

FLL300IL-1, FLL300IL-2, FLL300IL-3

L-Band Medium & High Power GaAs FET

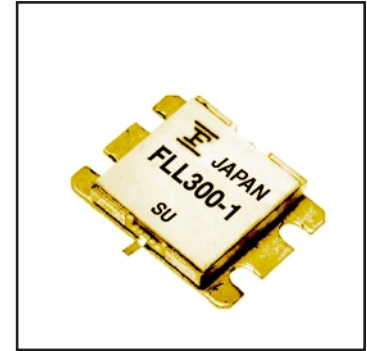
FEATURES

- High Output Power: $P_{1dB} = 44.5\text{dBm}$ (Typ.)
- High Gain: $G_{1dB} = 12.0\text{dB}$ (Typ.) @ 1.8GHz (FLL300IL-2)
- High PAE: $\eta_{add} = 44\%$ (Typ.)
- Proven Reliability
- Hermetically Sealed Package

DESCRIPTION

The FLL300IL-1, FLL300IL-2, FLL300IL-3 are Power GaAs FETs that are specifically designed to provide high power at L-Band frequencies with gain, linearity and efficiency superior to that of silicon devices. The performance in multitone environments for Class AB operation make them ideally suited for base station applications.

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



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

Item	Symbol	Condition	Rating	Unit
Drain-Source Voltage	V_{DS}		15	V
Gate-Source Voltage	V_{GS}		-5	V
Total Power Dissipation	P_T	$T_C = 25^\circ\text{C}$	100	W
Storage Temperature	T_{stg}		-65 to +175	$^\circ\text{C}$
Channel Temperature	T_{ch}		175	$^\circ\text{C}$

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 80.4 and -17.4 mA respectively with gate resistance of 25Ω .
3. The operating channel temperature (T_{ch}) should not exceed 145°C .

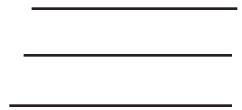
ELECTRICAL CHARACTERISTICS (Ambient Temperature $T_a=25^\circ\text{C}$)

Item	Symbol	Test Conditions*	Limit			Unit	
			Min.	Typ.	Max.		
Saturated Drain Current	I_{DSS}	$V_{DS} = 5\text{V}, V_{GS} = 0\text{V}$	-	12	16	A	
Transconductance	g_m	$V_{DS} = 5\text{V}, I_{DS} = 7200\text{mA}$	-	6000	-	mS	
Pinch-off Voltage	V_p	$V_{DS} = 5\text{V}, I_{DS} = 720\text{mA}$	-1.0	-2.0	-3.5	V	
Gate Source Breakdown Voltage	V_{GSO}	$I_{GS} = -720\mu\text{A}$	-5	-	-	V	
Output Power at 1dB G.C.P.	FLL300IL-1	$V_{DS} = 10\text{V}$ $I_{DS} = 0.5 I_{DSS}$ (Typ.)	43.0	44.5	-	dBm	
	FLL300IL-2						f=900MHz
	FLL300IL-3						f=1.8GHz
Power Gain at 1dB G.C.P.	FLL300IL-1		f=2.6GHz	11.0	13.0	-	dB
	FLL300IL-2		f=900MHz	10.0	12.0	-	dB
	FLL300IL-3		f=1.8GHz	8.0	10.0	-	dB
Drain Current	I_{dsr}	$V_{DS} = 10\text{V}$	-	6.0	8.0	A	
Power added Efficiency	η_{add}	$I_{DS} = 0.5 I_{DSS}$ (Typ.)	-	44	-	%	
Thermal Resistance	R_{th}	Channel to Case	-	1.1	1.5	$^\circ\text{C}/\text{W}$	
Channel Temperature Rise	ΔT_{ch}	$(10\text{V} \times I_{dsr} - P_{out} + P_{in}) \times R_{th}$	-	-	80	$^\circ\text{C}$	

