

FLL21E045IY

L,S-band High Power GaAs FET

FEATURES

- High Voltage Operation (VDS=28V) GaAs FET
- High Gain: 15.5dB(typ.) at Pout=40dBm(Avg.)
- Broad Frequency Range : 2110 to 2170MHz
- High Reliability

DESCRIPTION

The FLL21E045IY 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		92	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}	$R_G=2\Omega$	<176	mA
Reverse Gate Current	I_{GR}	$R_G=2\Omega$	>-15.9	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	$V_{DS}=5V, I_{DS}=75.4mA$	-0.1	-0.2	-0.5	V
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS}=-754\mu A$	-5	-	-	V
3rd Order Intermodulation Distortion	IM_3	$V_{DS}=28V$	-	-33	-30	dBc
Power Gain	G_P	$I_{DS}(DC)=500mA$	14.5	15.5	-	dB
Drain Efficiency	η_D	$P_{out}=40dBm(Avg.)$	-	26	-	%
Adjacent Channel Leakage Power Ratio	ACLR	Note 1	-	-35	-	dBc
Thermal Resistance	R_{th}	Channel to Case	-	1.7	1.9	$^{\circ}C/W$

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 12-0) BS-1 64ch non clipping modulation, measured over 3.84MHz at $f_0\pm 5MHz$

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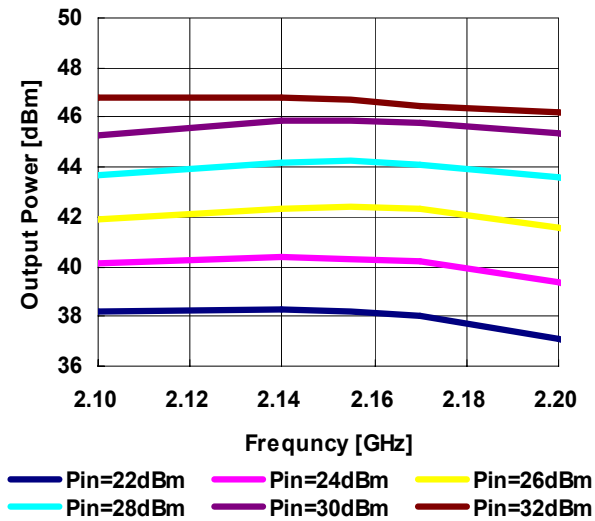
Note : Based on EIAJ ED-4701 C-111A(C=100pF, R=1.5k Ω)

CASE STYLE : IY

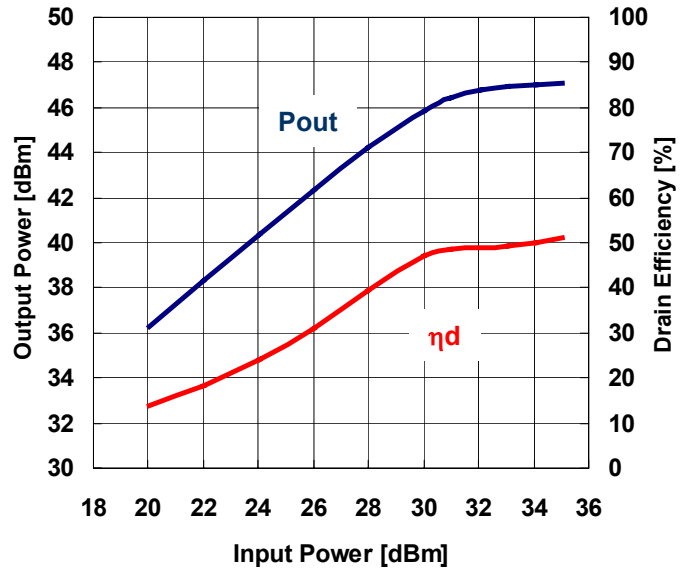
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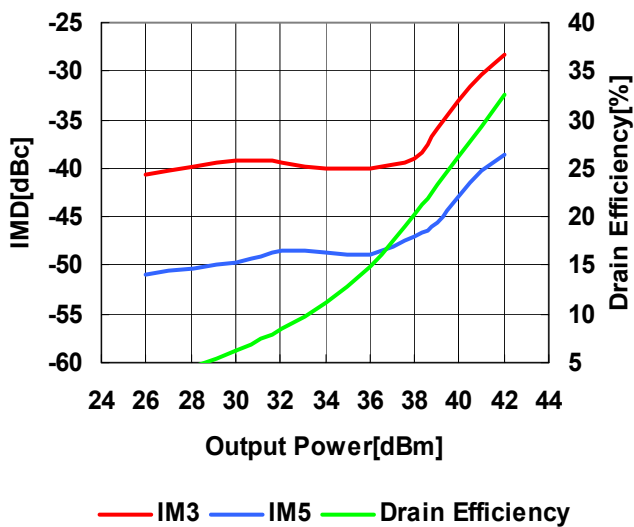
Output Power vs. Frequency
VDS=28V, IDS=500mA



