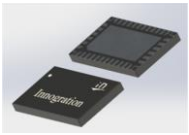
Gallium Nitride 12V, 7W,6GHz RF Power Transistor

XTAN60007C6



Description

The XTAN60007C6 is a 7watt, CW capable， GaN HEMT, ideal for multiple application up to 6GHz. It features high gain, high efficiency and low cost, in 10*6mm plastic open cavity package, enabling surface mounted on PCB through grounding vias directly.

- Typical Class AB RF CW performance with device soldered through grounding vias
  Vds=12V, Idq=10mA

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
5100	38.93	7.8	50.7	11.86	40.34	10.8	56.7
5200	38.91	7.8	52.8	11.62	40.23	10.5	58.5
5300	38.68	7.4	54.3	11.51	40.02	10.0	60.0
5400	38.36	6.9	54.8	11.4	39.75	9.5	60.7
5500	38.33	6.8	56.9	11.46	39.7	9.3	63.4
5600	38.24	6.7	59.2	11.63	39.53	9.0	65.3
5700	37.86	6.1	58.7	11.71	39.21	8.3	64.8
5800	37.6	5.8	57.2	11.66	38.99	7.9	62.6
5900	37.47	5.6	55.5	11.49	38.94	7.8	60.8

Applications

- UHF/L/S/C band power amplifier
- 5.8G WIFI amplifier
- 2.45G ISM application

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

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	+80	Vdc
Gate--Source Voltage	V_{GS}	-8 to +0.5	Vdc
Operating Voltage	V_{DD}	18	Vdc
Maximum gate current	Igs	5	mA
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 by FEA T_C= 85°C, at Pout=7W CW， mounted on high density vias	$R_{\theta JC}$	4.5	°C /W

Table 3. Electrical Characteristics (TA = 25℃ unless otherwise noted)

DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=5mA	V_{DSS}		80		V
Gate Threshold Voltage	VDS =10V, ID =5mA	$V_{GS(th)}$	-4	-3	-2	V
Gate Quiescent Voltage	VDS =12V, IDS=10mA, Measured in Functional Test	$V_{GS(Q)}$		-2.4		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	6GHz, Pout=7W pulse CW All phase, No device damages	VSWR		10:1		

Figure 1:Pin Definition(Top View)

Pin No.	Symbol	Description
8,9,10,11,14,15,16,17	Vgs/RF In	Vgs and RF input
26,27,28,29,32,33,34,35	Vds/RF out	Vds and RF output
2,5,7,12,13,18,20,23,25,30,31,36	GND	DC/RF Ground
Package Base	GND	DC/RF Ground.
Others	NC	

