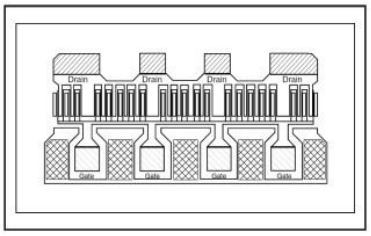
FLK107XV

GaAs FET Chips

FEATURES

- High Output Power: P_{1dB} = 30.0dBm(Typ.)
- High Gain: G_{1dB} = 6.5dB(Typ.)
- High Power Added Efficiency: PAE = 31%(Typ.)
- Proven Reliability



DESCRIPTION

The FLK107XV chip is a power GaAs FET that is designed for general purpose applications in the Ku-Band frequency range as it provides superior power, gain, and efficiency.
Sumitomo Electric stringent Quality Assurance Program assures the highest reliability and consistent performance.

ABSOLUTE MAXIMUM RATING (Ambient Temperature Ta=25deg.C)

Item	Symbol	Condition	Rating	Unit
Drain-Source Voltage	V_{DS}		15	V
Gate-Source Voltage	V_{GS}		-5	V
Total Power Dissipation	P_{tot}	Tc = 25deg.C	7.50	W
Storage Temperature	T_{stg}		-65 to +175	deg.C
Channel Temperature	T_{ch}		175	deg.C

Sumitomo Electric recommends the following conditions for the reliable operation of GaAs FETs:

1. The drain-source operating voltage (V_{DS}) should not exceed 10 volts.
2. The forward and reverse gate currents should not exceed 8.8 and -0.5 mA respectively with gate resistance of 500ohm.
3. The operating channel temperature (T_{ch}) should not exceed 145deg.C.

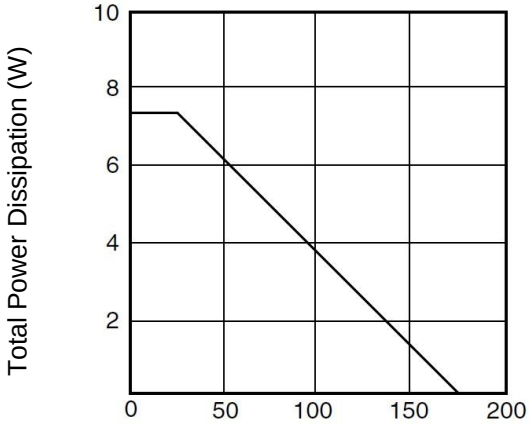
ELECTRICAL CHARACTERISTICS (Ambient Temperature Ta=25deg.C)

Item	Symbol	Test Conditions	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I_{DSS}	V_{DS} = 5V, V_{GS} = 0V	-	400	600	mA
Transconductance	gm	V_{DS} = 5V, I_{DS} = 250mA	-	200	-	mS
Pinch-off Voltage	Vp	V_{DS} = 5V, I_{DS} = 20mA	-1.0	-2.0	-3.5	V
Gate Source Breakdown Voltage	V_{GSO}	I_{GS} = -20uA	-5	-	-	V
Output Power at 1dB Gain Compression Point	P_{1dB}	V_{DS} = 10V	29	30	-	dBm
Power Gain at 1dB Gain Compression Point	G_{1dB}	$I_{DS} \approx 0.6 I_{DSS}$ f = 14.5GHz	5.5	6.5	-	dB
Power-added Efficiency	PAE		-	31	-	%
Thermal Resistance	R_{th}	Channel to Case	-	15	20	deg.C/W

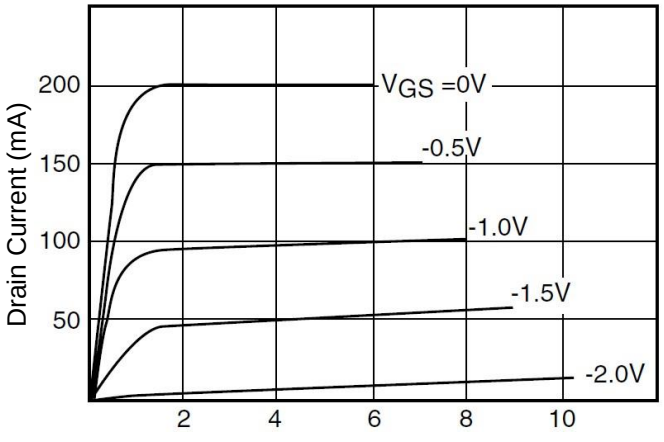
Note: RF parameter sample size 10pcs. criteria (accept/reject)=(2/3)
The chip must be enclosed in a hermetically sealed environment for optimum performance and reliability.

