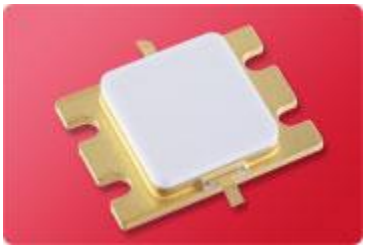
SGN1214-220H-R

High Voltage - High Power GaN-HEMT for Radar

FEATURES

•High Voltage Operation : V_{DS}=50V
•High Power : 270W (typ.)
•High Efficiency: 65%(typ.)



RoHS COMPLIANCE	Yes

DESCRIPTION

Sumitomo GaN-HEMT SGN1214-220H-R offers high power, high efficiency, ease of matching and greater consistency covering 1.2 to 1.4GHz for L-band radar applications with 50V operation.
The low thermal resistance allows to use long pulse up to 5 msec pulse width with duty of 10%.

ABSOLUTE MAXIMUM RATINGS (Case Temperature Tc=25 deg.C)

Item	Symbol	Condition	Rating	Unit
Operating Voltage	V_{DS}		55	V
Drain-Source Voltage	V_{DS}	V_{GS}=-10V	250	V
Gate-Source Voltage	V_{GS}		- 15	V
Storage Temperature	T_{stg}		-55 to +125	deg.C
Channel Temperature	T_{ch}		250	deg.C

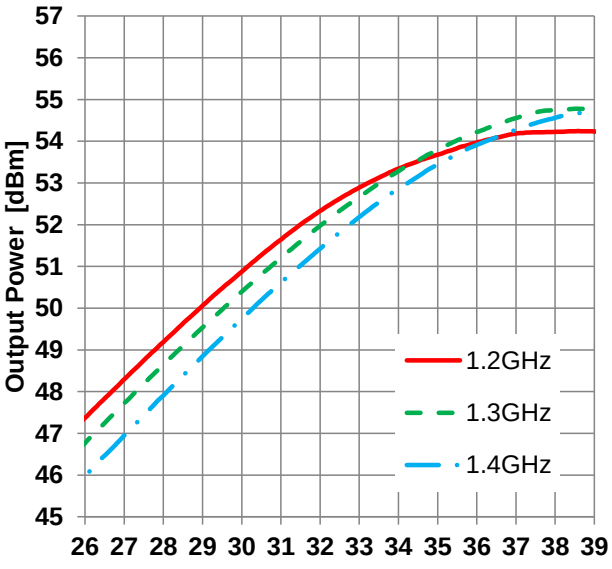
RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V_{DS}		≤ 50	V
Forward Gate Current	I_{GF}	R_G=5.1 ohm	≤ 244	mA
Reverse Gate Current	I_{GR}	R_G=5.1 ohm	≥ -10.4	mA
Pulse Width	PW	Duty 10%	≤ 5000	μsec
		Duty 25%	≤ 1500	μsec
Peak Channel Temperature	$T_{ch\text{-}peak}$	Duty 10%	≤ 215	deg.C
		Duty 25%	≤ 205	deg.C

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

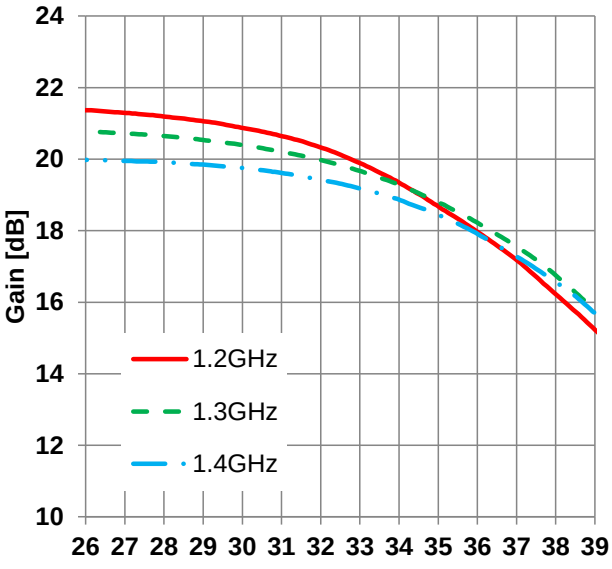
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-Off Voltage	V_p	V_{DS}=50V I_{DS}=72mA	-4.0	-3.0	-2.0	V
Output Power	P_{out}	V_{DS}=50V	53.4	54.3	-	dBm
Drain Efficiency	DE	$I_{DS(DC)}$=1A	-	65	-	%
Power Gain	G_p	P_{in}=4.5W (36.5dBm)	16.9	17.8	-	dB
Gain Flatness	GF	f=1.2, 1.3, 1.4GHz	-	0.5	1.0	dB
Load Mismatch Ruggedness	VSWR	PW=200μsec, Duty 10%	10:1	-	-	-
Thermal Resistance	R_{th}	Channel to Case	-	0.55	0.7	deg.C/W
		Measured w/CW at 105W P_{DC}				

