

## ■ Features

- High Output Power:  $P_{sat}=55.3\text{dBm}$  (Typ.)
- High Gain:  $G_p=9.3\text{dB}$  (Typ.)
- High Power Added Efficiency:  $PAE=38\%$  (Typ.)
- Broad Band: 9.0 to 10.0GHz
- Impedance Matched  $Z_{in}/Z_{out} = 50\text{ohm}$
- Hermetically Sealed Package
- Long pulse operation \*

\*Reduced  $V_{ds}$  and/or low case temperature are needed to keep  $T_{ch}$  below 200 deg.C. Please contact for the detail.



## ■ Description

The SGC0910-301B-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 $T_c=25\text{ deg.C}$ )

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	$V_{DS}$		$\leq 50$	V
Forward Gate Current	$I_{GF}$	$R_g=10\text{ohm}$	$\leq 187.2$	mA
Reverse Gate Current	$I_{GR}$	$R_g=10\text{ohm}$	$\geq -13.6$	mA
Channel Temperature	$T_{ch}$		$< +200$	deg.C
Output Power	$P_{out}$		$\leq P5\text{dB}$	dBm

### ELECTRICAL CHARACTERISTICS (Case Temperature $T_c=25\text{ deg.C}$ )

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-off Voltage	$V_p$	$V_{DS}=50\text{V}, I_{DS}=20.0\text{mA}$	-	-4.5	-	V
Frequency Range	Freq.	$V_{DS}=50\text{V}$ $I_{DS(DC)}=1.0\text{A}$ Pulse Width=100 $\mu\text{sec.}$ Duty=10% *1:f=9.0 to 9.6GHz *2:f=9.6 to 10.0GHz $P_{in}=46\text{dBm}$	9.0	-	10.0	GHz
Output Power *1	$P_{sat}$		54.3	55.3	-	dBm
Output Power *2	$P_{sat}$		53.7	54.7	-	dBm
Power Gain *1	$G_p$		8.3	9.3	-	dB
Power Gain *2	$G_p$		7.7	8.7	-	dB
Drain Current	$I_{DSR}$		-	15.8	18.4	A
Power Added Efficiency	PAE		-	38	-	%
Thermal Resistance	$R_{th}$	Channel to Case ( $P_{diss}=100\text{W,CW}$ )	-	0.7	0.8	deg.C/W

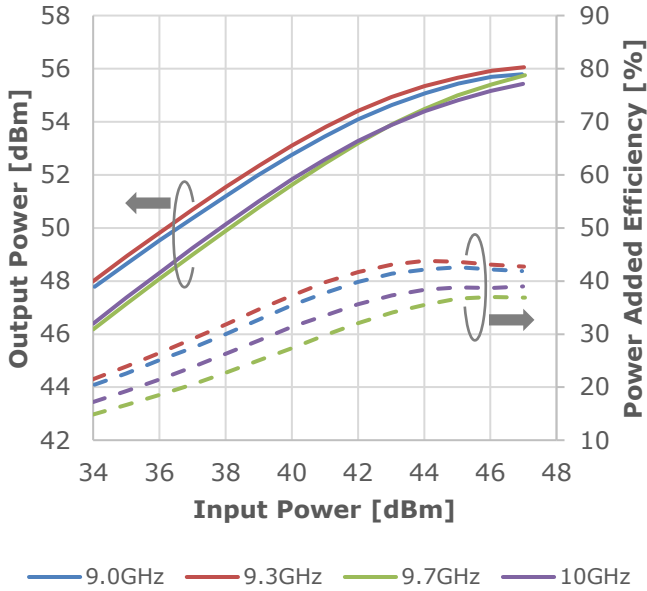
CASE STYLE	I2K
RoHS Compliance	YES
ESD	Class 2
	2000V to <4000V

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

## RF Characteristics

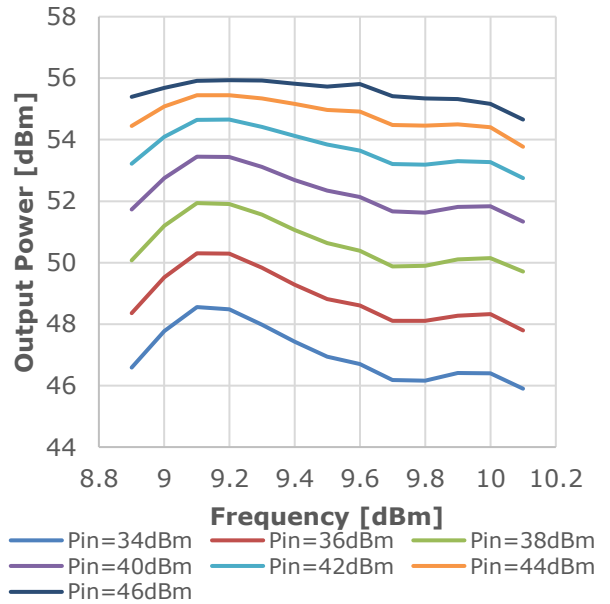
### Output Power & Power Added Efficiency vs. Input Power