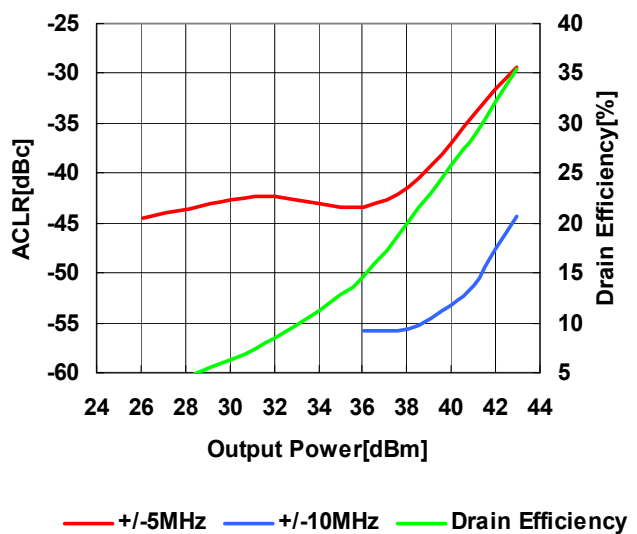
Output Power & Drain Efficiency vs. Input Power
VDS=28V, IDS=500mA, f=2.14GHz



Two-Carrier IMD(ACLR) vs. Output Power
VDS=28V, IDS=500mA, f₀=2.135, f₁=2.145GHz
W-CDMA 3-GPP BS-1 64ch Modulation



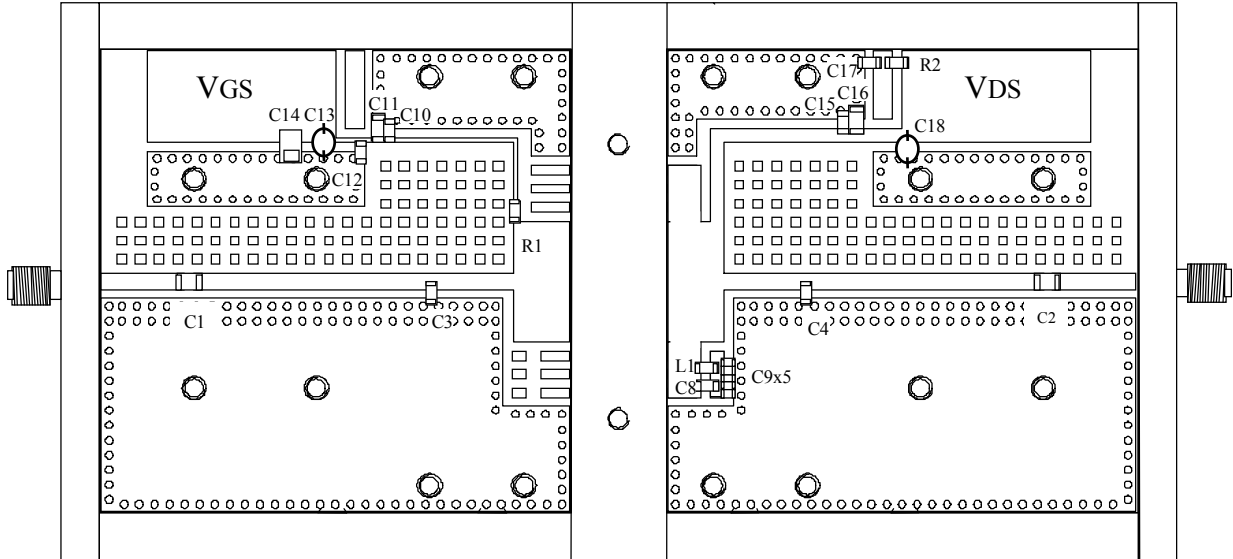
Single-Carrier ACLR vs. Output Power
VDS=28V, IDS=500mA, f₀=2.135GHz
W-CDMA 3GPP BS-1 64ch Modulation



