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
  Po=36.5dBm(TYP.) @f=2.15GHz,Pin=25Bm
- High power gain
  Glp=13.5dB(TYP.) @f=2.15GHz
- High power added efficiency
  ηadd=50%(TYP.) @f=2.15GHz,Pin=25dBm
- Plastic Mold Lead-less PKG

APPLICATION

- For L/S Band power amplifiers

QUALITY

- GG

RECOMMENDED BIAS CONDITIONS

- Vds=10V
- Ids=700mA
- Rg=100Ω

Delivery Tape & Reel(1.5K)

Fig.1

Absolute maximum ratings (Ta=25°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	Cannel temperature	150	°C
Tstg	Storage temperature	-40 to +150	°C

Recommended maximum ratings (Ta=25°C)

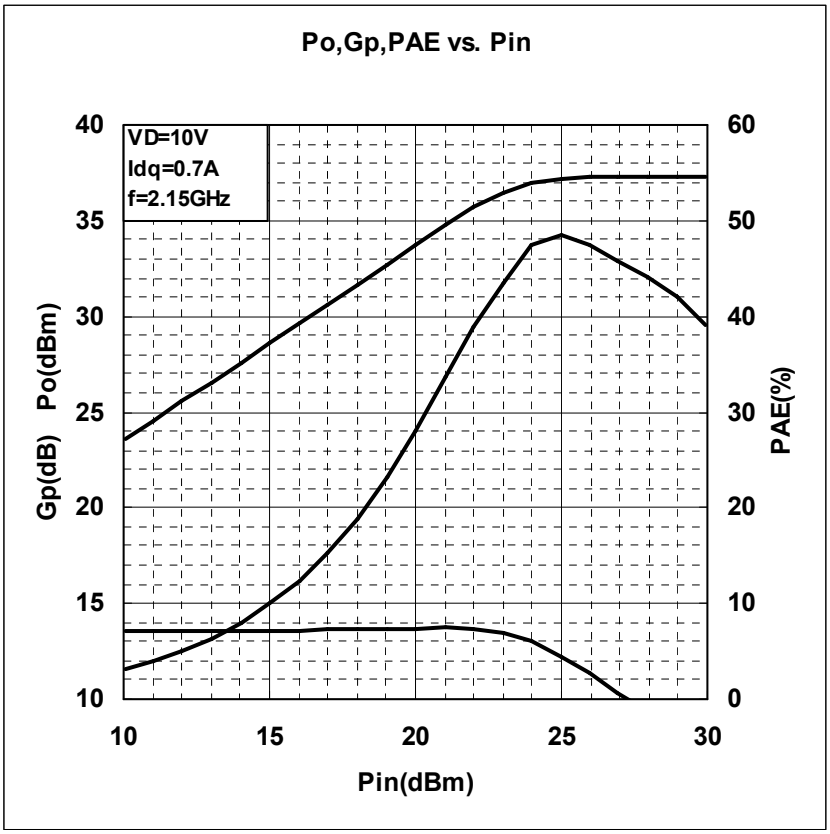
Symbol	Parameter	Ratings	Unit
Tch	Cannel temperature	150	°C

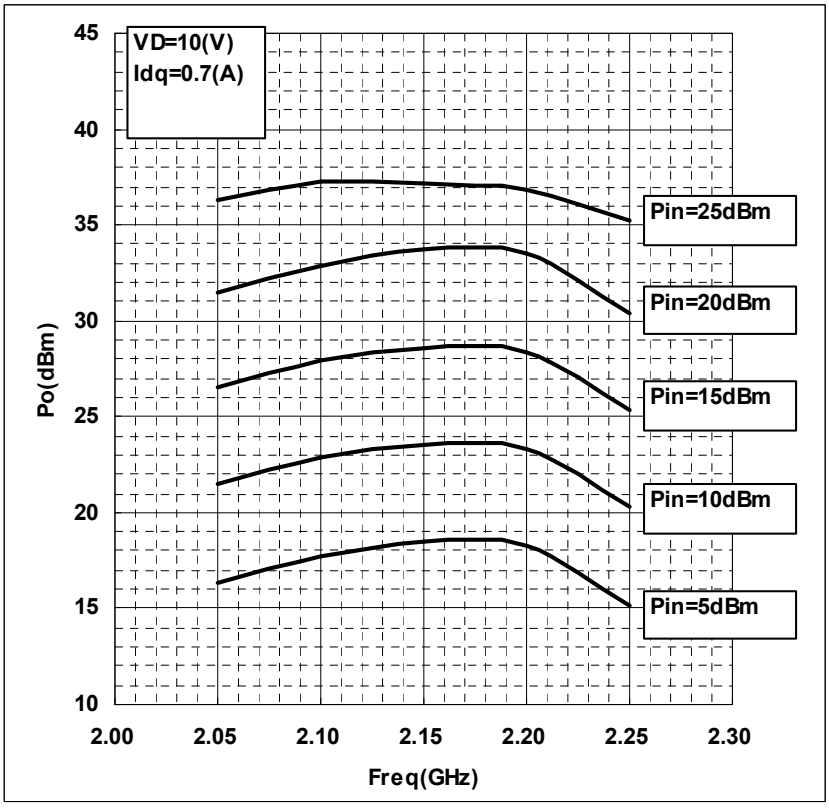
Electrical characteristics (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
VGS(off)	Gate to source cut-off voltage	VDS=3V,ID=12.6mA	-1	-3	-5	V
Po *1	Output power	VDS=10V,ID=700mA,f=2.15GHz	35.0	36.5	--	dBm
ηadd *1	Power added Efficiency	*1:Pin=25dBm, *2:Pin=15dBm	--	50	--	%
GLP *2	Linear Power Gain	*3:f1=2.15GHz,f2=2.16GHz	11	13.5	--	dB
IM3 *3	3rd order Modulation Distortion	Po(SCL)=25dBm	--	-42	--	dBc
Rth(ch-c)	Thermal Resistance *1	ΔVf Method	--	4.5	6.5	°C/W

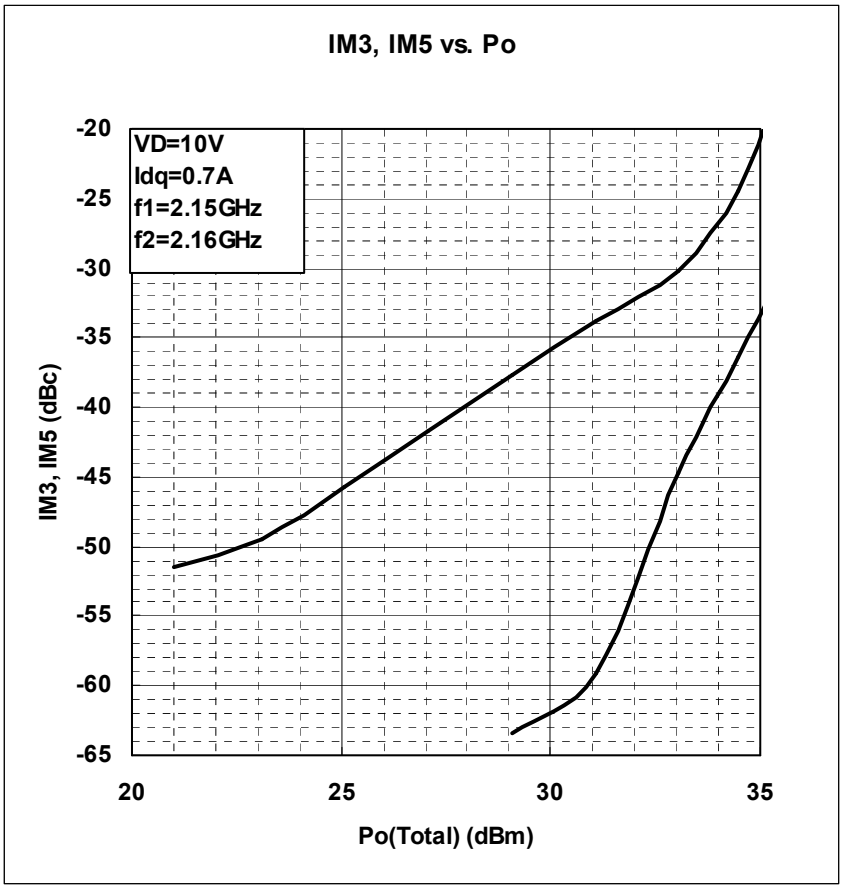
*1:Channel to case / Above parameters, ratings, limits are subject to change.

MGF0952P TYPICAL CHARACTERISTICS





MGF0952P TYPICAL CHARACTERISTICS



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

!freq.	S11		S21		S12		S22	
!(GHz)	(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	0784	−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

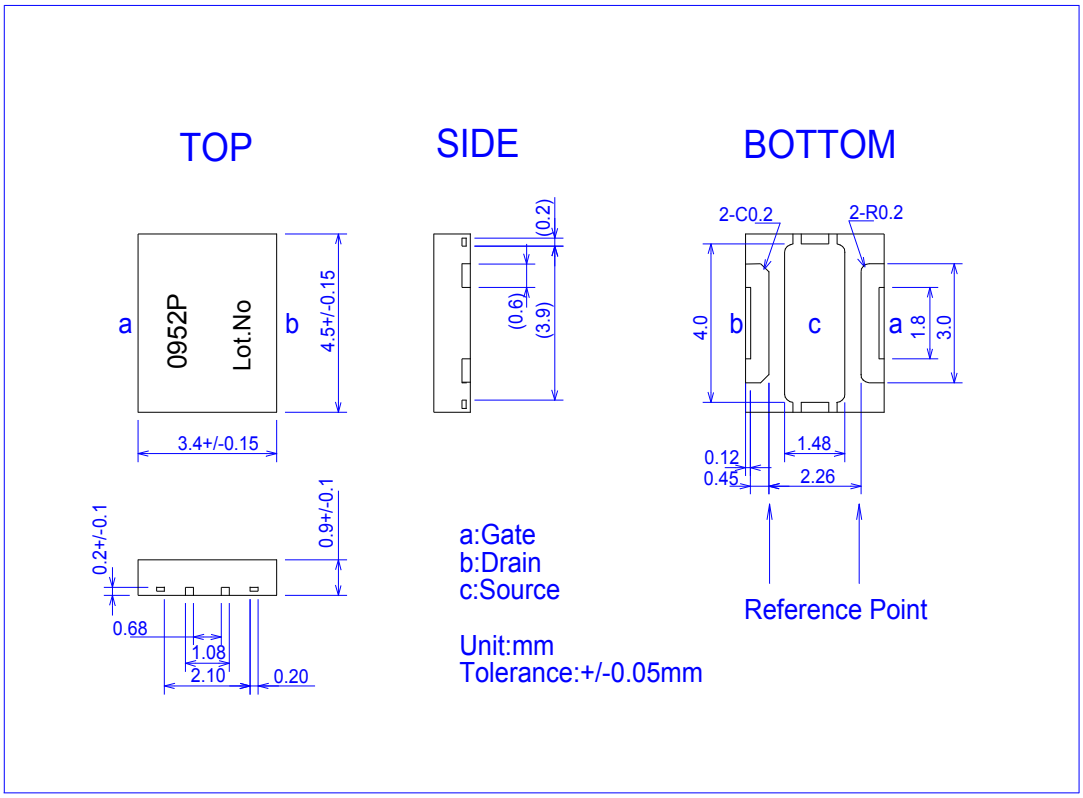
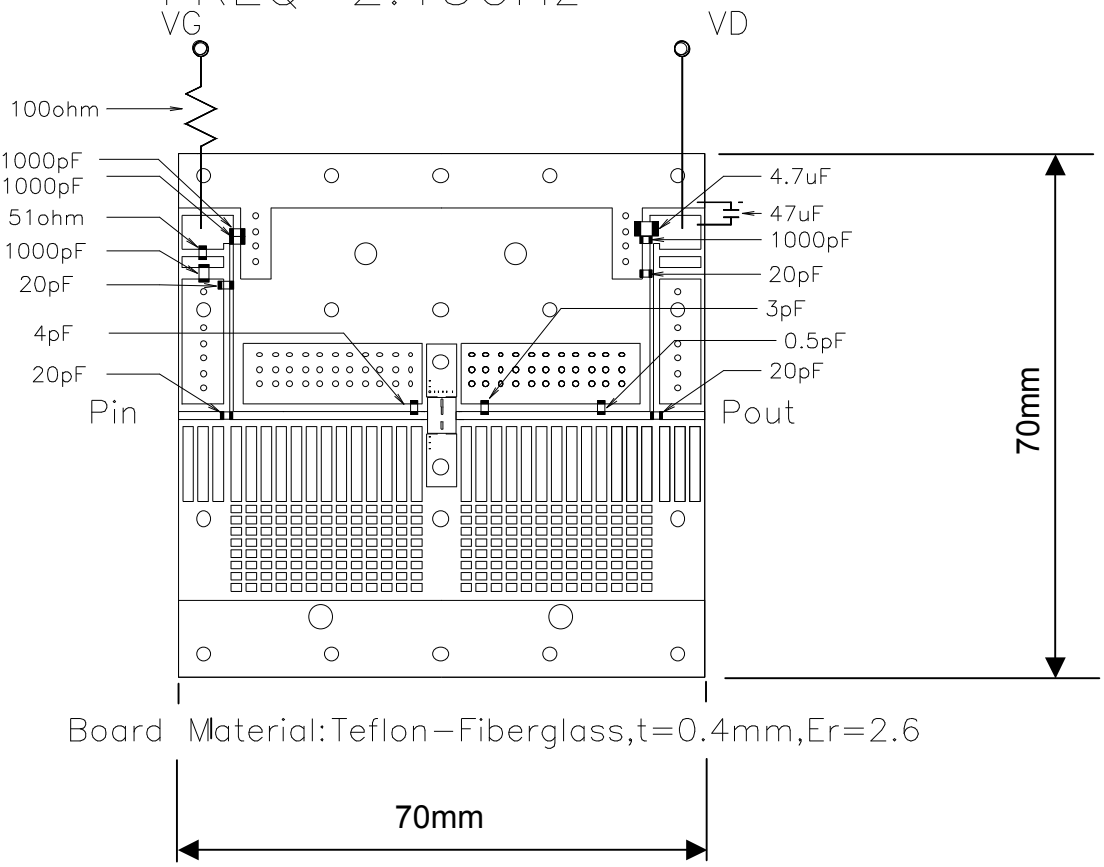
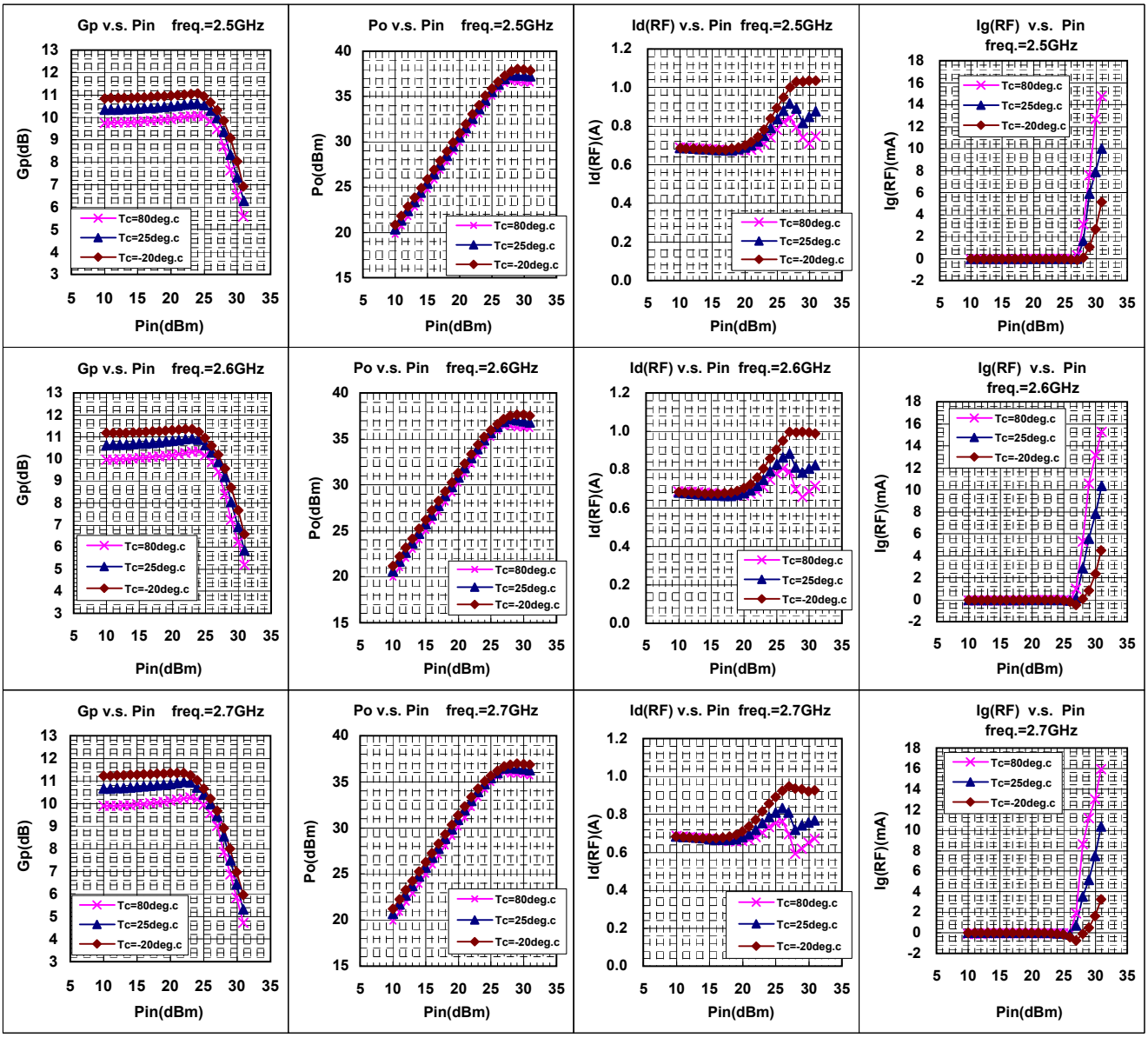


Fig1. OUTLINE DRAWING

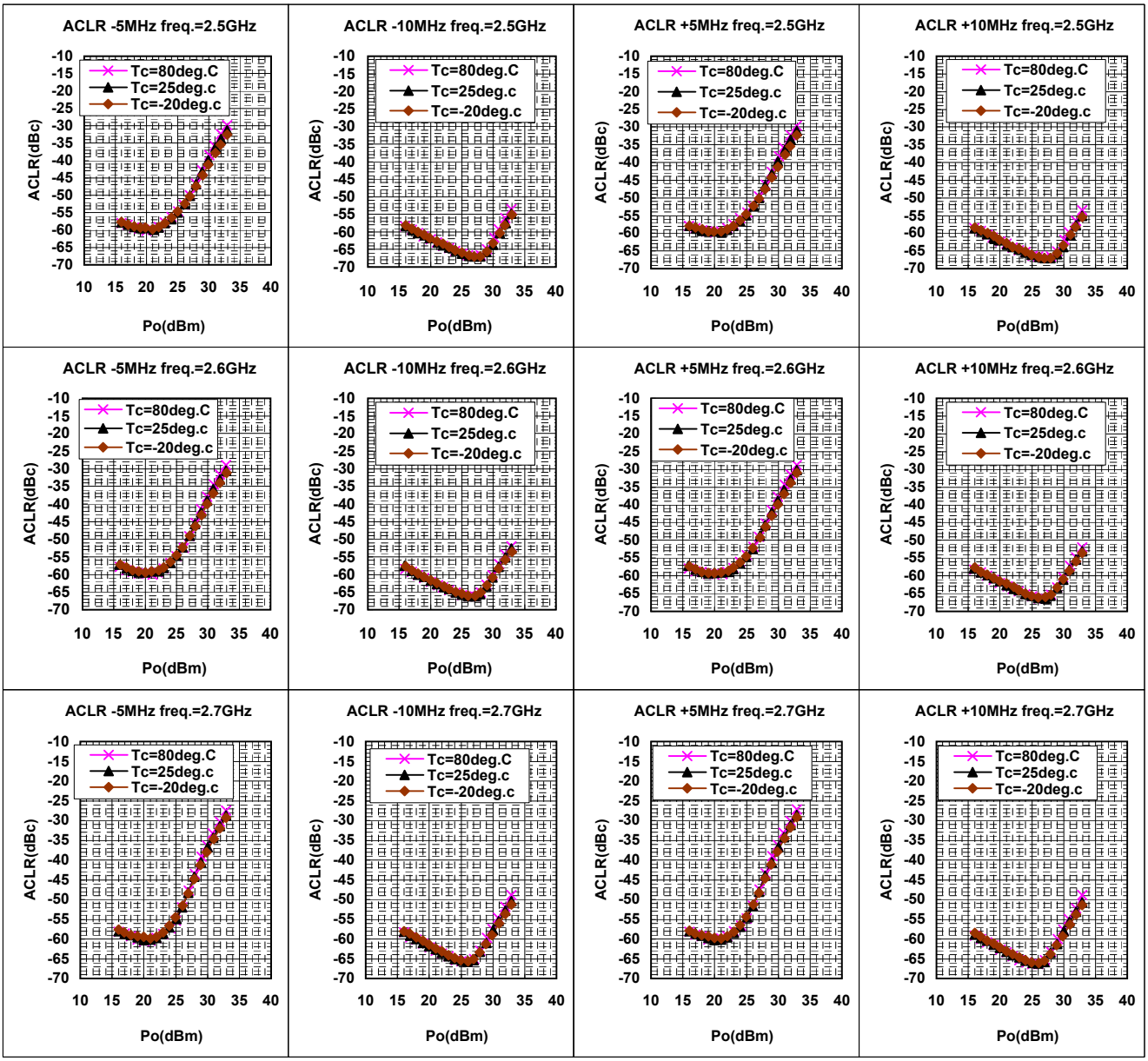

MGF0952P TESTFIXTURE
FREQ=2.15GHz
VG
VD
100ohm
1000pF
1000pF
51ohm
1000pF
20pF
4pF
20pF
Pin
4.7uF
47uF
1000pF
20pF
3pF
0.5pF
20pF
Pout
70mm
Board Material:Teflon-Fiberglass,t=0.4mm,Er=2.6
70mm

