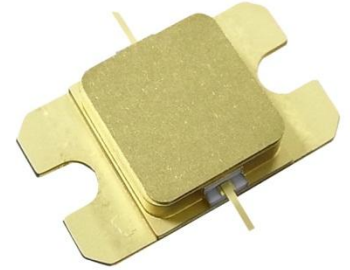


■ Features

- High Output Power: Pout=45.5dBm (Typ.)
- High Linear Gain: GL=11.0dB (Typ.)
- High Power Added Efficiency: PAE=40% (Typ.)
- Broad Band: 10.7 to 11.7GHz
- Impedance Matched Zin/Zout = 50ohm
- Hermetically Sealed Package



■ Description

The SGK1011-25C is a high power GaN-HEMT that is internally matched for standard communication 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}	26	V
Gate-Source Voltage	V _{GS}	-10	V
Total Power Dissipation	P _T	97.8	W
Storage Temperature	T _{stg}	-55 to +125	deg.C
Channel Temperature	T _{ch}	+250	deg.C
Case Temperature	T _c	-40 to +125	deg.C

RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
Drain-Source Voltage	V _{DS}		≤24	V
Forward Gate Current	I _{GF}	Rg=100ohm	≤6.8	mA
Reverse Gate Current	I _{GR}	Rg=100ohm	≥-2.1	mA
Channel Temperature	T _{ch}		<+193	deg.C

Note:Electrical specifications are measured under specified test conditions. Not all recommended operating conditions can be guaranteed to meet specifications.

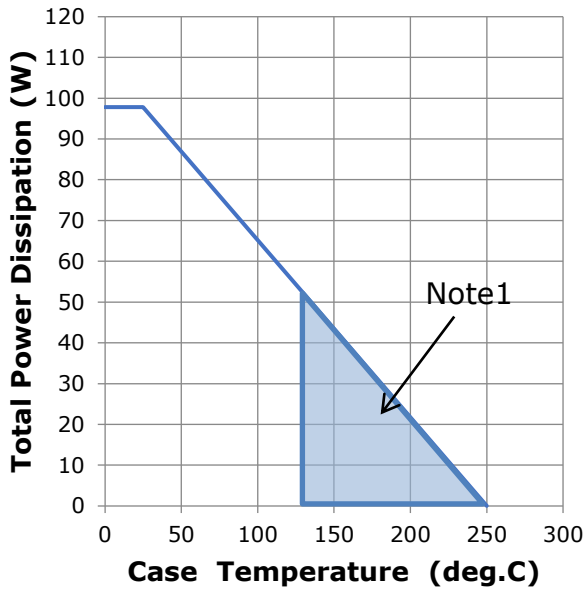
ELECTRICAL CHARACTERISTICS (Case Temperature T_c=25 deg.C)

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I _{DSS}	V _{DS} =10V, V _{GS} =0V	-	7.3	-	A
Trans Conductance	G _m	V _{DS} =24V, I _{DS} =0.86A	-	1.9	-	S
Pinch-off Voltage	V _p	V _{DS} =24V, I _{DS} =0.86mA	-2.5	-3.6	-5.5	V
Output Power at 5dB G.C.P.	P _{5dB}	V _{DS} =24V(typ.)	43.0	45.5	-	dBm
Linear Gain at Pin=24dBm	GL		9.0	11.0	-	dB
Drain Current at 5dB G.C.P.	I _{DSR}	I _{DS(DC)} =1.2A(typ.)	-	3.0	3.9	A
Power Added Efficiency at 5dB G.C.P.	PAE	f=10.7 to 11.7 GHz	-	40	-	%
Gain Flatness	ΔG		-	-	1.6	dB
3rd Order Inter Modulation Distortion	IM ₃	f=10.7GHz, 11.7GHz Δf=10MHz, 2-tone Test Pout=29dBm (S.C.L.)	-37.0	-42.0	-	dBc
Thermal Resistance	R _{th}	Channel to Case	-	1.9	2.3	deg.C/W
Channel Temperature Rise	ΔT _{ch}	(V _{DS} × I _{DSR} - Pout + Pin) × R _{th}	-	90	150	deg.C

