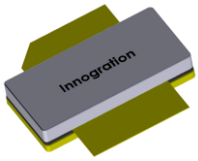
XTAH58220C2 GaN TRANSISTOR

Document Number: XTAH58220C2
Preliminary Datasheet V1.0

GaN 28V 220W, C band RF Power Transistor

XTAH58220C2



Description

The XTAH58220C2 is a 220W internally matched, GaN HEMT, designed from 5.0 to 6.0GHz, especially 5G NR or LTE application, as well as either Pulse or CW application

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

- Typical **CW/Pulsed CW** performance (on 5.7-5.9GHz fixture with device soldered):

Vds=28V, I_{DQ}=100mA, Tc=25 °C

Pulsed CW (100us, 10%)

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff(%)	P1dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
5700	53.04	201.4	44.9	11.16	53.83	241.7	47.5
5800	52.61	182.3	44.4	12.58	53.66	232.0	47.6
5900	52.37	172.5	43.4	11.37	53.69	233.7	47.4

CW

Freq (MHz)	Pin (dBm)	Pout (W)	Pout Gain(dB)	Ids (A)	Pout Eff(%)
5700	44.6	226	8.9	17.34	46.55
5800	43.6	221	9.8	16.79	47.00
5900	45.1	220	8.3	16.99	46.24

Applications and Features

- Suitable for wireless communication infrastructure, wideband amplifier, EMC testing, ISM etc.
- High Efficiency and Linear Gain Operations
- Thermally Enhanced Industry Standard Package
- High Reliability Metallization Process
- Excellent thermal Stability and Excellent Ruggedness
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

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 (28V)
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}	150	Vdc
Gate--Source Voltage	V_{GS}	-10,+2	Vdc
Operating Voltage	V_{DD}	36	Vdc
Maximum Forward Gate Current @ TC = 25°C	Igmax	50.4	mA
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C

Operating Junction Temperature(See note 1)	T_J	+225	°C

Note: 1. Continuous operation at maximum junction temperature will affect MTTF

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 85°C, RF CW operation	$R_{\theta JC}$	0.5	C/W

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

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=50.4mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D =50.4mA	V_{GS}(th)	-4		-2	V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=1000mA, Measured in Functional Test	$V_{GS(Q)}$		-2.32		V