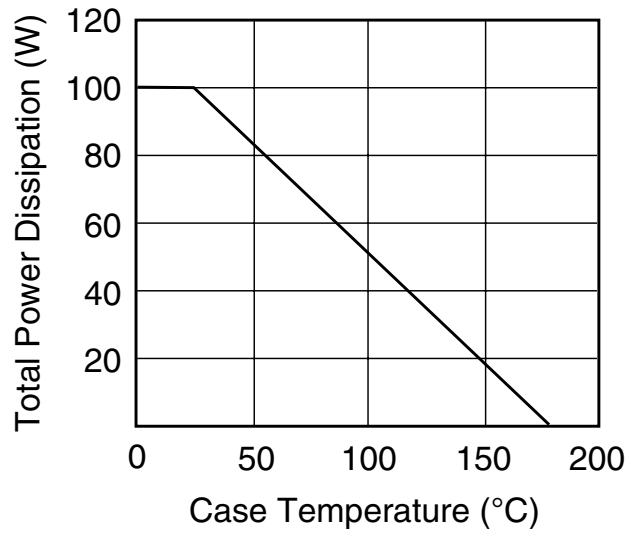
CASE STYLE: IL

G.C.P.: Gain Compression Point

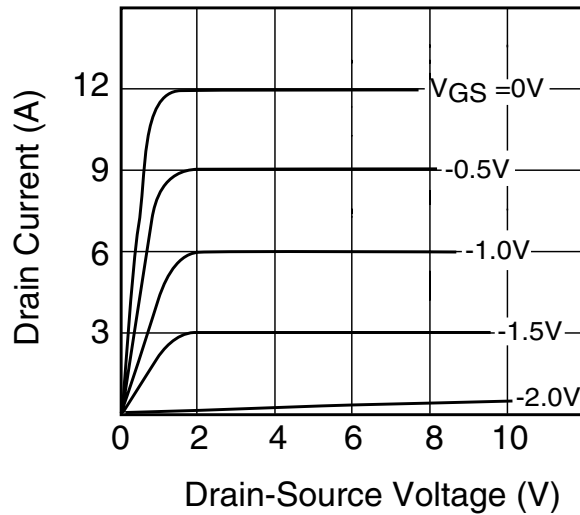
* Under fixed VGS bias condition



POWER DERATING CURVE

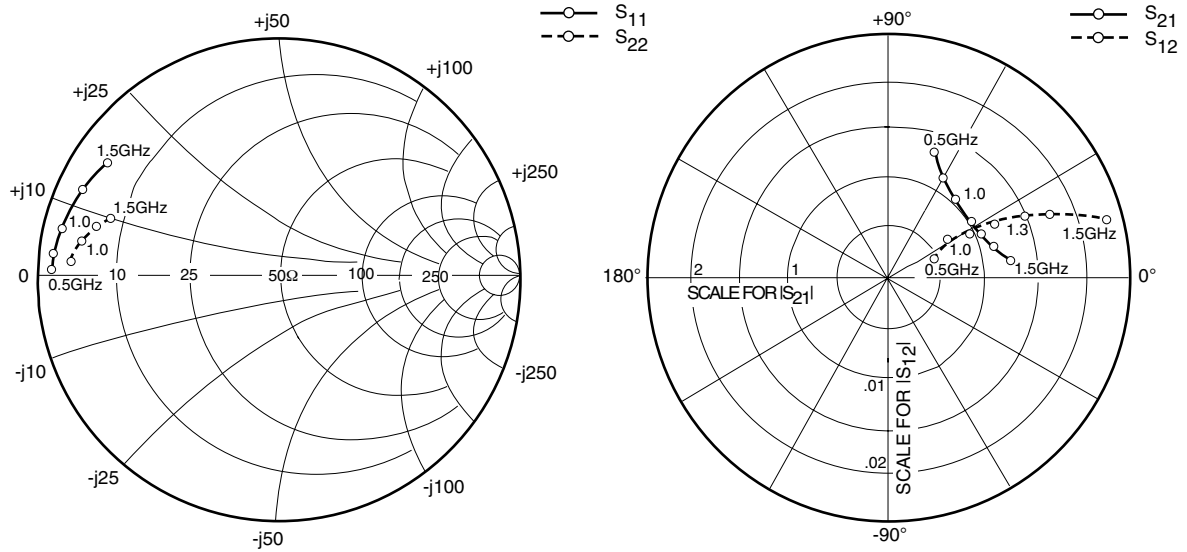


DRAIN CURRENT vs. DRAIN-SOURCE VOLTAGE



FLL300IL-1

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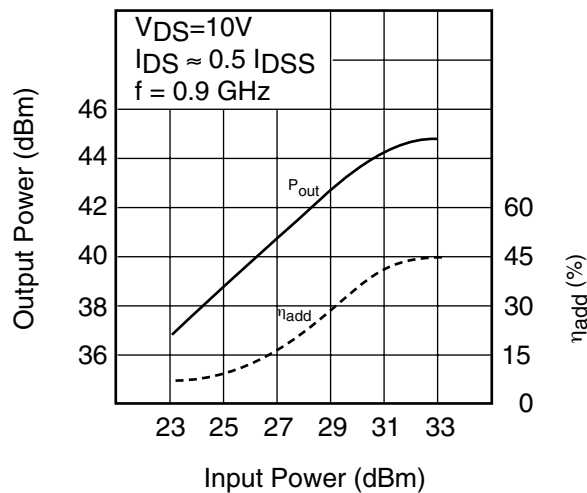


S-PARAMETERS

$V_{DS} = 10V, I_{DS} = 6000mA$

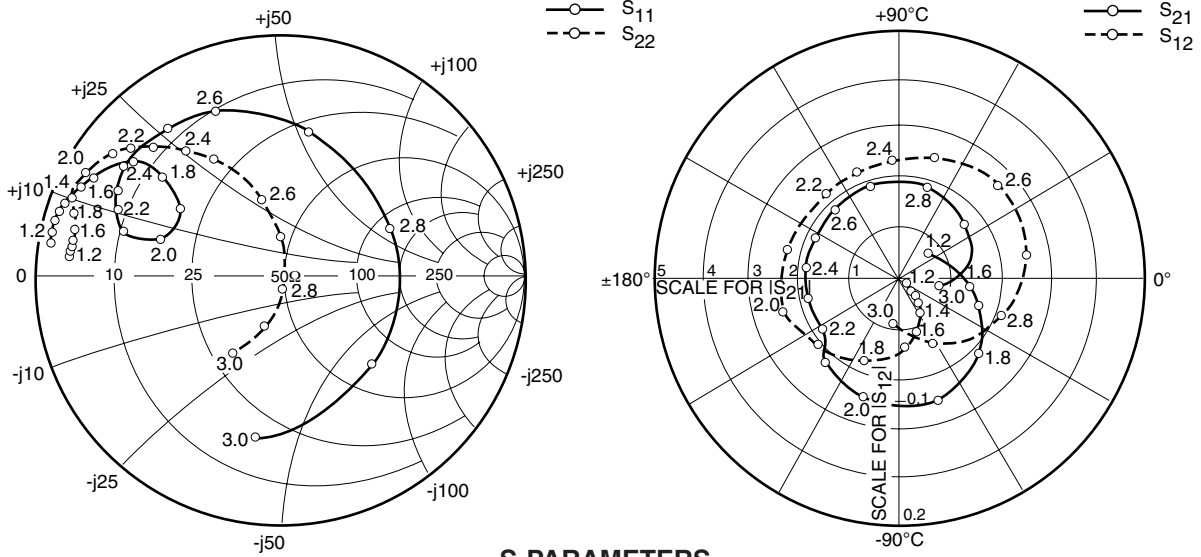
FREQUENCY (MHZ)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
500	.961	176.7	1.318	70.0	.005	26.1	.889	174.0
600	.957	174.7	1.162	64.9	.005	26.6	.884	173.0
700	.956	172.5	1.053	59.9	.006	33.0	.880	171.7
800	.955	170.6	.989	55.1	.007	32.2	.871	170.5
900	.948	168.2	.951	49.6	.008	28.6	.865	169.5
1000	.943	166.0	.944	44.5	.009	25.7	.855	167.7
1100	.933	161.9	.952	37.9	.010	32.6	.841	167.0
1200	.923	158.8	.975	31.7	.012	25.2	.828	165.1
1300	.910	155.1	1.021	24.7	.015	23.1	.810	163.3
1400	.898	151.0	1.094	16.8	.017	19.7	.789	161.1
1500	.875	145.8	1.182	8.4	.023	15.1	.760	158.9

