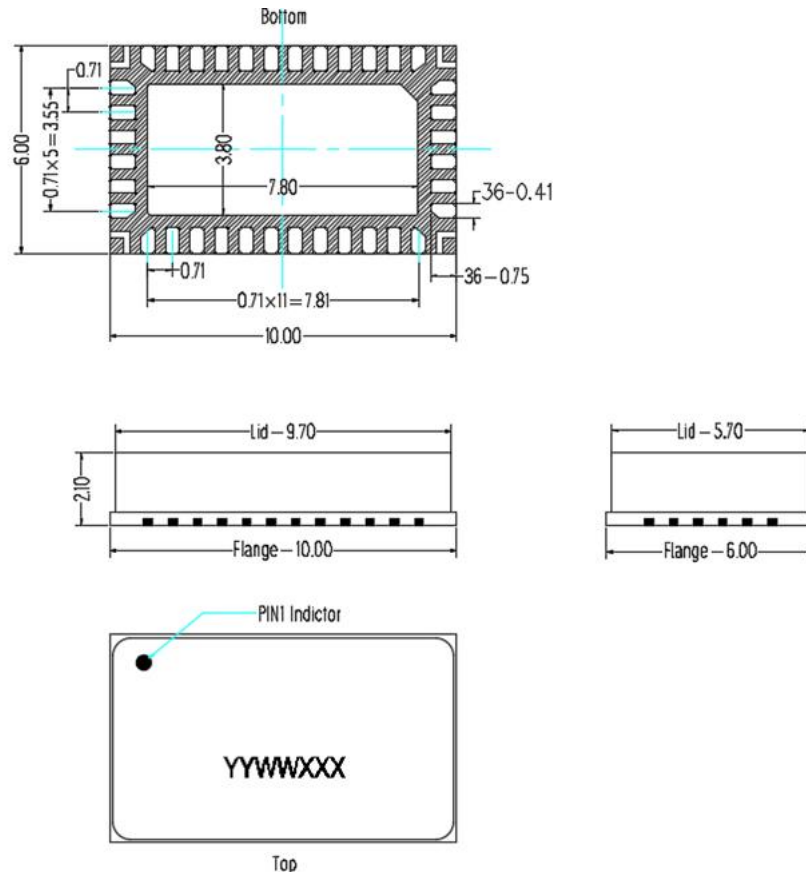


Table 4. Bill of materials of application board (PCB layout upon request, RO4350B 20mils)

Reference	Footprint	Value	Quantity
C1,C3,C4,C7	0603	3.9 pF	4
C2	0603	0.1 pF	1
C5	0805	10 nF	1
C6,C8	1210	10 uF/63V	2
C9	/	470 uF	1
R1	0603	10 ohm	1
U1	C6	XTAH78030C6	1



## 10\*6 Plastic Package



### Notes:

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

## Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2025/8/11	V1.0	Preliminary Datasheet Creation

Application data based on: CWZ-25-14

### Notice

Specifications are subject to change without notice. Innegration believes the information within the data sheet to be reliable. Innegration makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose.

“Typical” parameter is the average values expected by Innegration in quantities and are provided for information purposes only. It can and do vary in different applications and related performance can vary over time. All parameters should be validated by customer’s technical experts for each application.

Innegration 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 Innegration 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, please check with Innegration and authorized distributors

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