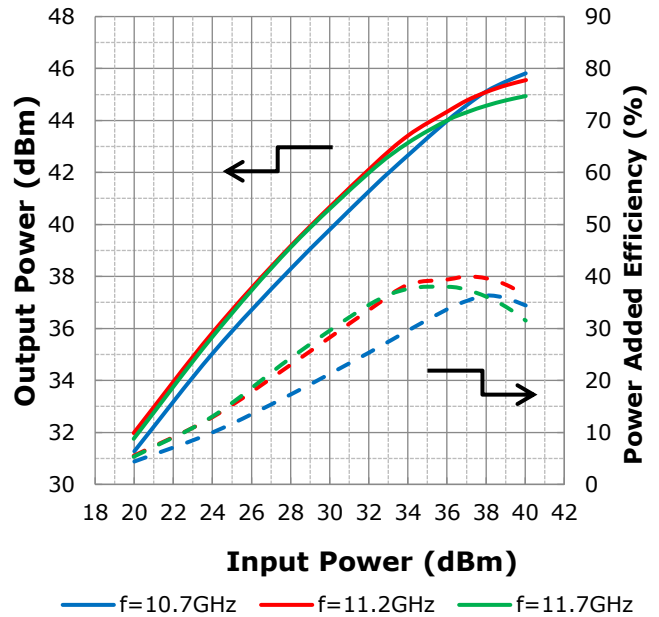
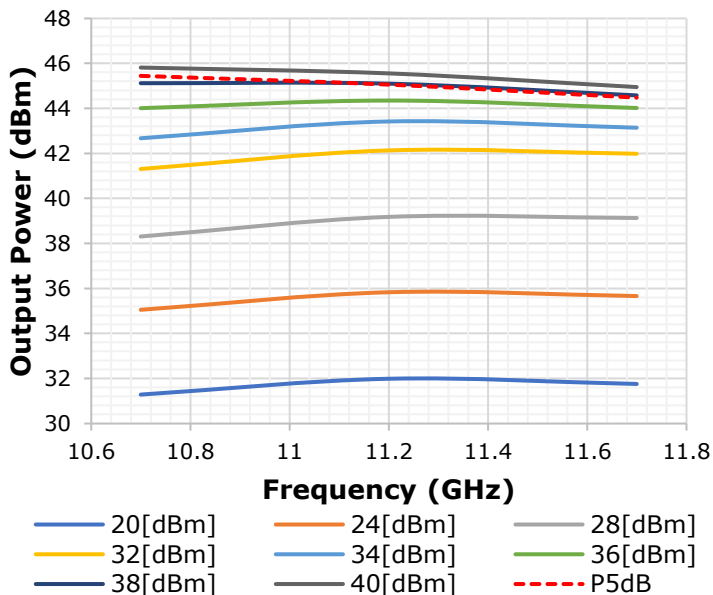
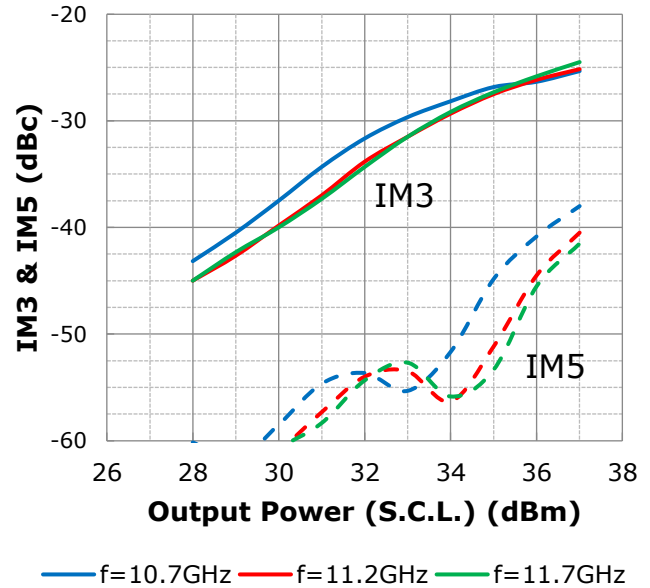
G.C.P. : Gain Compression Point, S.C.L. : Single Carrier Level

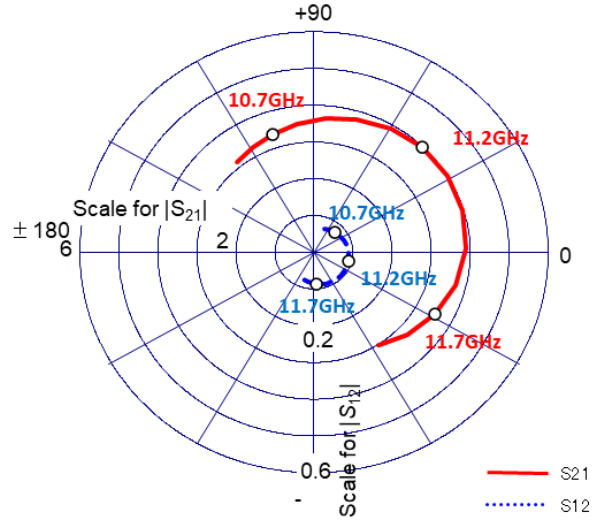
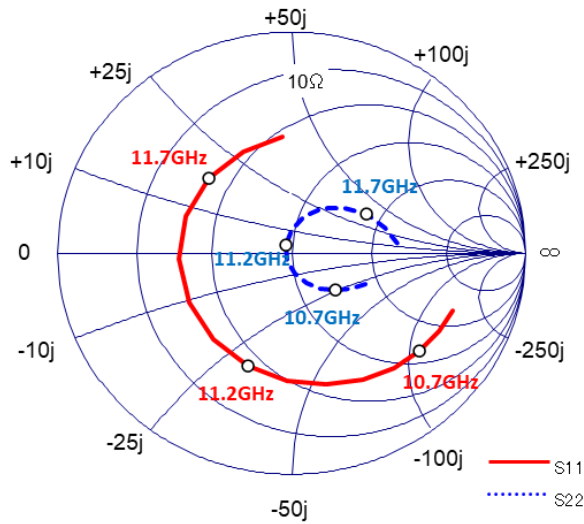
CASE STYLE	IBK		
RoHS Compliance	YES		
ESD *1	Class 2	2000V to < 4000V	

