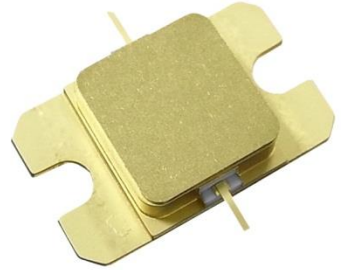


■ Features

- High Output Power: P5dB=45.0dBm (Typ.)
- High Linear Gain: GL=14.0dB (Typ.)
- High Power Added Efficiency: PAE=44% (Typ.)
- Broad Band: 7.7 to 8.5GHz
- Impedance Matched Zin/Zout = 50ohm
- Hermetically Sealed Package



■ Description

The SGK7785-30C 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	86.5	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	<=4.4	mA
Reverse Gate Current	I _{GR}	Rg=100ohm	>=-2.3	mA
Channel Temperature	T _{ch}		<+193	deg.C

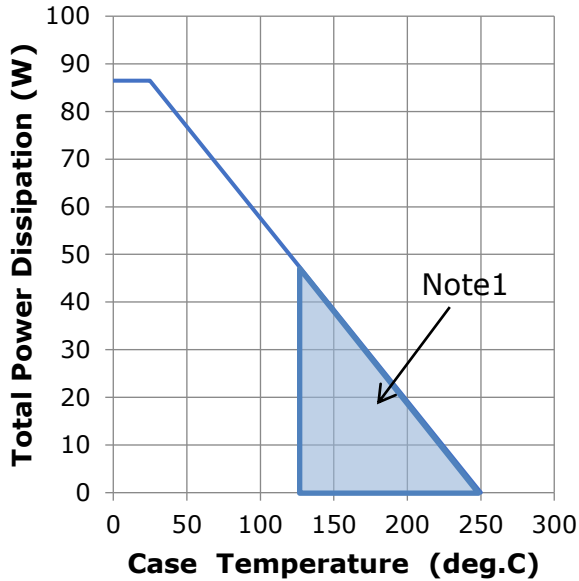
ELECTRICAL CHARACTERISTICS (Case Temperature T_c=25 deg.C)

Item	Symbol	Condition	Limit			Unit	
			Min.	Typ.	Max.		
Saturated Drain Current	I _{DSS}	V _{DS} =10V, V _{GS} =0V	-	8.3	-	A	
Trans Conductance	G _m	V _{DS} =24V, I _{DS} =0.96A	-	2.2	-	S	
Pinch-off Voltage	V _p	V _{DS} =24V, I _{DS} =0.96mA	-2.5	-4.0	-5.5	V	
Output Power at 5dB G.C.P.	P _{5dB}	V _{DS} =24V(typ.) I _{DS(DC)} =1.75A(typ.) f=7.7 to 8.5 GHz Vgs-constant	44.0	45.0	-	dBm	
Linear Gain at Pin=23dBm	GL		11.0	14.0	-	dB	
Drain Current at 5dB G.C.P.	I _{DSR}		-	3.2	4.0	A	
Power Added Efficiency at 3dB G.C.P.	PAE		-	44.0	-	%	
Gain Flatness	ΔG		-	-	1.2	dB	
3rd Order Inter Modulation Distortion	IM ₃		f=8.5GHz Δf=10MHz, 2-tone Test Pout=29.5dBm (S.C.L.)	-40.0	-42.0	-	dBc
Thermal Resistance	R _{th}		Channel to Case	-	2.2	2.6	deg.C/W
Channel Temperature Rise	ΔT _{ch}	(V _{DS} × I _{DSR} - Pout + Pin) × R _{th}	-	83	150	deg.C	

