# MGF0951P

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

### DESCRIPTION

The MGF0951P GaAs FET with an N-channel schottky Gate, is designed for use L/S band amplifiers.

### FEATURES

- High output power
  Po=31dBm(TYP.) @f=2.15GHz,Pin=20dBm
- High power gain
  Glp=13dB(TYP.) @f=2.15GHz
- High power added efficiency
  ηadd=50%(TYP.) @f=2.15GHz,Pin=20dBm
- Plastic Mold Lead-less PKG

### APPLICATION

- For L/S Band power amplifiers

### QUALITY

- GG

### RECOMMENDED BIAS CONDITIONS

- Vds=10V • Ids=200mA • Rg=500Ω

**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 | 800 | mA |
| IGR | Reverse gate current | -2.5 | mA |
| IGF | Forward gate current | 5.4 | mA |
| PT | Total power dissipation | 6.0 | W |
| Tch | Cannel temperature | 150 | °C |
| Tstg | Storage temperature | -40 to +150 | °C |

### Recommended maximum ratings (Ta=25°C)

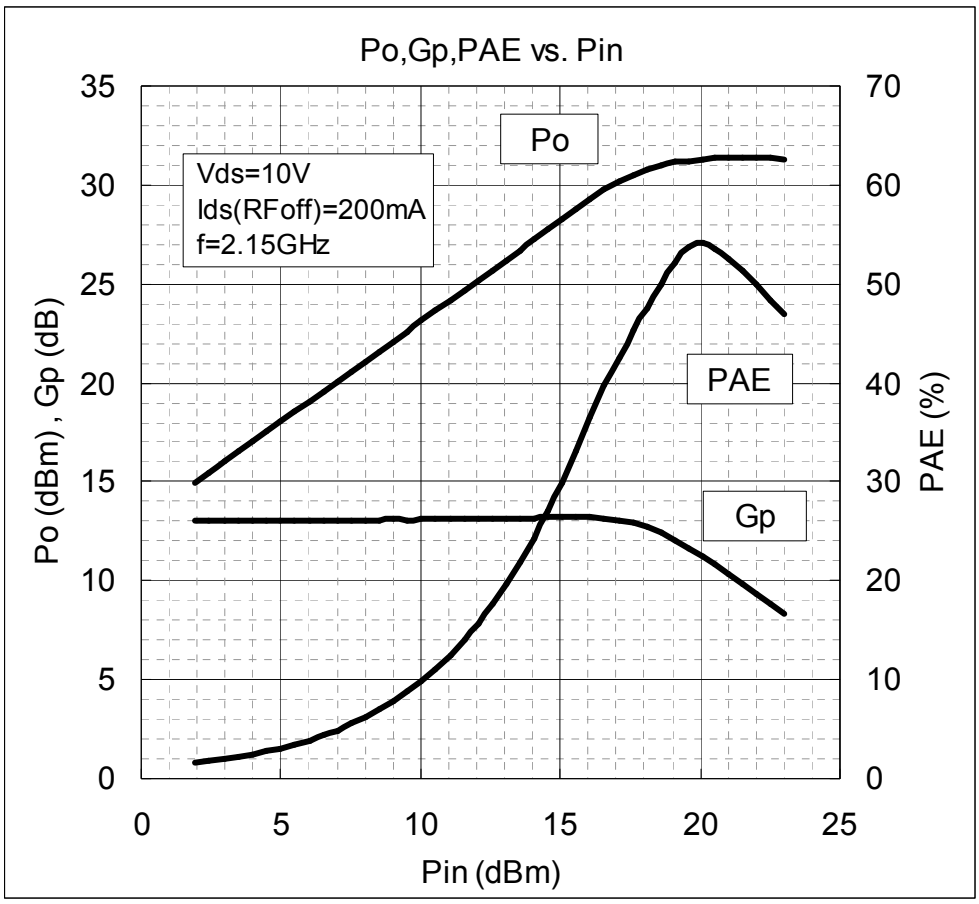
| Symbol | Parameter | Ratings | Unit |
|---|---|---|---|
| Tch | Cannel temperature | 150 | °C |

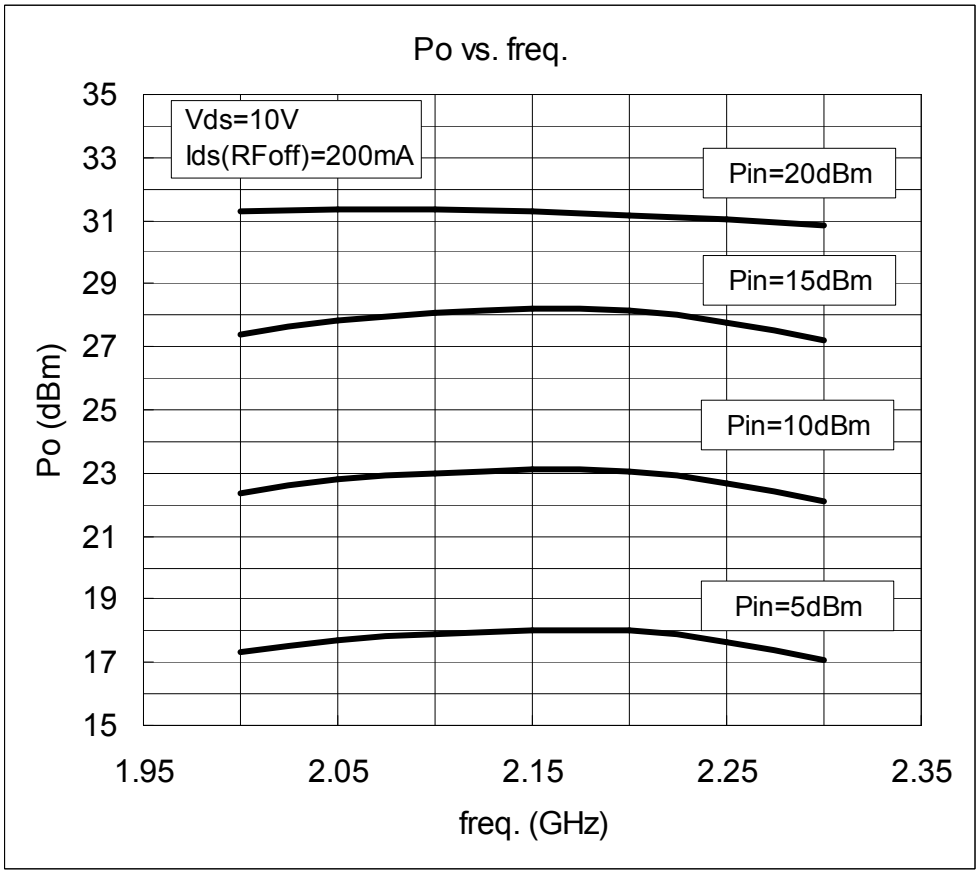
### Electrical characteristics (Ta=25°C)

| Symbol | Parameter | Test conditions | Limits | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| VGS(off) | Gate to source cut-off voltage | VDS=3V,ID=2.5mA | -1 | -3 | -5 | V |
| gm | Transconductance | VDS=3V,ID=300mA | -- | 200 | -- | mS |
| Po | Output power | VDS=10V,ID=200mA,f=2.15GHz | 29.5 | 31 | -- | dBm |
| ηadd *1 | Power added Efficiency | *1:Pin=20dBm, *2:Pin=10dBm | -- | 50 | -- | % |
| GLP *2 | Linear Power Gain | *3:f1=2.15GHz,f2=2.16GHz | 11 | 13 | -- | dB |
| IM3 *3 | 3rd order Modulation Distortion | Po(SCL)=20dBm | -- | -45 | -- | dBc |
| Rth(ch-c) | Thermal Resistance *1 | ΔVf Method | -- | 20 | 25 | °C/W |

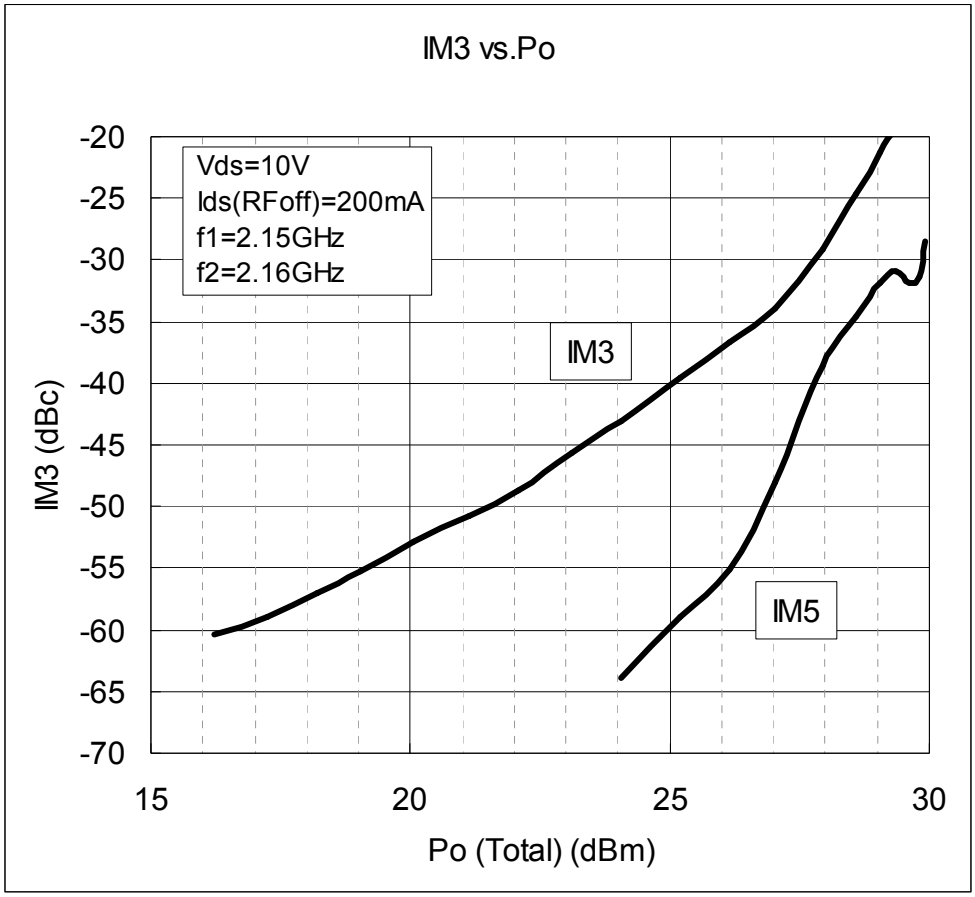
*1:Channel to case / Above parameters, ratings, limits are subject to change.

MGF0951P TYPICAL CHARACTERISTICS



MGF0951P TYPICAL CHARACTERISTICS



**MGF0951P S PARAMETERS** (Ta=25°C,VD=10V,ID=200mA)

| f (MHz) | S Parameter(TYP.) | | | | | | | | K | MSG/MAG (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| | S11 | | S21 | | S12 | | S22 | | | |
| | Magn. | Angle(deg.) | Magn. | Angle(deg.) | Magn. | Angle(deg.) | Magn. | Angle(deg.) | | |
| 600 | 0.847 | -98.9 | 7.176 | 117.6 | 0.039 | 44.1 | 0.186 | -115.6 | 0.476 | 22.7 |
| 800 | 0.827 | -115.4 | 5.972 | 106.5 | 0.043 | 37.8 | 0.207 | -126.0 | 0.564 | 21.4 |
| 1000 | 0.807 | -127.9 | 5.076 | 97.3 | 0.046 | 34.1 | 0.225 | -133.2 | 0.666 | 20.4 |
| 1200 | 0.797 | -137.6 | 4.392 | 89.6 | 0.048 | 31.5 | 0.240 | -137.7 | 0.767 | 19.6 |
| 1400 | 0.785 | -145.0 | 3.867 | 82.8 | 0.051 | 29.6 | 0.256 | -140.5 | 0.855 | 18.8 |
| 1600 | 0.777 | -151.3 | 3.450 | 76.6 | 0.052 | 29.0 | 0.270 | -142.7 | 0.951 | 18.2 |
| 1800 | 0.772 | -156.1 | 3.127 | 71.0 | 0.053 | 28.2 | 0.284 | -143.5 | 1.027 | 16.7 |
| 2000 | 0.763 | -160.3 | 2.865 | 65.7 | 0.056 | 28.0 | 0.295 | -144.3 | 1.099 | 15.2 |
| 2200 | 0.754 | -164.1 | 2.655 | 60.8 | 0.058 | 27.2 | 0.303 | -144.8 | 1.173 | 14.1 |
| 2400 | 0.745 | -167.7 | 2.485 | 55.8 | 0.060 | 27.4 | 0.314 | -145.3 | 1.223 | 13.3 |
| 2600 | 0.733 | -171.3 | 2.342 | 50.9 | 0.064 | 26.7 | 0.325 | -145.4 | 1.269 | 12.5 |
| 2800 | 0.720 | -175.0 | 2.223 | 46.1 | 0.067 | 25.9 | 0.335 | -145.3 | 1.312 | 11.9 |
| 3000 | 0.709 | -178.8 | 2.114 | 41.4 | 0.070 | 25.4 | 0.342 | -145.4 | 1.358 | 11.3 |
| 3200 | 0.698 | 177.4 | 2.023 | 36.7 | 0.073 | 24.8 | 0.346 | -146.1 | 1.399 | 10.7 |
| 3400 | 0.689 | 173.5 | 1.939 | 31.8 | 0.076 | 23.9 | 0.350 | -147.5 | 1.426 | 10.2 |
| 3600 | 0.678 | 169.7 | 1.867 | 27.2 | 0.080 | 22.8 | 0.351 | -148.9 | 1.451 | 9.7 |
| 3800 | 0.669 | 166.0 | 1.807 | 22.6 | 0.084 | 22.0 | 0.351 | -149.5 | 1.462 | 9.3 |
| 4000 | 0.660 | 162.4 | 1.756 | 18.1 | 0.089 | 21.6 | 0.346 | -150.5 | 1.458 | 8.9 |
| 4200 | 0.651 | 158.4 | 1.715 | 13.4 | 0.095 | 20.2 | 0.340 | -152.0 | 1.451 | 8.6 |
| 4400 | 0.641 | 154.1 | 1.677 | 8.5 | 0.101 | 18.6 | 0.334 | -154.4 | 1.442 | 8.3 |
| 4600 | 0.630 | 149.4 | 1.640 | 3.6 | 0.108 | 16.8 | 0.332 | -156.5 | 1.413 | 8.0 |
| 4800 | 0.619 | 144.6 | 1.604 | -1.2 | 0.114 | 15.0 | 0.328 | -158.4 | 1.410 | 7.7 |
| 5000 | 0.608 | 140.0 | 1.572 | -6.1 | 0.122 | 12.9 | 0.323 | -160.6 | 1.398 | 7.4 |
| 5200 | 0.599 | 135.2 | 1.543 | -11.1 | 0.129 | 10.5 | 0.318 | -163.5 | 1.378 | 7.1 |
| 5400 | 0.589 | 130.4 | 1.512 | -16.2 | 0.137 | 7.9 | 0.316 | -167.3 | 1.356 | 6.9 |
| 5600 | 0.577 | 125.2 | 1.486 | -21.3 | 0.146 | 5.1 | 0.316 | -170.5 | 1.337 | 6.6 |
| 5800 | 0.563 | 120.3 | 1.466 | -26.4 | 0.156 | 2.2 | 0.314 | -172.9 | 1.305 | 6.4 |
| 6000 | 0.549 | 115.0 | 1.453 | -31.6 | 0.165 | -0.9 | 0.307 | -175.5 | 1.287 | 6.2 |
| 6200 | 0.533 | 108.4 | 1.440 | -37.1 | 0.177 | -4.6 | 0.300 | -178.9 | 1.263 | 6.0 |
| 6400 | 0.518 | 101.4 | 1.427 | -42.9 | 0.189 | -8.3 | 0.293 | 177.0 | 1.243 | 5.8 |
| 6600 | 0.505 | 93.1 | 1.417 | -48.9 | 0.201 | -12.7 | 0.286 | 173.4 | 1.222 | 5.6 |
| 6800 | 0.497 | 84.1 | 1.403 | -55.3 | 0.213 | -17.2 | 0.269 | 169.2 | 1.206 | 5.4 |
| 7000 | 0.501 | 74.8 | 1.386 | -61.9 | 0.226 | -22.5 | 0.245 | 162.5 | 1.185 | 5.3 |

