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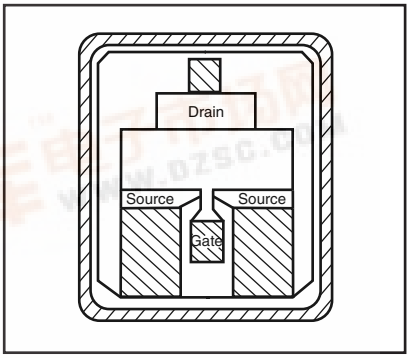
FLK017XP

GaAs FET & HEMT Chips

FEATURES

- High Output Power: P_{1dB} = 20.5dBm(Typ.)
- High Gain: G_{1dB} = 8.0dB(Typ.)
- High PAE: η_{add} = 26%(Typ.)
- Proven Reliability



DESCRIPTION

The FLK017XP 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.

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

ABSOLUTE MAXIMUM RATING (Ambient Temperature Ta=25°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°C	1.15	W
Storage Temperature	T_{stg}		-65 to +175	°C
Channel Temperature	T_{ch}		175	°C

Fujitsu 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 1.34 and -0.05 mA respectively with gate resistance of 3000Ω.
3. The operating channel temperature (T_{ch}) should not exceed 145°C.

ELECTRICAL CHARACTERISTICS (Ambient Temperature Ta=25°C)

Item	Symbol	Test Conditions	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I_{DSS}	V_{DS} = 5V, V_{GS} = 0V	-	60	90	mA
Transconductance	gm	V_{DS} = 5V, I_{DS} = 40mA	-	30	-	mS
Pinch-off Voltage	V_p	V_{DS} = 5V, I_{DS} = 3mA	-1.0	-2.0	-3.5	V
Gate Source Breakdown Voltage	V_{GSO}	I_{GS} = -3μA	-5	-	-	V
Output Power at 1dB G.C.P.	P_{1dB}	V_{DS} = 10V $I_{DS} \approx 0.6\ I_{DSS}$ f = 14.5GHz	19.5	20.5	-	dBm
Power Gain at 1dB G.C.P.	G_{1dB}		7.0	8.0	-	dB
Power-added Efficiency	η_{add}		-	26	-	%
Noise Figure	NF	V_{DS} = 3V I_{DS} = 20mA f = 12GHz	-	2.5	-	dB
Associated Gain	Gas		-	7	-	dB
Maximum Availble Gain	$G_{a(max)}$	V_{DS} = 10V I_{DS} = 36mA f = 12GHz	-	11	-	dB
Thermal Resistance	R_{th}	Channel to Case	-	65	130	°C/W

Note: RF parameter sample size 10pcs. criteria (accept/reject)=(2/3) **G.C.P.: Gain Compression Point**