TYPICAL PERFORMANCE



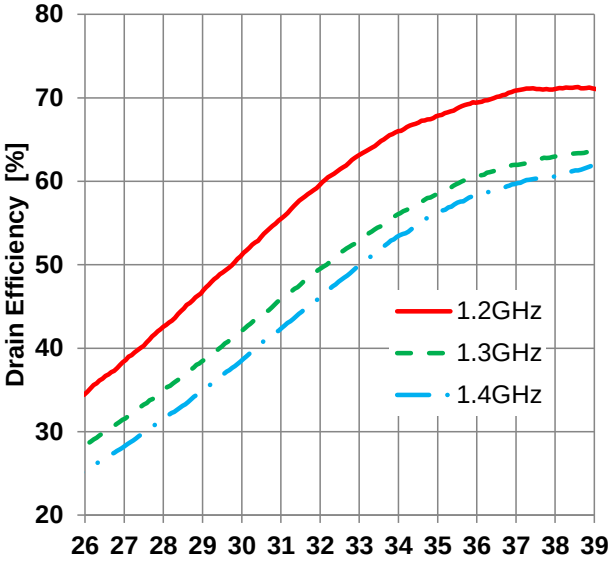
V_{DS}=50V, $I_{DS(DC)}$=1A,
PW=200µsec, Duty 10%