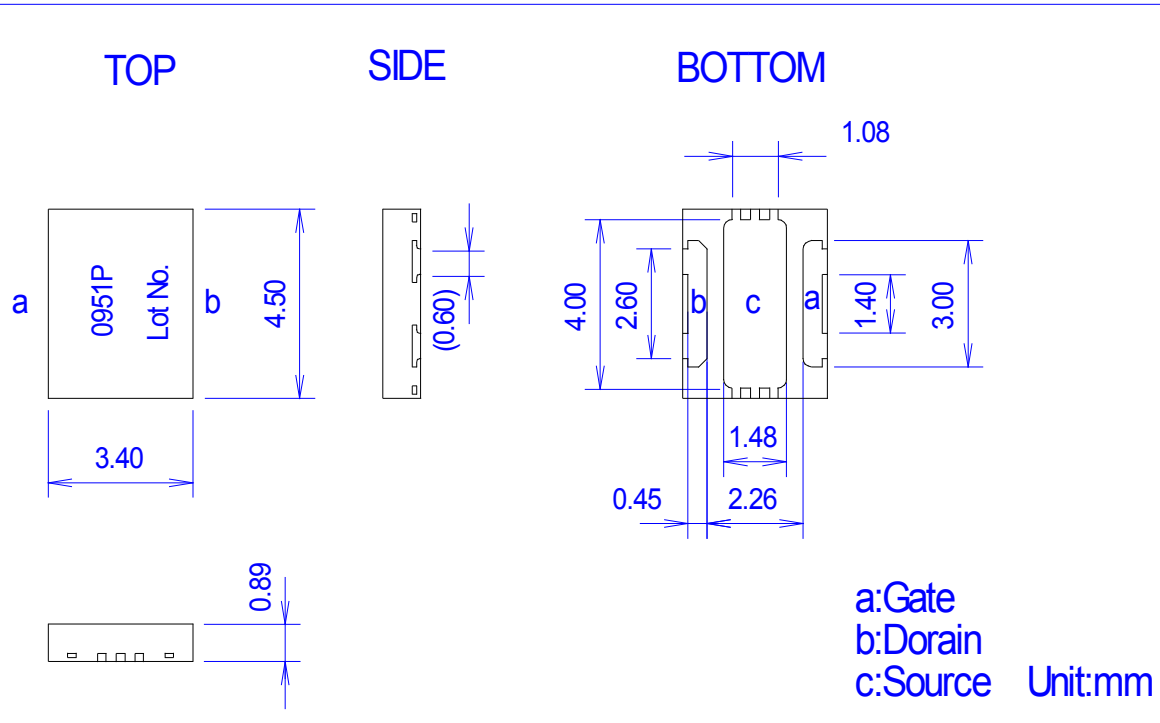
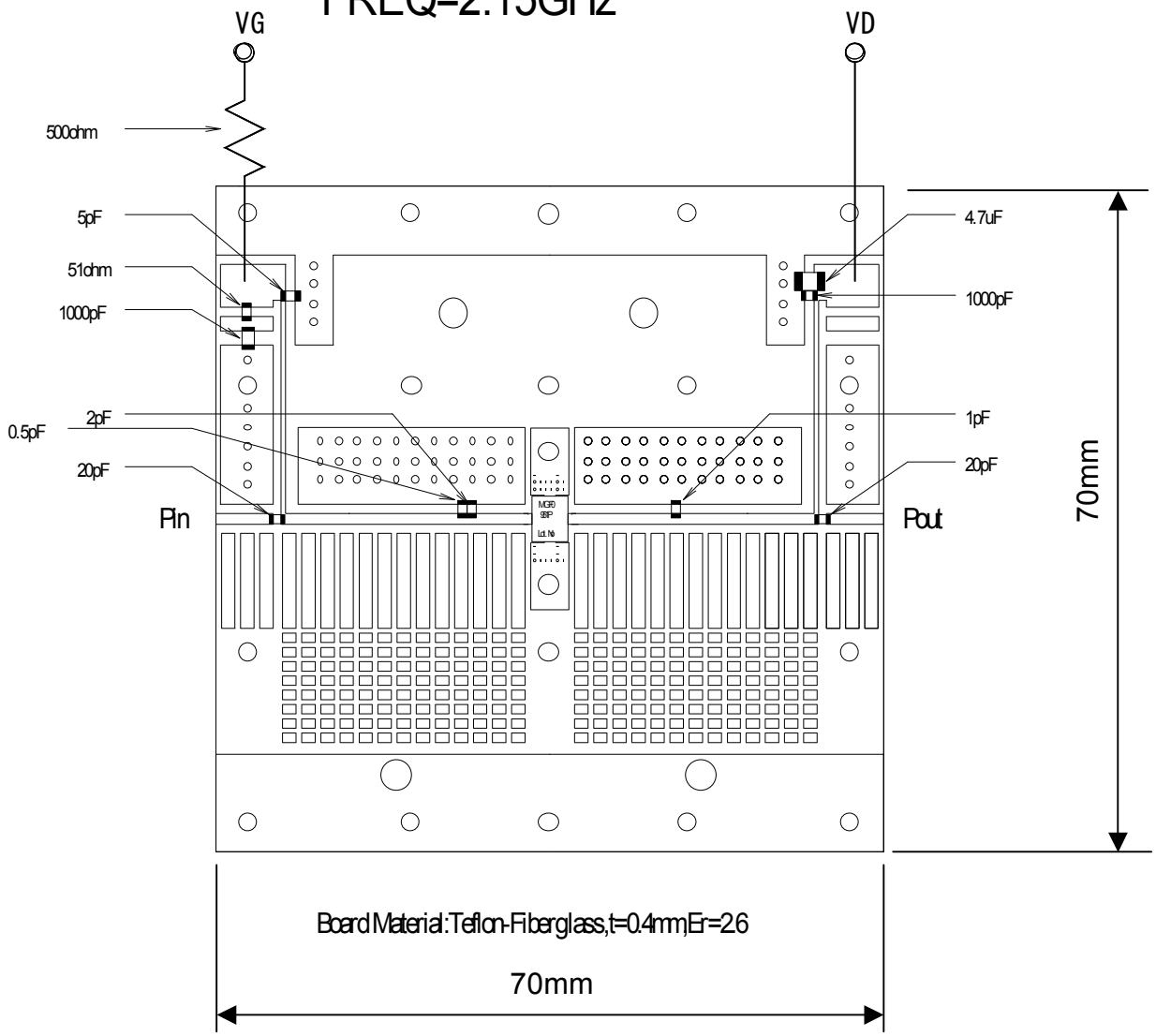


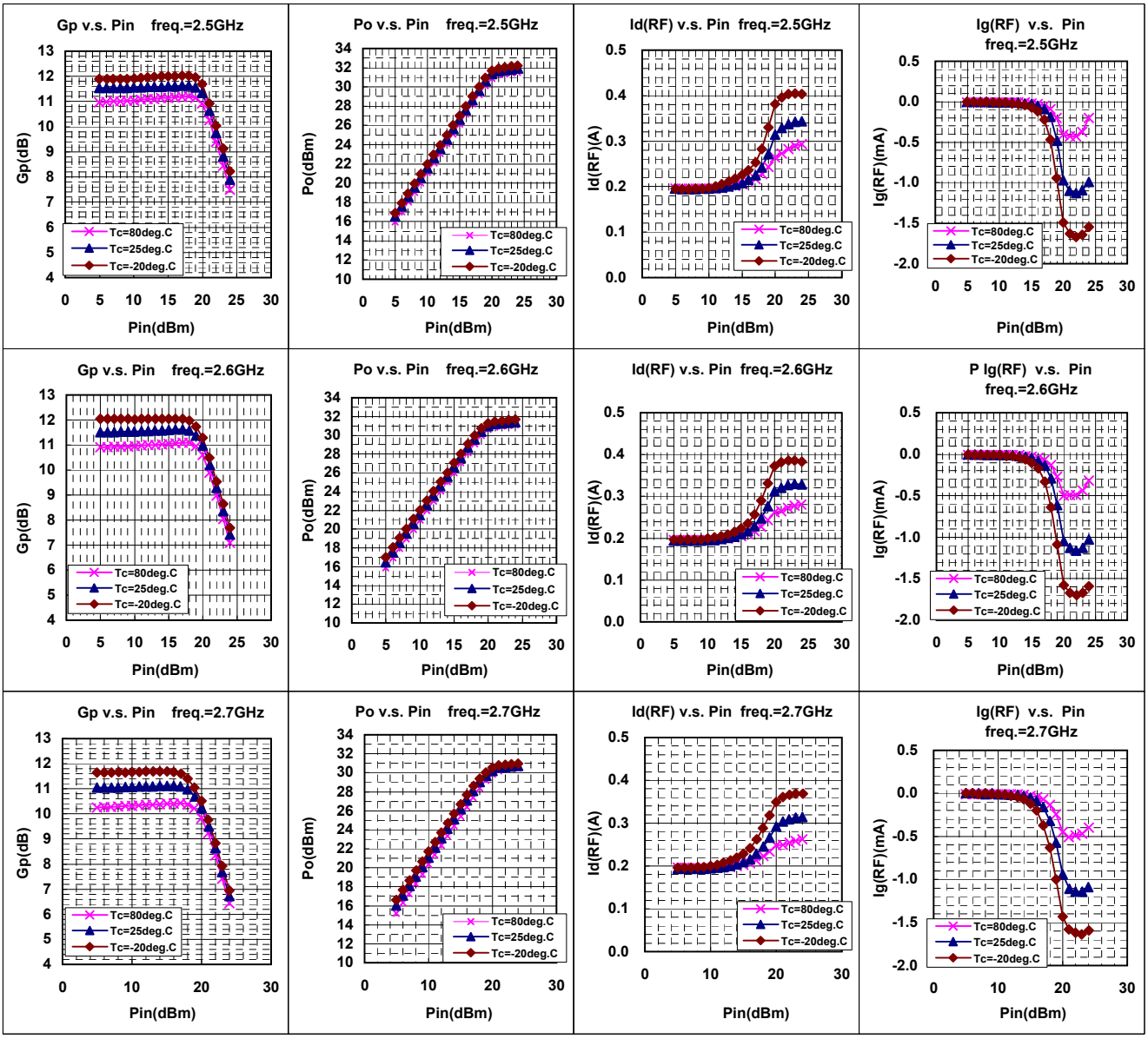

Fig1.OUTLINE DRAWING

# MGF0951P TESTFIXTURE
# FREQ=2.15GHz

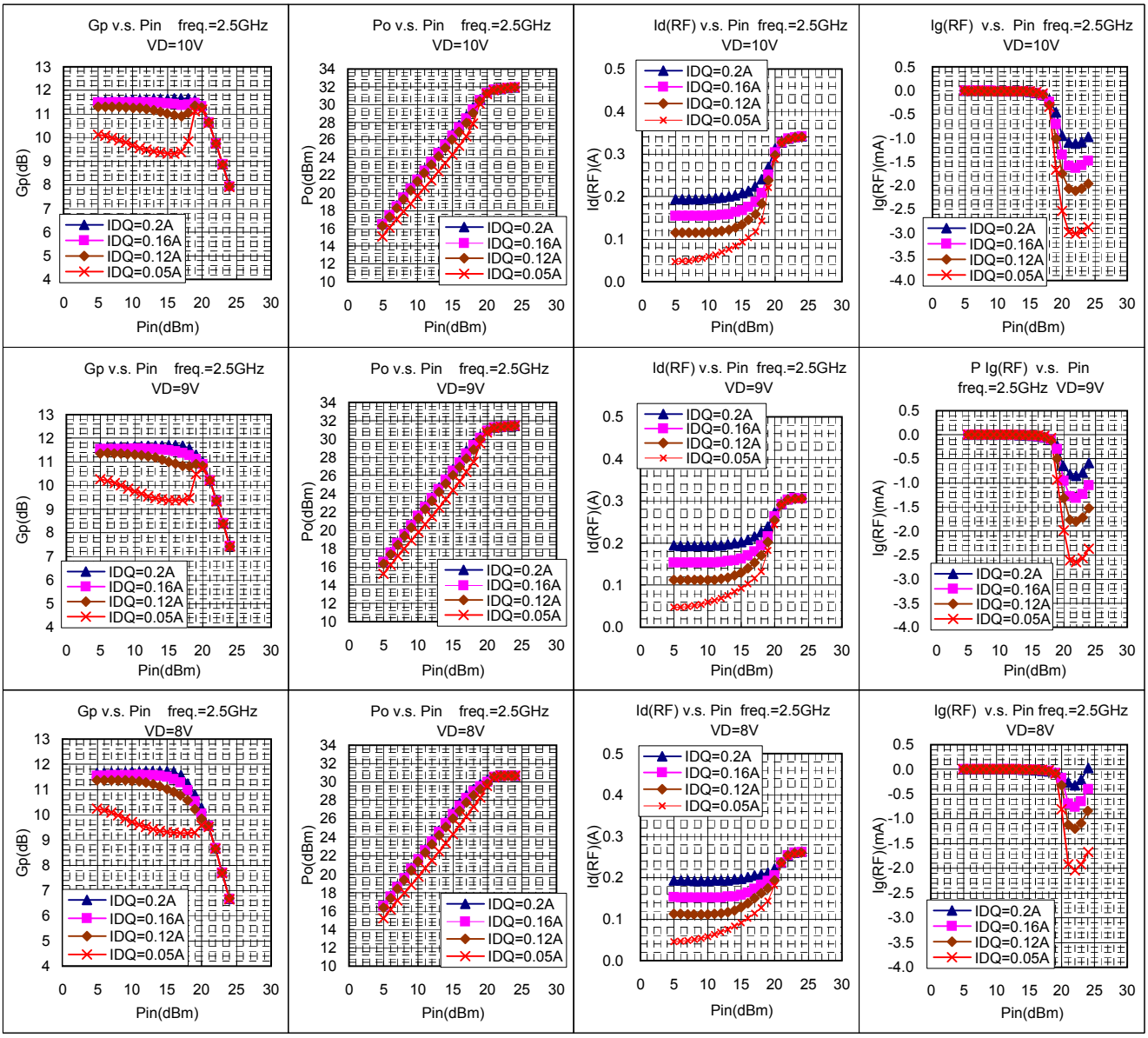


# MGF0951P RF TEST DATA(CW) VD=10V,Idq=0.2A

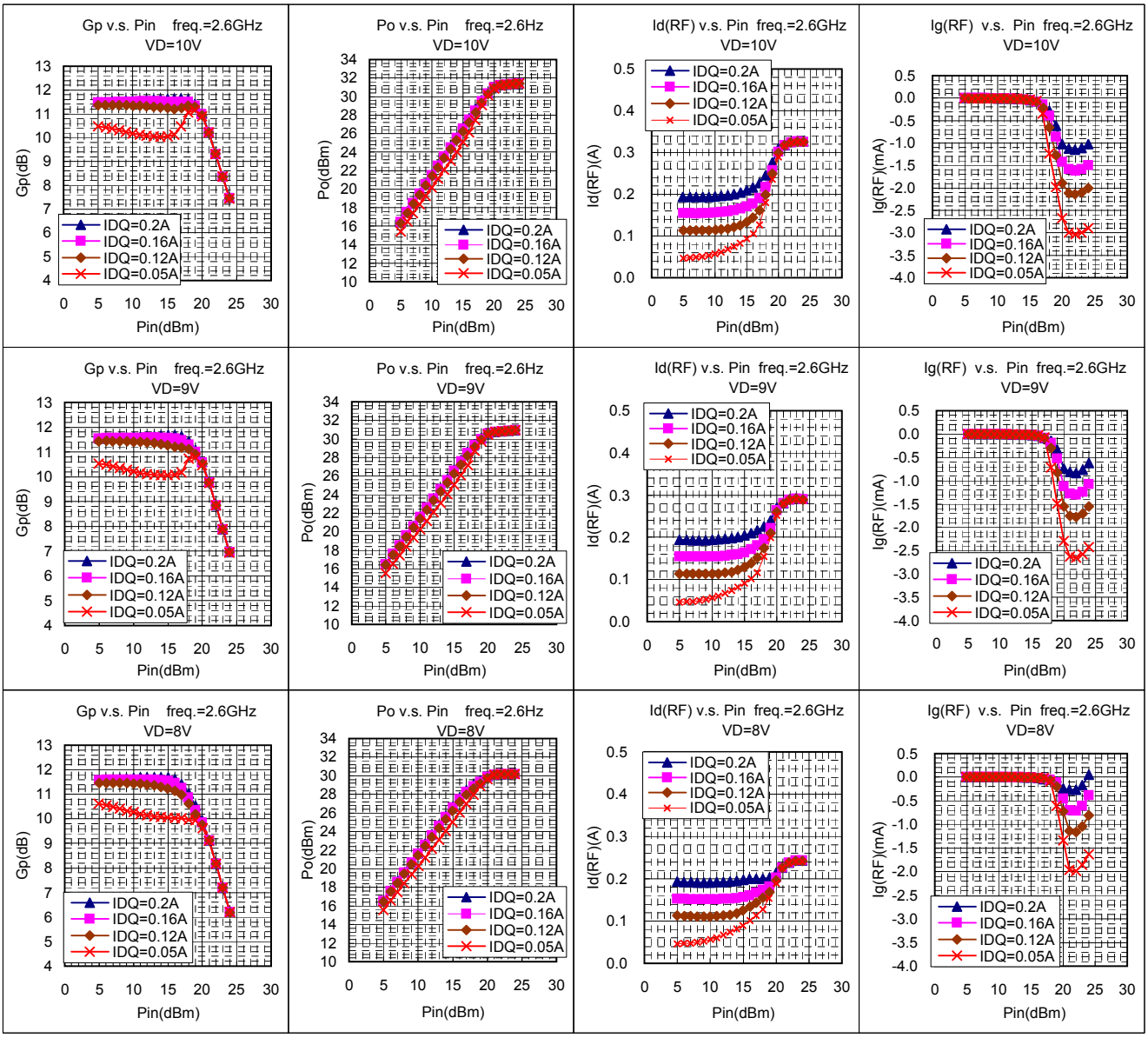
## Gp,Po,Id(RF),Ig(RF) v.s. Pin



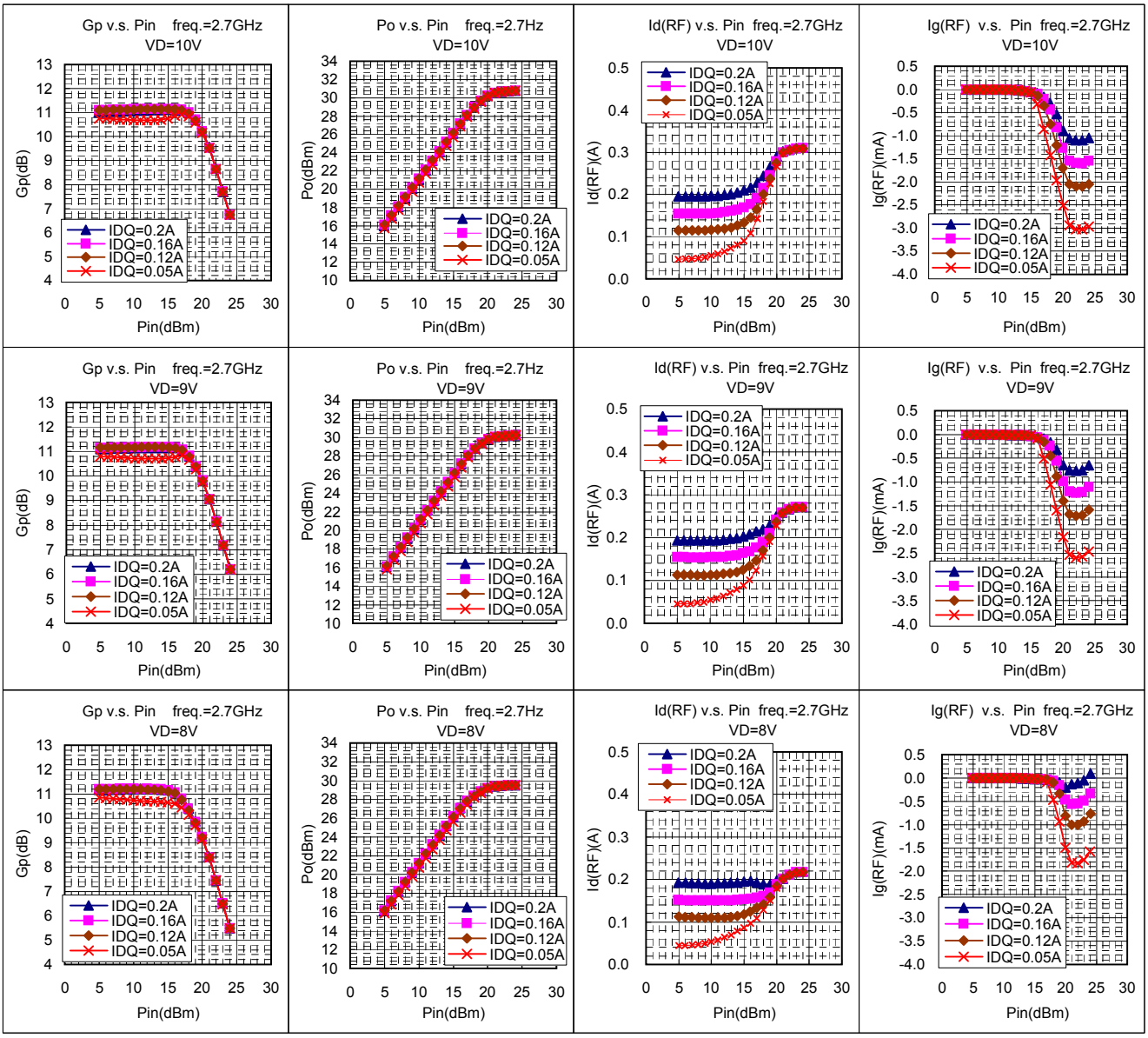
# MGF0951P RF TEST DATA(CW)
# Gp,Po,Id(RF),Ig(RF) v.s. Pin