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

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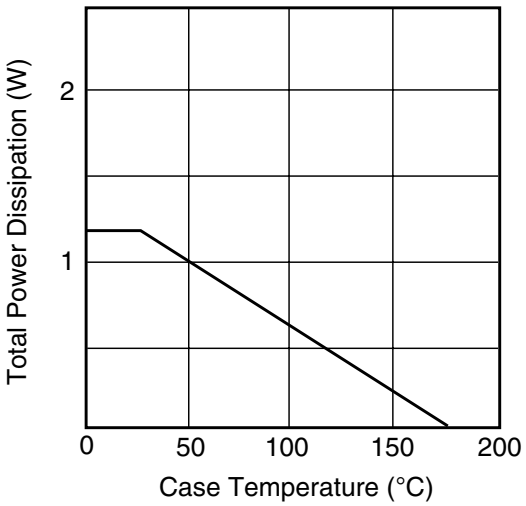
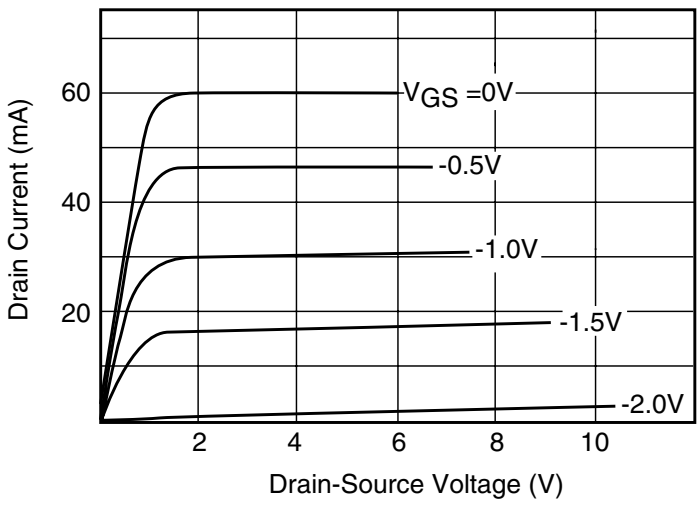
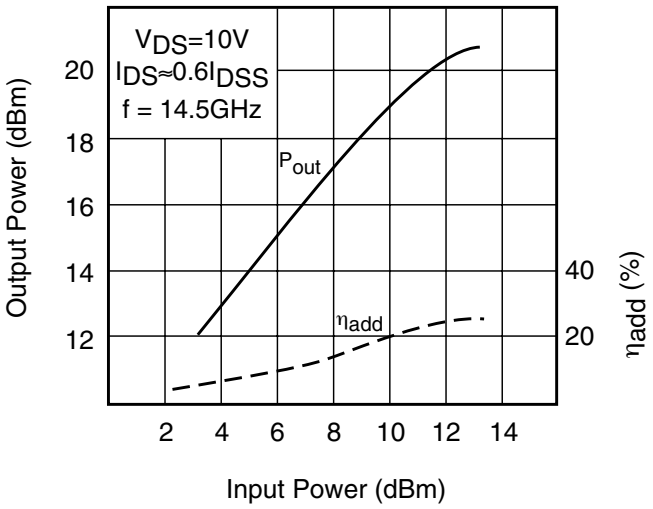
POWER DERATING CURVE



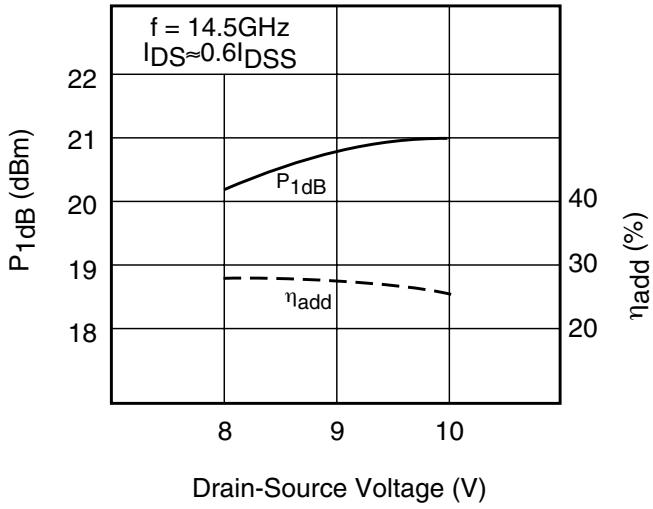
DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



