

MITSUBISHI SEMICONDUCTOR<GaAs FET>
MGF0952P

L & S BAND GaAs FET [Plastic Mold Lead-less PKG]

DESCRIPTION

The MGF0952P GaAs FET with an N-channel schottky Gate, is designed for use L/S band amplifiers.

FEATURES

- High output power
 $P_o=36.5\text{dBm(TYP.) @}f=2.15\text{GHz, Pin}=25\text{dBm}$
- High power gain
 $G_{lp}=13.5\text{dB(TYP.) @}f=2.15\text{GHz}$
- High power added efficiency
 $\eta_{add}=50\%(TYP.) @f=2.15\text{GHz, Pin}=25\text{dBm}$
- Plastic Mold Lead-less PKG

APPLICATION

- For L/S Band power amplifiers

QUALITY

- GG

RECOMMENDED BIAS CONDITIONS

- $V_{ds}=10\text{V}$ • $I_{ds}=700\text{mA}$ • $R_g=100\Omega$

Delivery Tape & Reel(1.5K)

Absolute maximum ratings ($T_a=25^\circ\text{C}$)

Symbol	Parameter	Ratings	Unit
VGSO	Gate to source breakdown voltage	-15	V
VGDO	Gate to drain breakdown voltage	-15	V
ID	Drain current	3.5	A
IGR	Reverse gate current	-10	mA
IGF	Forward gate current	21	mA
PT	Total power dissipation	20.0	W
Tch	Channel temperature	150	°C
Tstg	Storage temperature	-40 to +150	°C

Recommended maximum ratings ($T_a=25^\circ\text{C}$)

Symbol	Parameter	Ratings	Unit
Tch	Channel temperature	150	°C

Electrical characteristics ($T_a=25^\circ\text{C}$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
VGS(off)	Gate to source cut-off voltage	$V_{DS}=3\text{V, } I_{D}=12.6\text{mA}$	-1	-3	-5	V
P_o *1	Output power	$V_{DS}=10\text{V, } I_{D}=700\text{mA, } f=2.15\text{GHz}$	35.0	36.5	--	dBm
η_{add} *1	Power added Efficiency	*1: $P_{in}=25\text{dBm}$, *2: $P_{in}=15\text{dBm}$	--	50	--	%
GLP *2	Linear Power Gain	*3: $f_1=2.15\text{GHz, } f_2=2.16\text{GHz}$	11	13.5	--	dB
IM3 *3	3 rd order Modulation Distortion	$P_o(\text{SCL})=25\text{dBm}$	--	-42	--	dBc
Rth(ch-c)	Thermal Resistance *1	ΔV_f Method	--	4.5	6.5	°C/W

*1: Channel to case / Above parameters, ratings, limits are subject to change.

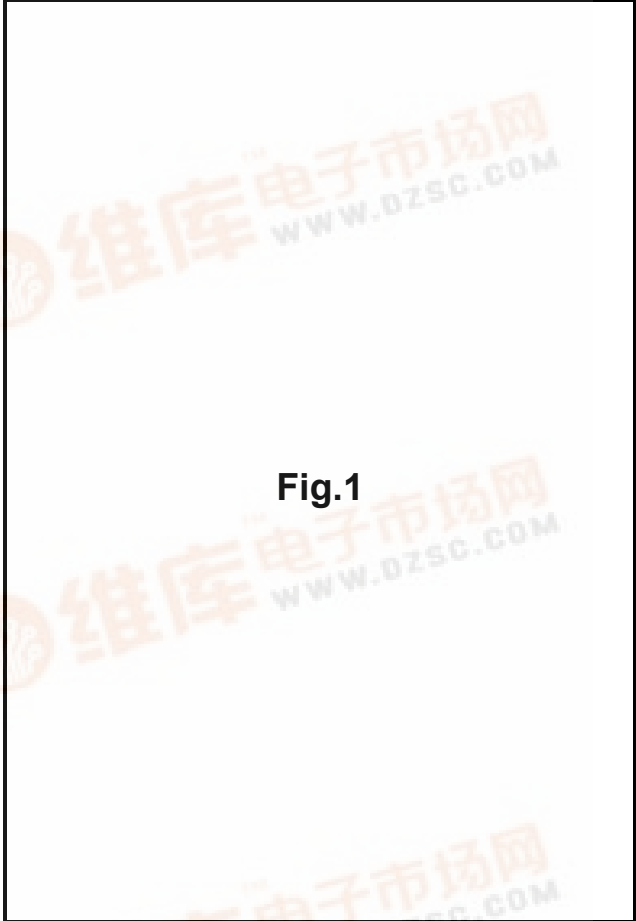
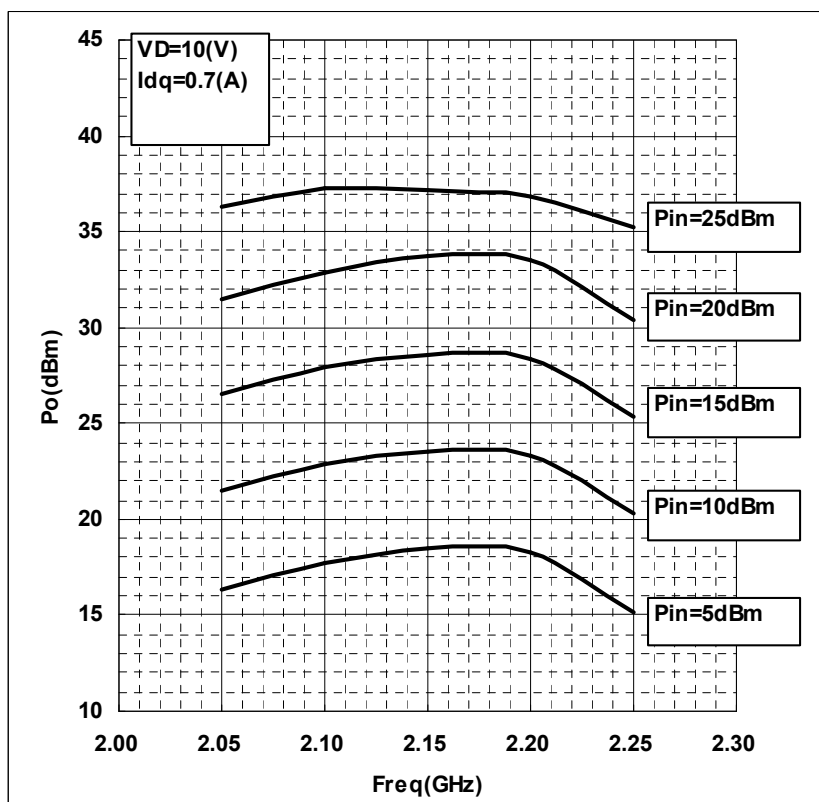
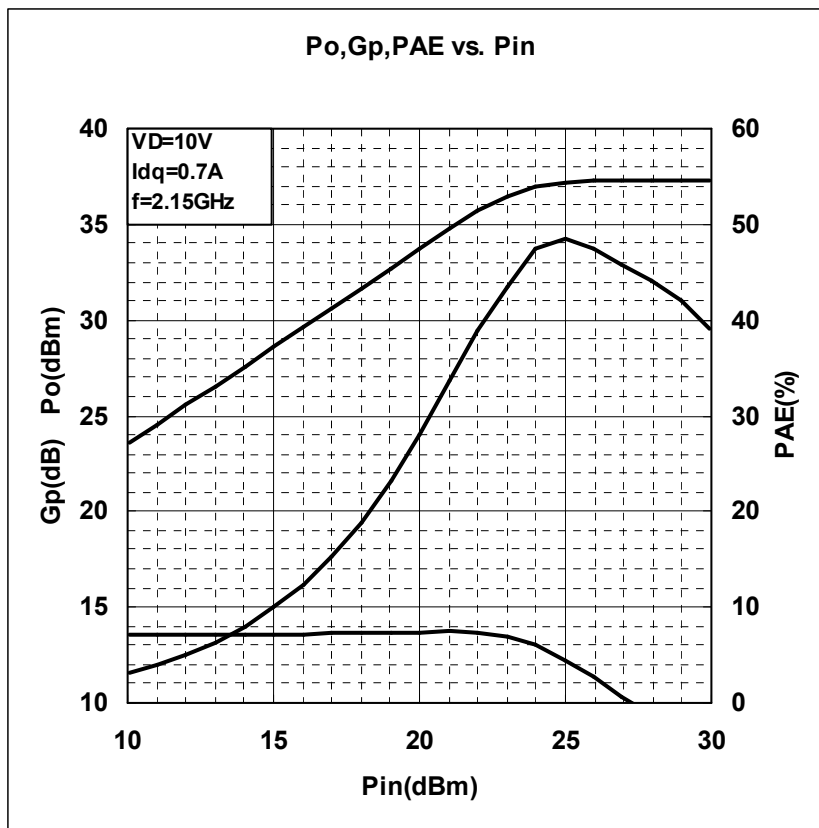


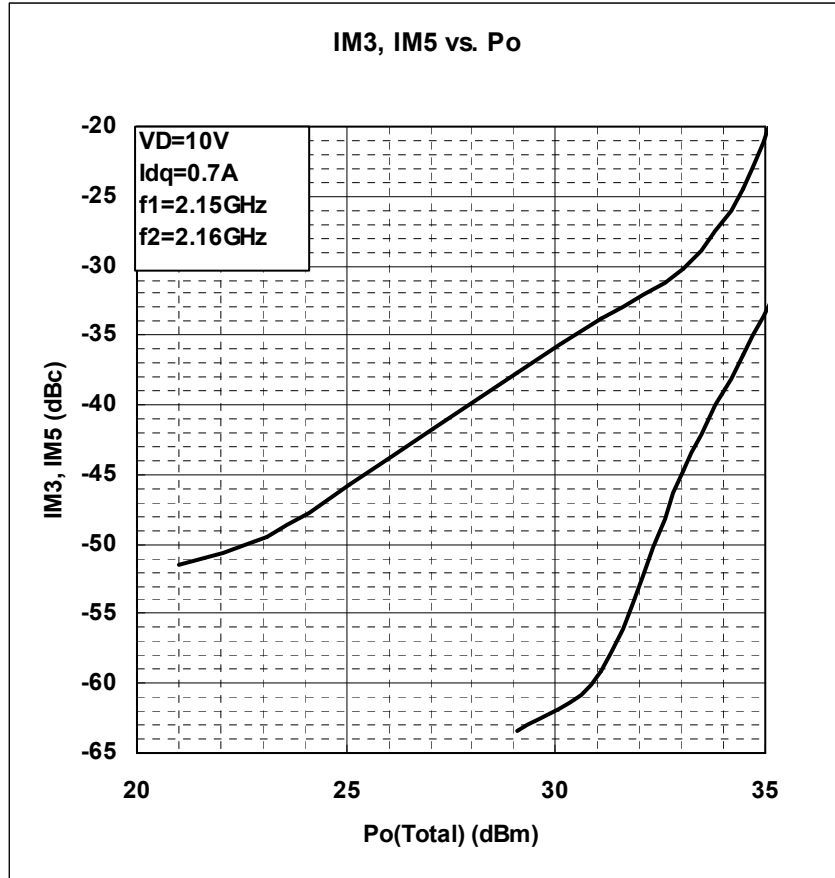
Fig.1



MGF0952P TYPICAL CHARACTERISTICS



MGF0952P TYPICAL CHARACTERISTICS



MGF0952P S PARAMETERS (Ta=25°C,VD=10V,ID=700mA)

!freq. !(GHz)	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
0.60	0.941	-155.46	3.198	95.74	0.020	14.53	0.775	-176.77
0.80	0.945	-161.45	2.434	90.37	0.020	12.33	0.777	-176.95
1.00	0.945	-165.05	1.970	86.23	0.021	12.00	0.777	-176.88
1.20	0.946	-167.53	1.656	82.72	0.021	10.97	0.776	-176.62
1.40	0.948	-169.74	1.383	79.43	0.020	11.07	0.784	-176.51
1.60	0.949	-170.98	1.223	76.56	0.020	11.75	0.783	-176.15
1.80	0.945	-172.20	1.097	73.77	0.020	9.96	0.782	-175.84
2.00	0.943	-173.14	0.998	71.28	0.020	10.52	0.783	-175.41
2.20	0.944	-173.68	0.918	68.77	0.020	11.92	0.782	-174.89
2.40	0.946	-174.29	0.855	66.48	0.020	12.32	0.782	-174.38
2.60	0.946	-174.91	0.802	64.21	0.020	11.26	0.781	-173.87
2.80	0.945	-175.53	0.755	61.97	0.020	10.49	0.781	-173.41
3.00	0.945	-176.04	0.717	59.85	0.021	10.21	0.780	-172.87
3.20	0.942	-176.30	0.681	57.82	0.021	8.73	0.780	-172.57
3.40	0.950	-176.75	0.658	55.70	0.020	5.23	0.785	-172.11
3.60	0.945	-178.34	0.624	53.05	0.018	4.47	0.783	-172.82
3.80	0.942	-178.98	0.600	51.01	0.018	12.59	0.778	-172.69
4.00	0.940	-179.40	0.581	48.78	0.019	16.08	0.776	-172.55
4.20	0.942	179.63	0.562	46.21	0.020	13.00	0.776	-173.07
4.40	0.942	178.51	0.543	43.59	0.021	12.22	0.778	-173.71
4.60	0.941	177.39	0.525	40.94	0.020	9.78	0.779	-174.47
4.80	0.941	176.53	0.511	38.30	0.021	8.54	0.779	-175.57
5.00	0.940	175.20	0.495	35.58	0.022	6.78	0.780	-176.58
5.20	0.939	173.69	0.481	32.70	0.021	4.96	0.783	-177.54
5.40	0.938	172.28	0.467	30.04	0.021	3.17	0.784	-178.54
5.60	0.936	171.29	0.457	27.42	0.022	1.75	0.786	-179.32
5.80	0.936	169.82	0.449	24.82	0.022	0.51	0.790	179.87
6.00	0.933	167.83	0.440	21.94	0.023	-0.94	0.792	178.97
6.20	0.932	166.34	0.430	19.46	0.023	-1.38	0.794	178.44
6.40	0.933	165.13	0.424	17.22	0.023	-2.56	0.797	178.03
6.60	0.931	163.73	0.421	14.95	0.024	-2.05	0.801	177.89
6.80	0.930	162.01	0.420	12.61	0.024	-3.27	0.804	177.64
7.00	0.931	160.33	0.418	10.17	0.025	-2.88	0.807	177.45

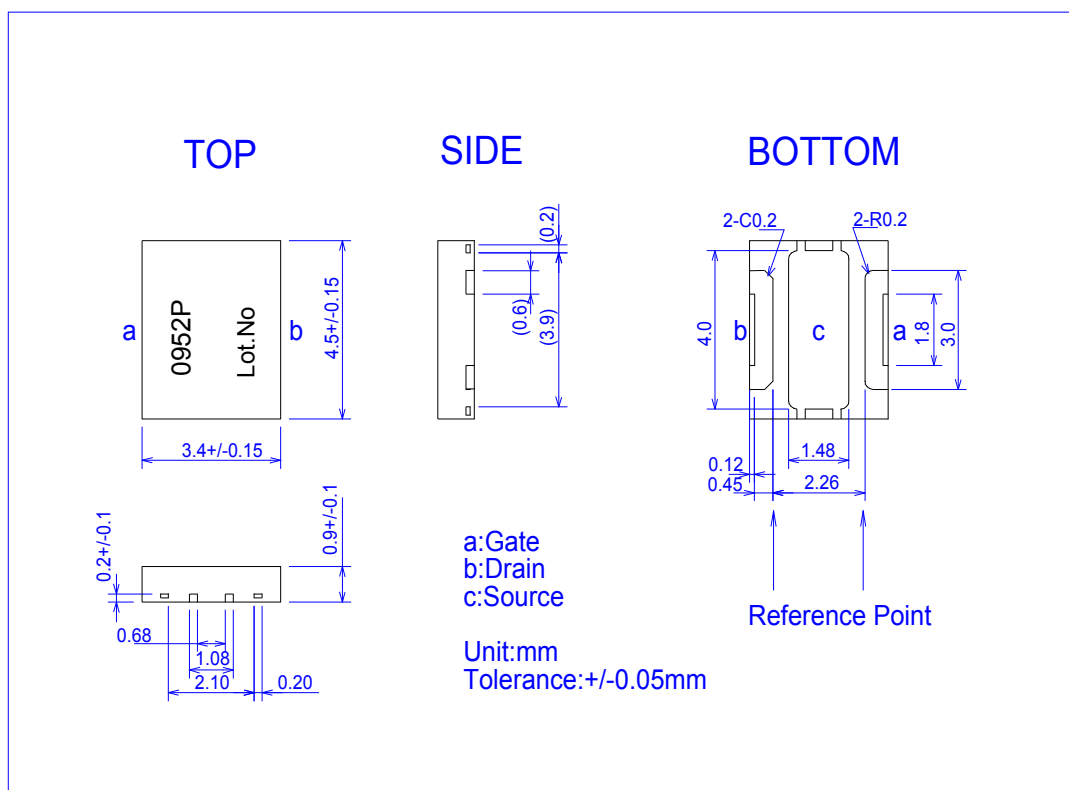
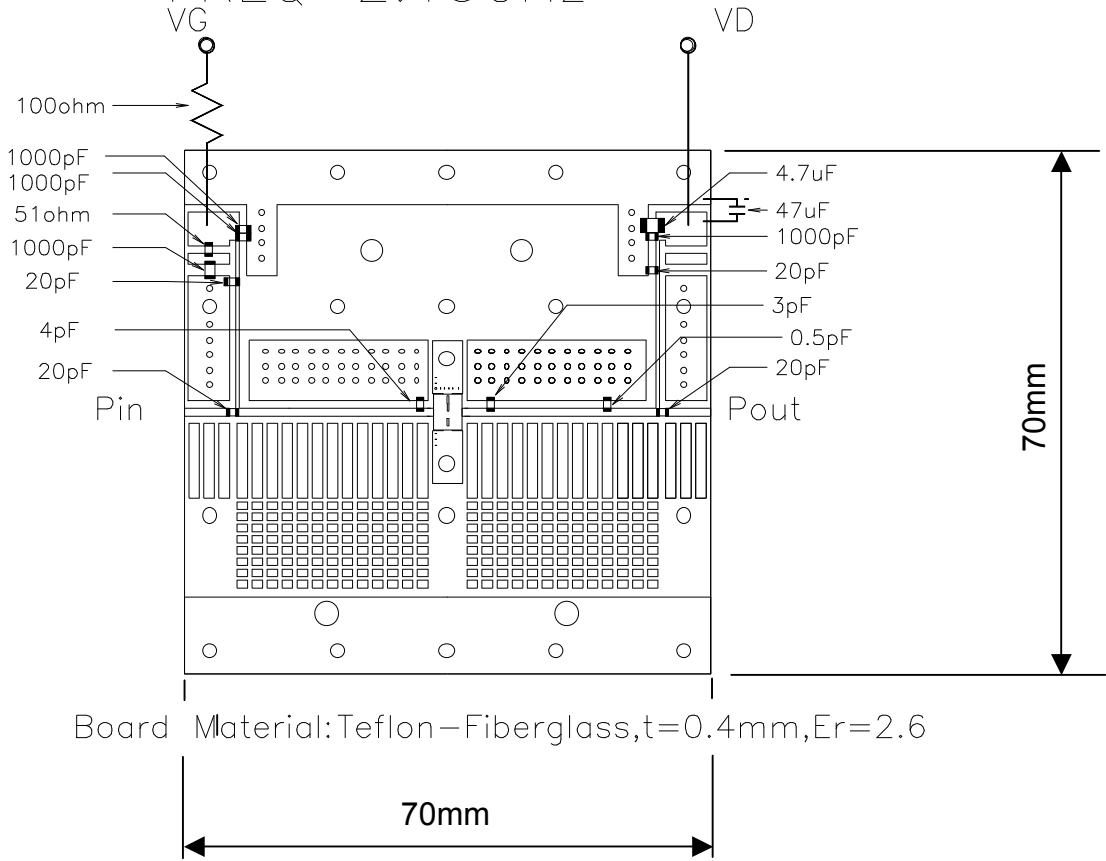