Typical characters

Figure 2: Network analyser output S11/S21

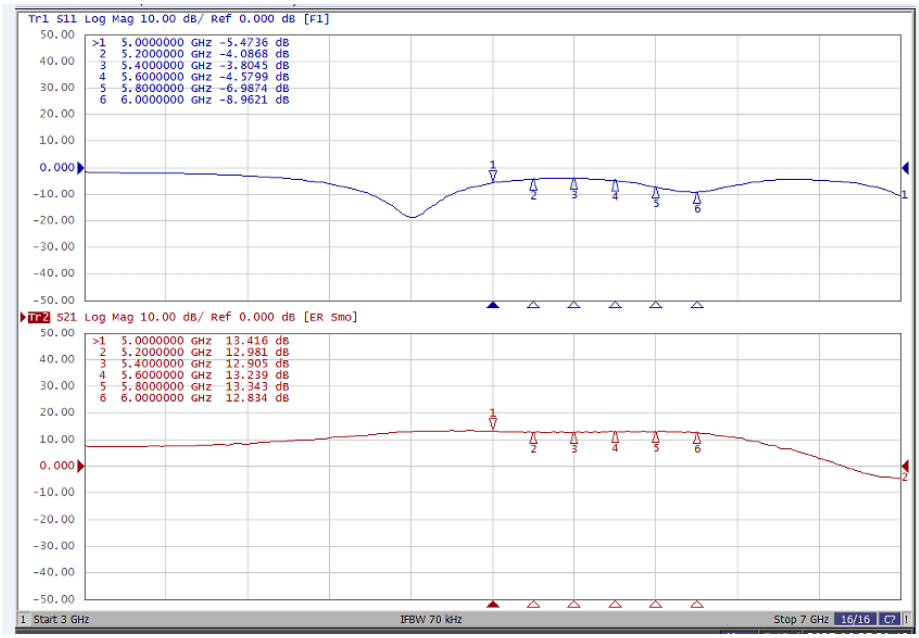
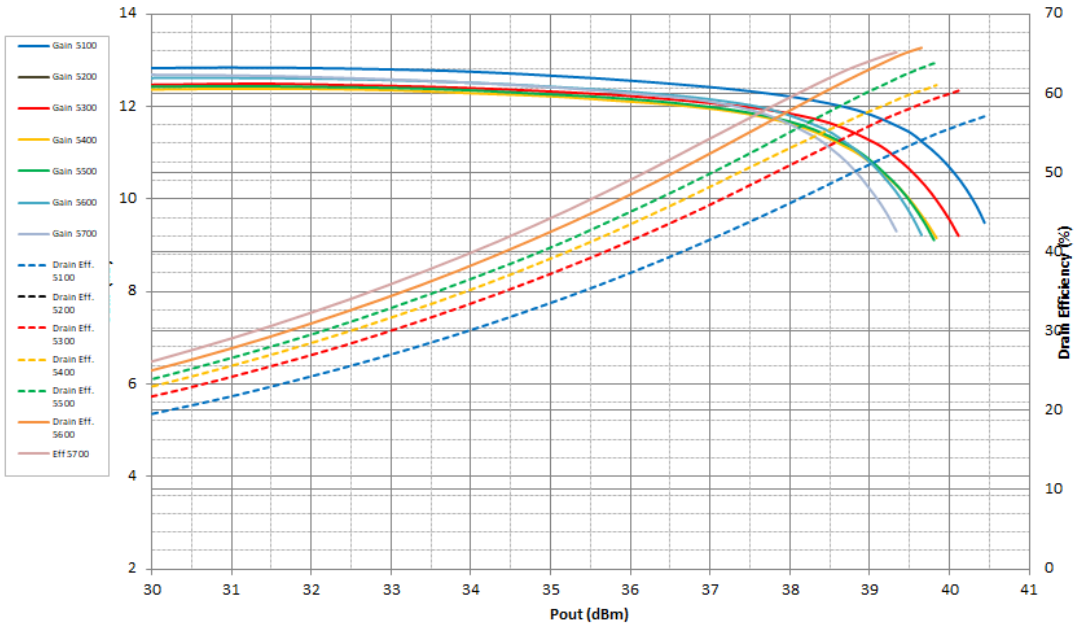