$V_{DS}=50V, I_{DS(DC)}=1.0A$   
 $PW=100\mu sec., Duty=10\%$



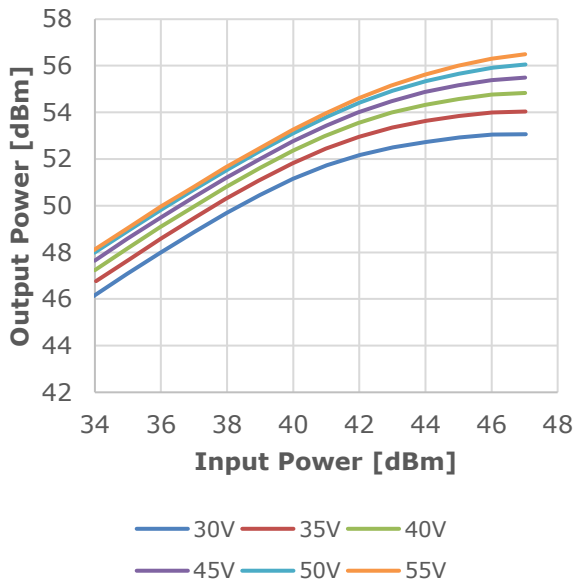
### Output Power vs. Frequency

$V_{DS}=50V, I_{DS(DC)}=1.0A$   
 $PW=100\mu sec., Duty=10\%$



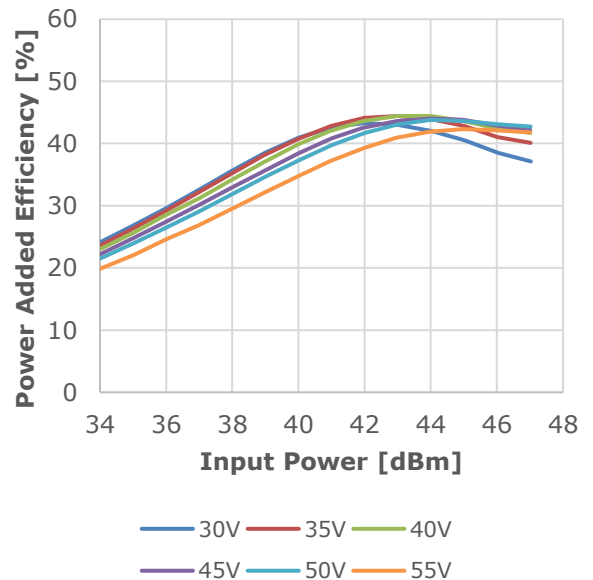
### Output Power vs. Input Power by Drain Voltage

$f=9.3GHz, I_{DS(DC)}=1.0A$   
 $PW=100\mu sec., Duty=10\%$



### Drain Efficiency vs. Input Power by Drain Voltage

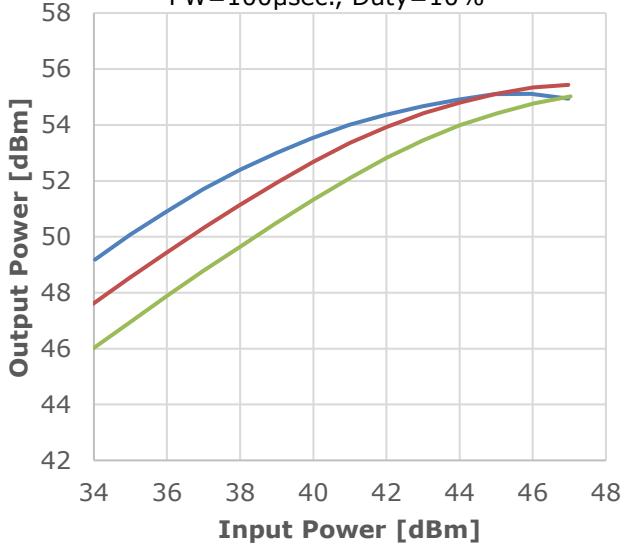
$f=9.3GHz, I_{DS(DC)}=1.0A$   
 $PW=100\mu sec., Duty=10\%$