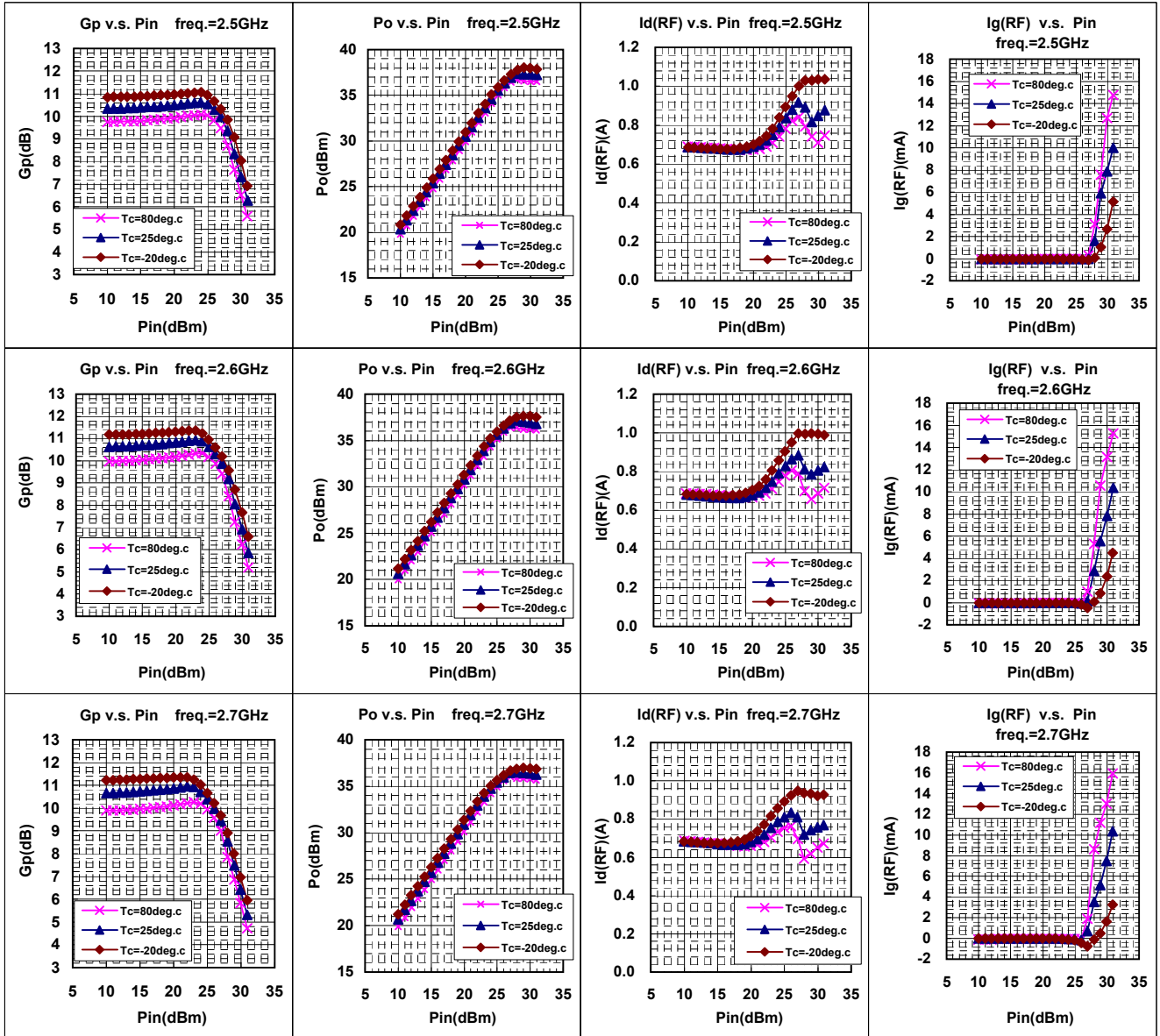
Fig1. OUTLINE DRAWING

MGF0952P TESTFIXTURE

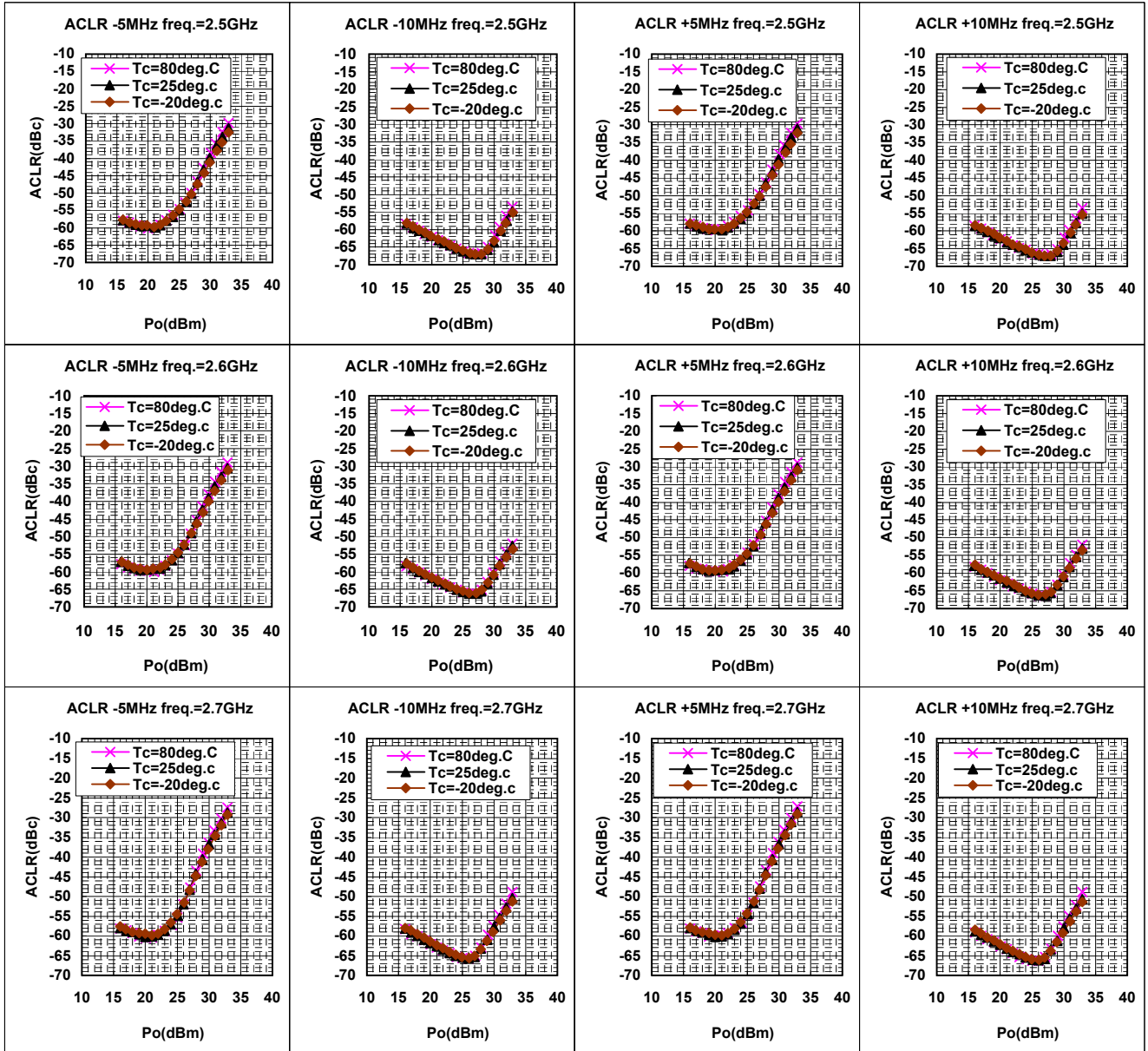
FREQ=2.15GHz



MGF0952P RF TEST DATA(CW) VD=10V,Idq=0.7A
Gp,Po,Id(RF),I_g(RF) v.s. Pin

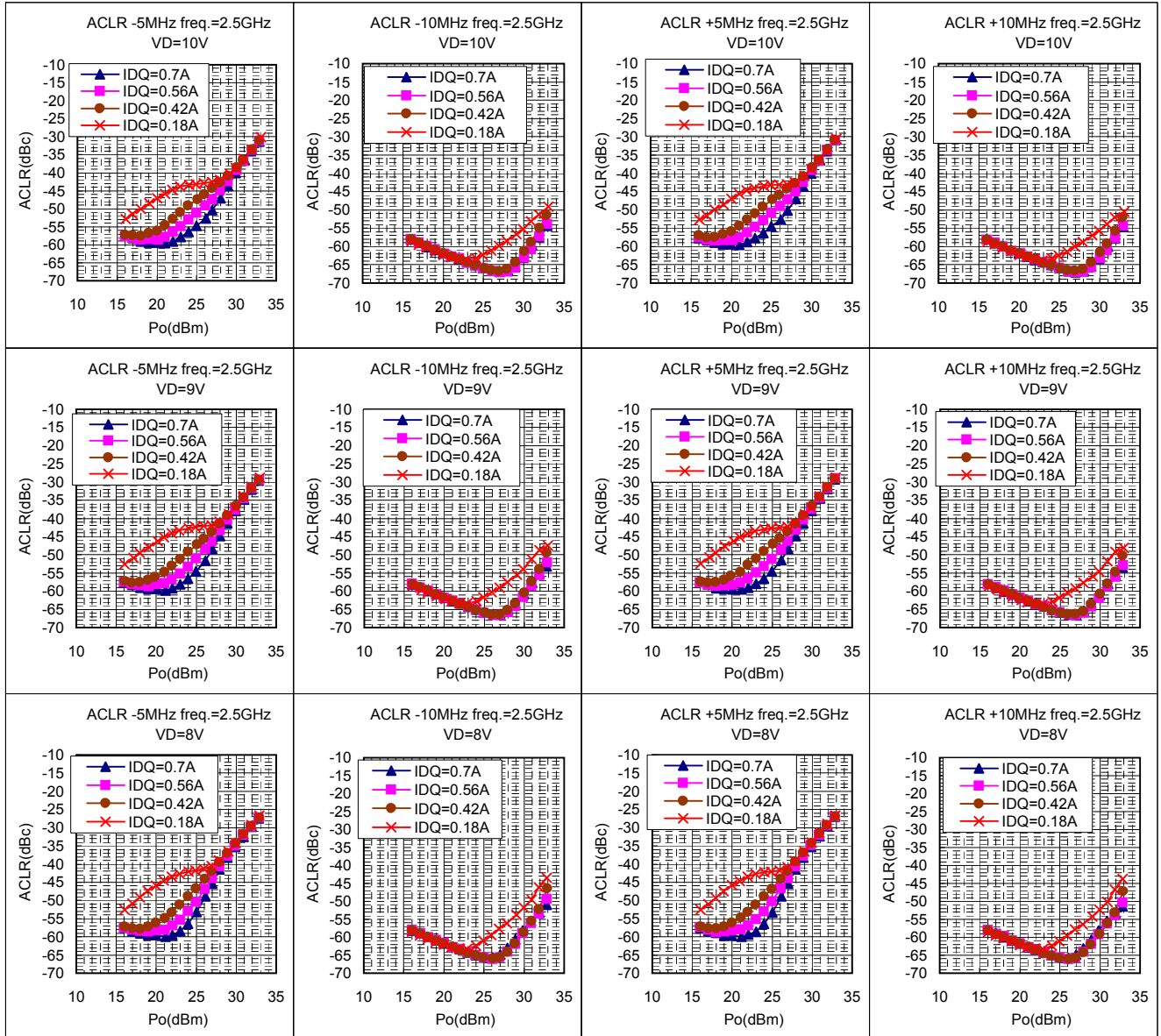


MGF0952P RF TEST DATA(W-CDMA) VD=10V,Idq=0.7A
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal

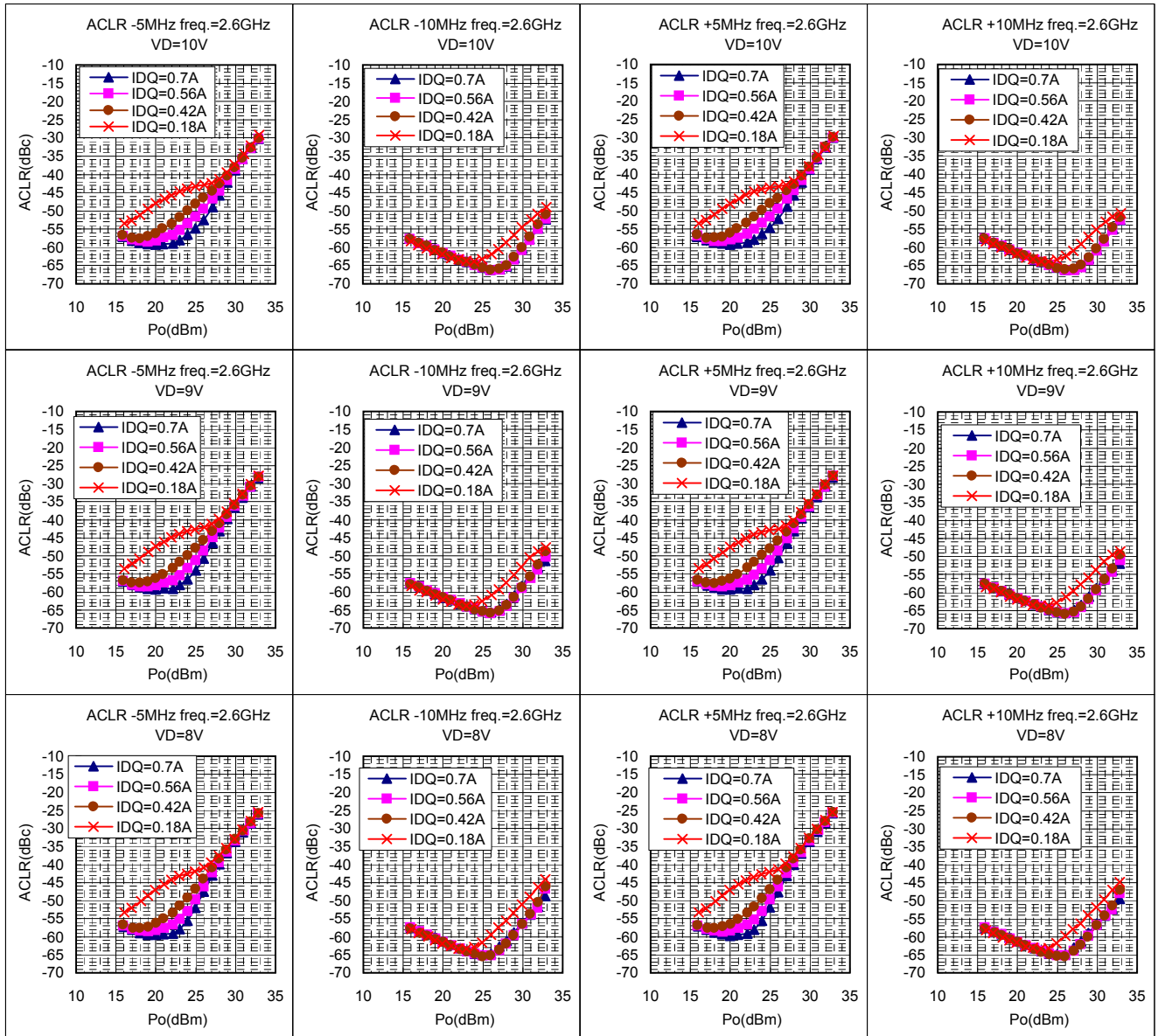


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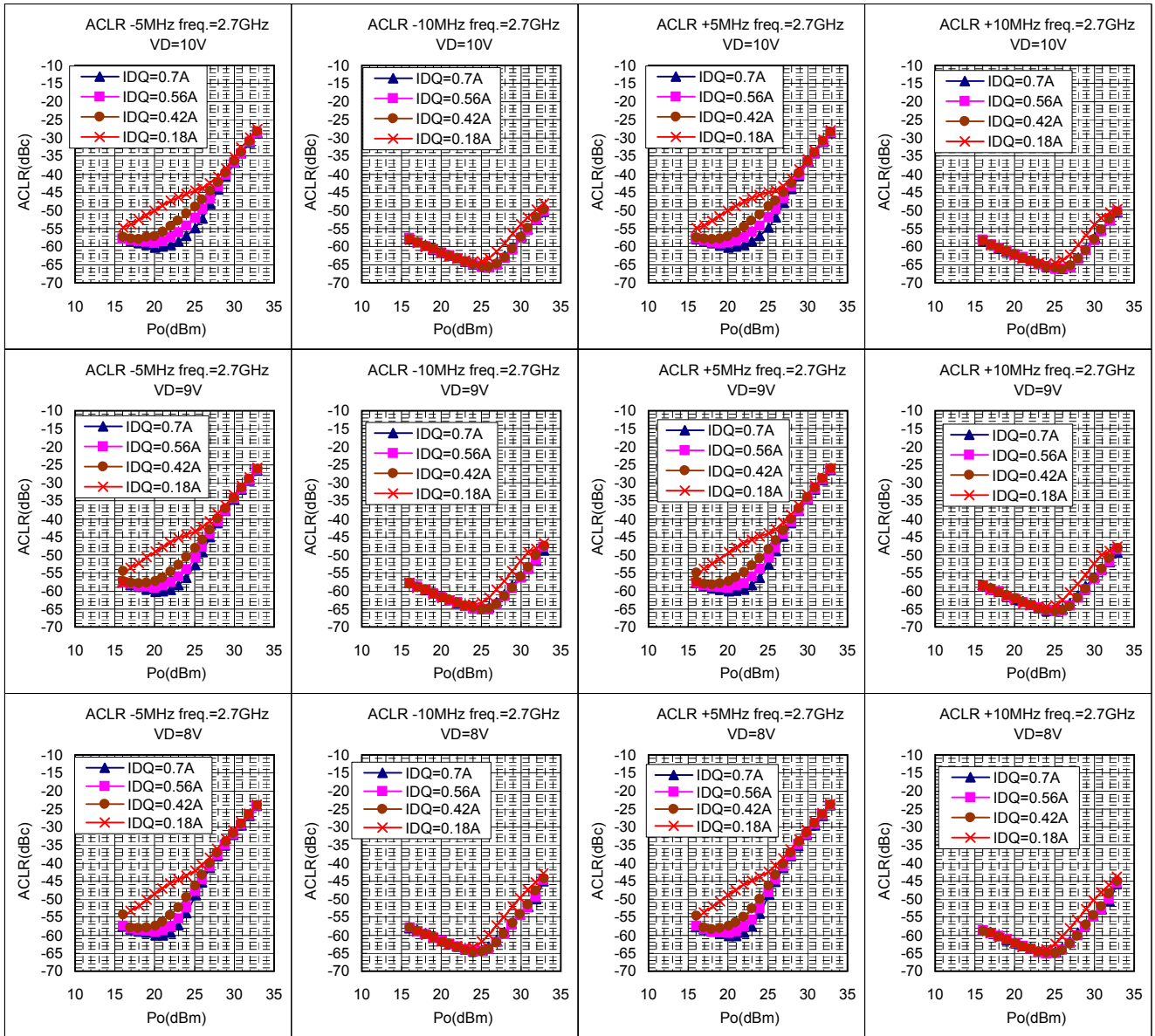
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



MGF0952P RF TEST DATA(W-CDMA)
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal

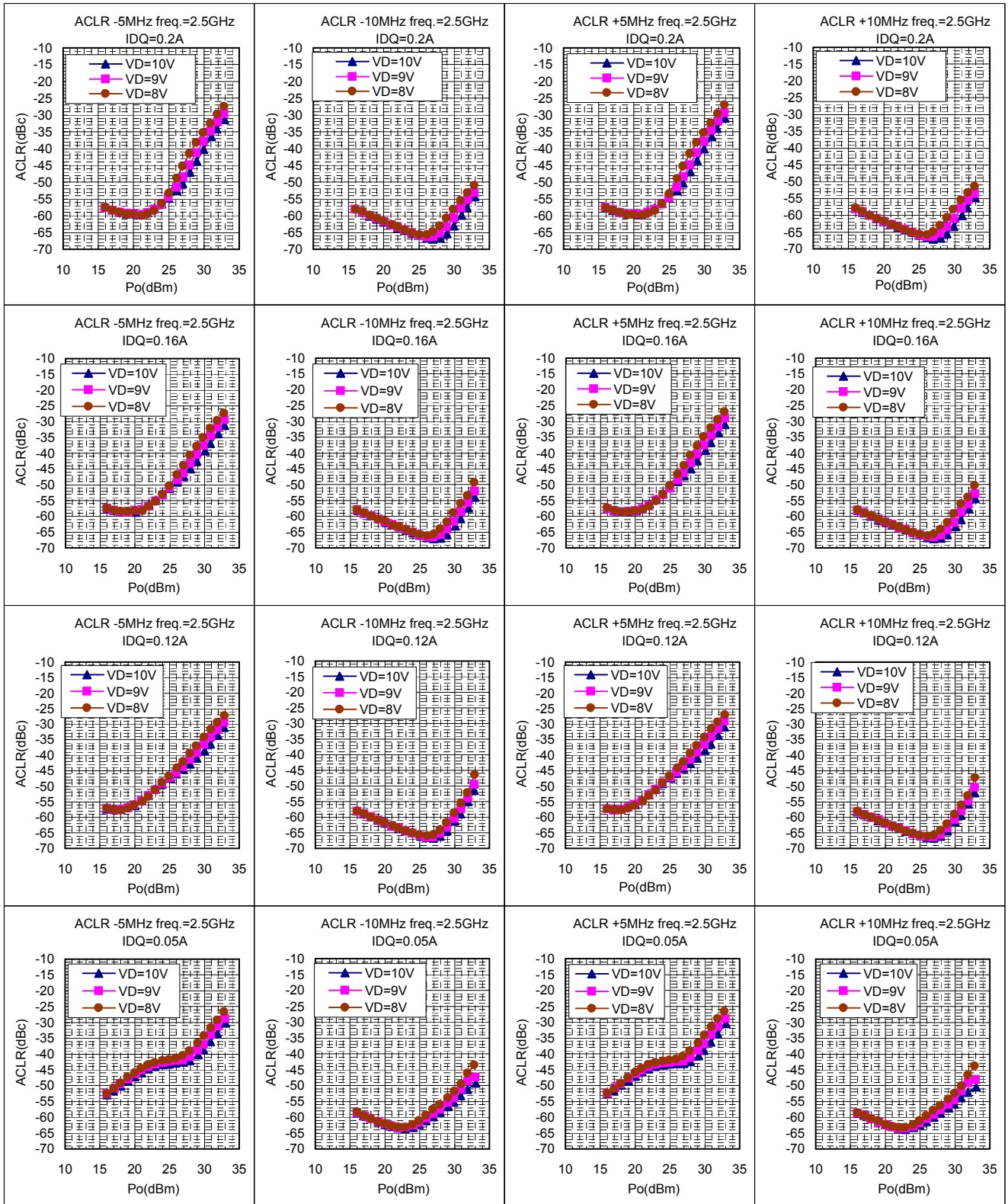


MGF0952P RF TEST DATA(W-CDMA)
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



