

FLL21E090IY

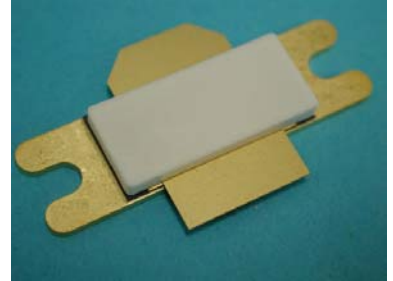
L,S-band High Power GaAs FET

FEATURES

- High Voltage Operation ($V_{DS}=28V$) GaAs FET
- High Gain: 15.5dB(typ.) at $P_{out}=43dBm$ (Avg.)
- Broad Frequency Range : 2110 to 2170MHz
- High Reliability

DESCRIPTION

The FLL21E090IY is a high power GaAs FET that offers high efficiency, ease of matching, greater consistency and broad bandwidth for high power L-band amplifiers. This device is targeted for high voltage, low current operation in digitally modulated base station amplifiers. This product is ideally suited for W-CDMA and Multi-carrier PCS base station amplifiers while offering high gain, long term reliability and ease of use.



ABSOLUTE MAXIMUM RATING

Item	Symbol	Condition	Rating	Unit
Drain-Source Voltage	V_{DS}	$T_c=25^{\circ}C$ (Case Temperature)	32	V
Gate-Source Voltage	V_{GS}		-3	V
Total Power Dissipation	P_T		134	W
Storage Temperature	T_{stg}	-	65 to +175	$^{\circ}C$
Channel Temperature	T_{ch}	-	200	$^{\circ}C$

RECOMMENDED OPERATING CONDITION (Case Temperature $T_c=25^{\circ}C$)

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V_{DS}		<28	V
Forward Gate Current	I_{GF}	$R_G=2\Omega$	<352	mA
Reverse Gate Current	I_{GR}	$R_G=2\Omega$	>-31	mA
Channel Temperature	T_{ch}		155	$^{\circ}C$

ELECTRICAL CHARACTERISTICS (Case Temperature $T_c=25^{\circ}C$)

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-Off Voltage	V_P	$V_{DS}=5V, I_{DS}=151mA$	-0.1	-0.2	-0.5	V
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS}=-1.51mA$	-5	-	-	V
3rd Order Intermodulation Distortion	IM_3	$V_{DS}=28V$	-	-33	-30	dBc
Power Gain	G_P	$I_{DS}(DC)=750mA$	14.5	15.5	-	dB
Drain Efficiency	η_D	$P_{out}=43dBm$ (Avg.)	-	26	-	%
Adjacent Channel Leakage Power Ratio	ACLR	Note 1	-	-35	-	dBc
Thermal Resistance	R_{th}	Channel to Case	-	1.1	1.3	$^{\circ}C/W$

Note 1 : IM_3 , ACLR and Gain test conditions as follows

IM_3 & Gain : $f_0=2.1325GHz, f_1=2.1475GHz$ W-CDMA(3GPP3.4 12-0) BS-1 64ch non clipping modulation measured over 3.84MHz at $f_0-15MHz$ and $f_1+15MHz$.

ACLR : $f_0=2.1325GHz$ W-CDMA (3GPP3.4 12-00) BS-1 64ch non clipping modulation, measured over 3.84MHz at $f_0 \pm 5MHz$

ESD	CLASS III	2000V ~
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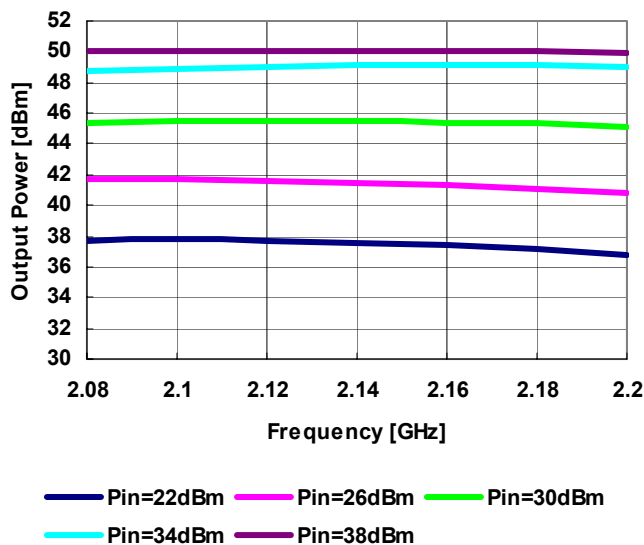
Note : Based on EIAJ ED-4701 C-111A(C=100pF, R=1.5k Ω)