## ● RF Characteristics

### Output Power vs. Input Power by case temperature

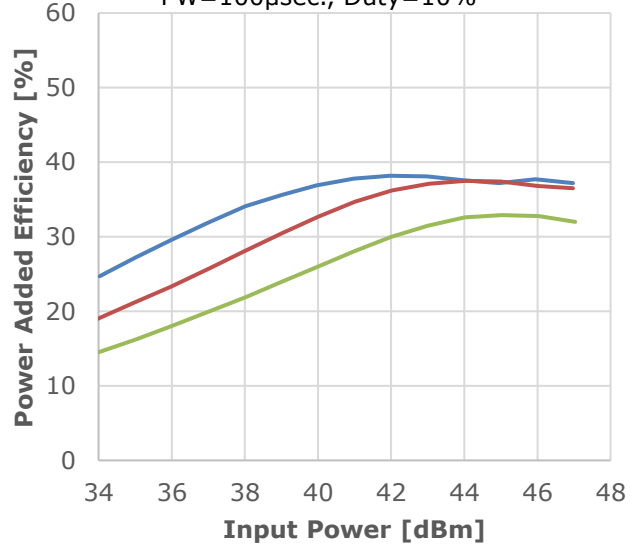
$f=9.3\text{GHz}$ ,  $V_{DS}=50\text{V}$ ,  $I_{DS(DC)}=1.0\text{A}$   
 $PW=100\mu\text{sec.}$ , Duty=10%



— -40deg.C — 25deg.C — 85deg.C

### Power Added Efficiency vs. Input Power by case temperature

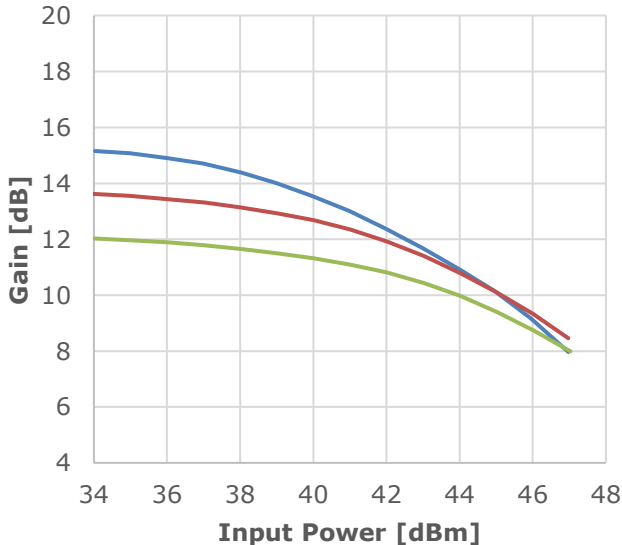
$f=9.3\text{GHz}$ ,  $V_{DS}=50\text{V}$ ,  $I_{DS(DC)}=1.0\text{A}$   
 $PW=100\mu\text{sec.}$ , Duty=10%



— -40deg.C — 25deg.C — 85deg.C

### Gain vs. Input Power by case temperature

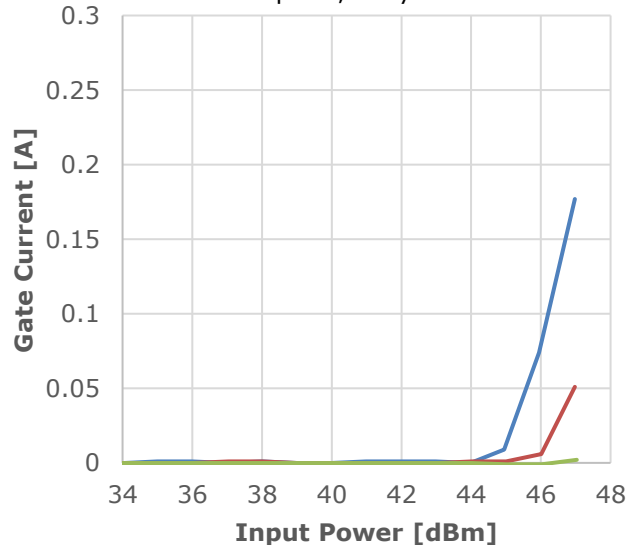
$f=9.3\text{GHz}$ ,  $V_{DS}=50\text{V}$ ,  $I_{DS(DC)}=1.0\text{A}$   
 $PW=100\mu\text{sec.}$ , Duty=10%