Figure 3: Power Gain Efficiency as function of Pout, CW



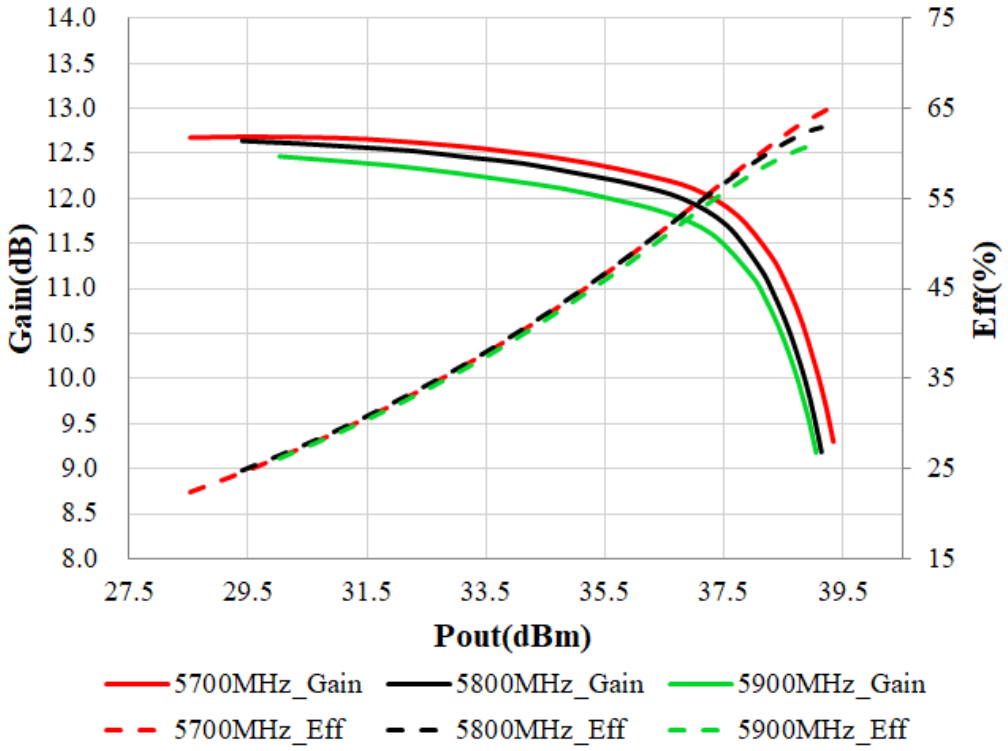


Figure 4: Picture of application board

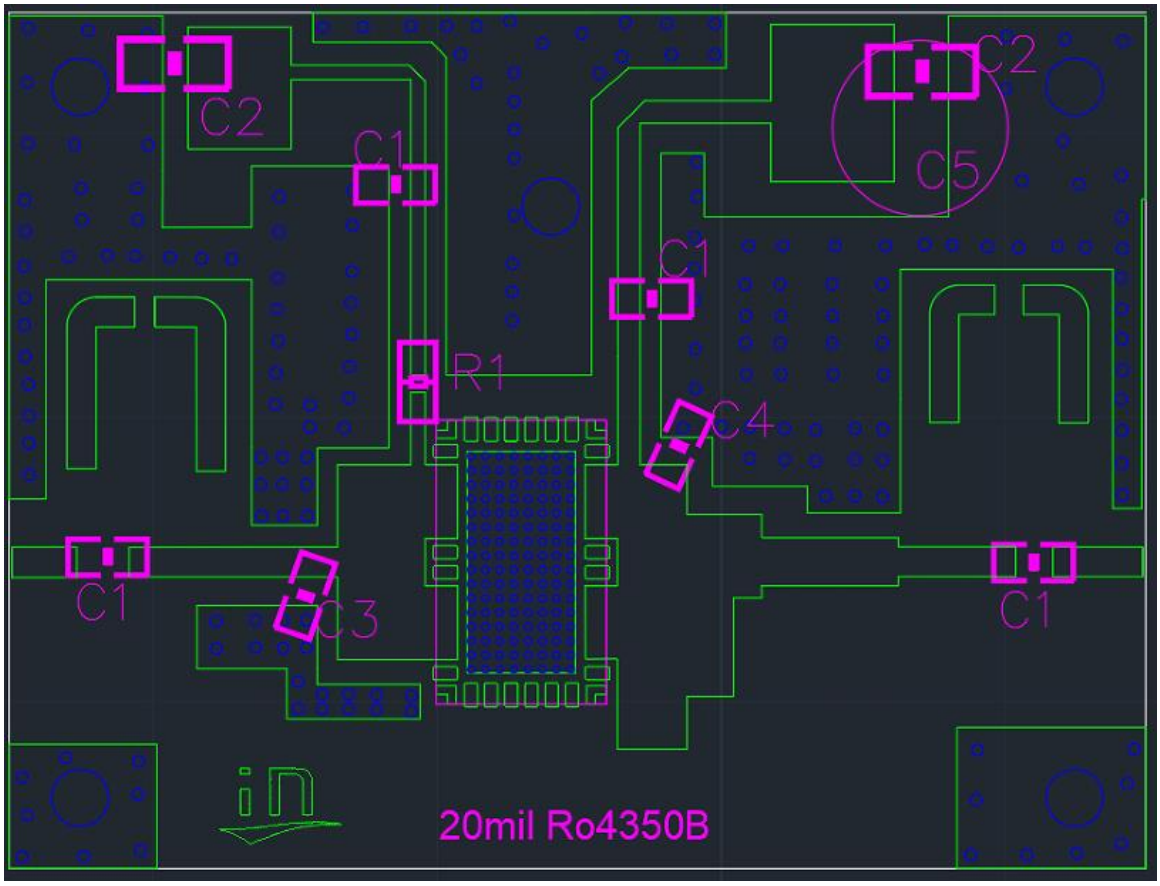
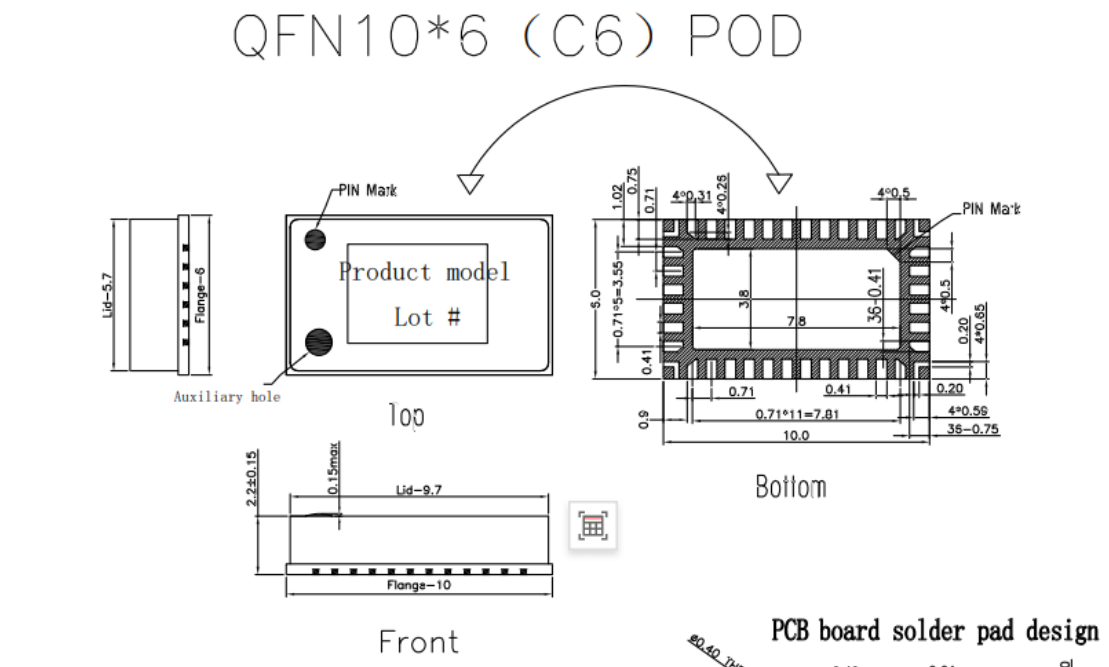


Table 4. Bill of materials of application board (RO4350B 20mils,PCB layout upon request)

Component	Value	Quantity
C1	3.9pF	4
C2	10uF	2
R1	10 ohm	1
C3	0.2pF	1
C4	0.3pF	1
C5	470uF	1

Package Dimensions

10*6 Plastic Package



X.X	±0.10
X.XX	±0.05

Notes:

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

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2025/6/30	V1.0	Preliminary Datasheet Creation

Application data based on: ZXY-25-0825-24

Notice