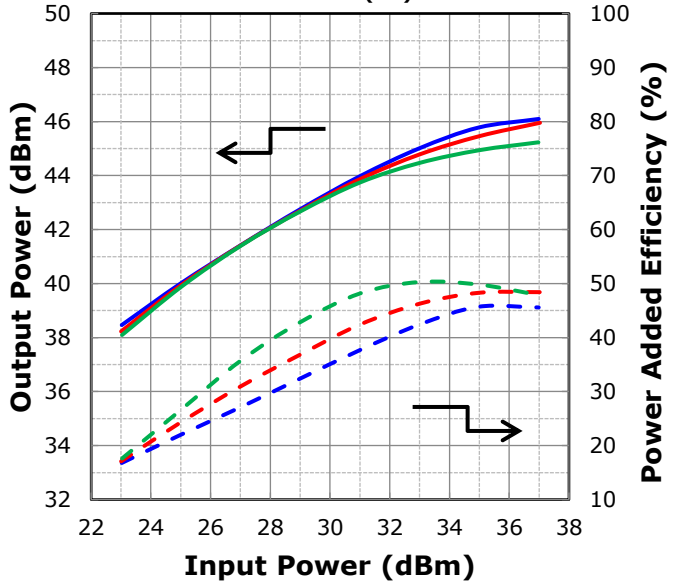
G.C.P. : Gain Compression Point, S.C.L. : Single Carrier Level

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

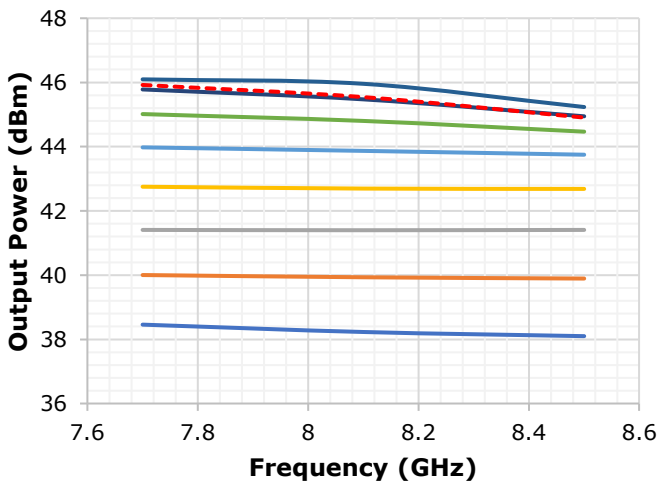
Note : *1 Based on ANSI/ESDA/JEDEC JS-001-2012(C=100pF, R=1.5kohm)

RF Characteristics
Power Derating Curve


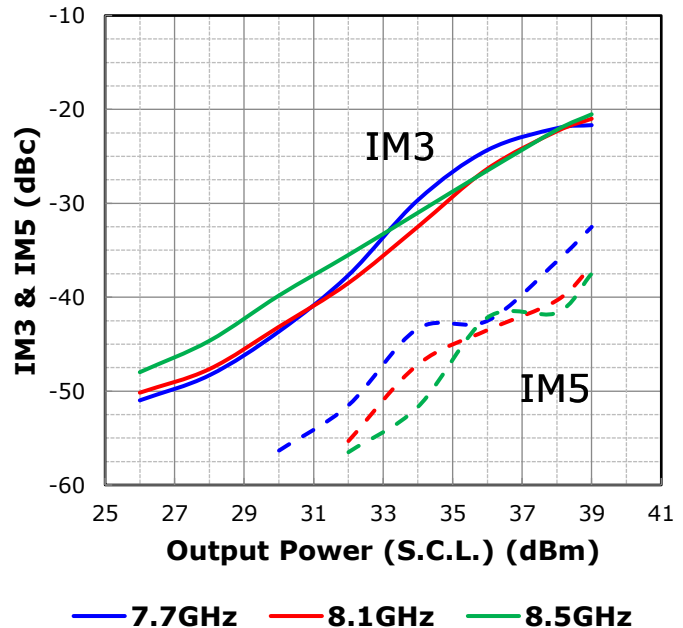
Note 1: Shaded area exceeds Maximum Case Operating Temperature (See Page1)

Input Power vs. Output Power and Power Added Efficiency
 $V_{DS}=24V, I_{DS(DC)}=1.75A$


