

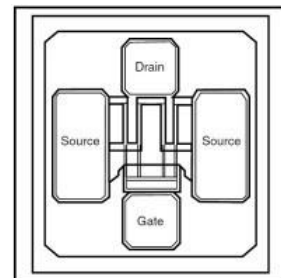
FEATURES

- Medium Power Output: $P_{1dB}=21.5\text{dBm(Typ.)}@8.0\text{GHz}$
- High Power Gain: $G_{1dB}=11\text{dB(Typ.)}@8.0\text{GHz}$
- Proven Reliability

DESCRIPTION

The FSX017X is a general purpose GaAs FET designed for medium power applications up to 12GHz. These devices have a wide dynamic range and are suitable for use in medium power, wide band, linear drive amplifiers or oscillators.

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}		12	V
Gate-Source Voltage	V_{GS}		-5	V
Total Power Dissipation	P_{tot}	$T_c = 25\text{deg.C}$	1.0	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 8 volts.
2. The forward and reverse gate currents should not exceed 0.7 and -0.1 mA respectively with gate resistance of 2000ohm.
3. The operating channel temperature (T_{ch}) should not exceed 145deg.C.

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

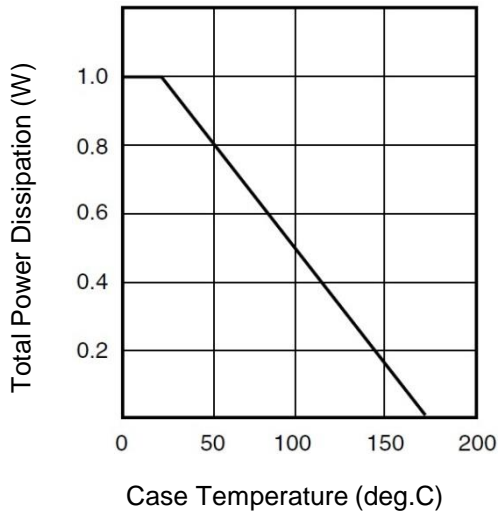
Item	Symbol	Test Conditions	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I_{DSS}	$V_{DS} = 3V, V_{GS} = 0V$	35	55	75	mA
Transconductance	gm	$V_{DS} = 3V, I_{DS} = 27\text{mA}$	-	50	-	mS
Pinch-off Voltage	V_p	$V_{DS} = 3V, I_{DS} = 2.7\text{mA}$	-0.7	-1.2	-1.7	V
Gate Source Breakdown Voltage	V_{GSO}	$I_{GS} = -2.7\mu A$	-5.0	-	-	V
Noise Figure	NF	$V_{DS} = 3V, I_{DS} = 10\text{mA}$	-	2.5	-	dB
Associated Gain	G_{as}	$f = 8\text{GHz}$	-	10.5	-	dB
Output Power at 1dB G.C.P.	P_{1dB}	$V_{DS} = 8V, I_{DS} = 0.7I_{DSS}, f = 4\text{GHz}$	-	21.5	-	dBm
		$f = 8\text{GHz}$	20.5	21.5	-	dBm
		$f = 12\text{GHz}$	-	20.5	-	dBm
Power Gain at 1dB G.C.P.	G_{1dB}	$V_{DS} = 8V, I_{DS} = 0.7I_{DSS}, f = 4\text{GHz}$	-	15.0	-	dB
		$f = 8\text{GHz}$	10.0	11.0	-	dB
		$f = 12\text{GHz}$	-	7.5	-	dB
Thermal Resistance	R_{th}	Channel to Case	-	120	150	deg.C/W

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

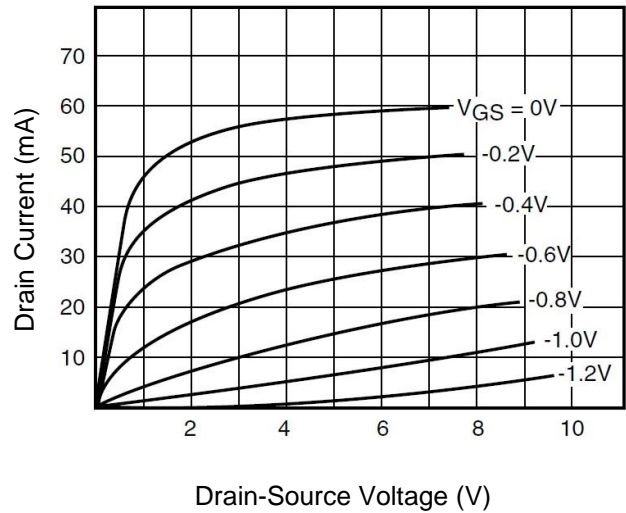
The chip must be enclosed in a hermetically sealed environment for optimum performance and reliability.

