SGK7785-30A

C-Band Internally Matched GaN-HEMT

FEATURES

- High Output Power: P5dB=45.0dBm (Typ.)
- High Gain: GL=12.0dB (Typ.)
- High PAE: ηadd=39% (Typ.)
- Broad Band: 7.7 to 8.5GHz
- Impedance Matched Zin/Zout = 50ohm
- Hermetically Sealed Package

DESCRIPTION

The SGK7785-30A 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 Tc=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

RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
Drain-Source Voltage	V_{DS}		<=24	V
Forward Gate Current	I_{GF}	Rg=100ohm	<=6	mA
Reverse Gate Current	I_{GR}	Rg=100ohm	>=-3	mA
Channel Temperature	T_{CH}		<+192	deg.C

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

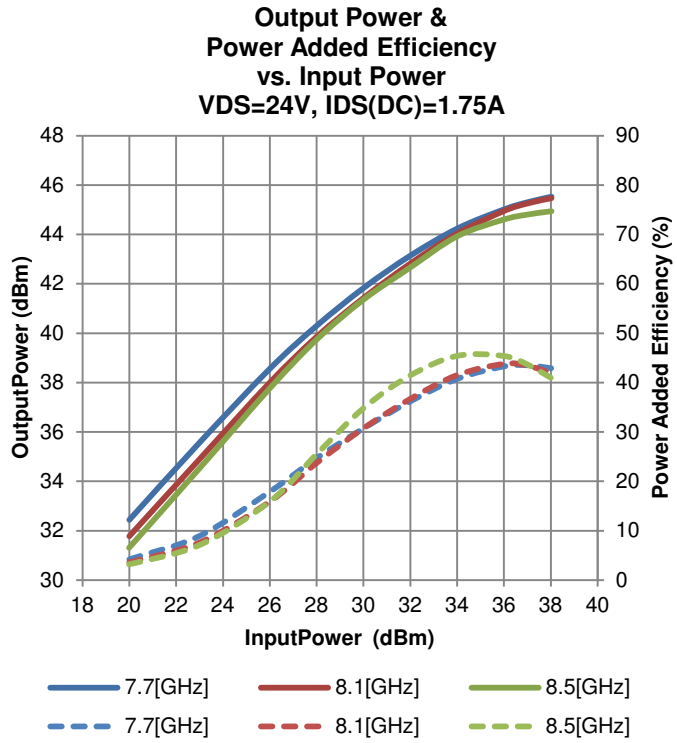
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	Idss	Vds=10V, Vgs=0V		6.5		A
Trans Conductance	gm	Vds=24V, Ids=1.3A	-	3.0	-	S
Pinch-off Voltage	V_P	Vds=10V, Ids=1.3mA	-	-3	-	V
Output Power at 5dB G.C.P.	P_{5dB}	V_{DS}=24V(Typ.) I_{DSDC}=1.75A(Typ.) f=7.7 to 8.5 GHz	44.0	45.0	-	dBm
Linear Gain at Pin=23dBm	GL		11.0	12.0	-	dB
Drain Current at 5dB G.C.P.	I_{dsr}		-	2.7	4.0	A
Power Added Efficiency at 3dB G.C.P.	η_{add}		-	39	-	%
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	-45.0	-	dBc
Thermal Resistance	R_{th}	Channel to Case	-	2.2	2.6	deg.C/W
Channel Temperature Rise	ΔT_{ch}	$(V_{DS} \times I_{dsr} - P_{out} + P_{in}) \times R_{th}$	-	82.8	150	deg.C

