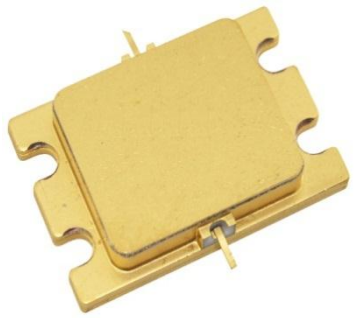
SGK7785-100A

C-Band Internally Matched GaN-HEMT

FEATURES

- High Output Power: P5dB=50.0dBm (Typ.)
- High Gain: GL=12.0dB (Typ.)
- High PAE: ηadd=42% (Typ.)
- Broad Band: 7.7 to 8.5GHz
- Impedance Matched Zin/Zout = 50ohm
- Hermetically Sealed Package



DESCRIPTION

The SGK7785-100A 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	300	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=25ohm	<=24	mA
Reverse Gate Current	I_{GR}	Rg=25ohm	>=-12	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	-	26	-	A
Trans Conductance	gm	Vds=24V, Vgs=5.3A	-	12	-	S
Pinch-off Voltage	V_P	Vds=24V, Vgs=5.3mA	-	-3	-	V
Output Power at 5dB G.C.P.	P_{5dB}	V_{DS}=24V(Typ.) I_{DSDC}=4.0A(Typ.) f=7.7 to 8.5 GHz	49.0	50.0	-	dBm
Linear Gain at Pin=28.0dBm	GL		11.0	12.0	-	dB
Drain Current at 5dB G.C.P.	I_{dsr1}		-	10	14	A
Power Added Efficiency at 3dB G.C.P.	η_{add}		-	42	-	%
Gain Flatness	ΔG		-	-	1.2	dB
3rd Order Inter modulation Distortion	IM_3	f=8.5GHz Δf=10MHz, 2-tone Test Pout=44.0dBm (S.C.L.)	-25.0	-	-	dBc
Thermal Resistance	R_{th}	Channel to Case	-	0.55	0.75	deg.C/W
Channel Temperature Rise	ΔT_{ch}	$(V_{DS} \times I_{dsr} - P_{out} + P_{in}) \times R_{th}$	-	88	140	deg.C

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

CASE STYLE	I2F	
RoHS Compliance	YES	
ESD	Class 1C	1000V to 2000V

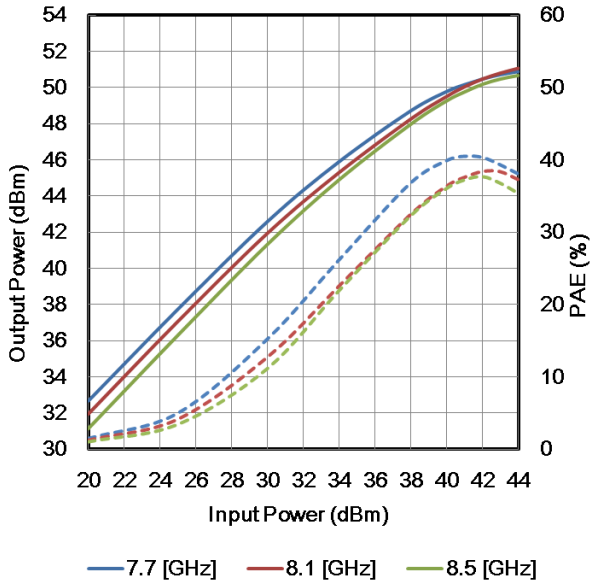
Note : Based on EIAJ ED-4701 C-111A(C=100pF, R=1.5kohm)