Figure 1. Output Power vs Input Power



V_{DS}=50V, $I_{DS(DC)}$=1A,
PW=200µsec, Duty 10%

Figure 2. Gain vs Input Power



V_{DS}=50V, $I_{DS(DC)}$=1A,
PW=200µsec, Duty 10%

Figure 3. Drain Efficiency vs Input Power

TYPICAL PERFORMANCE

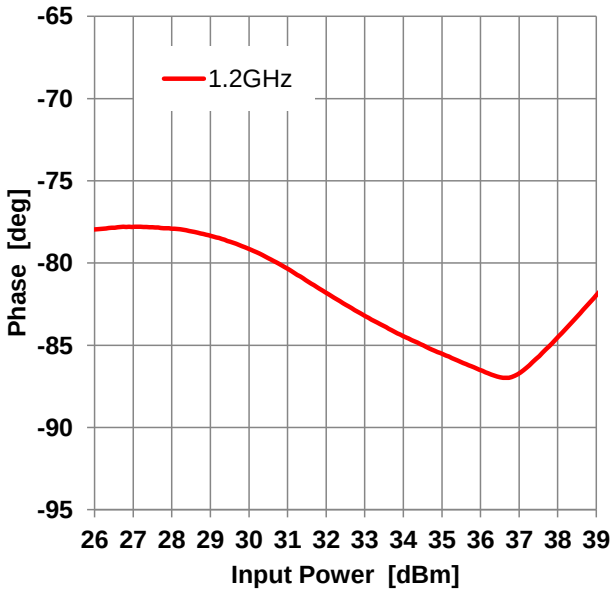


Figure 4.a) f=1.2GHz

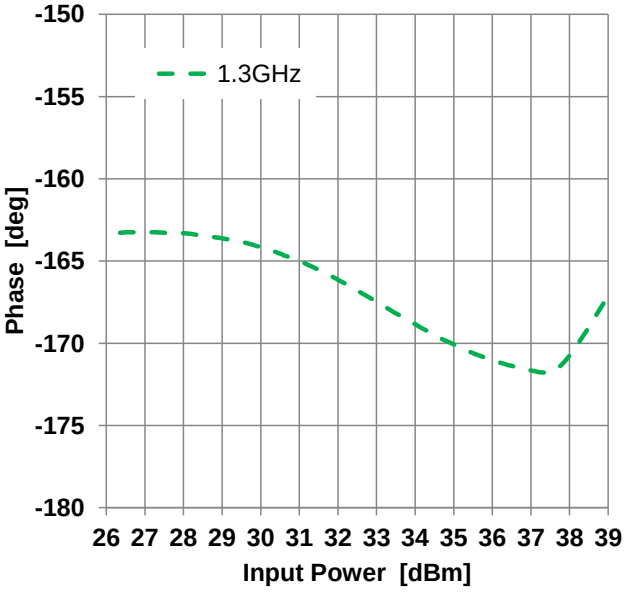


Figure 4.b) f=1.3GHz

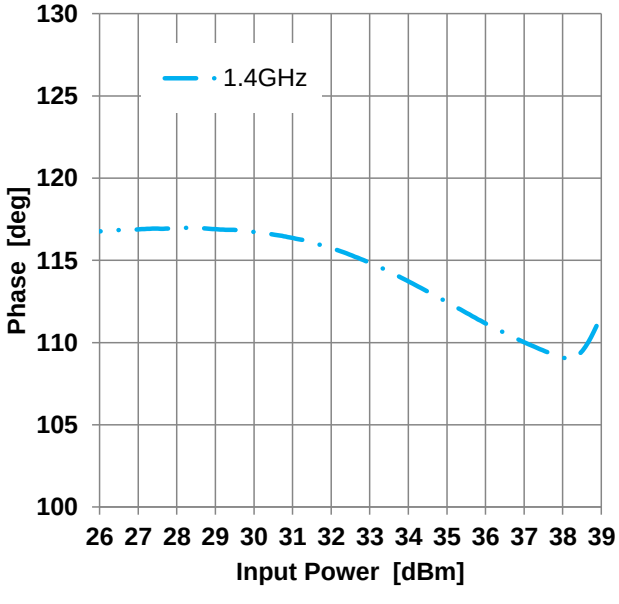


Figure 4.c) f=1.4GHz