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

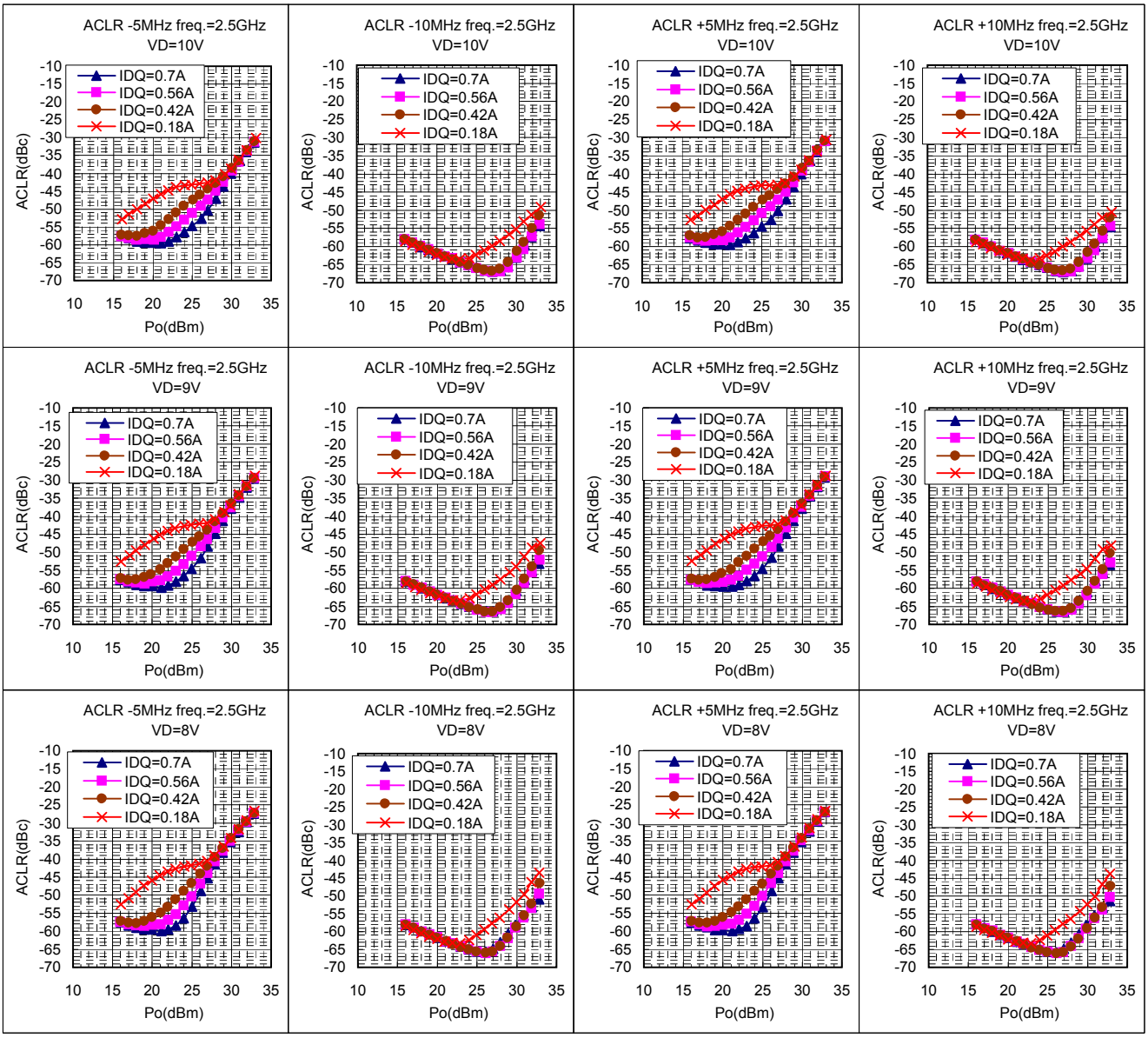
Gp,Po,Id(RF),Ig(RF) v.s. Pin



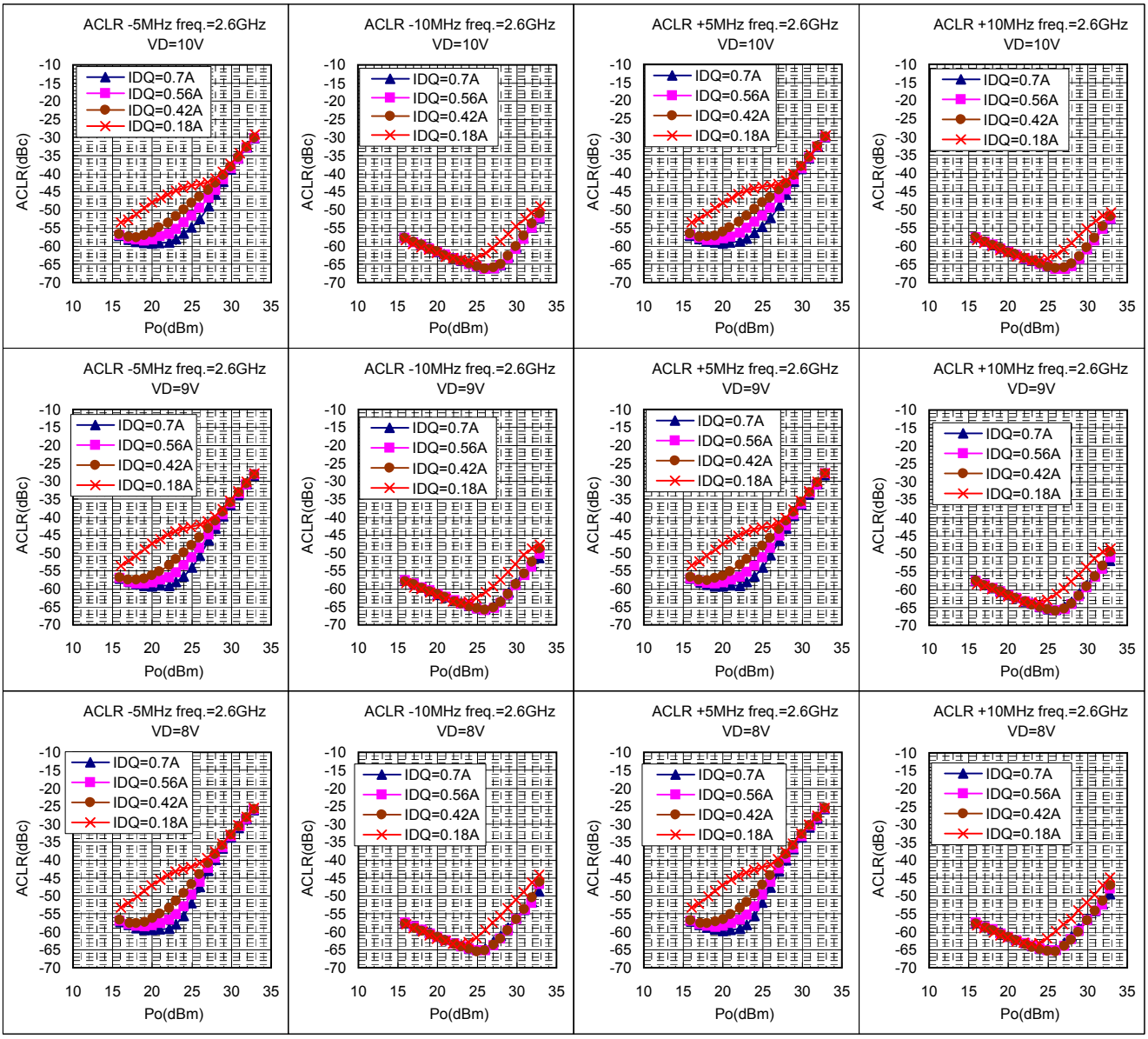
MGF0952P RF TEST DATA(W-CDMA) VD=10V,Idq=0.7A
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



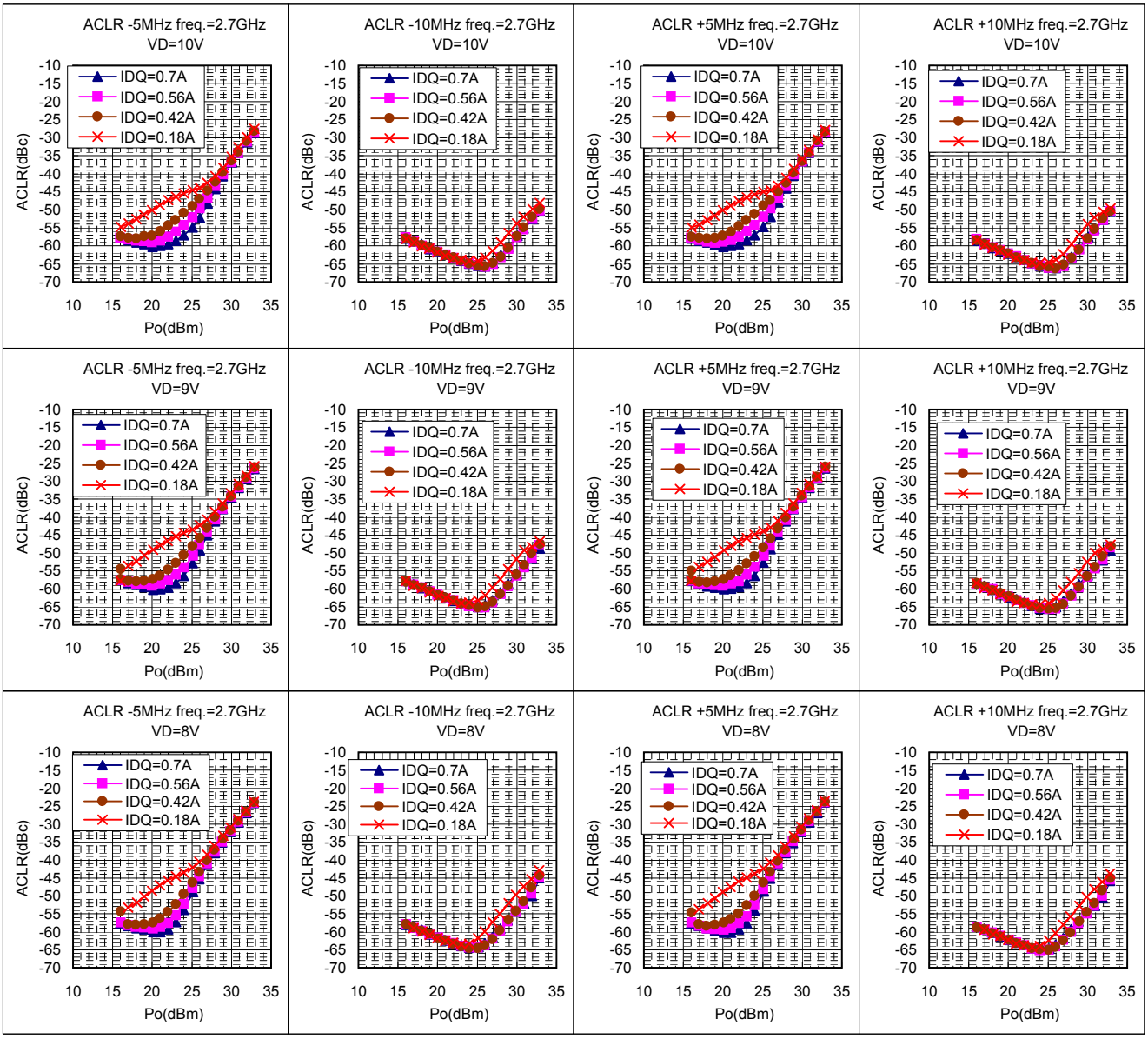
MGF0952P RF TEST DATA(W-CDMA)
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



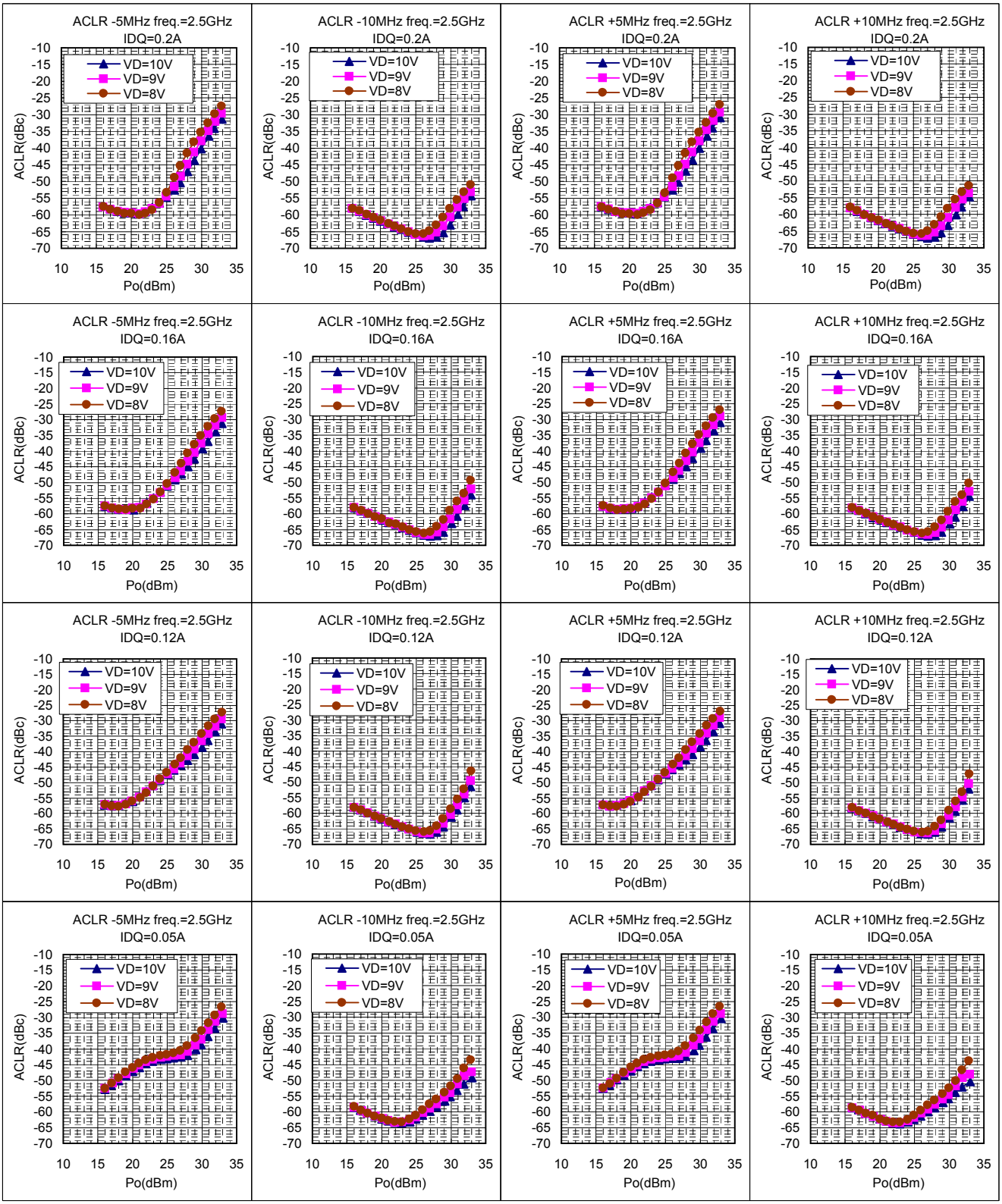
MGF0952P RF TEST DATA(W-CDMA)
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



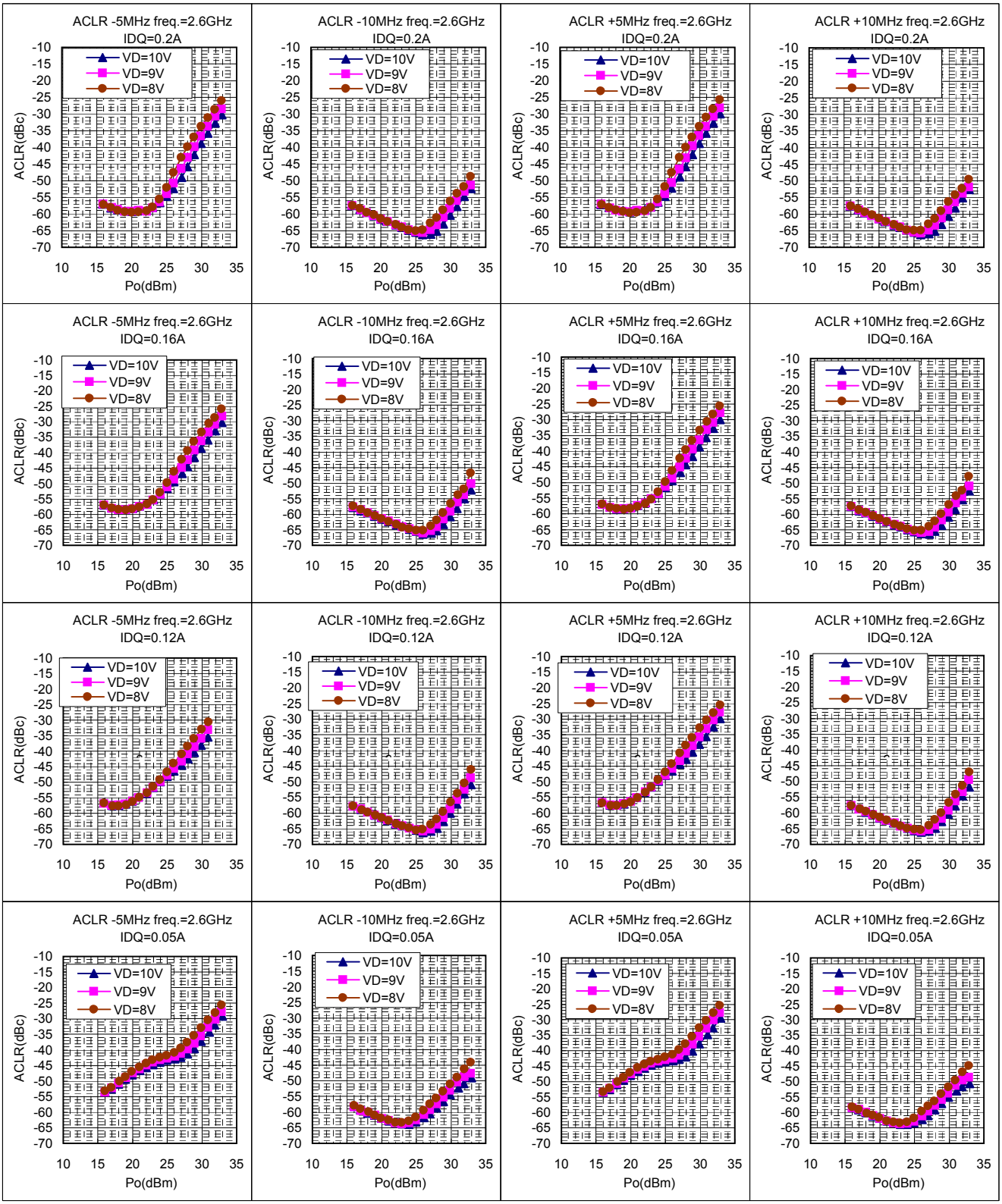
MGF0952P RF TEST DATA(W-CDMA)
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