RoHS Compliance	Yes
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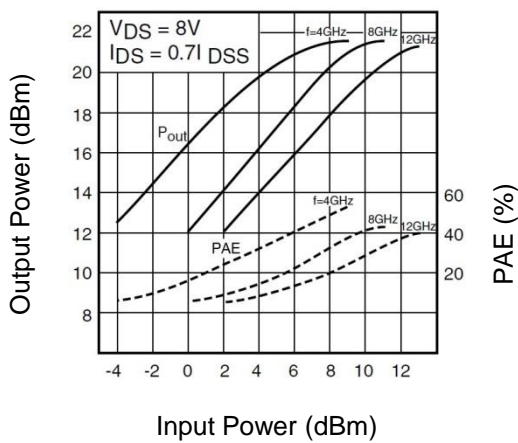
POWER DERATING CURVE



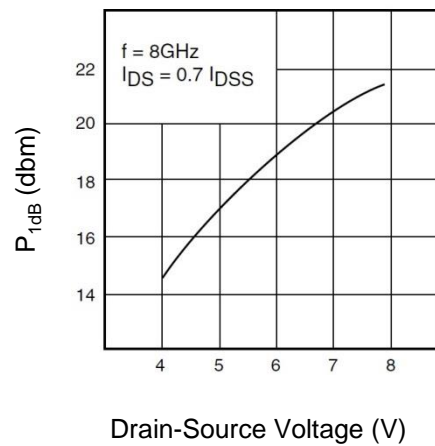
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



OUTPUT POWER vs. INPUT POWER



P_{1dB} vs. V_{DS}



S-PARAMETERS

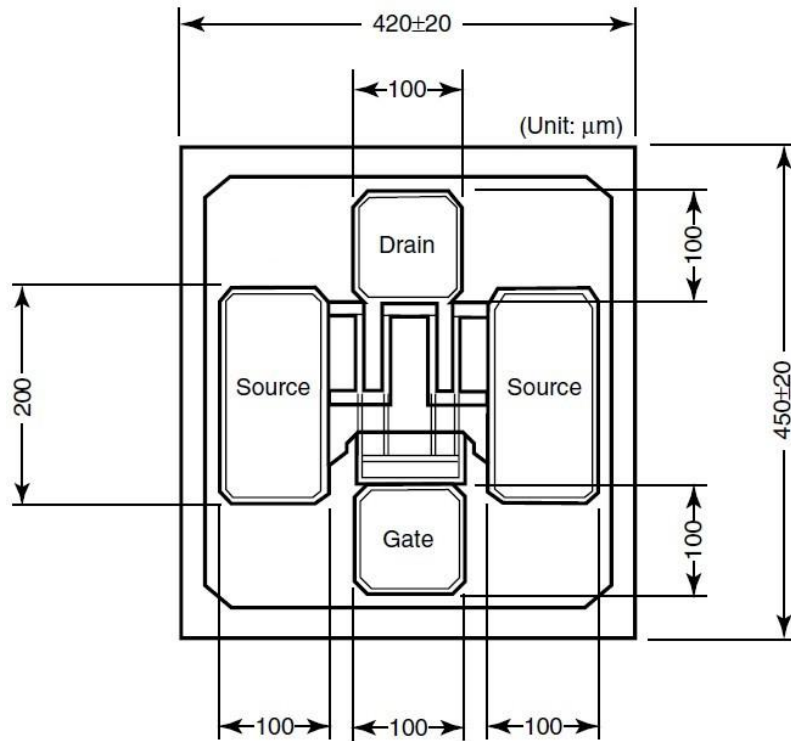
$V_{DS} = 8V$, $I_{DS} = 35mA$

Freq (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1000	0.989	-24.0	4.538	162.3	0.013	76.7	0.837	-6.1
2000	0.960	-46.5	4.260	145.7	0.025	65.4	0.820	-11.9
3000	0.925	-66.6	3.890	130.9	0.035	55.1	0.801	-16.9
4000	0.890	-84.0	3.493	117.7	0.042	46.0	0.782	-21.6
5000	0.860	-99.0	3.132	106.3	0.048	38.6	0.764	-25.9
6000	0.833	-111.8	2.814	95.9	0.052	32.5	0.751	-29.9
7000	0.814	-122.6	2.525	86.5	0.054	27.4	0.740	-33.8
8000	0.799	-132.1	2.294	78.2	0.057	23.2	0.733	-37.8
9000	0.788	-140.6	2.095	70.2	0.060	18.6	0.726	-41.7
10000	0.780	-148.1	1.931	62.8	0.061	15.1	0.720	-45.7
11000	0.773	-154.7	1.782	55.5	0.063	12.0	0.716	-49.7
12000	0.768	-160.9	1.646	48.7	0.064	9.1	0.710	-53.6
13000	0.762	-166.3	1.536	42.5	0.065	5.9	0.704	-57.6
14000	0.759	-171.4	1.442	36.4	0.065	2.6	0.702	-61.4
15000	0.759	-176.0	1.343	29.7	0.065	2.1	0.699	-65.4
16000	0.759	179.6	1.269	25.1	0.068	-0.2	0.699	-69.5
17000	0.764	175.6	1.215	18.1	0.066	-3.1	0.697	-73.4
18000	0.766	171.6	1.137	12.7	0.069	-3.6	0.695	-77.7
19000	0.771	167.7	1.087	7.5	0.071	-6.6	0.694	-81.8
20000	0.778	164.1	1.042	1.2	0.070	-10.1	0.691	-85.4

NOTE:* The data includes bonding wires.

n: number of wires	Gate	n=1 (0.1mm length, 25um Dia Au wire)
	Drain	n=1 (0.1mm length, 25um Dia Au wire)
	Source	n=4 (0.2mm length, 25um Dia Au wire)

CHIP OUTLINE



Die Thickness: 100 \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.