

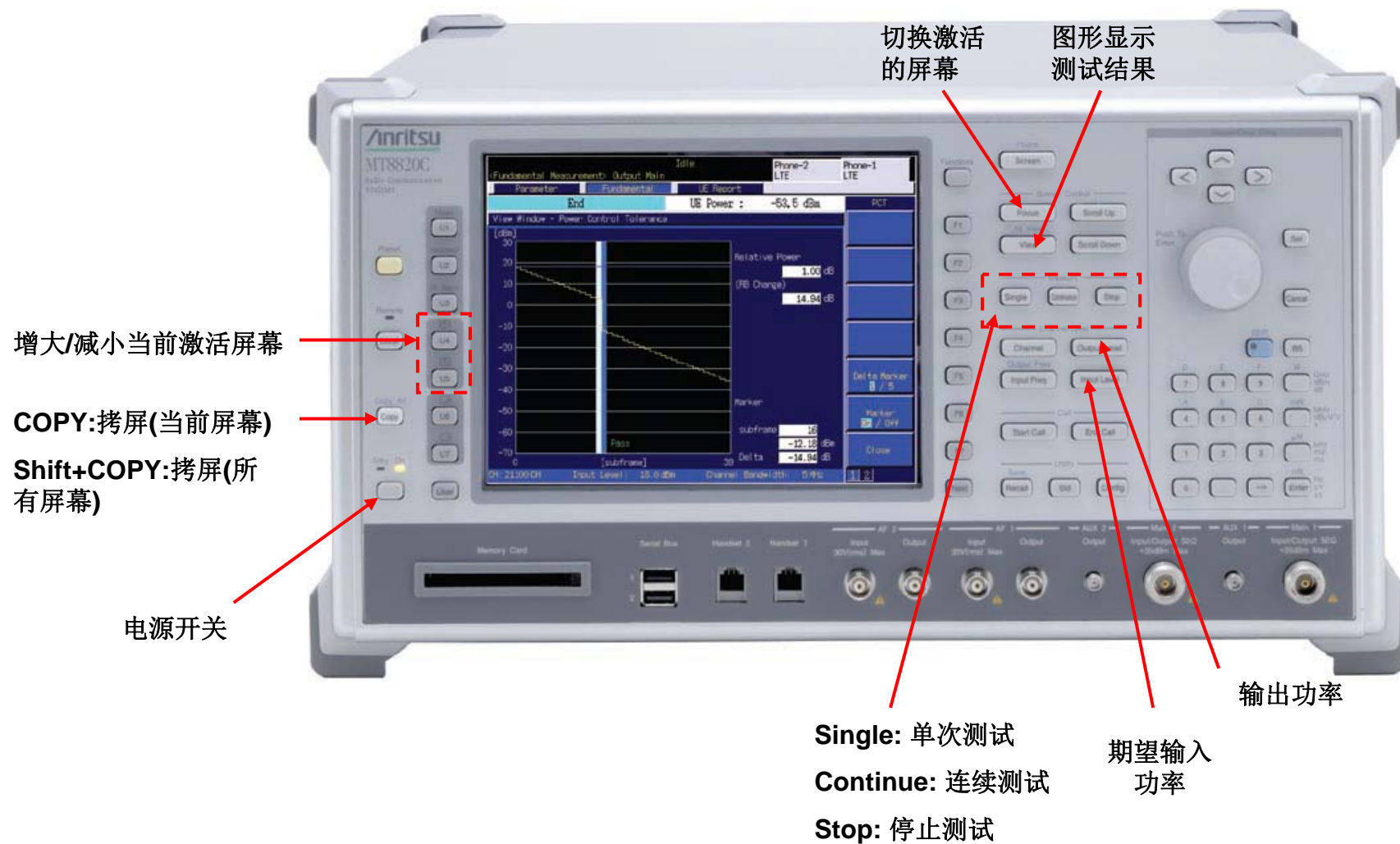


## ***MT8820C LTE 操作简介***

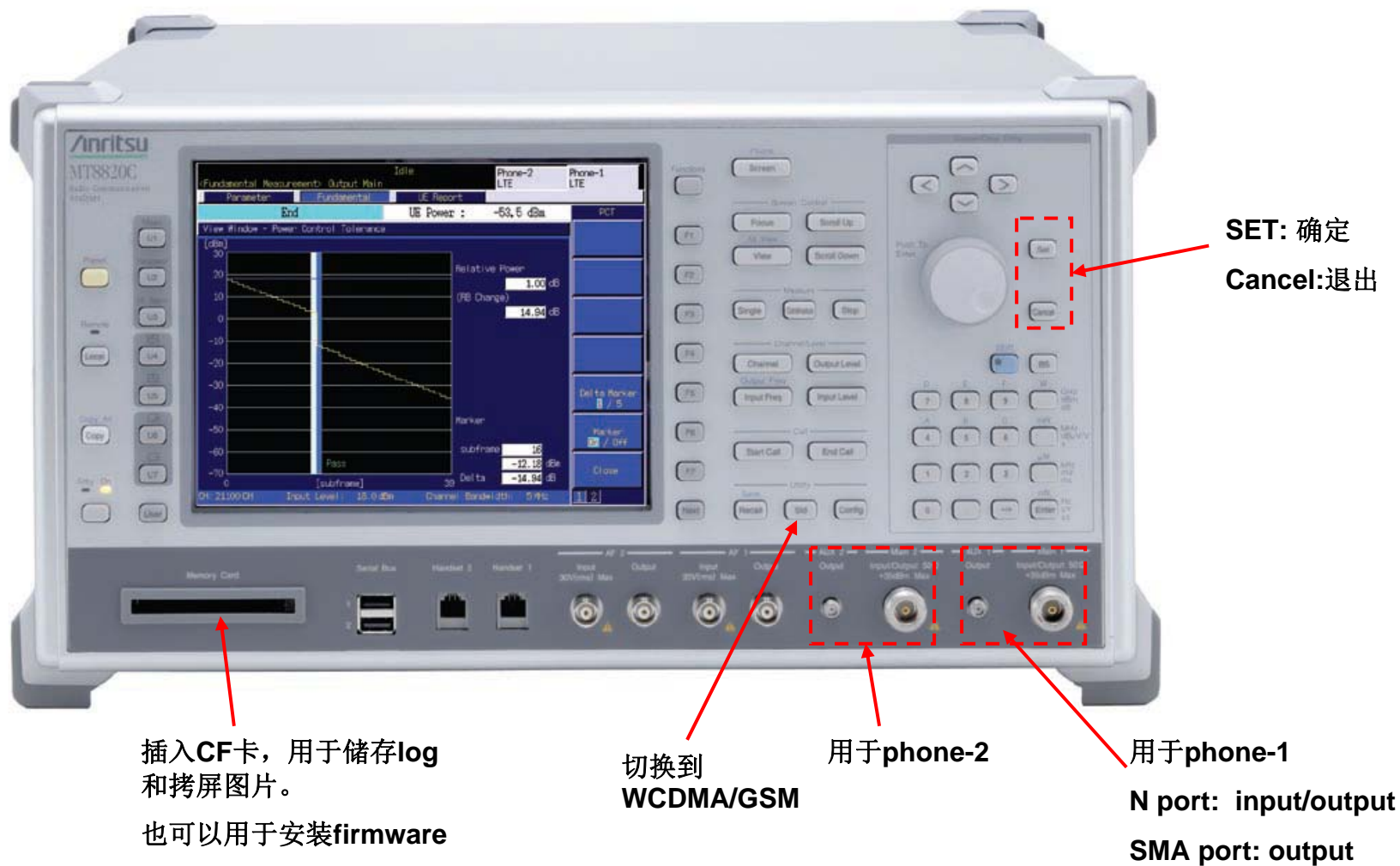
v2.0

@胡浩 2012.03

# 前面板



# 前面板



## 后面板

**GPIB**

分别用于phone1和phone2



**LAN**

可用于安装firmware

Discover What's Possible™

4

**Anritsu**

# MT8820软件安装

软件下载:

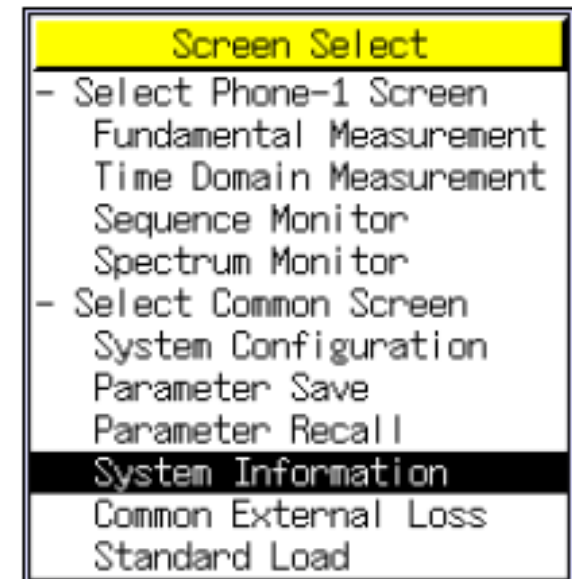
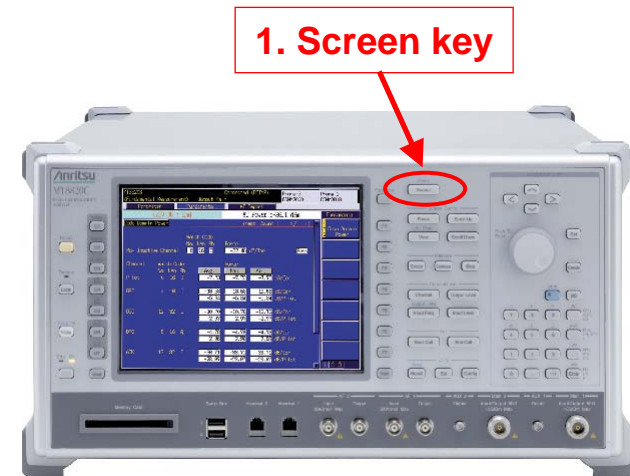
<https://www1.anritsu.co.jp/Download/MService/Registration.asp>

需要使用仪表序列号注册



# 查看系统信息

1. 按[Screen]键
2. 旋转光标到 "System Information"
3. 按[Set]键查看系统信息
4. 查看完以后，使用同样方法回到“Fundamental Measurement”



# 查看系统信息

```
Maintenance Information
Serial Number      6200837771
Power On Time      108210 [min]
Full Cal Time      ----/--/-- --:--
CF Type            2000 MB
CF Unused Area     1,240,583 kbyte
```