CASE STYLE : IY

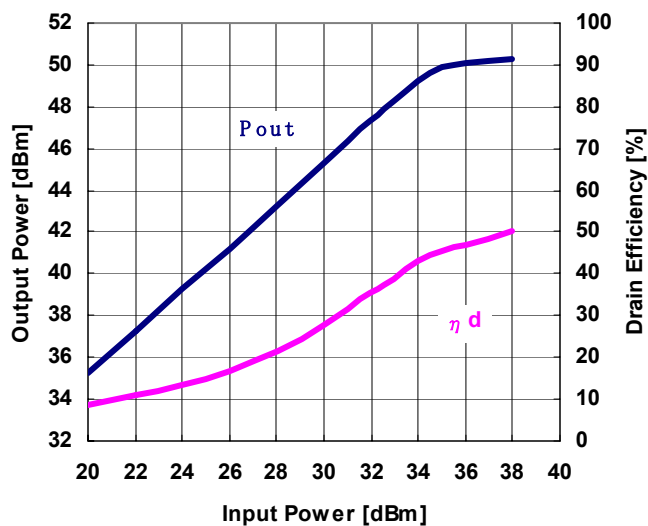
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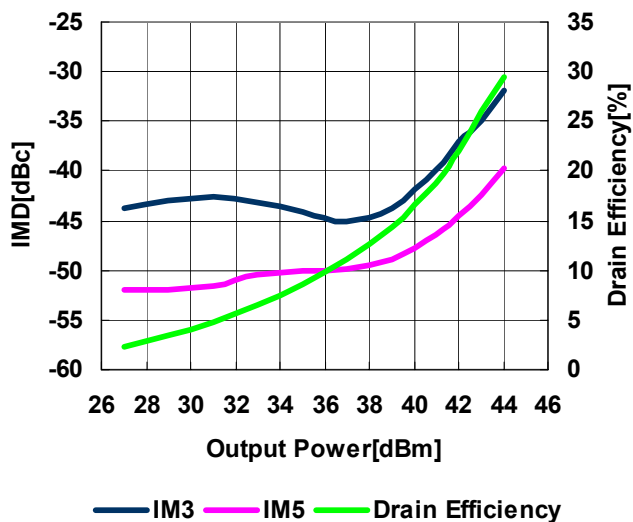
Output Power vs. Frequency
VDS=28V, IDS=750mA



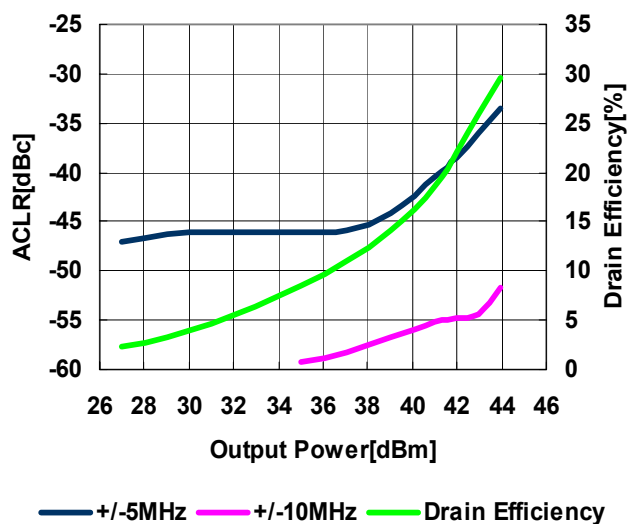
Output Power & Drain Efficiency vs. Input Power
VDS=28V, IDS=750mA, f=2.14GHz



