■ Features

- High Output Power: Psat=48.0dBm (Typ.)
- High Gain: Gp=11.0dB (Typ.)
- High Power Added Efficiency: PAE=41% (Typ.)
- Broad Band: 8.5 to 9.8GHz
- Impedance Matched Zin/Zout = 50ohm
- Hermetically Sealed Package

■ Description

The SGC8598-51B-R is a high power GaN-HEMT that is internally matched for X-band radar bands to provide optimum power and gain in a 50ohm system.

ABSOLUTE MAXIMUM RATING (Case Temperature T_c=25 deg.C)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	55	V
Gate-Source Voltage	V_{GS}	-15	V
Storage Temperature	T_{stg}	-55 to +125	deg.C
Channel Temperature	T_{ch}	+250	deg.C

RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
Drain-Source Voltage	V_{DS}		<=50	V
Forward Gate Current	I_{GF}	Rg=100ohm	<=30.8	mA
Reverse Gate Current	I_{GR}	Rg=100ohm	>=-2.2	mA
Channel Temperature	T_{ch}		<+200	deg.C
Output Power	P_{out}		<=P5dB	dBm

ELECTRICAL CHARACTERISTICS (Case Temperature T_c=25 deg.C)

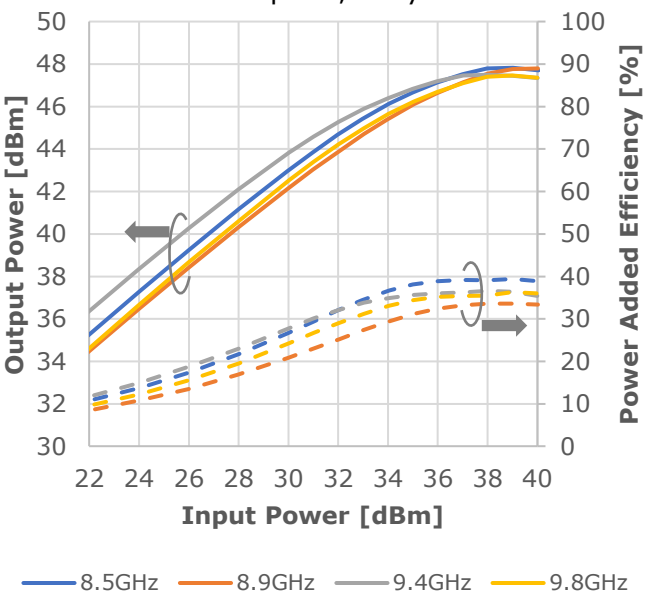
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-off Voltage	V_p	V_{DS}=50V, I_{DS}=3.0mA	-	-4.5	-	V
Frequency Range	Freq.	V_{DS}=50V $I_{DS(DC)}$=0.17A Pulse Width=100µsec. Duty=10%	8.5	-	9.8	GHz
Output Power at Pin=38dBm	P_{sat}		47.0	48.0	-	dBm
Power Gain at Pout=47dBm	G_p		10.0	11.0	-	dB
Drain Current at Pin=38dBm	I_{DSR}		-	2.8	4.1	A
Power Added Efficiency at Pin=38dBm	PAE		-	41	-	%
Gain Flatness	ΔG		-	1.6	-	dB
Thermal Resistance	R_{th}	Channel to Case (P_{diss}=50W,CW)	-	2.4	3.0	deg.C/W