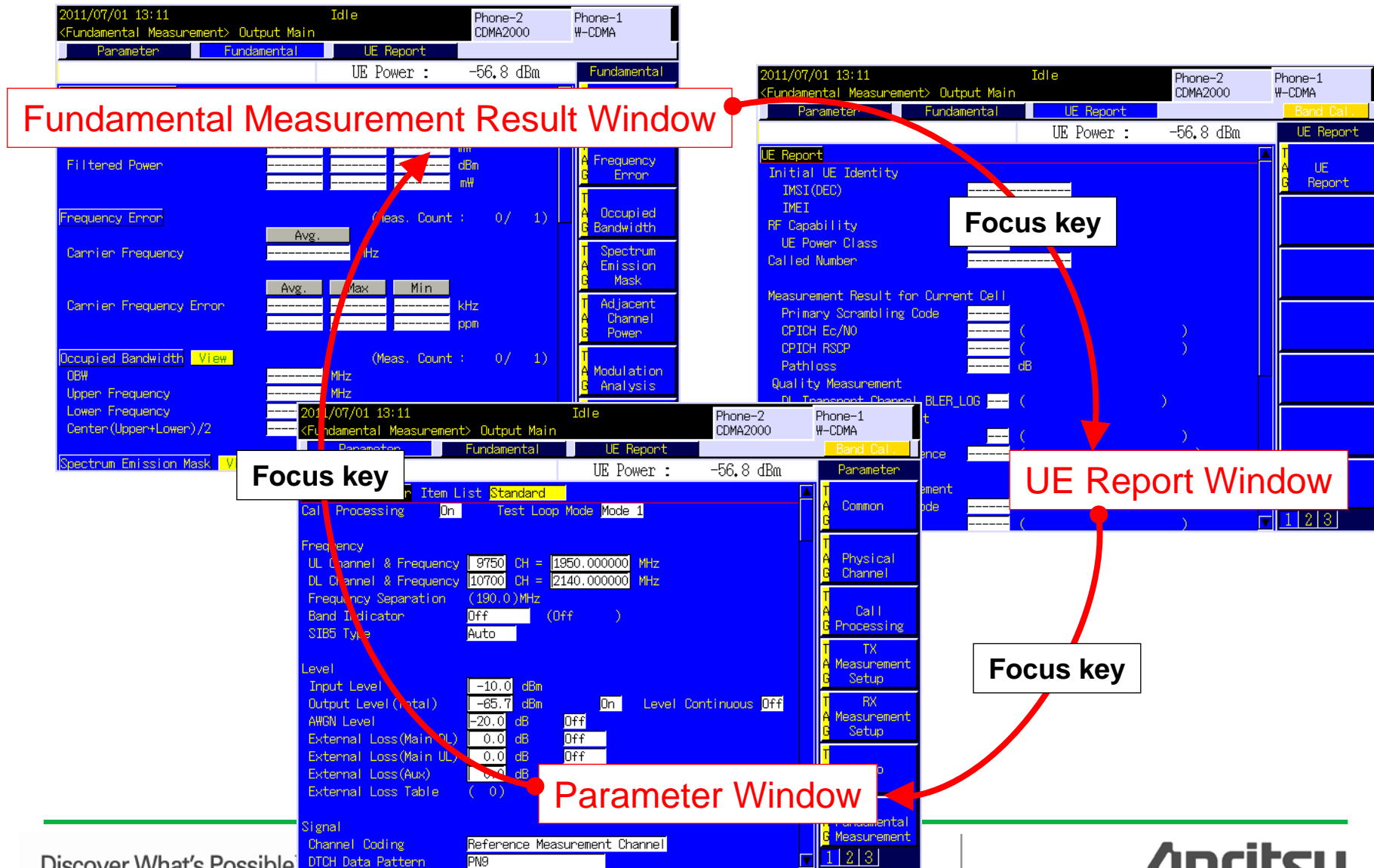
```
Software Version
Firmware           : MT8820C   22.00 #011
                   : IPL       13.00 #003
                   : OS        12.00 #001
[Standard]
LTE                : MX882012C/13C/42C 22.20S#026
ARB                : Normal 003
```

```
Software Option
MX882000C          : W-CDMA MEASUREMENT SOFTWARE
MX882000C-001      : W-CDMA VOICE CODEC
MX882000C-011      : HSDPA MEASUREMENT SOFTWARE
MX882000C-013      : HSDPA HIGH DATA RATE
MX882000C-021      : HSUPA MEASUREMENT SOFTWARE
MX882000C-031      : HSPA EVOLUTION MEASUREMENT SOFTWARE
MX882001C          : GSM MEASUREMENT SOFTWARE
MX882001C-001      : GSM VOICE CODEC
MX882001C-002      : GSM EXTERNAL PACKET DATA
MX882001C-011      : EGPRS MEASUREMENT SOFTWARE
```

Firmware信息

Option选件信息

# 切换屏幕





# 建立和UE连接

- 按preset, 然后按F1, 初始化仪表

- 设置FDD/TDD

Frame Structure FDD

- 设置带宽、channel, 注意Frequency会随着channel自动变化

Channel Bandwidth	10MHz
UL Channel & Frequency	20175 CH = 1732.500000 MHz
DL Channel & Frequency	2175 CH = 2132.500000 MHz

- 设置线损, 注意设为on才生效

External Loss	Off
Main UL	0.0 dB
Main DL	0.0 dB

- 设置RRC Release during registration为off

RRC Release during Registration Off

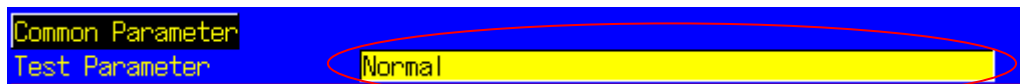
- 插入Anritsu提供的USIM到UE, UE开机, 当状态为connected表示成功连接

2010/04/20 15:22	Connected	Phone-2	Phone-1
------------------	-----------	---------	---------

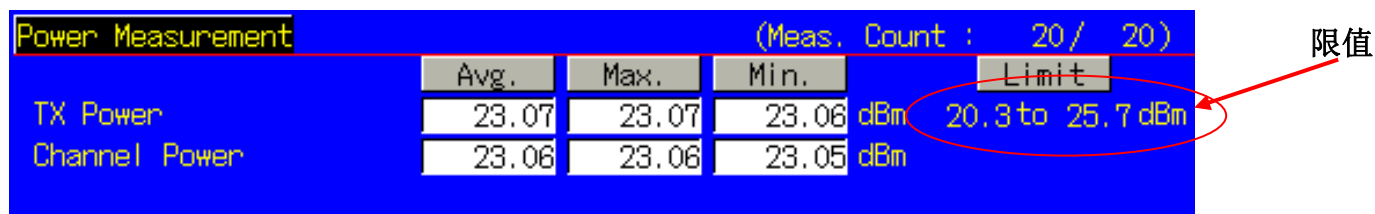
# **3GPP TS36.521测试项目**

# UE Maximum output power

- 选择测试项，TX1 - Max. Power(QPSK/1RB)



- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量



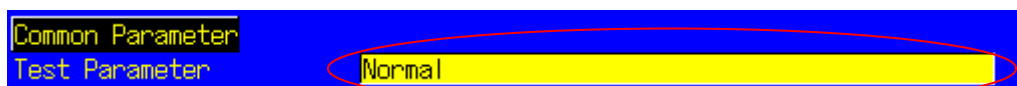
Power Measurement (Meas. Count : 20 / 20)

	Avg.	Max.	Min.	Limit
TX Power	23.07	23.07	23.06 dBm	20.3 to 25.7 dBm
Channel Power	23.06	23.06	23.05 dBm	

- 选择测试项，TX1 - Max. Power(QPSK/PartialRB)
- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

# Maximum Power Reduction

- 测试目的：为了保证最大功率和ACLR的要求同时满足，允许UE标称的最大功率可以有衰退(即最大功率的下限减小)
- 选择测试项，TX1 - Max. Power(QPSK/FullRB)



- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

Power Measurement (Meas. Count : 20 / 20)

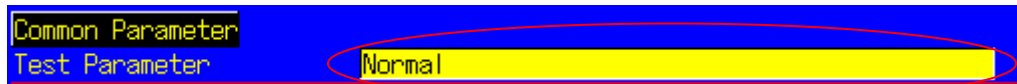
	Avg.	Max.	Min.	Limit
TX Power	20.33	20.43	20.25 dBm	19.3 to 25.7 dBm
Channel Power	20.30	20.40	20.22 dBm	

限值

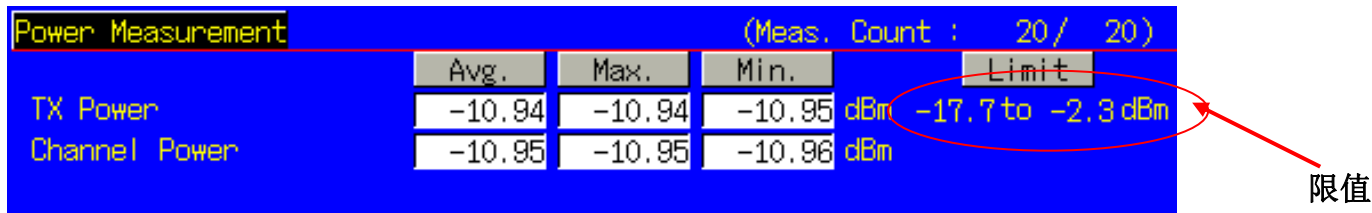
- 选择测试项，TX1 - Max. Power(16QAM/PartialRB)  
或者TX1 - Max. Power(16QAM/FullRB)
- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

# Configured UE transmitted output power

- 测试目的：验证UE发射功率不超过p-max
- 选择测试项，TX2 - Configured Power(Test Point 1)



- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量



Power Measurement (Meas. Count : 20 / 20)

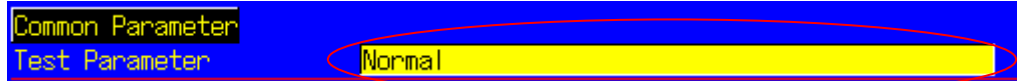
	Avg.	Max.	Min.	Limit
TX Power	-10.94	-10.94	-10.95 dBm	-17.7 to -2.3 dBm
Channel Power	-10.95	-10.95	-10.96 dBm	

限值

- 选择测试项，TX2 - Configured Power(Test Point 2)  
或者TX2 - Configured Power(Test Point 3)
- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

# Minimum output power

- 选择测试项，TX1 - Min. Power



- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

A screenshot of the 'Power Measurement' screen. It displays a table with columns for 'Avg.', 'Max.', 'Min.', and 'Limit'. The 'Limit' column shows a value of  $\leq -39.0$  dBm, which is circled in red. A red arrow points from the Chinese text '限值' (Limit) to this circled value. The table also includes a '(Meas. Count : 20 / 20)' indicator.