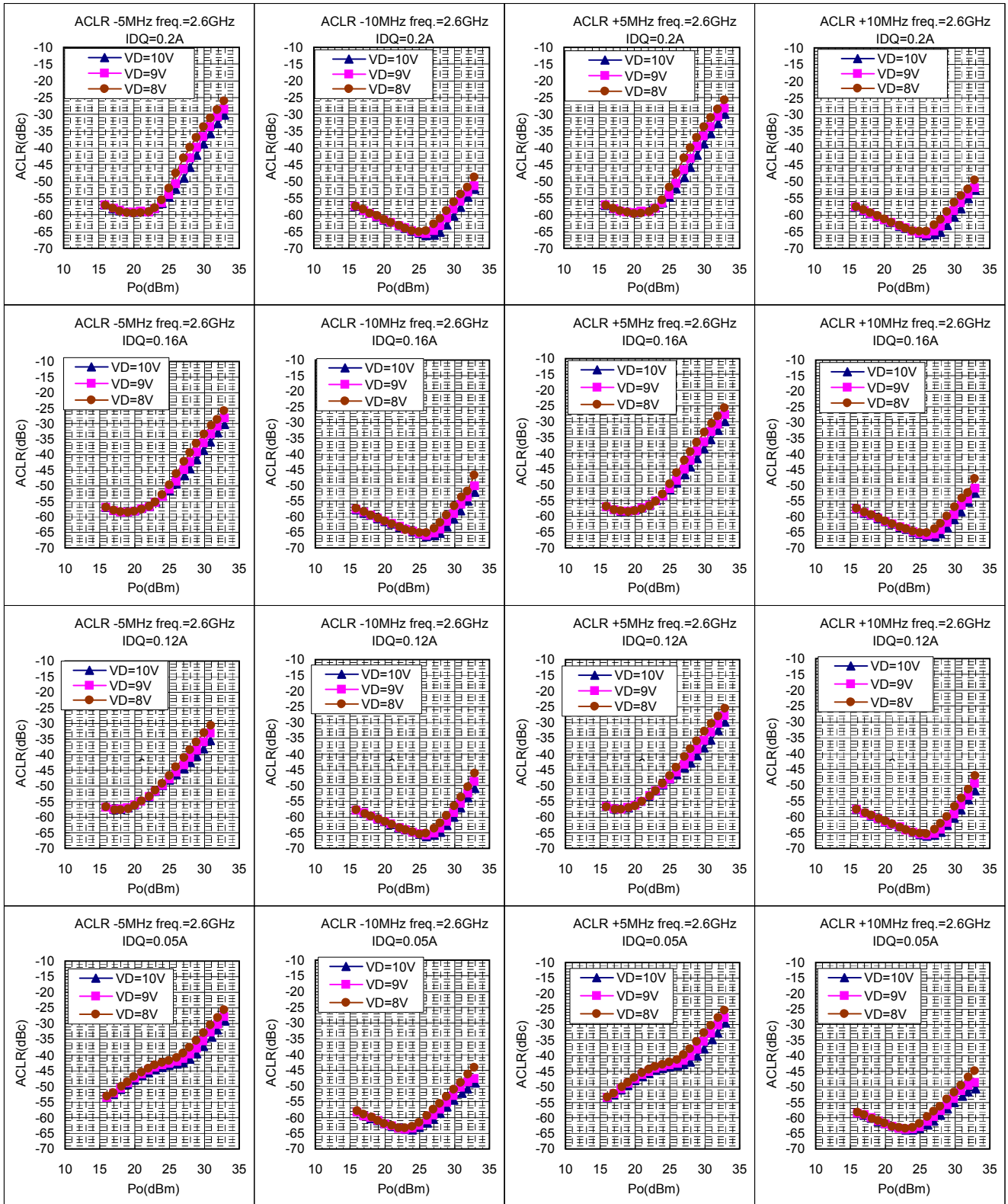
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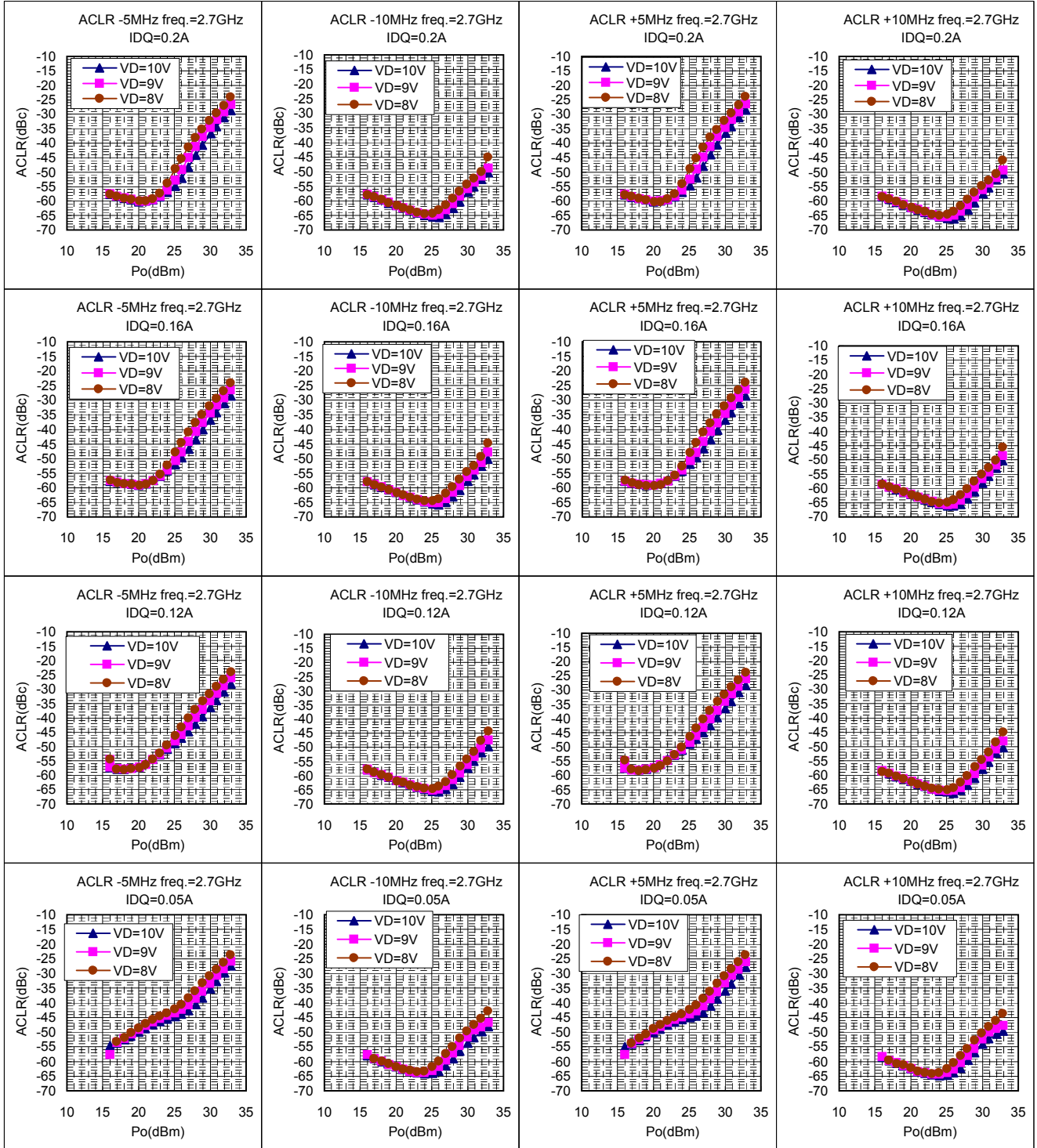


MGF0952P RF TEST DATA(W-CDMA)

ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal

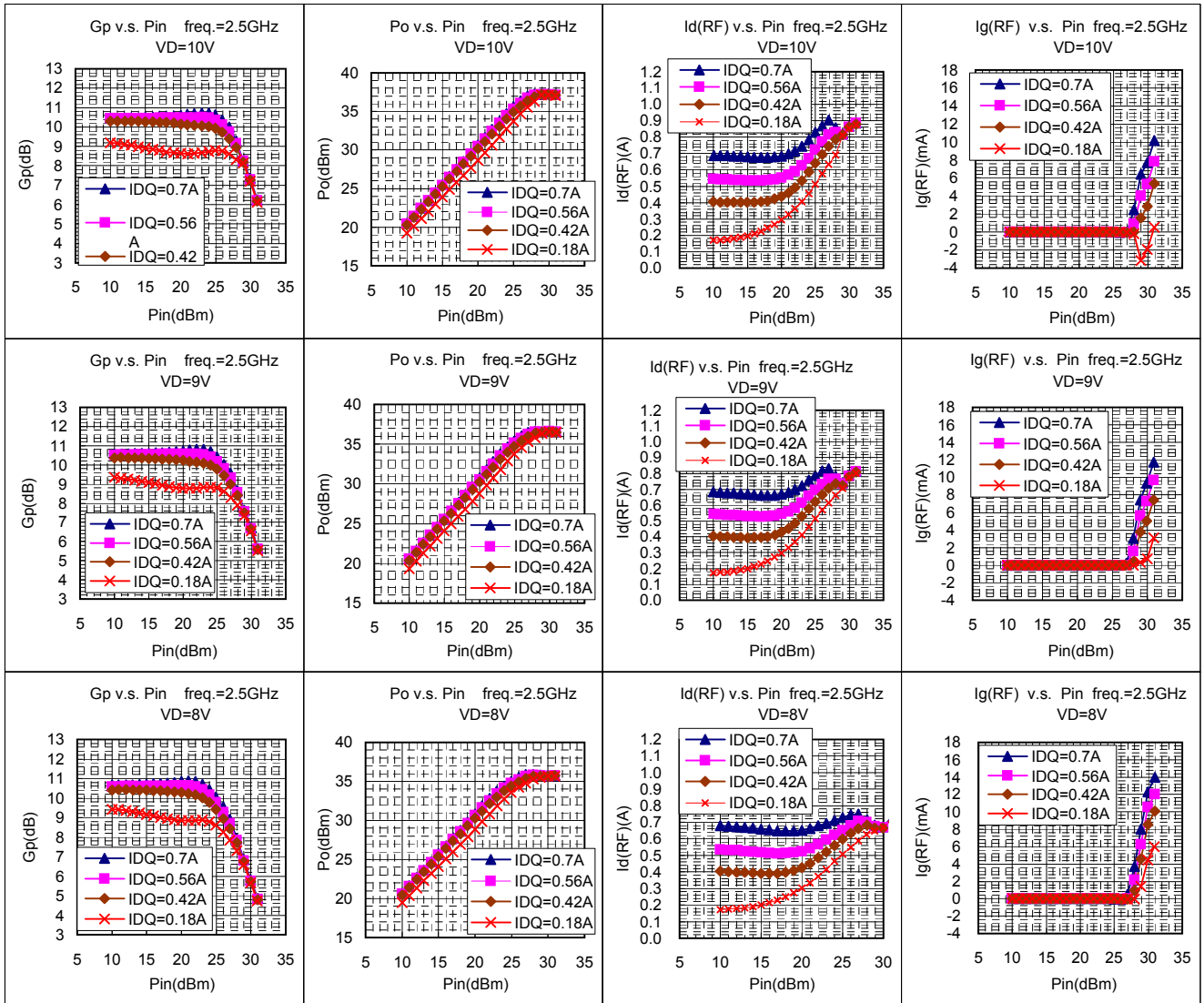


MGF0952P RF TEST DATA(W-CDMA)
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



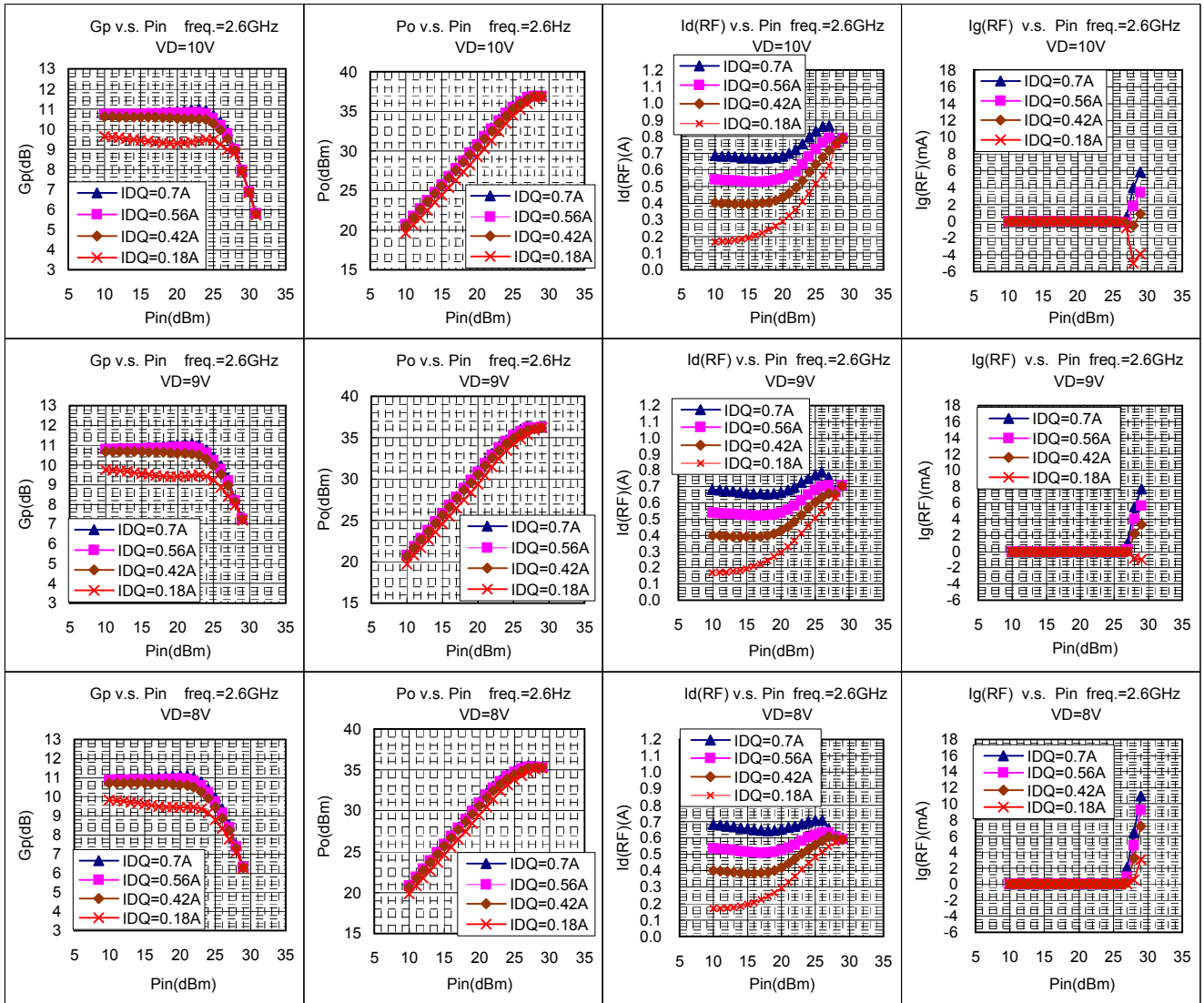
MGF0952P RF TEST DATA(CW)

Gp,Po,Id(RF),I_g(RF) v.s. Pin



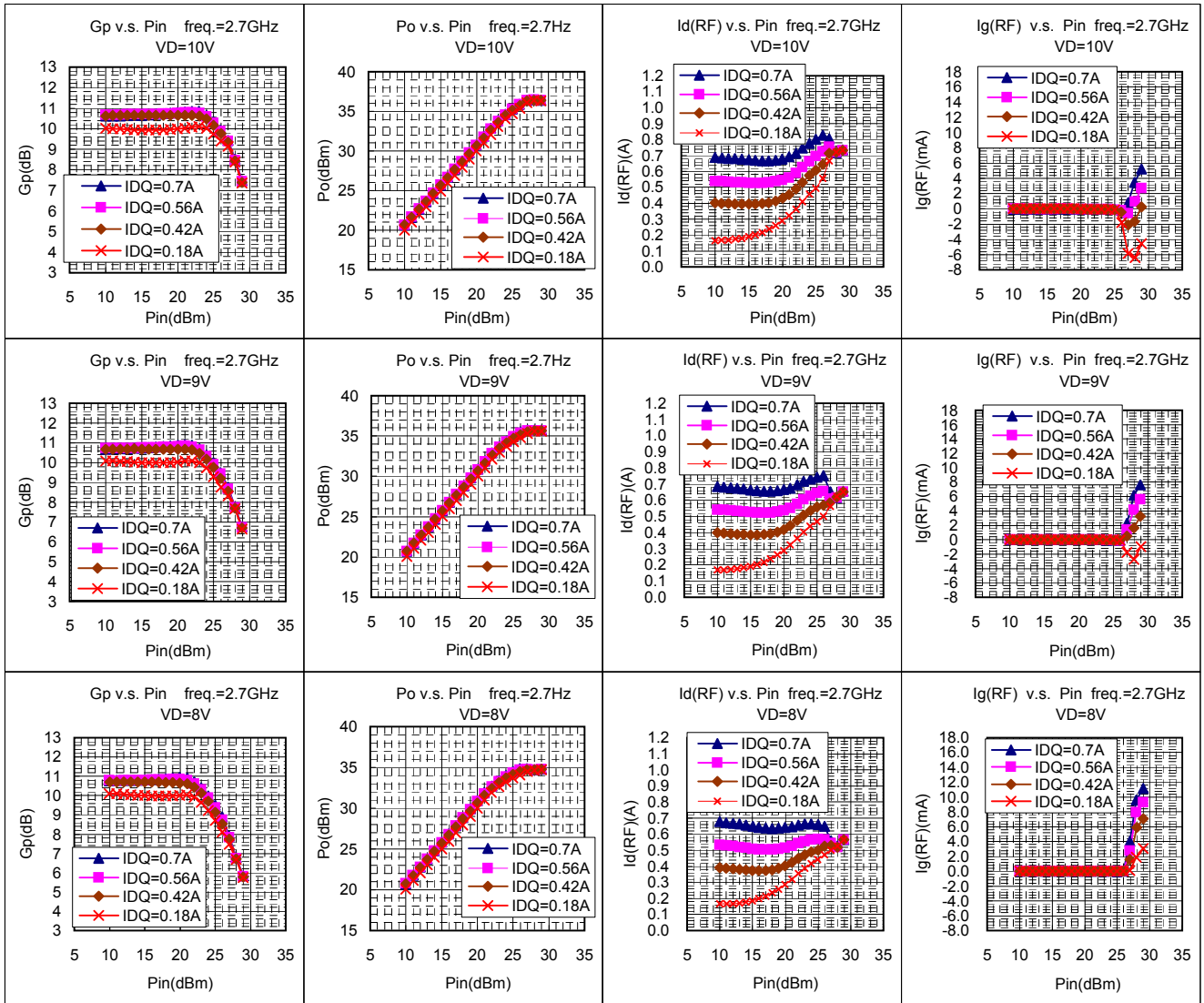
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Gp,Po,Id(RF),Iq(RF) v.s. Pin