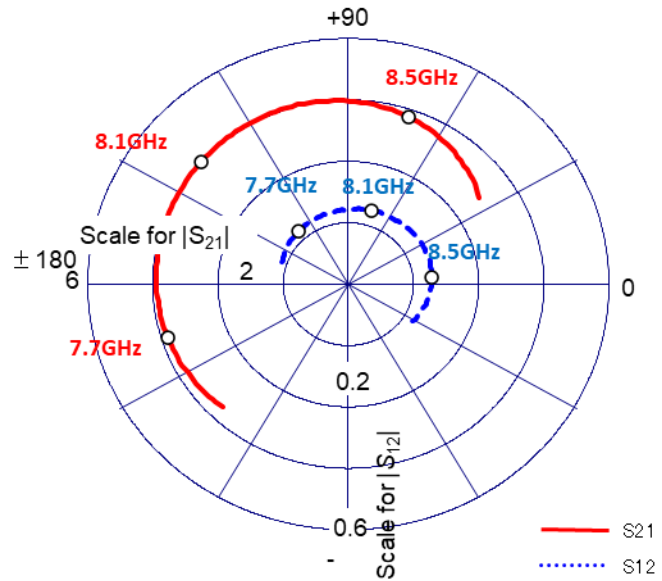
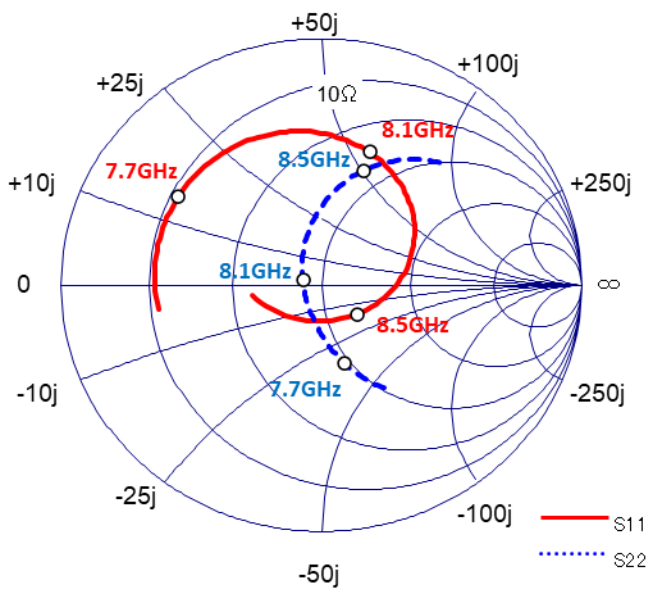
— 7.7GHz — 8.1GHz — 8.5GHz

Output Power vs. Frequency
 $V_{DS}=24V, I_{DS(DC)}=1.75A$


— 23[dBm] — 25[dBm] — 27[dBm]
 — 29[dBm] — 31[dBm] — 33[dBm]
 — 35[dBm] — 37[dBm] - - - P5dB