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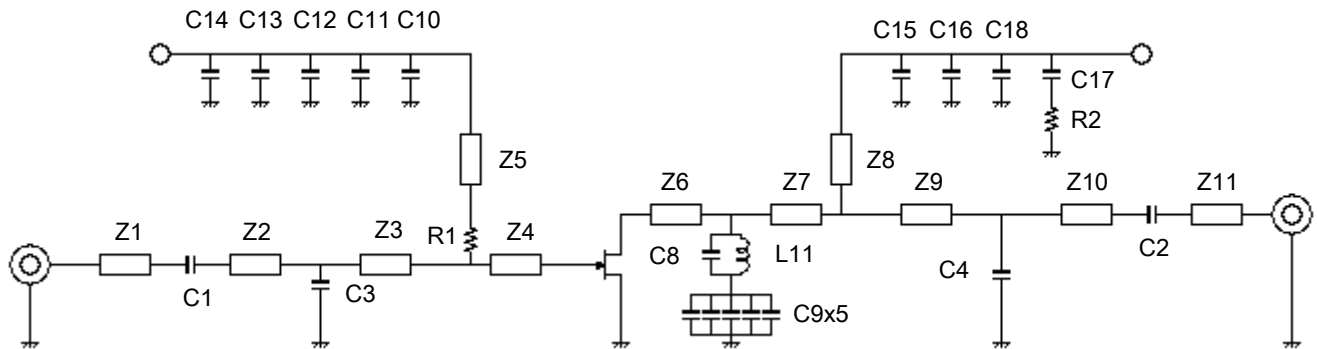
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Board Layout



$\epsilon_r=3.5$ $t=0.8$ mm

Circuit Diagram of the Board



Z1, Z11	9.00mm x 1.78mm	Transmission Line
Z2	25.5mm x 1.78mm	Transmission Line
Z3	7.30mm 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	7.30mm x 1.78mm	Transmission Line
Z10	25.5mm x 1.78mm	Transmission Line

C1, C2	10pF
C3	1.5pF
C4	2.0pF
C8	1.5pF
C9	0.1uF
C10, C15	20pF
C11, C16	100nF
C12, C17	1000pF
C13, C14	10uF