RoHS Compliance	Yes

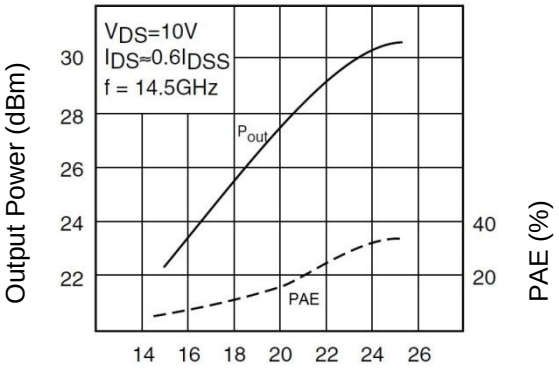
POWER DERATING CURVE



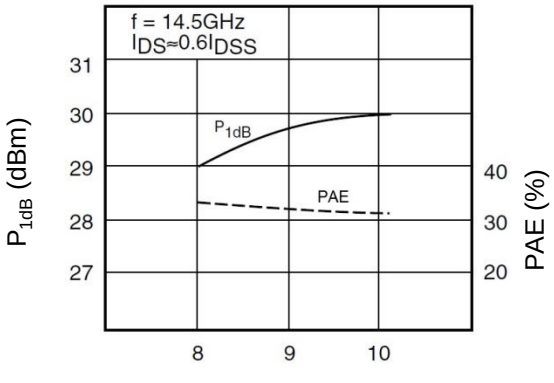
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



