CMU200 WCDMA 手机测试步骤

所有测试基于3GPP TS34.121。

CMU200测试前的设置

1. 按“Reset” 键初始化 CMU200。
2. 按“Menu Select”键，选择“WCDMA FDD – Signaling”。
3. 按“BS Signal”软键（屏幕下部），进入“Node-B Settings”，选择“Level Reference”，设置成“Output Channel Power”。
4. 按“Connection”软键（屏幕下部），选择“Dedicated Chann.”软键（屏幕右），设置成“RMC”。
5. 打开手机电源，等待手机注册（在CMU上的状态由“Signal On”变成“Registered”）
6. 按“Connect UE”软键（右上），CMU200会呼叫手机，确认手机已经进入连接状态。

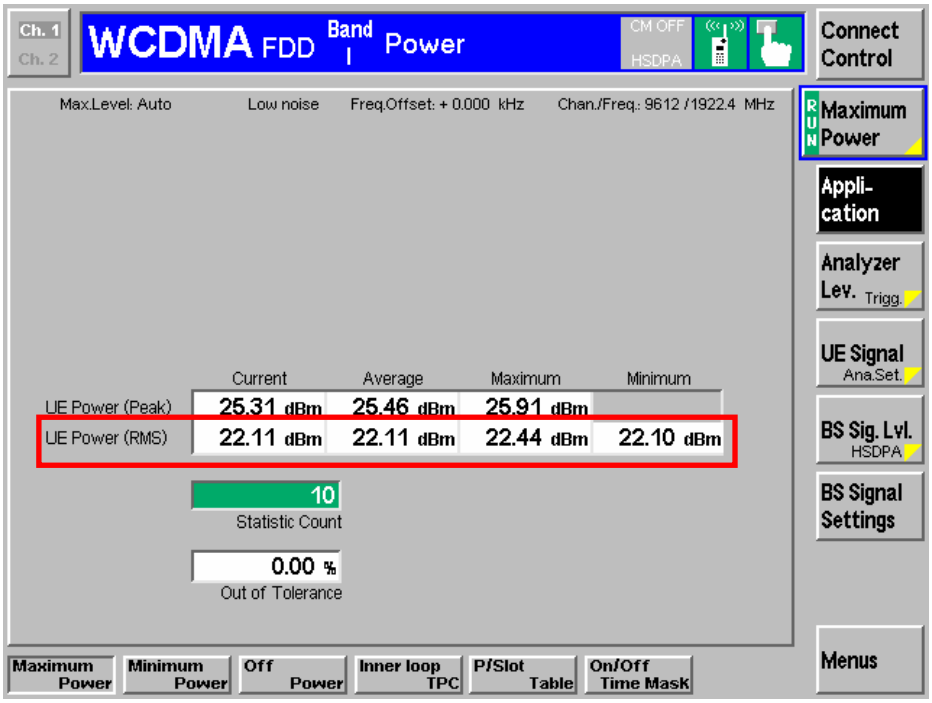
5. 发射机测试项目：

- ✓ **5.2 Maximum Output Power**
- ✓ **5.3 Frequency Error**
- ✓ **5.4 Output Power Dynamics in the Uplink**
  - 5.4.1 Open Loop Power Control in the Uplink
  - 5.4.2 Inner Loop Power Control in the Uplink
  - 5.4.3 Minimum Output Power
- ✓ **5.5 Transmit ON/OFF Time mask**
- ✓ **5.7 Power setting in uplink compressed mode**
- ✓ **5.8 Occupied Bandwidth(OBW)**
- ✓ **5.9 Spectrum emission mask**
- ✓ **5.10 Adjacent Channel Leakage Power Ratio(ACLR)**
- ✓ **5.11 Spurious Emissions**
- ✓ **5.13 Transmit Modulation**
  - 5.13.1 Error Vector Magnitude(EVM)
  - 5.13.2 Peak code domain error
  - 5.13.3 UE phase discontinuity
  - 5.13.4 PRACH preamble quality

5.2 Maximum RF Output Power

1. 确认手机已经进入连接状态。
2. 按“Menus”软键（右下），选择“Power”软键（下部），然后“Application”软键（右上），选择“Maximum Power”软键（下部）。
3. 读取Max power测量值（读取RMS值）。