Typical performance

Figure 2: Small singal gain and return loss Vs Frequency

Vds=28V, Idq=1000mA, input power=0dBm

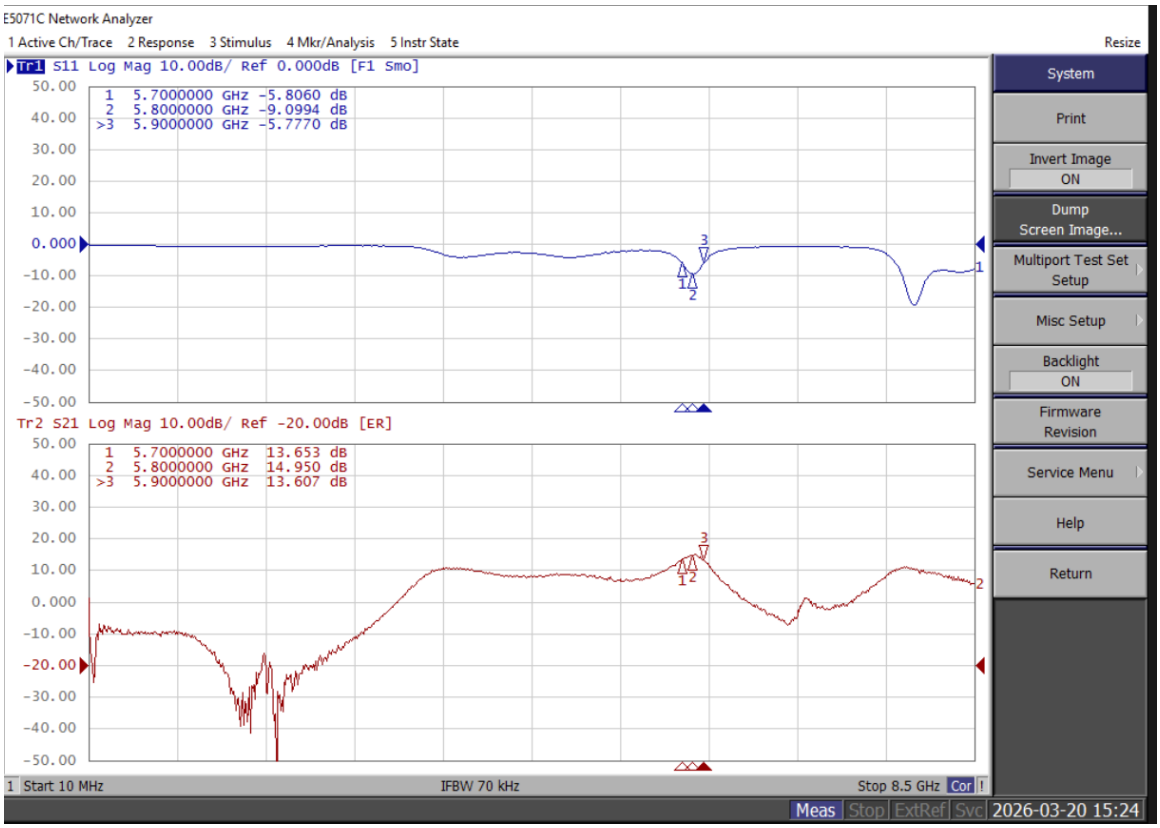


Figure 3:Power gain， Efficiency as function of output power

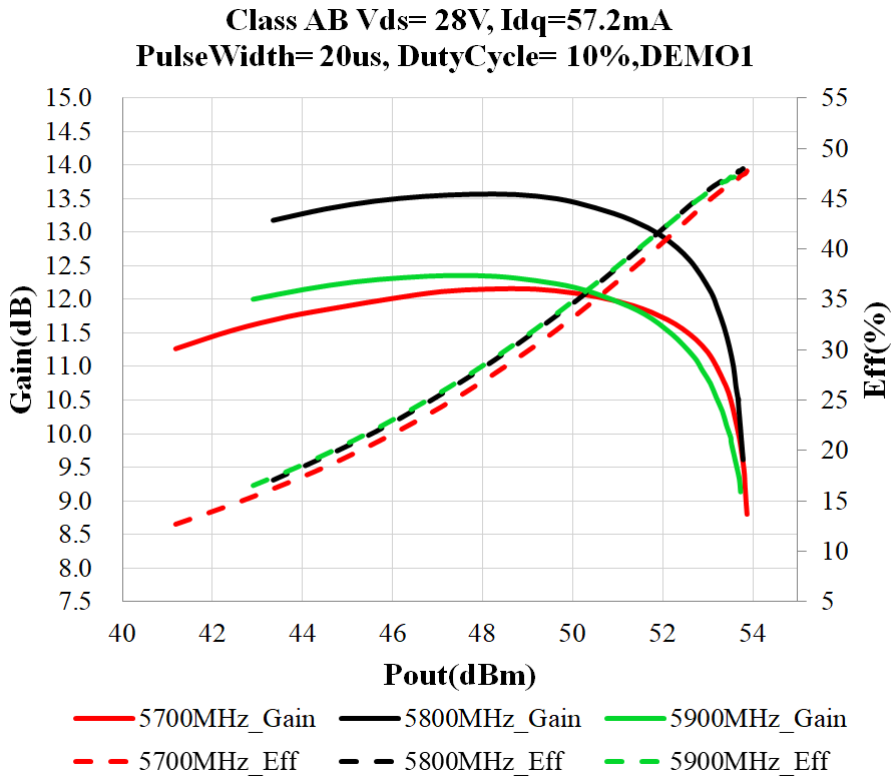
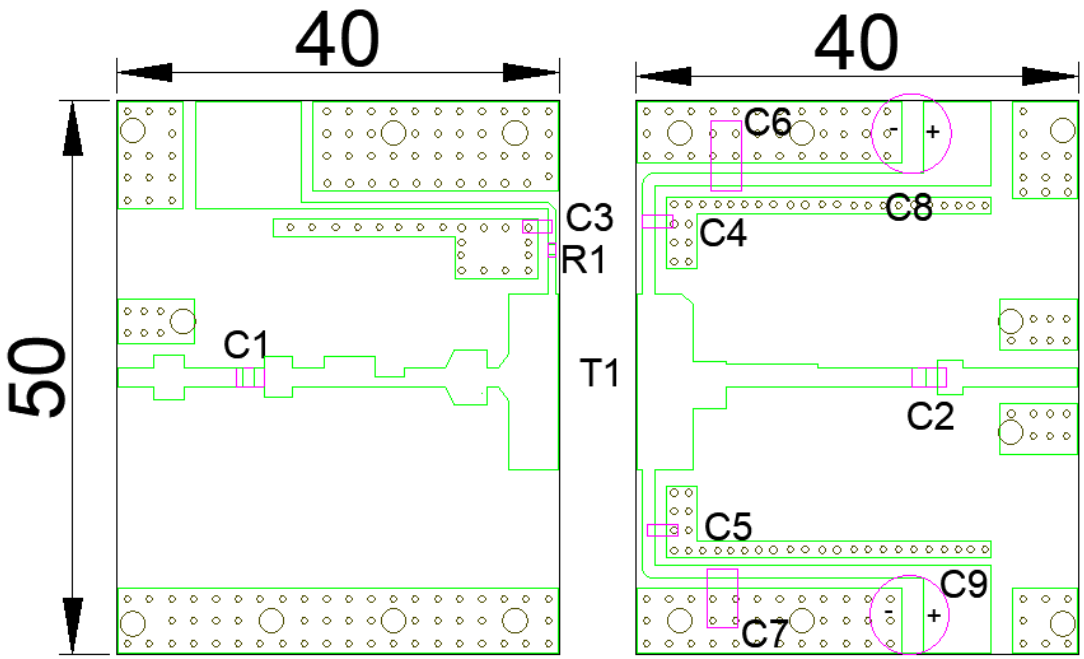