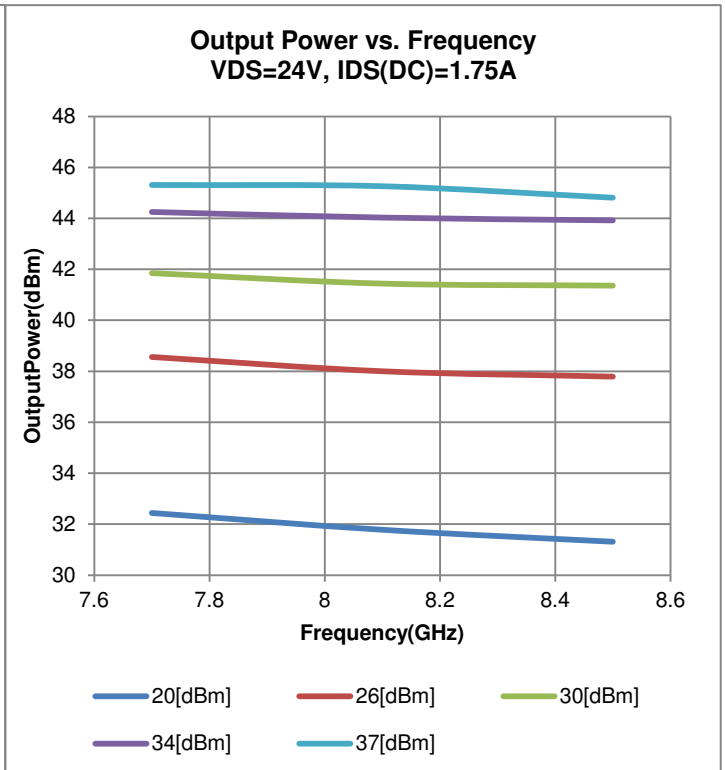
G.C.P. : Gain Compression Point, S.C.L. : Single Carrier Level

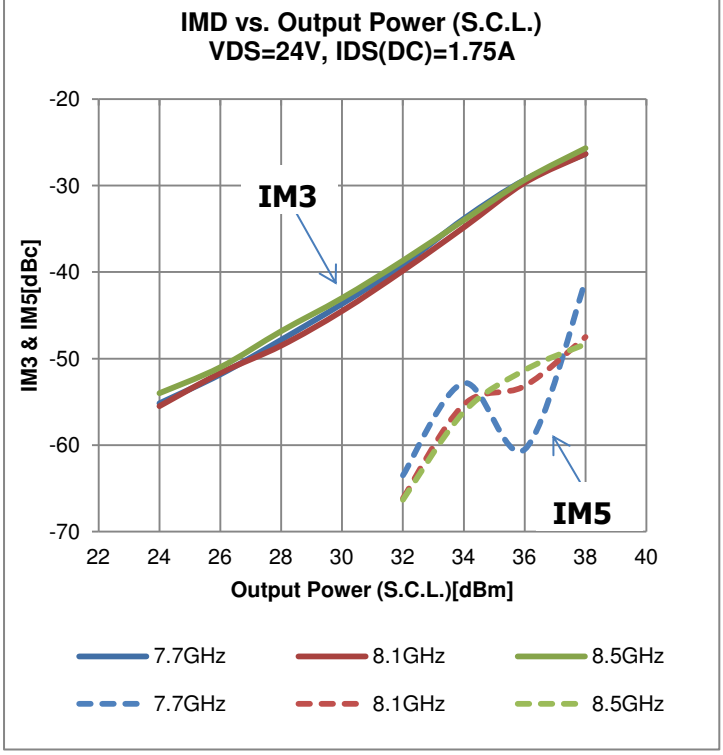
CASE STYLE	IBK	
RoHS Compliance	YES	
ESD	Class 1C	1000V to 2000V

Note : Based on EIAJ ED-4701 C-111A(C=100pF, R=1.5kohm)