Note : *1 Based on ANSI/ESDA/JEDEC JS-001(C=100pF, R=1.5kohm)

● RF Characteristics
Power Derating Curve


Note 1: Shaded area exceeds Maximum Case Operating Temperature (See Page1)

Output Power and Power Added Efficiency vs. Input Power
 $V_{DS}=24V, I_{DS(DC)}=1.2A$

Output Power vs. Frequency
 $V_{DS}=24V, I_{DS(DC)}=1.2 A$

IMD vs. Output Power (S.C.L.)
 $V_{DS}=24V, I_{DS(DC)}=1.2 A, \Delta f=10MHz$


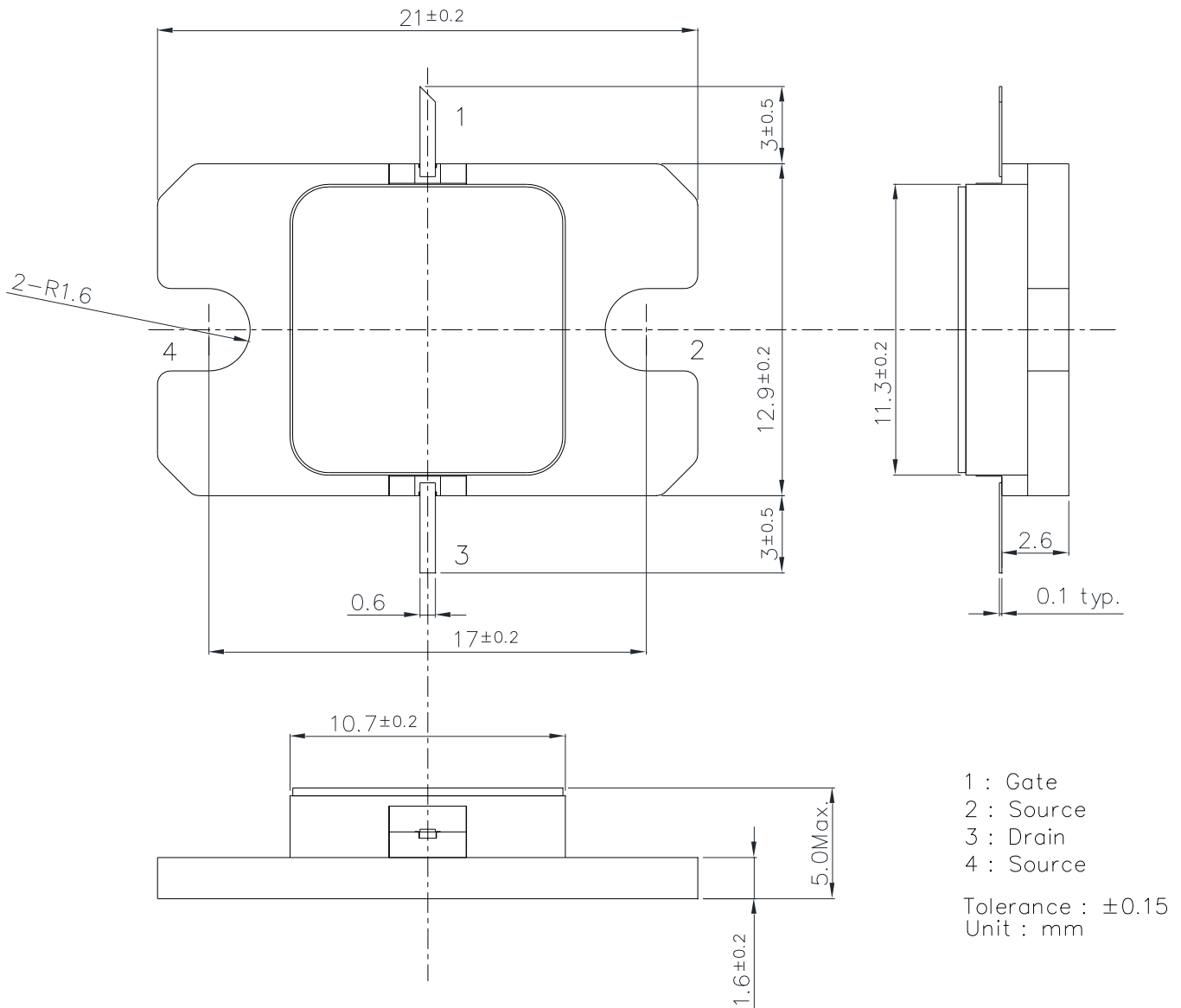
● S-Parameter


Bias Condition $V_{DS}=24V$, $I_{DS(DC)}=1.2A$
 $R_g = 100\text{ohm}$

Freq.	S11		S21		S12		S22	
	mag	phase	mag	phase	mag	phase	mag	phase
10.5GHz	0.737	-20.8	3.152	128.6	0.070	66.6	0.341	-23.8
10.6GHz	0.720	-29.5	3.264	118.4	0.073	56.5	0.298	-32.4
10.7GHz	0.701	-39.1	3.377	108.3	0.077	46.3	0.252	-41.9
10.8GHz	0.677	-49.9	3.525	97.1	0.080	34.9	0.202	-52.2
10.9GHz	0.648	-62.0	3.658	85.4	0.083	23.3	0.148	-64.6
11GHz	0.613	-76.0	3.785	73.1	0.086	11.3	0.093	-80.5
11.1GHz	0.576	-92.0	3.899	59.6	0.089	-1.6	0.038	-118.6
11.2GHz	0.542	-110.3	3.976	45.9	0.091	-14.8	0.045	125.6
11.3GHz	0.511	-130.5	4.001	31.4	0.093	-28.2	0.107	91.1
11.4GHz	0.489	-153.0	3.976	16.6	0.093	-42.6	0.175	72.3
11.5GHz	0.480	-176.7	3.890	1.6	0.092	-57.1	0.242	56.7
11.6GHz	0.480	159.6	3.729	-13.8	0.090	-71.7	0.305	42.3
11.7GHz	0.489	136.3	3.540	-28.6	0.087	-86.5	0.362	29.1
11.8GHz	0.503	114.4	3.276	-43.2	0.082	-101.0	0.414	16.5
11.9GHz	0.530	94.3	3.025	-57.0	0.077	-114.5	0.458	4.9

● Package Out line

Case Style : IBK



● Mounting Instructions for Packaged FETs

1. Screw Mounting

- (1) The flange of package may be attached using screws. Torque conditions are shown in table 1.

Table1. Recommended and Maximum Torque for Screw Mounting

Package	Recommended Screws	Recommended Torque	Maximum Torque
IB, IBK, IZZ	M3.0	45 N-cm (4.0 in lbf)	50 N-cm (4.4 in lbf)

