

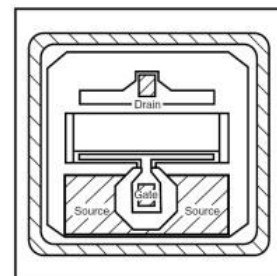
FEATURES

- High Output Power: $P_{1dB} = 28.5\text{dBm(Typ.)}$
- High Gain: $G_{1dB} = 7.0\text{dB(Typ.)}$
- High Power Added Efficiency: $PAE = 31.5\%(Typ.)$
- Proven Reliability

DESCRIPTION

The FLC087XP chip is a power GaAs FET that is designed for general purpose applications in the C-Band frequency range as it provides superior power, gain, and efficiency.

Sumitomo Electric's stringent Quality Assurance Program assures the highest reliability and consistent performance.



ABSOLUTE MAXIMUM RATING (Ambient Temperature $T_a=25\text{deg.C}$)

Item	Symbol	Condition	Rating	Unit
Drain-Source Voltage	V_{DS}		15	V
Gate-Source Voltage	V_{GS}		-5	V
Total Power Dissipation	P_{tot}	$T_c = 25\text{deg.C}$	4.16	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 4.8 and -0.5 mA respectively with gate resistance of 400ohm.
3. The operating channel temperature (T_{ch}) should not exceed 145deg.C.

ELECTRICAL CHARACTERISTICS (Ambient Temperature $T_a=25\text{deg.C}$)

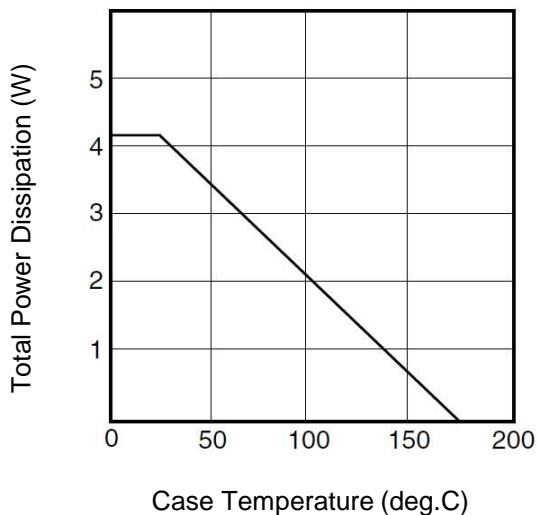
Item	Symbol	Test Conditions	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I_{DSS}	$V_{DS} = 5V, V_{GS} = 0V$	-	300	450	mA
Transconductance	g_m	$V_{DS} = 5V, I_{DS} = 200\text{mA}$	75	150	-	mS
Pinch-off Voltage	V_p	$V_{DS} = 5V, I_{DS} = 15\text{mA}$	-1.0	-2.0	-3.5	V
Gate Source Breakdown Voltage	V_{GSO}	$I_{GS} = -15\mu A$	-5	-	-	V
Output Power at 1dB Gain Compression Point	P_{1dB}	$V_{DS} = 10V$	27.5	28.5	-	dBm
Power Gain at 1dB Gain Compression Point	G_{1dB}	$I_{DS} \approx 0.6I_{DSS}$ $f = 8\text{GHz}$	6.0	7.0	-	dB
Power-added Efficiency	PAE		-	31.5	-	%
Thermal Resistance	R_{th}	Channel to Case	-	25	36	deg.C/W

Note: RF parameter sample size 10pcs. criteria (accept/reject)=(2/3)

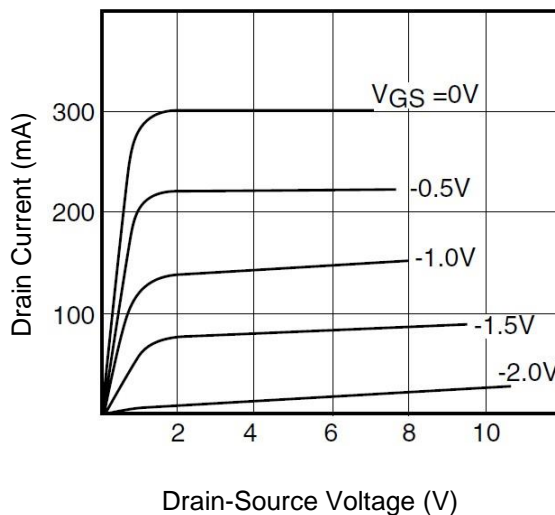
The chip must be enclosed in a hermetically sealed environment for optimum performance and reliability.

RoHS Compliance	Yes
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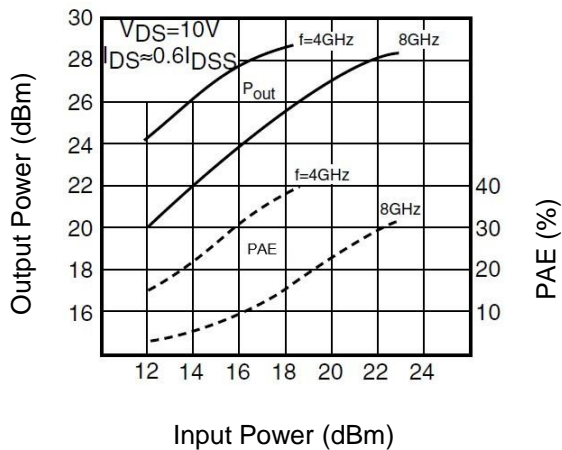
POWER DERATING CURVE