CASE STYLE	I2K	
RoHS Compliance	YES	
ESD	Class 2	2000V to <4000V

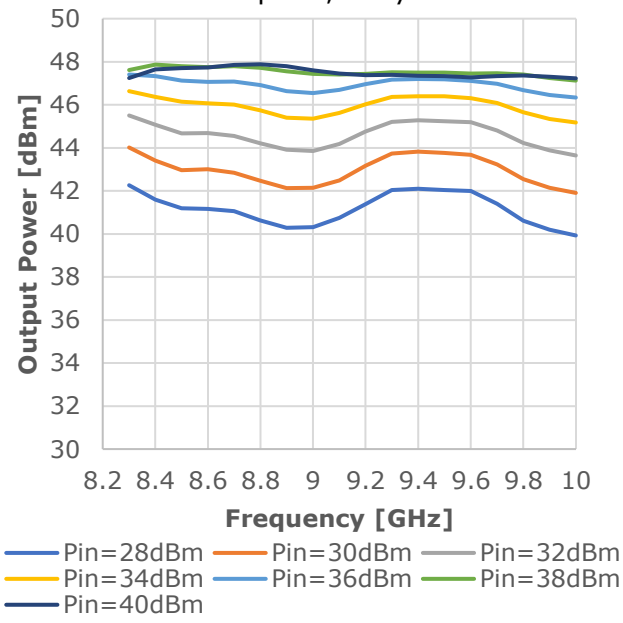
Note: Based on ANSI/ESDA/JEDEC JS-001-2012(C=100pF, R=1.5kohm)

● RF Characteristics

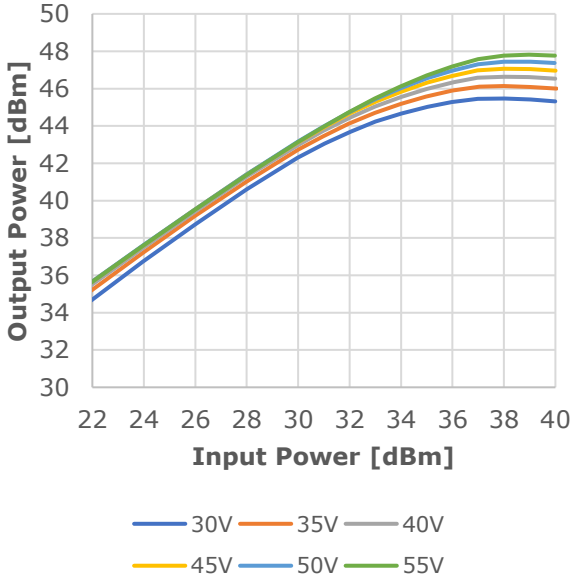
Output Power & Power Added Efficiency vs. Input Power
V_{DS}=50V, $I_{DS(DC)}$=0.17A
PW=100µsec., Duty=10%



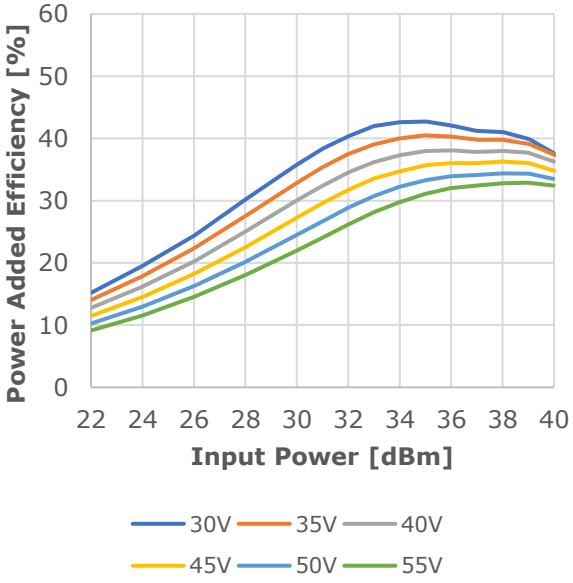
Output Power vs. Frequency by Input Power
V_{DS}=50V, $I_{DS(DC)}$=0.17A
PW=100µsec., Duty=10%



Output Power vs. Input Power by Drain Voltage
f=9.2GHz, $I_{DS(DC)}$=0.17A
PW=100µsec., Duty=10%