OUTPUT POWER vs. INPUT POWER



FLL300IL-2

L-Band Medium & High Power GaAs FET

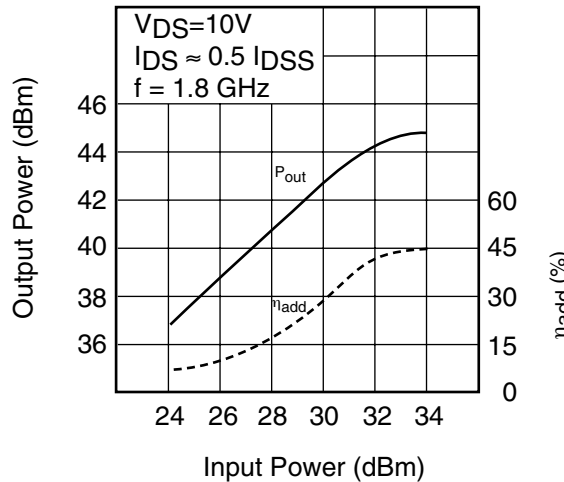


S-PARAMETERS

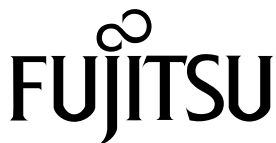
$V_{DS} = 10V, I_{DS} = 6000mA$

FREQUENCY (MHZ)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1000	.953	167.2	.788	34.0	.003	-32.3	.869	169.9
1100	.944	164.6	.811	28.0	.005	-31.6	.864	169.0
1200	.933	161.0	.882	21.5	.006	-50.9	.859	167.9
1300	.923	157.3	.997	14.0	.007	-50.6	.857	166.2
1400	.903	153.3	1.169	5.3	.008	-60.5	.850	165.2
1500	.864	148.3	1.419	-6.9	.010	-71.2	.853	164.7
1600	.788	142.2	1.752	-23.0	.014	-86.6	.868	162.7
1700	.654	137.8	2.179	-45.3	.018	-109.7	.889	160.0
1800	.506	144.5	2.526	-74.2	.023	-136.9	.923	155.3
1900	.522	161.1	2.523	-104.9	.024	-167.7	.907	148.1
2000	.652	162.2	2.249	-131.4	.022	165.4	.852	141.8
2100	.716	154.3	1.946	-149.5	.021	148.1	.789	136.7
2200	.746	150.0	1.984	-167.8	.023	129.7	.730	130.5
2300	.771	139.4	1.902	171.9	.022	110.3	.644	124.2
2400	.763	125.1	1.887	152.6	.023	91.3	.555	117.9
2500	.722	106.2	1.935	133.4	.025	71.1	.460	113.5
2600	.626	75.9	1.998	106.5	.027	41.9	.323	103.1
2700	.508	23.4	1.932	73.3	.026	9.1	.161	89.3
2800	.544	-45.8	1.613	36.7	.021	-25.1	.031	-62.8
2900	.686	-94.8	1.136	3.4	.016	-63.2	.210	-105.9
3000	.791	-123.6	.726	-22.0	.010	-90.8	.370	-118.5