V_{DS}=50V, $I_{DS(DC)}$=1A,
PW=200µsec, Duty 10%

Figure 4. Insertion Phase shift vs Input Power

TYPICAL PERFORMANCE

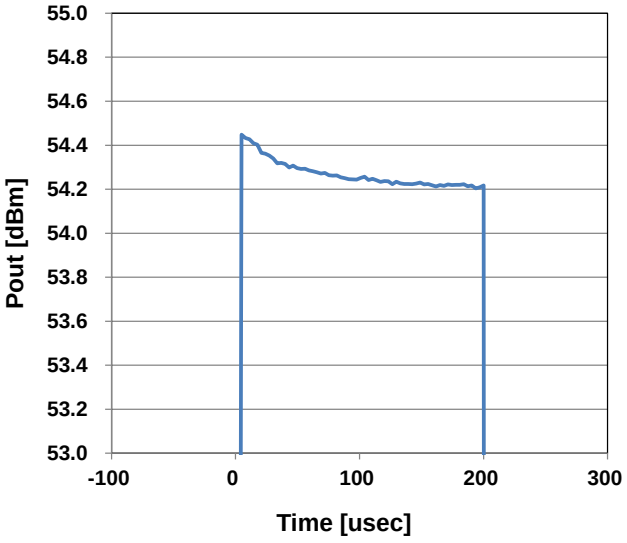


Figure 5.a) f=1.2GHz

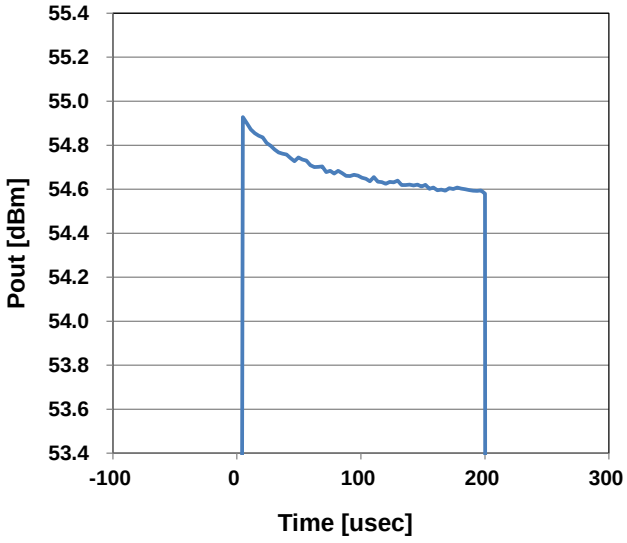


Figure 5.b) f=1.3GHz

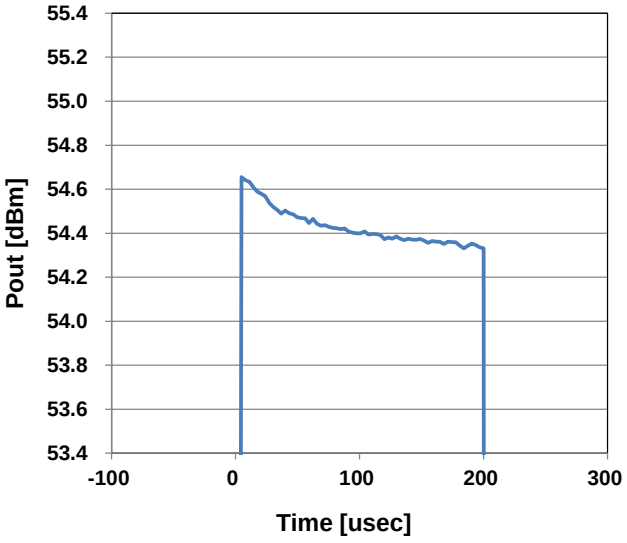


Figure 5.c) f=1.4GHz

V_{DS}=50V, $I_{DS(DC)}$=1A, Pin=36.5dBm
PW=200μsec, Duty 10%

Figure 5 . Pulse Performance (Power)