Two-Carrier IMD(ACLR) vs. Output Power
VDS=28V IDS=750mA fo=2.1325, f1=2.1475GHz
W-CDMA 3-GPP BS-1 64ch Modulation



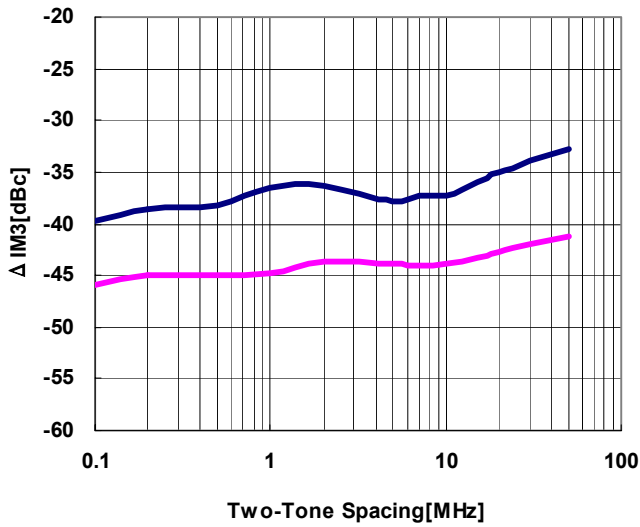
Single-Carrier ACLR vs. Output Power
VDS=28V IDS=750mA fo=2.1325GHz
W-CDMA 3GPP BS-1 64ch Modulation



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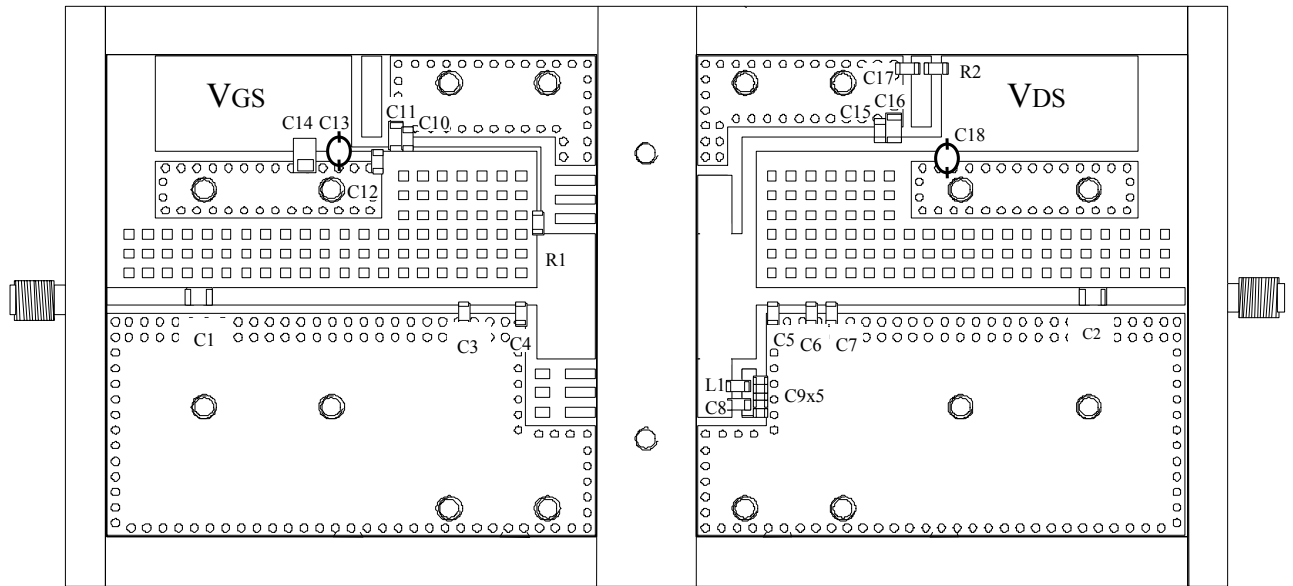
CW IMD vs. Tone Spacing
@VDS=28V, IDS=750mA, fc=2.14GHz
Pout=43dBm