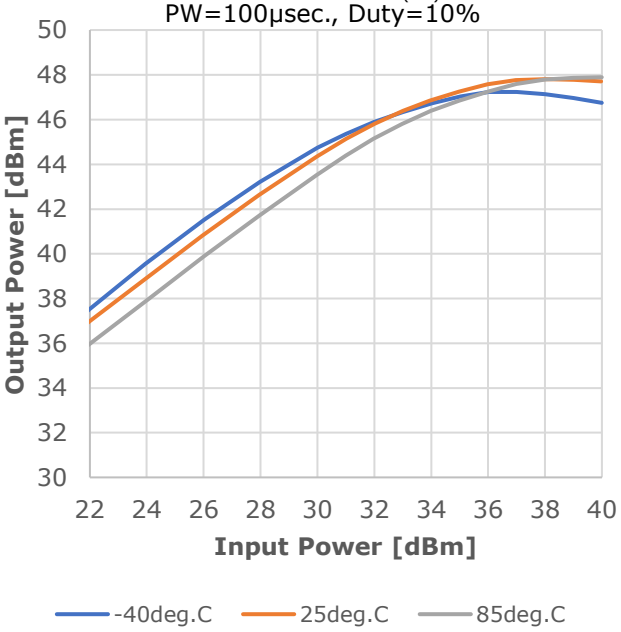


Power Added Efficiency vs. Input Power by Drain Voltage
f=9.2GHz, $I_{DS(DC)}$=0.17A
PW=100µsec., Duty=10%

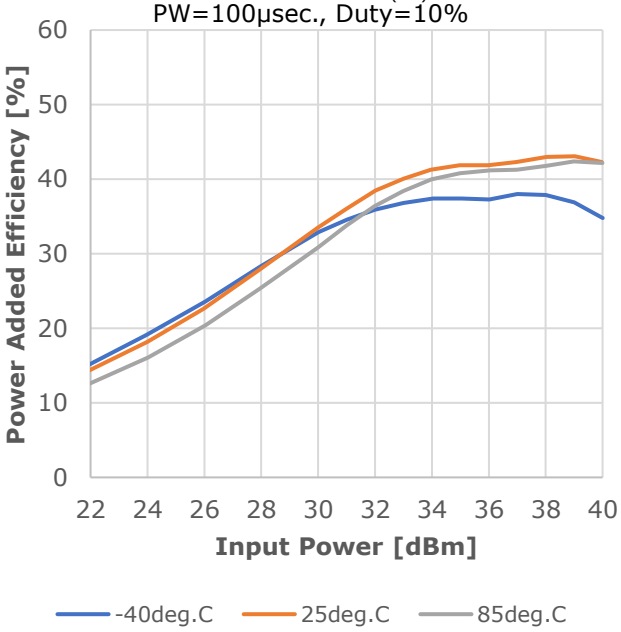


● RF Characteristics

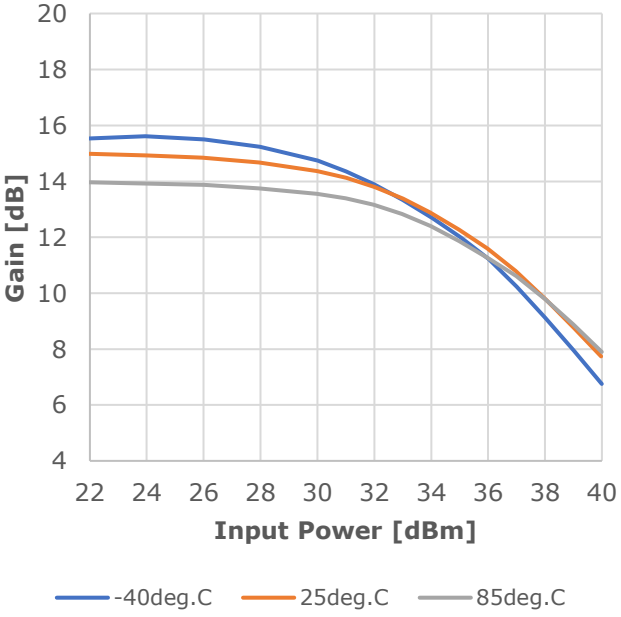
Output Power vs. Input Power by Case Temperature
f=9.2GHz, V_{DS}=50V, $I_{DS(DC)}$=0.17A
PW=100µsec., Duty=10%