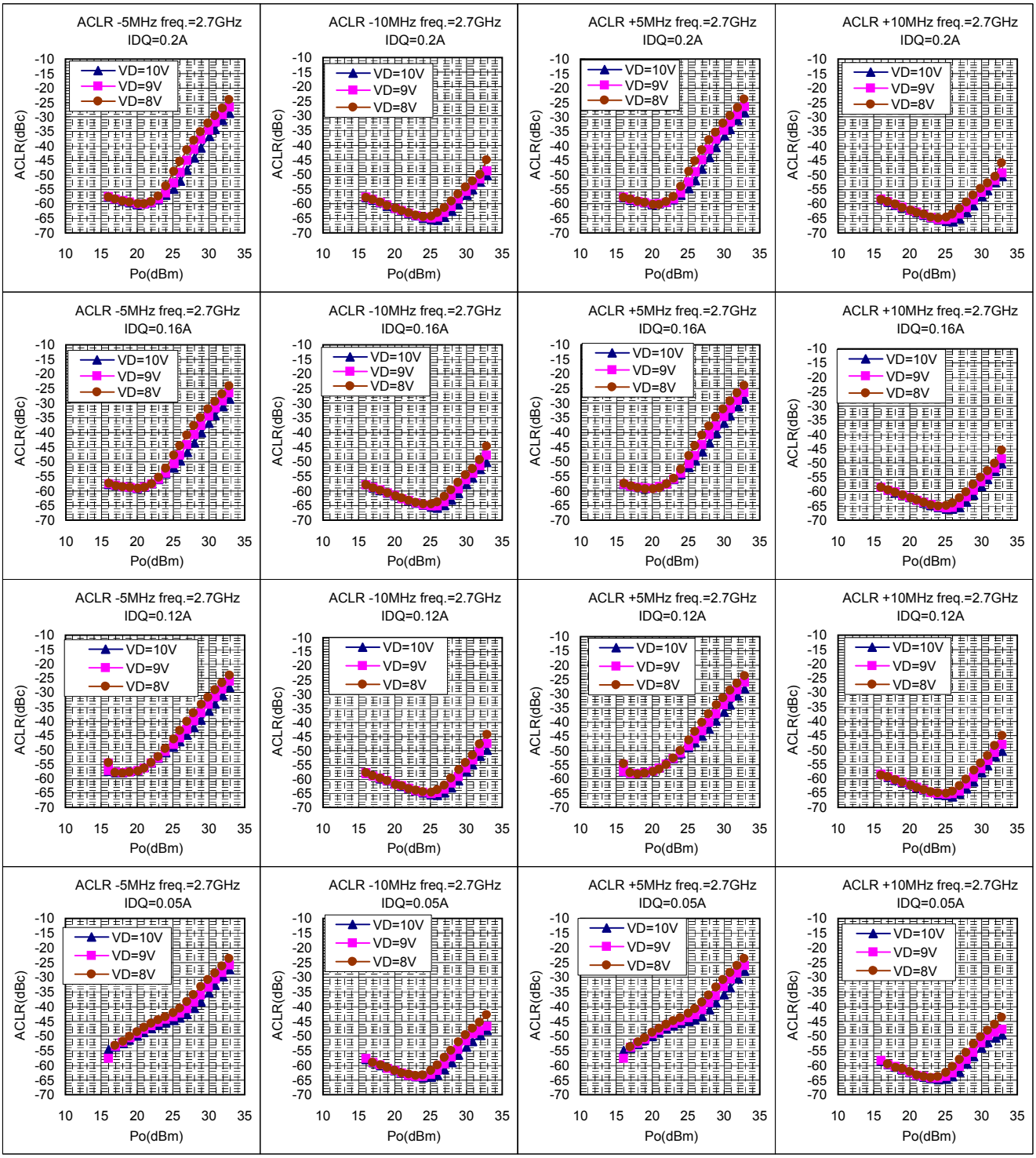
MGF0952P RF TEST DATA(W-CDMA)
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



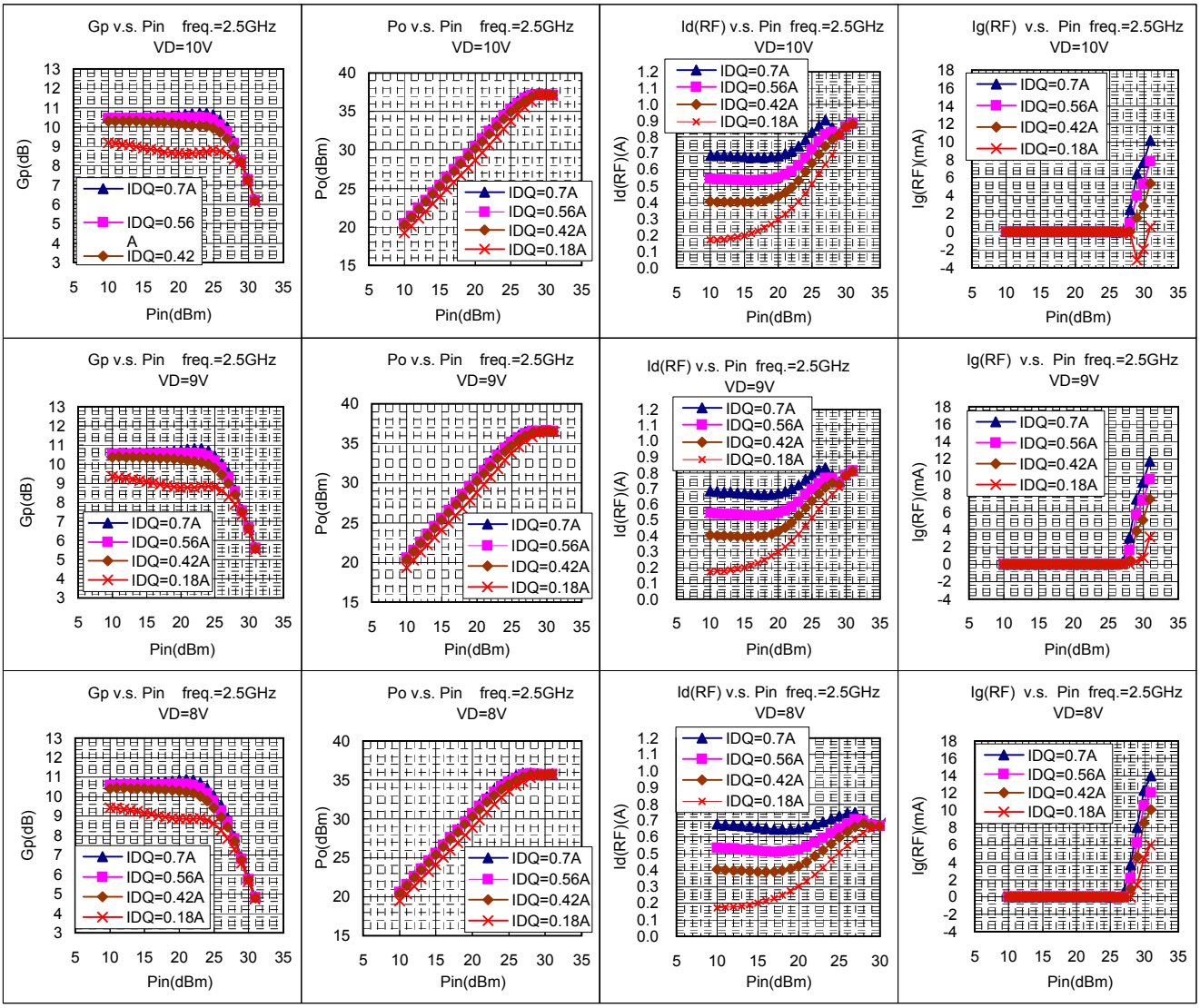
MGF0952P RF TEST DATA(W-CDMA)
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



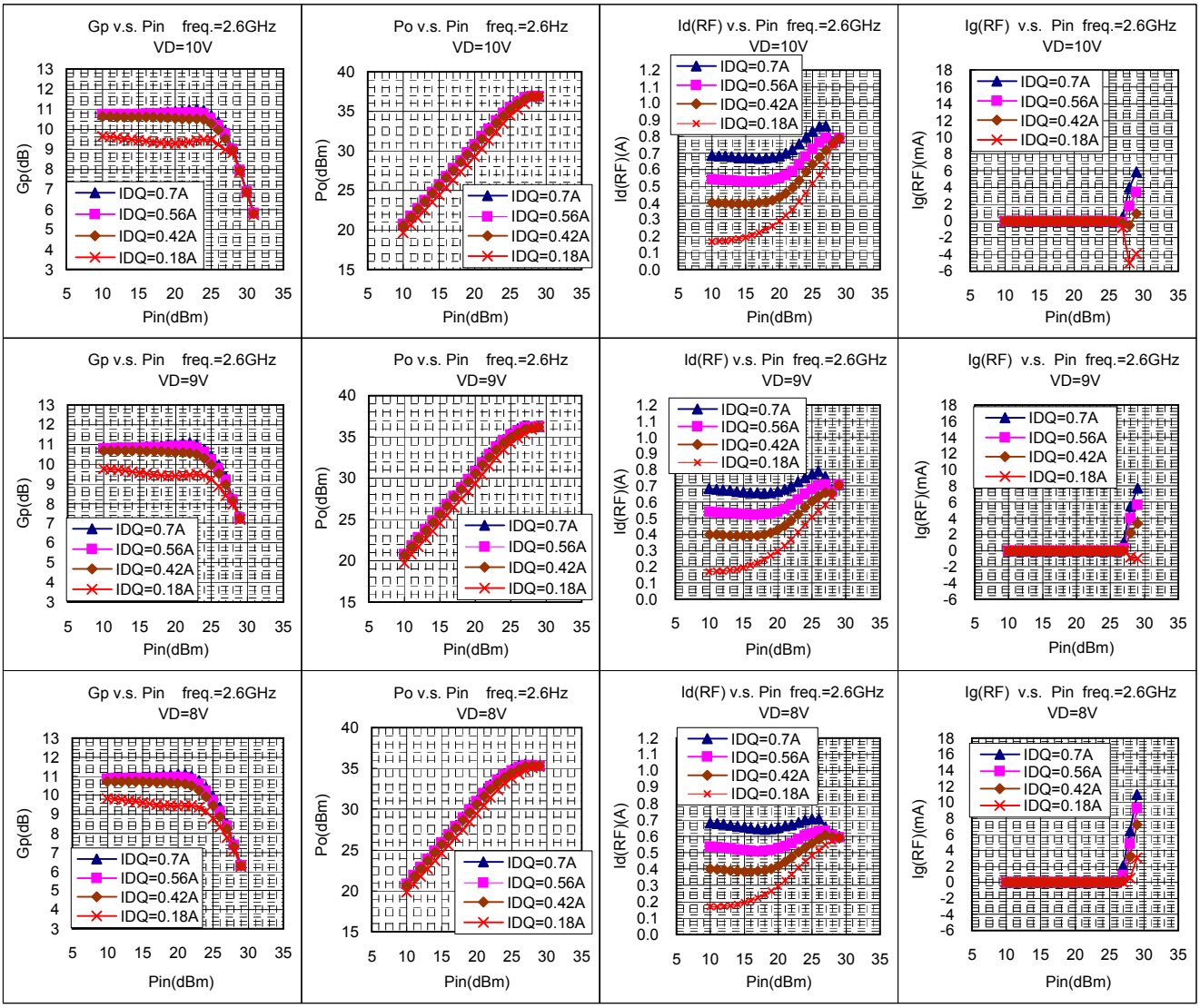
MGF0952P RF TEST DATA(W-CDMA)
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



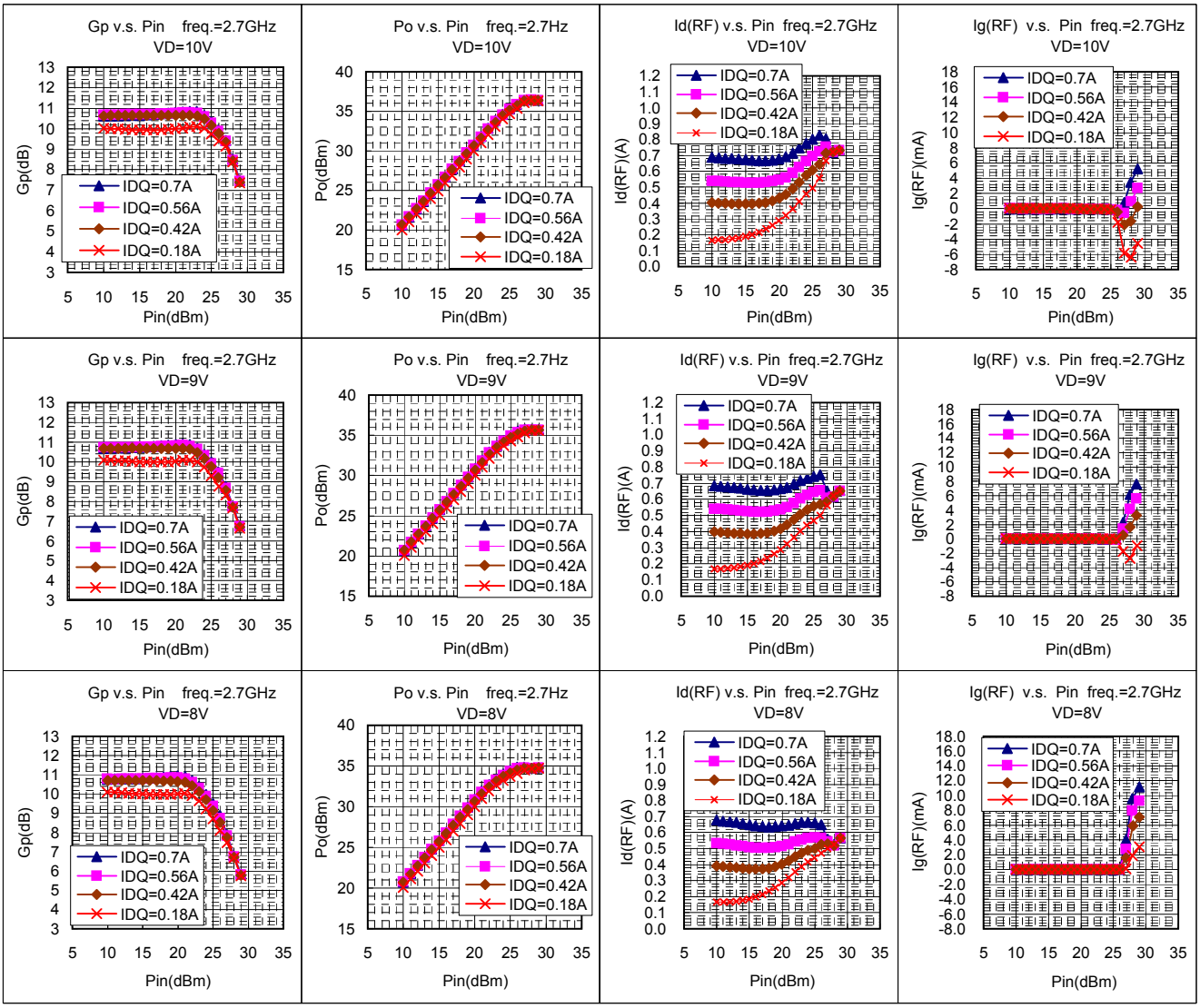
MGF0952P RF TEST DATA(CW)
Gp,Po,Id(RF),Ig(RF) v.s. Pin



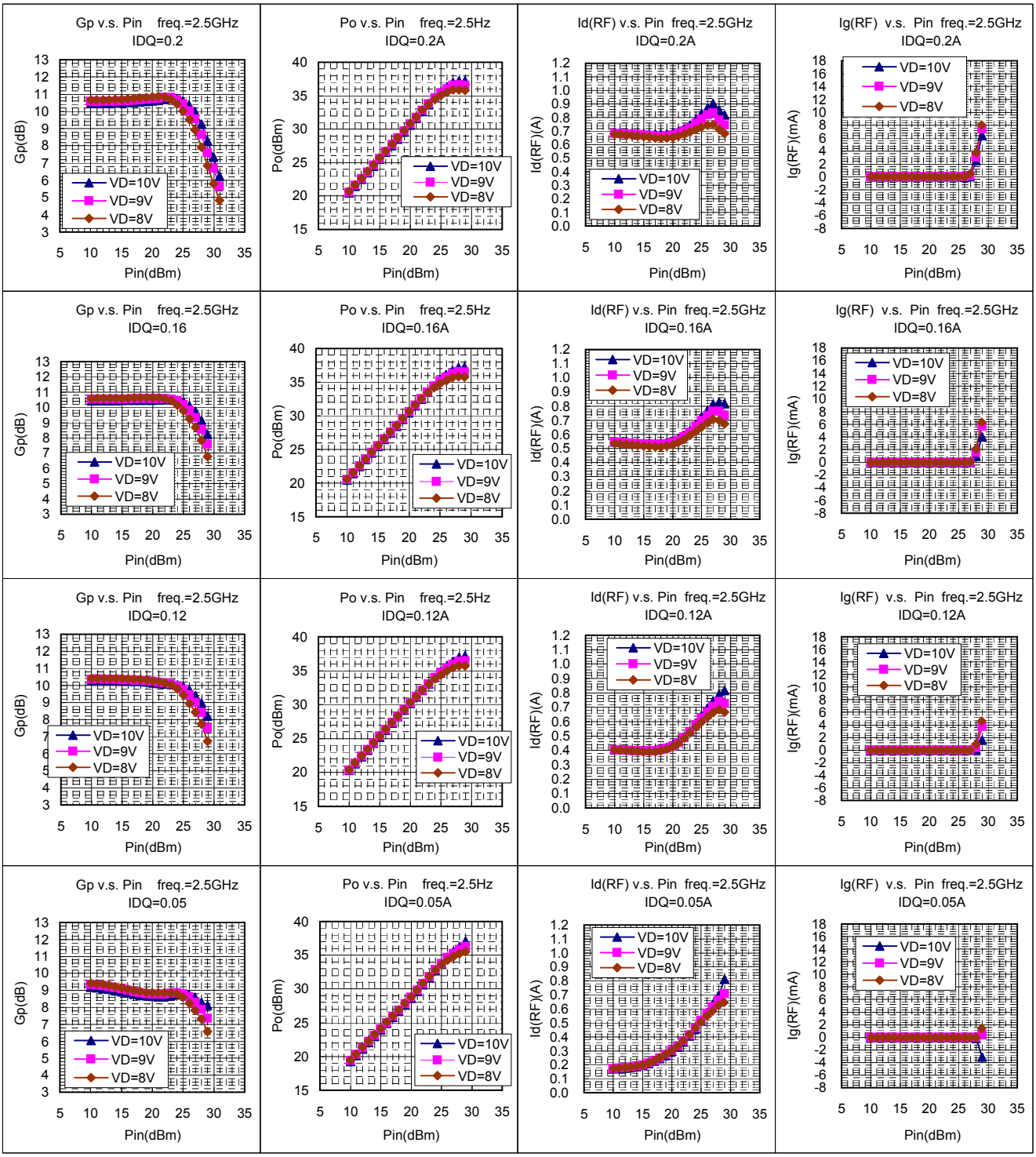
MGF0952P RF TEST DATA(CW)
Gp,Po,Id(RF),Ig(RF) v.s. Pin



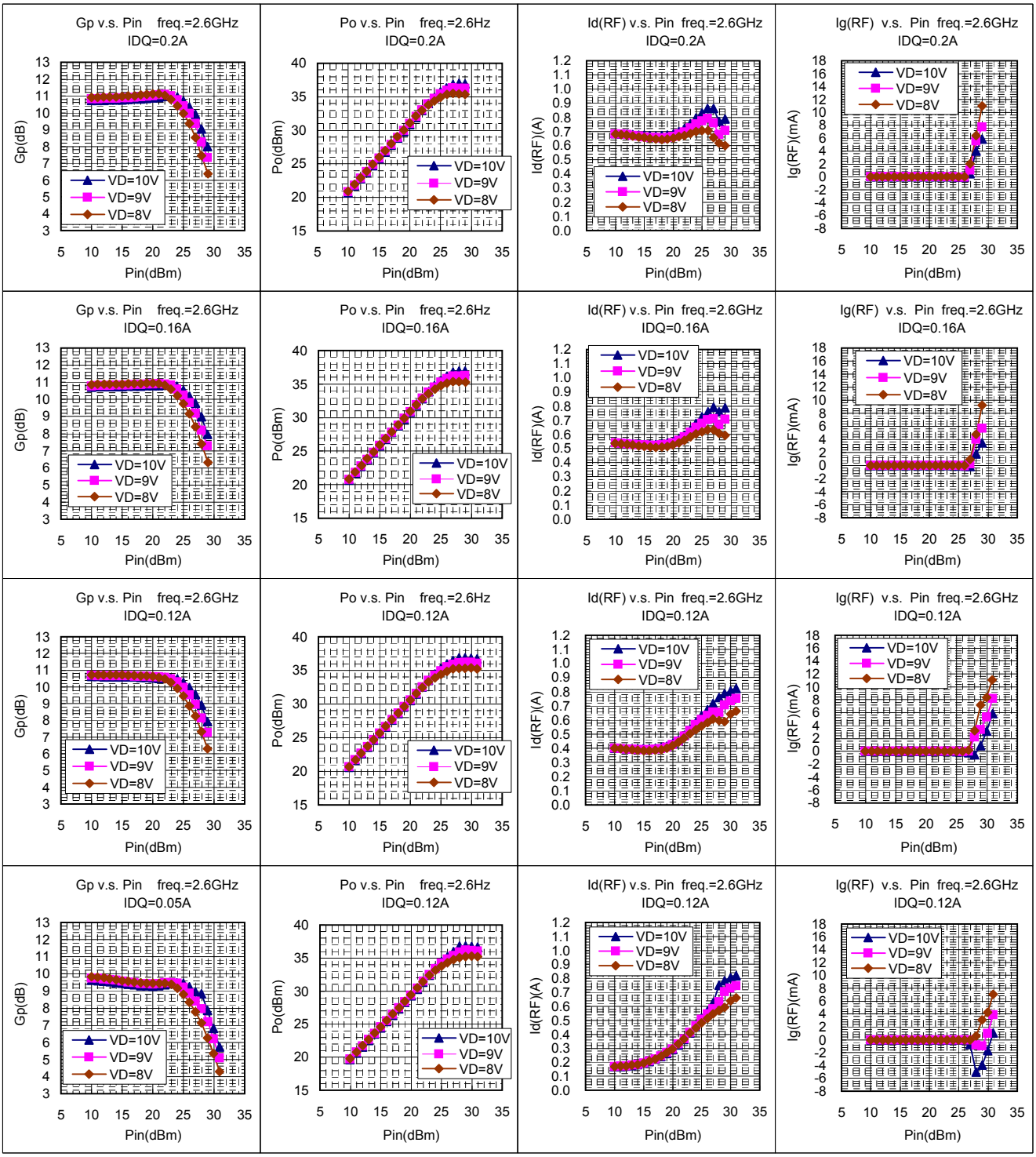
MGF0952P RF TEST DATA(CW)
Gp,Po,Id(RF),Ig(RF) v.s. Pin