测量结果：



Minimum Requirements in 3GPP TS34.121

Table 5.2.1: Nominal Maximum Output Power

Operating Band	Power Class 1		Power Class 2		Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+33	+1/-3	+27	+1/-3	+24	+1/-3	+21	+2/-2
Band II	-	-	-	-	+24	+1/-3	+21	+2/-2
Band III	-	-	-	-	+24	+1/-3	+21	+2/-2
Band V	-	-	-	-	+24	+1/-3	+21	+2/-2
Band VI					+24	+1/-3	+21	+2/-2

Test Requirements in 3GPP TS34.121

Table 5.2.2: Nominal Maximum Output Power

Operating Band	Power Class 1		Power Class 2		Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)	Power (dBm)	Tol (dB)
Band I	+33	+1,7/-3,7	+27	+1,7/-3,7	+24	+1,7/-3,7	+21	+2,7/-2,7
Band II	-	-	-	-	+24	+1,7/-3,7	+21	+2,7/-2,7
Band III	-	-	-	-	+24	+1,7/-3,7	+21	+2,7/-2,7
Band V	-	-	-	-	+24	+1,7/-3,7	+21	+2,7/-2,7
Band VI					+24	+1,7/-3,7	+21	+2,7/-2,7

5.3 Frequency Error

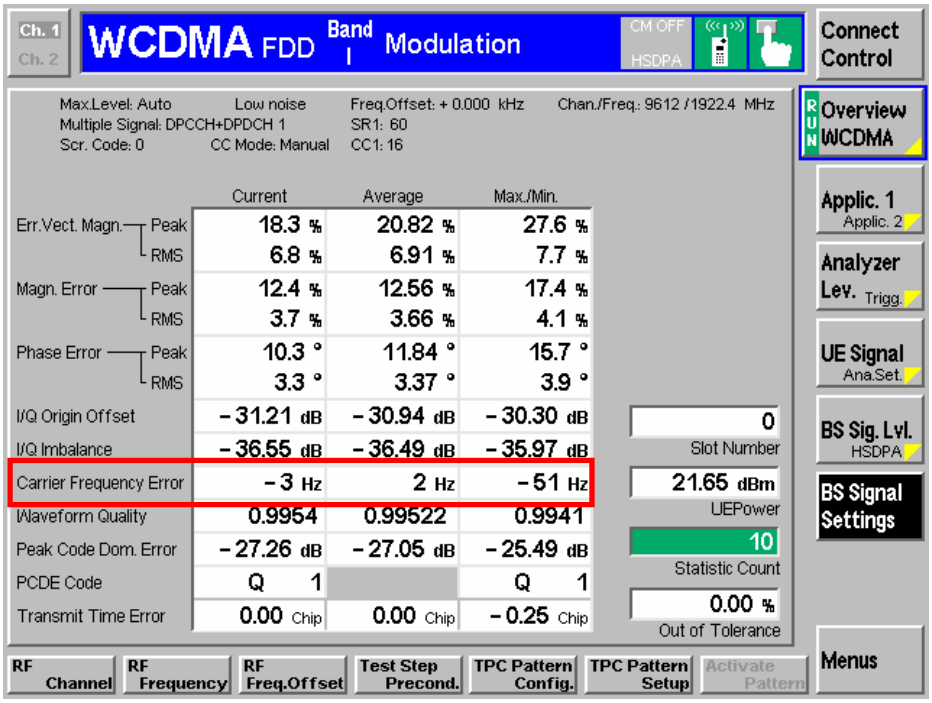
1. 确认手机已经进入连接状态。
2. 按“Menus”软键（右下），选择“Modulation”软键（下部），然后“Applic.1”软键（右上），选择“Overview WCDMA”软键（下部）。
3. 按“BS. Sig.Lvl”软键（右部），选择“Level”软键，设置“Output Chn. Power”为 -106.7dBm，设置“DPCH power”为-10.3dB(默认值)。