● RF Characteristics

Output Power &

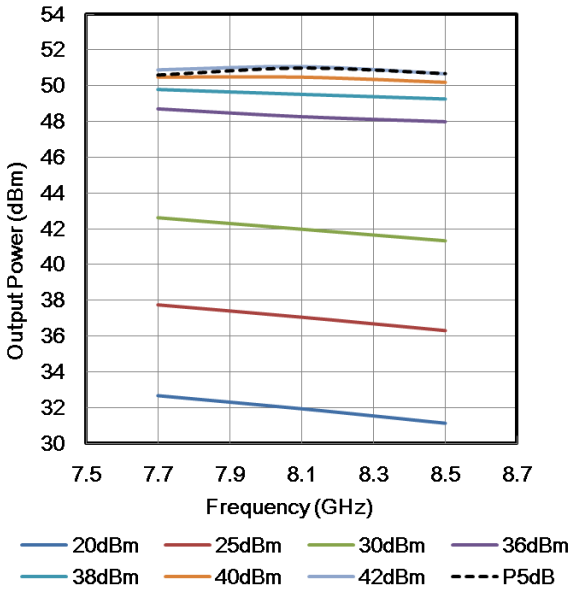
Power Added Efficiency vs. Input Power

V_{DS}=24V, $I_{DS(DC)}$=4.0A



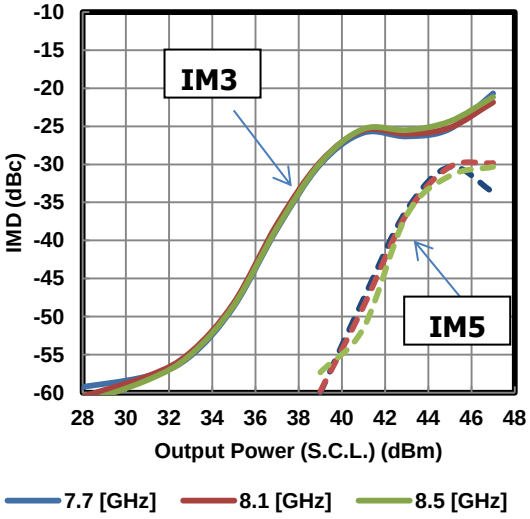
Output Power vs. Frequency

V_{DS}=24V, $I_{DS(DC)}$=4.0A



IMD vs. Output Power(S.C.L.)

V_{DS}=24V, $I_{DS(DC)}$=4.0A

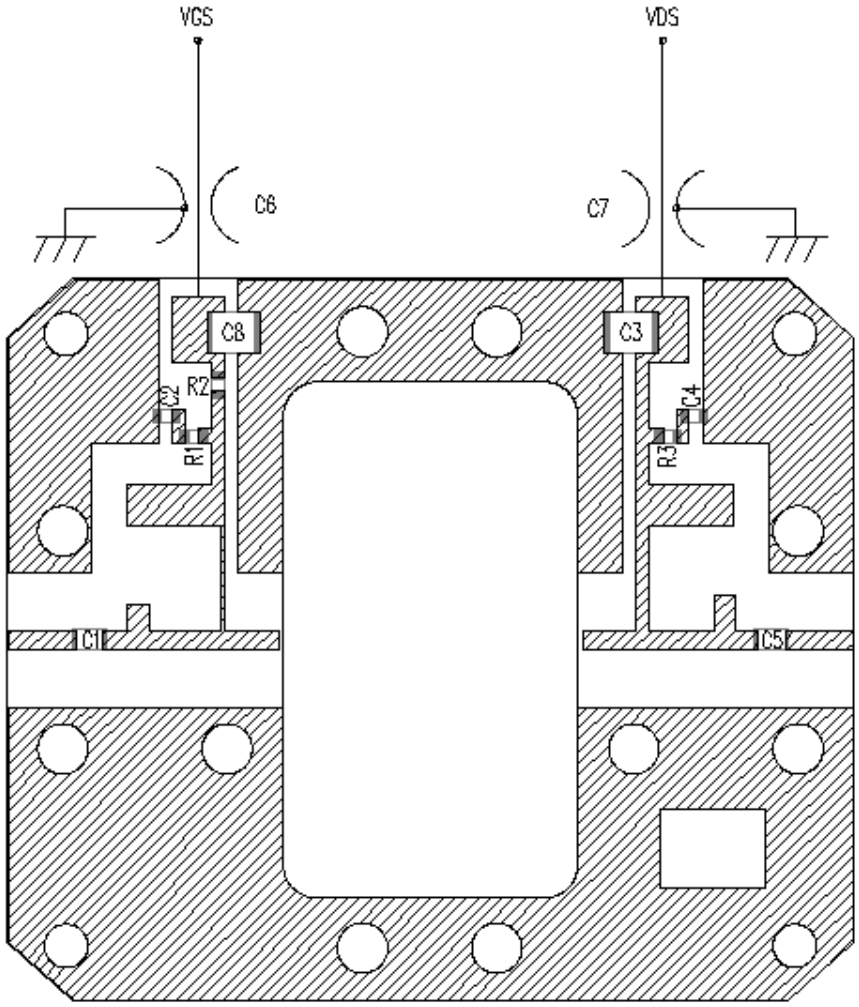


- **S-parameter**

Freq.	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7500 MHz	0.731	17.2	2.878	160.4	0.057	96.6	0.302	16.0
7600 MHz	0.706	5.7	2.969	145.0	0.060	80.8	0.297	-1.7
7700 MHz	0.681	-2.2	3.035	133.3	0.063	69.1	0.291	-13.7
7800 MHz	0.650	-9.9	3.130	121.9	0.065	56.6	0.282	-26.3
7900 MHz	0.600	-19.9	3.281	105.8	0.069	40.1	0.252	-42.0
8000 MHz	0.551	-26.8	3.457	93.8	0.073	27.0	0.219	-55.8
8100 MHz	0.485	-34.0	3.622	80.0	0.076	14.3	0.169	-76.3
8200 MHz	0.366	-44.3	3.904	59.9	0.084	-4.6	0.099	-144.1
8300 MHz	0.240	-45.3	4.014	42.9	0.088	-21.3	0.139	150.1
8400 MHz	0.144	-15.3	3.961	25.3	0.089	-38.5	0.244	115.4
8500 MHz	0.218	25.0	3.711	3.0	0.087	-59.7	0.391	86.8
8600 MHz	0.321	28.3	3.491	-11.8	0.084	-75.0	0.475	68.6
8700 MHz	0.406	22.9	3.225	-26.2	0.080	-88.7	0.538	54.8