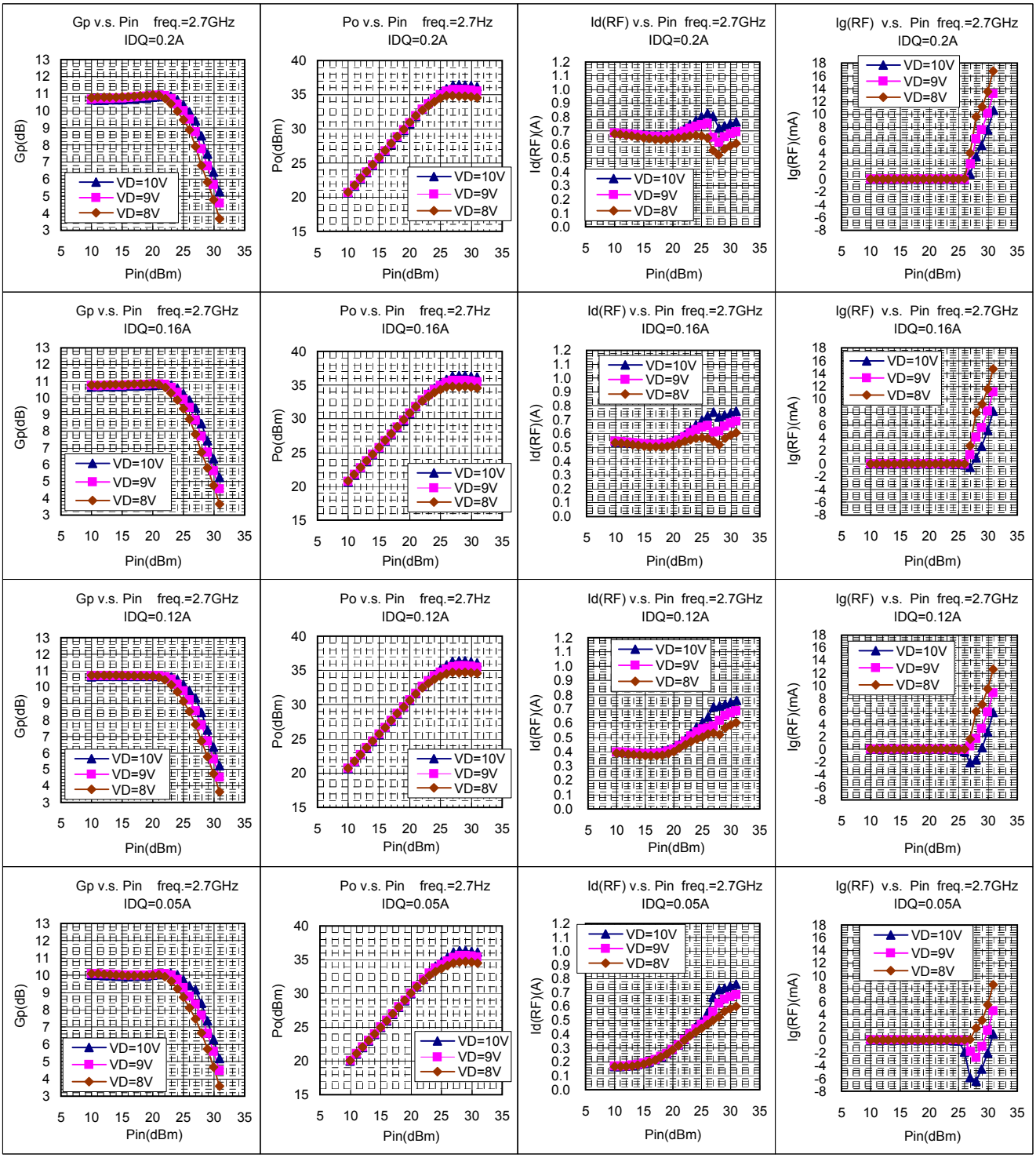
MGF0952P RF TEST DATA(CW)
Gp,Po,Id(RF),Ig(RF) v.s. Pin



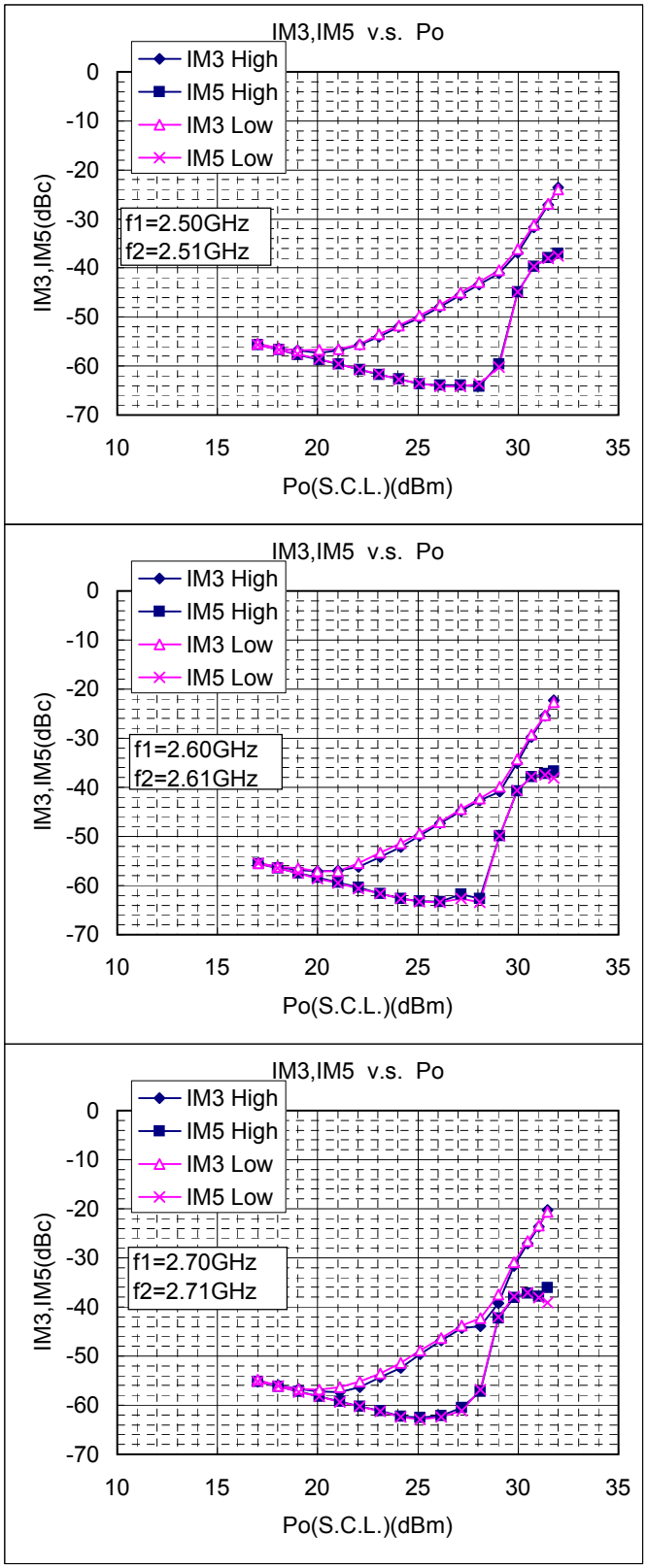
MGF0952P RF TEST DATA(CW)
Gp,Po,Id(RF),Ig(RF) v.s. Pin



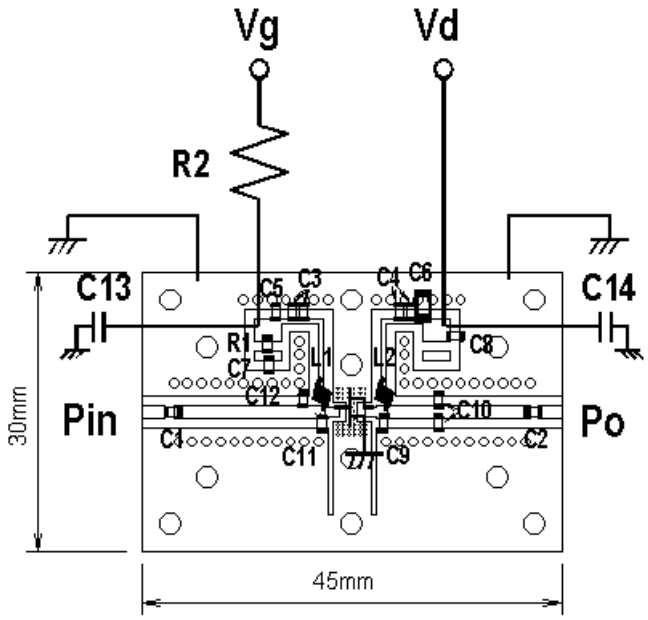
MGF0952P RF TEST DATA(CW)
Gp,Po,Id(RF),Ig(RF) v.s. Pin



IM3,IM5 v.s. Pin



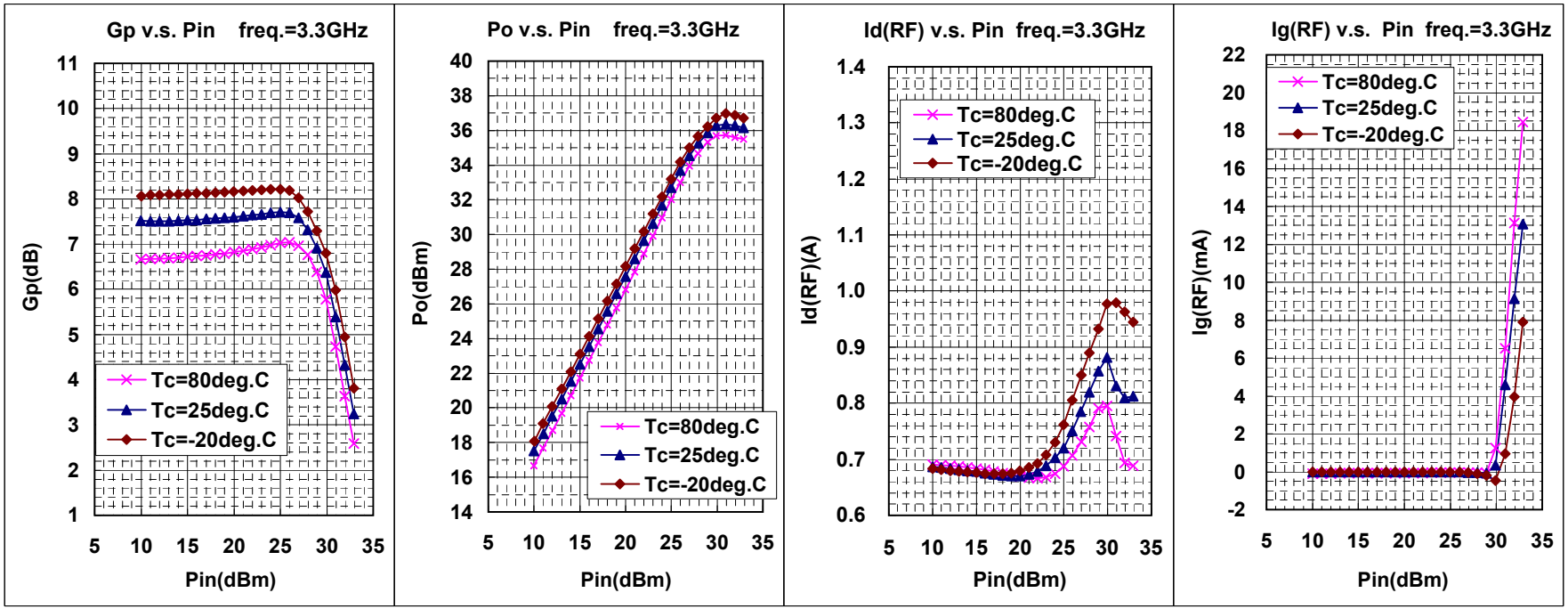
MGF0952P TEST FIXTURE f=2.6GHz



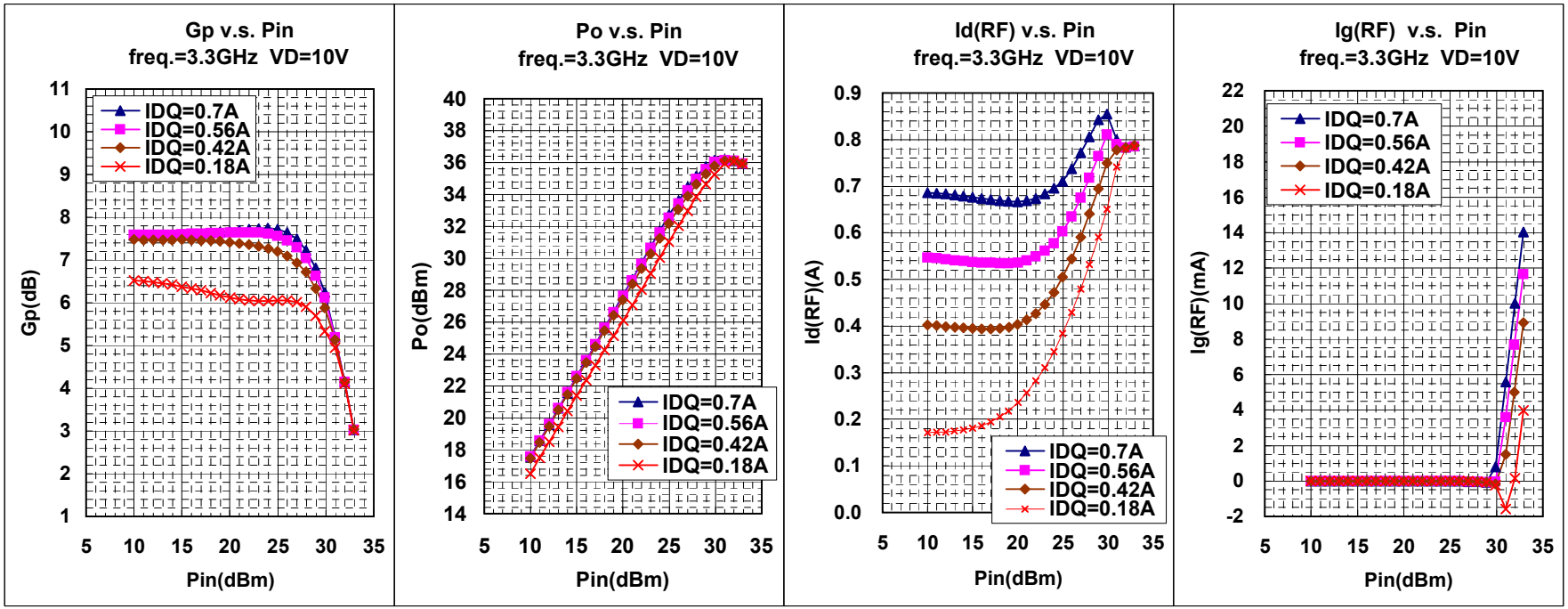
C1,C2,C3,C4=20pF
C5,C7,C8=1000pF
C9,C11=2pF
C10=1pF
C13=330uF
C14=47uF
C12=0.5pF
C6=4.7uF
L1,L2=12nH
R1=51ohm
R2=100ohm

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

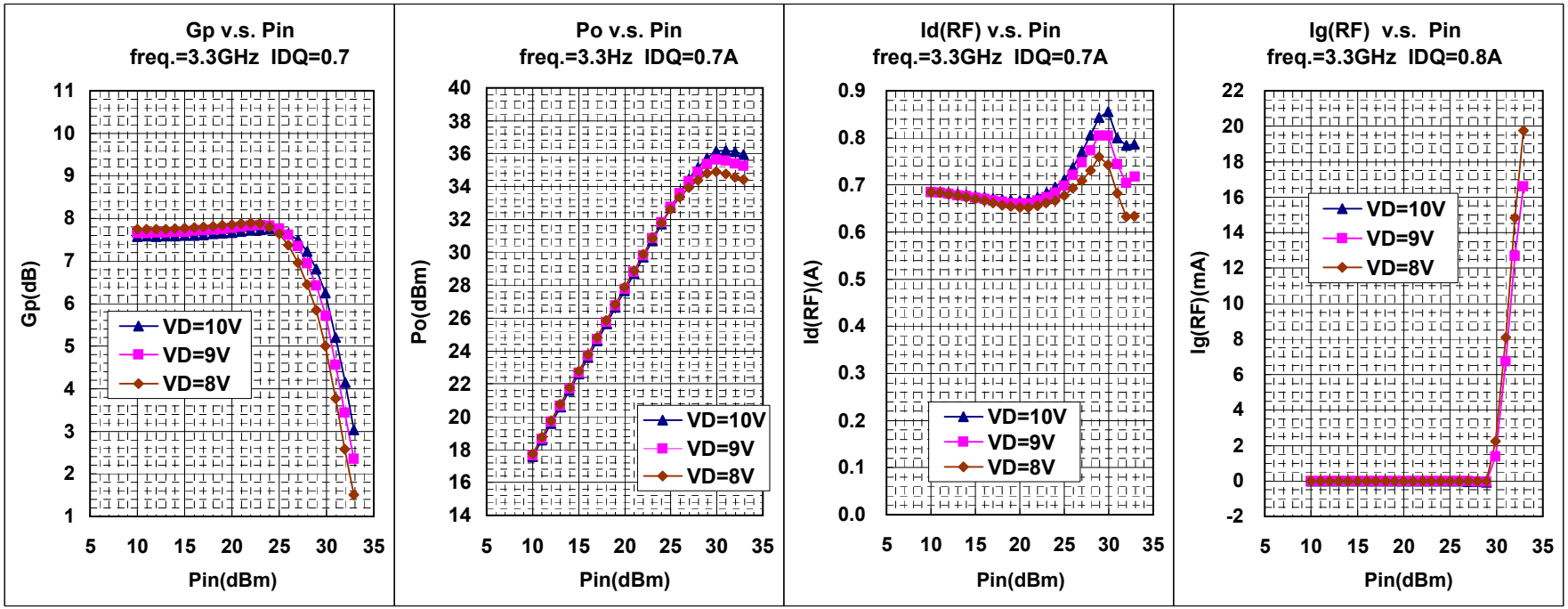
MGF0952P RF TEST DATA(CW) VD=10V,Idq=0.7A
Gp,Po,Id(RF),Ig(RF) v.s. Pin