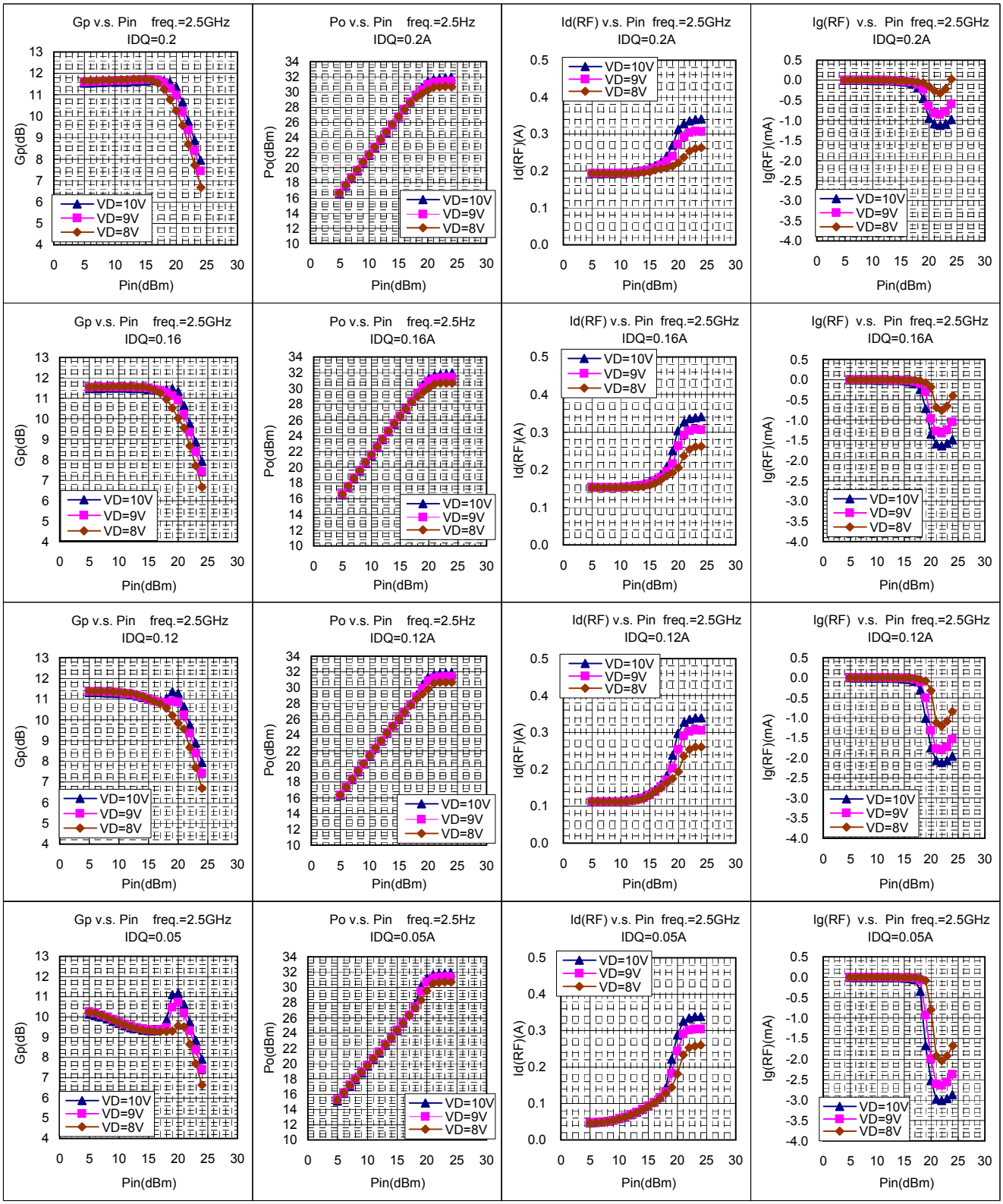
# MGF0951P RF TEST DATA(CW)
## Gp,Po,Id(RF),Ig(RF) v.s. Pin



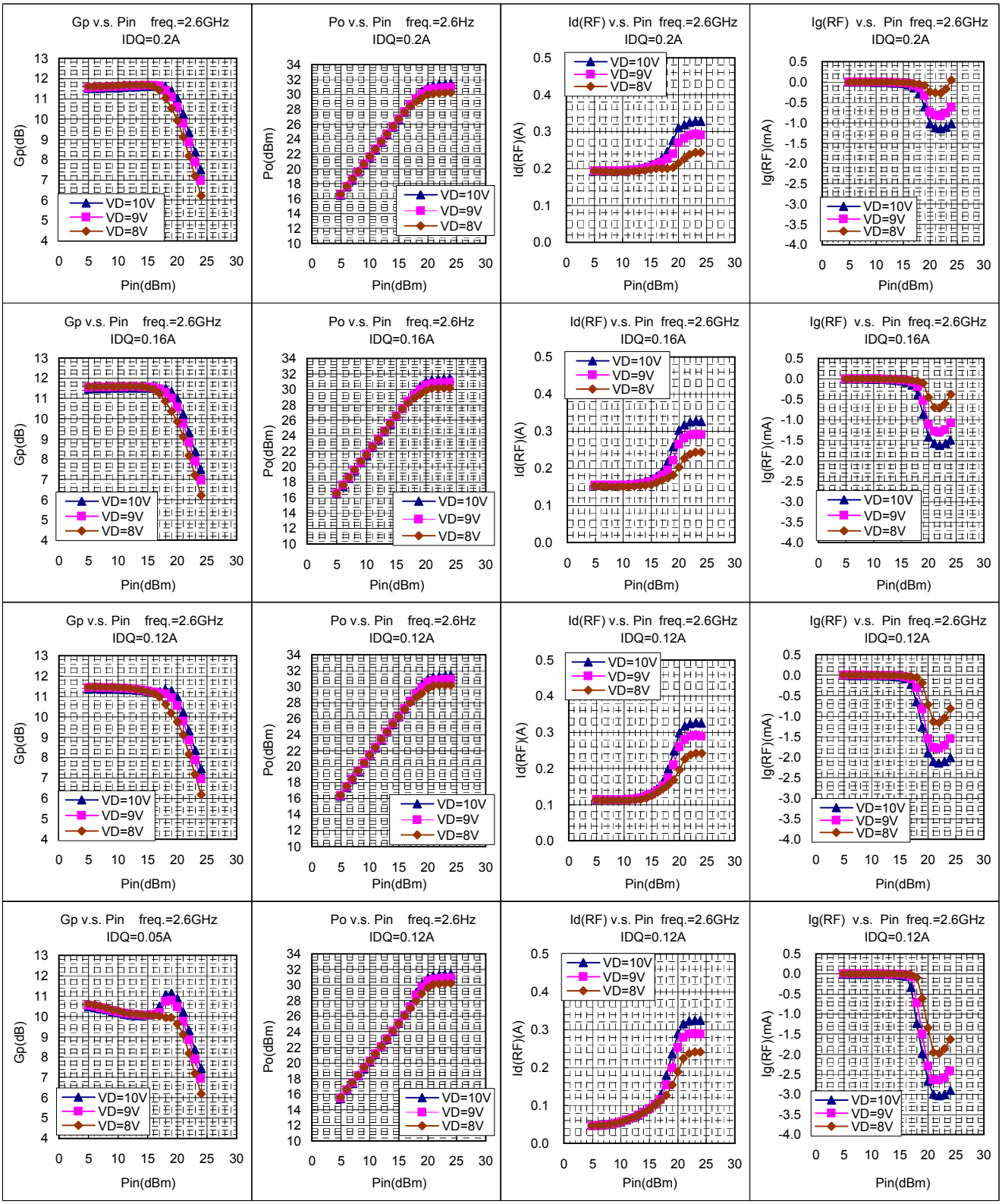
# MGF0951P RF TEST DATA(CW)
# Gp,Po,Id(RF),Ig(RF) v.s. Pin



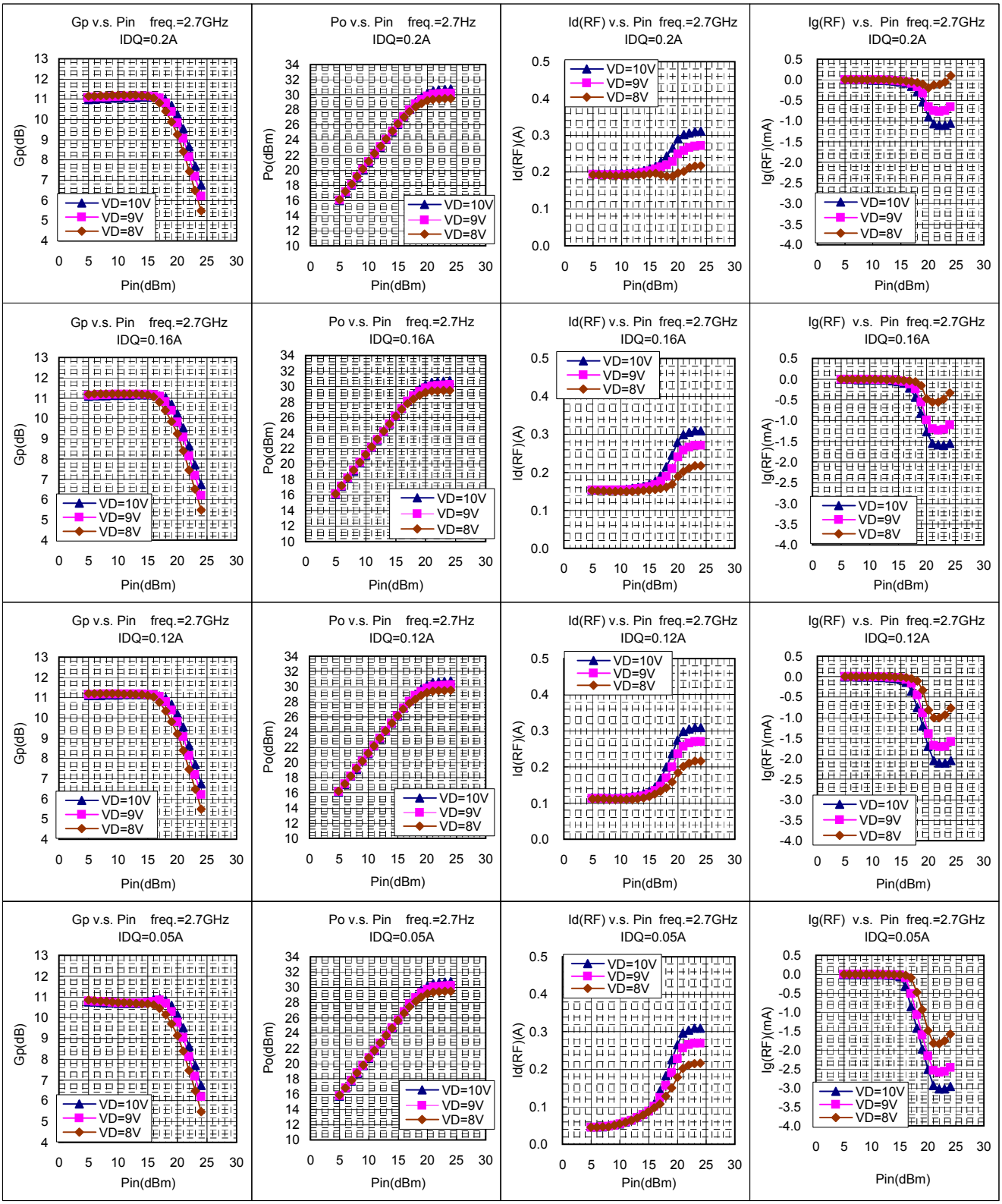
# MGF0951P RF TEST DATA(CW)
# Gp,Po,Id(RF),Ig(RF) v.s. Pin



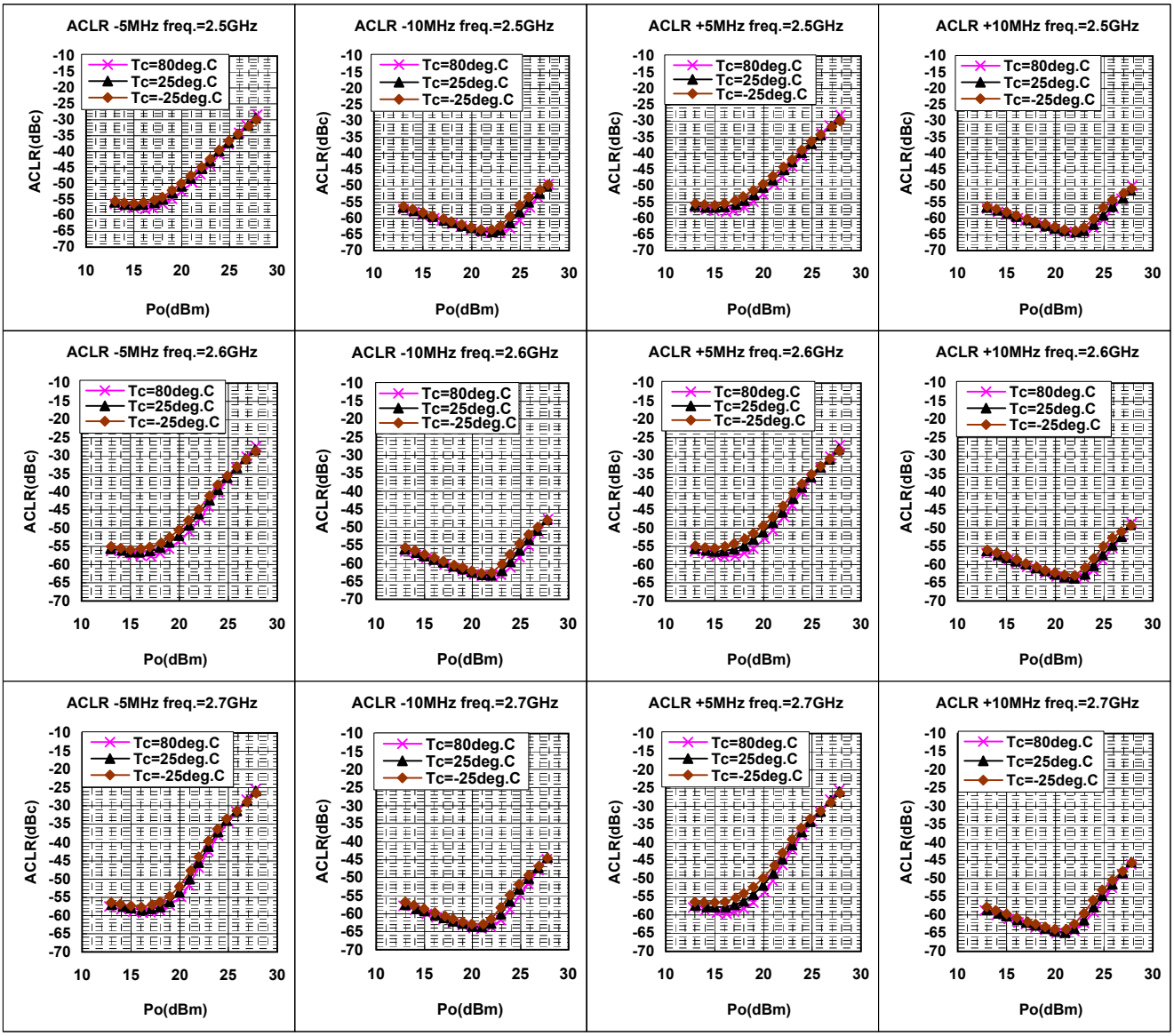
# MGF0951P RF TEST DATA(CW)
# Gp,Po,Id(RF),Ig(RF) v.s. Pin



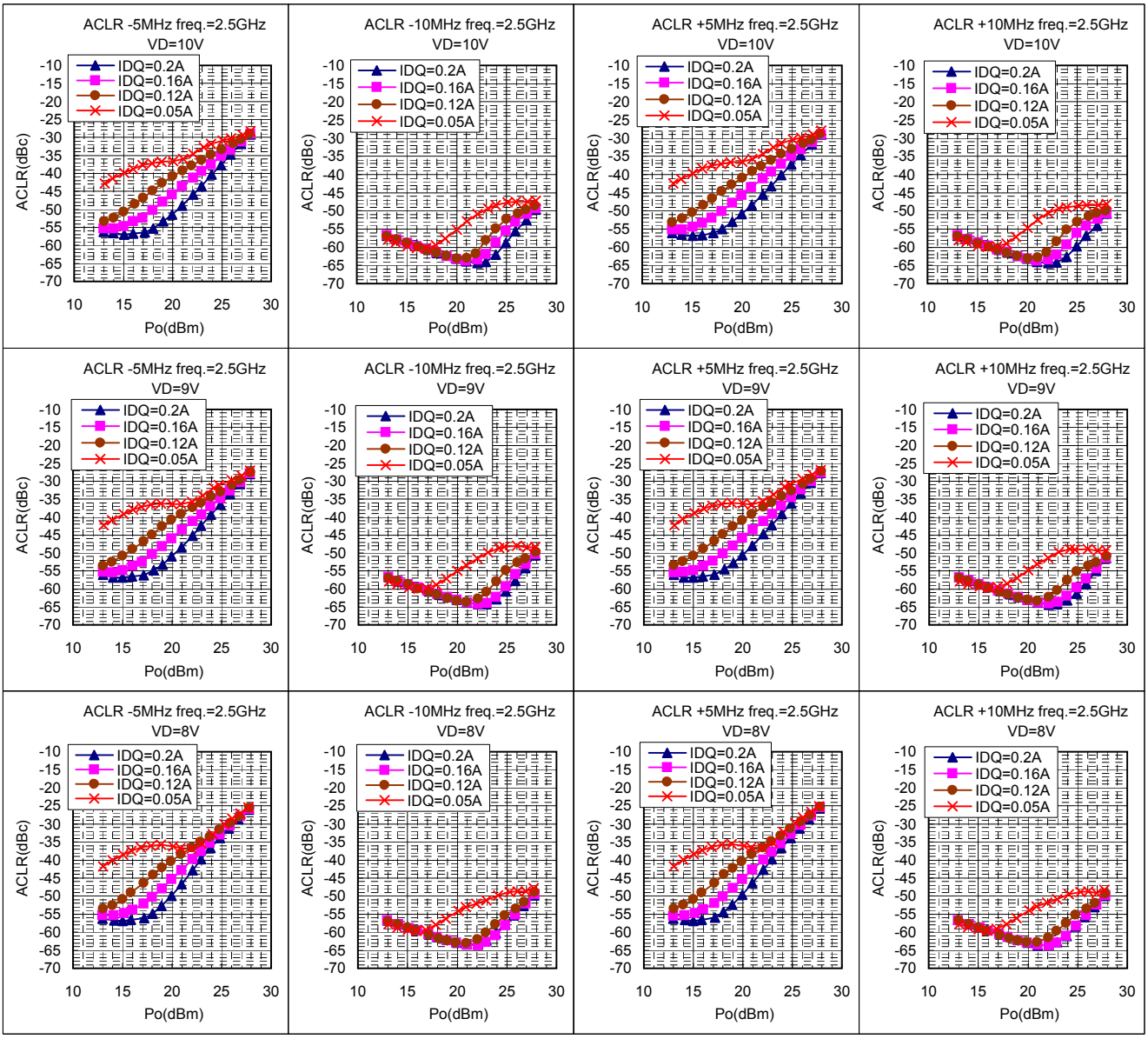
# MGF0951P RF TEST DATA(CW)
## Gp,Po,Id(RF),Ig(RF) v.s. Pin