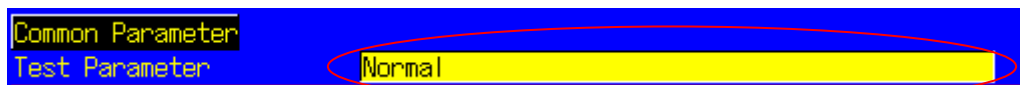
	Avg.	Max.	Min.	Limit
TX Power	-60.08	-60.06	-60.10 dBm	
Channel Power	-60.09	-60.07	-60.11 dBm	$\leq -39.0$ dBm



# General ON/OFF Time Mask

## Transmit OFF power

- 选择测试项，TX2 - General Time Mask



- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

Power Template View (Meas. Count : 1/ 1)

	Avg.	Max.	Min.	Limit
On Power	-9.47	-9.47	-9.47 dBm	-16.1 to -1.1 dBm
Off Power (Before)	-82.41	-82.41	-82.41 dBm	≤ -48.5 dBm
Off Power (After)	-82.54	-82.54	-82.54 dBm	≤ -48.5 dBm

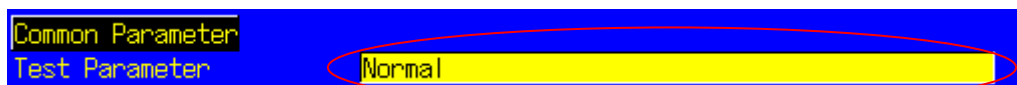
ON Power  
限值

OFF Power  
限值

按View可以  
图示结果

# PRACH and SRS time mask

- 选择测试项，Idle/Call - PRACH Time Mask



- 设置RRC Release during registration为on



- 插入Anritsu提供的USIM到UE，UE开机，到状态为idle(regist)
- 按Single Meas. & Start Call测量

Power Template View (Meas. Count : 1 / 1)

	Avg.	Max.	Min.	Limit
On Power	-5.95	-5.95	-5.95 dBm	-8.5 to 6.5 dBm
Off Power (Before)	-63.19	-63.19	-63.19 dBm	≤ -48.5 dBm
Off Power (After)	-63.19	-63.19	-63.19 dBm	≤ -48.5 dBm

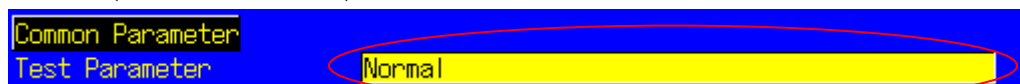
ON Power  
限值

OFF Power  
限值

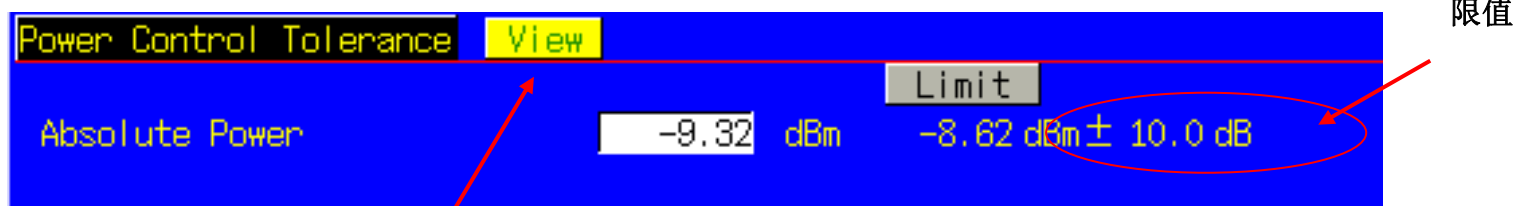
按View可以  
图示结果

# Power Control Absolute power tolerance

- 测试说明：在忽略一些小的影响因素后， **Absolute power** (dBm) = 标称PUSCH功率 (dBm) + 10log(上行RB数) + alpha\*路损。其中，标称PUSCH功率即p0-nominal PUSCH，路损= reference signal power - 下行EPRE功率。我们来计算一下test point 1的情况，条件如下：p0-nominal PUSCH = -105 dBm，上行RB=50，alpha=0.8，reference signal power = 18dBm (上两项来自 36.508 4.6.3)，下行EPRE功率 = -85dBm (来自36.521 C.0)。那么，UE上行PUSCH功率 = -105+10log(50)+0.8\*(18+85) = -5.6 dbm
- 选择测试项，TX3 - Absolute Power (Test Point1) 或者TX3 - Absolute Power (Test Point2)



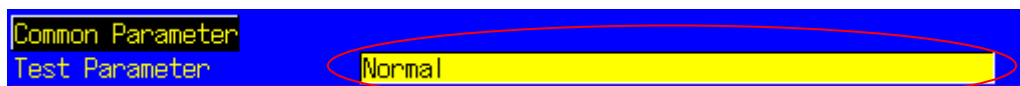
- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量



按View可以图示结果  
(下同)

# Power Control Relative power tolerance

- 测试目的：验证UE的闭环功控
- 选择测试项，TX3 - Relative Power (Ramping Up A/B/C)或者TX3 - Relative Power (Ramping Down A/B/C)或者TX3 - Relative Power (Alternating)



- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

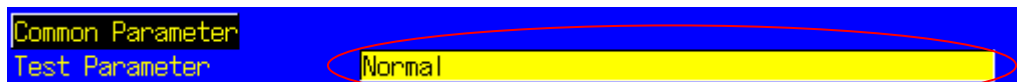
Power Control Tolerance		View	Limit	
Relative Power (Worst Value)	-0.04 dB		1.00 dB±	1.7 dB
(RB Change)	13.11 dB		14.01 dB±	5.7 dB
(Exception 1)	-0.12 dB		1.00 dB±	6.7 dB
(Exception 2)	-0.10 dB		1.00 dB±	6.7 dB

限值

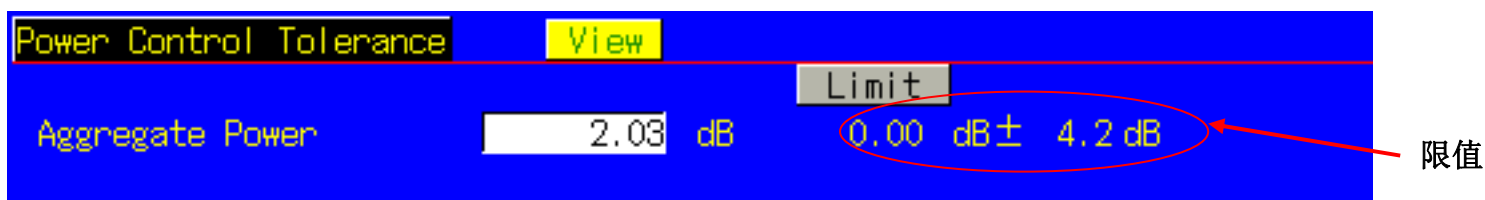
- 说明：在Ramping Up或者Ramping Down中，允许有两个exception点

# Aggregate power control tolerance

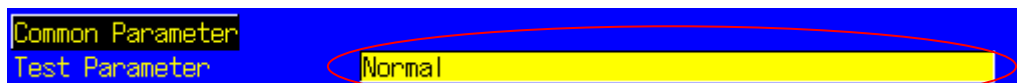
- 选择测试项，TX3 - Aggregate Power(PUSCH Sub-test)



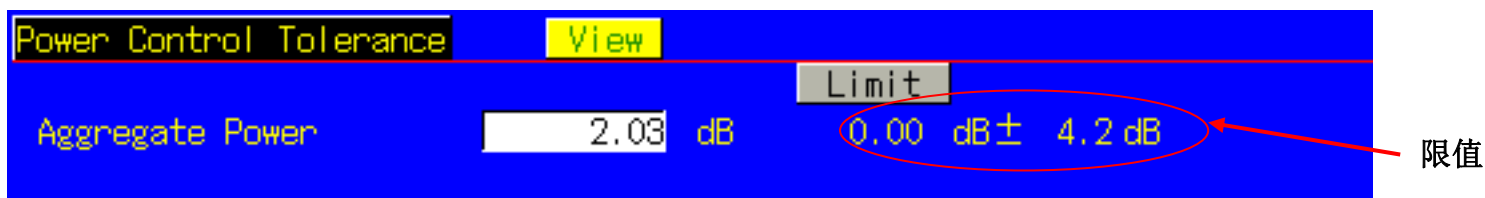
- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量



- 选择测试项，TX3 - Aggregate Power(PUCCH Sub-test)

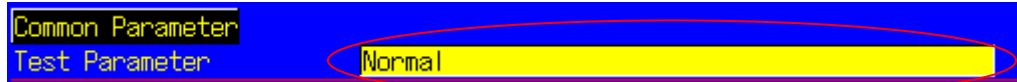


- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量



# Frequency Error

- 选择测试项，RX - Reference Sens/Freq.Error



- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

Modulation Analysis View (Meas. Count : 20 / 20)

	Avg.	
Carrier Frequency	1949.999997	MHz

	Avg.	Max.	Min.	Limit
Carrier Frequency Error	-0.0030	0.0053	-0.0114	kHz
	0.00	0.00	-0.01	ppm ≤ 0.1 ppm+ 15.0 Hz

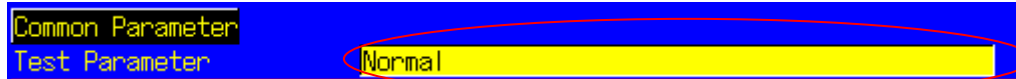
限值

- 说明：测试时的DL功率为reference sensitive功率，即测试灵敏度的功率



# EVM – PUSCH(1)

- 测试说明：共有8种情况，选择测试项时也一一对应
  - ❖ QPSK Partial RB @Max Power
  - ❖ QPSK Full RB @Max Power
  - ❖ QPSK Partial RB @-36.8dBm
  - ❖ QPSK Full RB @-36.8dBm
  - ❖ 16QAM Partial RB @Max Power
  - ❖ 16QAM Full RB @Max Power
  - ❖ 16QAM Partial RB @-36.8dBm
  - ❖ 16QAM Full RB @-36.8dBm
- 选择测试项：
  - ❖ TX1 - Max. Power(QPSK/PartialRB)
  - ❖ TX1 - Max. Power(QPSK/FullRB)
  - ❖ TX1 - EVM/IBE/LEAK @ -40dBm(QPSK/PartialRB)
  - ❖ TX1 - EVM @ -40dBm(QPSK/Full RB)
  - ❖ TX1 - Max. Power(16QAM/PartialRB)
  - ❖ TX1 - Max. Power(16QAM/FullRB)
  - ❖ TX1 - EVM @ -40dBm(16QAM/Partial RB)
  - ❖ TX1 - EVM @ -40dBm(16QAM/Full RB)



## EVM – PUSCH(2)

- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

Modulation Analysis		View		(Meas. Count : 20 / 20)	
		Avg.			
Carrier Frequency		2535.000002		MHz	
		Avg.	Max.	Min.	Limit
Carrier Frequency Error		0.0019	0.0178	-0.0168	kHz
		0.00	0.01	-0.01	ppm
EVM		3.45	4.22	2.76	%(rms) ≤ 17.5 %(rms)

限值

# EVM – PUCCH

- 测试说明：共有2种情况，选择测试项时也一一对应
  - ❖ Uplink@Max Power
  - ❖ Uplink@-36.8dBm
- 选择测试项：
  - ❖ TX2 - PUCCH EVM @ Max.
  - ❖ TX2 - PUCCH EVM/IBE @ -40dBm



- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

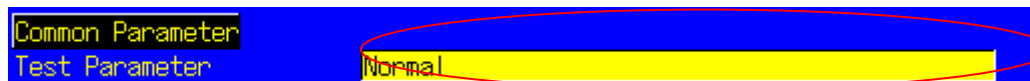
Modulation Analysis View (Meas. Count : 20 / 20)