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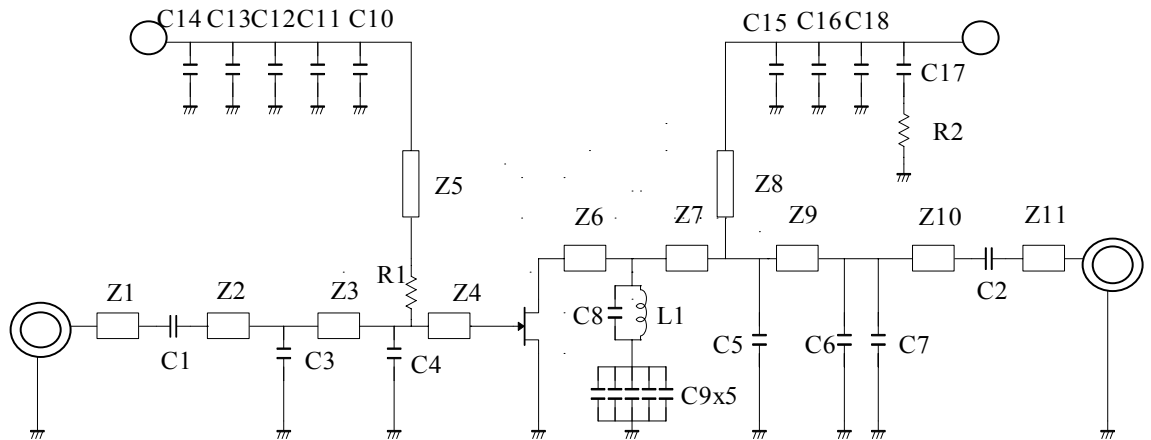
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■ Board Layout



$\epsilon_r=3.5$ $t=0.8\text{mm}$

■ Circuit Diagram of the Board



Z1, Z11	9.00mm x 1.78mm Transmission Line
Z2	26.2mm x 1.78mm Transmission Line
Z3	6.60mm x 1.78mm Transmission Line
Z4	6.00mm x 13.0mm Transmission Line
Z5	23.0mm x 0.50mm Transmission Line
Z6	3.00mm x 25.0mm Transmission Line
Z7	3.00mm x 13.0mm Transmission Line
Z8	23.0mm x 1.50mm Transmission Line
Z9	10.8mm x 1.78mm Transmission Line
Z10	22.0mm x 1.78mm Transmission Line

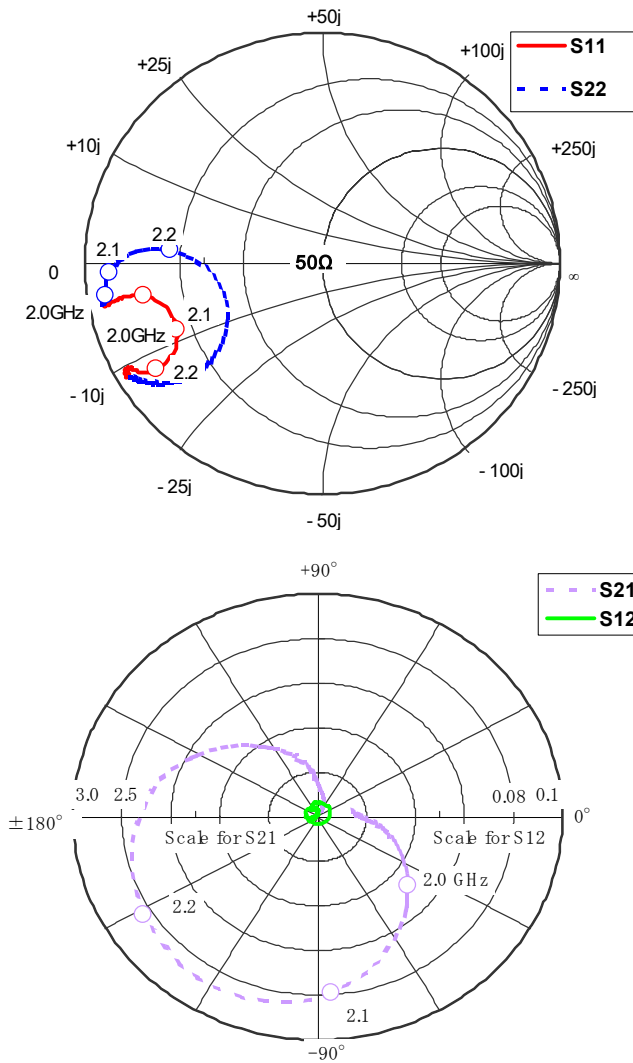
C1, C2	10pF	C18	22uF
C3	1.0pF	L1	3.3nF
C4	2.0pF	R1	2.0ohm
C5, C6, C7	0.5pF	R2	51ohm
C8	1.5pF		
C9	0.1uF		
C10, C15	20pF		
C11, C16	100nF		
C12, C17	1000pF		
C13, C14	10uF		