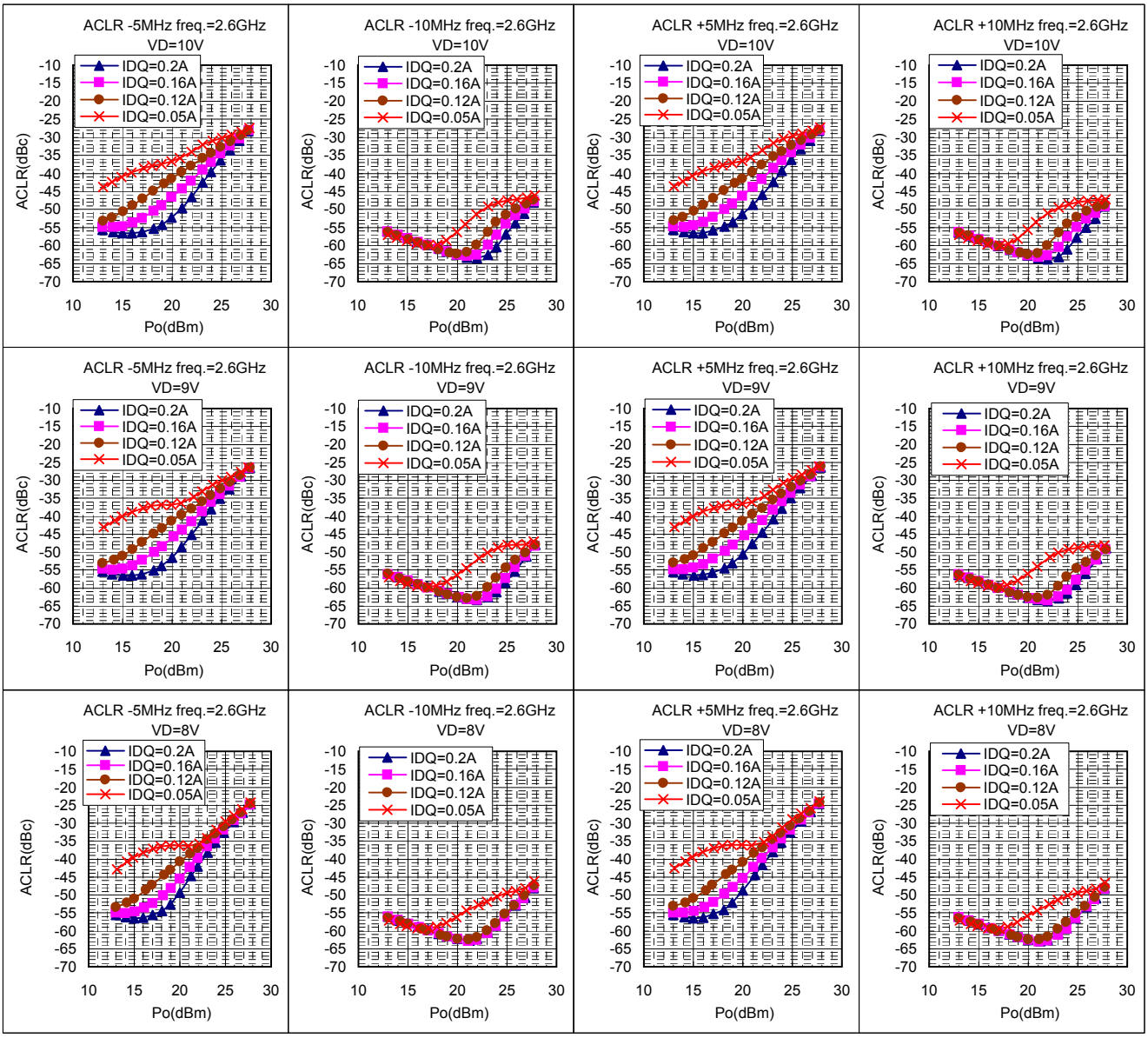
# MGF0951P RF TEST DATA(W-CDMA) VD=10V,Idq=0.2A
## ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



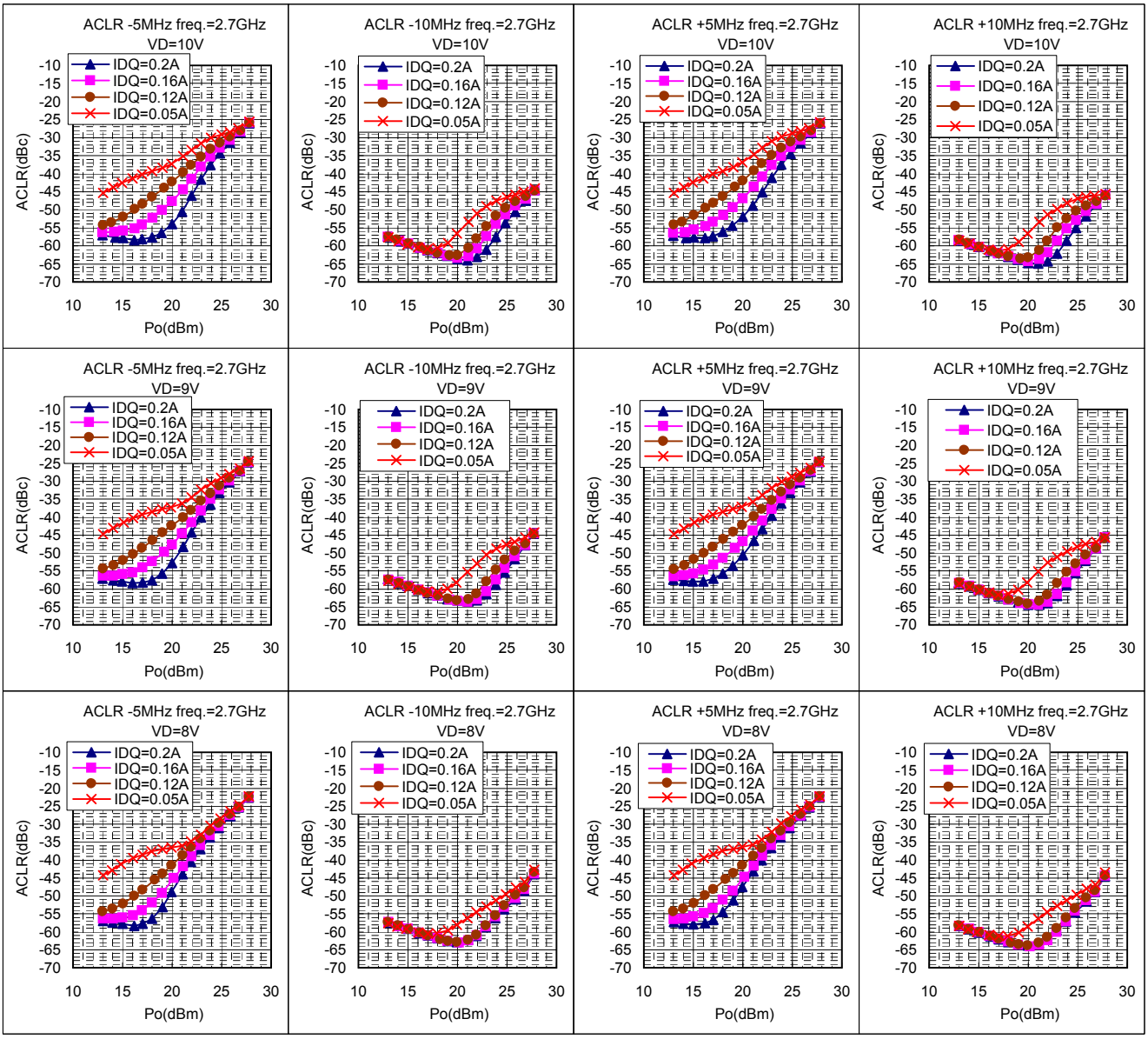
# MGF0951P RF TEST DATA(W-CDMA)
## ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



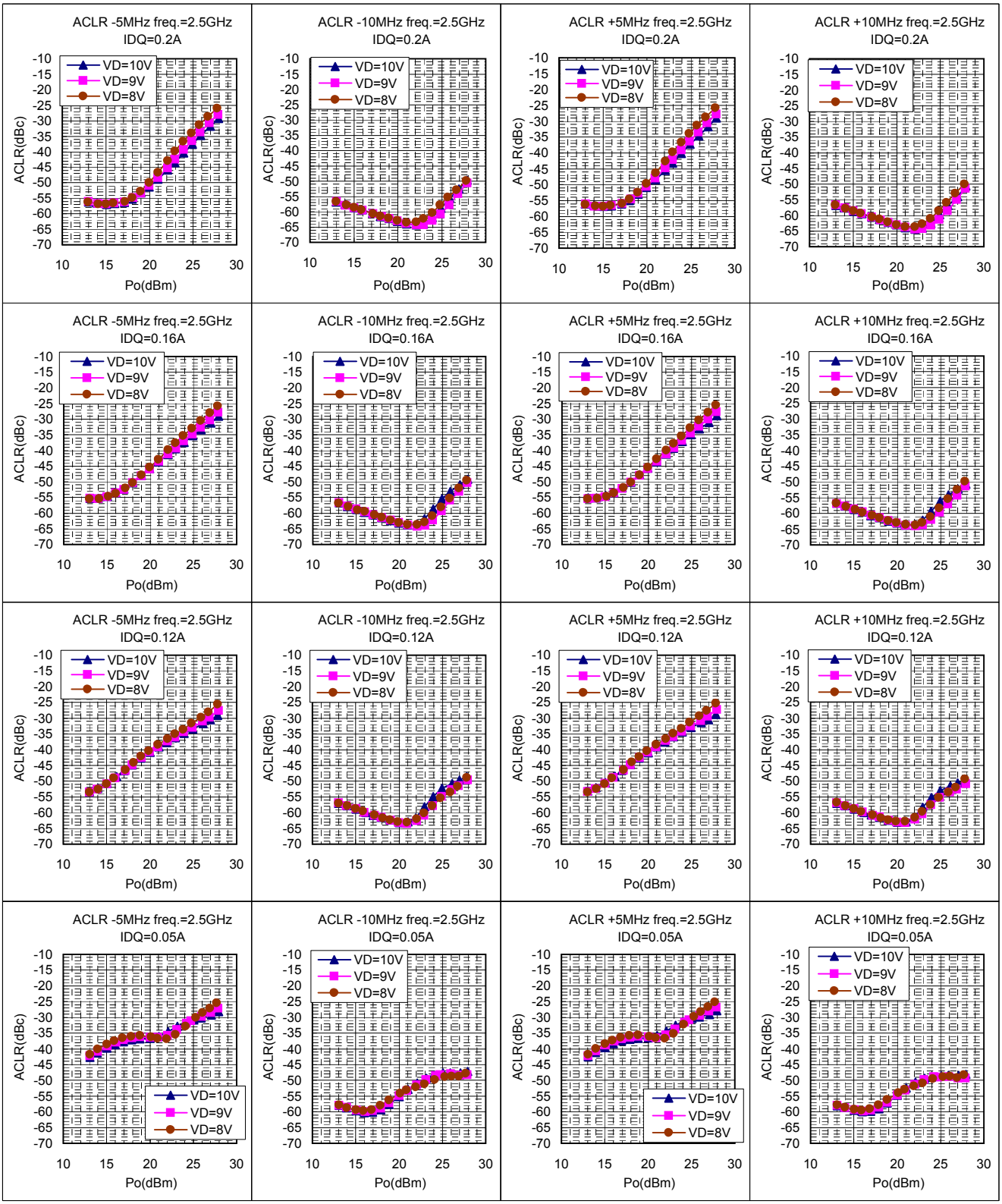
# MGF0951P RF TEST DATA(W-CDMA)
# ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



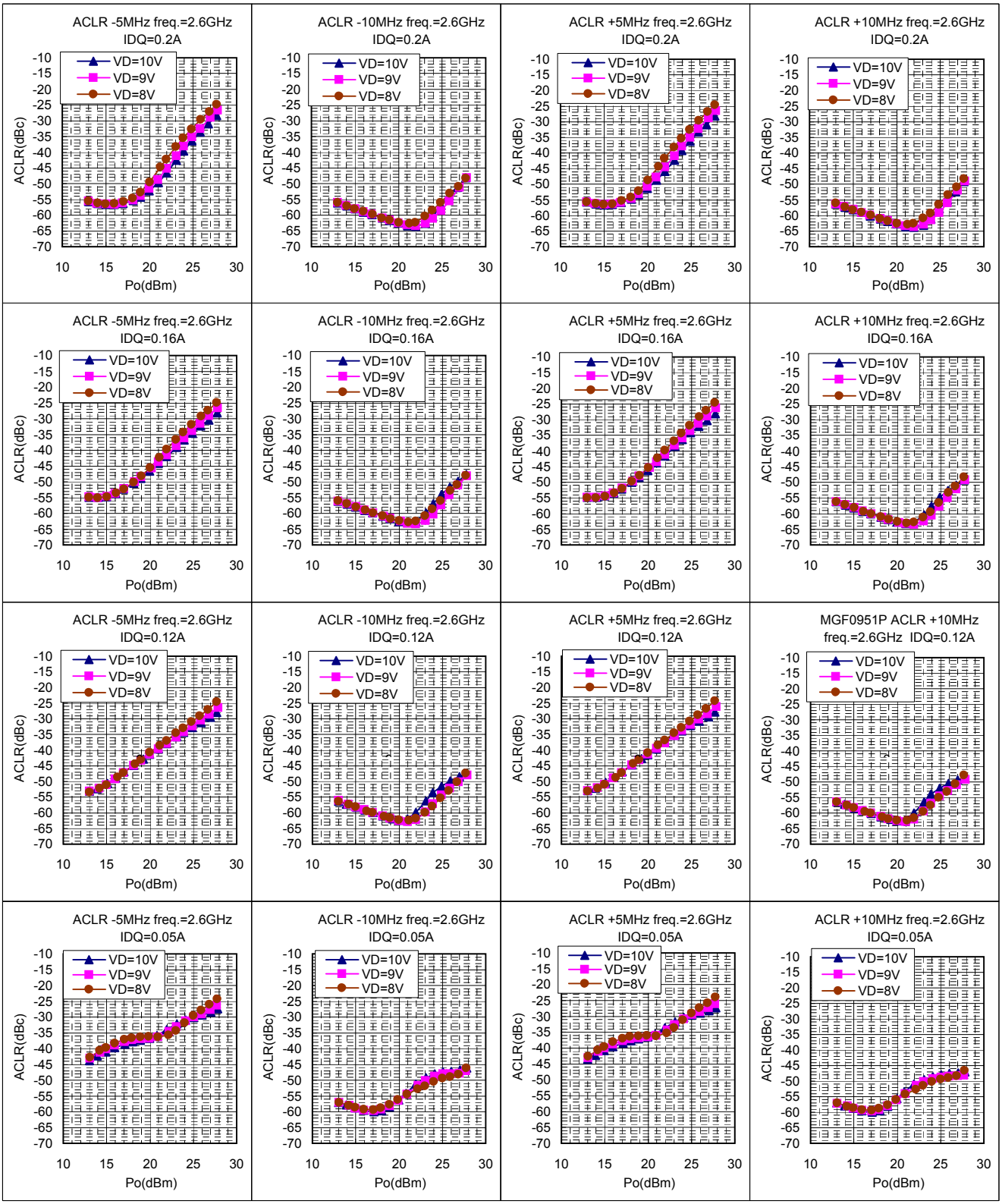
# MGF0951P RF TEST DATA(W-CDMA)
## ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal



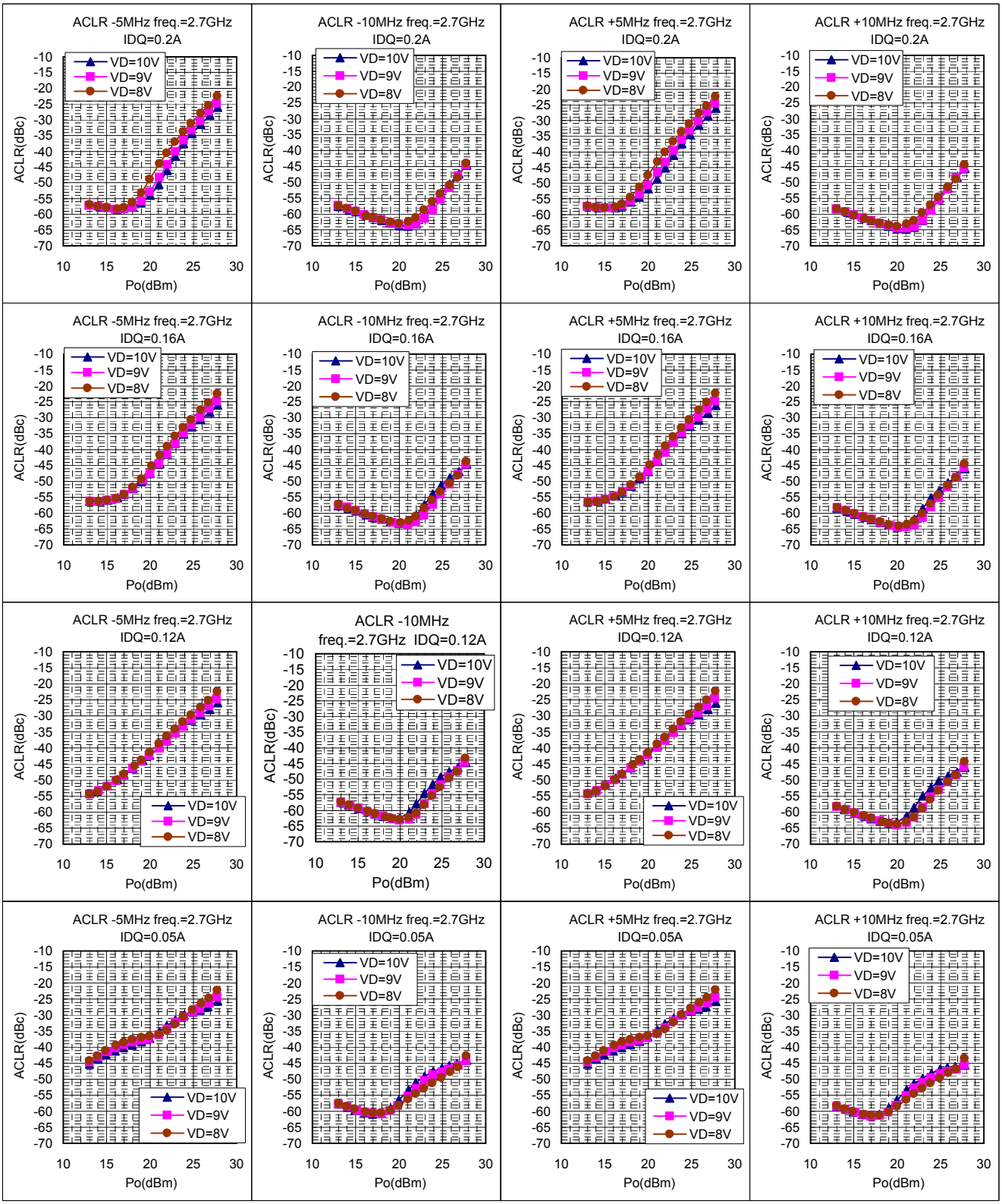
# MGF0951P RF TEST DATA(W-CDMA)
## ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal