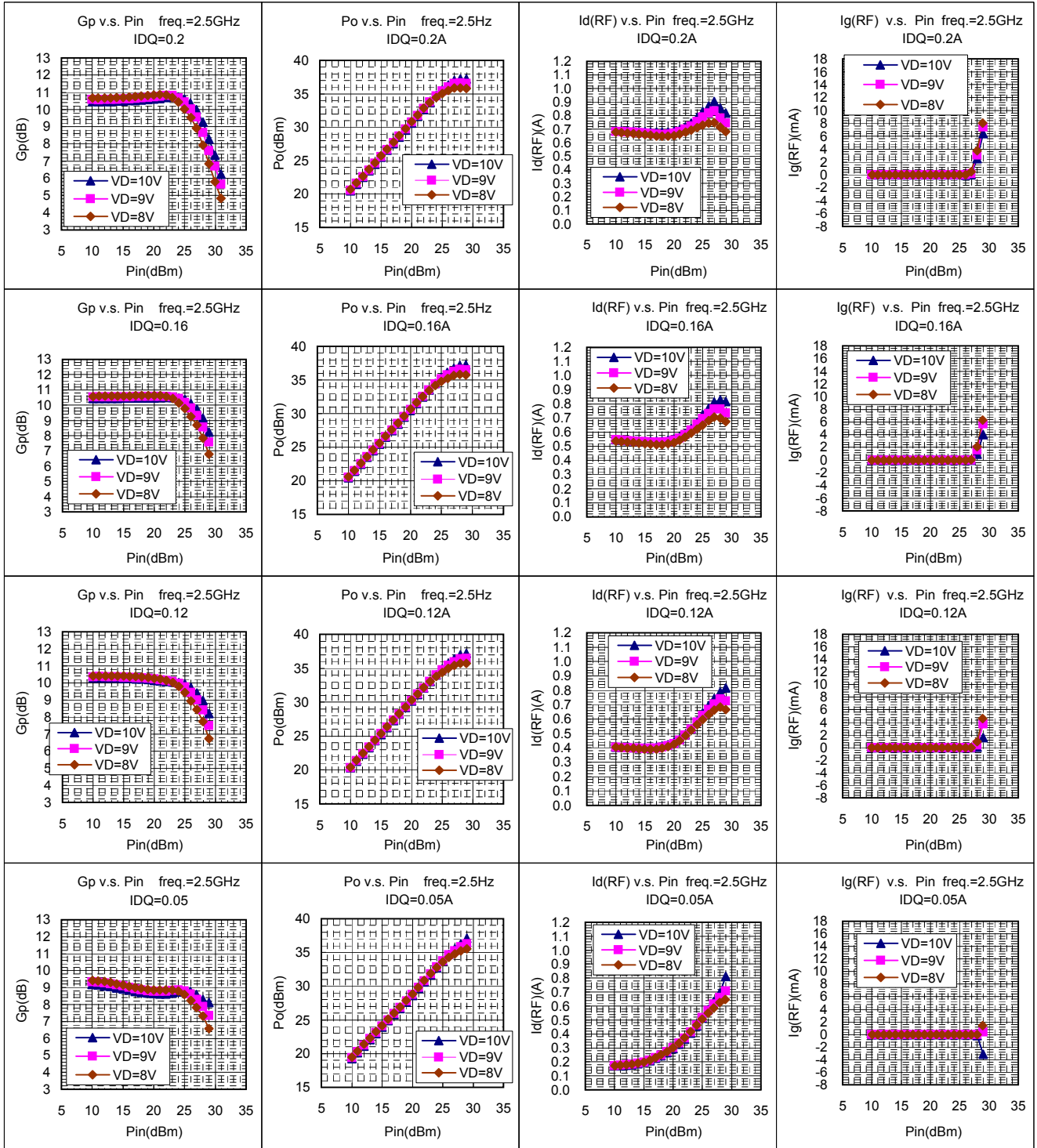
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Gp,Po,Id(RF),I_g(RF) v.s. Pin



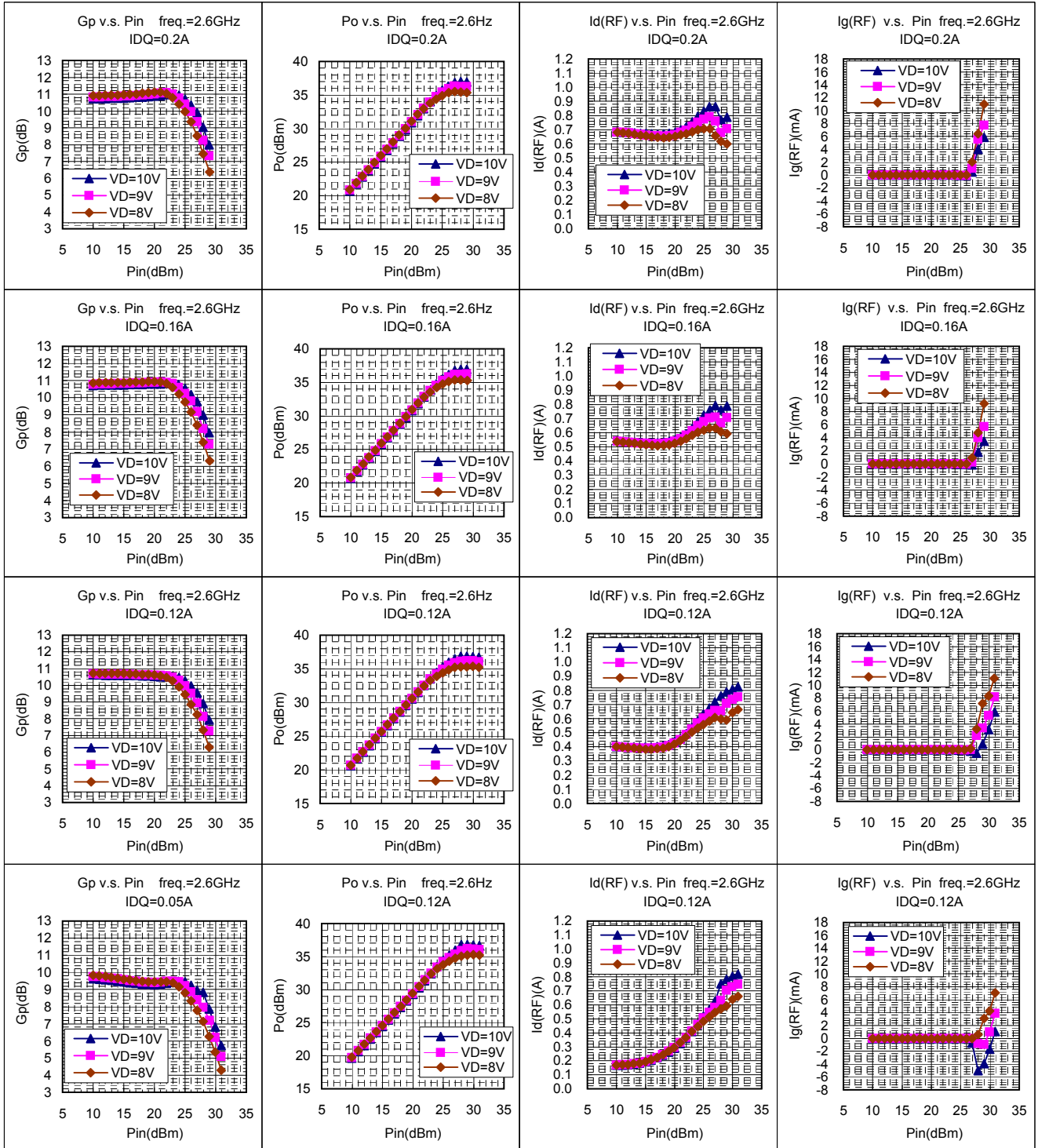
MGF0952P RF TEST DATA(CW)

Gp,Po,Id(RF),I_g(RF) v.s. Pin



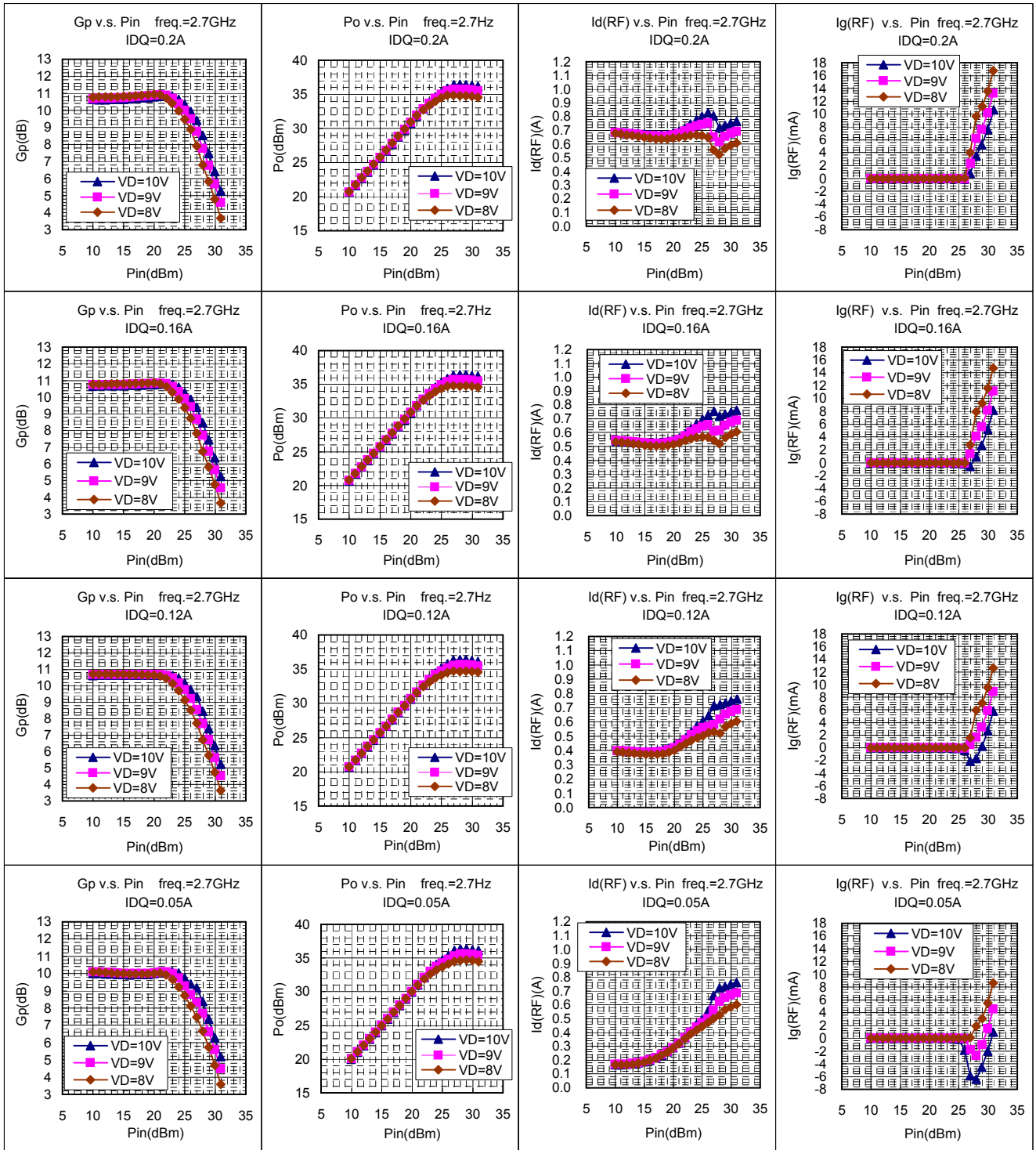
MGF0952P RF TEST DATA(CW)

Gp,Po,Id(RF),I_g(RF) v.s. Pin

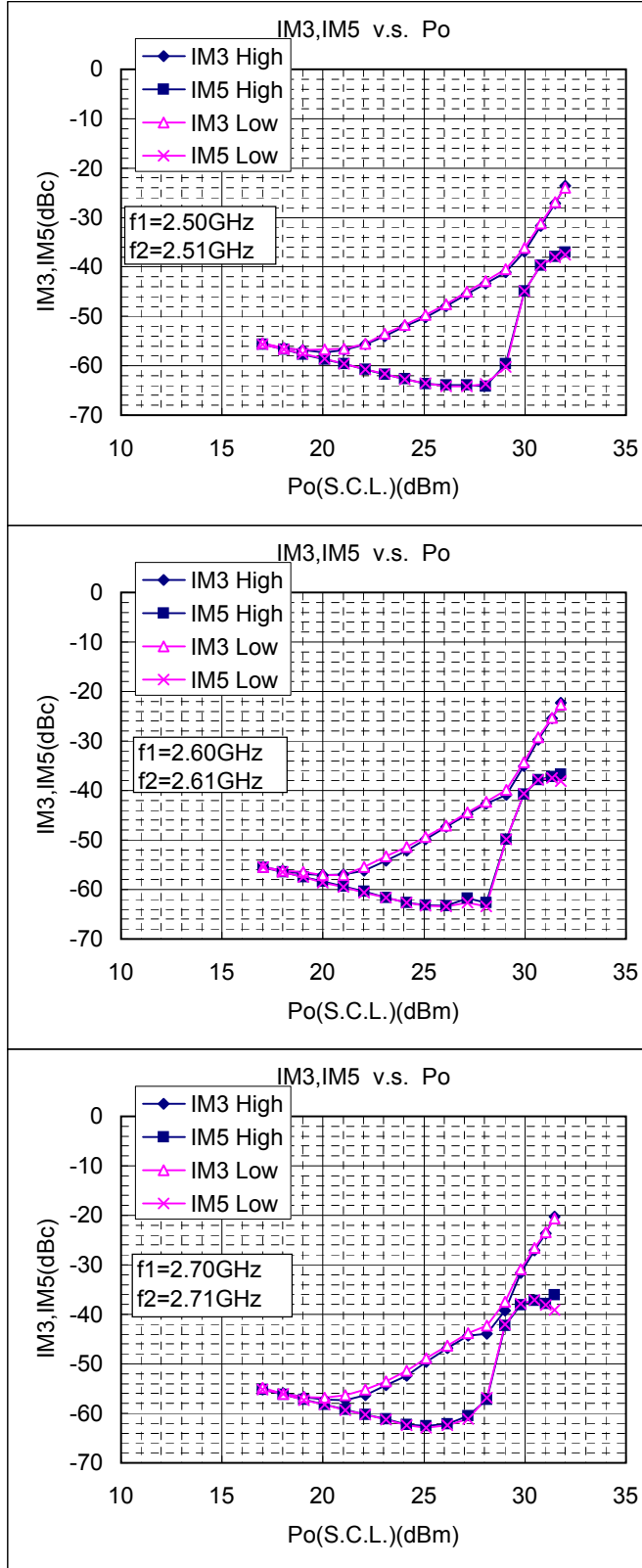


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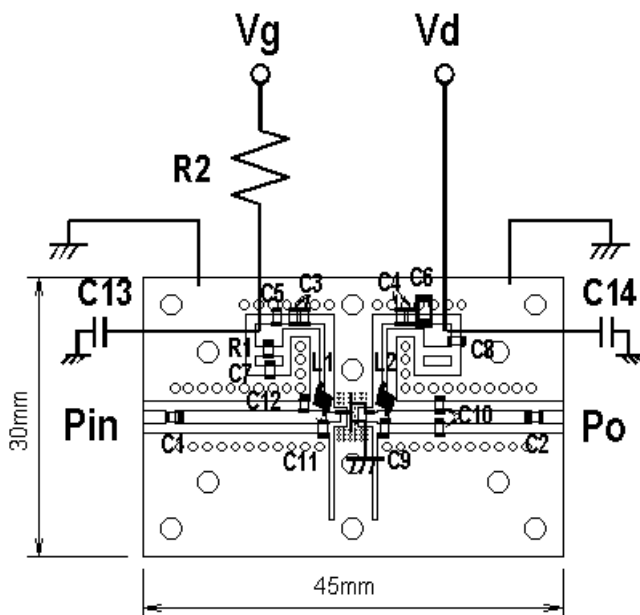
Gp,Po,Id(RF),I_g(RF) v.s. Pin



MGF0952P RF TEST DATA VD=10V, Idq=0.8A
IM3,IM5 v.s. Pin



MGF0952P TEST FIXTURE $f=2.6\text{GHz}$

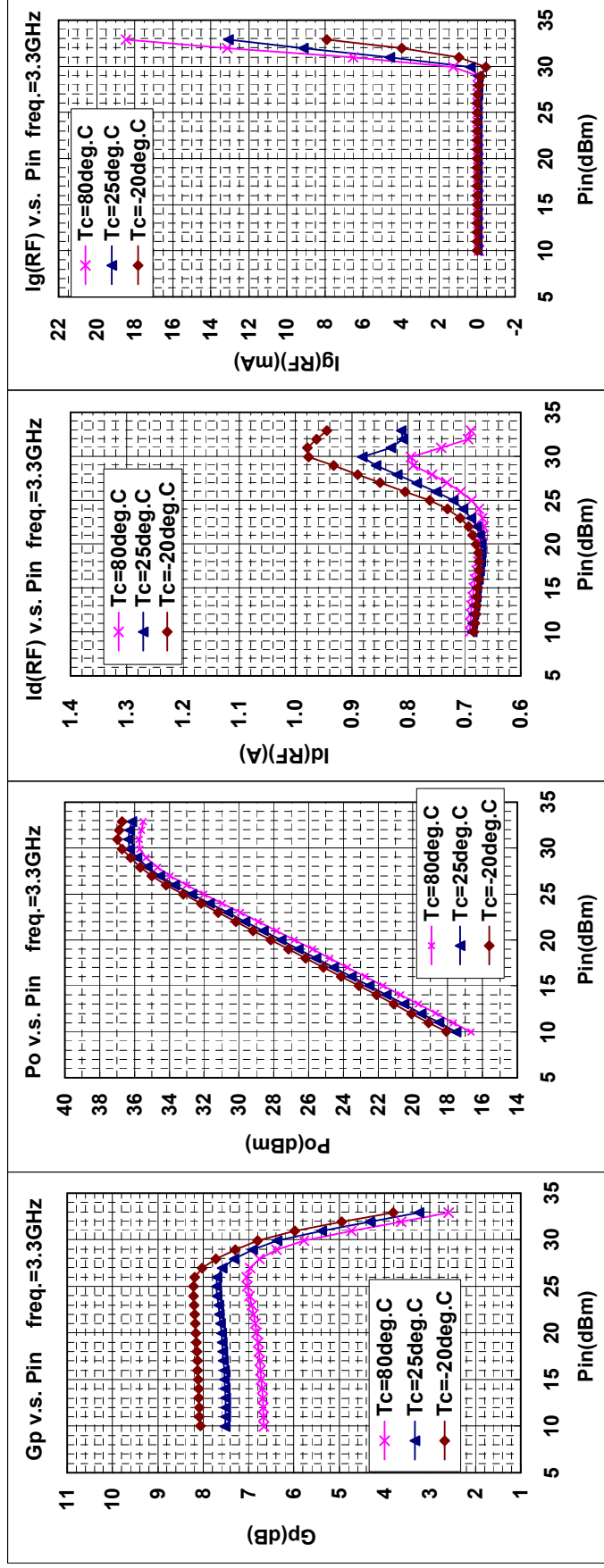


- C1,C2,C3,C4=20pF
- C5,C7,C8=1000pF
- C9,C11=2pF
- C10=1pF
- C13=330uF
- C14=47uF
- C12=0.5pF
- C6=4.7uF
- L1,L2=12nH
- R1=51ohm
- R2=100ohm

Board material:FR4 Thickness=0.8(mm)
Specific dielectric constant=4.4

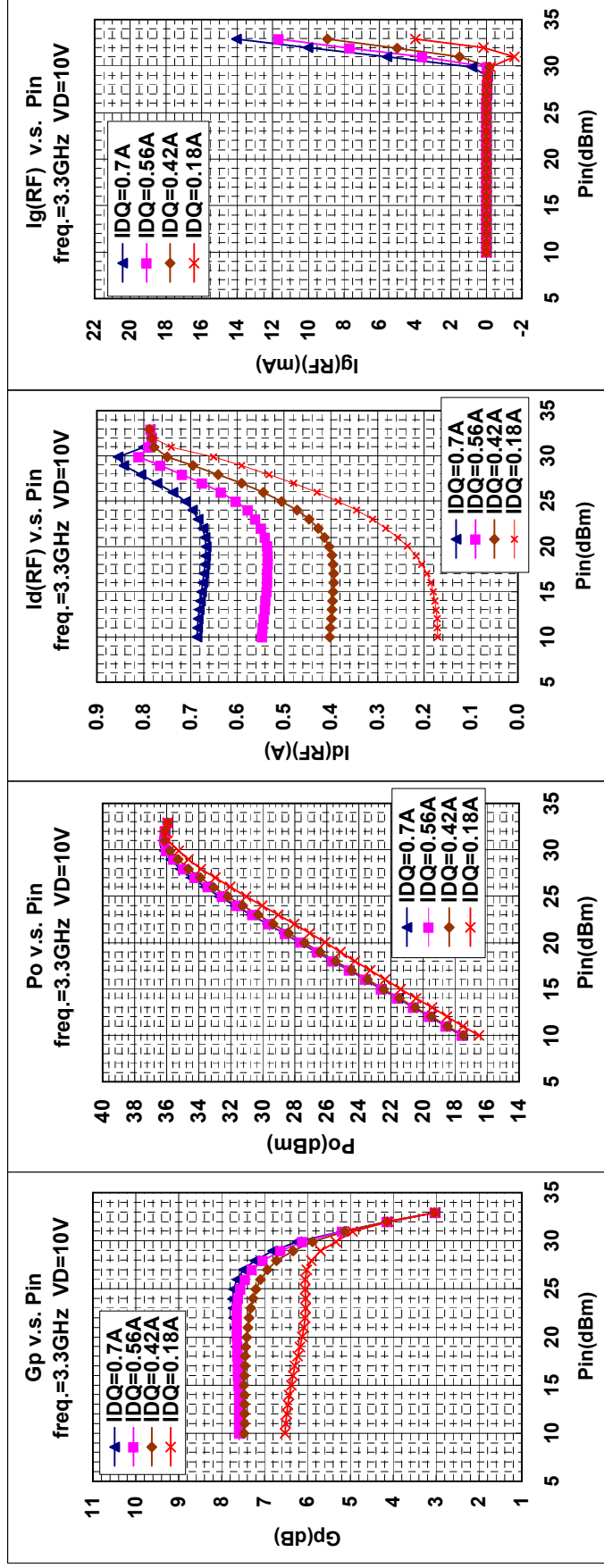
MGF0952P RF TEST DATA(CW) VD=10V,Idq=0.7A