IMD vs. Output Power (S.C.L.)
 $V_{DS}=24V, I_{DS(DC)}=1.75A, \Delta f=10MHz$


— 7.7GHz — 8.1GHz — 8.5GHz

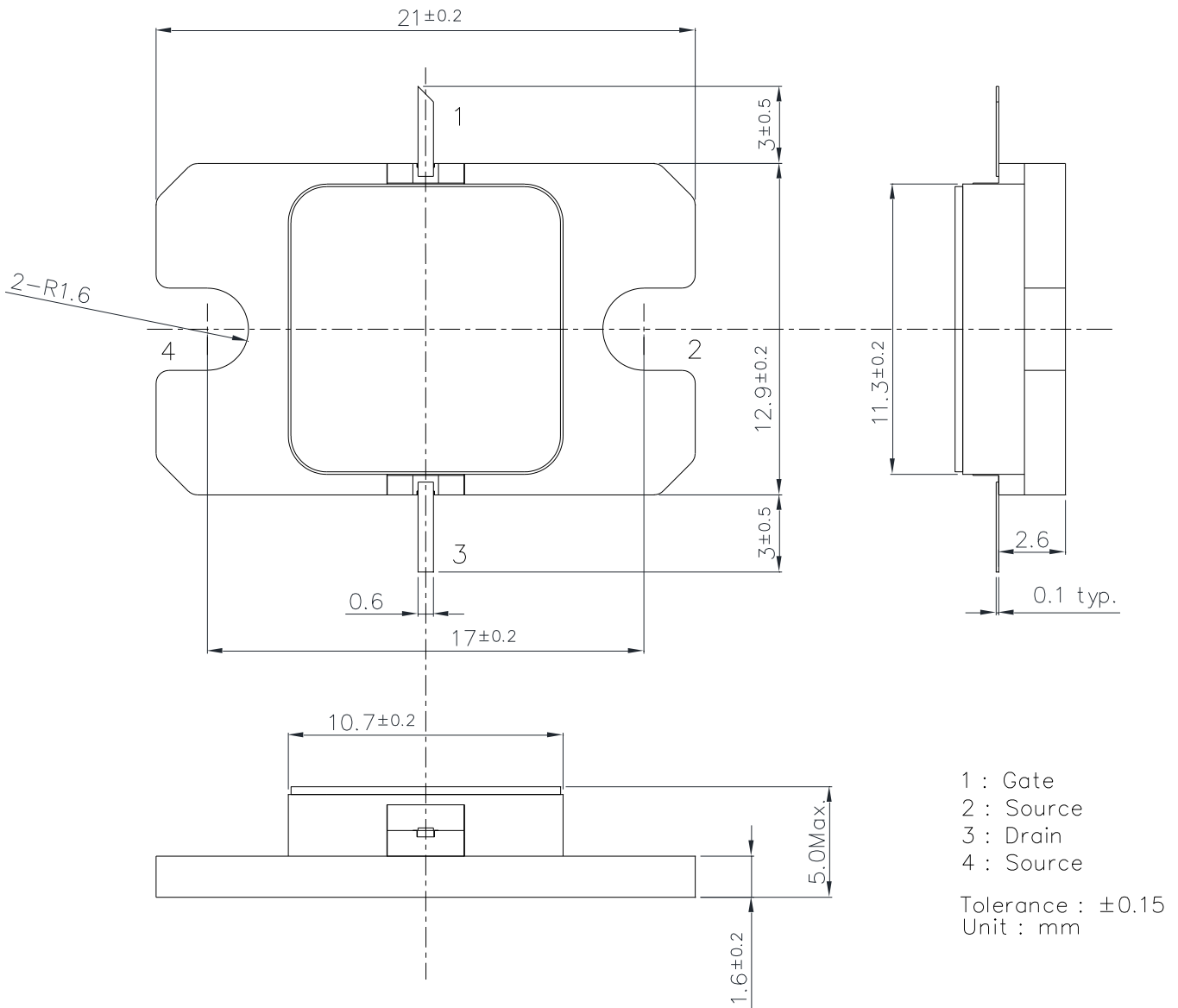
● S-Parameter


Bias Condition $V_{DS}=24V$, $I_{DS(DC)}=1.75A$
 $R_g = 100\text{ohm}$

Freq.	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7.5GHz	0.633	-171.2	5.545	-133.9	0.081	160.0	0.482	-59.8
7.6GHz	0.646	167.4	5.694	-148.3	0.084	146.2	0.408	-67.2
7.7GHz	0.656	146.7	5.809	-162.7	0.086	131.8	0.329	-74.5
7.8GHz	0.657	127.2	5.882	-177.2	0.088	117.9	0.249	-83.1
7.9GHz	0.644	108.3	5.931	168.4	0.090	103.6	0.169	-95.2
8.0GHz	0.617	90.0	5.982	153.7	0.092	88.9	0.095	-123.5
8.1GHz	0.572	71.2	6.025	138.7	0.094	73.7	0.073	164.7
8.2GHz	0.503	51.6	6.051	123.1	0.095	57.9	0.148	118.2
8.3GHz	0.412	29.7	6.046	106.7	0.097	41.0	0.254	98.5
8.4GHz	0.296	2.5	5.967	89.4	0.097	23.8	0.373	84.1
8.5GHz	0.180	-40.4	5.765	71.4	0.097	5.4	0.493	70.9
8.6GHz	0.158	-118.0	5.398	53.0	0.093	-13.4	0.602	58.0
8.7GHz	0.270	-170.9	4.907	34.9	0.087	-31.5	0.686	45.7

● **Package Out line**

Case Style : IBK



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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