● RF Characteristics







- **S-Parameter**

Freq.	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7500 MHz	0.366	-174.1	4.276	-154.3	0.094	135.7	0.272	-107.2
7600 MHz	0.365	162.0	4.269	-168.0	0.094	122.3	0.215	-115.5
7700 MHz	0.376	140.3	4.226	178.2	0.095	108.7	0.162	-124.4
7800MHz	0.387	120.7	4.189	164.8	0.095	95.2	0.114	-133.1
7900 MHz	0.393	103.1	4.156	151.2	0.095	81.8	0.070	-150.1
8000 MHz	0.390	87.2	4.097	137.9	0.095	67.8	0.035	168.4
8100 MHz	0.375	72.6	4.067	123.7	0.096	54.0	0.052	98.6
8200 MHz	0.335	59.8	4.044	109.7	0.097	39.3	0.102	74.1
8300 MHz	0.274	48.7	4.026	94.8	0.098	24.2	0.168	61.1
8400 MHz	0.186	41.8	3.987	78.7	0.099	8.3	0.249	50.9
8500 MHz	0.090	59.8	3.870	62.2	0.098	-8.7	0.341	40.5
8600 MHz	0.124	128.9	3.687	44.4	0.096	-26.2	0.439	28.7
8700 MHz	0.269	133.8	3.372	26.6	0.089	-44.1	0.529	16.2

- **Amplifier Circuit Outline**

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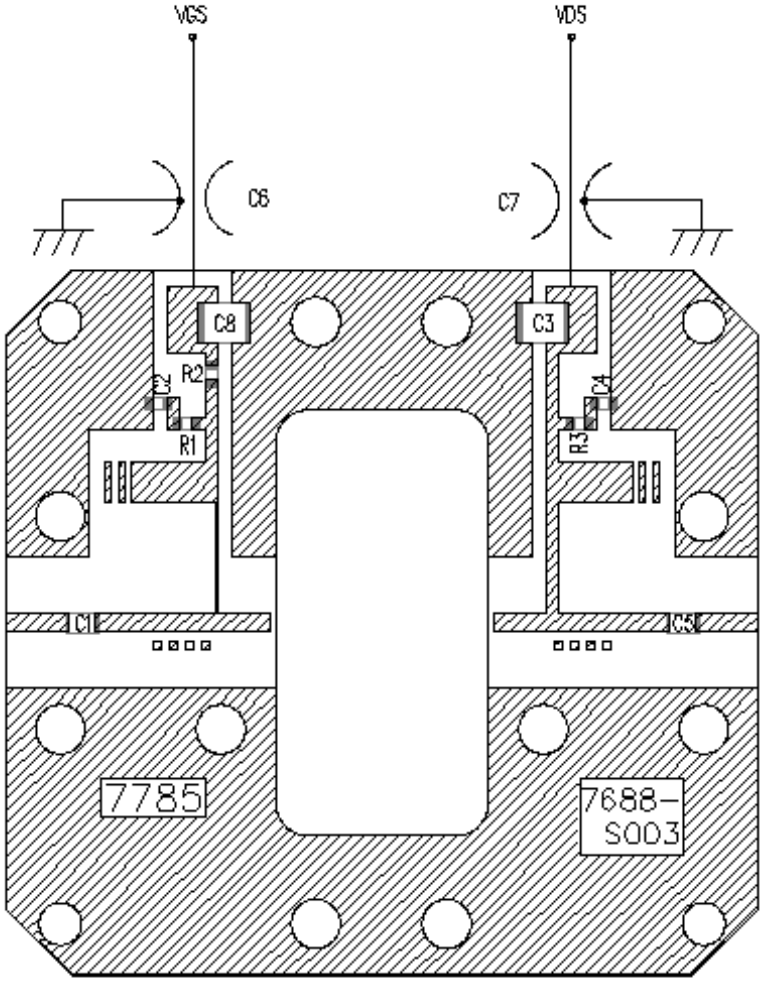


C1	2.0pF
C2	1000pF
C3	0.1uF
C4	1000pF
C5	2.0pF
C6	1000pF
C7	1000pF
C8	0.1uF
R1	51Ω
R2	100Ω
R3	51Ω