Gp,Po,Id(RF),Ig(RF) v.s. Pin



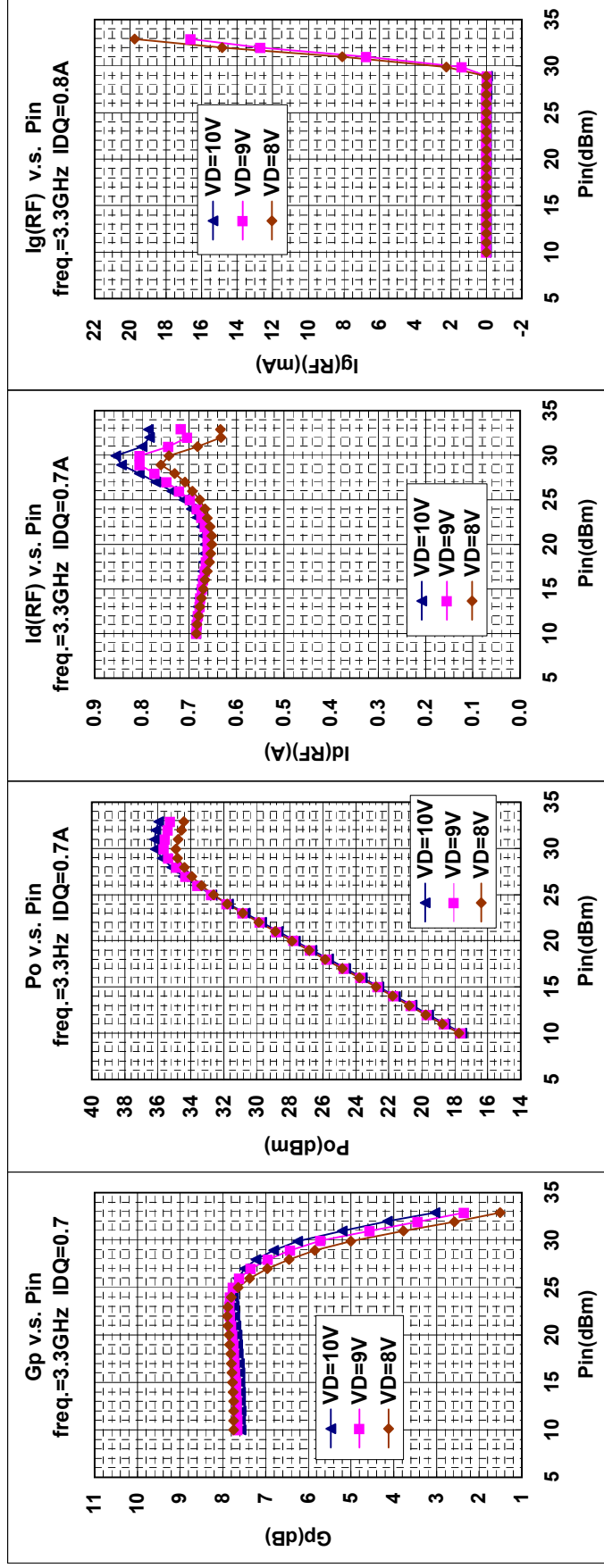
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Gp,Po,Id(RF),Ig(RF) v.s. Pin

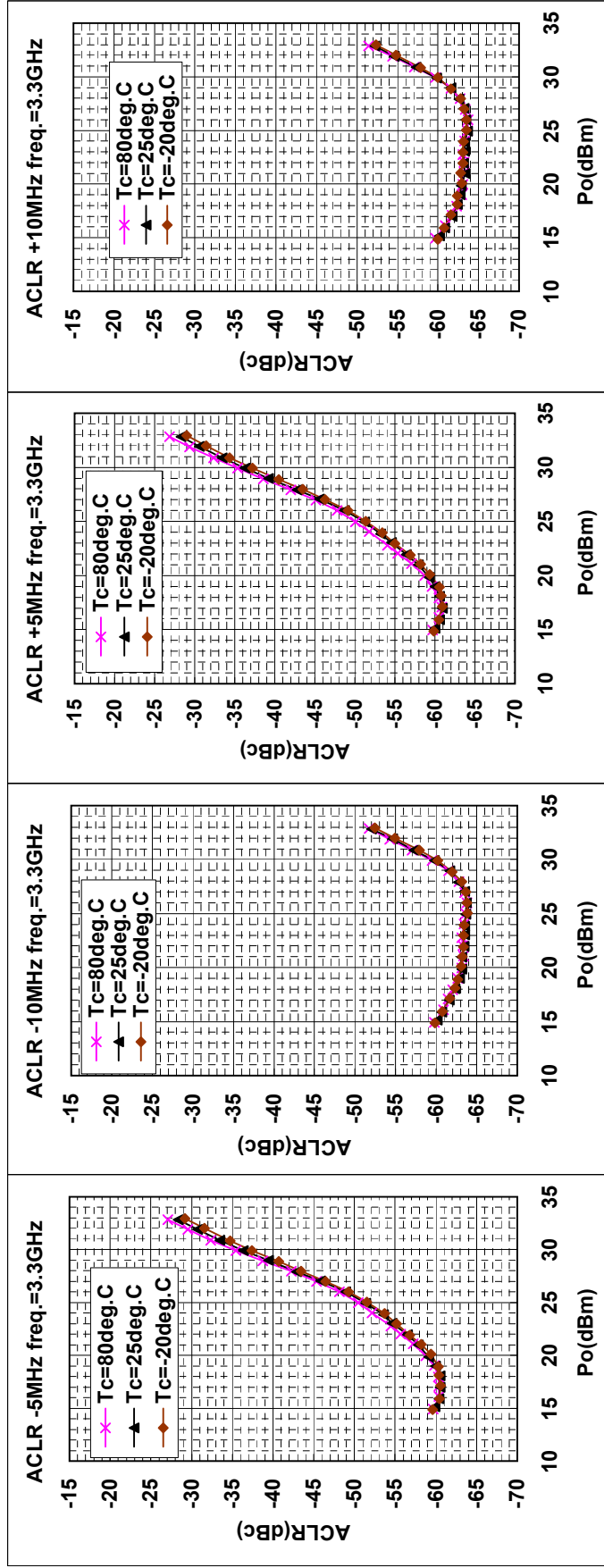


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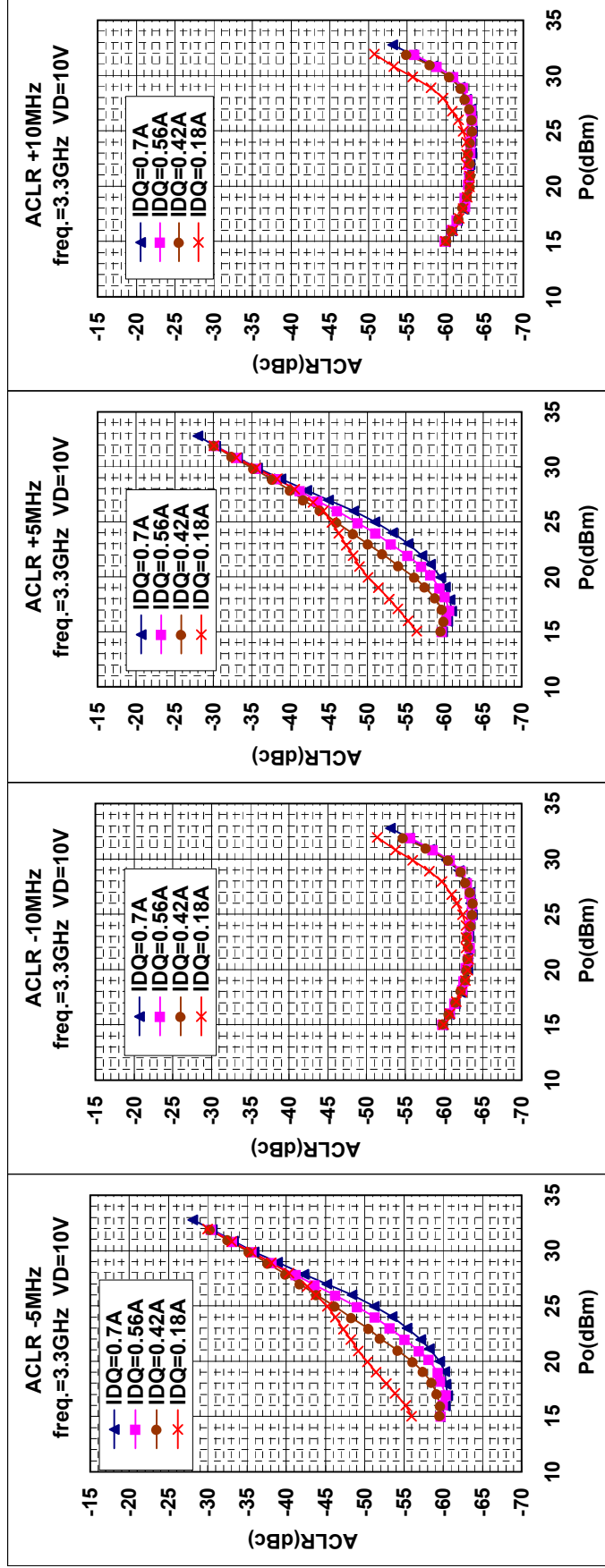
Gp,Po,Id(RF),Ig(RF) v.s. Pin



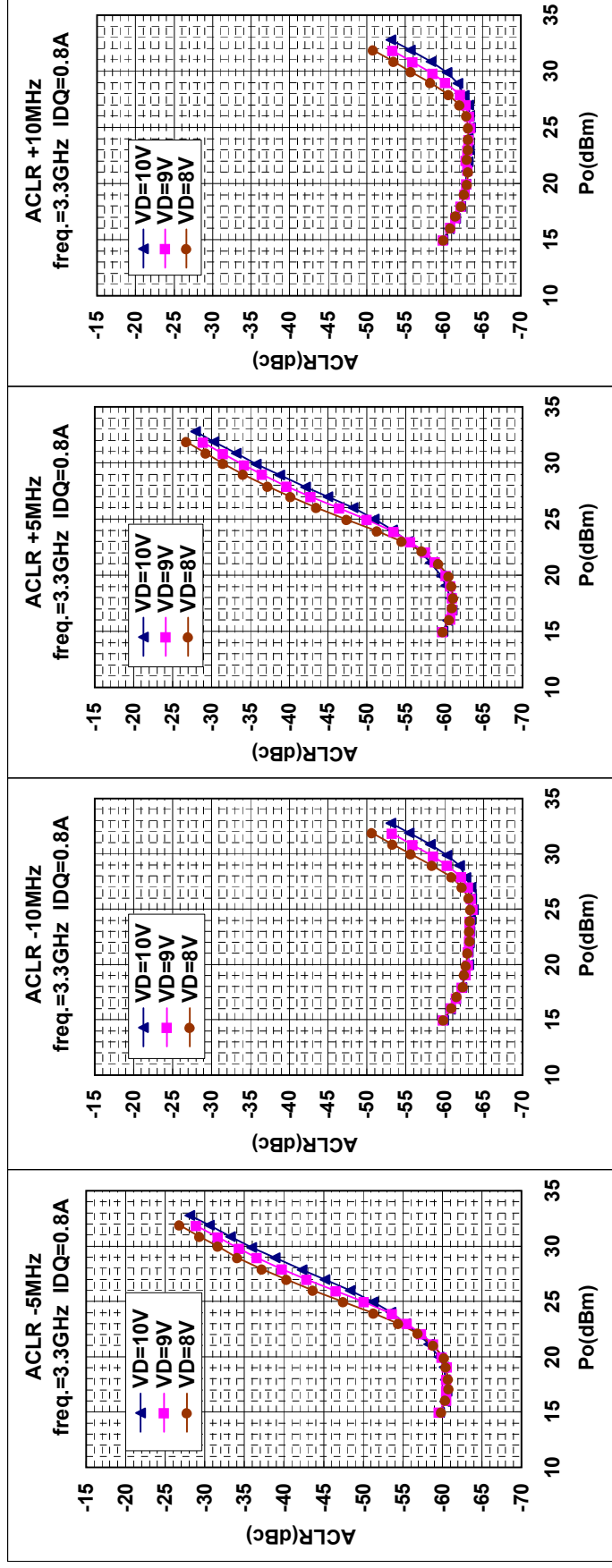
MGF0952P RF TEST DATA(W-CDMA) VD=10V,Idq=0.7A
 ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



MGF0952P RF TEST DATA(W-CDMA)
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal

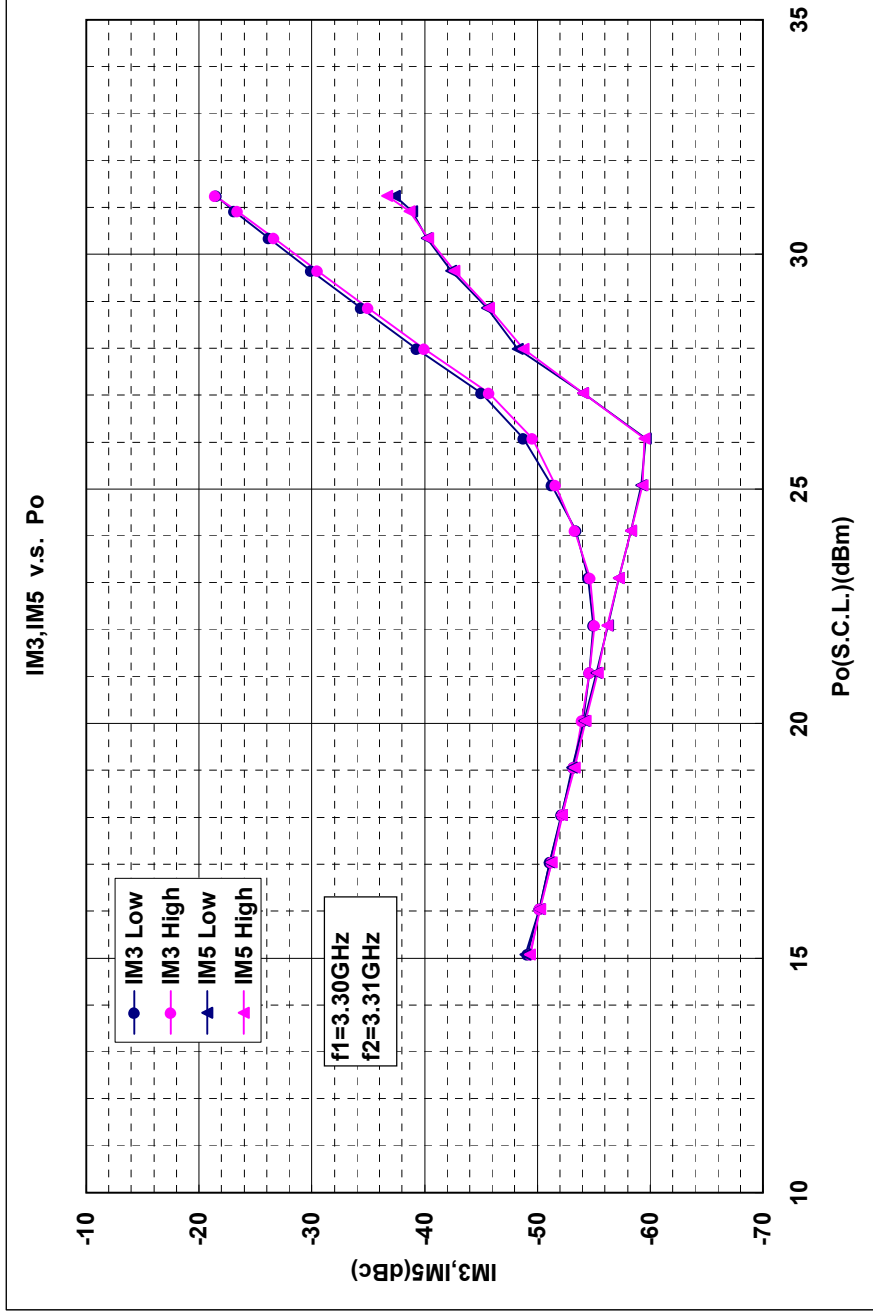


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ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal

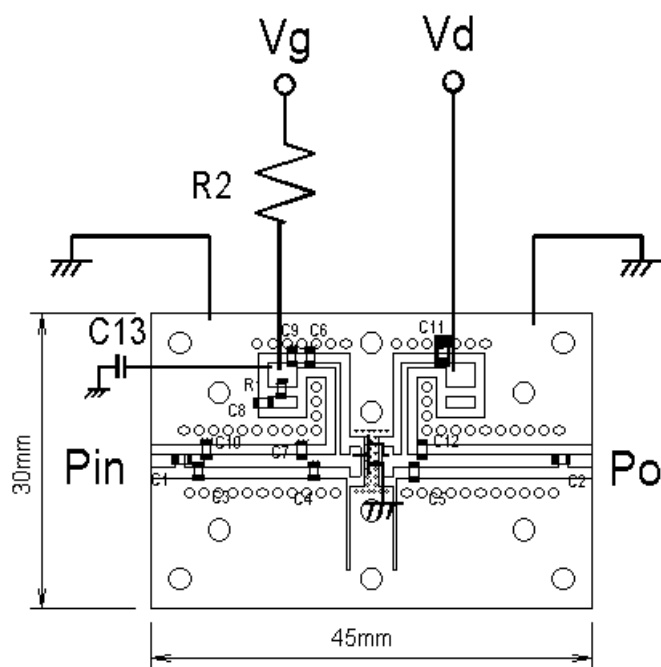


MGF0952P RF TEST DATA VD=10V,Idq=0.7A

IM3,IM5 v.s. Pin



MGF0952P TEST FIXTURE $f=3.3\text{GHz}$

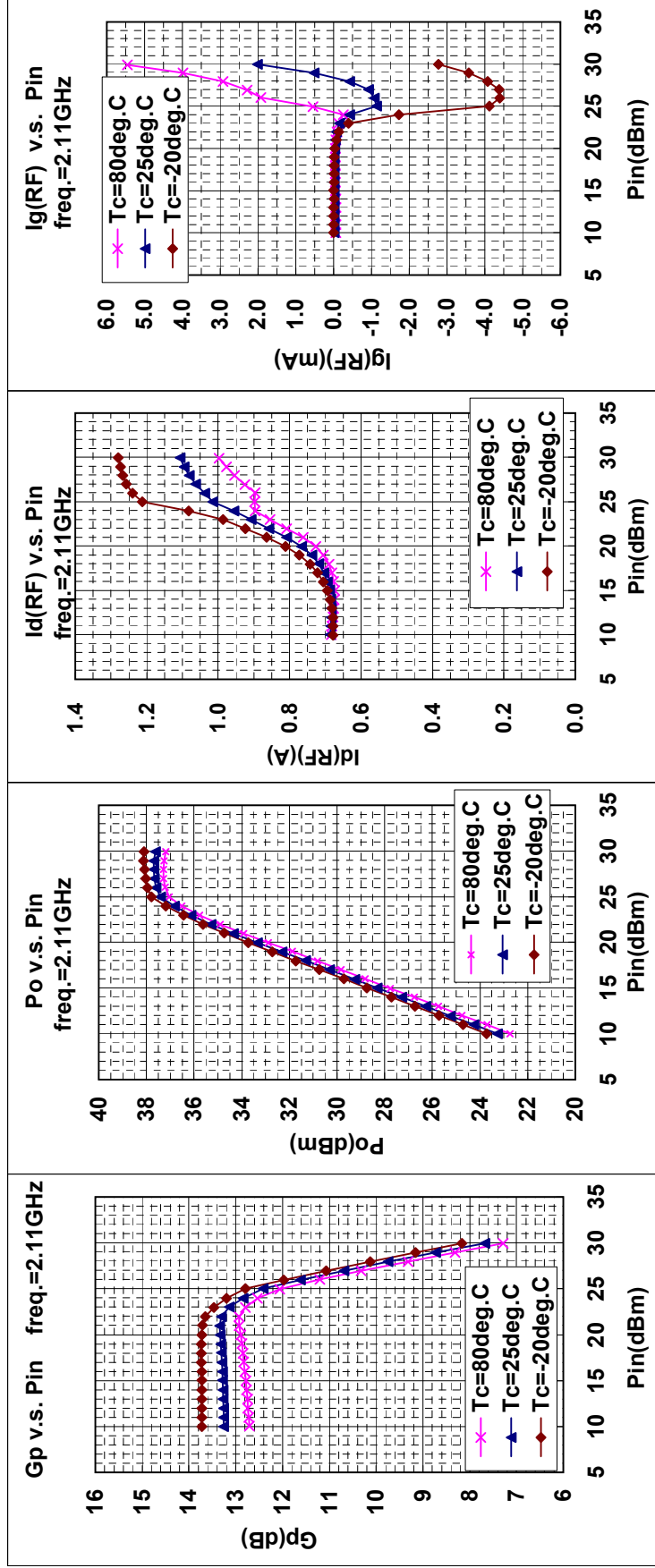


- C1,C2,=20pF
- C3,C4,C5=1P
- C6=22pF
- C7,C10,C12=0.5pF
- C8,C9=1000pF
- C11=4.7uF
- C13=330uF
- R1=51ohm
- R2=100ohm