Carrier Frequency	Avg. 2535.000002 MHz		
Carrier Frequency Error	Avg. 0.0019	Max. 0.0178	Min. -0.0168 kHz
	0.00	0.01	-0.01 ppm
EVM	3.45	4.22	2.76 % (rms) ≤ 17.5 % (rms)

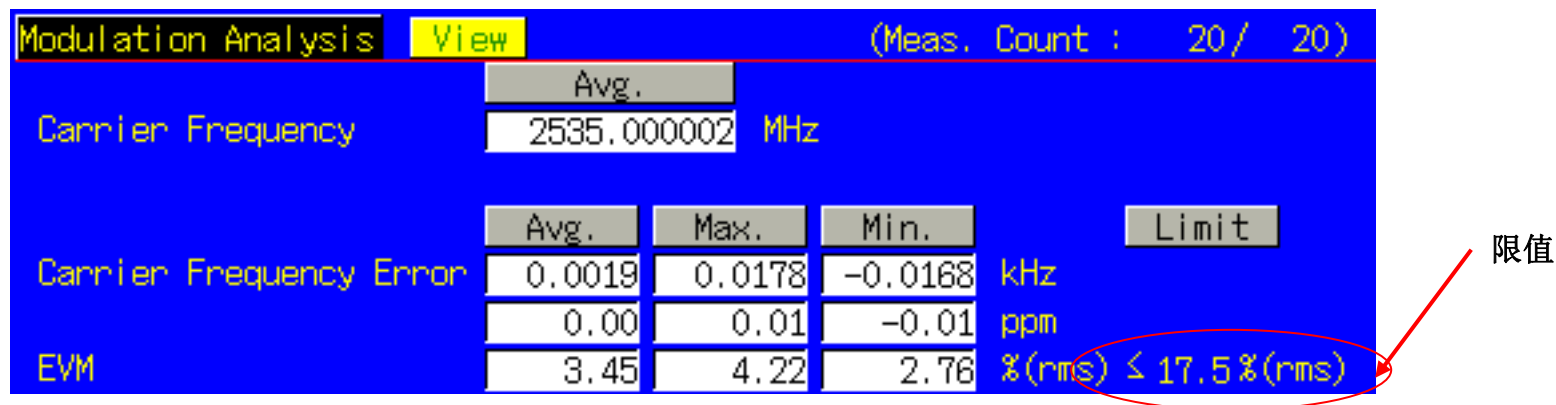
限值

# EVM – PRACH

- 测试说明：共有2种情况，选择测试项时也一一对应
  - ❖ RS EPRE = -63dBm/15kHz
  - ❖ RS EPRE = -78dBm/15kHz
- 选择测试项：
  - ❖ Idle/Call - PRACH EVM(Test Point1)
  - ❖ Idle/Call - PRACH EVM(Test Point2)



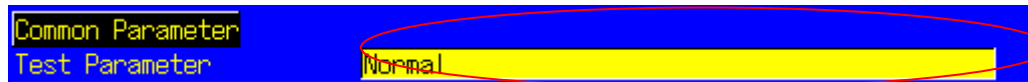
- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量



Modulation Analysis		View		(Meas. Count : 20 / 20)	
Carrier Frequency	Avg.	2535.000002 MHz			
Carrier Frequency Error	Avg.	Max.	Min.	Limit	
	0.0019	0.0178	-0.0168	kHz	
	0.00	0.01	-0.01	ppm	
EVM	3.45	4.22	2.76	%(rms) ≤ 17.5%(rms)	限值

# PUSCH-EVM with exclusion period

- 选择测试项:
  - ❖ TX3 - EVM with Exclusion Period(QPSK)
  - ❖ TX3 - EVM with Exclusion Period(16QAM)



- 插入Anritsu提供的USIM到UE, UE开机, 到状态为connected
- 按single键测量



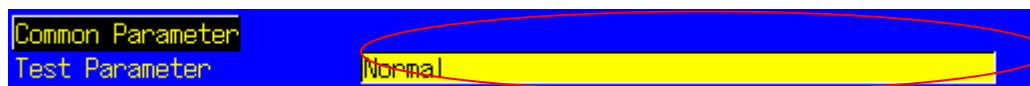
Modulation Analysis View (Meas. Count : 20 / 20)

	Avg.			
Carrier Frequency	2535.000002			MHz
	Avg.	Max.	Min.	Limit
Carrier Frequency Error	0.0019	0.0178	-0.0168	kHz
	0.00	0.01	-0.01	ppm
EVM	3.45	4.22	2.76	%(rms) ≤ 17.5 %(rms)

限值

# Carrier Leakage

- 测试说明：共有3种情况，选择测试项时也一一对应
  - ❖ Uplink @3.2dBm
  - ❖ Uplink @-26.8dBm
  - ❖ Uplink @-36.8dBm
- 选择测试项：
  - ❖ TX1 - IBE/LEAK @ 0dBm
  - ❖ TX1 - IBE/LEAK @ -30dBm
  - ❖ TX1 - EVM/IBE/LEAK @ -40dBm(QPSK/PartialRB)



- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

Modulation Analysis View (Meas. Count : 20 / 20)

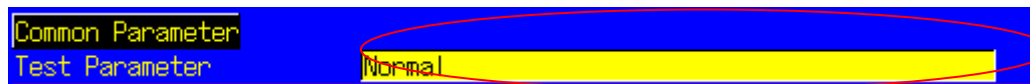
Carrier Frequency	Avg.	2535.000002 MHz		
Carrier Frequency Error	Avg.	Max.	Min.	Limit
	0.0019	0.0178	-0.0168	kHz
	0.00	0.01	-0.01	ppm
EVM	3.45	4.22	2.76	%(rms) ≤ 17.5%(rms)

限值



# In-band emissions for non allocated RB-PUSCH

- 测试说明：共有3种情况，选择测试项时也一一对应
  - ❖ Uplink @3.2dBm
  - ❖ Uplink @-26.8dBm
  - ❖ Uplink @-36.8dBm
- 测试结果包括3部分：
  - ❖ General
  - ❖ IQ image
  - ❖ DC Leakage
- 选择测试项：
  - ❖ TX1 - IBE/LEAK @ 0dBm
  - ❖ TX1 - IBE/LEAK @ -30dBm
  - ❖ TX1 - EVM/IBE/LEAK @ -40dBm(QPSK/PartialRB)



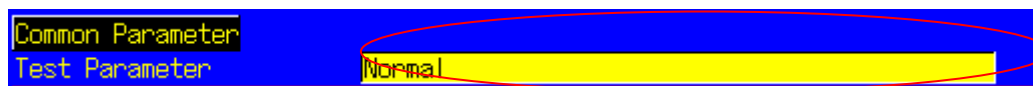
- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

In-Band Emissions				
General	-43.86	-42.57	-44.84	dB ≤ -8.8 dB
IQ Image	-36.39	-35.96	-36.88	dB ≤ -8.6 dB
Carrier Leakage	-56.06	-54.47	-57.40	dBc ≤ -8.8 dBc

限值

# In-band emissions for non allocated RB-PUCCH

- 测试说明：共有3种情况，选择测试项时也一一对应
  - ❖ Uplink @3.2dBm
  - ❖ Uplink @-26.8dBm
  - ❖ Uplink @-36.8dBm
- 测试结果包括3部分：
  - ❖ General
  - ❖ IQ image
  - ❖ DC Leakage
- 选择测试项：
  - ❖ TX2 - PUCCH IBE @ 0dBm
  - ❖ TX2 - PUCCH IBE @ -30dBm
  - ❖ TX2 - PUCCH EVM/IBE @ -40dBm



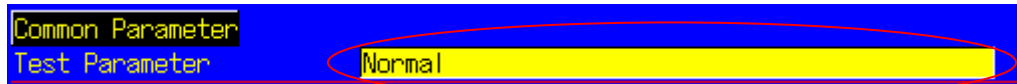
- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

In-Band Emissions				
General	-42.19	-41.03	-44.14	dB
IQ Image	-37.91	-37.87	-37.96	dB
Carrier Leakage	-69.83	-66.24	-71.38	dBc

限值

# Spectrum flatness

- 选择测试项，TX1 - Max. Power(QPSK/FullRB)



- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

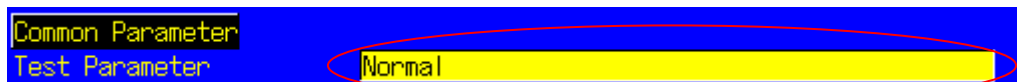
Spectrum Flatness

≥ 3MHz (R1 +)	0.24	0.31	0.19	dB
≥ 3MHz (R1 -)	-0.33	-0.29	-0.42	dB
≥ 3MHz (RP1)	0.57	0.64	0.52	dB(p-p) ≤ 5.4 dB
< 3MHz (R2 +)				dB
< 3MHz (R2 -)				dB
< 3MHz (RP2)				dB(p-p)
RP12				dB
RP21				dB

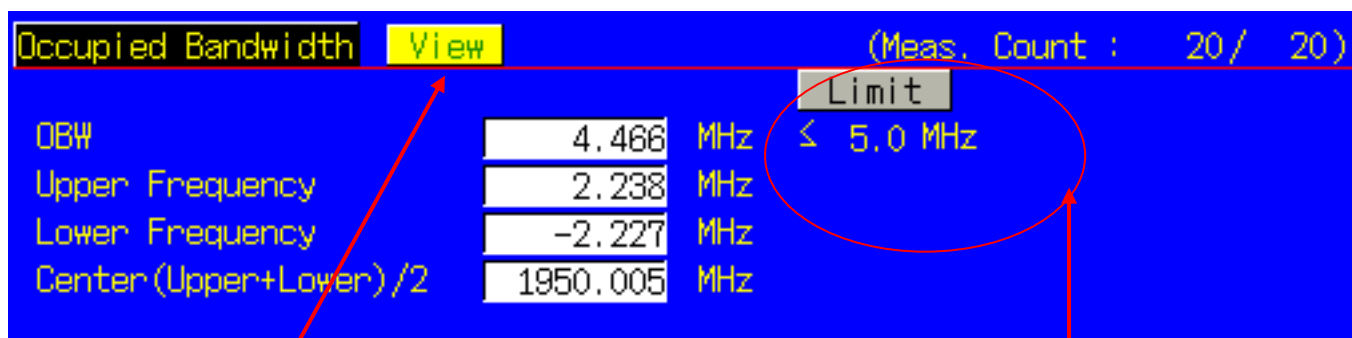
按View可以图示结果

# Occupied bandwidth

- 选择测试项，TX1 - Max. Power(QPSK/FullRB)



- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 按single键测量

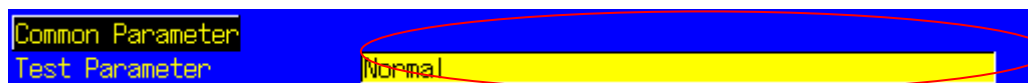


按View可以图示结果

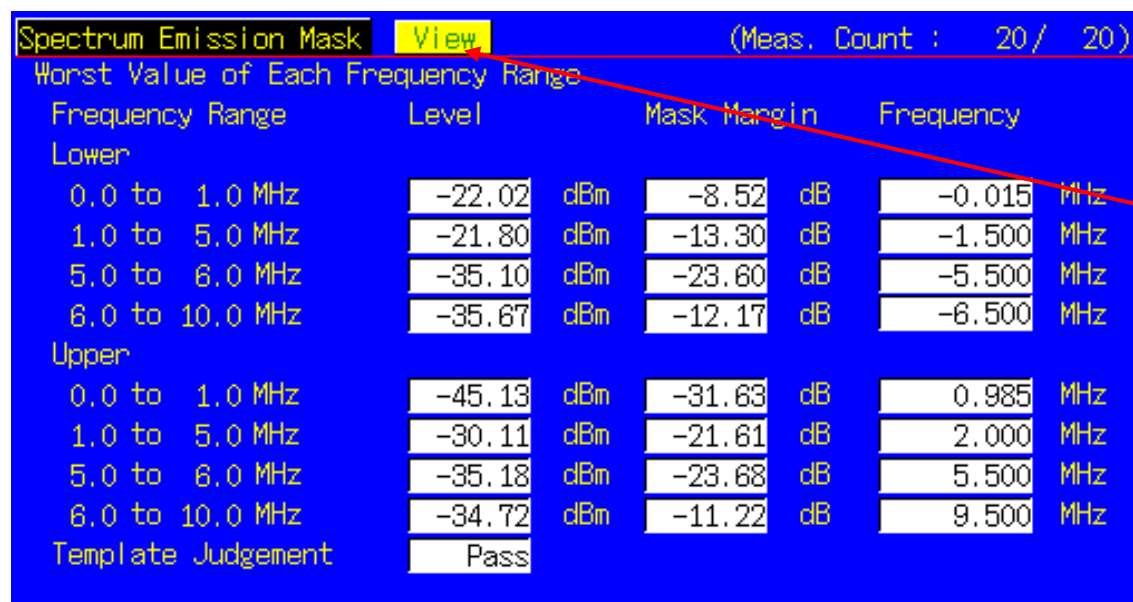
限值

# Spectrum Emission Mask

- 选择测试项:
  - ❖ TX1 - Max. Power(QPSK/PartialRB)
  - ❖ TX1 - Max. Power(QPSK/FullRB)
  - ❖ TX1 - Max. Power(16QAM/PartialRB)
  - ❖ TX1 - Max. Power(16QAM/FullRB)



- 插入Anritsu提供的USIM到UE, UE开机, 到状态为connected
- 按single键测量



Spectrum Emission Mask View (Meas. Count : 20 / 20)

Worst Value of Each Frequency Range

Frequency Range	Level	Mask Margin	Frequency
Lower			
0.0 to 1.0 MHz	-22.02 dBm	-8.52 dB	-0.015 MHz
1.0 to 5.0 MHz	-21.80 dBm	-13.30 dB	-1.500 MHz
5.0 to 6.0 MHz	-35.10 dBm	-23.60 dB	-5.500 MHz
6.0 to 10.0 MHz	-35.67 dBm	-12.17 dB	-6.500 MHz
Upper			
0.0 to 1.0 MHz	-45.13 dBm	-31.63 dB	0.985 MHz
1.0 to 5.0 MHz	-30.11 dBm	-21.61 dB	2.000 MHz
5.0 to 6.0 MHz	-35.18 dBm	-23.68 dB	5.500 MHz
6.0 to 10.0 MHz	-34.72 dBm	-11.22 dB	9.500 MHz
Template Judgement	Pass		


按View可以图示结果

# Adjacent Channel Leakage power Ratio

- 选择测试项:
  - ❖ TX1 - Max. Power(QPSK/PartialRB)
  - ❖ TX1 - Max. Power(QPSK/FullRB)
  - ❖ TX1 - Max. Power(16QAM/PartialRB)
  - ❖ TX1 - Max. Power(16QAM/FullRB)



- 插入Anritsu提供的USIM到UE, UE开机, 到状态为connected
- 按single键测量



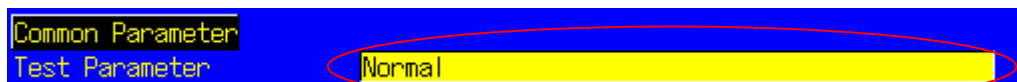
Adjacent Channel Power		View			(Meas. Count : 20 / 20)	
Offset Frequency	Power					
E-UTRA						
		Avg.	Max.	Min.		Limit
-5MHz		-34.02	-33.44	-34.77	dB	≤ -29.2 dB
5MHz		-48.10	-47.85	-48.31	dB	≤ -29.2 dB
UTRA						
-10MHz		-61.20	-59.74	-61.80	dB	≤ -35.2 dB
-5MHz		-37.00	-36.37	-37.79	dB	≤ -32.2 dB
5MHz		-48.51	-48.27	-48.70	dB	≤ -32.2 dB
10MHz		-56.50	-55.87	-57.44	dB	≤ -35.2 dB

按View可以图示结果

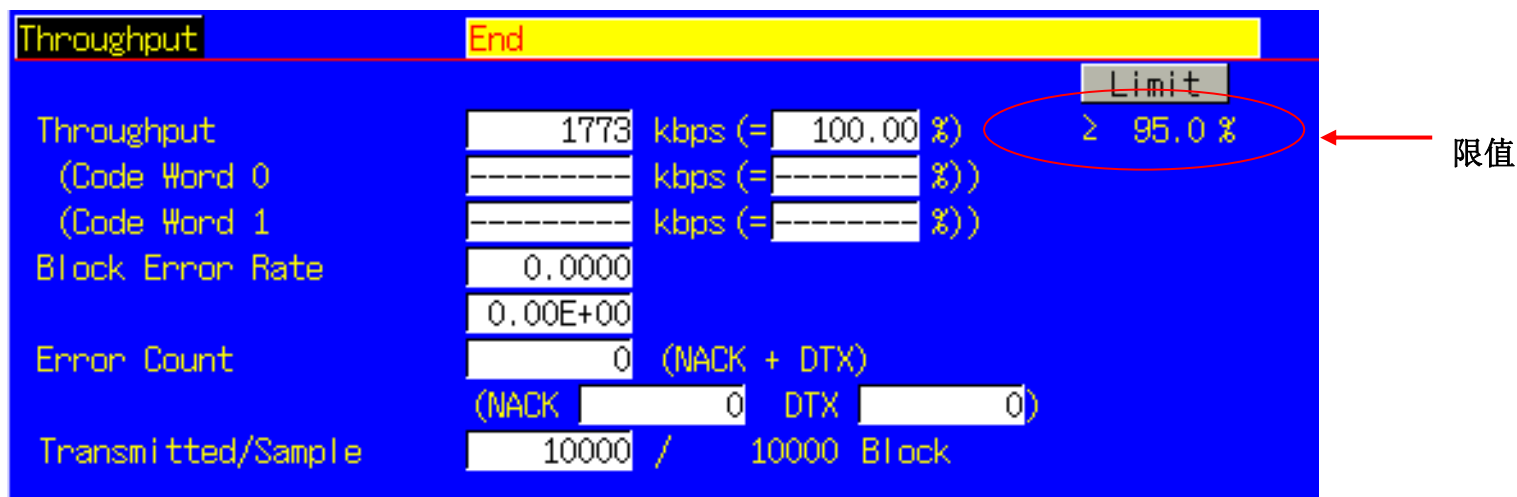


# Reference sensitivity level

- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 选择测试项，RX - Reference Sens/Freq.Error