TYPICAL PERFORMANCE

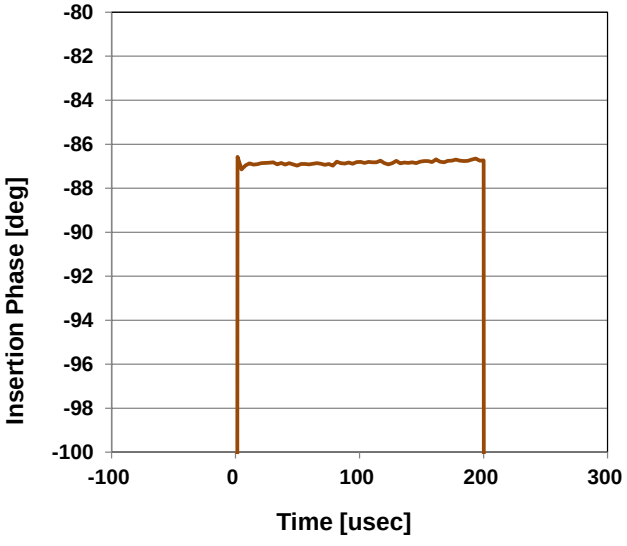


Figure 6.a) f=1.2GHz

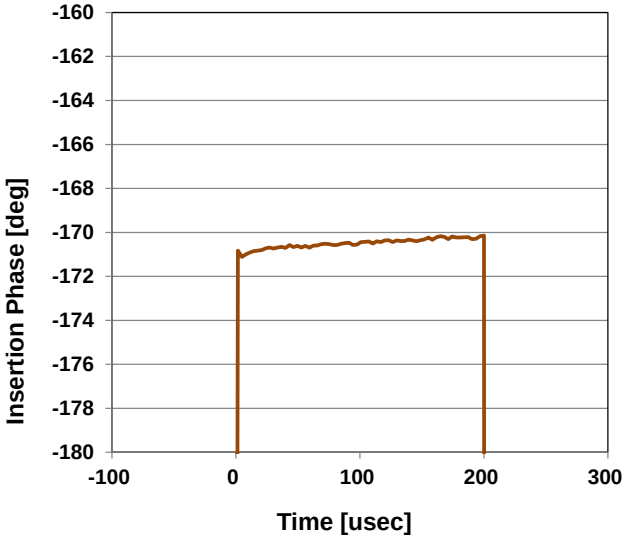


Figure 6.b) f=1.3GHz

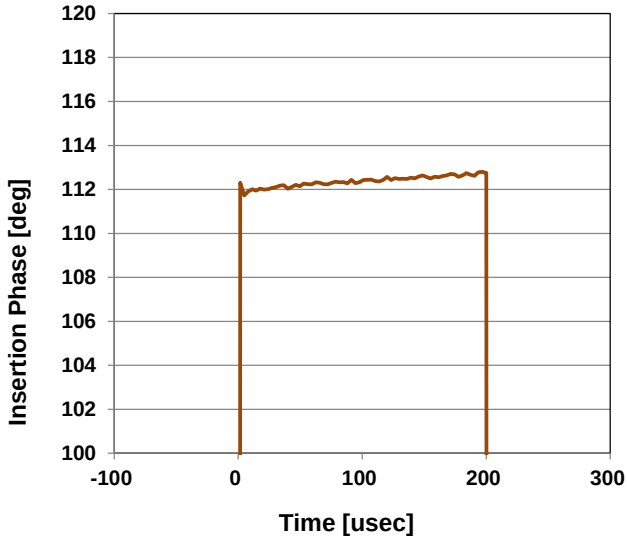


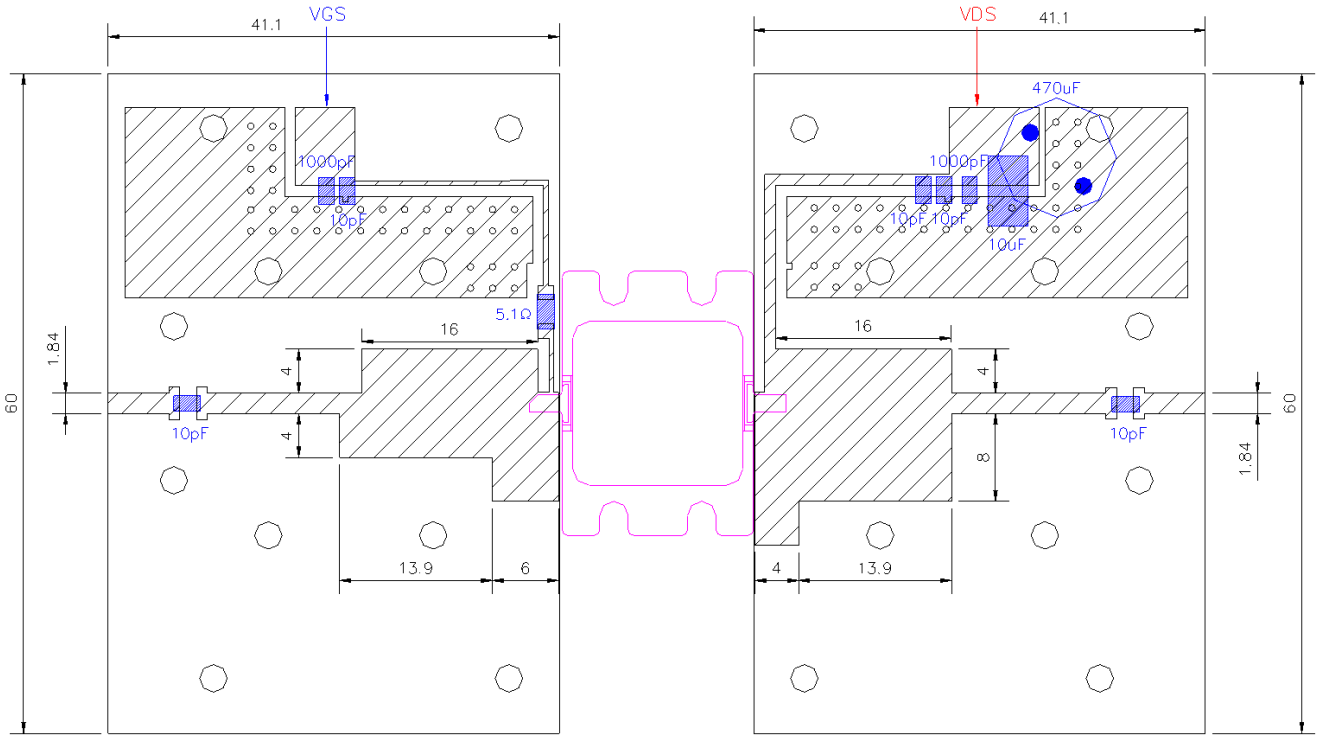
Figure 6.c) f=1.4GHz

V_{DS}=50V, $I_{DS(DC)}$=1A, Pin=36.5dBm
PW=200μsec, Duty 10%

Figure 6 . Pulse Performance (Insertion Phase Shift)