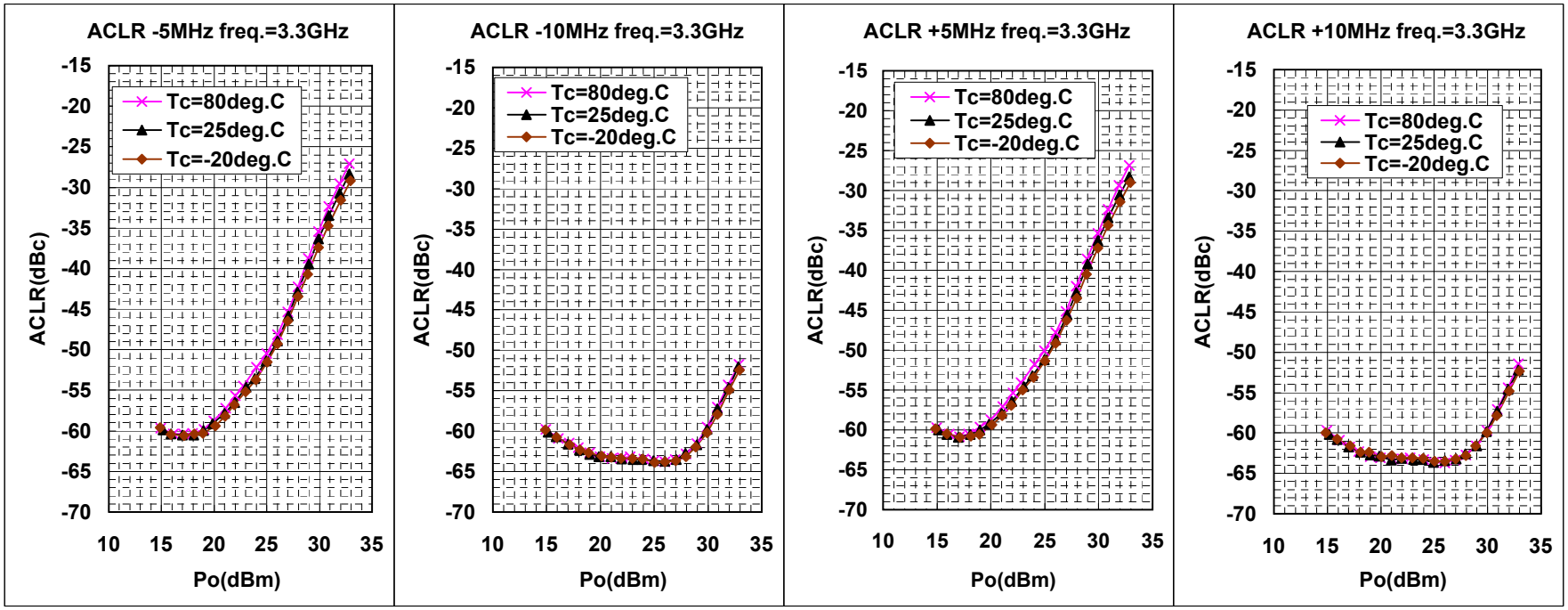


MGF0952P RF TEST DATA(CW)
Gp,Po,Id(RF),Ig(RF) v.s. Pin

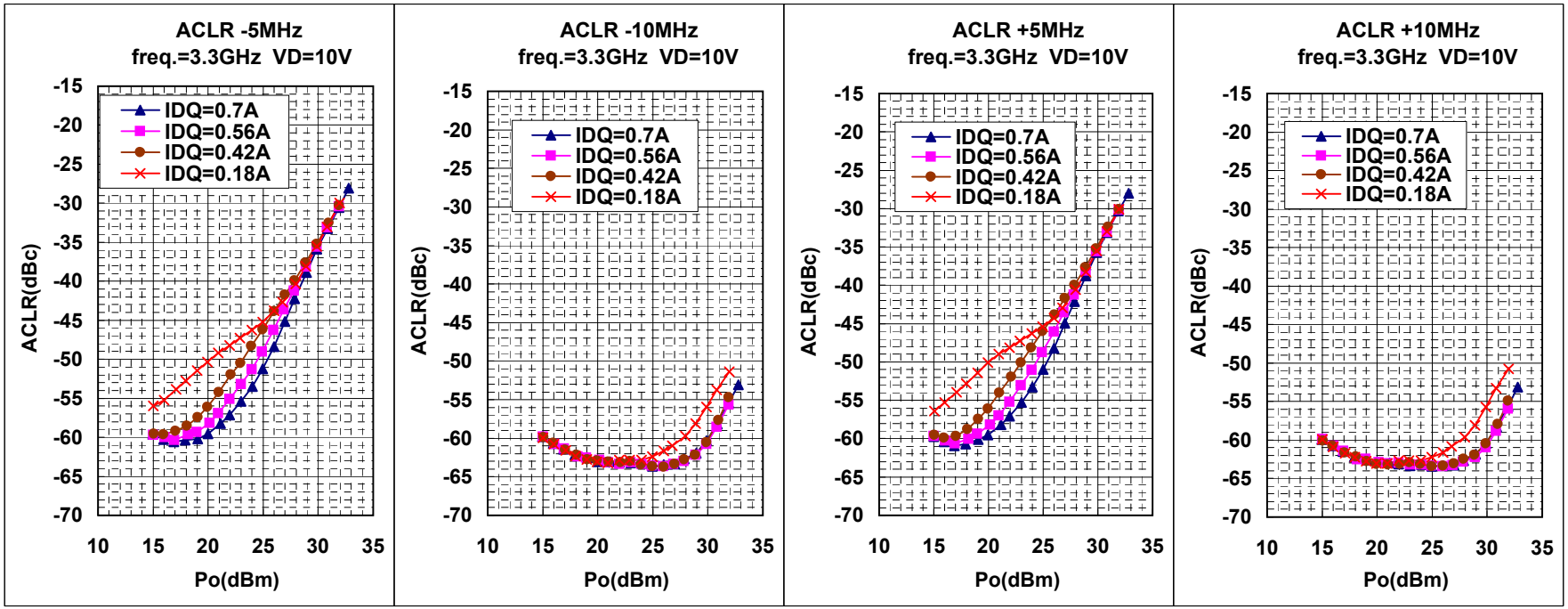


MGF0952P RF TEST DATA(CW)
Gp,Po,Id(RF),Ig(RF) v.s. Pin

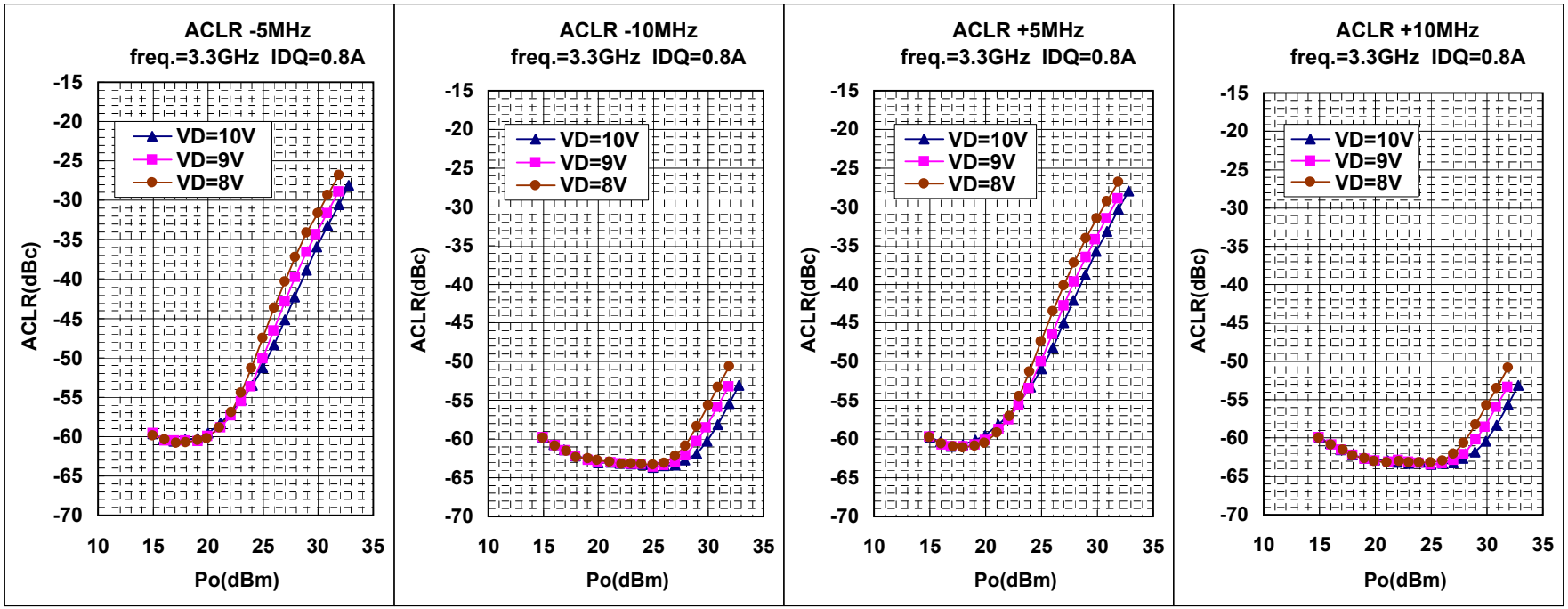



ACLR -5MHz freq.=3.3GHz
ACLR -10MHz freq.=3.3GHz
ACLR +5MHz freq.=3.3GHz
ACLR +10MHz freq.=3.3GHz
Tc=80deg.C
Tc=25deg.C
Tc=-20deg.C
ACLR(dBc)
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
35
Po(dBm)

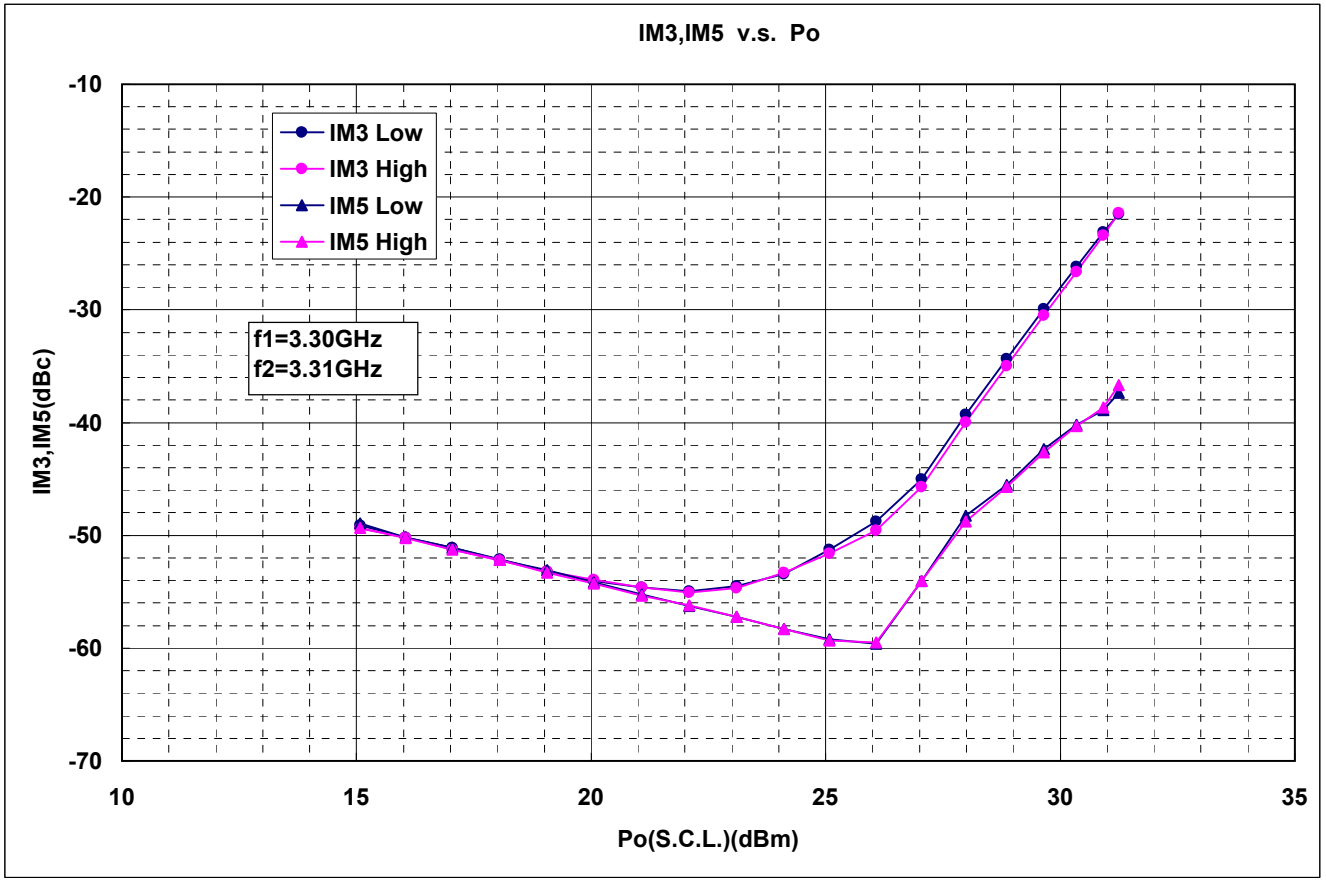
MGF0952P RF TEST DATA(W-CDMA)
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



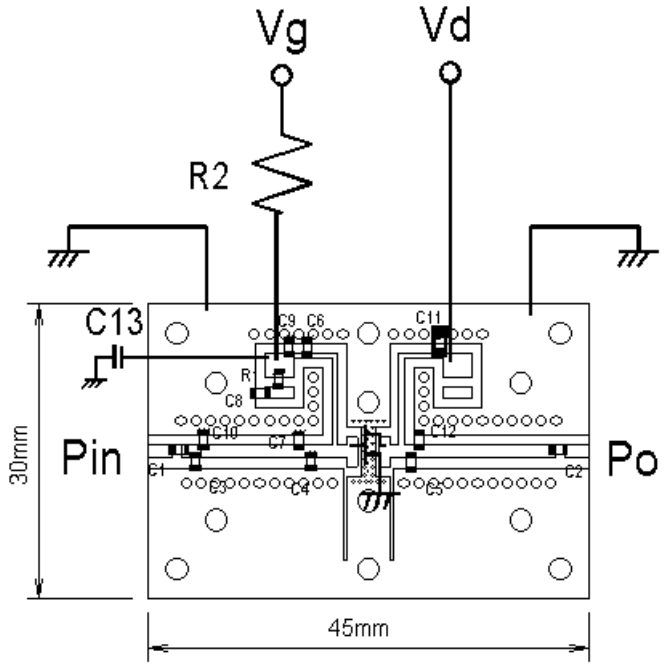
MGF0952P RF TEST DATA(W-CDMA)
ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



IM3,IM5 v.s. Pin



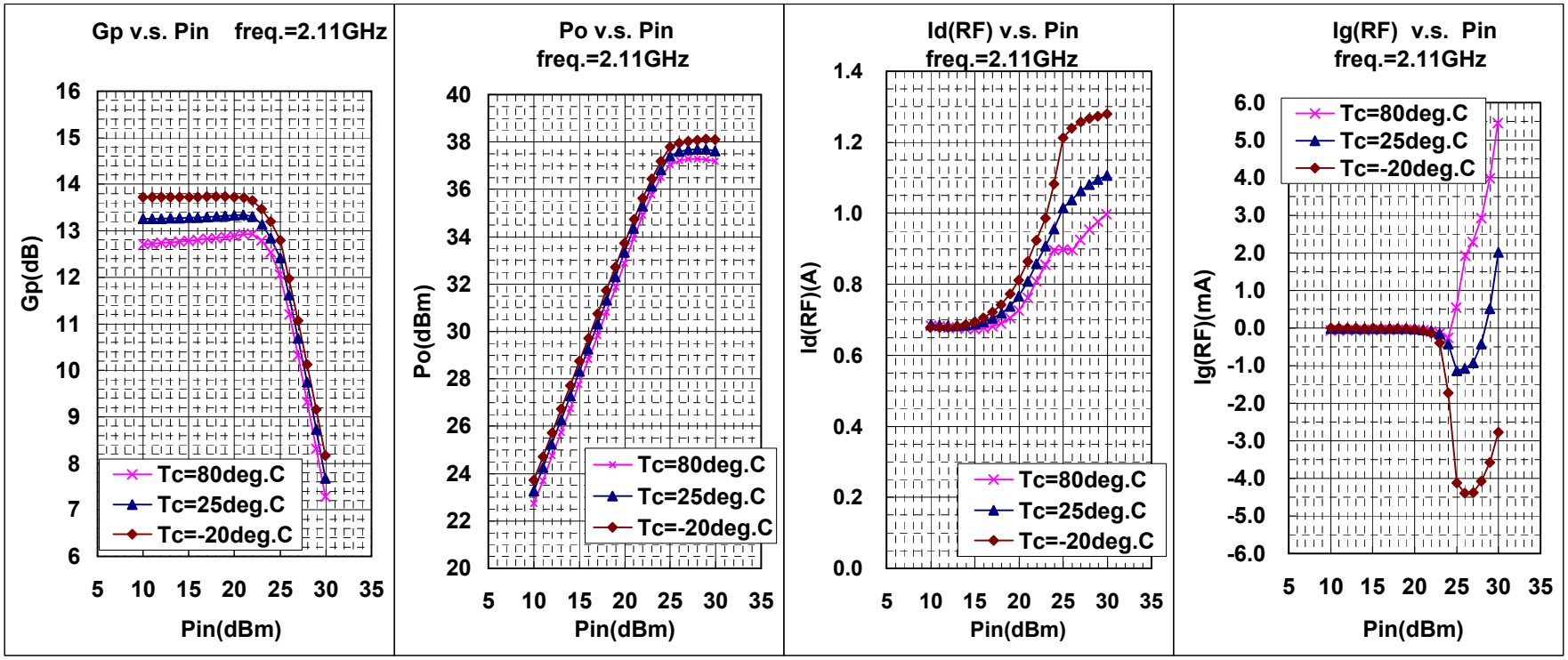
MGF0952P TEST FIXTURE f=3.3GHz



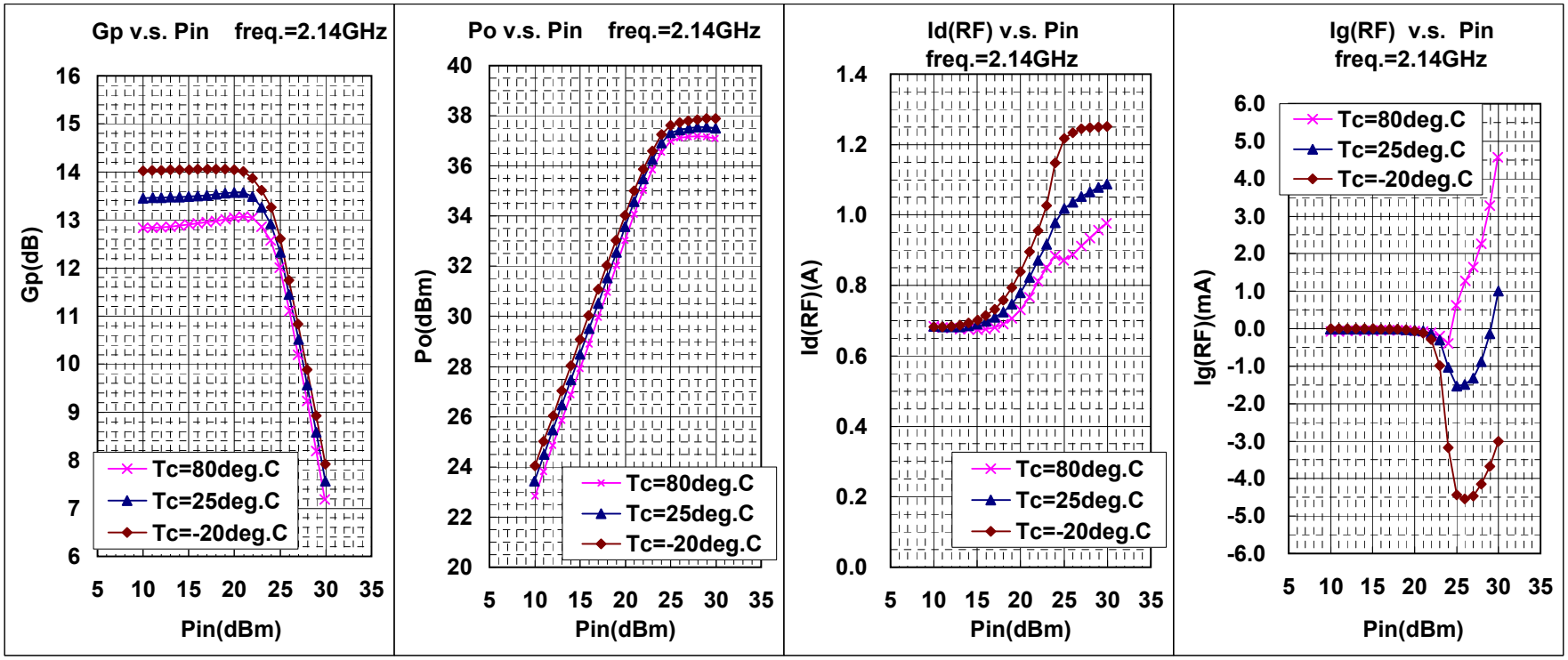
C1,C2,=20pF
C3,C4,C5=1P
C6=22pF
C7,C10,C12=0.5pF
C8,C9=1000pF
C11=4.7uF
C13=330uF
R1=51ohm
R2=100ohm