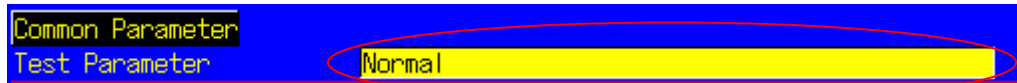


- 按single键测量

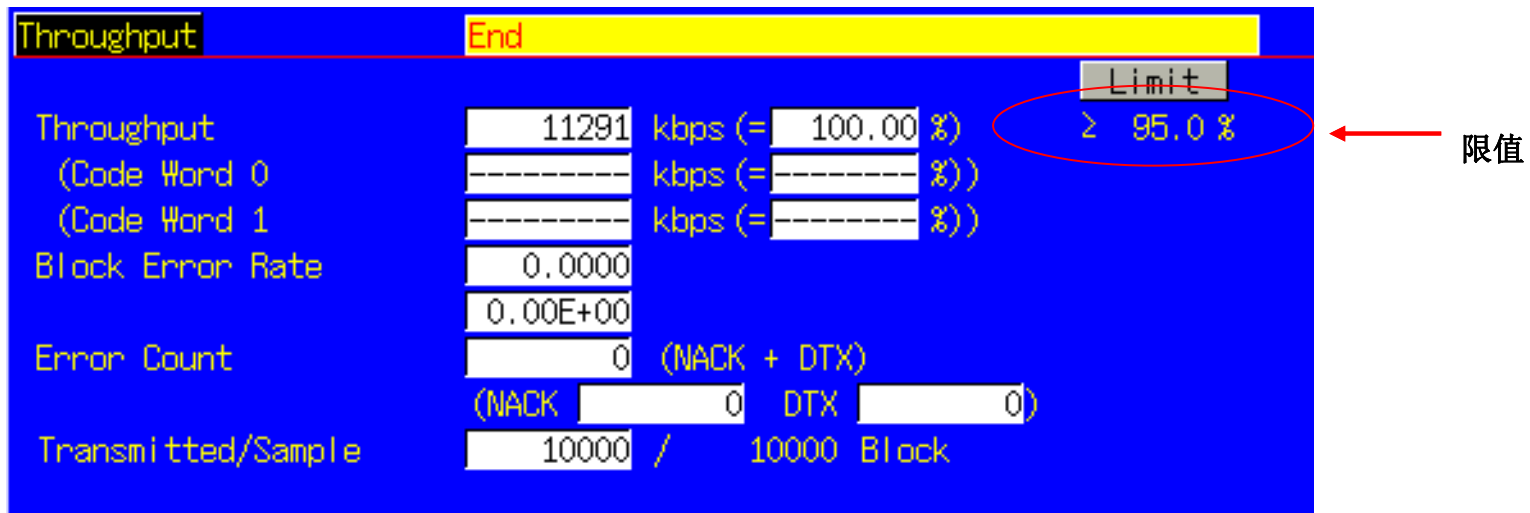


# Maximum input level

- 插入Anritsu提供的USIM到UE，UE开机，到状态为connected
- 选择测试项，RX - Max. Input Level



- 按single键测量



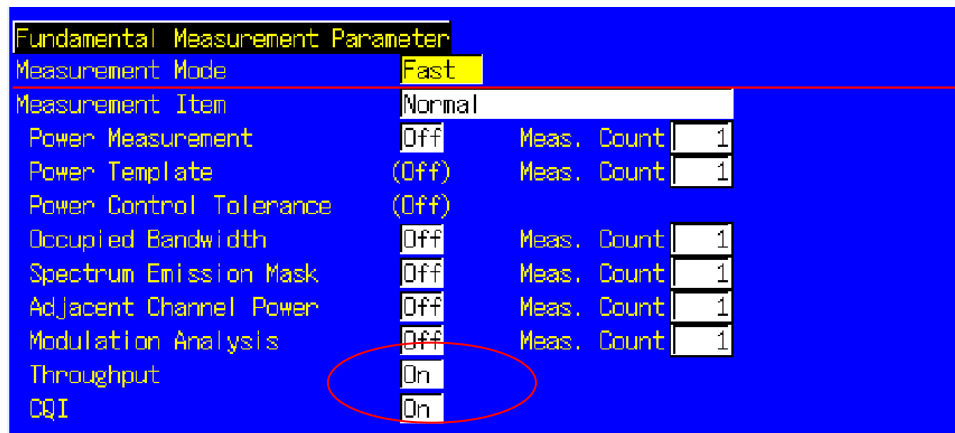
# *Through put*测试

# ThroughPut测试

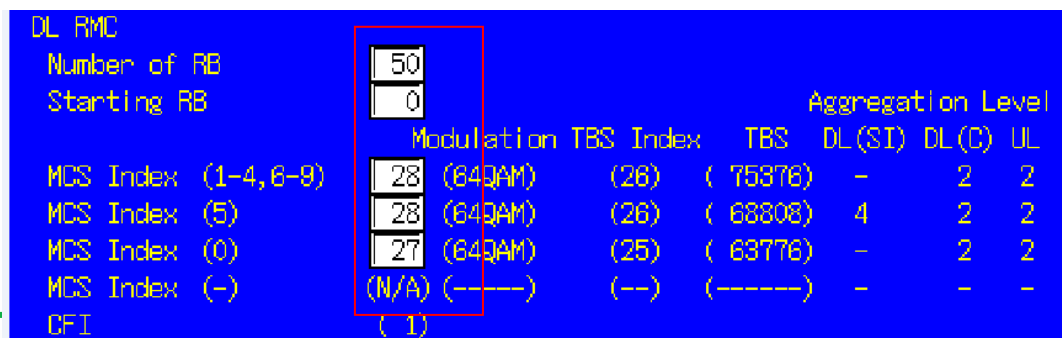
- 首先将UE和MT8820C建立连接



- 设置throughput测试项目为on

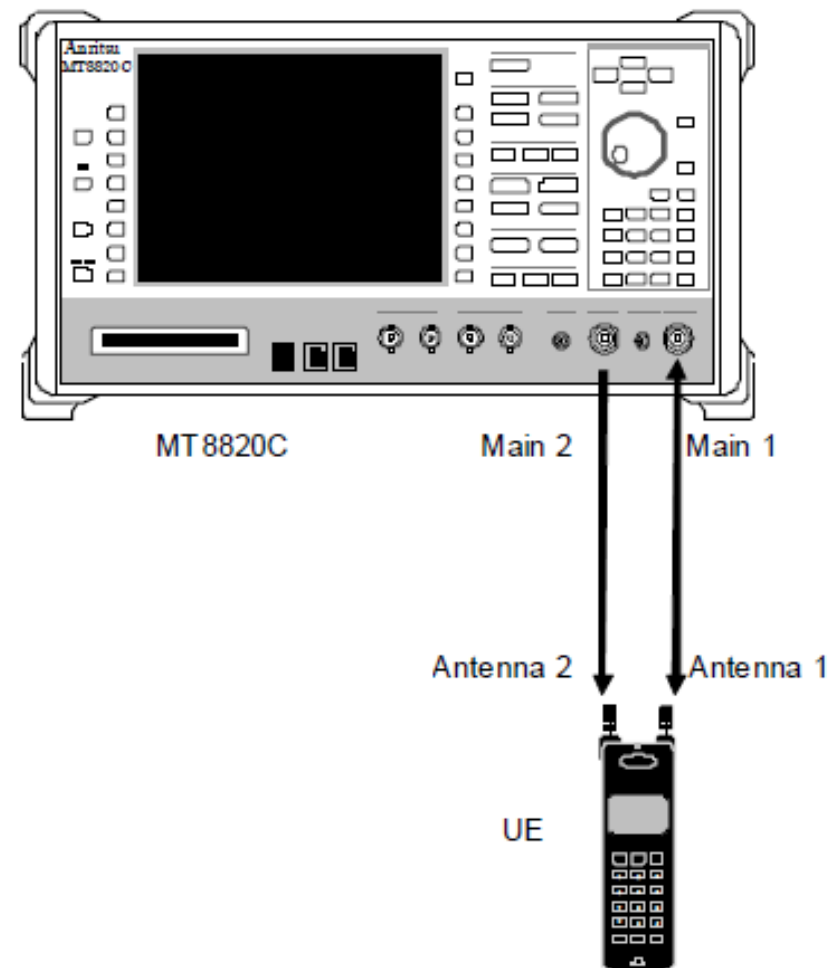


- 下面的设置会影响throughput: number of RB, MCS index



# MIMO测试

# 连接方法



# 建立和UE连接(MIMO)

- 设置带宽、channel, 注意Frequency会随着channel自动变化

Channel Bandwidth	10MHz
UL Channel & Frequency	20175 CH = 1732.500000 MHz
DL Channel & Frequency	2175 CH = 2132.500000 MHz

首先确定option中包含MIMO功能, 请参考前面查看system information的描述

- 设置RRC Release during registration为off

RRC Release during Registration Off

- 设置天线模式为2x2 MIMO

Signal	
Channel Coding	Packet
Antenna Configuration	2x2 MIMO(Closed Loop Multi Layer)
RMC Configuration	PUSCH

- 插入Anritsu提供的USIM到UE, UE开机, 当状态为connected表示成功连接

2010/04/20 15:22 Connected Phone-2 Phone-1

Throughput	End	Limit
Throughput	101840 kbps (= 100.00 %)	
(Code Word 0	50920 kbps (= 100.00 %)	
(Code Word 1	50920 kbps (= 100.00 %)	
Block Error Rate	0.0000	
	0.00E+00	
Error Count	0 (NACK + DTX)	
	(NACK 0 DTX 0)	
Transmitted/Sample	2000 / 2000 Block	