Board material:FR4 Thickness=0.8(mm)
Specific dielectric constant=4.4

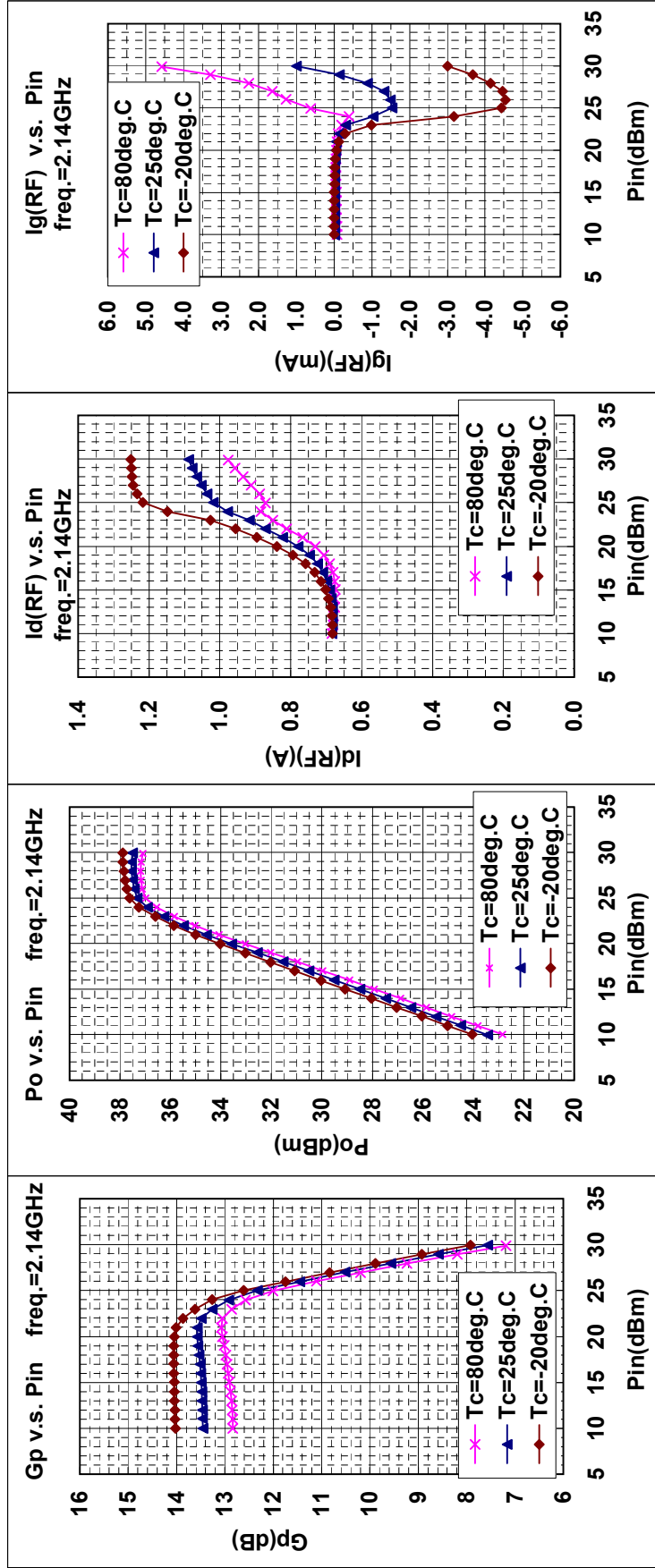
MGF0952P RF TEST DATA(CW) VD=10V, IDQ=0.7A

Gp,Po,Id(RF),Ig(RF) v.s. Pin



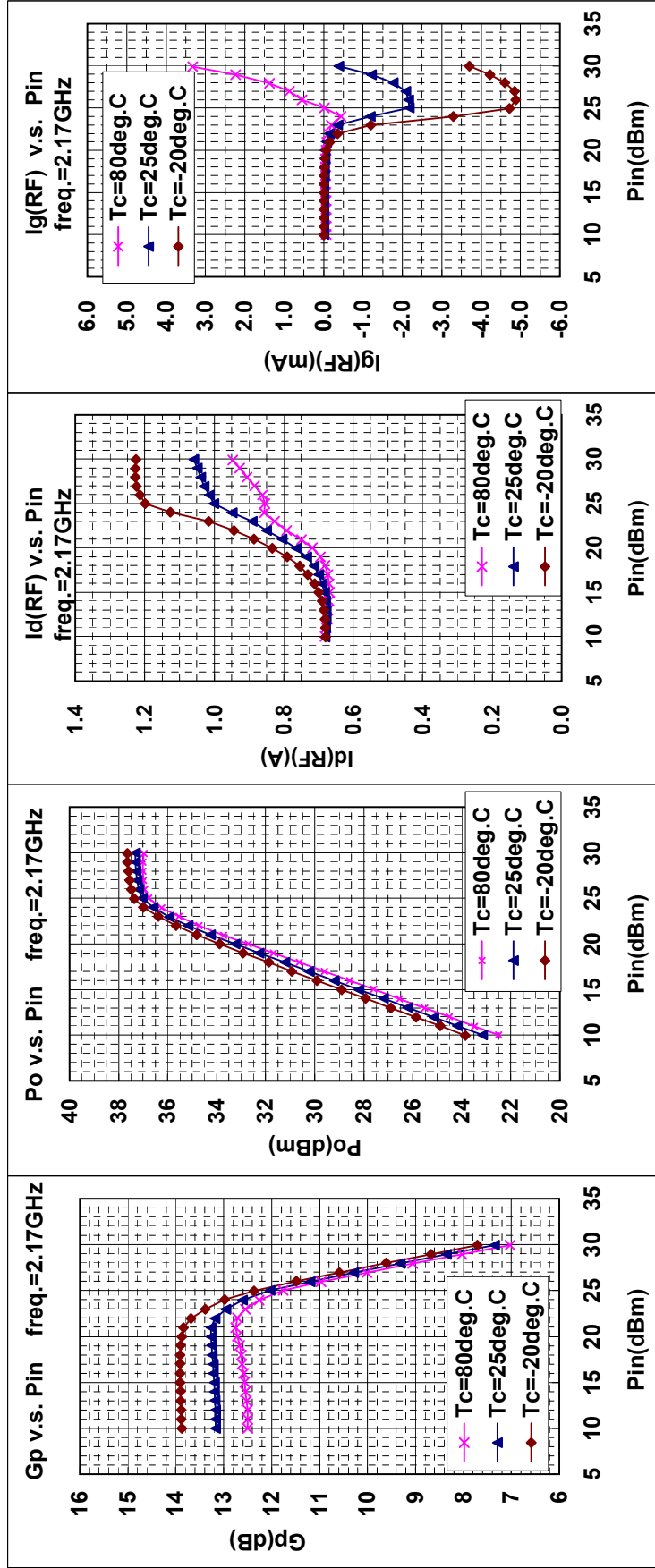
MGF0952P RF TEST DATA(CW) VD=10V, IDQ=0.7A

Gp, Po, Id(RF), Ig(RF) v.s. Pin



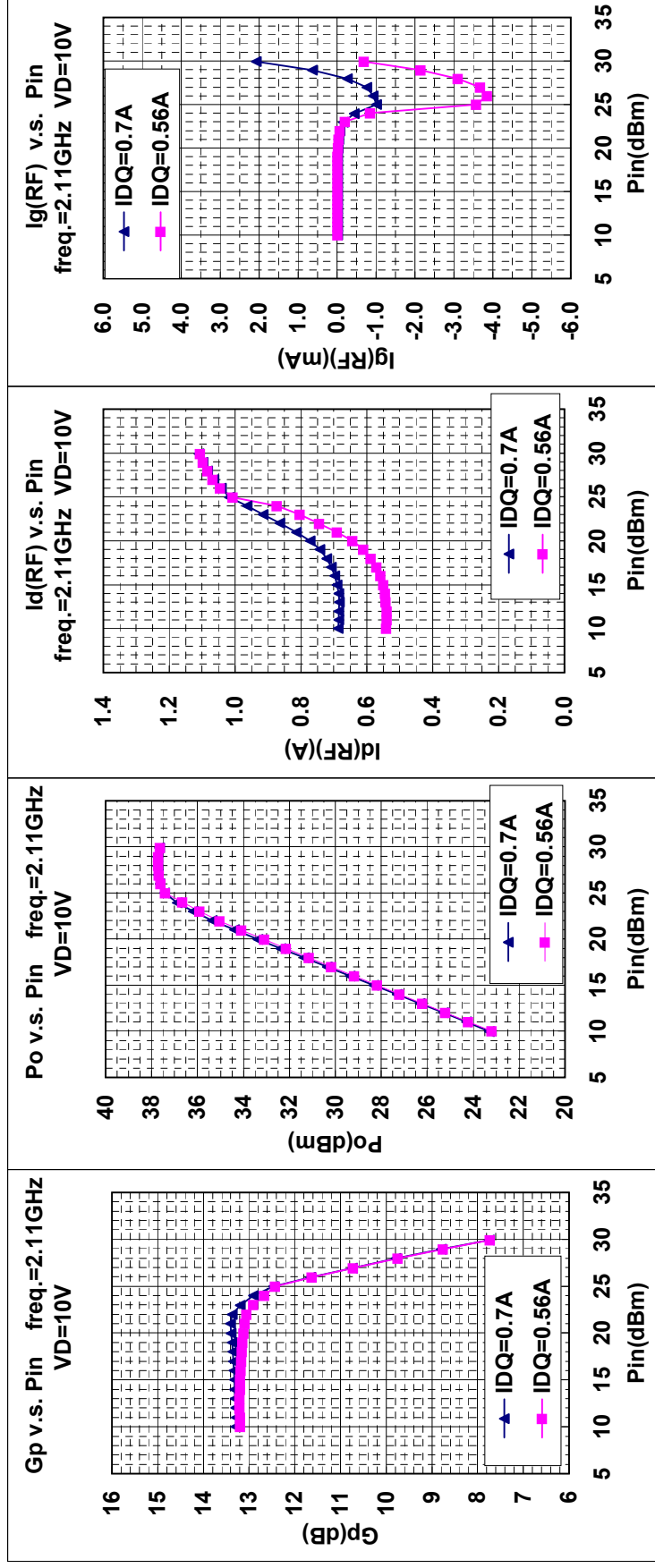
MGF0952P RF TEST DATA(CW) VD=10V, IDQ=0.7A

Gp,Po,Id(RF),Ig(RF) v.s. Pin



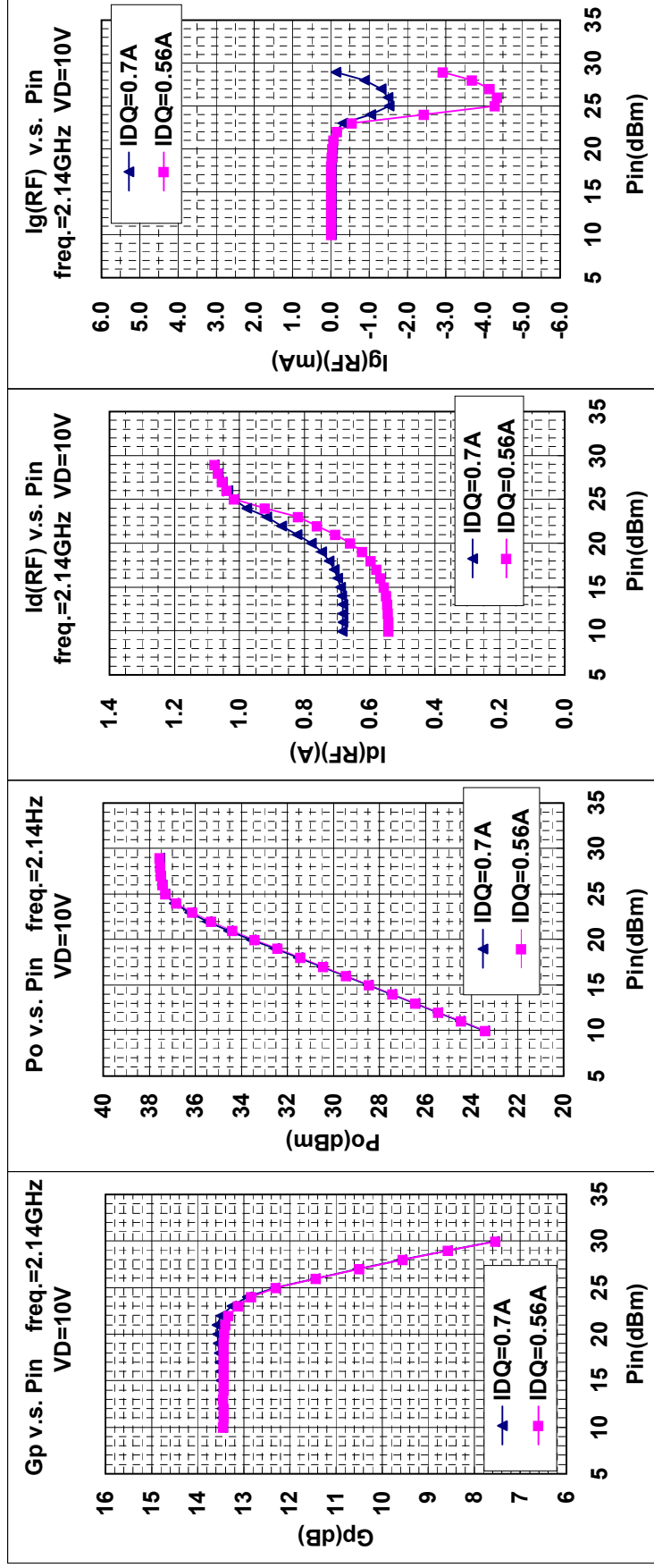
MGF0952P RF TEST DATA(CW)

Gp,Po,Id(RF),Ig(RF) v.s. Pin



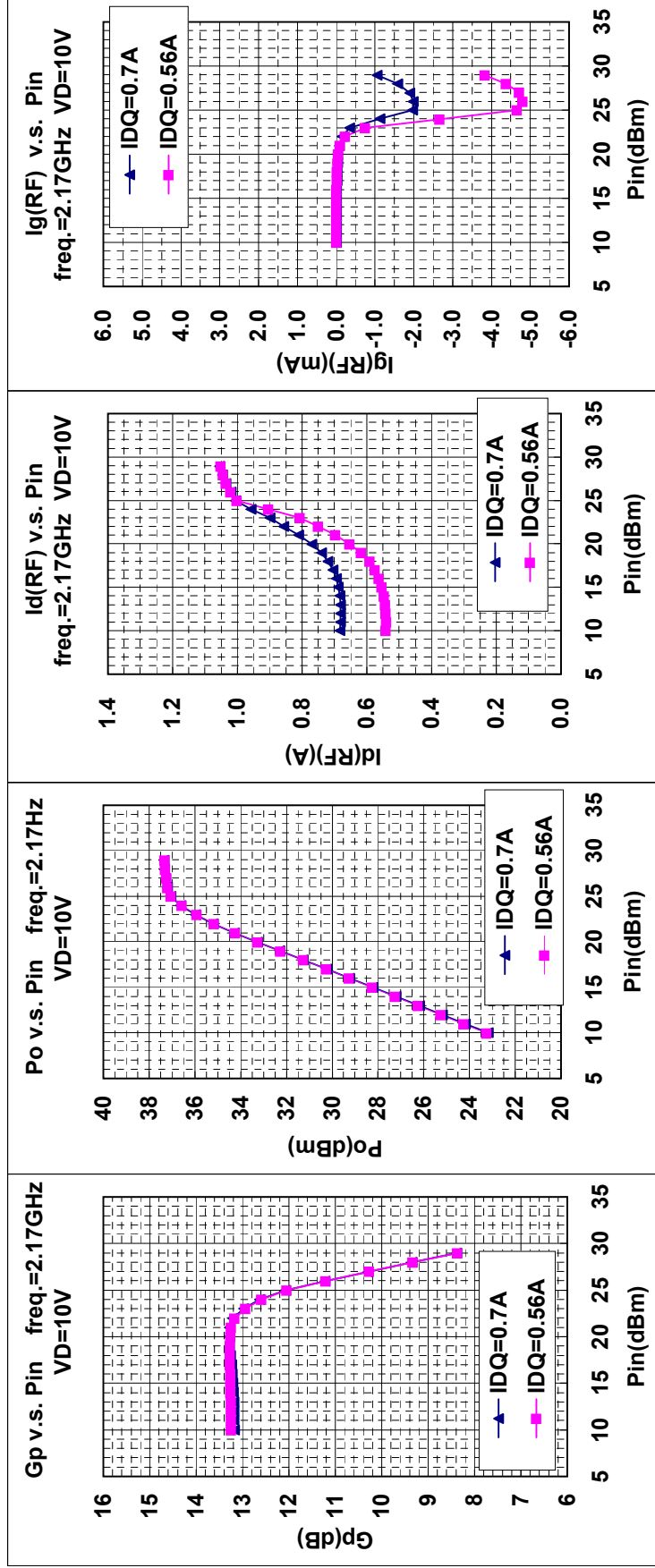
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Gp,Po,Id(RF),Ig(RF) v.s. Pin



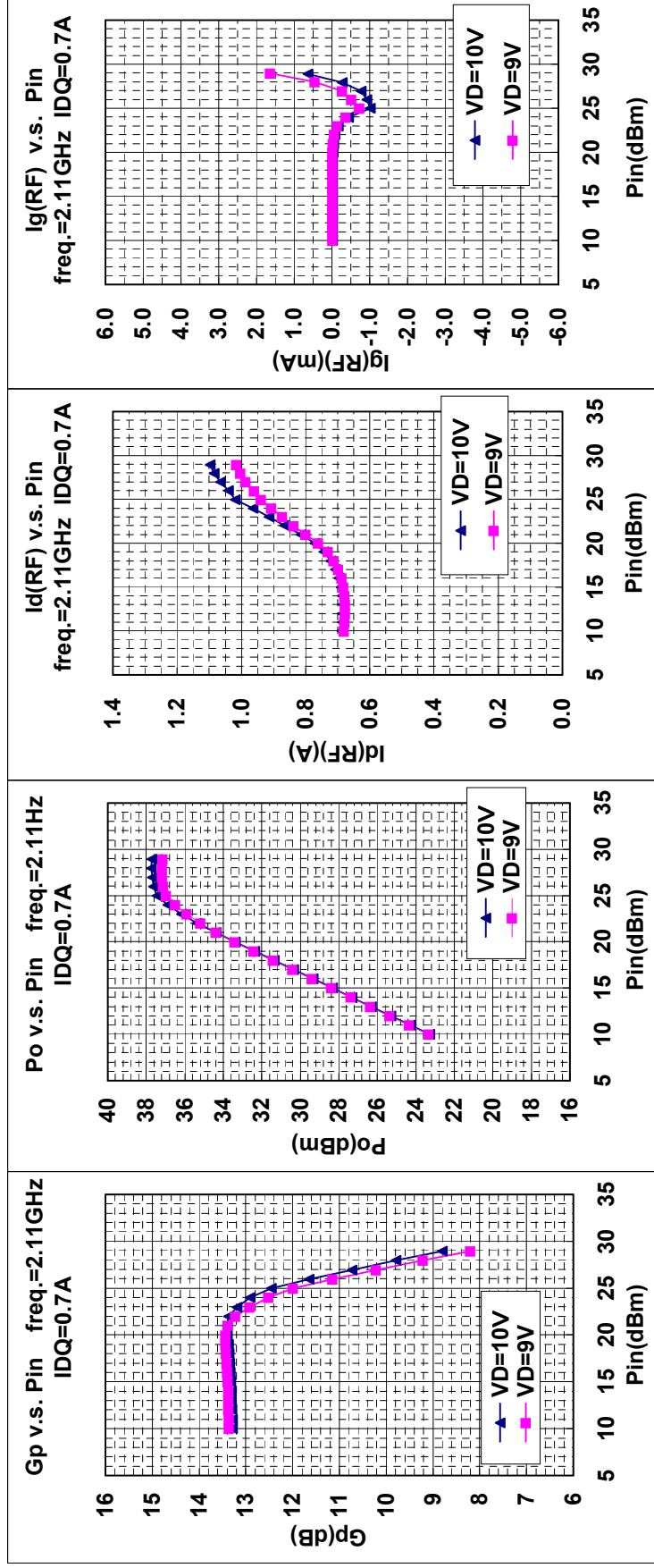
MGF0952P RF TEST DATA(CW)