— -40deg.C — 25deg.C — 85deg.C

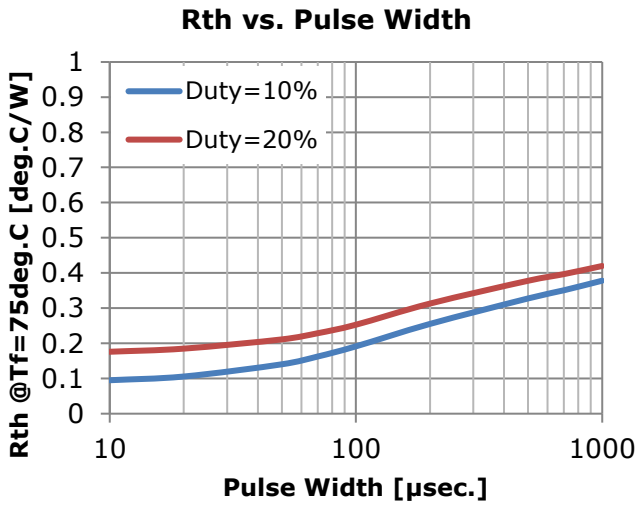
### Gate Current vs. Input Power by case temperature

$f=9.3\text{GHz}$ ,  $V_{DS}=50\text{V}$ ,  $I_{DS(DC)}=1.0\text{A}$   
 $PW=100\mu\text{sec.}$ , Duty=10%