Figure 4: Picture and Bill of materials of 5.7-5.9GHz wide band application circuit (30mils RO4350B, Layout Gerber file upon request)

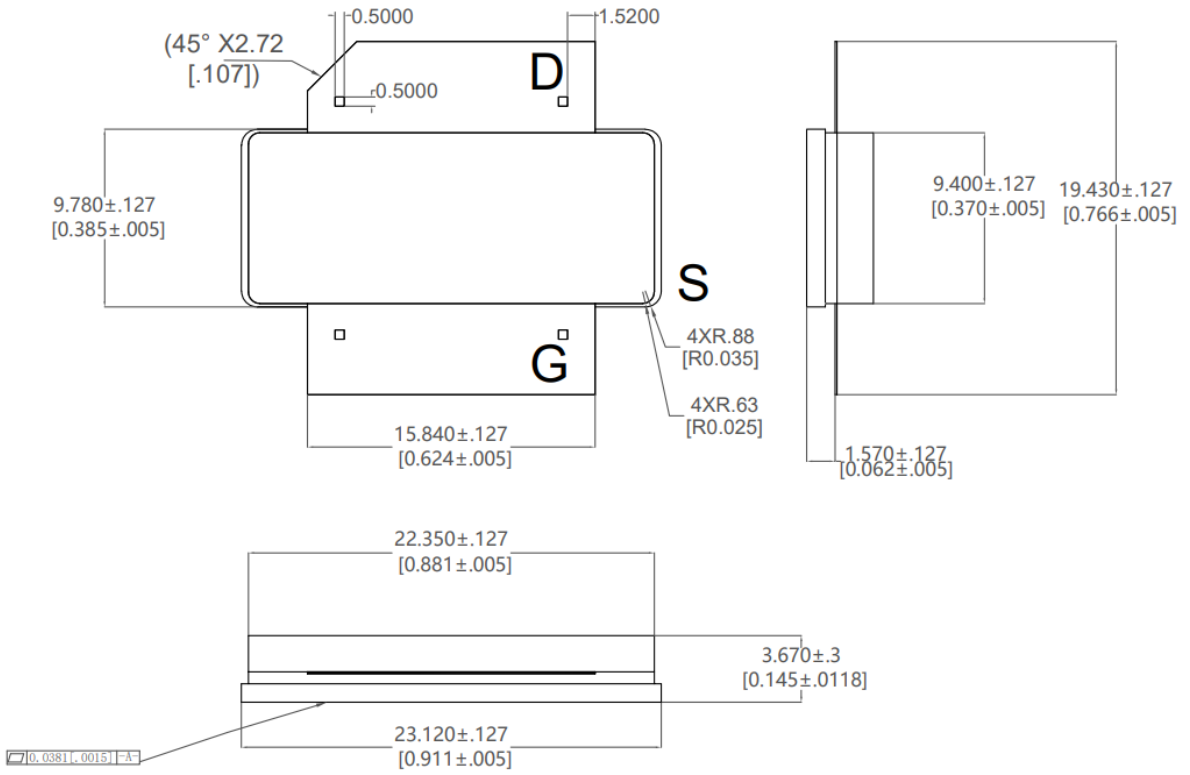


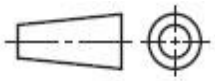
Part	Quantity	Description	Part Number	Manufacture
C1,C2,C3,C4,C5	5	3.9pFHigh Q Capacitor	251SHF3R9BSE	TEMEX
C6,C7	2	10uF MLCC	GRM32EC72A106ME05	Murata
R1	1	10Ω Power Resistor	ESR03EZPF100	ROHM
C8,C9	2	470uF		
T1	1	220W GaN Transistor	XTAH58220C2	Innogration

Package Outline

Flangeless ceramic package;

INP-688-2-EL（C2)



OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-C2					09/27/2018

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2026/3/24	V1.0	Preliminary Datasheet Creation

Application data based on LWH-26-07