Gp,Po,Id(RF),Ig(RF) v.s. Pin



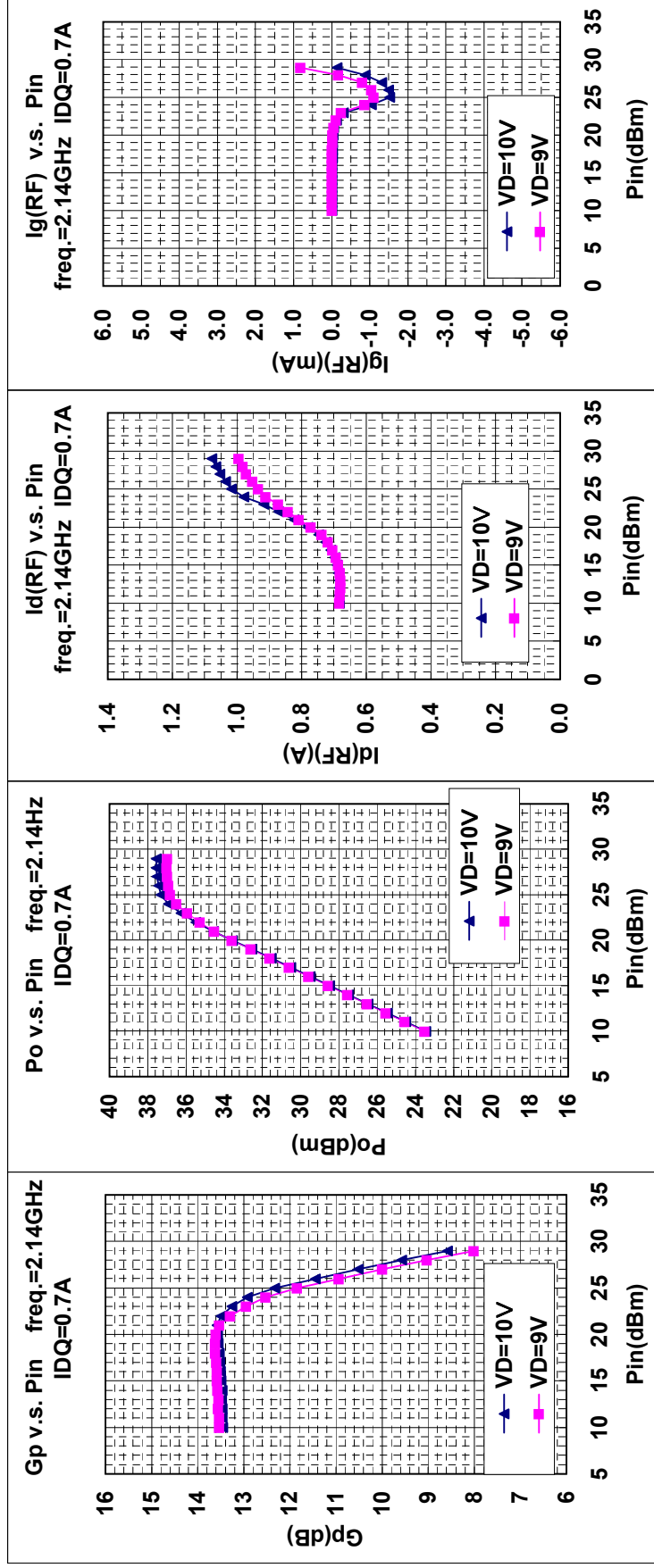
MGF0952P RF TEST DATA(CW)

Gp,Po,Id(RF),Ig(RF) v.s. Pin



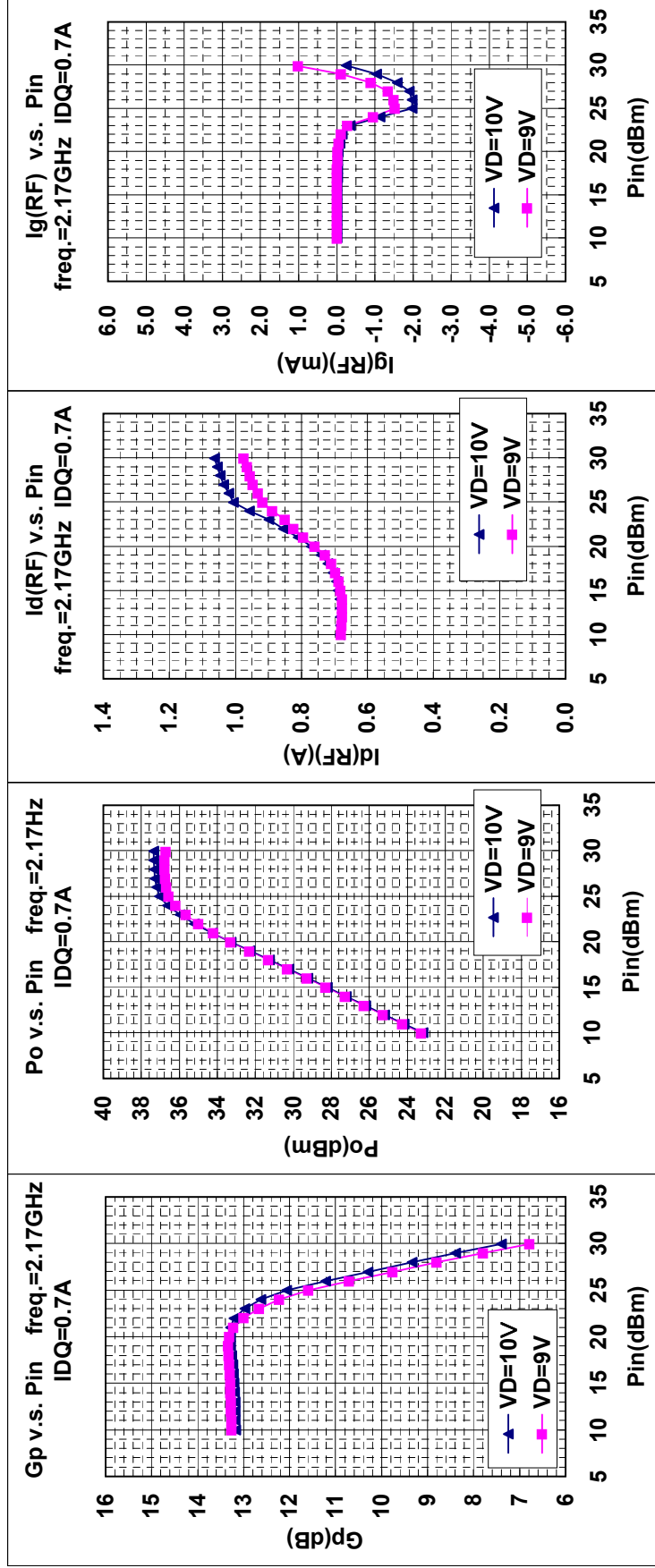
MGF0952P RF TEST DATA(CW)

Gp,Po,Id(RF),Ig(RF) v.s. Pin

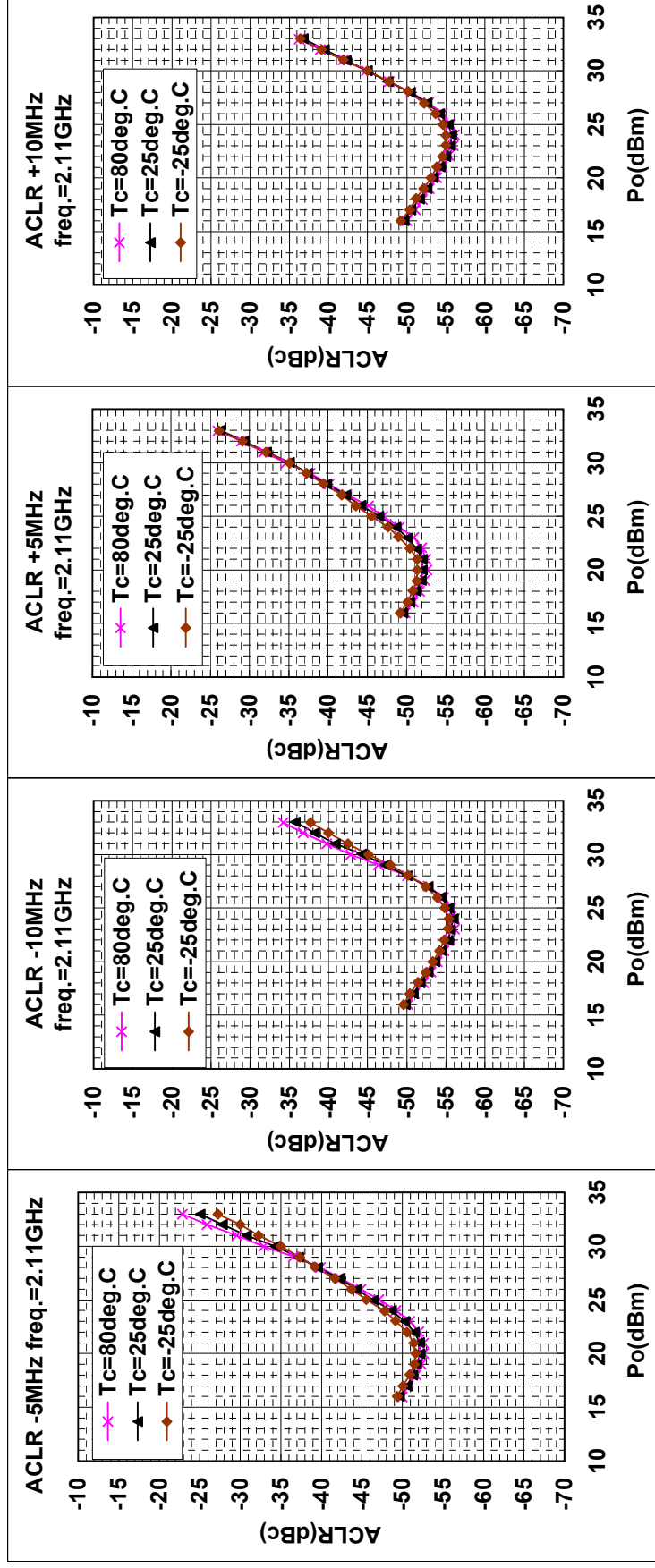


MGF0952P RF TEST DATA(CW)

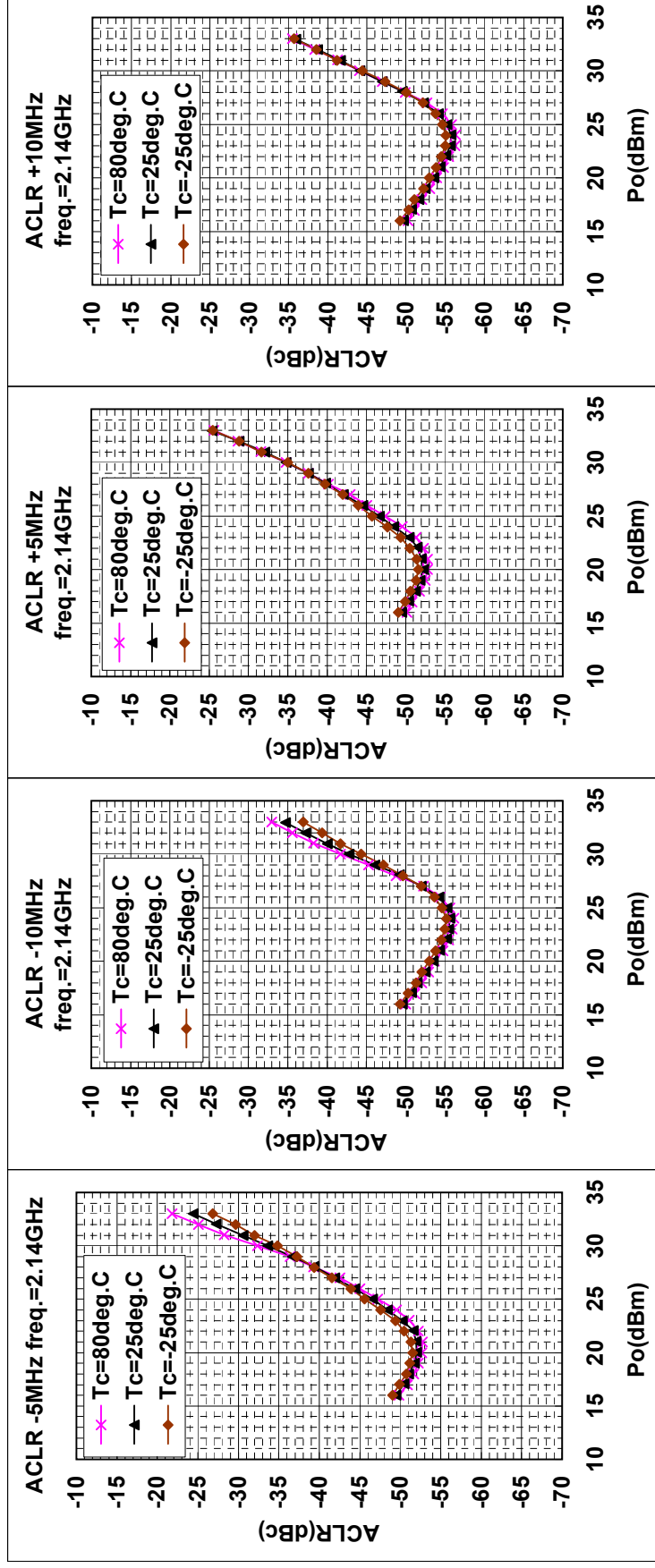
Gp,Po,Id(RF),Ig(RF) v.s. Pin



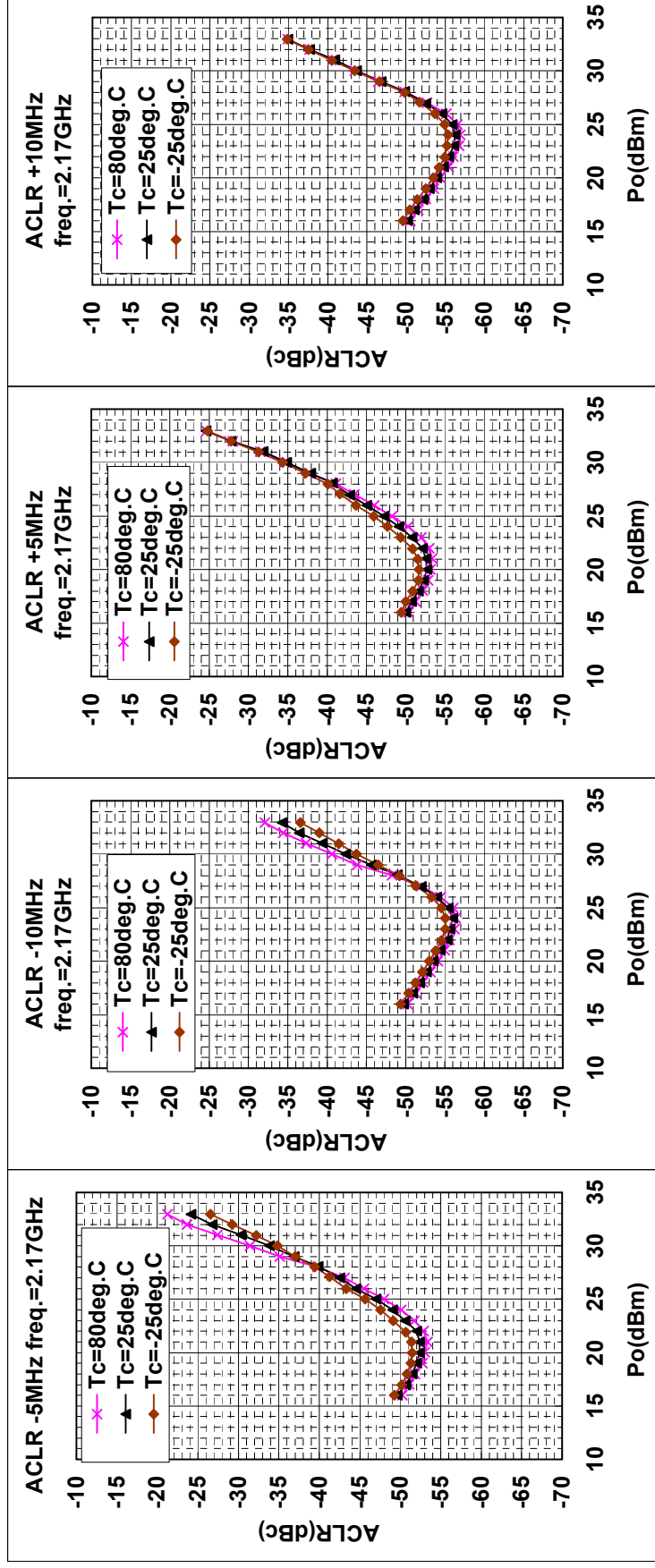
MGF0952P RF TEST DATA(W-CDMA) VD=10V,IDQ=0.7A
 ACLR v.s. Po 3GPP TEST MODEL1 64ch's 2carrier Signal



MGF0952P RF TEST DATA(W-CDMA) VD=10V,IDQ=0.7A
 ACLR v.s. Po 3GPP TEST MODEL1 64ch's 2carrier Signal

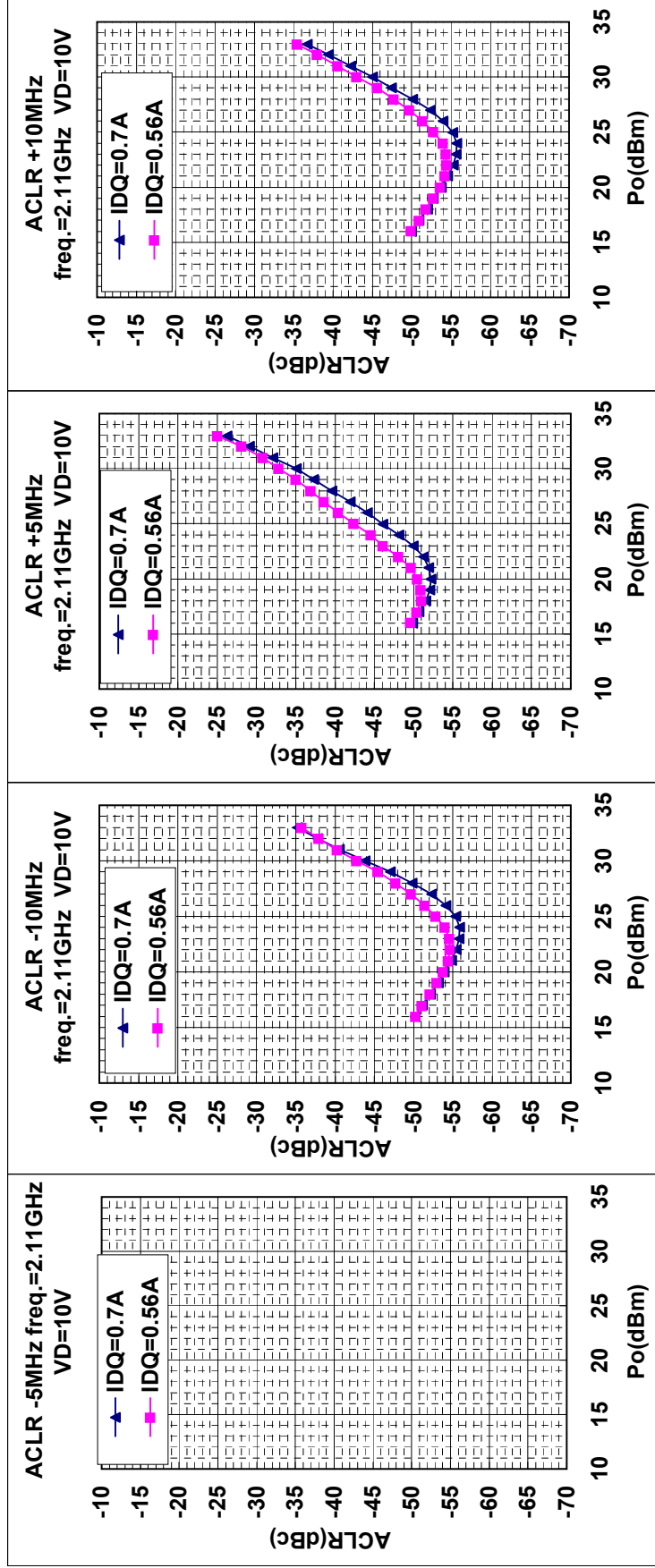


MGF0952P RF TEST DATA(W-CDMA) VD=10V,IDQ=0.7A
 ACLR v.s. Po 3GPP TEST MODEL1 64ch's 2carrier Signal