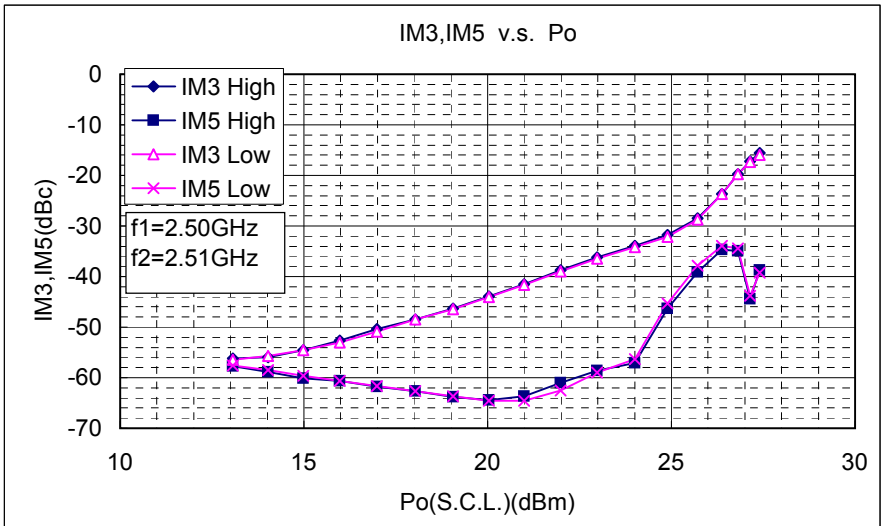


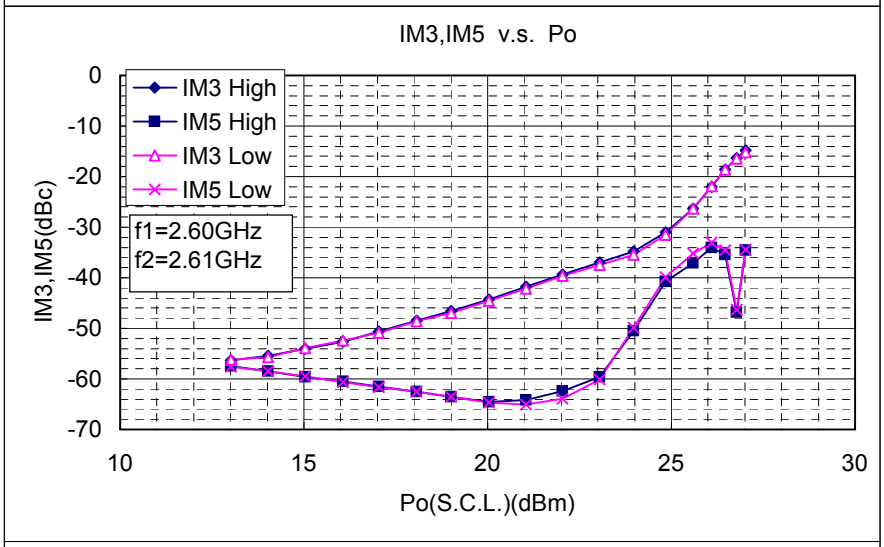
# MGF0951P RF TEST DATA(W-CDMA)
## ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal

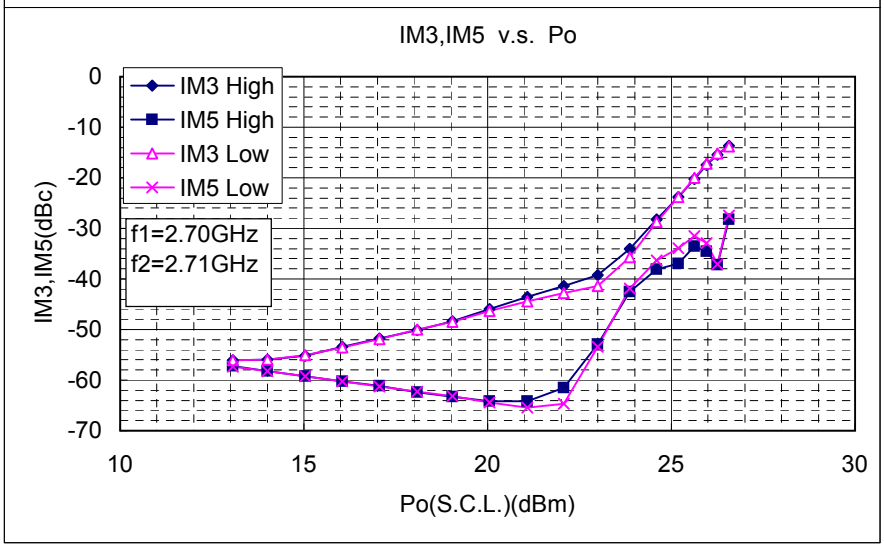


# MGF0951P RF TEST DATA(W-CDMA)
## ACLR v.s. Po 3GPP TEST MODEL1 64ch's Single Signal

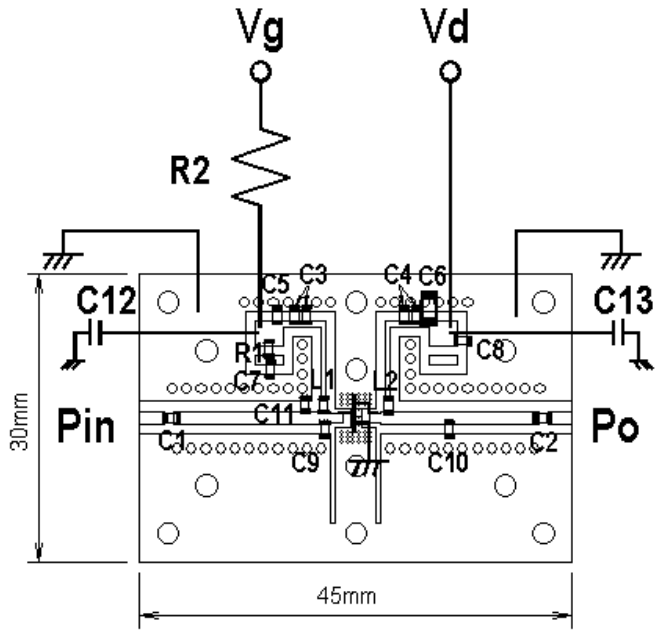



IM3,IM5 v.s. Po
IM3 High
IM5 High
IM3 Low
IM5 Low
f1=2.50GHz
f2=2.51GHz
IM3,IM5(dBc)
0
-10
-20
-30
-40
-50
-60
-70
10
15
20
25
30
Po(S.C.L.)(dBm)


IM3,IM5 v.s. Po
IM3 High
IM5 High
IM3 Low
IM5 Low
f1=2.60GHz
f2=2.61GHz
IM3,IM5(dBc)
0
-10
-20
-30
-40
-50
-60
-70
10
15
20
25
30
Po(S.C.L.)(dBm)


IM3,IM5 v.s. Po
IM3 High
IM5 High
IM3 Low
IM5 Low
f1=2.70GHz
f2=2.71GHz
IM3,IM5(dBc)
0
-10
-20
-30
-40
-50
-60
-70
10
15
20
25
30
Po(S.C.L.)(dBm)

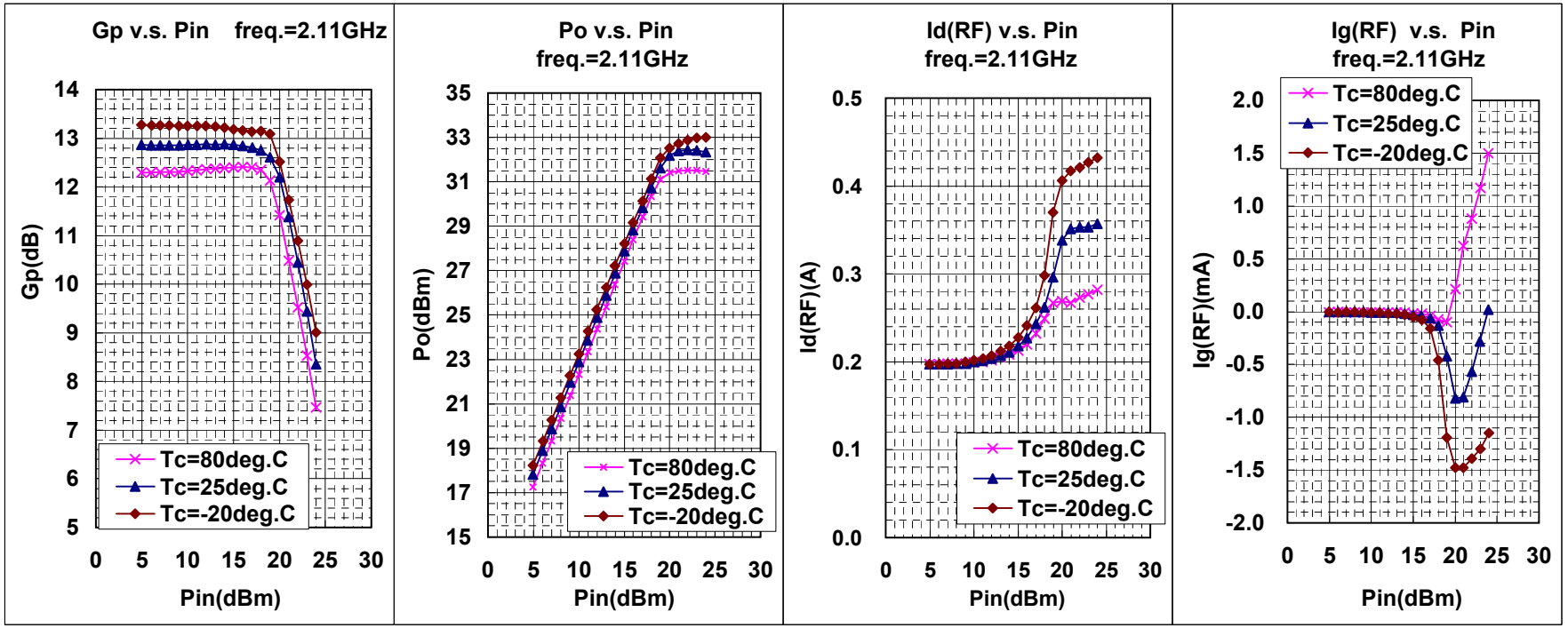
# MGF0951P TEST FIXTURE f=2.6GHz



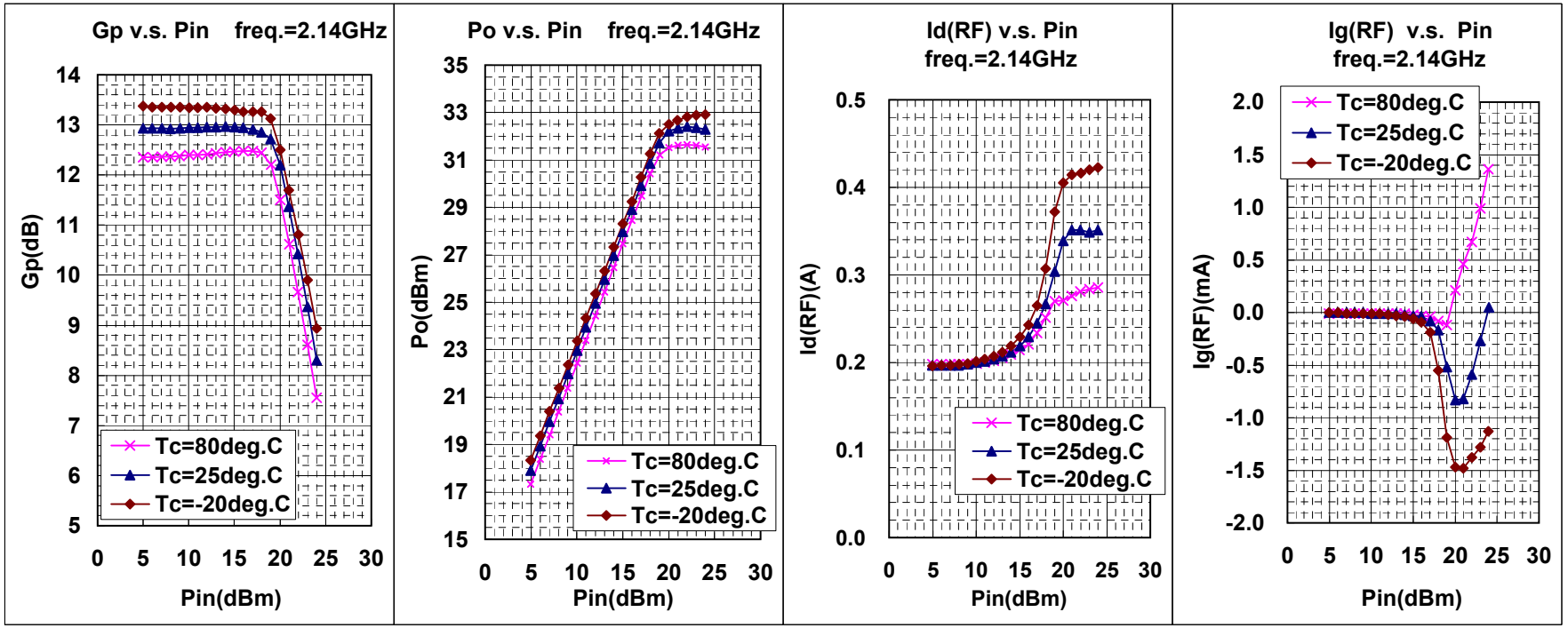

C1,C2,C3,C4=20pF
C5,C7,C8=1000pF
C9=2pF
C10=1pF
C12,C13=47uF
C11=0.5pF
C6=4.7uF
L1,L2=12nH
R1=51ohm
R2=500ohm

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

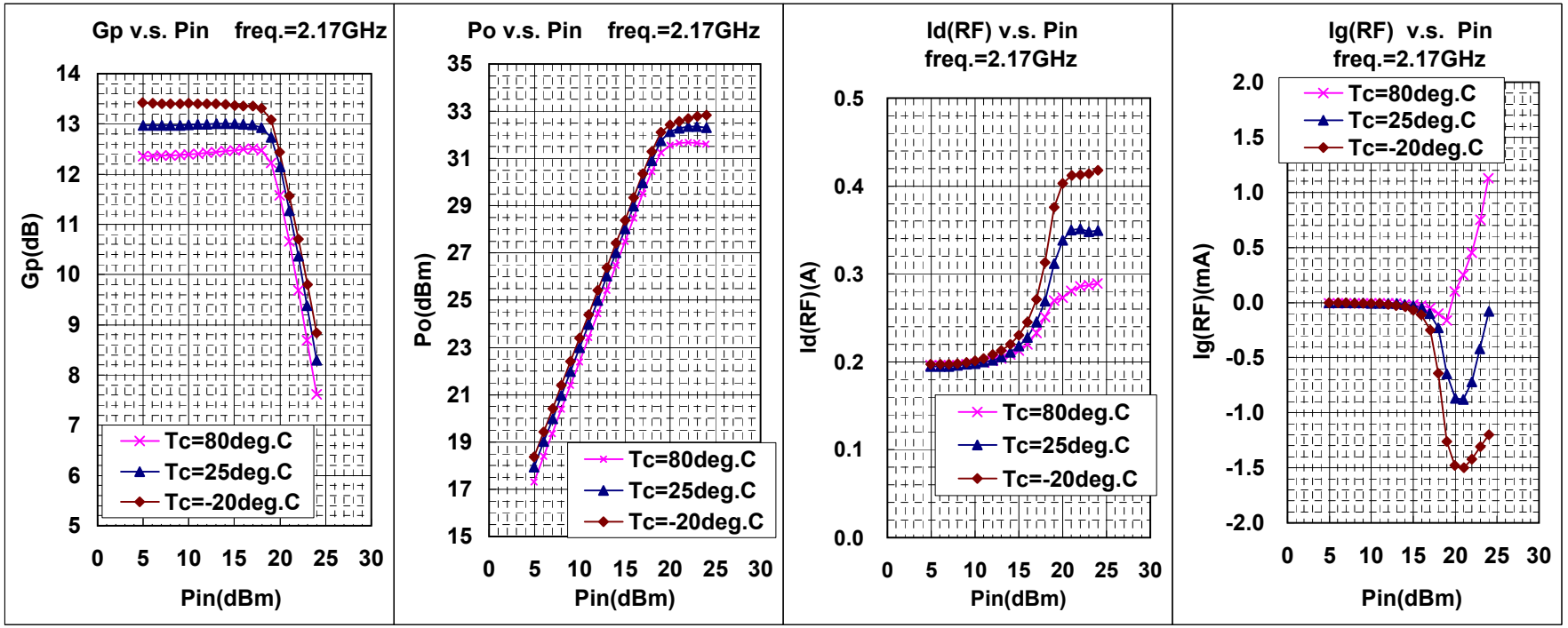
## MGF0951P RF TEST DATA(CW) VD=10V,IDQ=0.2A
## Gp,Po,Id(RF),Ig(RF) v.s. Pin