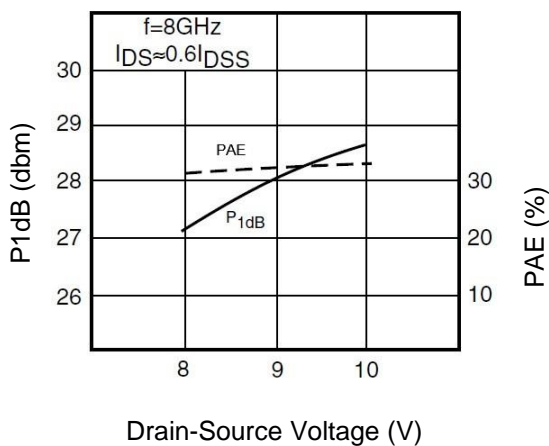
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



OUTPUT POWER vs. INPUT POWER



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



Typical on chip measurements

S-PARAMETERS

$V_{DS} = 10V$, $I_{DS} = 200mA$

Freq (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.998	-11.7	9.704	172.7	0.006	83.8	0.510	-4.7
500	0.965	-54.6	8.567	145.8	0.026	61.3	0.467	-21.1
1000	0.914	-92.8	6.593	121.3	0.039	42.4	0.399	-34.2
1500	0.883	-116.8	5.088	104.7	0.046	31.3	0.355	-42.2
2000	0.866	-132.5	4.067	92.4	0.048	24.5	0.332	-48.2
2500	0.857	-143.5	3.363	82.4	0.050	20.0	0.323	-53.7
3000	0.852	-151.7	2.856	73.7	0.051	16.9	0.320	-59.0
3500	0.848	-158.1	2.478	65.9	0.051	14.6	0.323	-64.3
4000	0.846	-163.4	2.186	58.6	0.052	12.9	0.330	-69.7
4500	0.845	-167.9	1.954	51.8	0.052	11.5	0.338	-74.9
5000	0.845	-171.8	1.765	45.2	0.052	10.5	0.349	-80.2
5500	0.845	-175.3	1.608	38.9	0.052	9.6	0.362	-85.3
6000	0.845	-178.4	1.476	32.7	0.053	8.9	0.375	-90.4
6500	0.845	178.7	1.362	26.7	0.053	8.4	0.390	-95.3
7000	0.846	176.1	1.264	20.8	0.053	8.0	0.406	-100.2
7500	0.847	173.6	1.177	15.0	0.053	7.6	0.422	-105.0
8000	0.847	171.2	1.099	9.3	0.053	7.3	0.439	-109.6
8500	0.848	169.0	1.030	3.7	0.053	7.1	0.456	-114.2
9000	0.849	166.8	0.967	-1.9	0.053	7.0	0.474	-118.7
9500	0.850	164.7	0.909	-7.4	0.053	6.9	0.492	-123.1
10000	0.852	162.7	0.856	-12.8	0.054	6.8	0.511	-127.5
10500	0.853	160.8	0.806	-18.1	0.054	6.7	0.529	-131.7
11000	0.854	158.9	0.760	-23.4	0.054	6.7	0.548	-135.9
11500	0.855	157.1	0.716	-28.7	0.054	6.7	0.567	-140.0
12000	0.857	155.3	0.675	-33.9	0.055	6.6	0.585	-144.0

NOTE:* The data includes bonding wires.

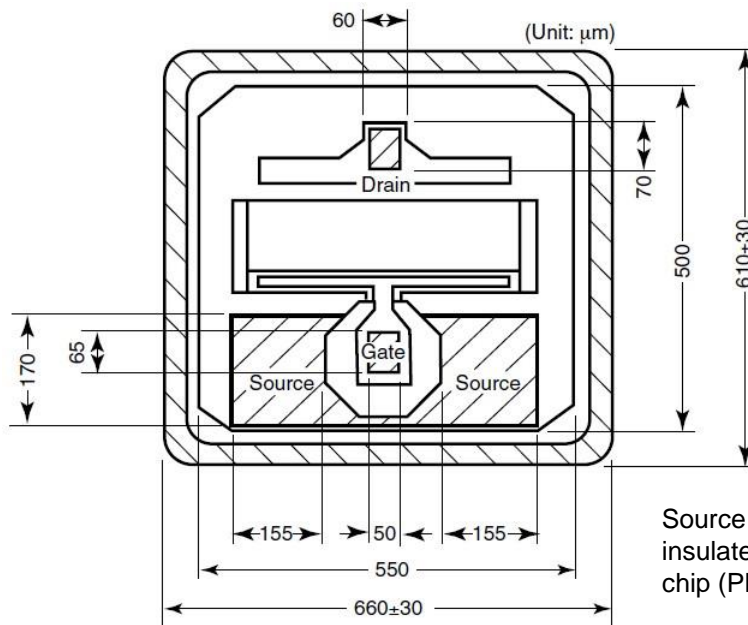
n: number of wires

Gate n=1 (0.3mm length, 25um Dia Au wire)

Drain n=1 (0.3mm length, 25um Dia Au wire)

Source n=4 (0.3mm length, 25um Dia Au wire)

CHIP OUTLINE



Source electrodes are electrically insulated from the bottom of the chip (PHS)

Die Thickness: 60 \pm 20 μm

■ 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.