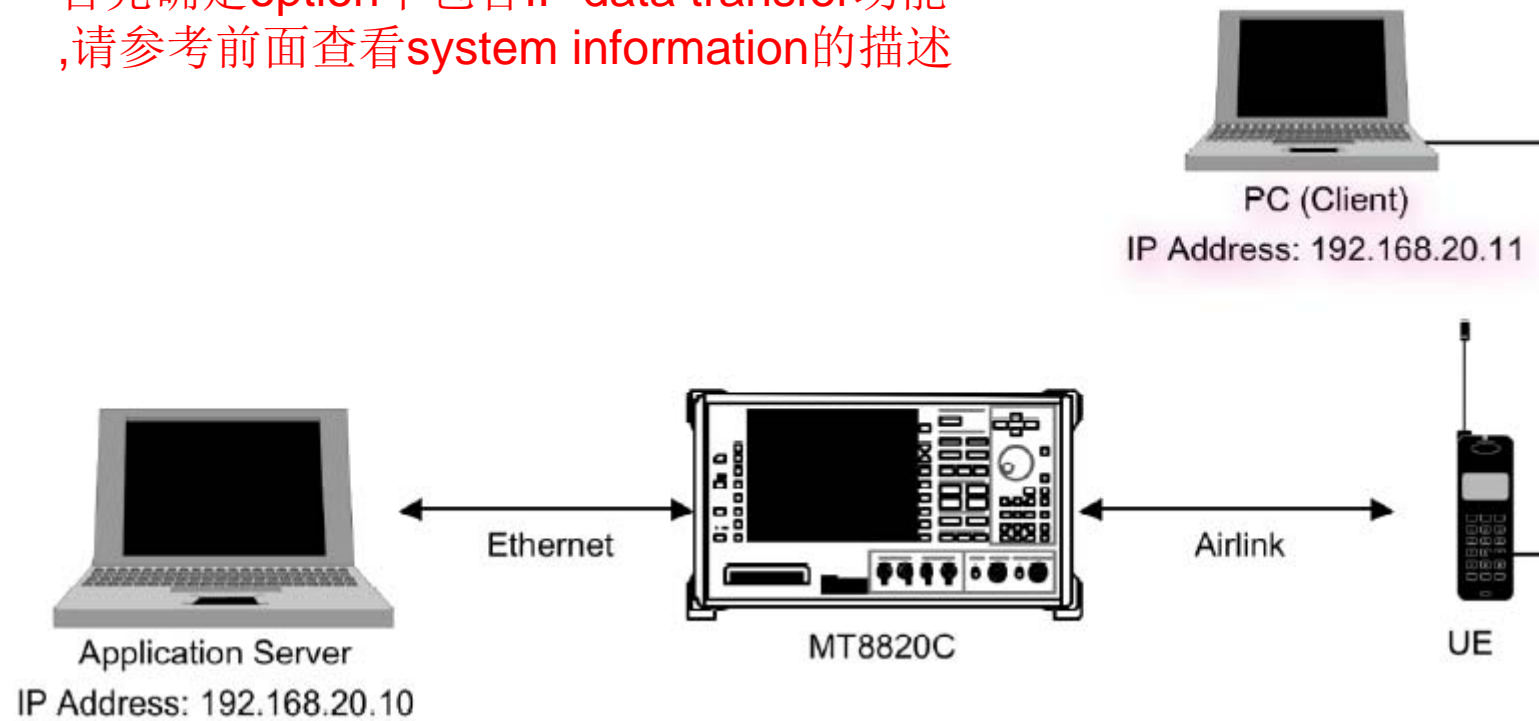
有两个code word

# ***IP data transfer测试***



# 连接方法

首先确定option中包含IP data transfer功能  
,请参考前面查看system information的描述

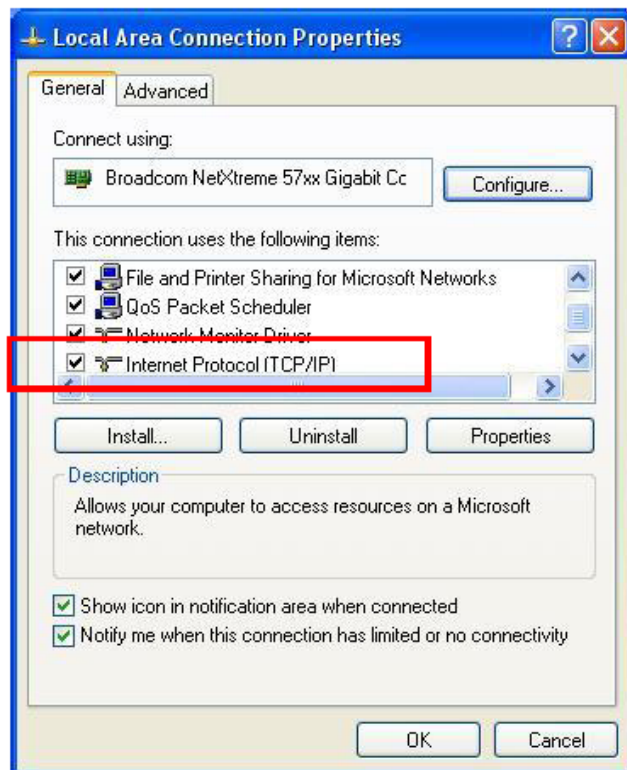


使用交叉网线连接MT8820C的  
网口(如图所示)和Application  
Server的网口

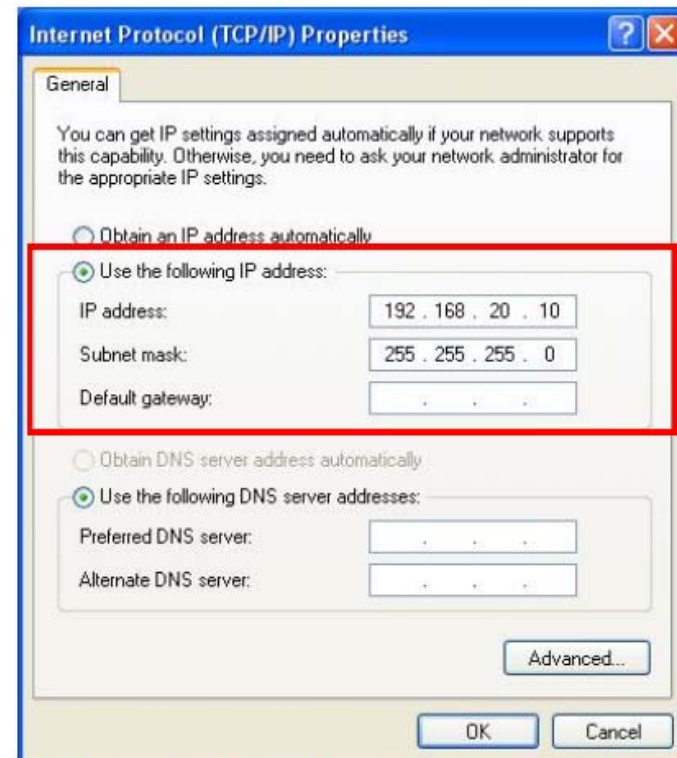


1000Base-TX/100Base-TX/10Base-T Port

## 设置Application Server的IP地址



Local Area Network Connection Properties (Windows XP)



Internet Protocol (TCP/IP) Properties Window (Windows XP)

## 关闭Application Server的防火墙



Advanced Tab of Local Area Network Connection Properties Window (Windows XP)

在MT8820C上设置IP地址:

**Server IP address**需要和前面**Application Server**的  
**IP地址**一致

**Client IP address**是分配给UE的IP地址

Packet Parameter				
Server IP Address	192	168	20	10
Client IP Address	192	168	20	11
Subnet Mask	255	255	255	0
Default Gateway	192	168	20	1

Client IP Address setting on the Call Processing Parameter setting display

- 注意！ MT8820C下面的设置会影响上行和下行的throughput:  
number of RB, MCS index

UL RMC							
Number of RB		100					
Starting RB		0					
MCS Index		20	16QAM	(19)	(43816)	Aggregation Level	C-RNTI
							2
DL RMC							
Number of RB		100					
Starting RB		0					
MCS Index	(1-4,6-9)	28	(64QAM)	(26)	( 75376)	SI-RNTI	C-RNTI
							2
MCS Index	(5)	28	(64QAM)	(26)	( 71112)	4	2
MCS Index	(0)	28	(64QAM)	(26)	( 75376)	-	2
MCS Index	(-)	(N/A)	(-----)	(--)	(-----)	-	-
CFI		( 1)					

UL/DL RMC Settings at Common Parameter Setting Screen

## 建立和UE连接（IP transfer）

- 按preset，然后按F1，初始化仪表

- 设置FDD/TDD

Frame Structure    FDD

- 设置带宽、channel，注意Frequency会随着channel自动变化

Channel Bandwidth	10MHz
UL Channel & Frequency	20175 CH = 1732.500000 MHz
DL Channel & Frequency	2175 CH = 2132.500000 MHz

- 设置Channel Coding为Packet.

- 单天线时设置天线模式为Single，两天线时设置天线模式为2x2 MIMO

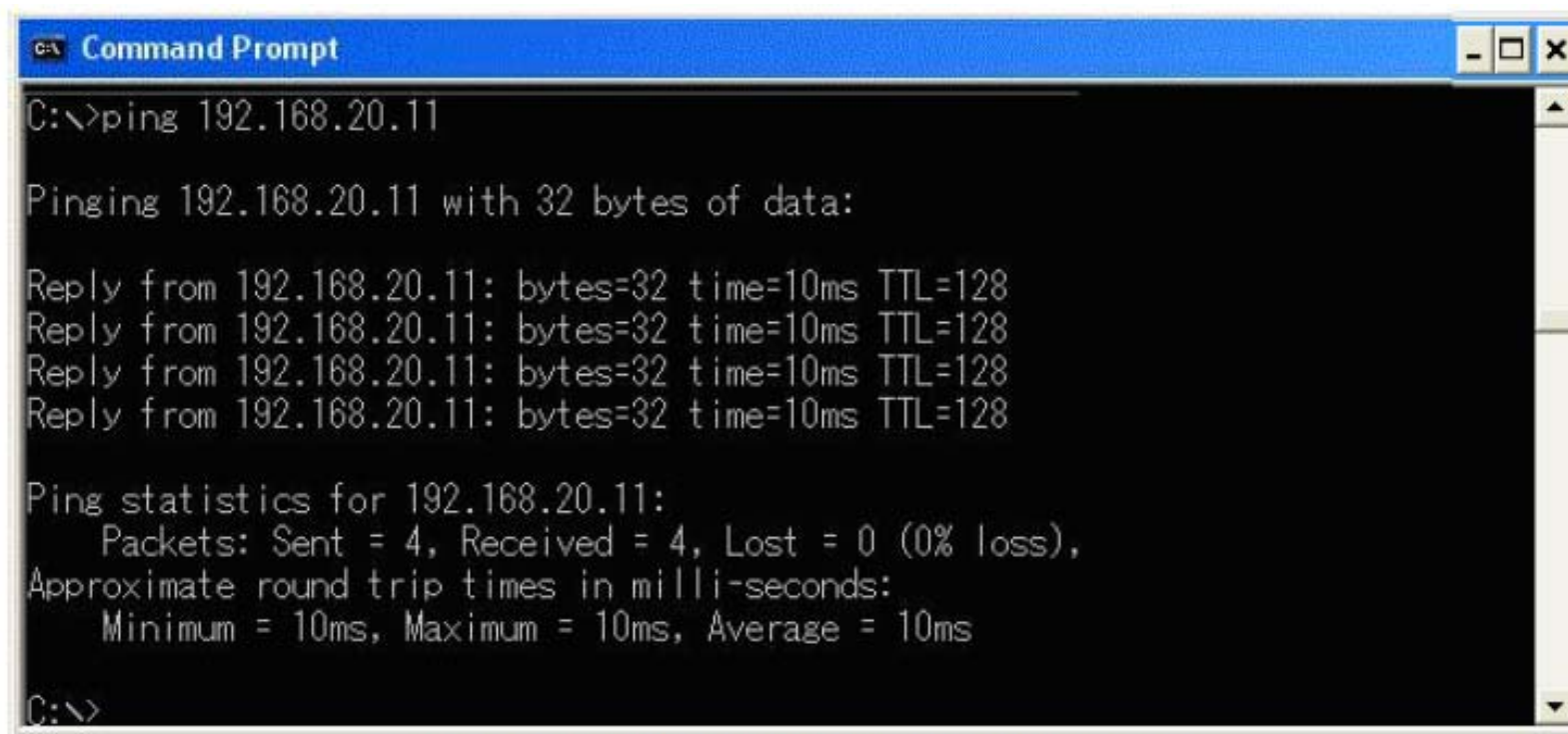
Signal	
Channel Coding	Packet
Antenna Configuration	Single
RMC Configuration	PUSCH

- 插入Anritsu提供的USIM到UE，UE开机，当状态为connected表示成功连接

2010/04/20 15:22	Connected	Phone-2	Phone-1
------------------	-----------	---------	---------

- UE拨号获得IP address

使用**Ping**检验Application Server和Client PC和联接



```
C:\>ping 192.168.20.11

Pinging 192.168.20.11 with 32 bytes of data:

Reply from 192.168.20.11: bytes=32 time=10ms TTL=128
Reply from 192.168.20.11: bytes=32 time=10ms TTL=128
Reply from 192.168.20.11: bytes=32 time=10ms TTL=128
Reply from 192.168.20.11: bytes=32 time=10ms TTL=128

Ping statistics for 192.168.20.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 10ms, Average = 10ms

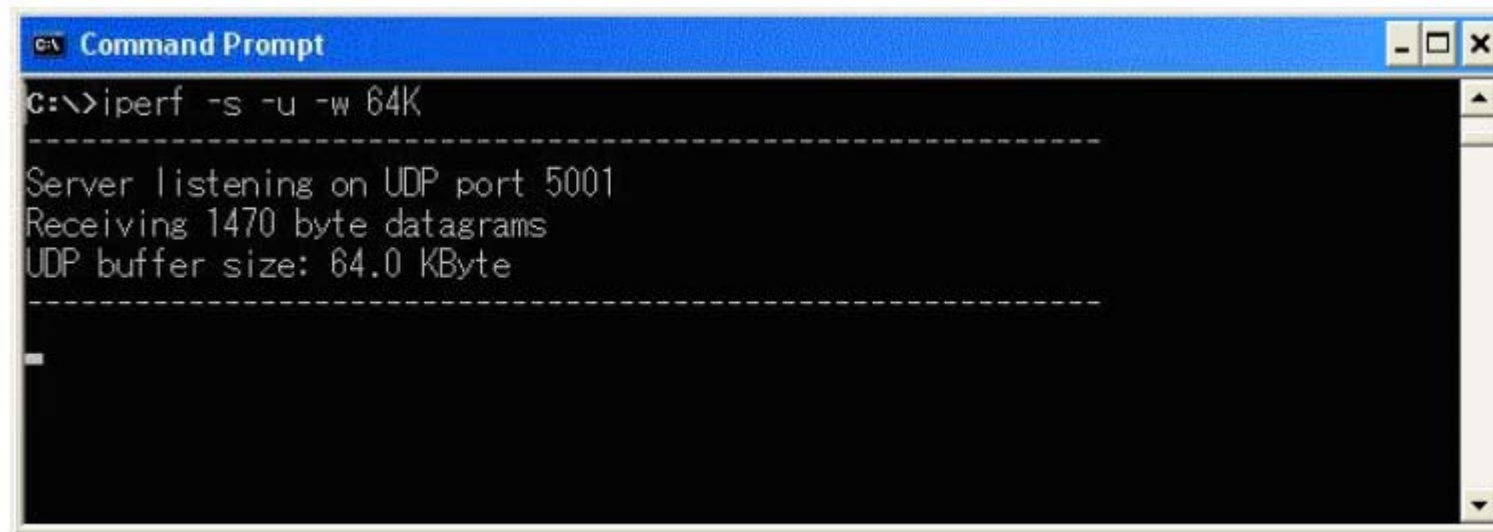
C:\>
```