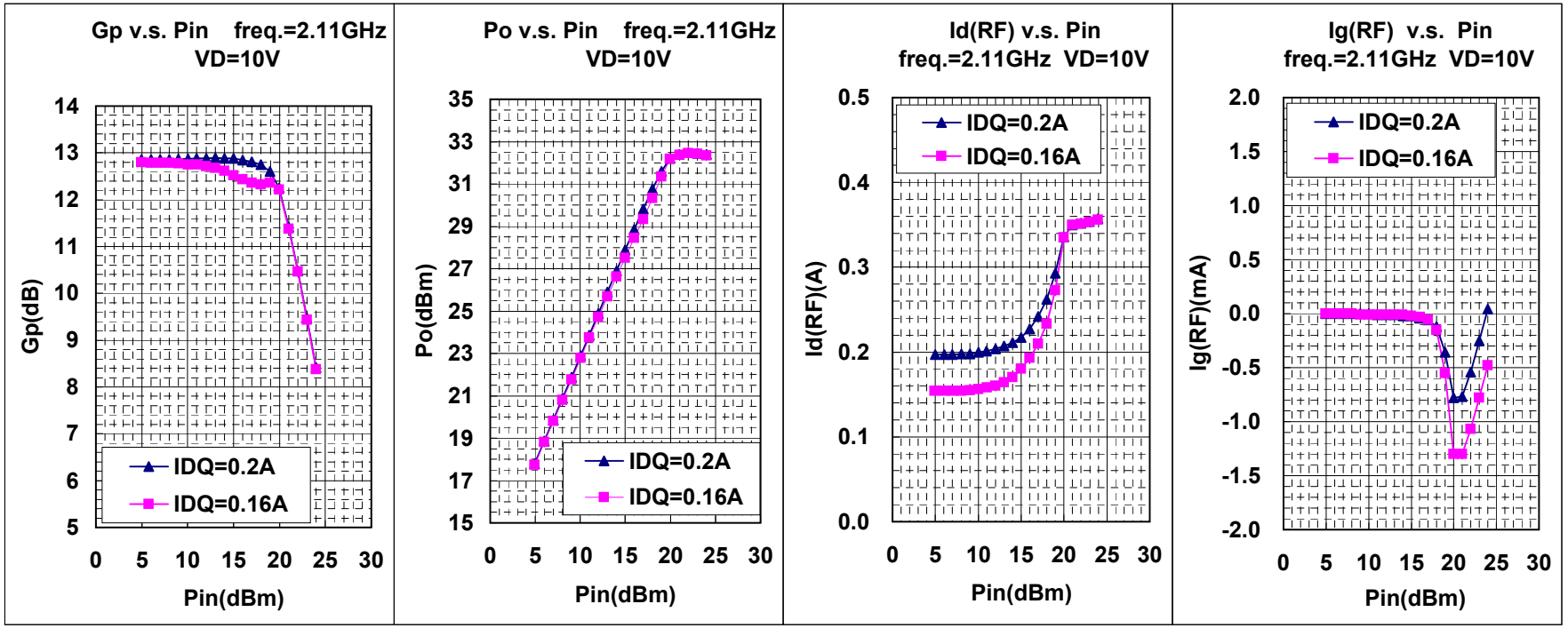
## Gp,Po,Id(RF),Ig(RF) v.s. Pin



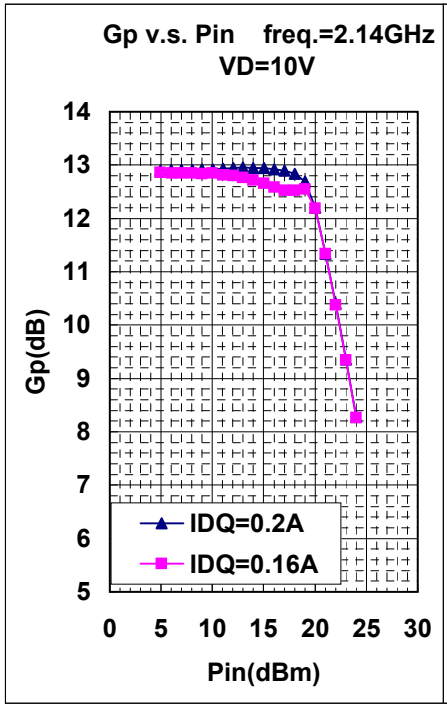
# MGF0951P RF TEST DATA(CW) VD=10V,IDQ=0.2A
## Gp,Po,Id(RF),Ig(RF) v.s. Pin

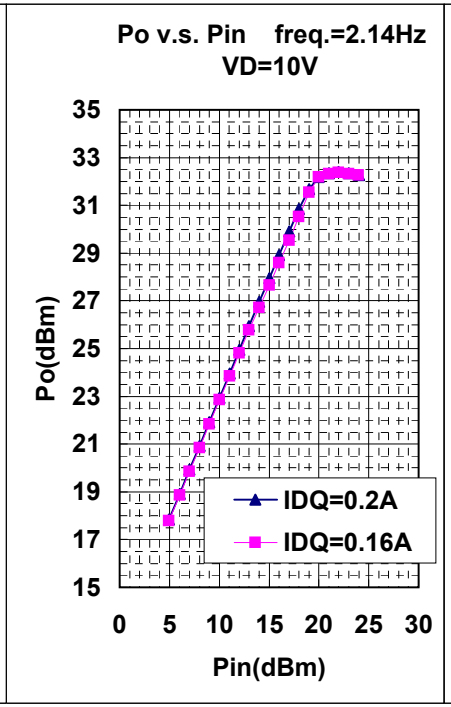


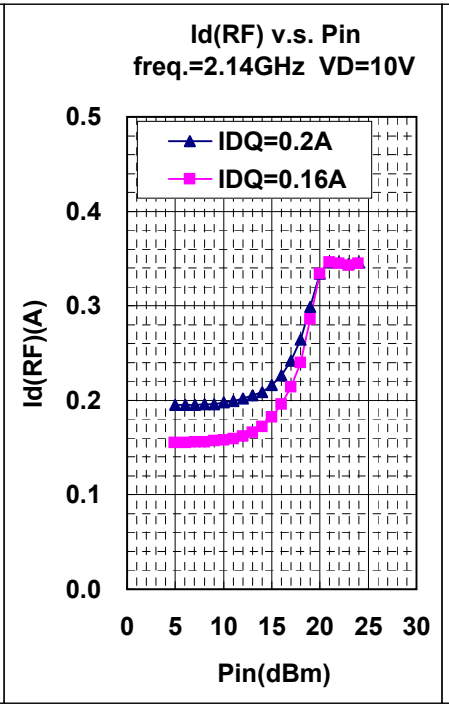
# MGF0951P RF TEST DATA(CW)
## Gp,Po,Id(RF),Ig(RF) v.s. Pin

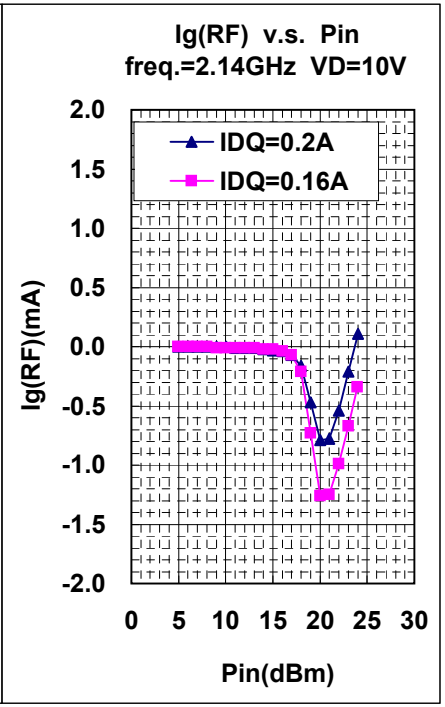


## Gp,Po,Id(RF),Ig(RF) v.s. Pin

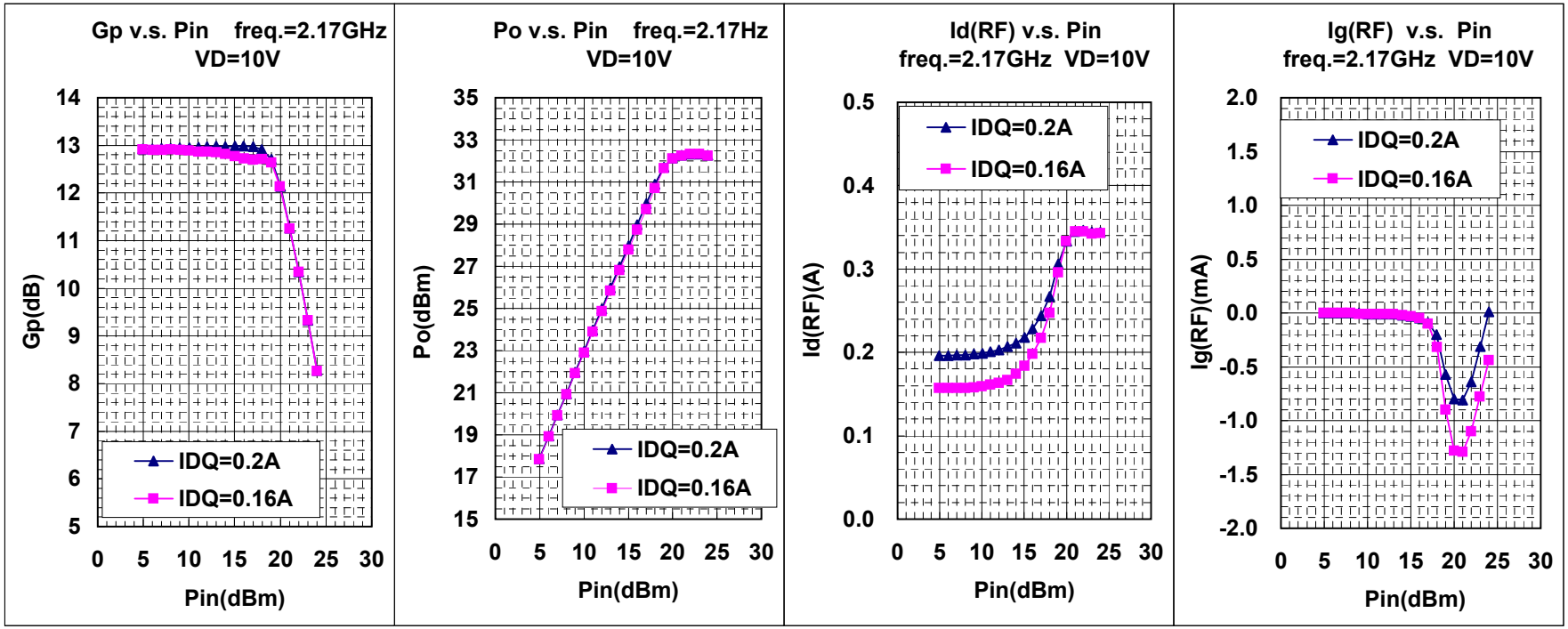


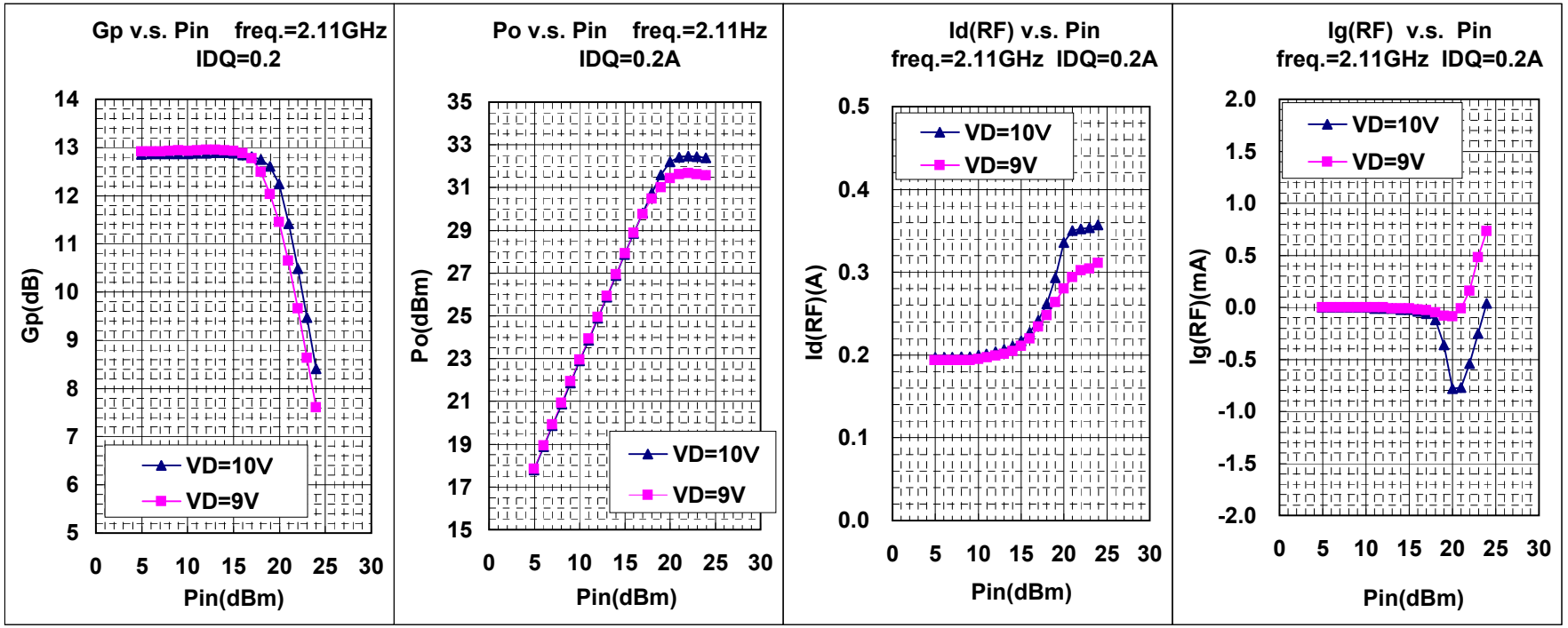



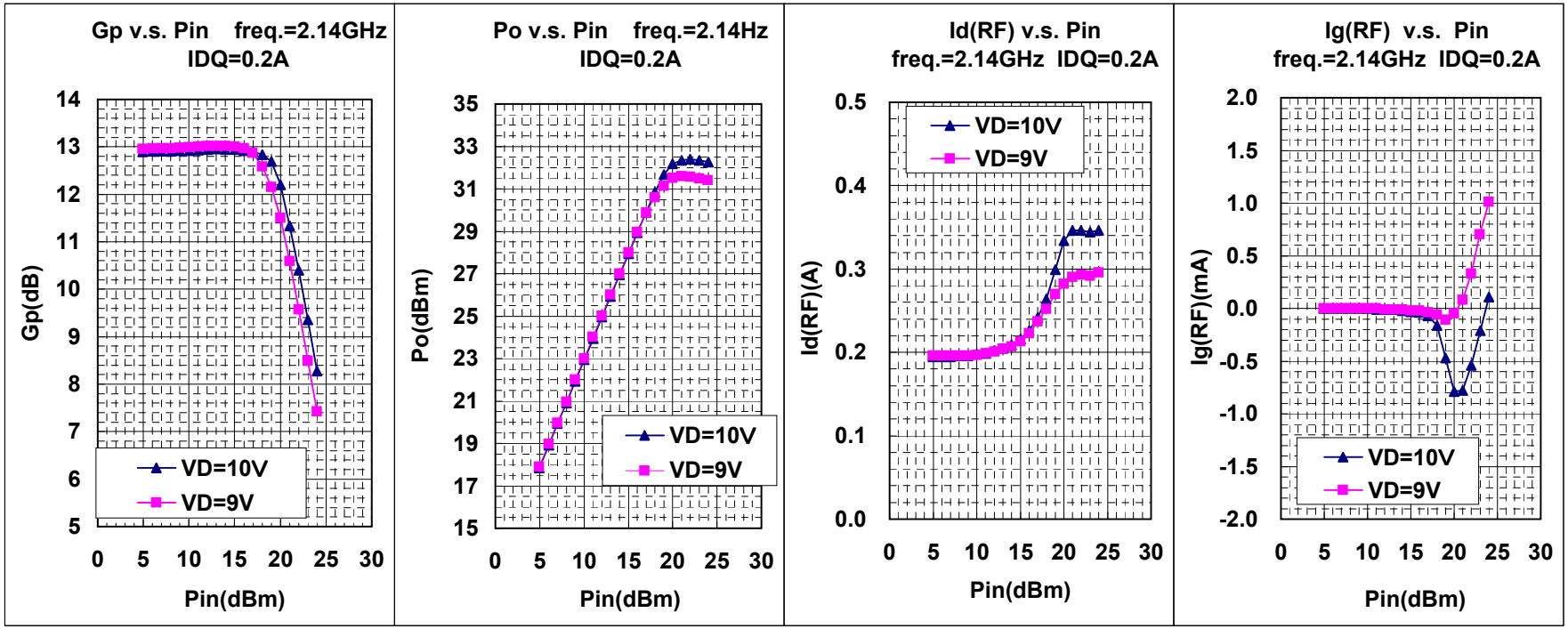
# MGF0951P RF TEST DATA(CW)
## Gp,Po,Id(RF),Ig(RF) v.s. Pin



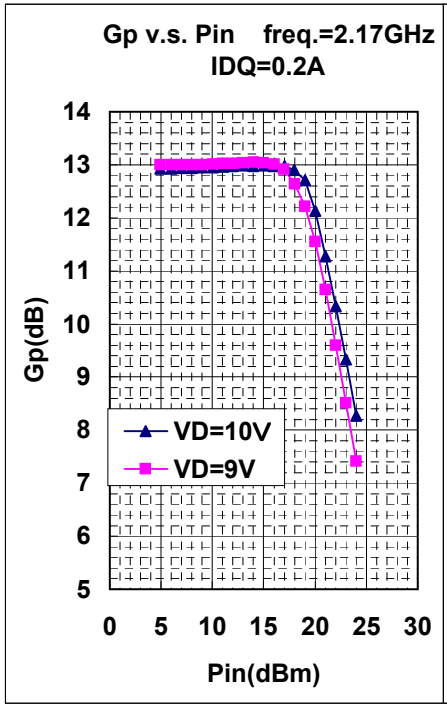
# MGF0951P RF TEST DATA(CW)
## Gp,Po,Id(RF),Ig(RF) v.s. Pin