OUTPUT POWER vs. INPUT POWER



P_{1dB} & PAE vs. V_{DS}



S-PARAMETERS

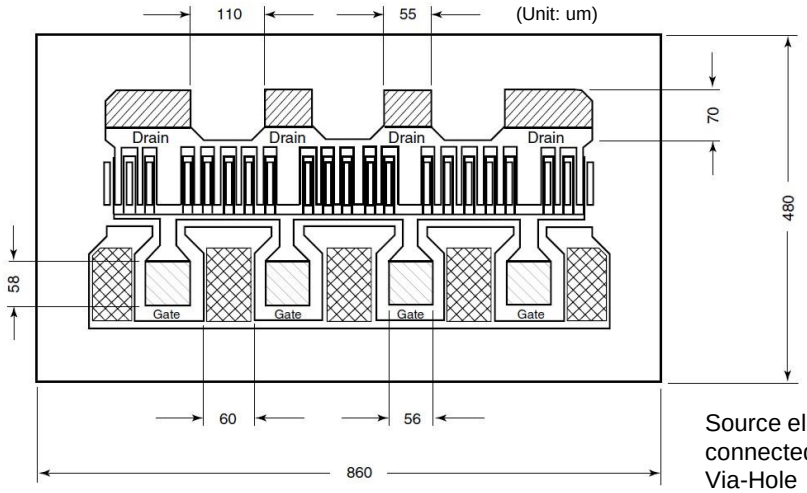
V_{DS} = 10V, I_{DS} = 240mA

Freq	S11		S21		S12		S22	
(MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.998	-14.5	11.209	171.6	0.007	82.1	0.214	-15.0
500	0.972	-65.3	9.441	142.2	0.031	54.8	0.227	-64.9
1000	0.941	-105.2	6.826	118.3	0.045	33.6	0.246	-98.3
1500	0.926	-127.5	5.082	103.5	0.050	21.4	0.263	-113.5
2000	0.919	-141.3	3.976	93.0	0.052	13.5	0.282	-121.0
2500	0.915	-150.7	3.236	84.7	0.053	7.8	0.302	-125.1
3000	0.913	-157.5	2.713	77.6	0.053	3.3	0.324	-127.7
3500	0.913	-162.9	2.325	71.3	0.053	-0.4	0.346	-129.6
4000	0.912	-167.3	2.026	65.6	0.053	-3.6	0.370	-131.1
4500	0.913	-171.0	1.789	60.2	0.053	-6.4	0.394	-132.6
5000	0.913	-174.2	1.596	55.1	0.052	-8.9	0.418	-134.0
5500	0.914	-177.1	1.436	50.2	0.052	-11.3	0.441	-135.4
6000	0.915	-179.7	1.301	45.5	0.051	-13.5	0.465	-136.8
6500	0.916	177.9	1.186	41.0	0.051	-15.5	0.487	-138.3
7000	0.917	175.6	1.086	36.6	0.050	-17.4	0.509	-139.8
7500	0.918	173.5	1.000	32.3	0.050	-19.2	0.530	-141.2
8000	0.919	171.5	0.923	28.2	0.049	-20.9	0.551	-142.7
8500	0.920	169.6	0.856	24.2	0.048	-22.5	0.570	-144.2
9000	0.921	167.7	0.795	20.3	0.048	-24.0	0.589	-145.7
9500	0.923	165.9	0.741	16.5	0.047	-25.5	0.607	-147.2
10000	0.924	164.2	0.692	12.7	0.046	-26.8	0.624	-148.7
10500	0.925	162.5	0.648	9.1	0.046	-28.2	0.640	-150.1
11000	0.926	160.9	0.608	5.6	0.045	-29.4	0.655	-151.6
11500	0.927	159.3	0.572	2.1	0.044	-30.6	0.669	-153.0
12000	0.928	157.7	0.538	-1.2	0.044	-31.8	0.683	-154.4
12500	0.929	156.2	0.508	-4.5	0.043	-32.9	0.696	-155.8
13000	0.930	154.7	0.479	-7.8	0.042	-33.9	0.708	-157.1
13500	0.932	153.2	0.453	-10.9	0.042	-34.9	0.720	-158.5
14000	0.933	151.7	0.429	-14.0	0.041	-35.9	0.731	-159.8
14500	0.934	150.3	0.407	-17.0	0.040	-36.8	0.741	-161.1
15000	0.935	148.9	0.386	-19.9	0.040	-37.7	0.751	-162.3
15500	0.936	147.5	0.367	-22.8	0.039	-38.6	0.760	-163.6
16000	0.937	146.1	0.349	-25.6	0.039	-39.4	0.769	-164.8
16500	0.937	144.8	0.333	-28.4	0.038	-40.2	0.777	-166.0
17000	0.938	143.5	0.317	-31.1	0.038	-41.0	0.785	-167.1
17500	0.939	142.1	0.302	-33.7	0.037	-41.7	0.793	-168.3
18000	0.940	140.8	0.289	-36.3	0.037	-42.5	0.800	-169.4
18500	0.941	139.6	0.276	-38.8	0.036	-43.2	0.806	-170.5
19000	0.942	138.3	0.264	-41.3	0.036	-43.8	0.813	-171.6
19500	0.943	137.1	0.252	-43.8	0.035	-44.5	0.819	-172.7
20000	0.944	135.8	0.241	-46.2	0.035	-45.1	0.824	-173.8

NOTE:* The data includes bonding wires.

n: number of wires Gate n=4 (0.2mm length, 25um Dia Au wire)
Drain n=4 (0.2mm length, 25um Dia Au wire)

CHIP OUTLINE



Source electrodes are connected to the PHS by Via-Hole

Die Thickness: 60±20um

(Via-Hole)

■ **BARE DIE INDEMNIFICATION**

All devices are DC probed and visually inspected at SEI, and non-compliant devices are removed. The RF electrical characteristics of the bare dice are warranted by the sampling inspection procedures. The standard sampling inspection procedure shall include the number of the sampling dice, position of the sampling dice in the wafer and RF electrical characteristics of the sampling dice measured in the test fixture. Customer shall understand that all the bare dice will not be 100% RF tested by SEI. It is the customer responsibility to verify performance of the devices.

Customer shall comply with the storage and handling requirements for condition and period of storage of the bare dice agreed by customer and SEI. Warranty will not apply when customer disregards the storage and handling requirements.

Warranty will not apply to the electrical characteristics and product quality to the bare dice after assembly by customer.

SEI will indemnify customer for warranty failures, provided however that the indemnification to customer shall be limited to supply of bare dice for substitution.

CAUTION

Sumitomo Electric Device Innovations, Inc. products contain **gallium arsenide (GaAs)** which can be hazardous to the human body and the environment. For safety, observe the following procedures:

・Do not put these products 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.

・Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.