C18	22uF
L1	3.3nF
R1	2.0ohm
R2	51ohm

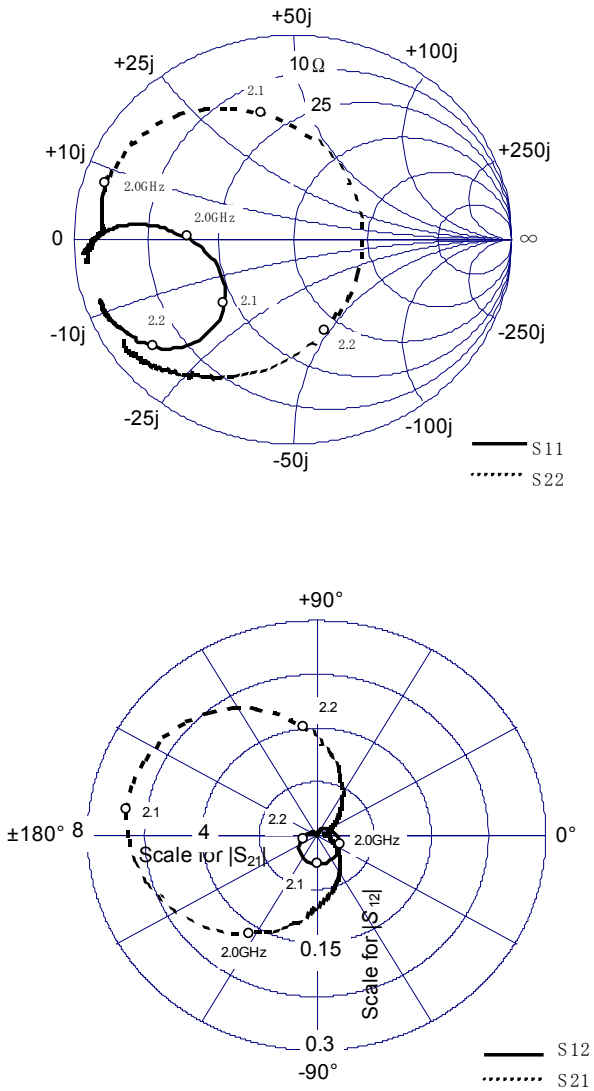
Board

input size $\epsilon_r=3.5$ $t=0.8$ mm
50mm x 50mm
output size $\epsilon_r=3.5$ $t=0.8$ mm
50mm x 50mm

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■ S-Parameters @VDS=28V, IDS=500mA, f=1.0 to 3.0 GHz