OUTPUT POWER vs. INPUT POWER

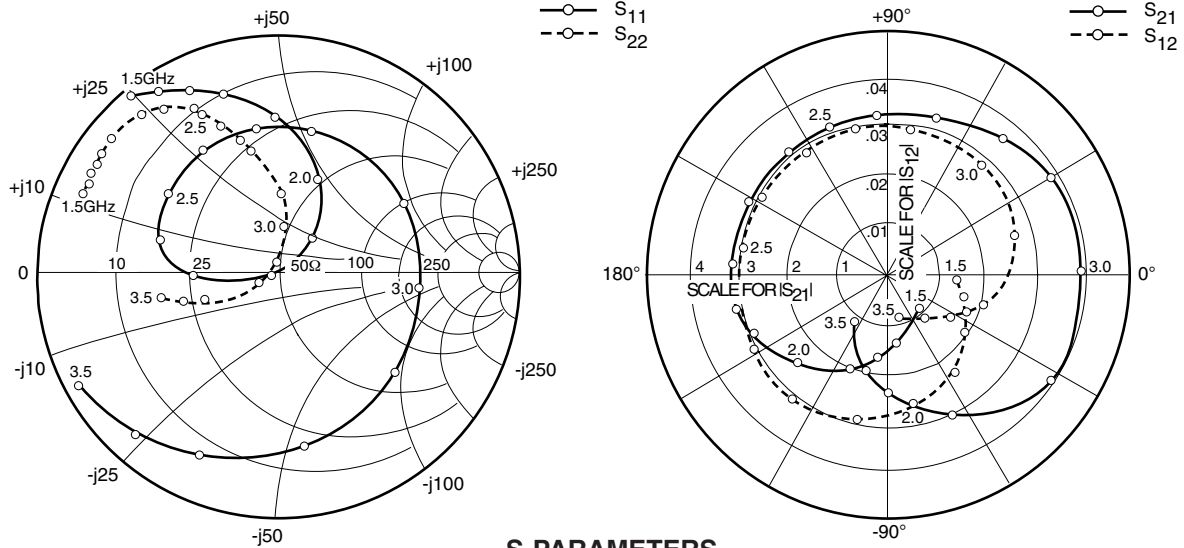


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FLL300IL-3

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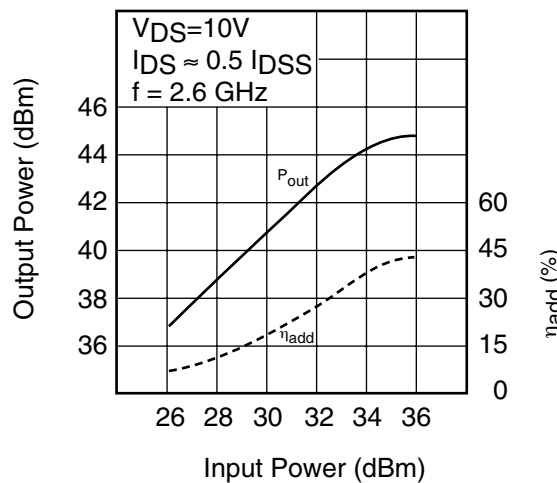


S-PARAMETERS

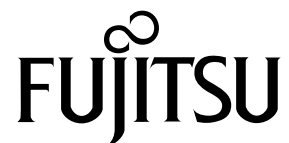
$V_{DS} = 10V, I_{DS} = 6000mA$

FREQUENCY (MHZ)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1500	.902	130.6	1.169	-3.1	.009	-55.7	.854	155.0
1600	.872	123.3	1.324	-13.4	.010	-69.8	.852	153.2
1700	.829	114.2	1.539	-25.8	.012	-81.5	.847	150.7
1800	.756	102.9	1.824	-40.5	.016	-96.1	.847	148.5
1900	.645	88.8	2.199	-57.7	.019	-113.4	.854	146.1
2000	.463	71.7	2.604	-78.8	.024	-134.7	.860	142.2
2100	.217	54.5	2.939	-103.5	.028	-160.3	.867	137.4
2200	.065	173.9	3.080	-129.4	.031	173.7	.848	131.6
2300	.285	175.2	3.055	-153.9	.032	150.2	.808	125.3
2400	.441	157.4	2.938	-176.2	.032	128.8	.752	119.7
2500	.523	137.6	2.843	166.5	.032	110.8	.700	119.6
2600	.560	119.7	2.768	146.9	.033	91.6	.628	113.6
2700	.583	99.3	2.791	126.7	.035	72.2	.550	109.0
2800	.578	72.8	2.840	104.2	.036	49.8	.461	102.5
2900	.564	37.9	2.854	79.1	.039	28.0	.348	94.4
3000	.564	-4.7	2.789	51.3	.039	0.5	.208	91.8
3100	.605	-44.2	2.536	20.3	.039	-33.2	.081	125.9
3200	.731	-80.2	1.981	-9.0	.031	-63.6	.132	-167.4
3300	.813	-109.5	1.502	-32.7	.023	-88.0	.253	-158.6
3400	.864	-131.0	1.130	-52.7	.019	-106.9	.345	-162.2
3500	.895	-147.1	.853	-69.8	.013	-121.2	.408	-168.1