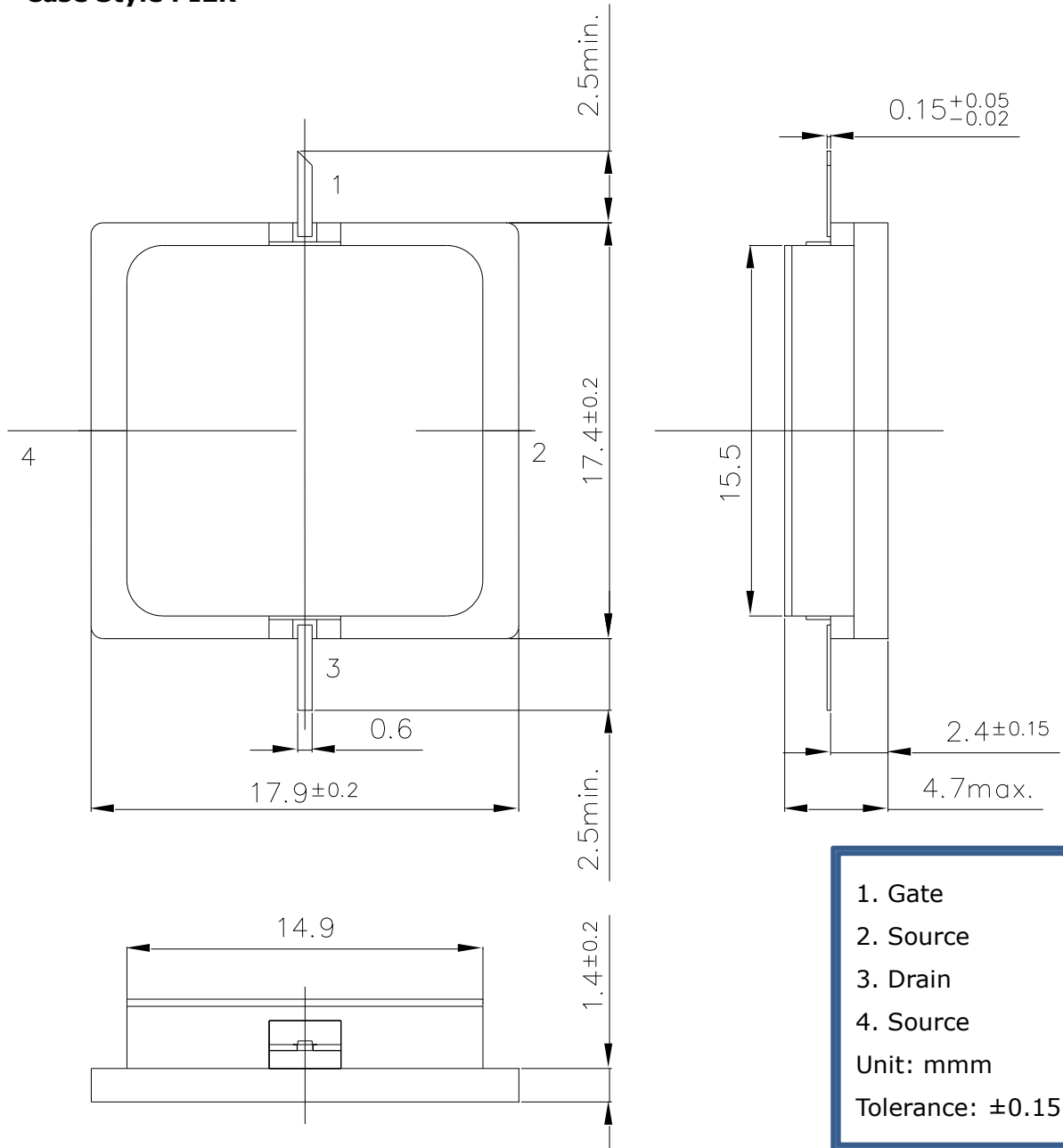
— -40deg.C — 25deg.C — 85deg.C

● **Thermal Characteristics In Pulsed Operation**

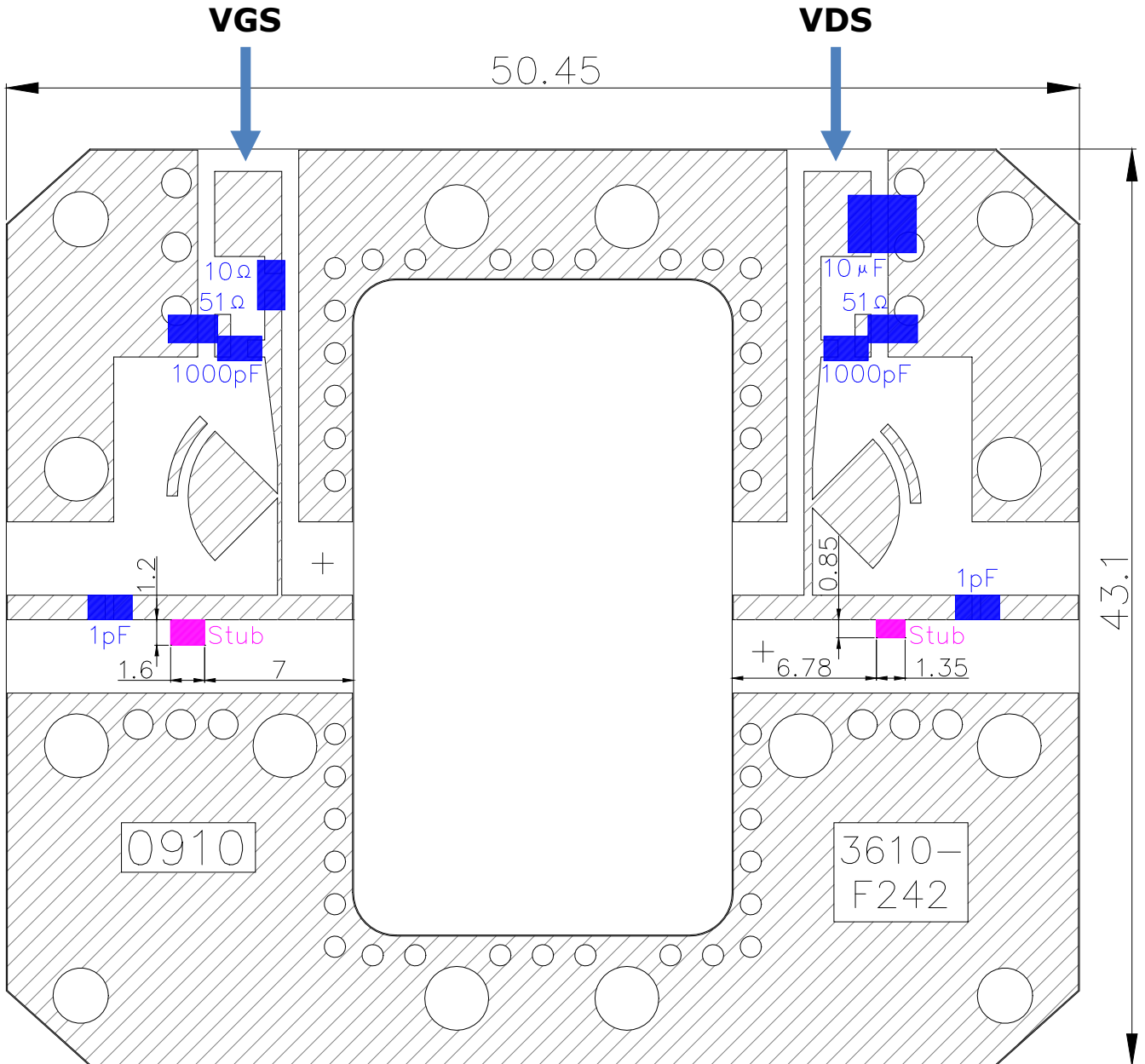


● **Package Outline**

**Case Style : I2K**



● Test Fixture



PCB : RO4003C H=0.5mm  $\epsilon_r=3.55$  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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