Rogers RO4003C

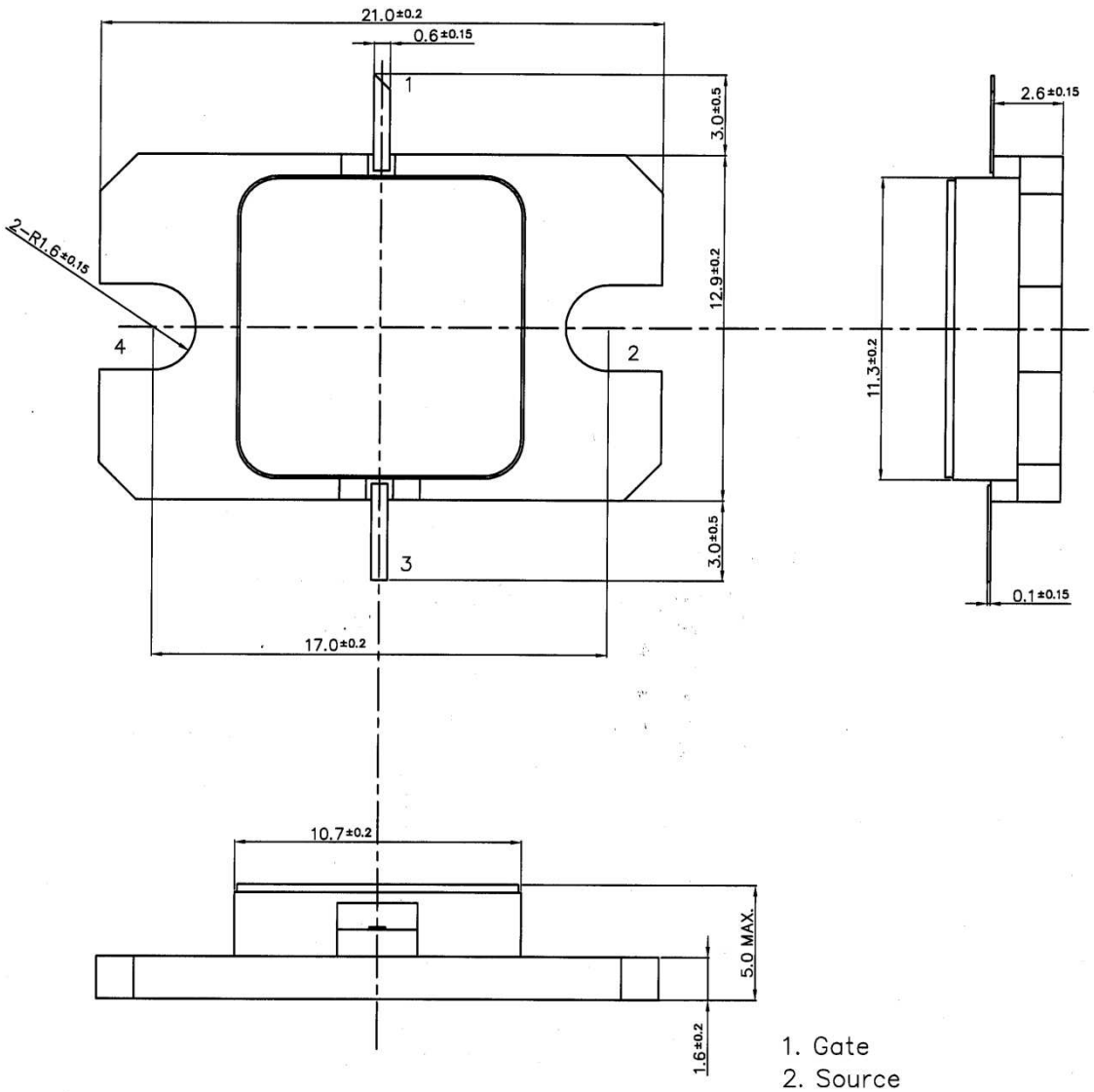
h=0.542mm εr=3.38

Cu=18um Unit:mm

C1 , C5 : ATC 600F(0805) , +/- 0.1pF
C6 , C7 : EMI FILTER MARUWA (FTA352AR102S-S)

- **Package Out line**

  Case Style : IBK



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

Unit: mm
Tolerance : ±0.15

For further information please contact:

http://global-sei.com/Electro-optic/about/office.html