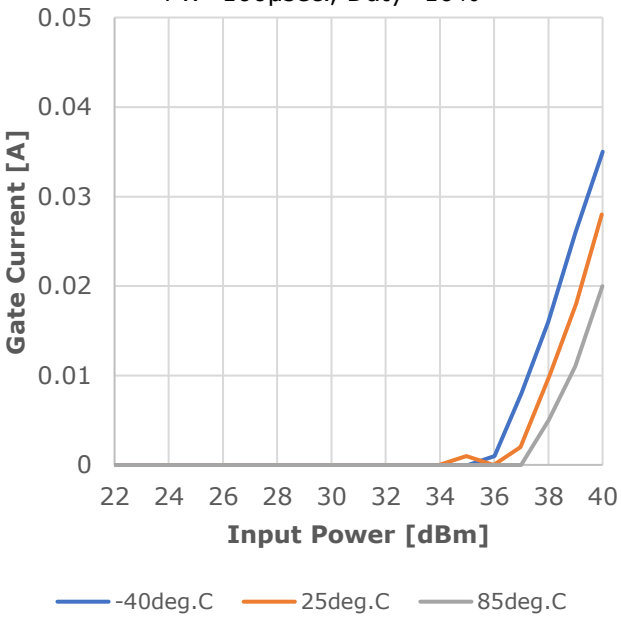
Power Added Efficiency vs. Input Power by Case Temperature
f=9.2GHz, V_{DS}=50V, $I_{DS(DC)}$=0.17A
PW=100µsec., Duty=10%



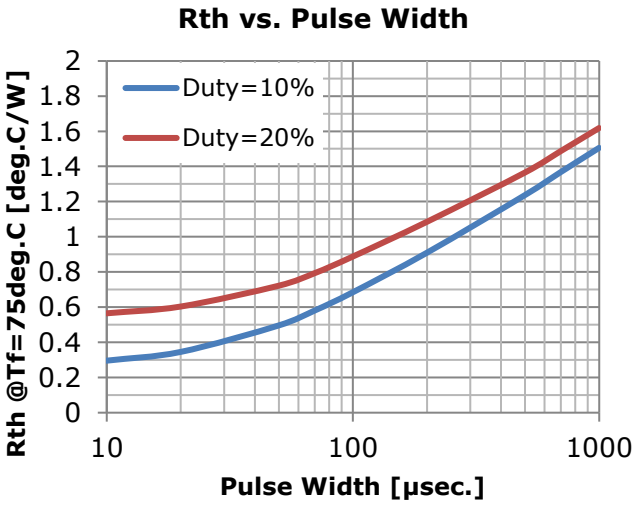
Gain vs. Input Power by Case Temperature
f=9.2GHz, V_{DS}=50V, $I_{DS(DC)}$=0.17A
PW=100µsec., Duty=10%



Gate Current vs. Input Power by Case Temperature
f=9.2GHz, V_{DS}=50V, $I_{DS(DC)}$=0.17A
PW=100µsec., Duty=10%