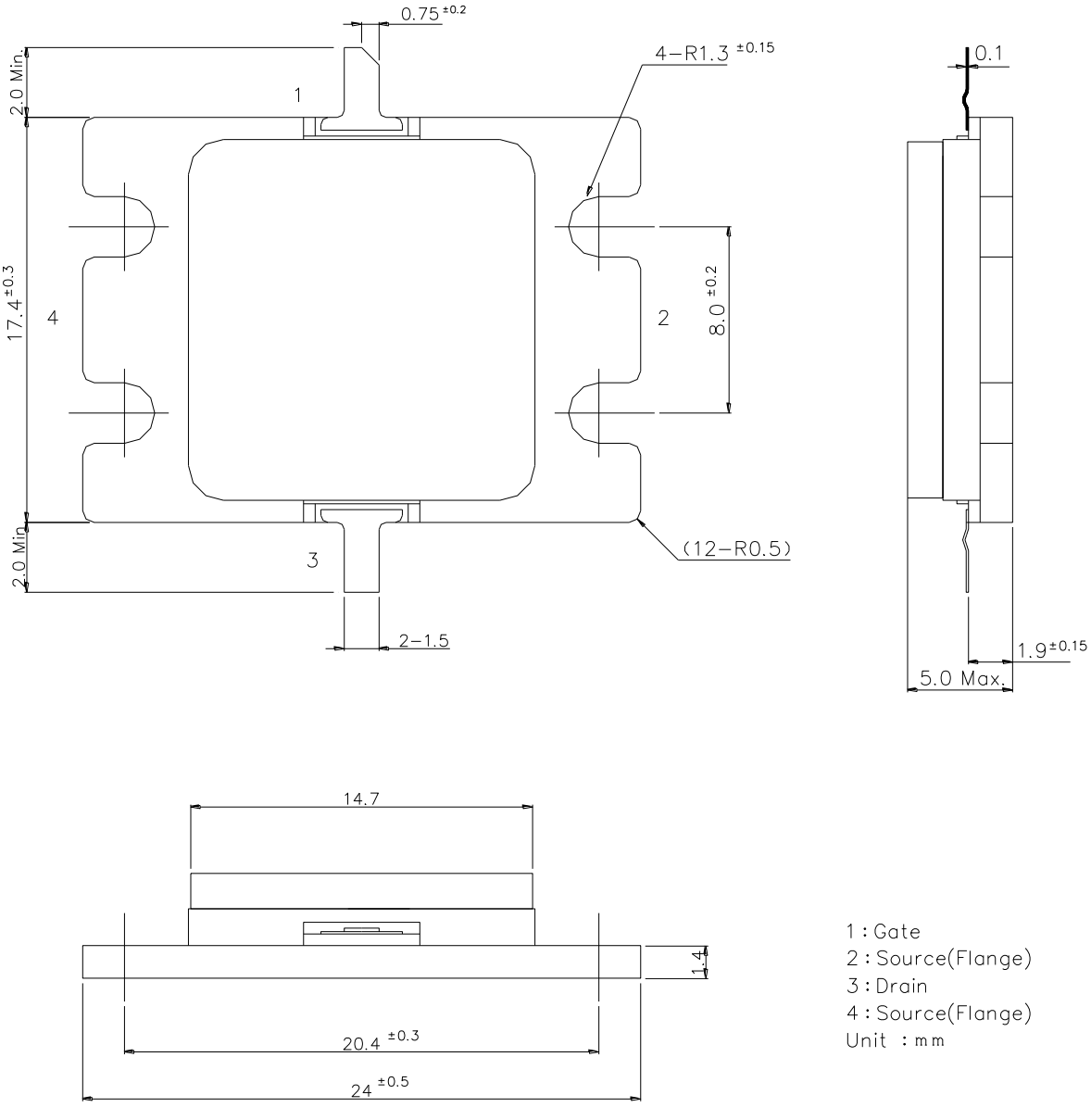
TEST FIXTURE

TF/SGN1214-220H-R



PCB : h=0.8mm, er=3.5, Cu=18um
Unit : mm

IV Package Outline
Metal-Ceramic Hermetic Package



1 : Gate
2 : Source(Flange)
3 : Drain
4 : Source(Flange)
Unit : mm