OUTPUT POWER vs. INPUT POWER



P_{1dB} & η_{add} vs. V_{DS}



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S-PARAMETERS

V_{DS} = 10V, I_{DS} = 40mA

FREQUENCY	S11		S21		S12		S22	
(MHZ)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	1.000	-1.9	2.832	178.4	.001	88.9	.846	-0.6
500	.998	-9.5	2.824	171.9	.007	84.7	.845	-2.9
1000	.992	-18.9	2.799	163.9	.014	79.5	.842	-5.7
1500	.982	-28.2	2.758	156.0	.021	74.3	.838	-8.5
2000	.969	-37.4	2.703	148.3	.028	69.4	.832	-11.2
2500	.953	-46.3	2.638	140.7	.034	64.6	.825	-13.8
3000	.936	-55.0	2.564	133.4	.039	60.0	.817	-16.4
3500	.918	-63.5	2.485	126.2	.044	55.6	.809	-18.8
4000	.899	-71.6	2.401	119.4	.049	51.5	.800	-21.2
4500	.881	-79.5	2.316	112.7	.053	47.6	.792	-23.5
5000	.863	-87.1	2.231	106.3	.056	44.0	.784	-25.8
5500	.846	-94.4	2.147	100.1	.059	40.6	.776	-28.0
6000	.830	-101.5	2.064	94.1	.062	37.3	.769	-30.1
6500	.816	-108.3	1.985	88.3	.064	34.3	.762	-32.2
7000	.802	-114.8	1.908	82.7	.066	31.5	.755	-34.3
7500	.791	-121.1	1.834	77.2	.067	28.9	.749	-36.4
8000	.780	-127.1	1.764	72.0	.069	26.4	.744	-38.4
8500	.771	-133.0	1.697	66.8	.070	24.1	.739	-40.5
9000	.764	-138.6	1.634	61.8	.071	21.9	.735	-42.5
9500	.757	-143.9	1.574	57.0	.072	19.8	.731	-44.6
10000	.752	-149.1	1.516	52.2	.072	17.9	.727	-46.7
10500	.747	-154.1	1.462	47.6	.073	16.1	.724	-48.8
11000	.744	-158.9	1.410	43.0	.073	14.4	.721	-51.0
11500	.741	-163.5	1.361	38.6	.073	12.8	.718	-53.2
12000	.739	-168.0	1.314	34.2	.073	11.3	.716	-55.4
12500	.738	-172.3	1.269	29.9	.073	9.9	.713	-57.6
13000	.738	-176.4	1.227	25.7	.073	8.6	.711	-59.8
13500	.738	179.6	1.186	21.6	.073	7.3	.710	-62.1
14000	.739	175.8	1.147	17.5	.073	6.2	.708	-64.5
14500	.740	172.1	1.110	13.5	.073	5.1	.707	-66.8
15000	.742	168.5	1.074	9.5	.072	4.1	.706	-69.2
15500	.744	165.1	1.039	5.6	.072	3.1	.705	-71.7
16000	.746	161.8	1.006	1.7	.072	2.3	.704	-74.2
16500	.749	158.5	.974	-2.1	.071	1.5	.704	-76.7
17000	.752	155.5	.943	-5.9	.071	0.7	.703	-79.2
17500	.755	152.5	.913	-9.6	.071	0.0	.703	-81.8
18000	.758	149.6	.885	-13.3	.070	-0.6	.703	-84.5
18500	.761	146.8	.856	-16.9	.070	-1.2	.703	-87.1
19000	.765	144.1	.829	-20.5	.070	-1.7	.703	-89.8
19500	.768	141.4	.803	-24.1	.070	-2.2	.704	-92.6
20000	.772	138.9	.777	-27.7	.069	-2.7	.704	-95.3

NOTE:* The data includes bonding wires.

n: number of wires Gate n=1 (0.2mm length, 25µm Dia Au wire)
Drain n=1 (0.2mm length, 25µm Dia Au wire)
Source n=4 (0.3mm length, 25µm Dia Au wire)

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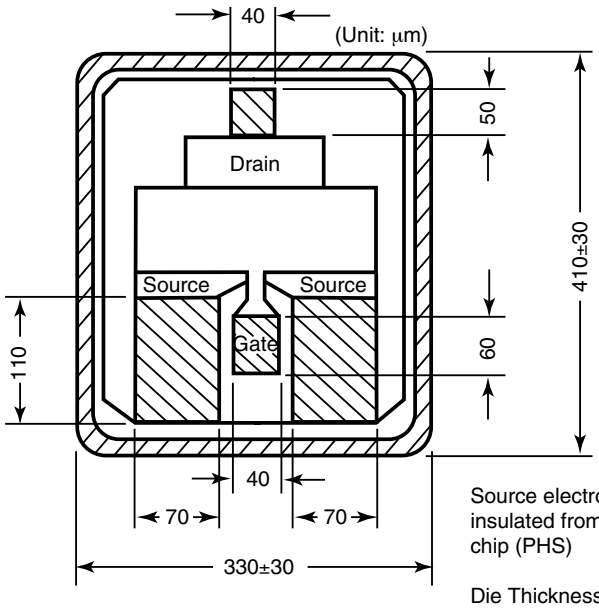
CHIP OUTLINE



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

Die Thickness: 60±20μm

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