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

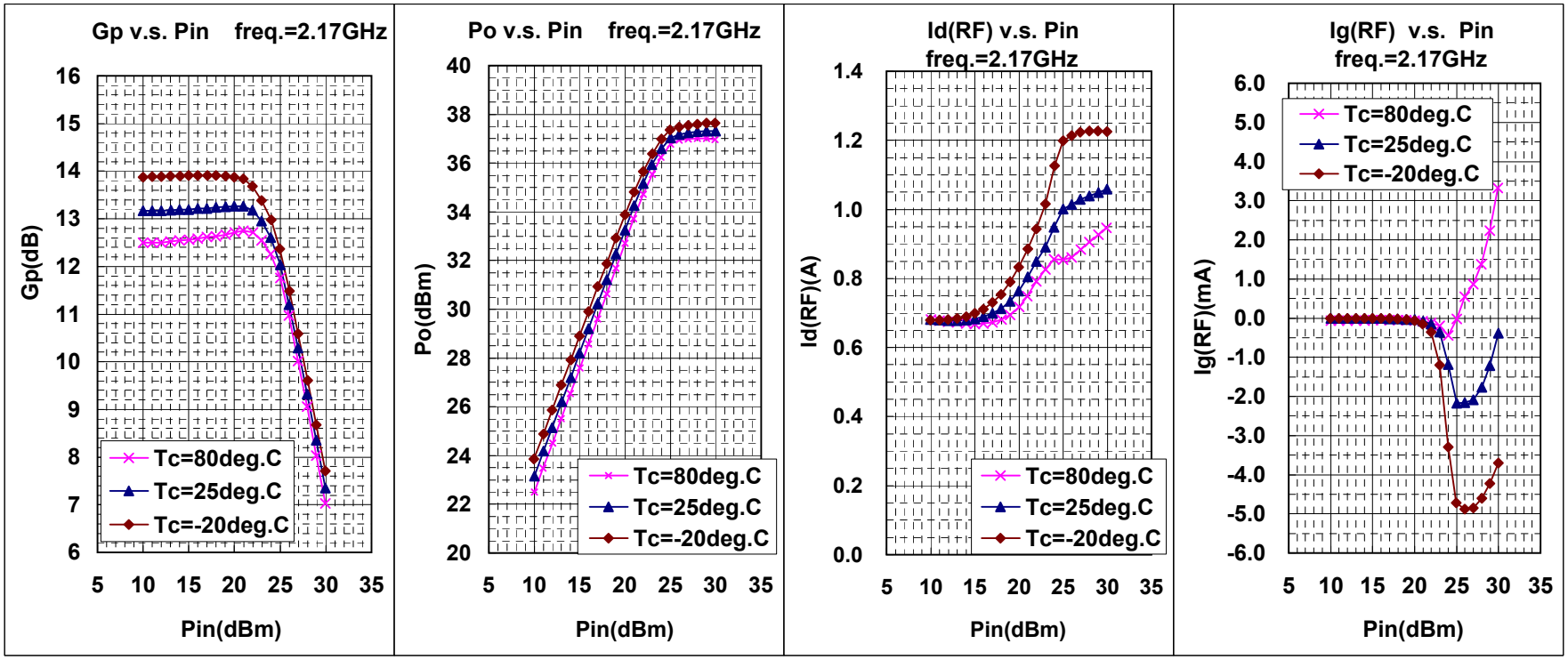
MGF0952P RF TEST DATA(CW) VD=10V,IDQ=0.7A
Gp,Po,Id(RF),Ig(RF) v.s. Pin

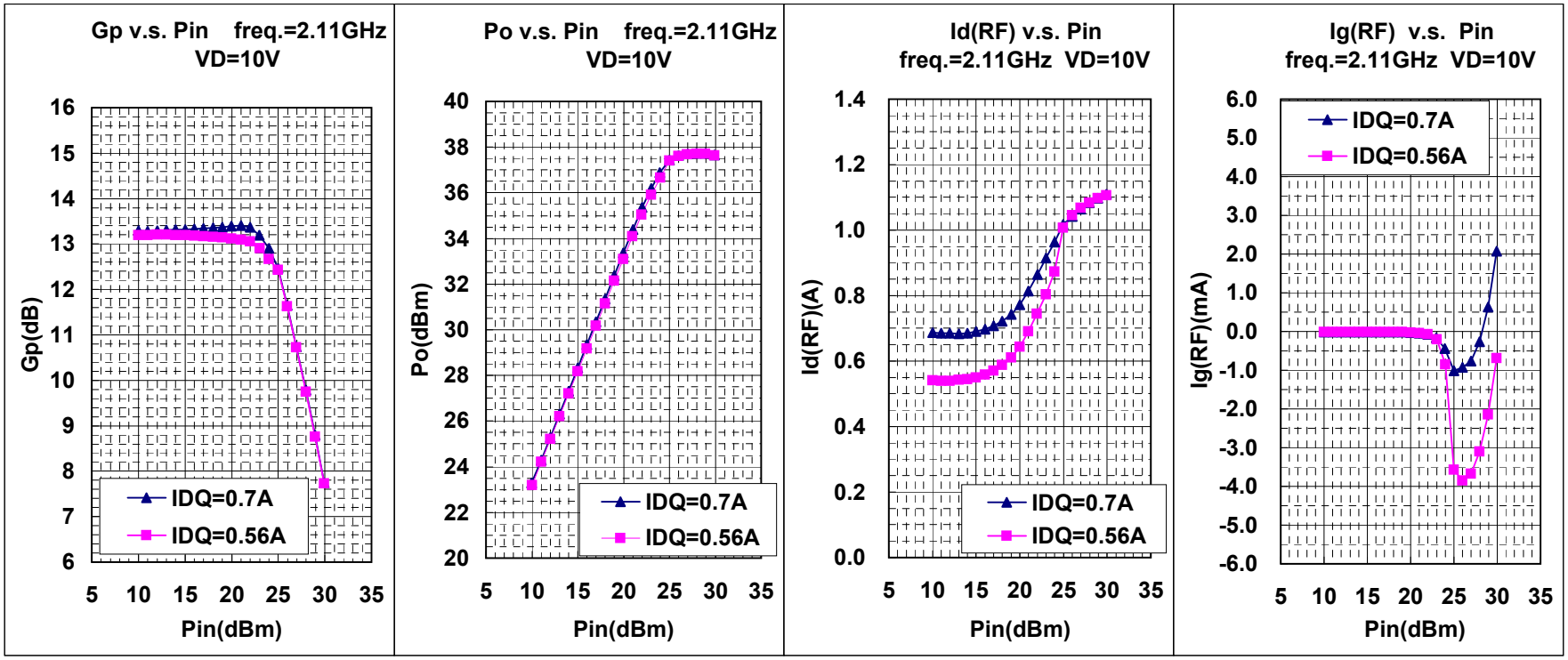


MGF0952P RF TEST DATA(CW) VD=10V,IDQ=0.7A
Gp,Po,Id(RF),Ig(RF) v.s. Pin

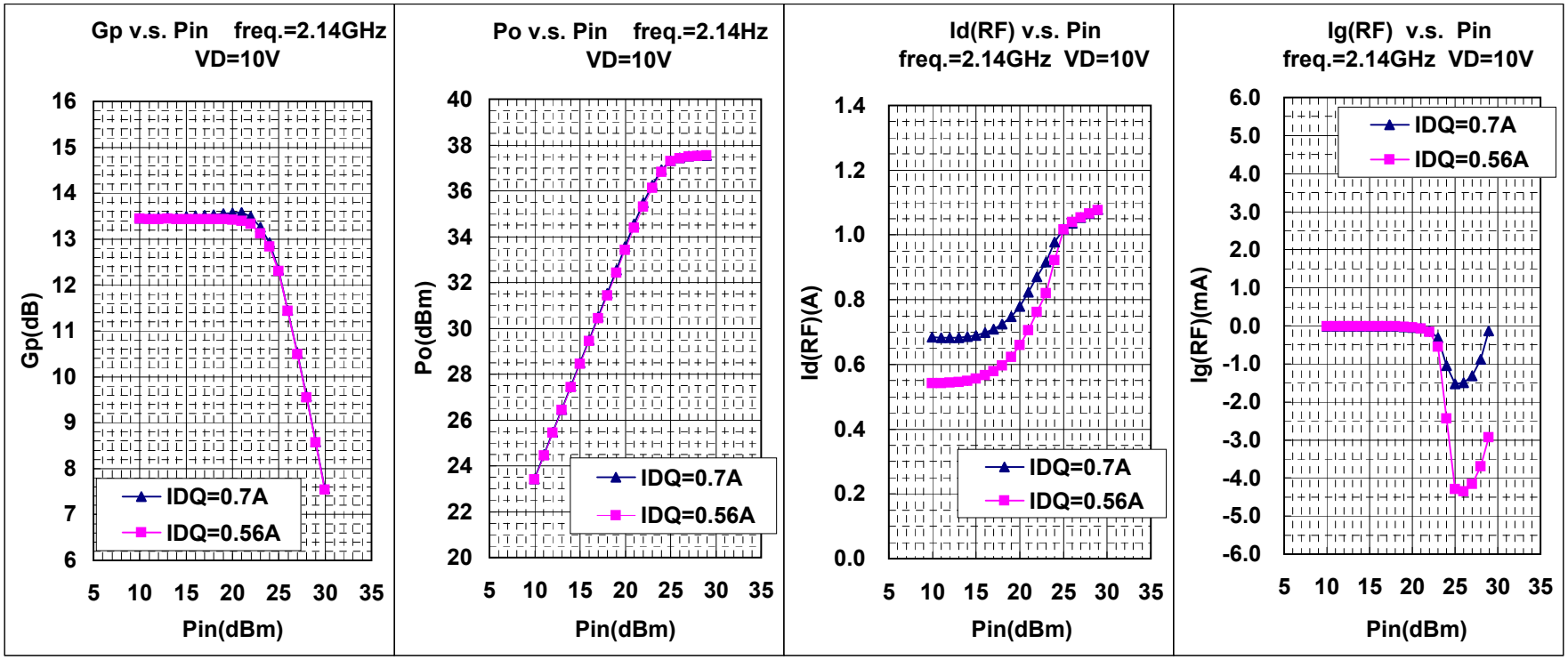


MGF0952P RF TEST DATA(CW) VD=10V,IDQ=0.7A
Gp,Po,Id(RF),Ig(RF) v.s. Pin

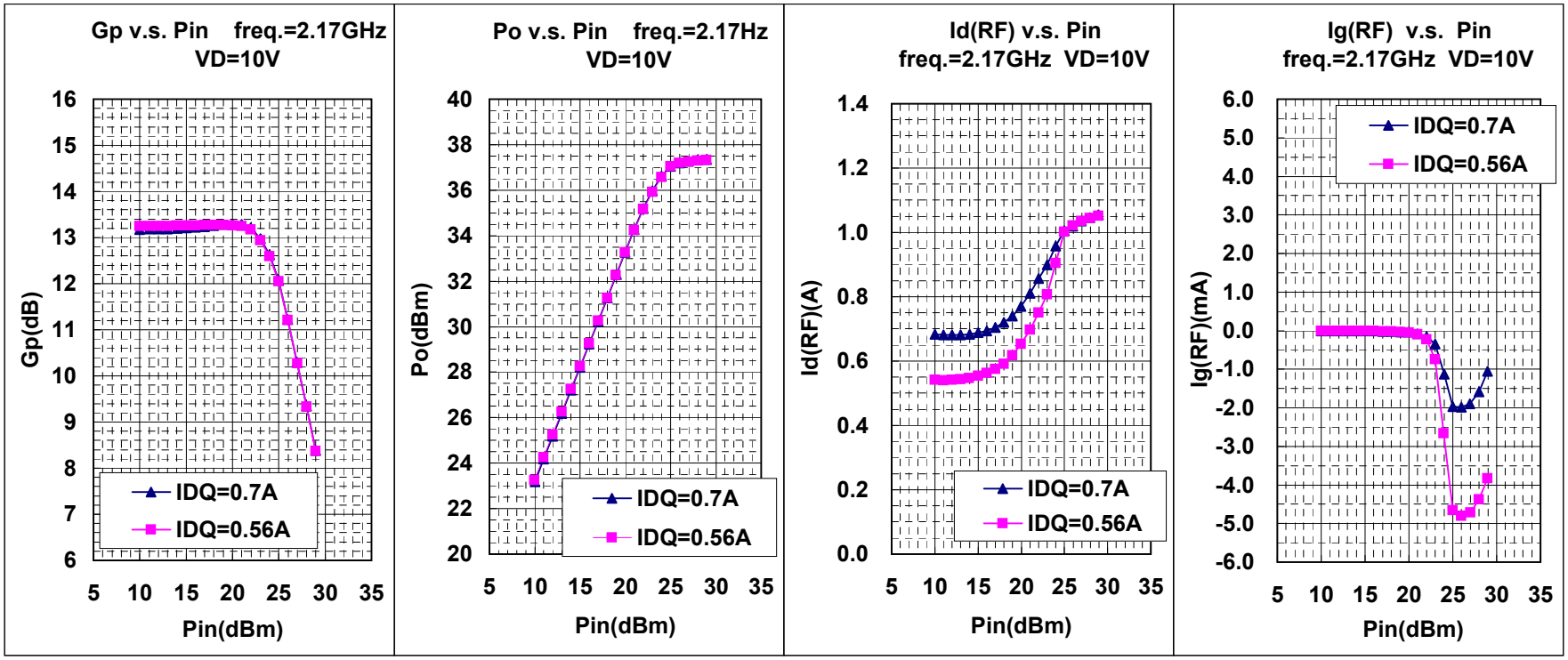


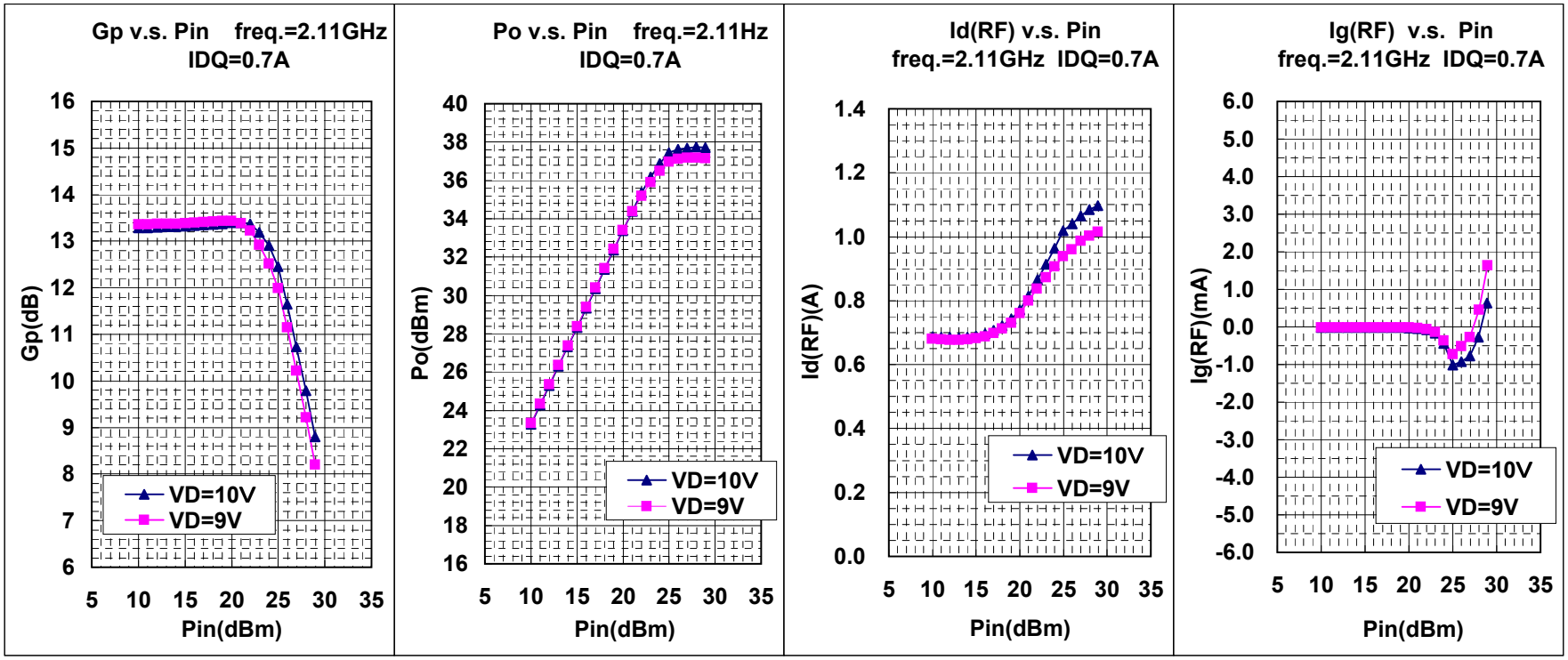

Gp v.s. Pin freq.=2.11GHz
VD=10V
Gp(dB)
Pin(dBm)
IDQ=0.7A
IDQ=0.56A
Po v.s. Pin freq.=2.11GHz
VD=10V
Po(dBm)
Pin(dBm)
IDQ=0.7A
IDQ=0.56A
Id(RF) v.s. Pin
freq.=2.11GHz VD=10V
Id(RF)(A)
Pin(dBm)
IDQ=0.7A
IDQ=0.56A
Ig(RF) v.s. Pin
freq.=2.11GHz VD=10V
Ig(RF)(mA)
Pin(dBm)
IDQ=0.7A
IDQ=0.56A

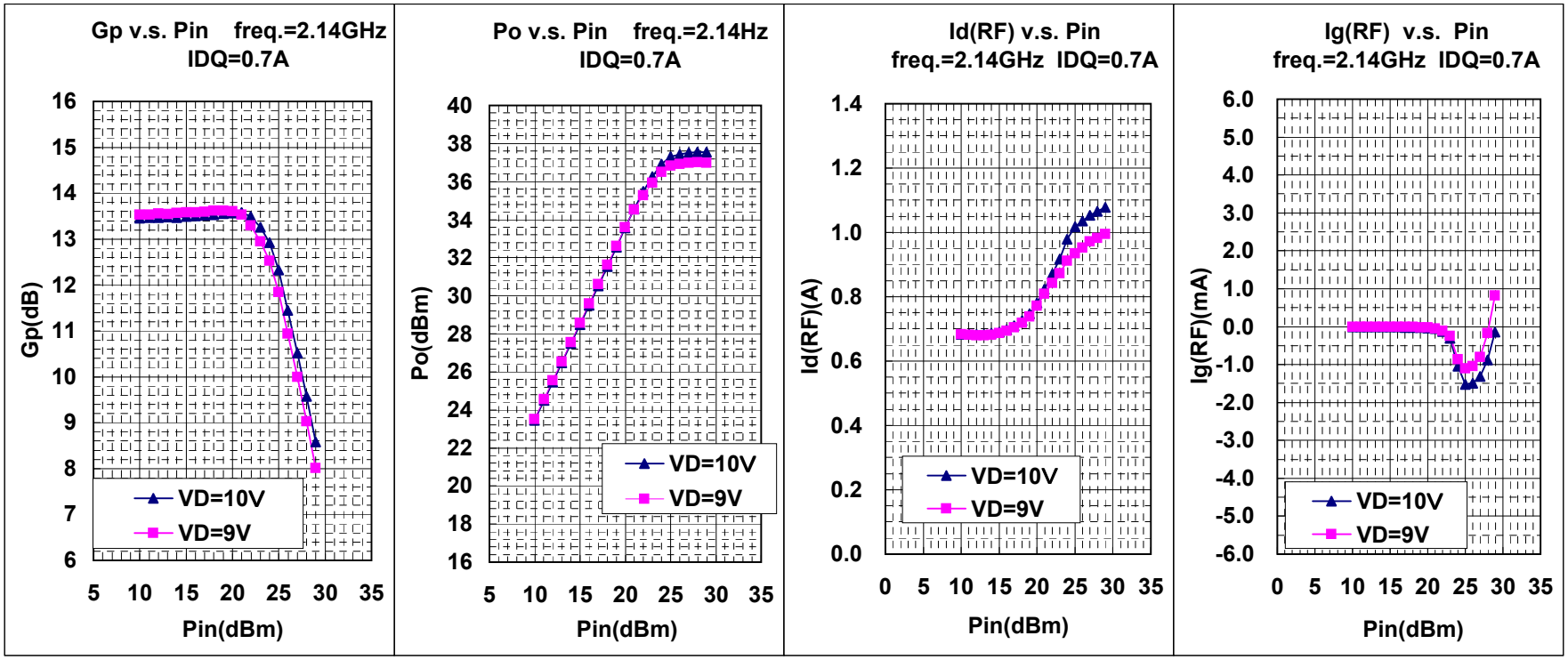
MGF0952P RF TEST DATA(CW)
Gp,Po,Id(RF),Ig(RF) v.s. Pin