Ping Result at Application Server (Windows XP)



# 使用Iperf（UDP Transfer）

## Client PC



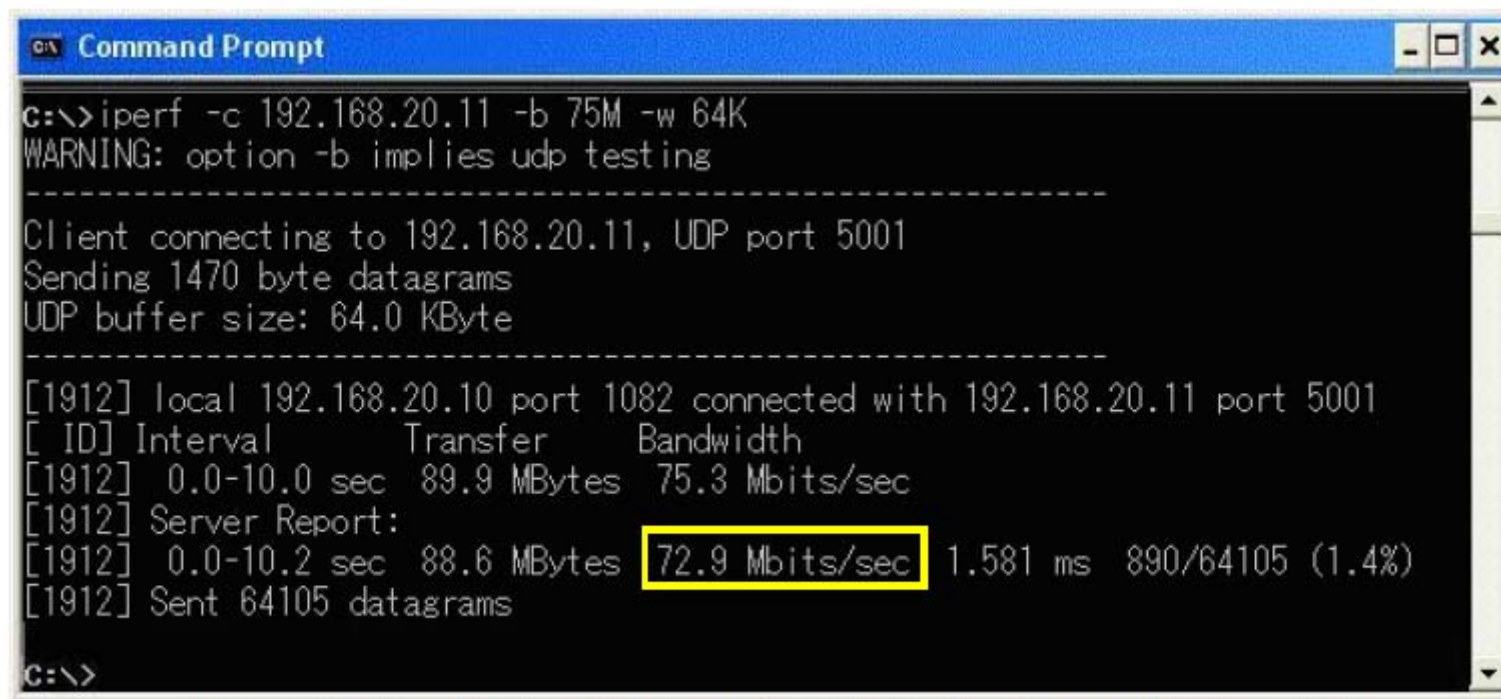
```
C:\>iperf -s -u -w 64K

-----
Server listening on UDP port 5001
Receiving 1470 byte datagrams
UDP buffer size: 64.0 KByte
-----
```

Screen after Running Iperf Command on Client PC (Windows XP)

# 使用Iperf（UDP Transfer）

## Application Server



The screenshot shows a Windows XP Command Prompt window titled "Command Prompt". The command entered is `c:\>iperf -c 192.168.20.11 -b 75M -w 64K`. The output shows a warning about UDP testing, connection details, and a performance report. The bandwidth result of 72.9 Mbits/sec is highlighted with a yellow box.

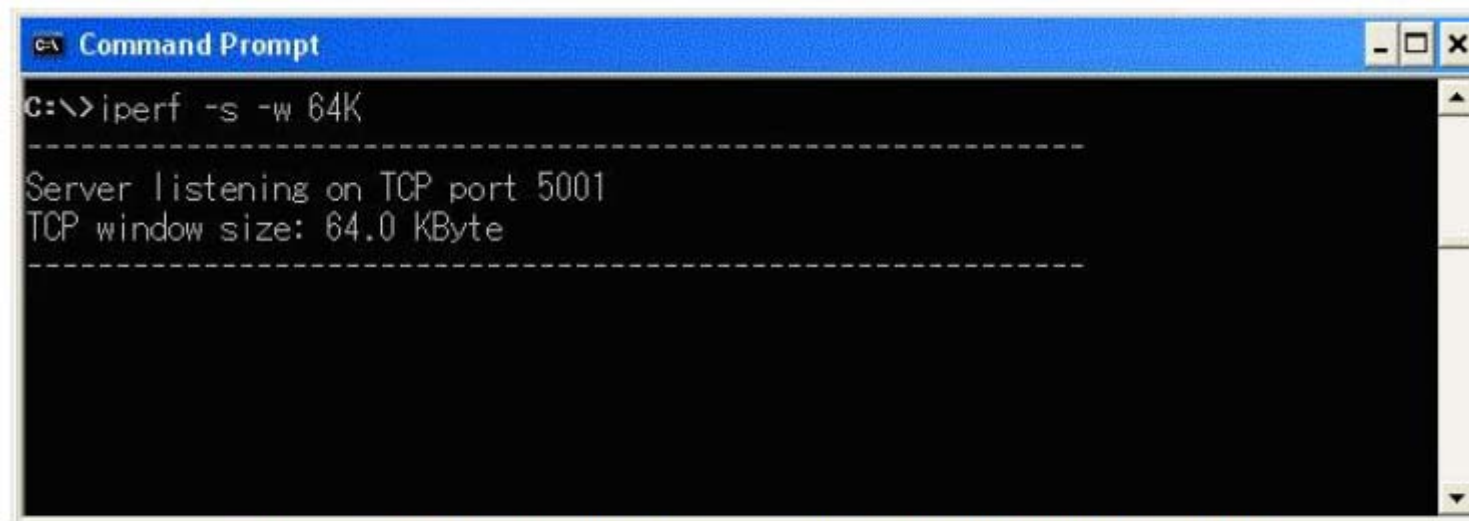
```
c:\>iperf -c 192.168.20.11 -b 75M -w 64K
WARNING: option -b implies udp testing
-----
Client connecting to 192.168.20.11, UDP port 5001
Sending 1470 byte datagrams
UDP buffer size: 64.0 KByte
-----
[1912] local 192.168.20.10 port 1082 connected with 192.168.20.11 port 5001
[ ID] Interval      Transfer    Bandwidth
[1912] 0.0-10.0 sec  89.9 MBytes 75.3 Mbits/sec
[1912] Server Report:
[1912] 0.0-10.2 sec  88.6 MBytes 72.9 Mbits/sec 1.581 ms 890/64105 (1.4%)
[1912] Sent 64105 datagrams

c:\>
```

Screen after Running Iperf Command on Application Server (Windows XP)

# 使用Iperf (TCP Transfer)

## Client PC

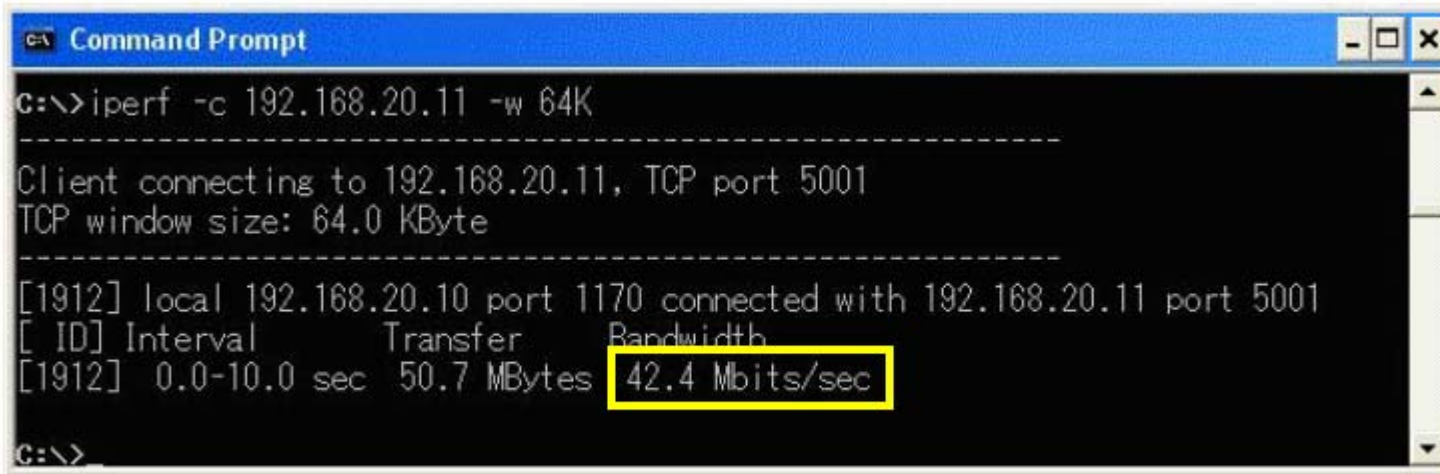


```
C:\>iperf -s -w 64K  
-----  
Server listening on TCP port 5001  
TCP window size: 64.0 KByte  
-----
```

Screen after Running Iperf Command at Client PC (Windows XP)

# 使用Iperf (TCP Transfer)

## Application Server

A screenshot of a Windows XP Command Prompt window. The title bar is blue and says "Command Prompt". The command prompt shows the command "C:\>iperf -c 192.168.20.11 -w 64K". Below the command, it shows "Client connecting to 192.168.20.11, TCP port 5001" and "TCP window size: 64.0 KByte". Then, it shows "[1912] local 192.168.20.10 port 1170 connected with 192.168.20.11 port 5001". Finally, it shows a table with three columns: "ID", "Interval", "Transfer", and "Bandwidth". The first row of data is "[1912] 0.0-10.0 sec 50.7 MBytes 42.4 Mbits/sec". The value "42.4 Mbits/sec" is highlighted with a yellow box.

```
C:\>iperf -c 192.168.20.11 -w 64K
-----
Client connecting to 192.168.20.11, TCP port 5001
TCP window size: 64.0 KByte
-----
[1912] local 192.168.20.10 port 1170 connected with 192.168.20.11 port 5001
[ ID] Interval      Transfer    Bandwidth
[1912] 0.0-10.0 sec 50.7 MBytes 42.4 Mbits/sec
C:\>
```

Screen after Running Iperf Command at Application Server (Windows XP)

***Thank you***