- (2) The surface finish of the heat sink should be better than 0.8 μm , and the surface flatness must be better than 20 μm .
- (3) Silicon based heat sink compounds should not be used for the thermal conductive grease. They cause poor grounding of the source flange, contamination and long term degradation of thermal resistance between the FET package and heat sink.
- (4) If customers have use of thermal compounds and limited interface materials placed between the package flange and the heatsink to provide thermal transfer, any use of such materials is done at the customer's own risk and must be properly evaluated. Sumitomo Electric uses Panasonic carbon graphite sheet for mounting our devices. Our recommended sheet is EYGS182310. Recommended thickness is 0.1mm. Thermal conductivity is about 700 W/mK in the x-y direction. In the Z direction is about 15 W/mK.

2. Soldering for Gate and Drain Terminals

- (1) Recommended solder are Tin-Lead solder (63Sn/37Pb), Lead-Free solder (Sn-3.0Ag-0.5Cu)*¹ or equivalent.
- (2) For soldering, Tin-Lead solder (63Sn/37Pb) or Lead-Free solder (Sn-3.0Ag-0.5Cu)*¹ shall be used. (*1: The figure displays with weight %. A predominantly tin-rich alloy with 3.0% silver and 0.5% copper.)
- (3) Recommended Flux is Rosin type with chlorine content: 0.2% or less and a low halogen content. After soldering, the flux residue should be removed by appropriate cleaning methods.
- (4) The following is shown the recommended soldering conditions.

* Partial heating method (soldering iron, spot laser/air)

Product terminal temperature: 260 deg.C, max 10 s / terminal or 400 deg.C, max 3 s / terminal

Caution1: Soldering iron must be connected to the ground.

Caution2: Do not rapid cooling the devices.

Notes & Disclaimer

- 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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