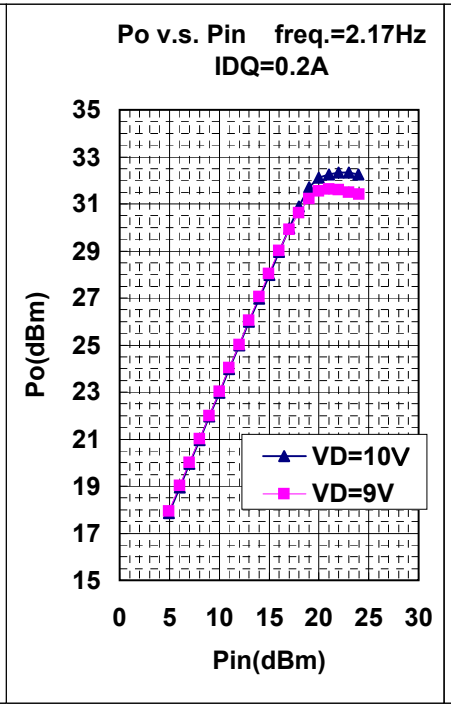


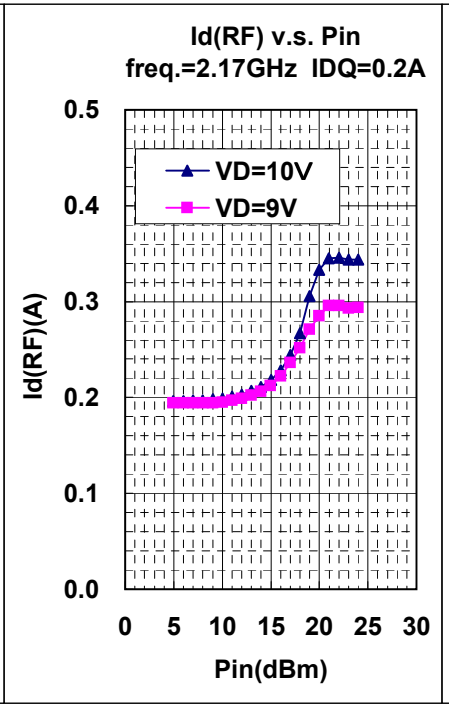
## Gp,Po,Id(RF),Ig(RF) v.s. Pin

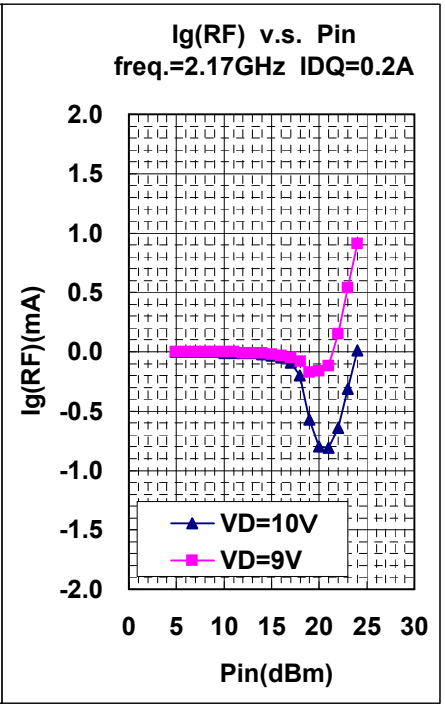


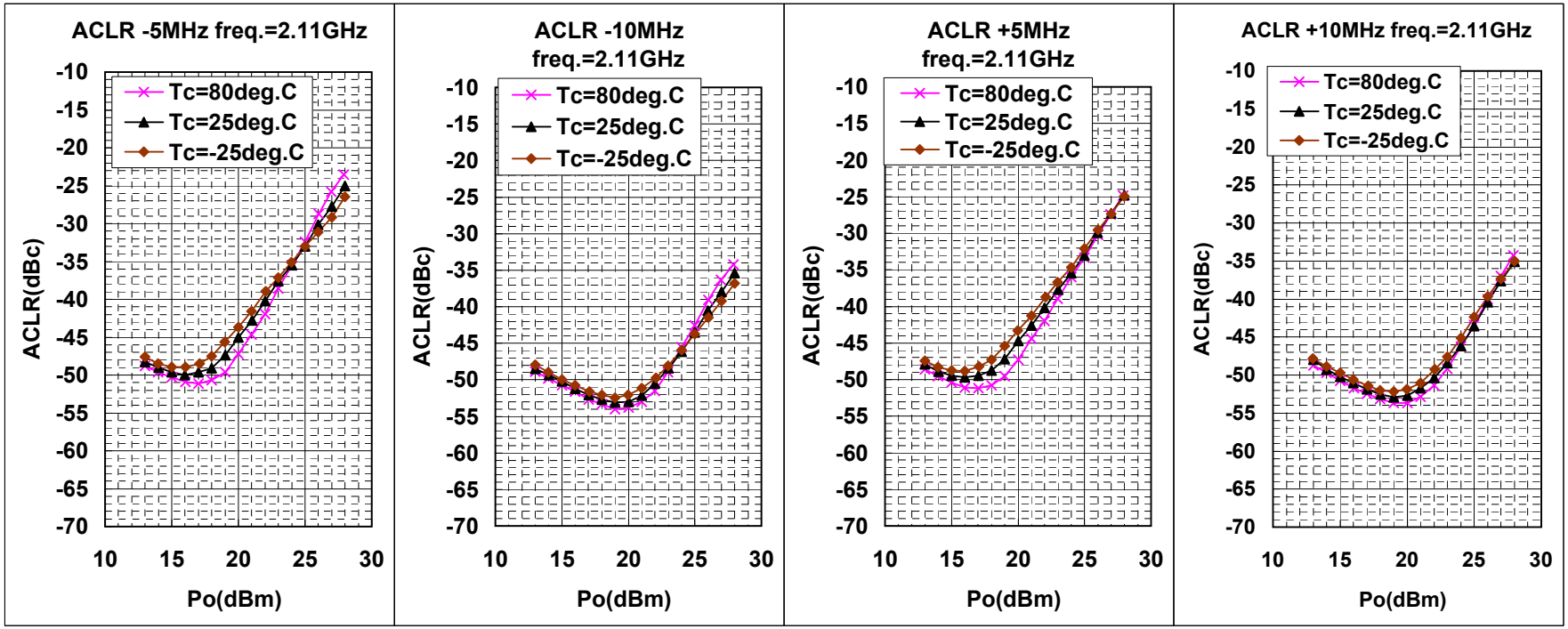
# MGF0951P RF TEST DATA(CW)
## Gp,Po,Id(RF),Ig(RF) v.s. Pin

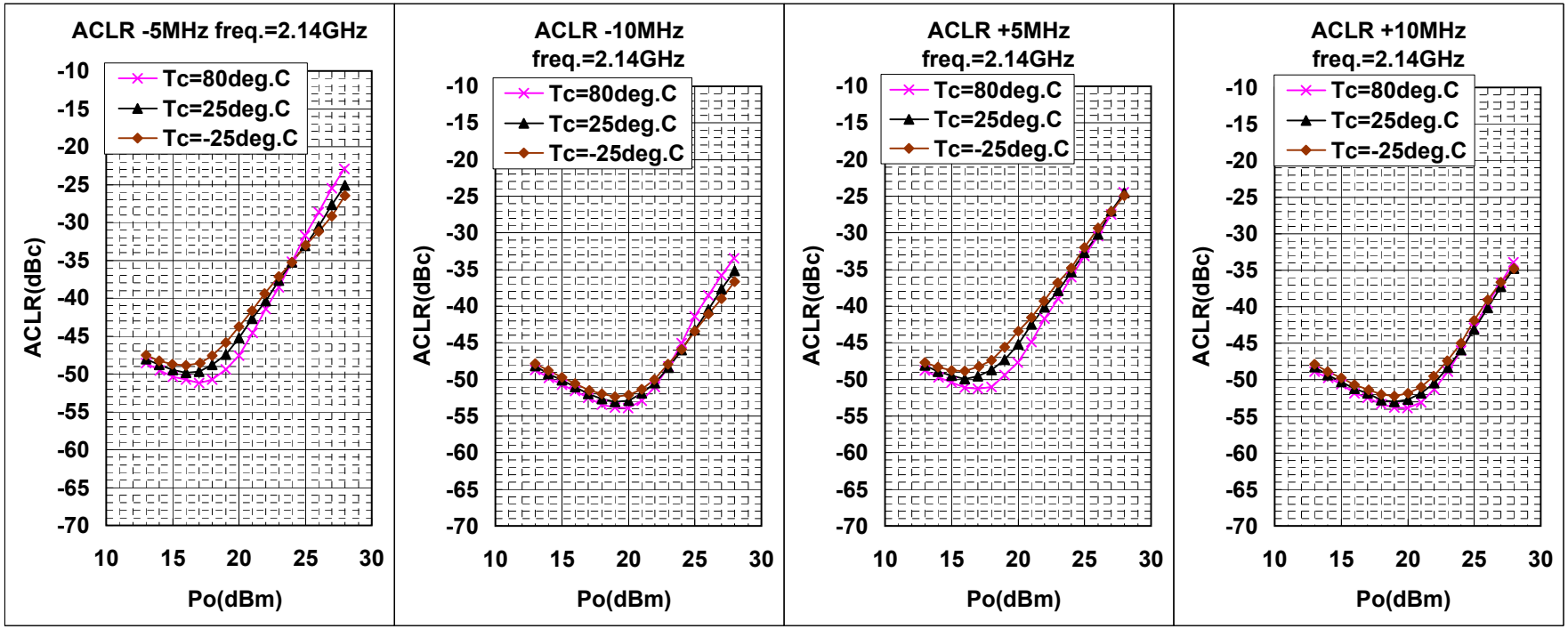


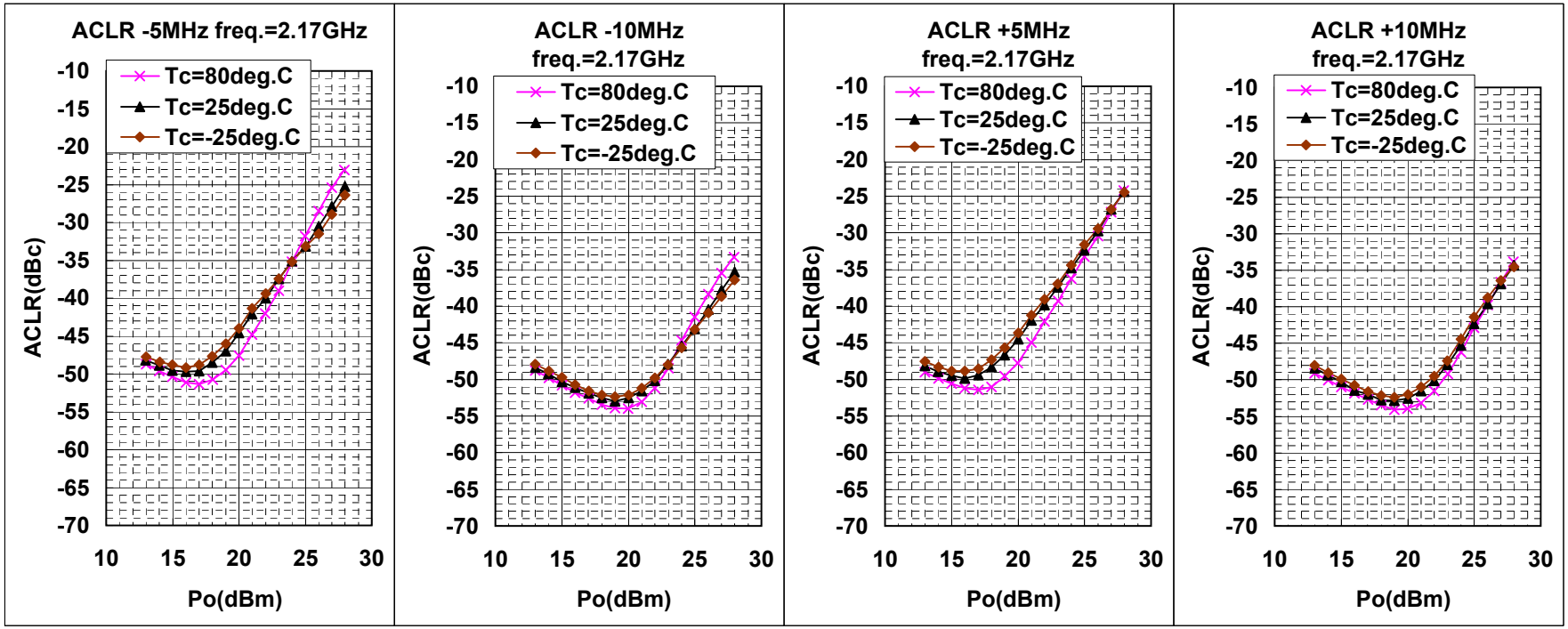



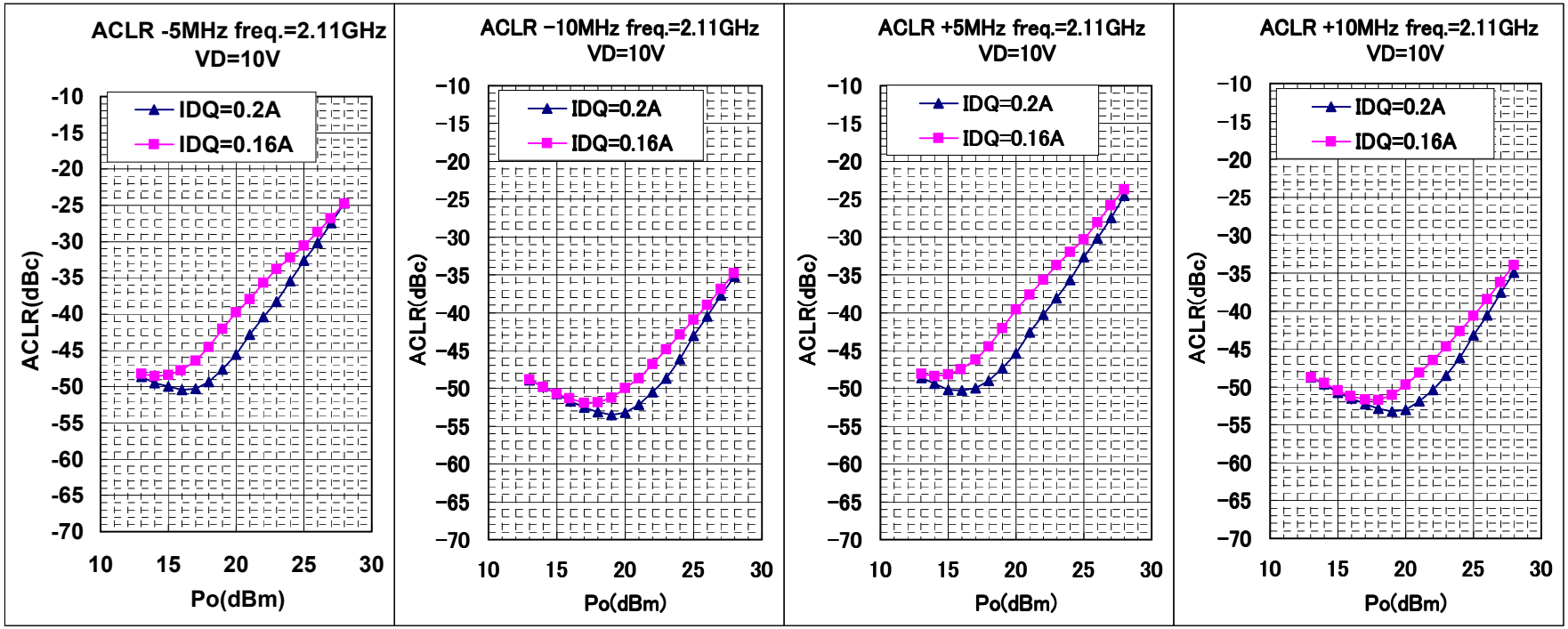



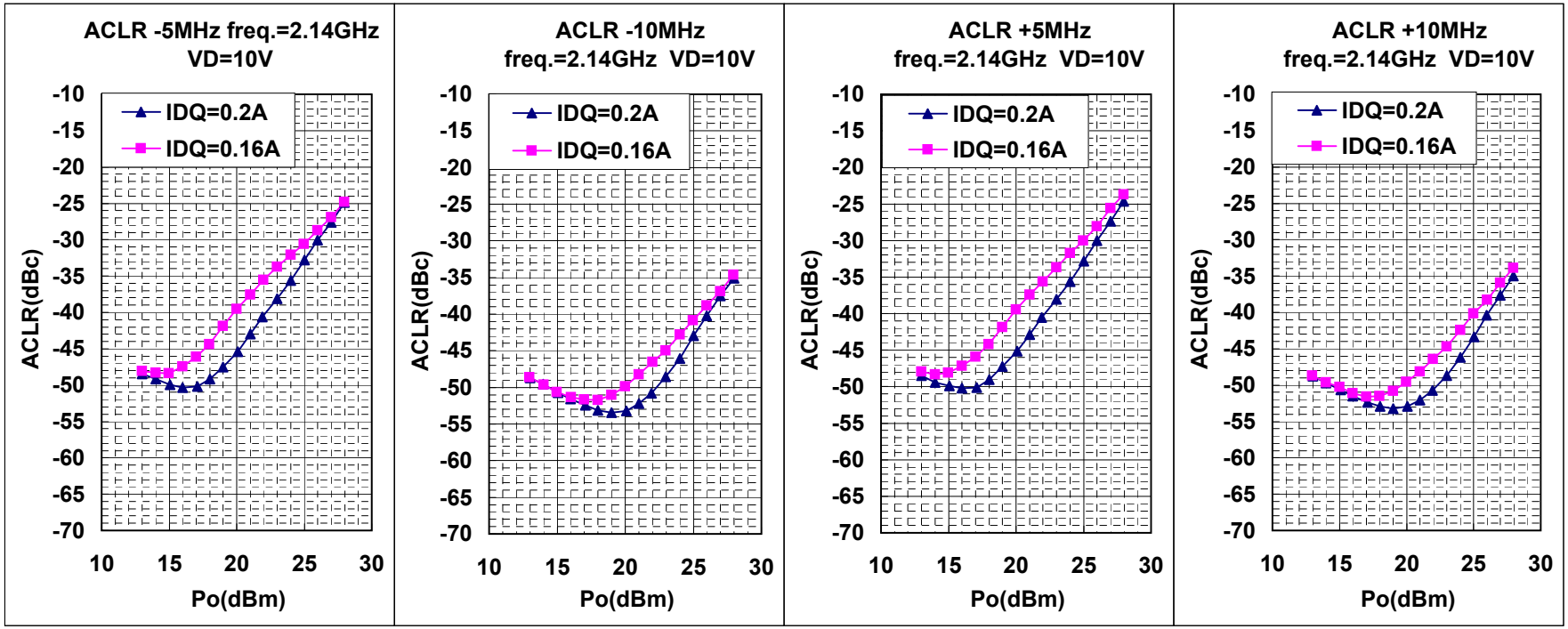



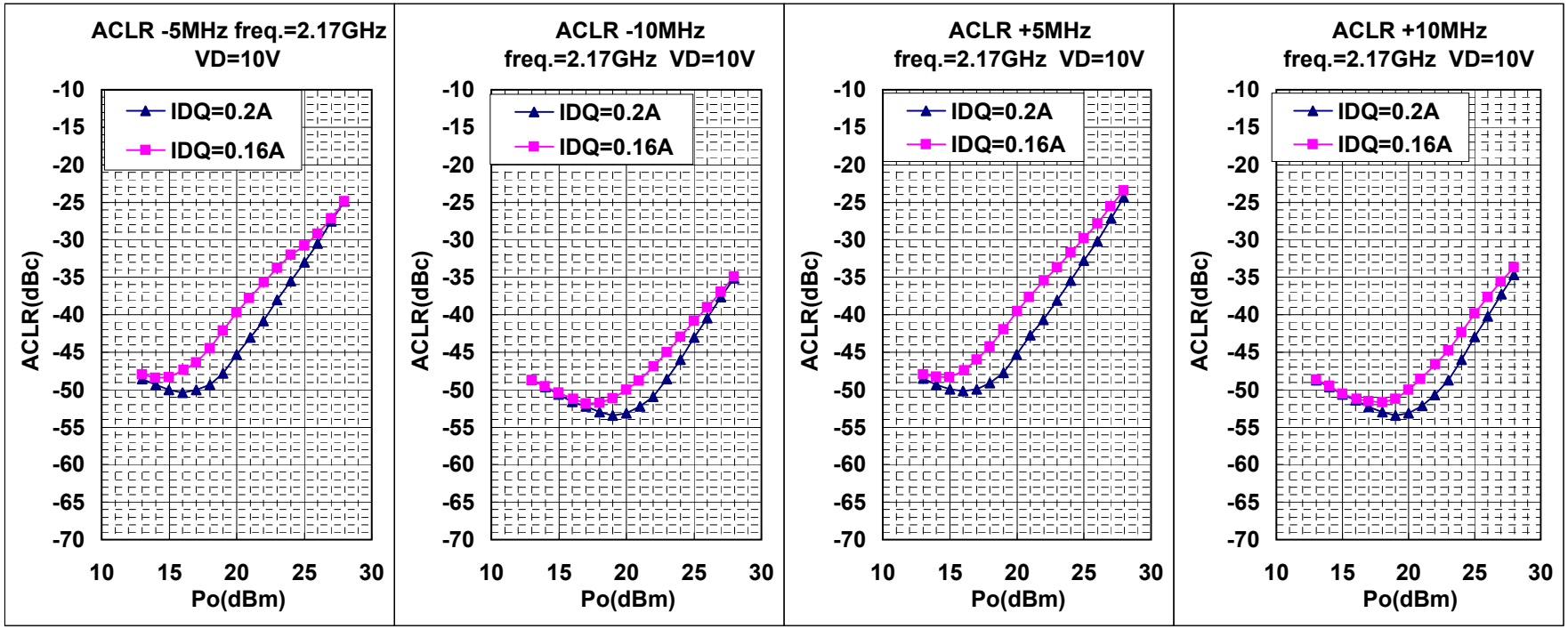

ACLR -5MHz freq.=2.11GHz
ACLR -10MHz freq.=2.11GHz
ACLR +5MHz freq.=2.11GHz
ACLR +10MHz freq.=2.11GHz
Tc=80deg.C
Tc=25deg.C
Tc=-25deg.C
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
Po(dBm)