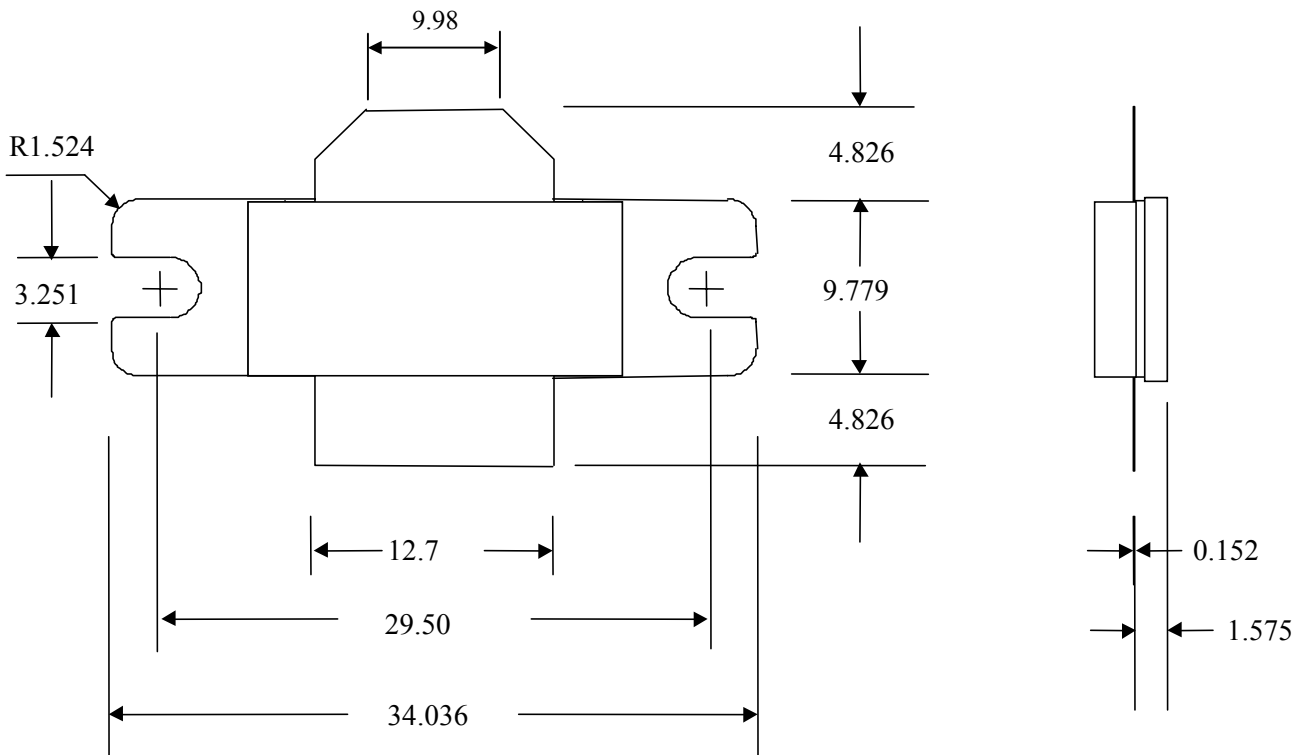


[GHz]	S11(mag)	S11(ang)	S21(mag)	S21(ang)	S12(mag)	S12(ang)	S22(mag)	S22(ang)
1	0.961	-176.09	0.475	0.09	0.002	72.44	0.941	-173.21
1.1	0.955	-176.12	0.465	-4.08	0.003	72.31	0.941	-174.11
1.2	0.955	-176.17	0.474	-8.51	0.003	73.23	0.938	-174.90
1.3	0.946	-176.41	0.512	-13.28	0.004	78.24	0.939	-175.61
1.4	0.938	-177.38	0.574	-19.09	0.005	73.43	0.937	-176.50
1.5	0.929	-178.32	0.676	-25.53	0.007	68.02	0.928	-177.31
1.6	0.903	-179.71	0.858	-34.12	0.008	60.18	0.922	-178.49
1.7	0.868	178.18	1.156	-46.13	0.011	51.50	0.901	179.94
1.8	0.802	175.71	1.676	-62.08	0.015	37.37	0.877	178.21
1.9	0.676	173.72	2.636	-86.18	0.022	13.74	0.879	174.82
2	0.482	178.20	4.384	-122.79	0.033	-20.98	0.898	162.03
2.1	0.441	-135.80	6.693	171.86	0.040	-88.96	0.634	102.88
2.11	0.490	-131.54	6.712	162.88	0.039	-97.96	0.560	90.14
2.12	0.540	-130.55	6.645	154.26	0.038	-107.99	0.484	75.71
2.13	0.596	-130.03	6.434	145.37	0.036	-116.93	0.414	58.35
2.14	0.649	-130.79	6.205	136.83	0.034	-127.37	0.353	36.86
2.15	0.692	-132.19	5.853	128.55	0.031	-133.60	0.323	12.79
2.16	0.731	-133.90	5.525	121.00	0.028	-145.32	0.321	-11.35
2.17	0.761	-135.91	5.126	113.86	0.026	-151.02	0.345	-32.46
2.18	0.783	-137.02	4.769	107.68	0.023	-156.69	0.384	-48.97
2.19	0.811	-138.98	4.402	101.97	0.021	-162.23	0.426	-61.84
2.2	0.823	-140.79	4.071	96.45	0.018	-168.12	0.472	-72.06
2.3	0.883	-148.92	1.953	62.43	0.006	140.62	0.742	-115.08
2.4	0.907	-152.47	1.125	44.59	0.003	131.01	0.838	-128.68
2.5	0.919	-154.44	0.742	32.86	0.002	67.07	0.885	-135.53
2.6	0.923	-156.00	0.539	24.36	0.000	145.10	0.909	-139.52
2.7	0.928	-157.30	0.423	17.45	0.001	-166.69	0.920	-141.86
2.8	0.930	-158.48	0.353	10.90	0.002	133.58	0.925	-143.60
2.9	0.929	-159.87	0.310	6.75	0.003	143.82	0.928	-145.78
3	0.925	-161.40	0.292	0.72	0.002	121.54	0.916	-147.36

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■ IY Package Outline



Unit : mm

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For further information please contact :

Eudyna Devices USA Inc.

2355 Zanker Rd.
San Jose, CA 95131-1138, U.S.A.
TEL: (408) 232-9500
FAX: (408) 428-9111
www.us.eudyna.com

Eudyna Devices Europe Ltd.

Network House
Norreys Drive
Maidenhead, Berkshire SL6 4FJ
United Kingdom
TEL: +44 (0) 1628 504800
FAX: +44 (0) 1628 504888

Eudyna Devices Asia Pte. Ltd.

Hong Kong Branch
Rm.1101,Ocean Centre, 5 Canton Road
Tsim Sha Tsui, Kowloon, Hong kong
TEL: +852-2377-0227
FAX: +852-2377-3921

Eudyna Devices Inc.

1000 Kamisukiahara, showa-cho
Nakakomagun, Yamanashi
409-3883, Japan
(Kokubo Industrial Park)
TEL +81-55-275-4411
FAX +81-55-275-9461

Sales Division

1, Kanai-cho, Sakae-ku
Yokohama,244-0845,Japan
TEL +81-45-853-8156
FAX +81-45-853-8170

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Eudyna Devices 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.

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