OUTPUT POWER vs. INPUT POWER

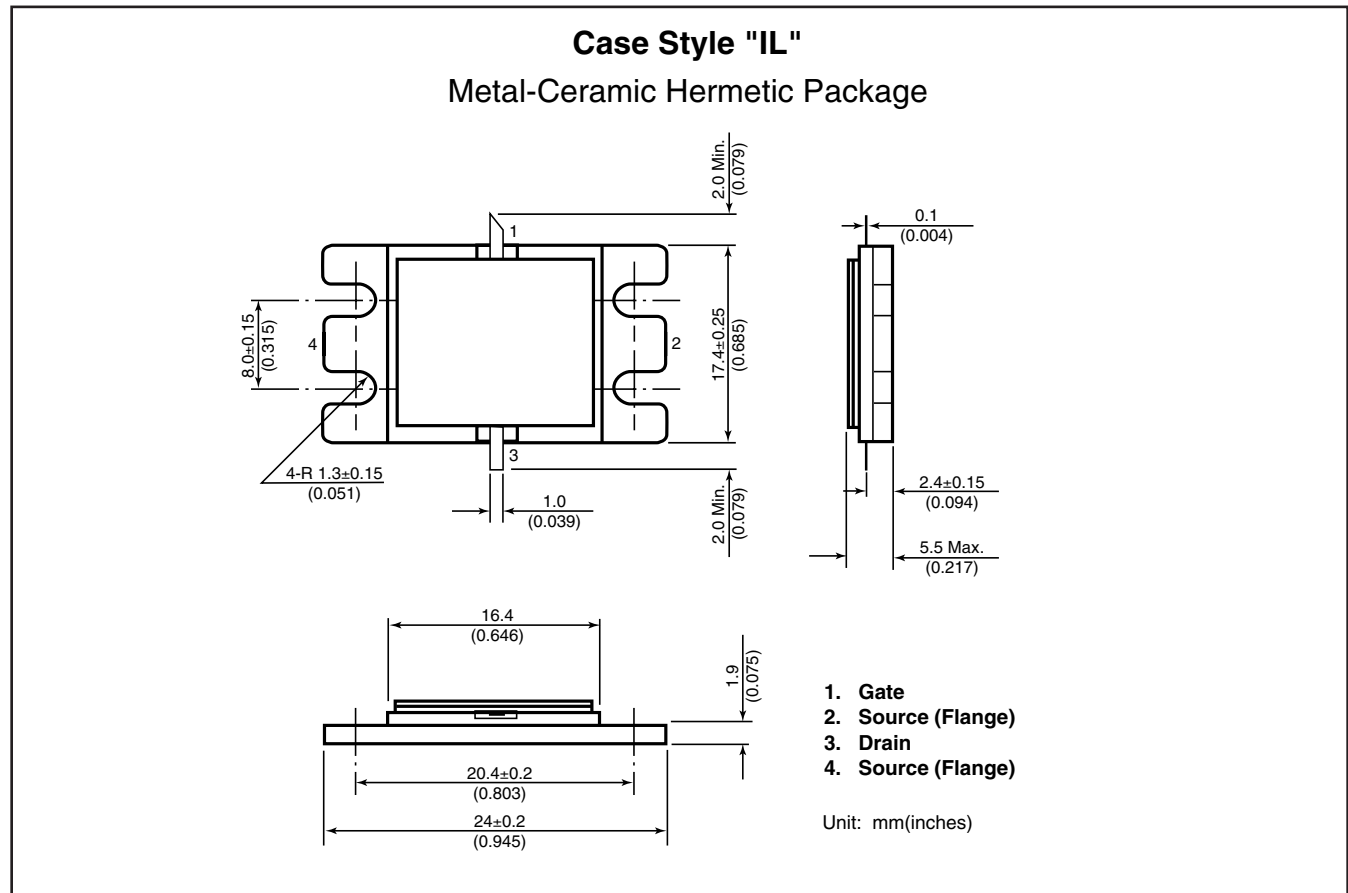


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