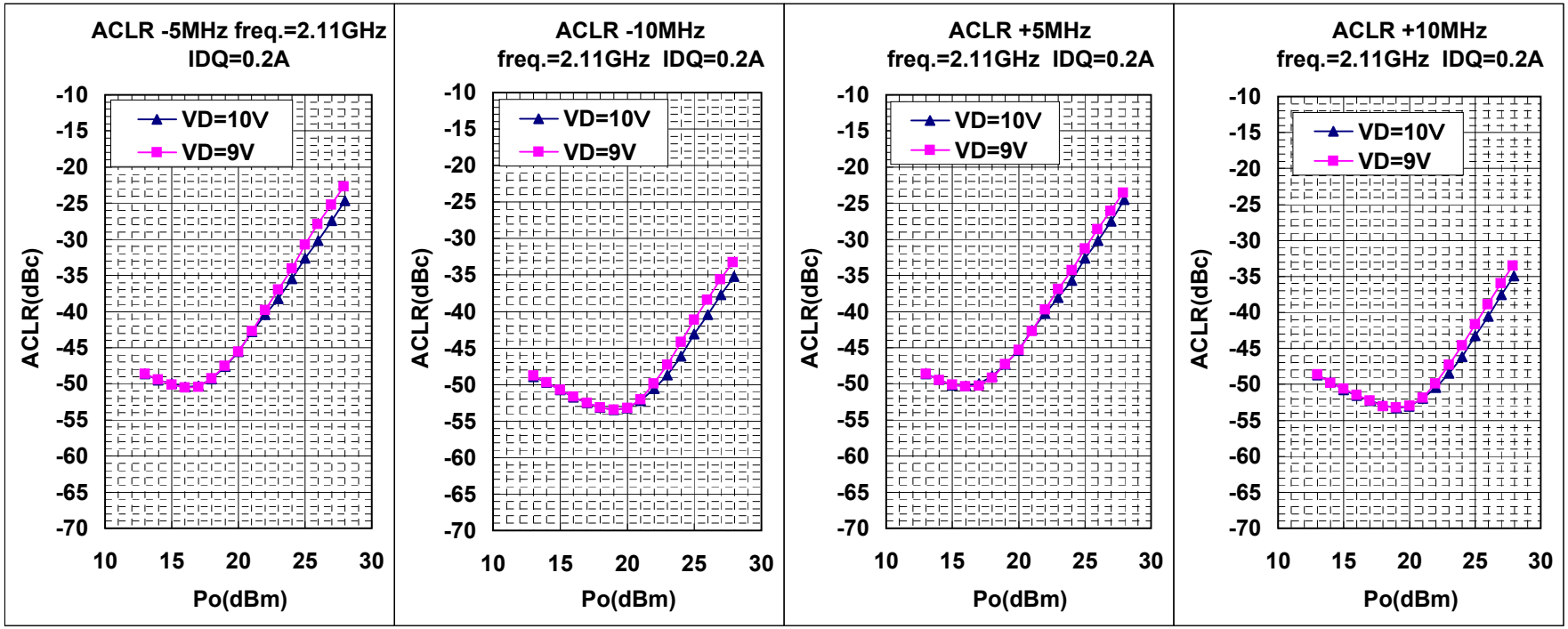

ACLR -5MHz freq.=2.14GHz
ACLR -10MHz freq.=2.14GHz
ACLR +5MHz freq.=2.14GHz
ACLR +10MHz freq.=2.14GHz
Tc=80deg.C
Tc=25deg.C
Tc=-25deg.C
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
Po(dBm)

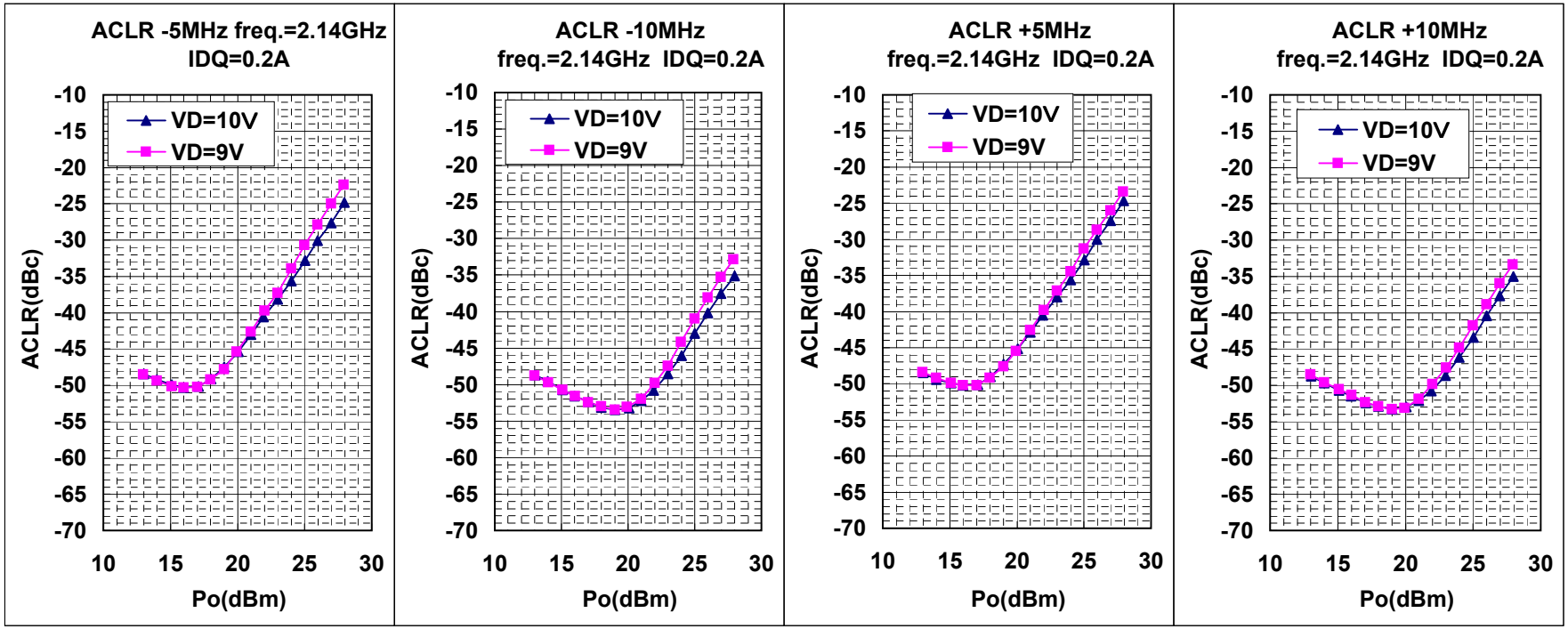

ACLR -5MHz freq.=2.17GHz
ACLR -10MHz freq.=2.17GHz
ACLR +5MHz freq.=2.17GHz
ACLR +10MHz freq.=2.17GHz
Tc=80deg.C
Tc=25deg.C
Tc=-25deg.C
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
Po(dBm)

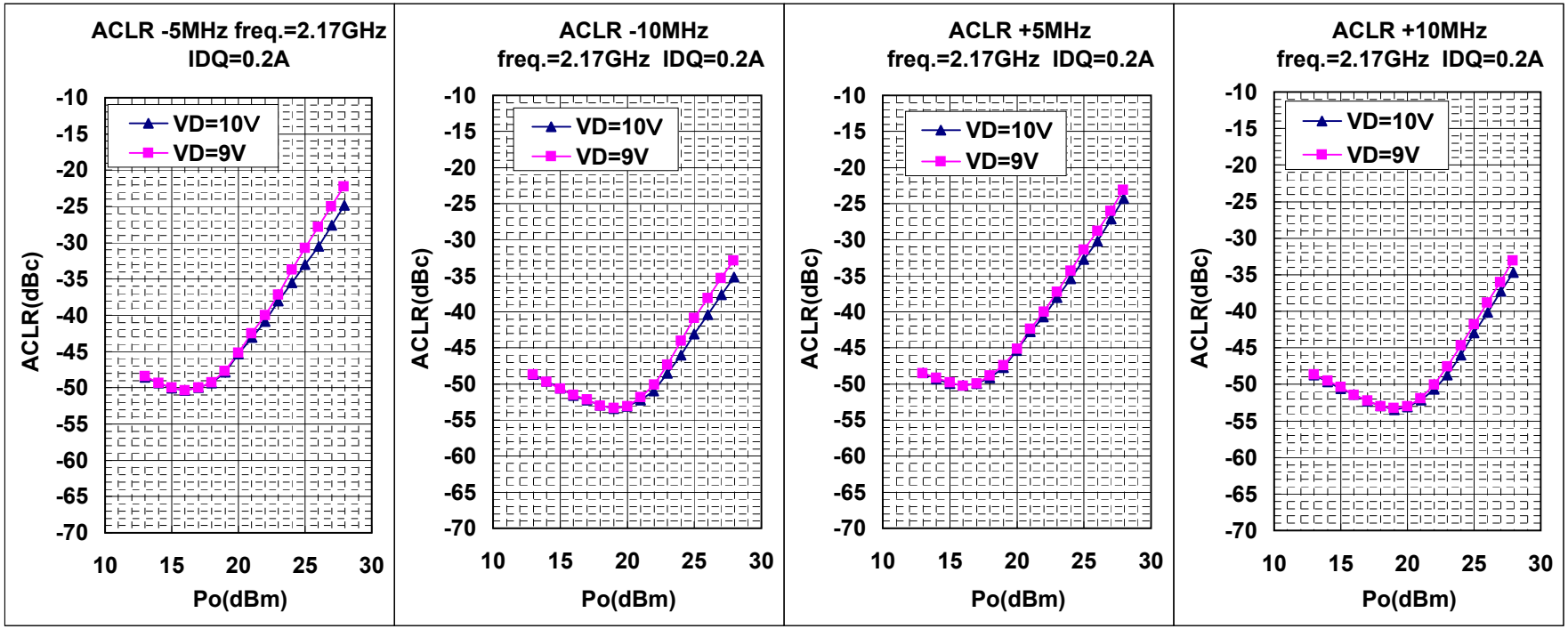

ACLR -5MHz freq.=2.11GHz
VD=10V
IDQ=0.2A
IDQ=0.16A
ACLR(dBc)
Po(dBm)
ACLR −10MHz freq.=2.11GHz
VD=10V
IDQ=0.2A
IDQ=0.16A
ACLR(dBc)
Po(dBm)
ACLR +5MHz freq.=2.11GHz
VD=10V
IDQ=0.2A
IDQ=0.16A
ACLR(dBc)
Po(dBm)
ACLR +10MHz freq.=2.11GHz
VD=10V
IDQ=0.2A
IDQ=0.16A
ACLR(dBc)
Po(dBm)


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=0.2A
IDQ=0.16A
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
Po(dBm)

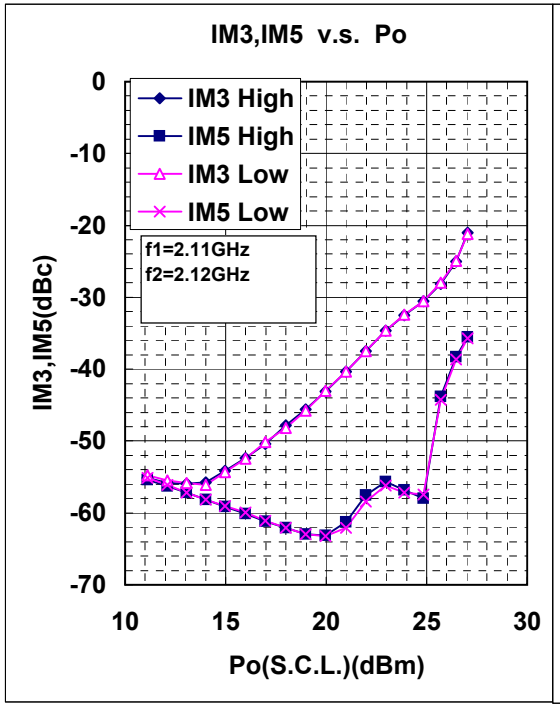

ACLR -5MHz freq.=2.17GHz
VD=10V
ACLR -10MHz
freq.=2.17GHz VD=10V
ACLR +5MHz
freq.=2.17GHz VD=10V
ACLR +10MHz
freq.=2.17GHz VD=10V
IDQ=0.2A
IDQ=0.16A
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
Po(dBm)

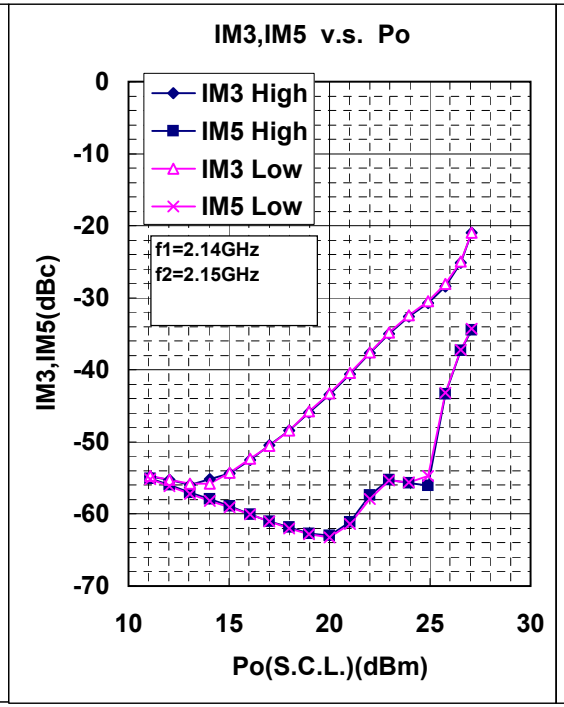

ACLR -5MHz freq.=2.11GHz
IDQ=0.2A
ACLR -10MHz
freq.=2.11GHz IDQ=0.2A
ACLR +5MHz
freq.=2.11GHz IDQ=0.2A
ACLR +10MHz
freq.=2.11GHz IDQ=0.2A
VD=10V
VD=9V
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
Po(dBm)

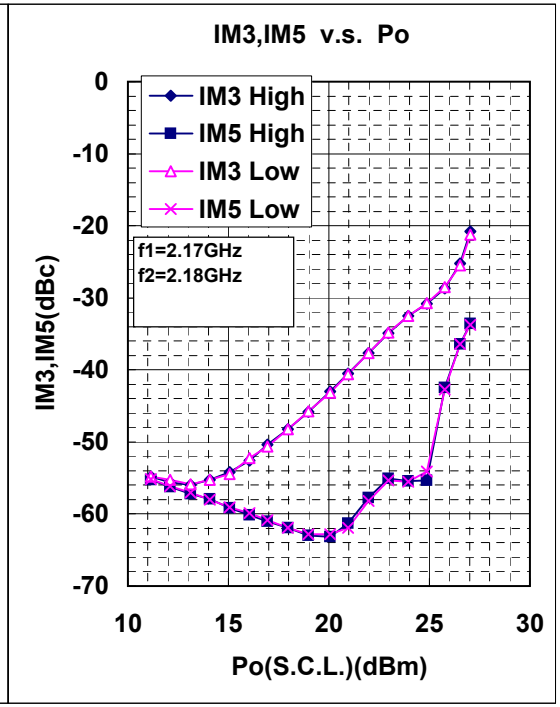

ACLR -5MHz freq.=2.14GHz
IDQ=0.2A
ACLR -10MHz
freq.=2.14GHz IDQ=0.2A
ACLR +5MHz
freq.=2.14GHz IDQ=0.2A
ACLR +10MHz
freq.=2.14GHz IDQ=0.2A
VD=10V
VD=9V
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
Po(dBm)


ACLR -5MHz freq.=2.17GHz
IDQ=0.2A
ACLR -10MHz
freq.=2.17GHz IDQ=0.2A
ACLR +5MHz
freq.=2.17GHz IDQ=0.2A
ACLR +10MHz
freq.=2.17GHz IDQ=0.2A
VD=10V
VD=9V
ACLR(dBc)
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
10
15
20
25
30
Po(dBm)

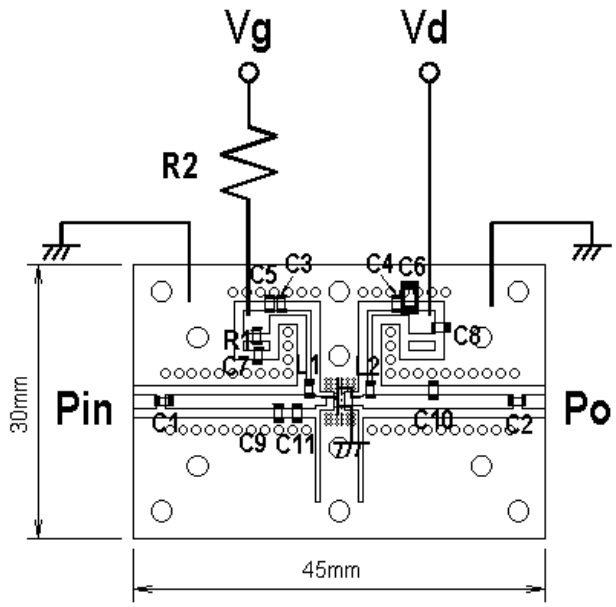
## IM3,IM5 v.s. Pin



# MGF0951P TEST FIXTURE f=2.11-2.17GHz




C1,C2,C3,C4=20pF
C5,C7,C8=1000pF
C9=2pF
C10=1pF
C11=0.5pF
C6=4.7uF
L1,L2=12nH
R1=51ohm
R2=500ohm

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

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