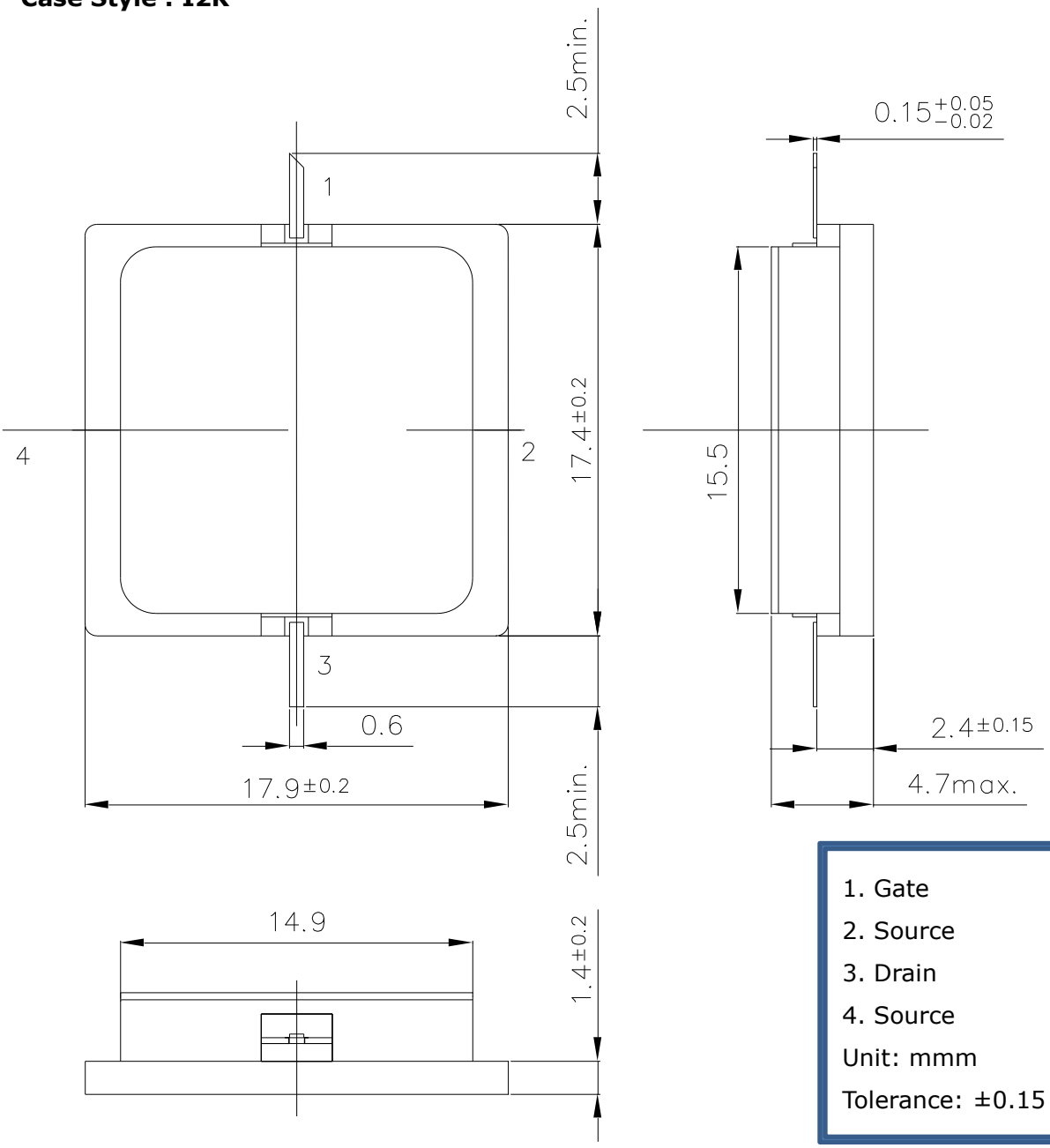


● Thermal Characteristics In Pulsed Operation



Package Outline

Case Style : I2K

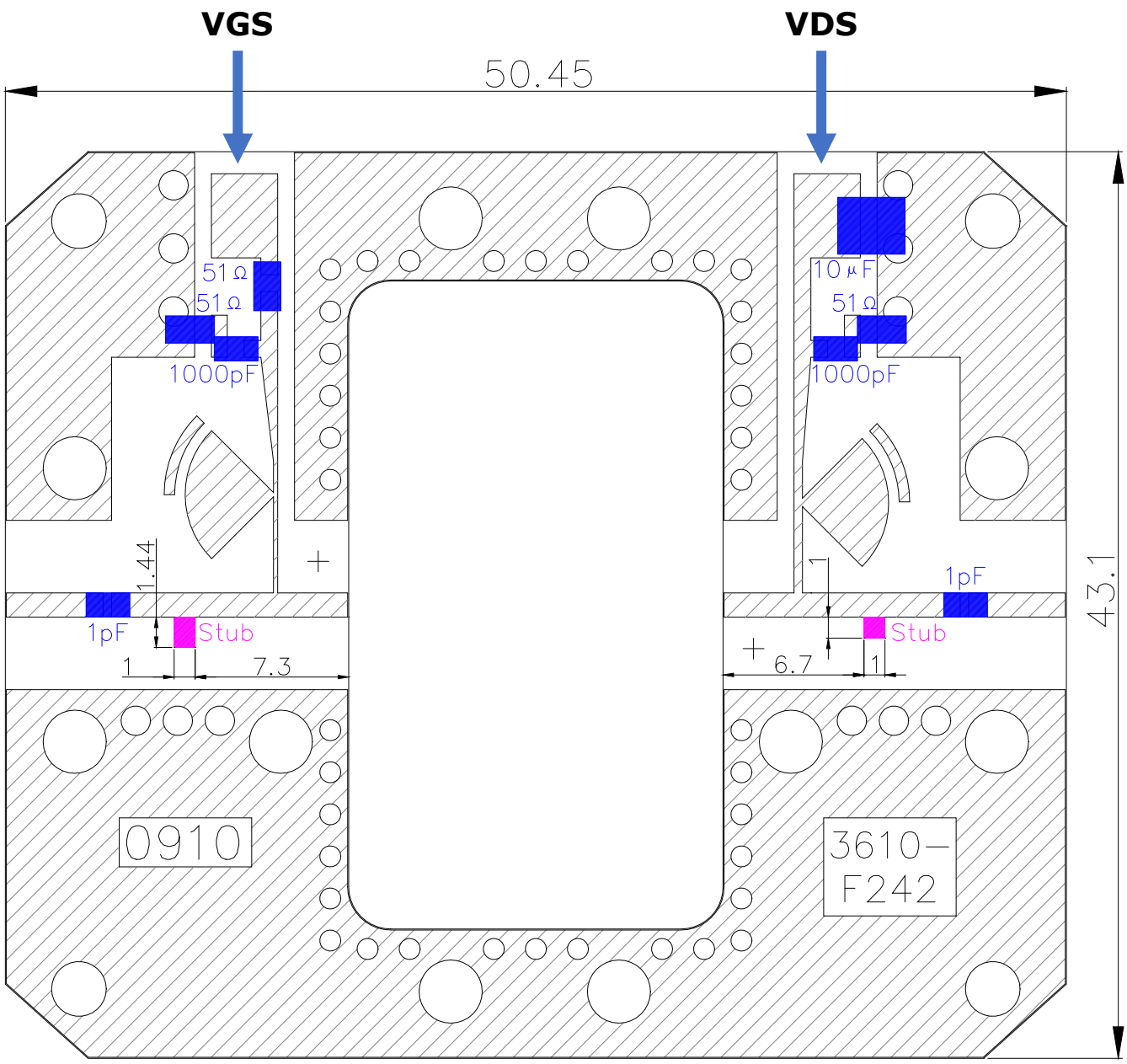


1. Gate
2. Source
3. Drain
4. Source

Unit: mmm

Tolerance: ±0.15

- **Test Fixture**



PCB : RO4003C H=0.5mm εr=3.55 Cu=18μm
Unit : mm

For Safety, Observe the Following Procedures Environmental Management

- Do not put this product into the mouth.
- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- Respect all applicable laws of the country when discarding this product.
  This product must be disposed in accordance with methods specified by applicable hazardous waste procedures.

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