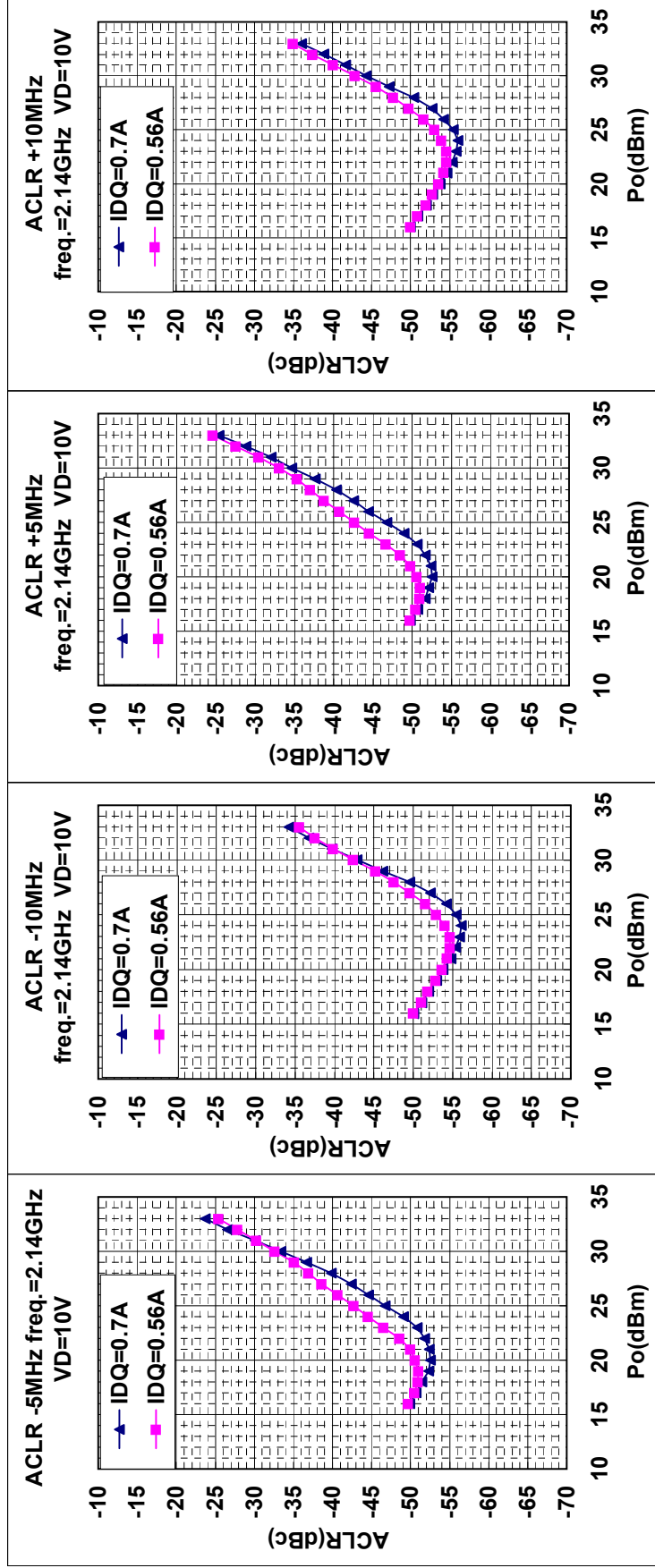
MGF0952P RF TEST DATA(W-CDMA)

ACLR v.s. Po 3GPP TEST MODEL1 64ch's 2carrier Signal



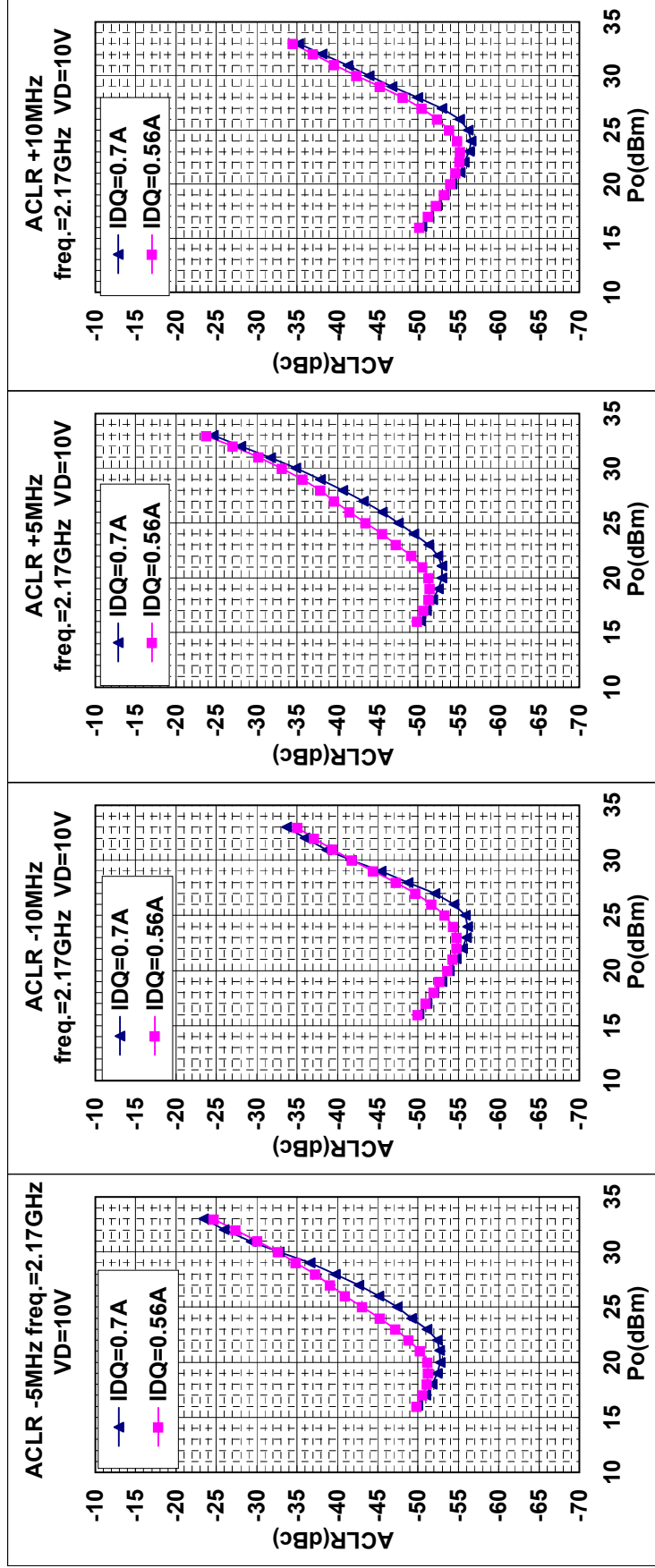
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ACLR v.s. Po 3GPP TEST MODEL1 64ch's 2carrier Signal



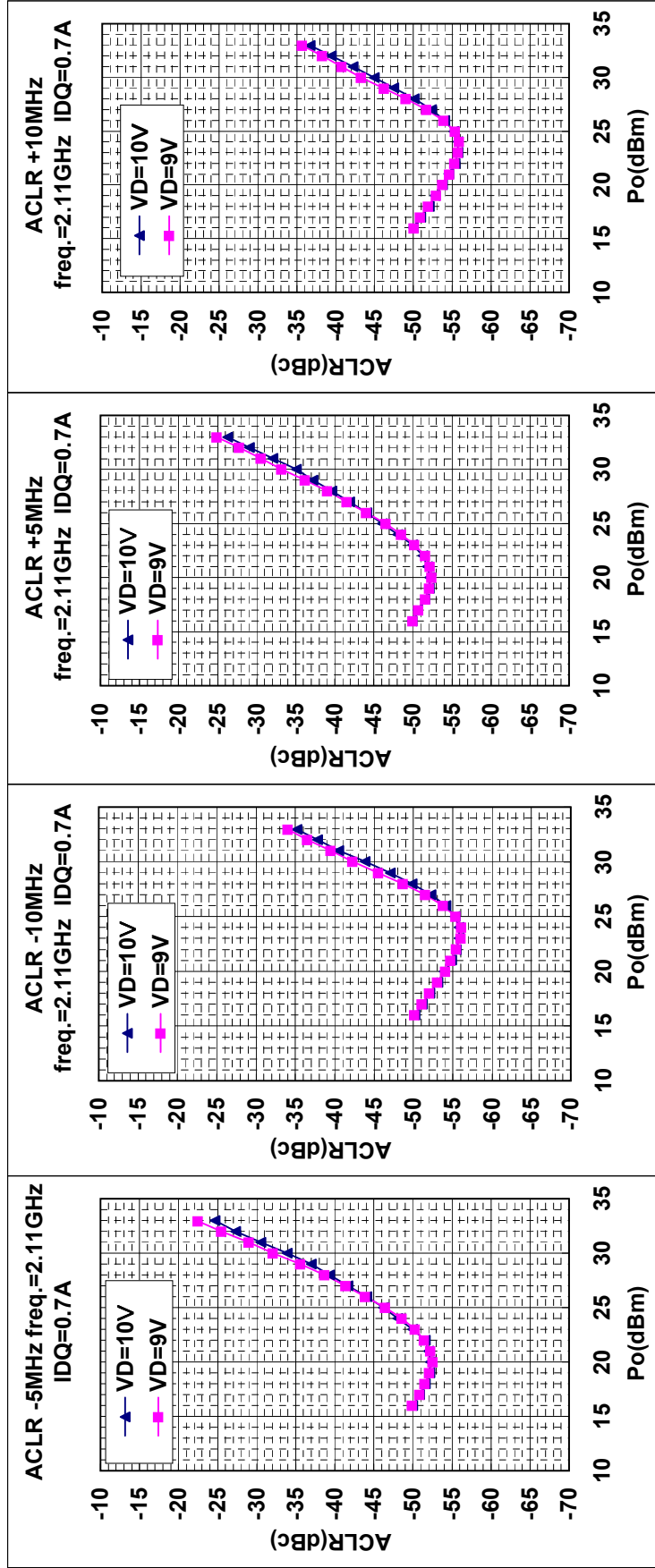
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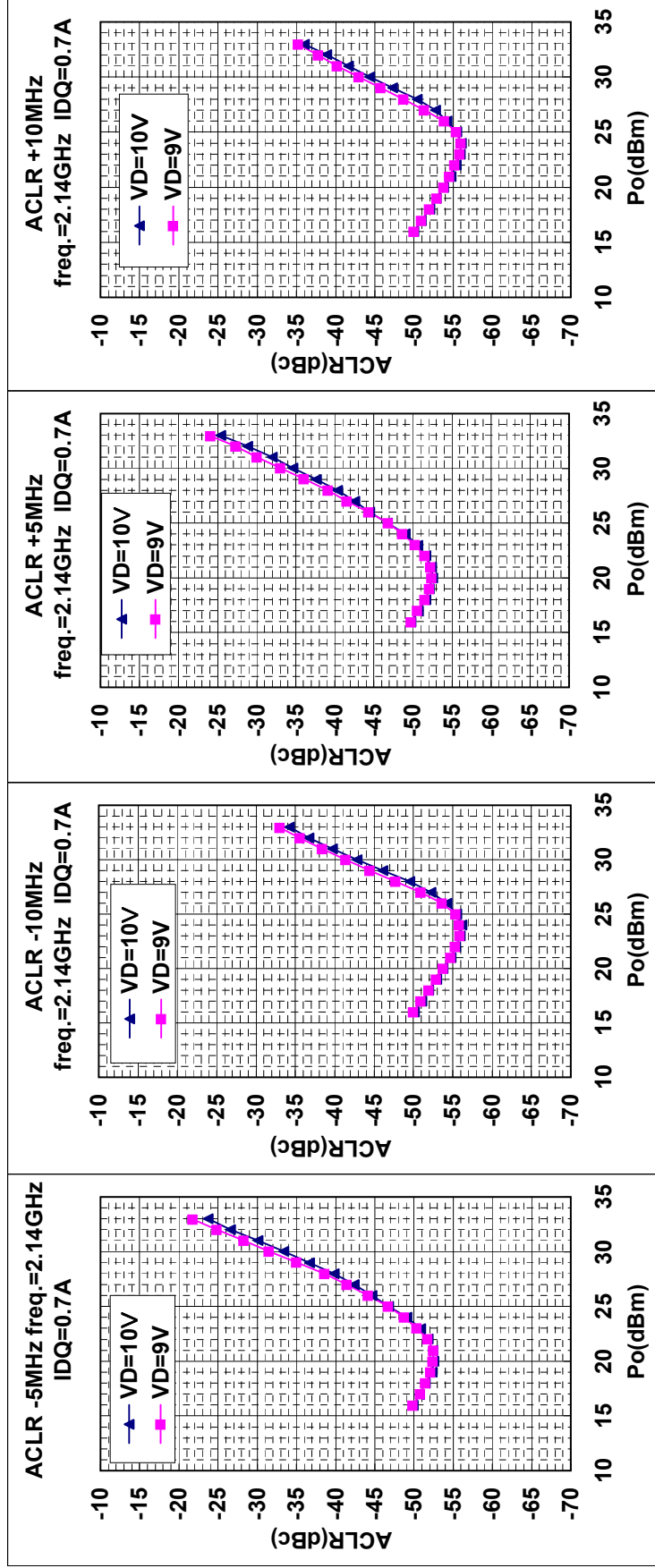
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ACLR v.s. Po 3GPP TEST MODEL1 64ch's 2carrier Signal



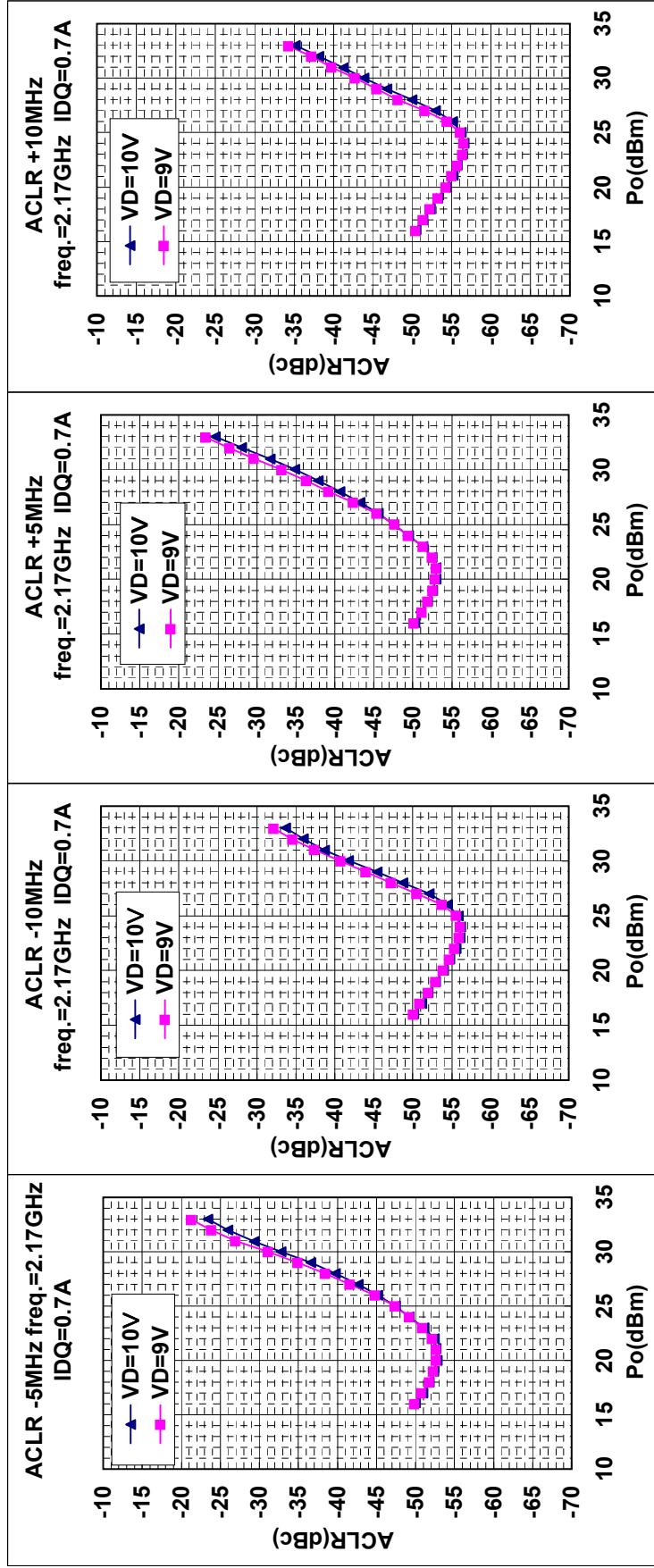
MGF0952P RF TEST DATA(W-CDMA)

ACLR v.s. Po 3GPP TEST MODEL1 64ch's 2carrier Signal



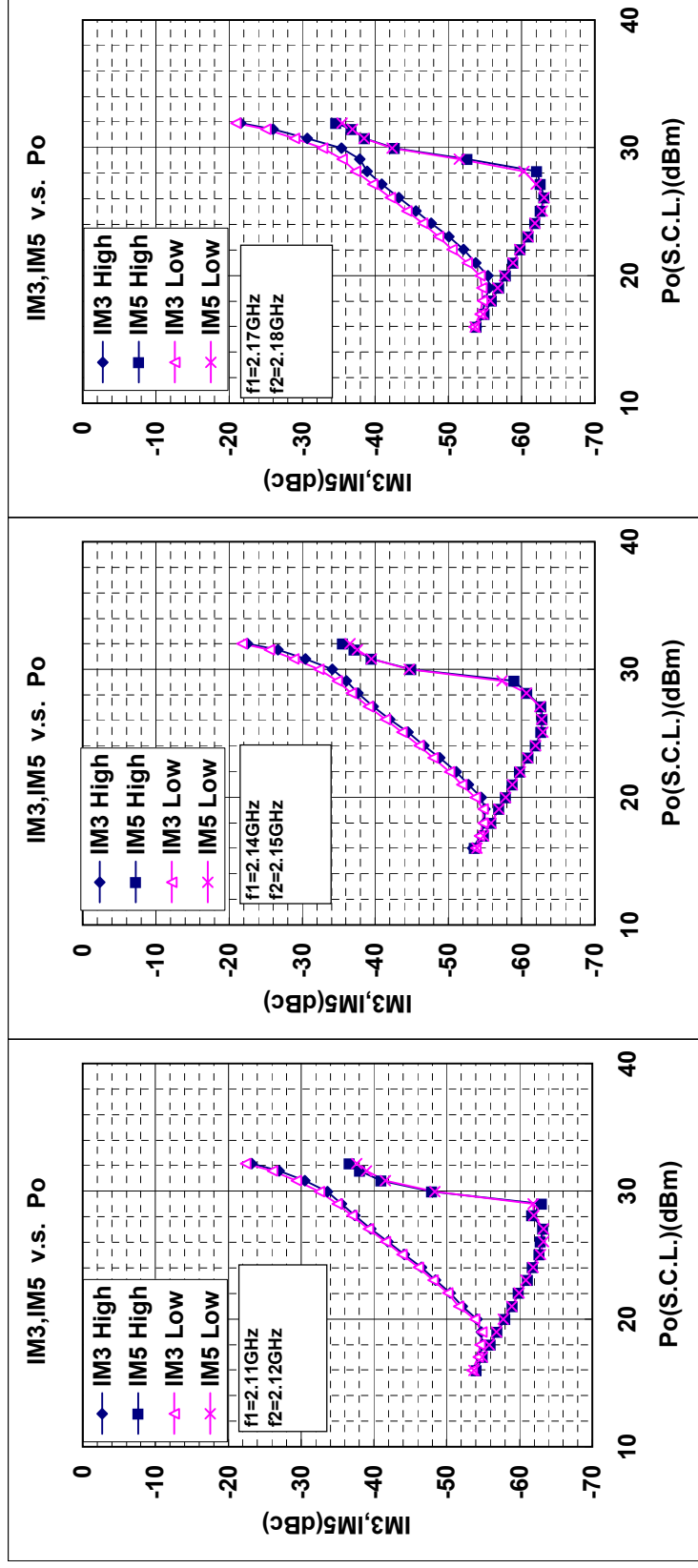
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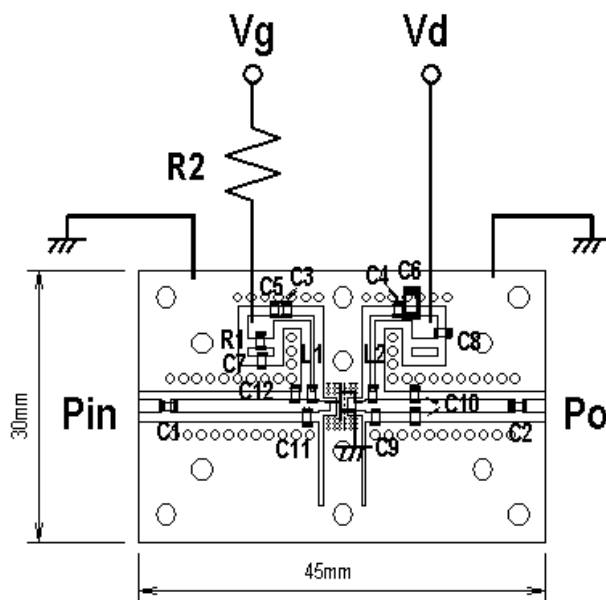


MGF0952P RF TEST DATA VD=10V, Idq=0.7A

IM3,IM5 v.s. Pin



MGF0952P TEST FIXTURE $f=2.11-2.17\text{GHz}$



C1,C2,C3,C4=20pF
C5,C7,C8=1000pF
C9=2pF
C11=3pF
C10=1pF
C12=0.5pF
C6=4.7uF
L1,L2=12nH
R1=51ohm
R2=100ohm

Board material:FR4 Thickness=0.8(mm)
Specific dielectric constant=4.4

L & S BAND GaAs FET [Plastic Mold Lead-less PKG]

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