● Amplifier Circuit Outline

SGK7785-100A



C1	2.0pF
C2	1000pF
C3	0.1uF
C4	1000pF
C5	2.0pF
C6	1000pF
C7	1000pF
C8	0.1uF
R1	51Ω
R2	25Ω
R3	51Ω

Rogers RO4003C

h=0.542mm εr=3.38

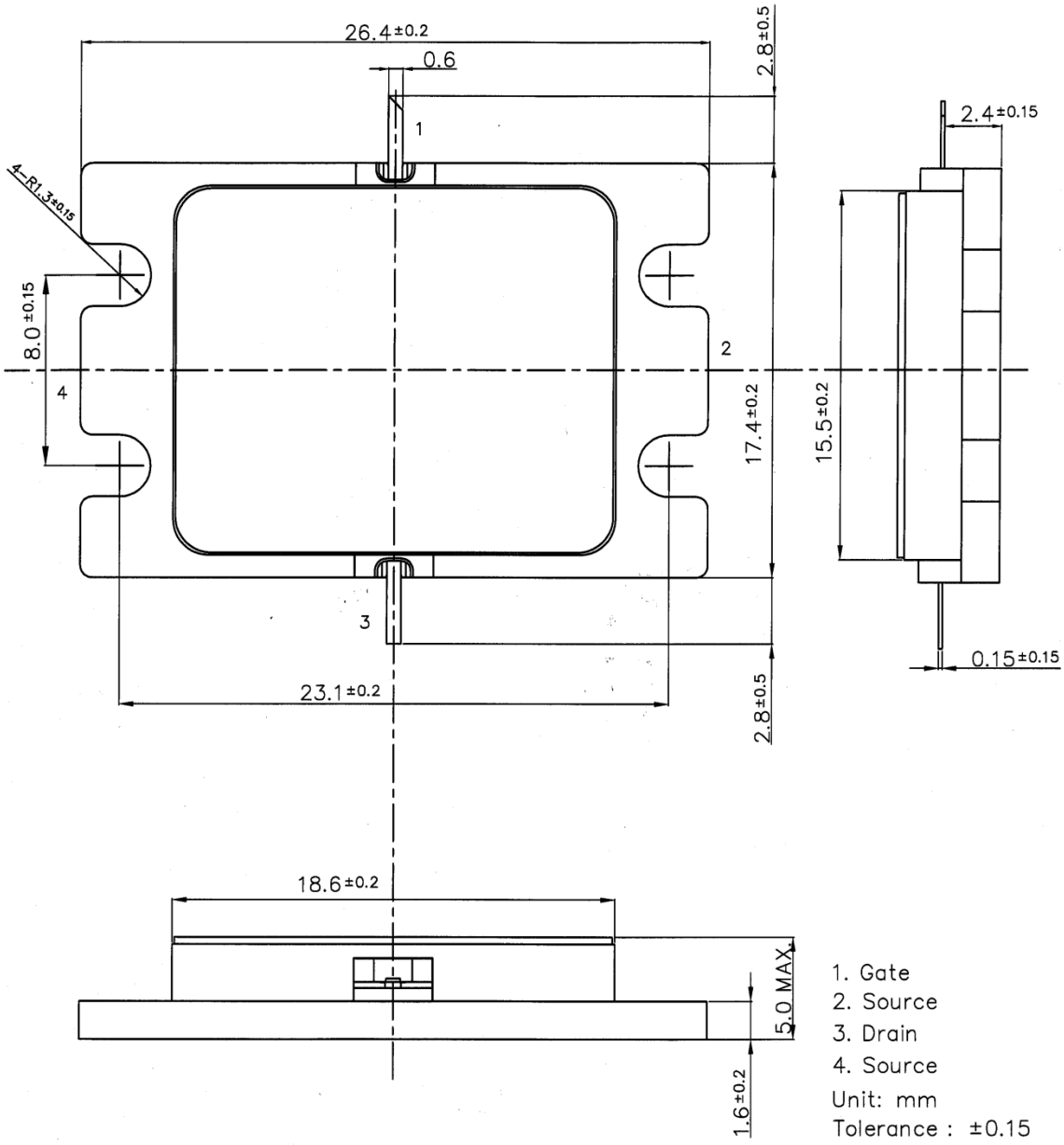
Cu=18um Unit:mm

C1 , C5 : ATC 600F(0805) , +/- 0.1pF

C6 , C7 : EMI FILTER MARUWA (FTA352AR102S-S)

- **Package Out Line**

Case Style: I2F



For further information please contact:

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