Board
input size $\epsilon_r=3.5$ $t=0.8\text{mm}$
50mm x 50mm
output size $\epsilon_r=3.5$ $t=0.8\text{mm}$
50mm x 50mm

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■S-Parameters @VDS=28V, IDS=750mA, f=1.0 to 3.0 GHz

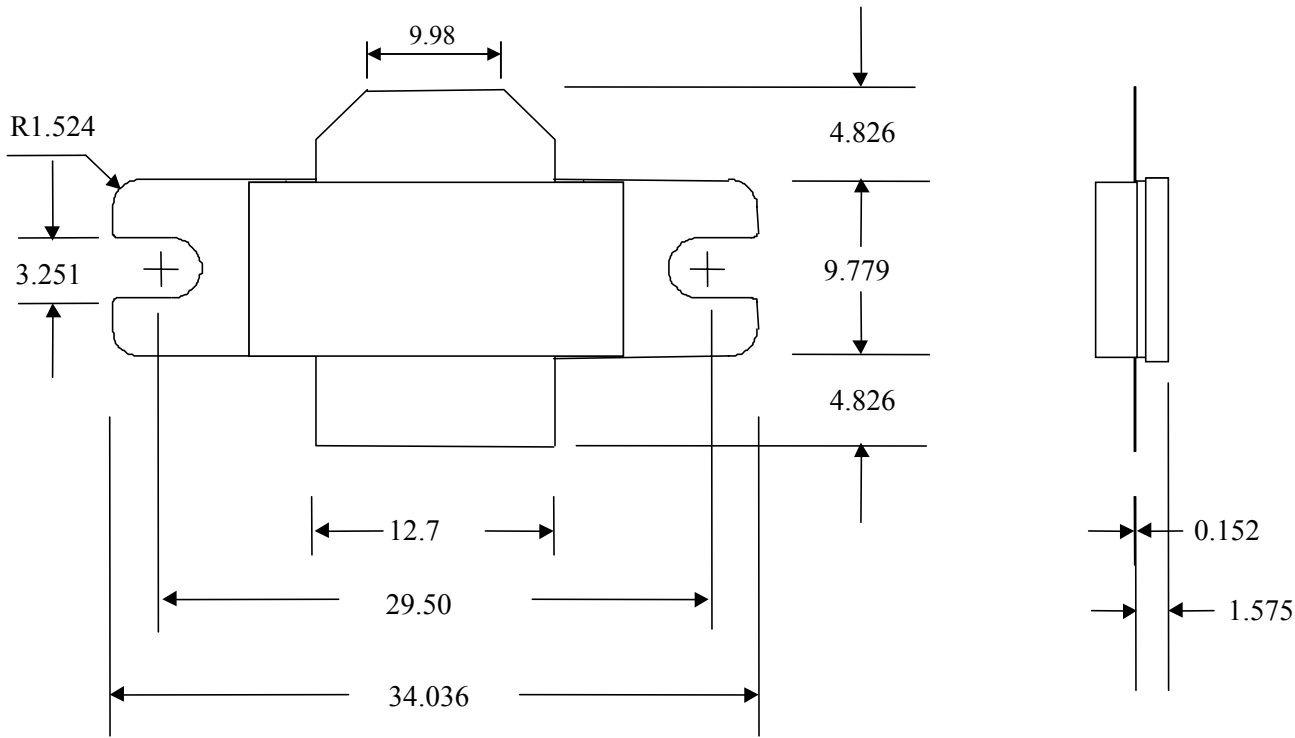


[GHz]	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1.00	0.9634	-172.52	0.185	21.926	0.0011	91.071	0.9638	-171.69
1.10	0.9567	-171.64	0.1738	22.708	0.0012	105.34	0.9571	-171.44
1.20	0.9592	-170.81	0.1796	23.891	0.0014	106.3	0.9589	-170.97
1.30	0.9583	-170.19	0.1856	22.494	0.0016	119.39	0.9571	-170.73
1.40	0.9524	-169.69	0.2063	23.295	0.0016	112.69	0.9566	-170.11
1.50	0.9571	-168.96	0.2399	20.502	0.0026	122.64	0.9558	-169.73
1.60	0.9465	-168.85	0.3019	19.887	0.0031	127.43	0.9539	-169.55
1.70	0.9396	-168.87	0.4171	9.7863	0.0039	122.24	0.9461	-169.47
1.80	0.918	-169.14	0.5432	-0.3251	0.004	113.26	0.9385	-169.79
1.90	0.8744	-169.91	0.8481	-13.596	0.0056	111.46	0.9276	-170.16
2.00	0.7691	-169.68	1.4267	-39.755	0.0064	73.076	0.9273	-171.5
2.10	0.6787	-155.22	2.3705	-86.126	0.0054	15.023	0.9018	-177.51
2.11	0.6782	-153.28	2.4453	-92.117	0.0049	4.6718	0.8894	-178.55