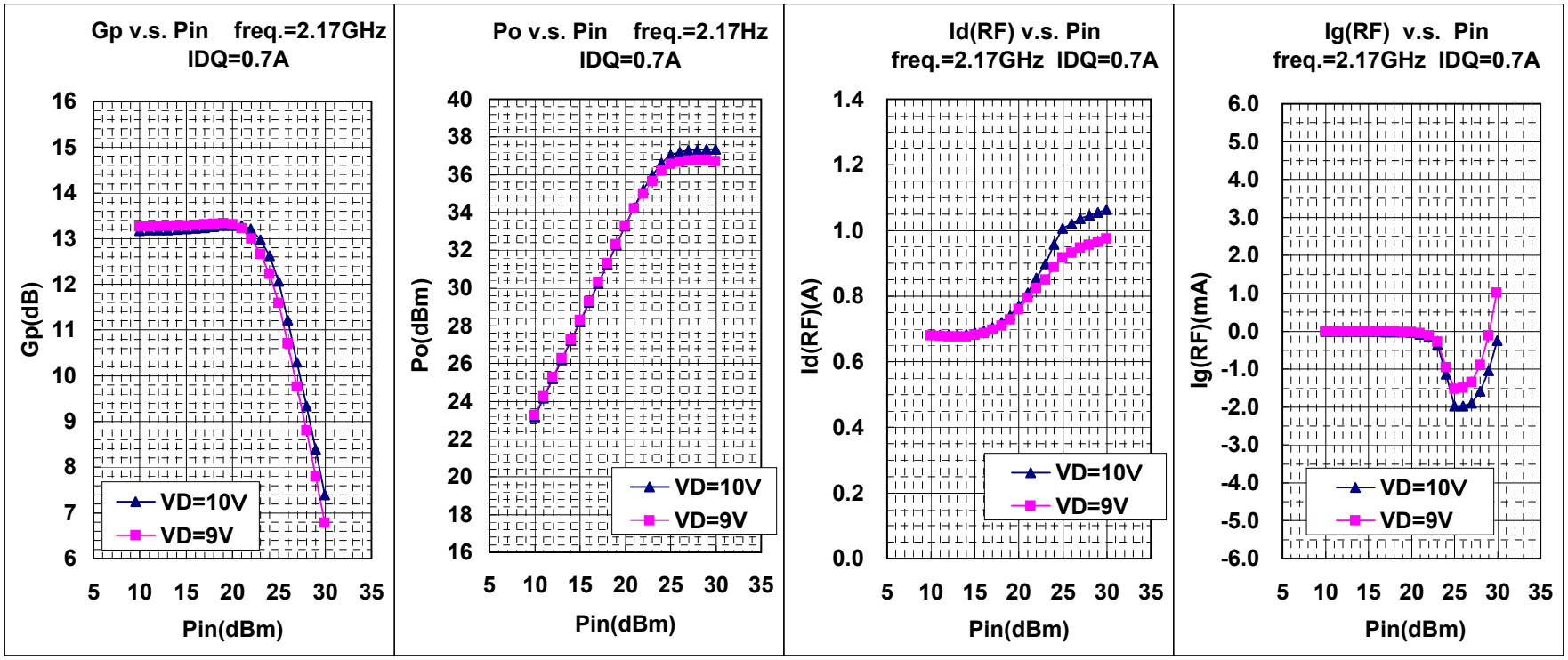


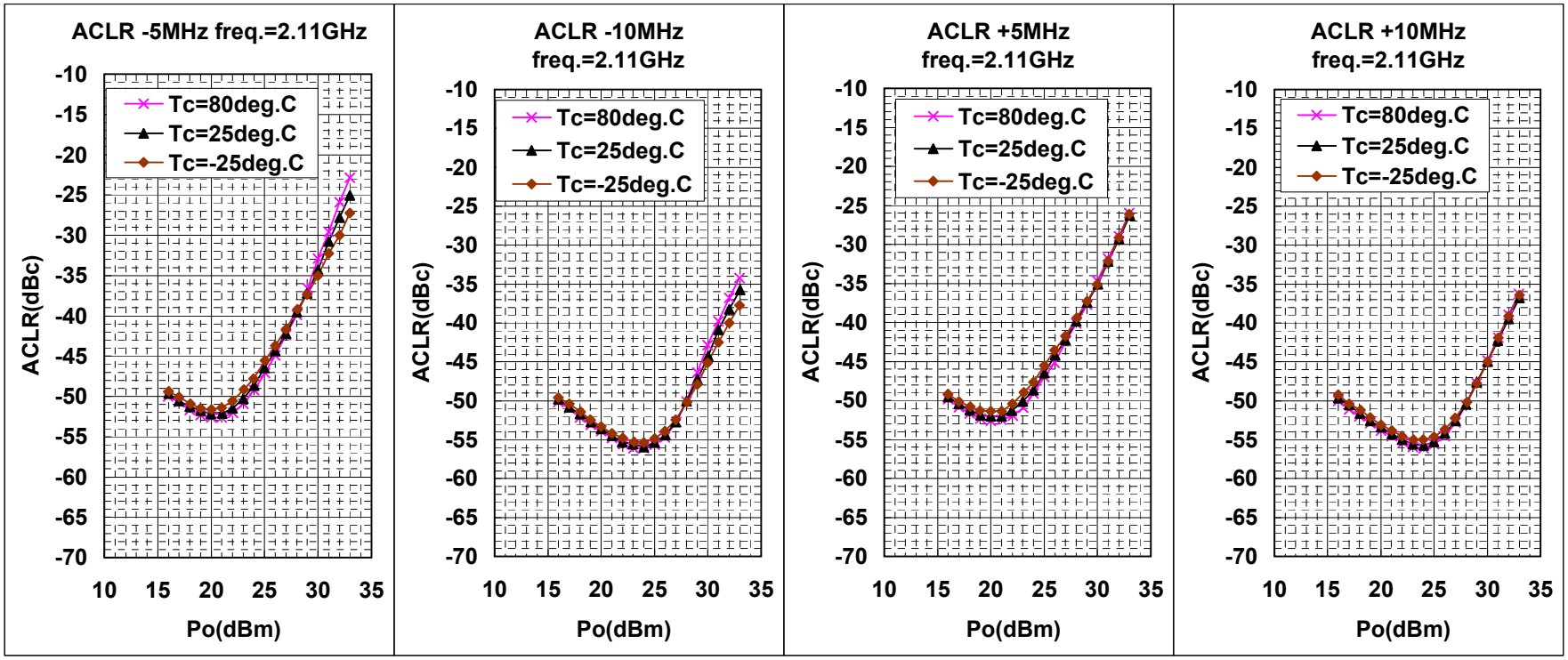
MGF0952P RF TEST DATA(CW)
Gp,Po,Id(RF),Ig(RF) v.s. Pin

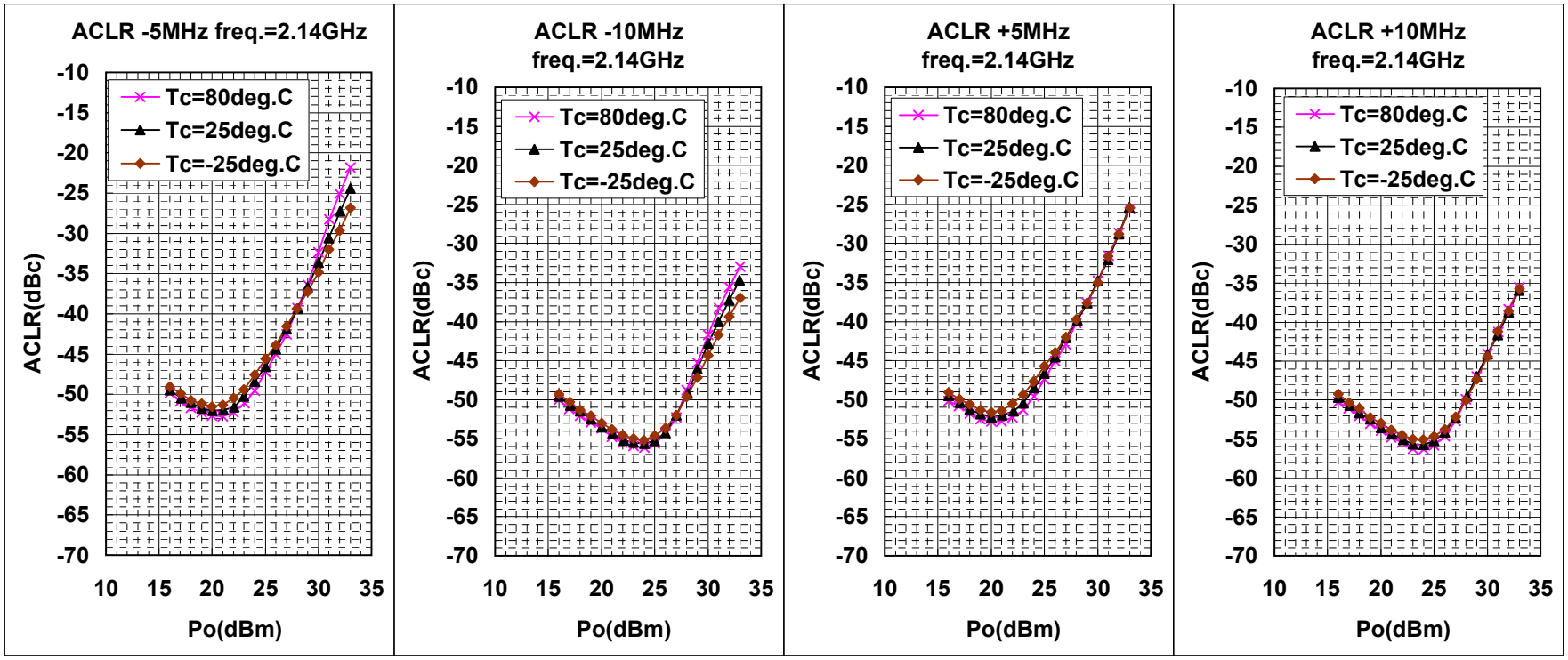


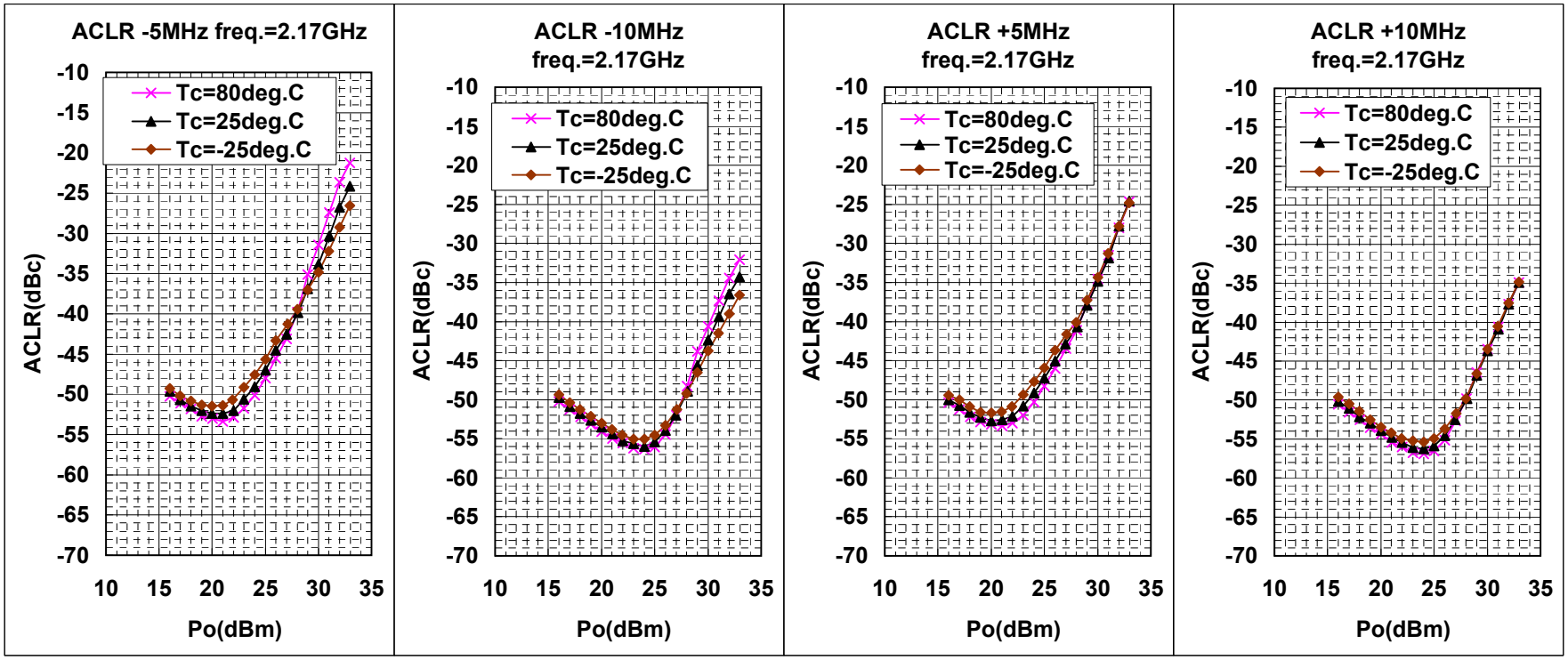

Gp v.s. Pin freq.=2.11GHz
IDQ=0.7A
Gp(dB)
Pin(dBm)
VD=10V
VD=9V
Po v.s. Pin freq.=2.11Hz
IDQ=0.7A
Po(dBm)
Pin(dBm)
VD=10V
VD=9V
Id(RF) v.s. Pin
freq.=2.11GHz IDQ=0.7A
Id(RF)(A)
Pin(dBm)
VD=10V
VD=9V
Ig(RF) v.s. Pin
freq.=2.11GHz IDQ=0.7A
Ig(RF)(mA)
Pin(dBm)
VD=10V
VD=9V

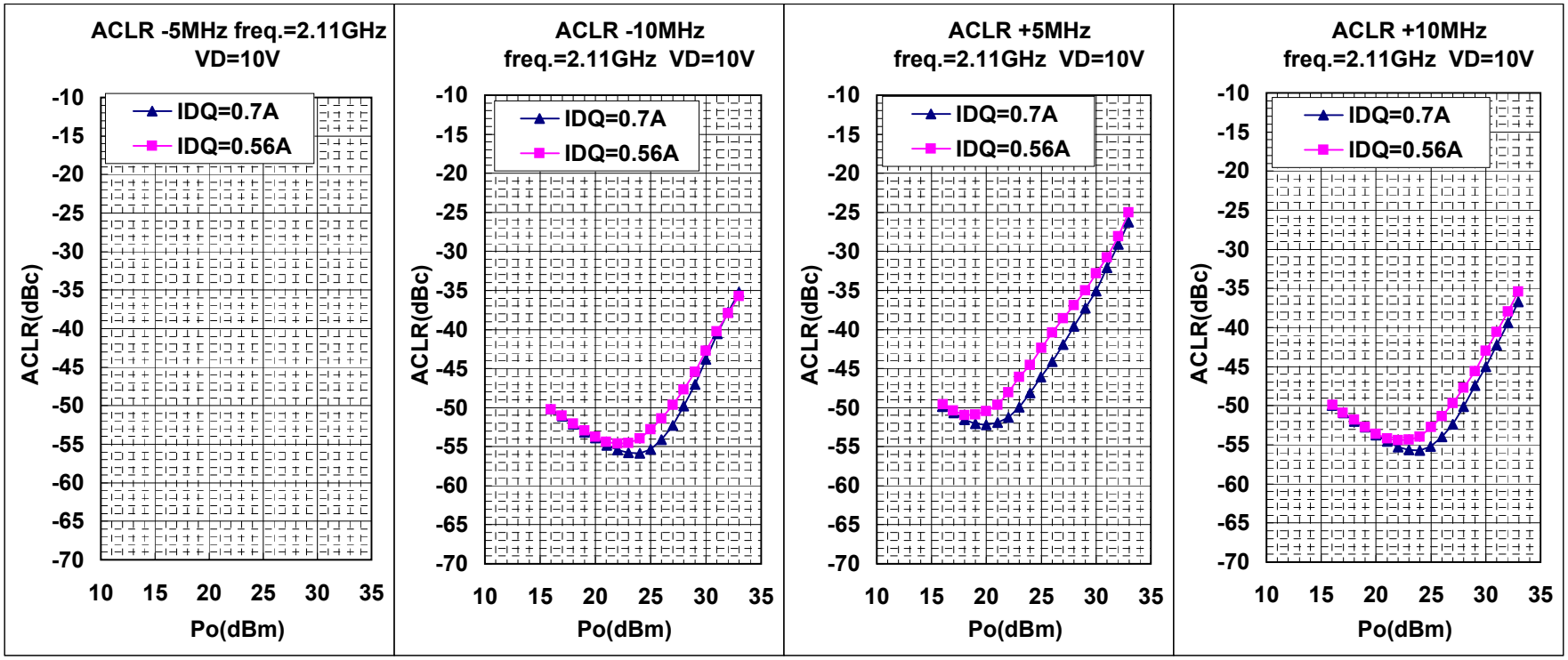

Gp v.s. Pin freq.=2.14GHz
IDQ=0.7A
Gp(dB)
Pin(dBm)
VD=10V
VD=9V
Po v.s. Pin freq.=2.14Hz
IDQ=0.7A
Po(dBm)
Pin(dBm)
VD=10V
VD=9V
Id(RF) v.s. Pin
freq.=2.14GHz IDQ=0.7A
Id(RF)(A)
Pin(dBm)
VD=10V
VD=9V
Ig(RF) v.s. Pin
freq.=2.14GHz IDQ=0.7A
Ig(RF)(mA)
Pin(dBm)
VD=10V
VD=9V

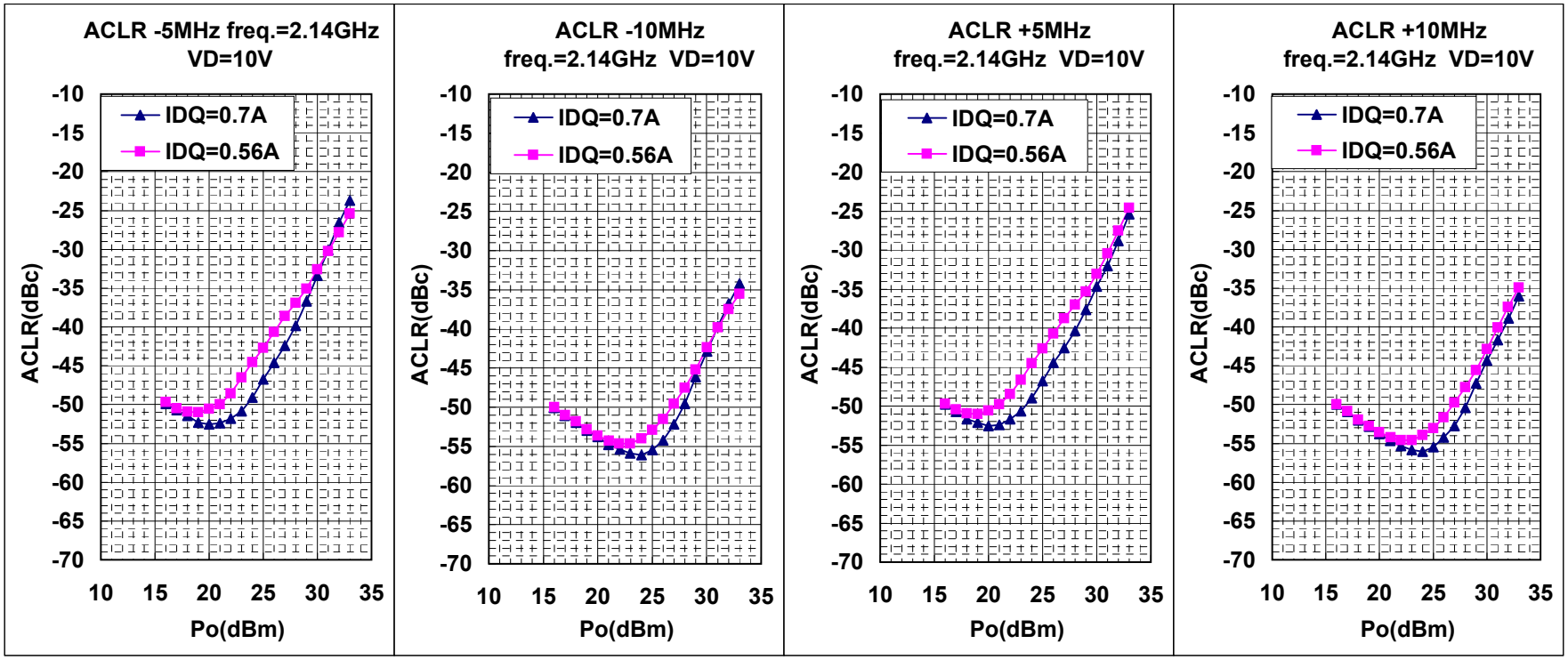

Gp v.s. Pin freq.=2.17GHz
IDQ=0.7A
Gp(dB)
Pin(dBm)
VD=10V
VD=9V
Po v.s. Pin freq.=2.17Hz
IDQ=0.7A
Po(dBm)
Pin(dBm)
VD=10V
VD=9V
Id(RF) v.s. Pin
freq.=2.17GHz IDQ=0.7A
Id(RF)(A)
Pin(dBm)
VD=10V
VD=9V
Ig(RF) v.s. Pin
freq.=2.17GHz IDQ=0.7A
Ig(RF)(mA)
Pin(dBm)
VD=10V
VD=9V