2.12	0.6957	-151.96	2.5065	-98.556	0.0047	-10.341	0.8739	-179.66
2.13	0.7087	-150.22	2.5554	-104.83	0.0044	-21.605	0.8562	179.2
2.14	0.7284	-148.84	2.5928	-111.25	0.0038	-31.755	0.8371	178.16
2.15	0.749	-147.98	2.6012	-117.67	0.0035	-51.932	0.8094	177.06
2.16	0.7702	-147.49	2.6085	-124.11	0.0032	-66.043	0.7809	176.19
2.17	0.785	-146.95	2.5937	-130.41	0.0034	-81.24	0.7498	175.39
2.18	0.8009	-146.8	2.5666	-136.59	0.0032	-99.392	0.7194	174.76
2.19	0.8271	-146.95	2.5421	-142.62	0.0033	-115.92	0.6822	174.43
2.20	0.84	-146.99	2.5068	-148.63	0.0033	-139.05	0.6444	174.64
2.30	0.9158	-149.95	1.781	154.66	0.0048	129.47	0.4764	-147.42
2.40	0.9361	-151.12	0.9958	115.92	0.0035	97.983	0.7412	-138.53
2.50	0.9386	-151.16	0.5194	93.577	0.0019	94.352	0.8586	-142.64
2.60	0.9455	-150.74	0.3276	82.725	0.0013	88.626	0.9035	-145.25
2.70	0.9501	-150.74	0.1998	72.912	0.001	-156.21	0.9267	-147.06
2.80	0.9493	-149.64	0.1465	77.149	0.0019	-171.48	0.9347	-147.9
2.90	0.9576	-149.8	0.1235	67.632	0.0022	-161.33	0.947	-148.56
3.00	0.9579	-149.24	0.0903	65.358	0.004	-162.61	0.947	-148.91

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■IY Package Outline



Unit : mm

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