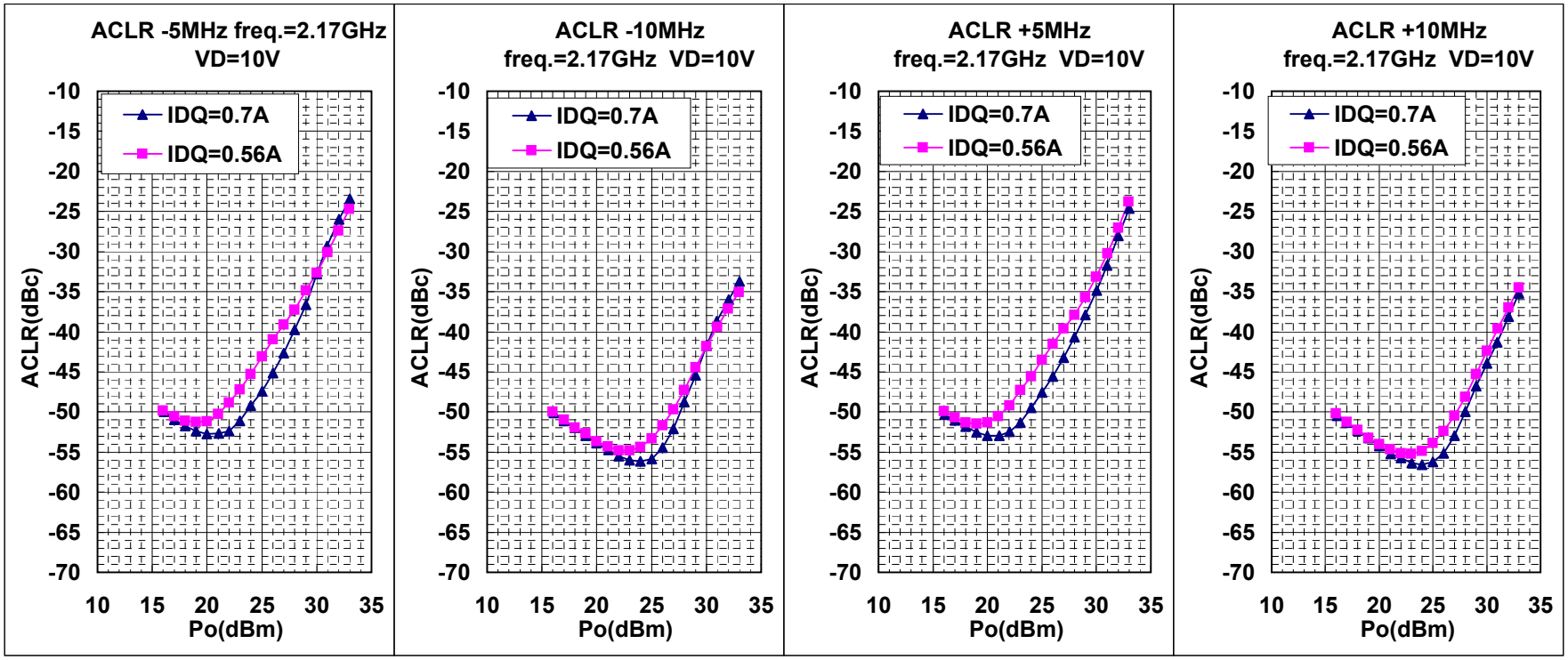

ACLR -5MHz freq.=2.11GHz
ACLR -10MHz freq.=2.11GHz
ACLR +5MHz freq.=2.11GHz
ACLR +10MHz freq.=2.11GHz
Tc=80deg.C
Tc=25deg.C
Tc=-25deg.C
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
35
Po(dBm)

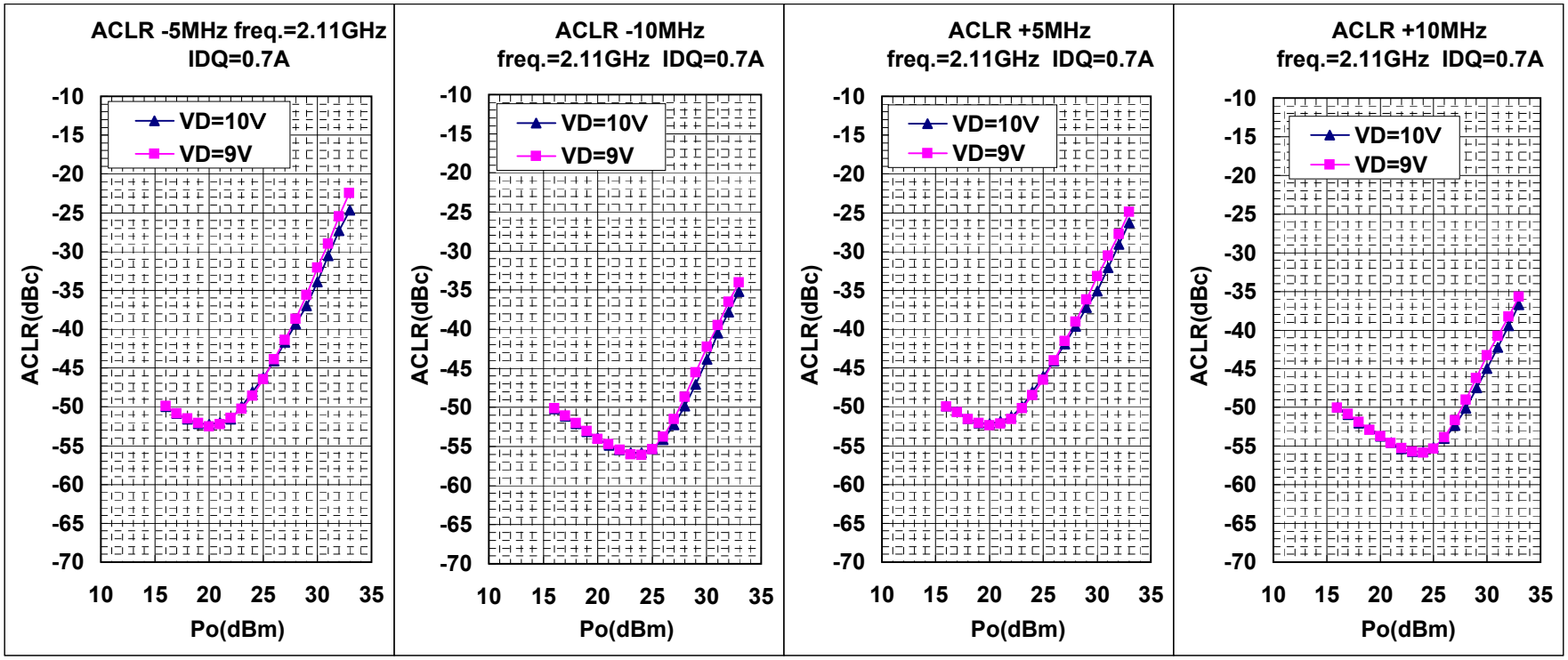

ACLR -5MHz freq.=2.14GHz
ACLR -10MHz freq.=2.14GHz
ACLR +5MHz freq.=2.14GHz
ACLR +10MHz freq.=2.14GHz
Tc=80deg.C
Tc=25deg.C
Tc=-25deg.C
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
35
Po(dBm)

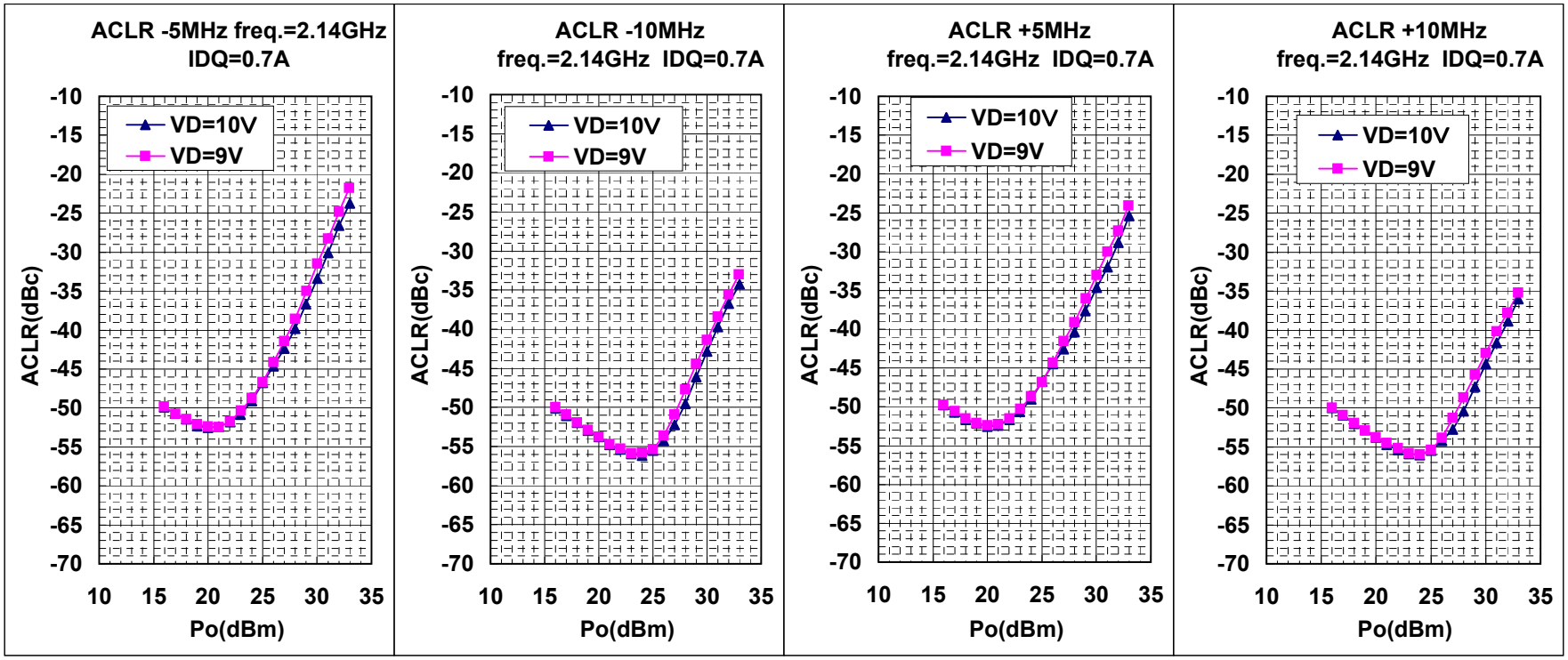

ACLR -5MHz freq.=2.17GHz
ACLR -10MHz freq.=2.17GHz
ACLR +5MHz freq.=2.17GHz
ACLR +10MHz freq.=2.17GHz
Tc=80deg.C
Tc=25deg.C
Tc=-25deg.C
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
35
Po(dBm)

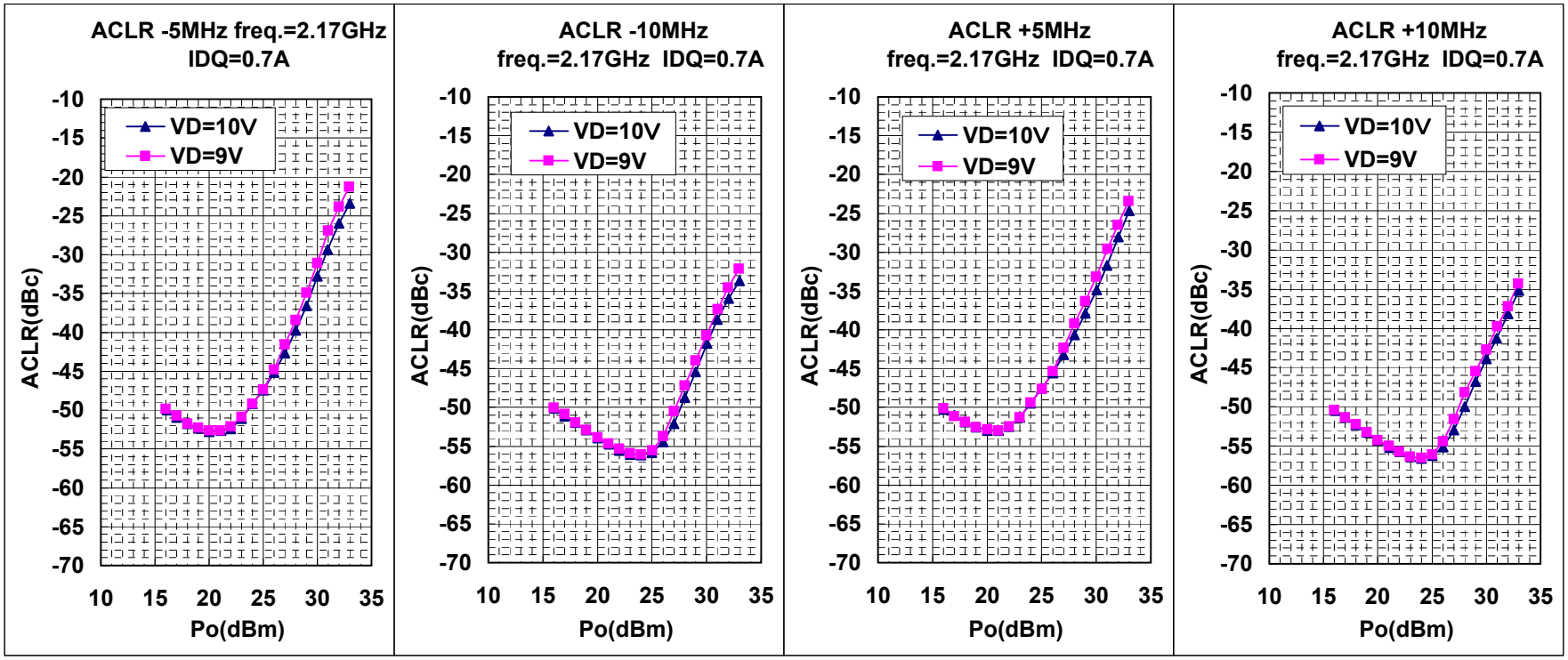

ACLR -5MHz freq.=2.11GHz
VD=10V
ACLR -10MHz
freq.=2.11GHz VD=10V
ACLR +5MHz
freq.=2.11GHz VD=10V
ACLR +10MHz
freq.=2.11GHz VD=10V
IDQ=0.7A
IDQ=0.56A
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
35
Po(dBm)


ACLR -5MHz freq.=2.14GHz
VD=10V
ACLR -10MHz
freq.=2.14GHz VD=10V
ACLR +5MHz
freq.=2.14GHz VD=10V
ACLR +10MHz
freq.=2.14GHz VD=10V
IDQ=0.7A
IDQ=0.56A
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
35
Po(dBm)

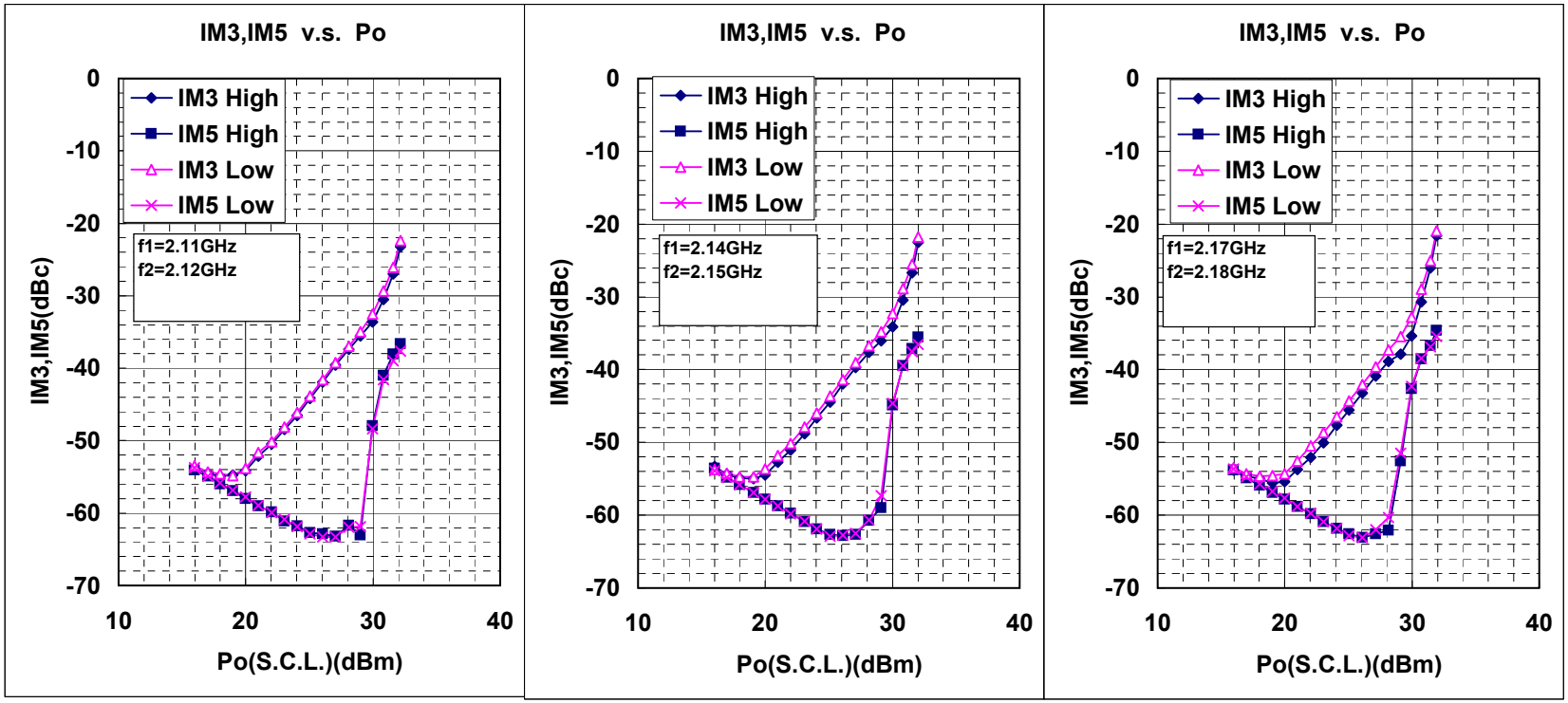

ACLR -5MHz freq.=2.17GHz
VD=10V
ACLR -10MHz
freq.=2.17GHz VD=10V
ACLR +5MHz
freq.=2.17GHz VD=10V
ACLR +10MHz
freq.=2.17GHz VD=10V
IDQ=0.7A
IDQ=0.56A
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
35
Po(dBm)


ACLR -5MHz freq.=2.11GHz
IDQ=0.7A
ACLR -10MHz
freq.=2.11GHz IDQ=0.7A
ACLR +5MHz
freq.=2.11GHz IDQ=0.7A
ACLR +10MHz
freq.=2.11GHz IDQ=0.7A
VD=10V
VD=9V
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
35
Po(dBm)

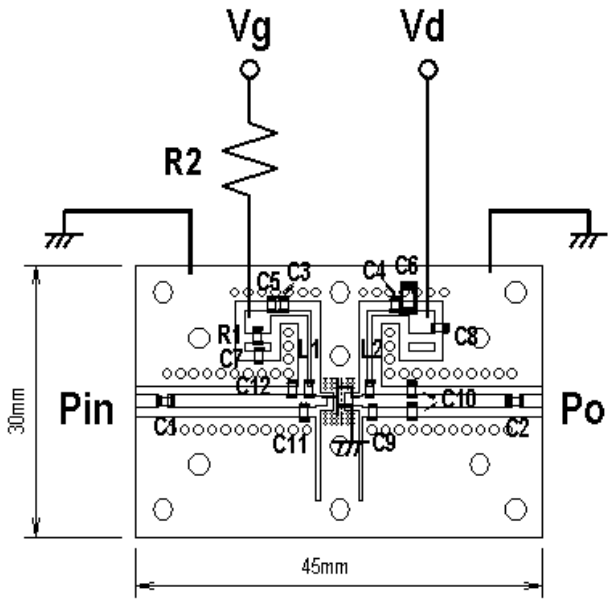

ACLR -5MHz freq.=2.14GHz
IDQ=0.7A
ACLR -10MHz
freq.=2.14GHz IDQ=0.7A
ACLR +5MHz
freq.=2.14GHz IDQ=0.7A
ACLR +10MHz
freq.=2.14GHz IDQ=0.7A
VD=10V
VD=9V
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
35
Po(dBm)


ACLR -5MHz freq.=2.17GHz
IDQ=0.7A
ACLR -10MHz
freq.=2.17GHz IDQ=0.7A
ACLR +5MHz
freq.=2.17GHz IDQ=0.7A
ACLR +10MHz
freq.=2.17GHz IDQ=0.7A
VD=10V
VD=9V
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
35
Po(dBm)

IM3,IM5 v.s. Pin



MGF0952P TEST FIXTURE f=2.11-2.17GHz



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

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