Table 5.3: Test parameters for Frequency Error

Parameter	Level / Status	Unit
DPCH_Ec	–117	dBm / 3,84 MHz
$\hat{I}_{or}$	–106,7	dBm / 3,84 MHz

4. 按“BS. Signal Settings”软键（右部），进入“TPC Pattern Config”（下部），设置“Set 2”中的“Pattern Type”为“All 1”；然后设置“TPC Pattern Setup”（下部）为“Set 2”。
5. 读取Carrier frequency error测量值。

测量结果：



Minimum Requirements in 3GPP TS34.121

The UE modulated carrier frequency shall be accurate to within ±0,1 ppm observed over a period of one timeslot compared to the carrier frequency received from the Node B.

Test Requirements in 3GPP TS34.121

For all measurements, the frequency error, shall not exceed ±(0,1 ppm + 10 Hz).

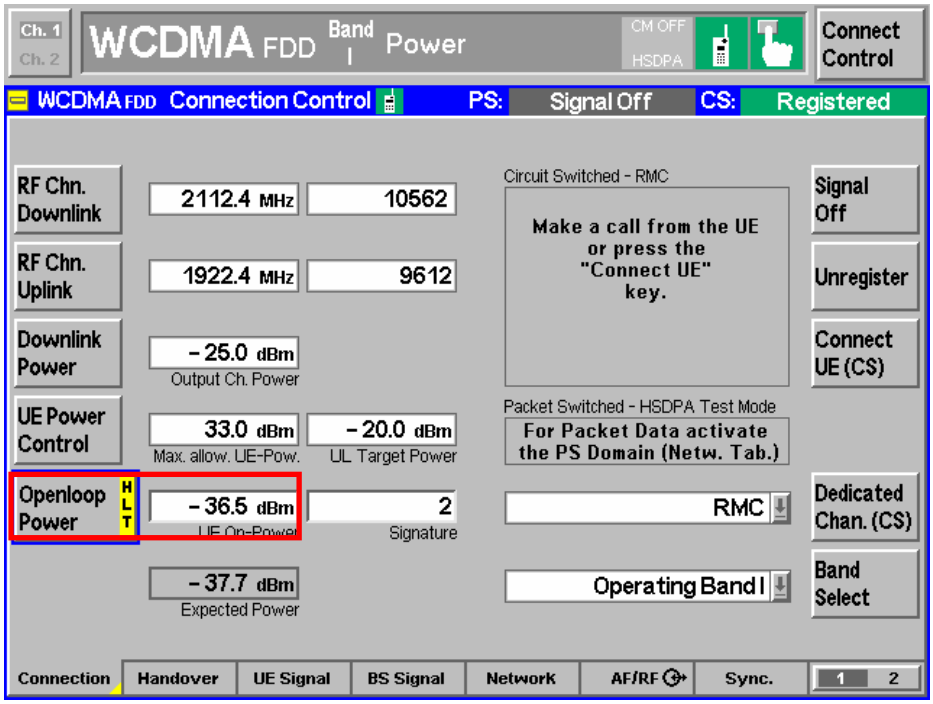
5.4.1 Open Loop Power Control in the Uplink

1. 关闭手机电源。
2. 按“UE signal”软键（下部），选择“UE Power Control”进入“Open Loop”设置如下参数：（以Rx Upper为例）
   – “Primary CPICH DL Tx Power”设成19 dBm；（即为：Reported P-CPICH-POWER）
   – “Uplink Interference”设成 –75 dBm；
   – “Constant Value”设成 –10 dB；
3. 按“Connection”软键（下部），根据下表设置“Downlink Power”（左边软键），以Rx Upper为例，设为-25dBm。
4. 按“OpenLoop Power”软键（左边），按一次“ON/OFF”键（位于数字键下方）打开OpenLoop Power测量。
5. 打开手机电源，等待手机注册，读取OpenLoop Power测量值。
6. 根据Rx Middle和Rx Sensitivity level重复步骤1到5。

Table 5.4.1.3: Test parameters for Open Loop Power Control (SS)

Parameter	RX Upper dynamic end	RX-middle	RX-Sensitivity level
$\hat{I}_{or}$ (note 3)	–25,0 dBm / 3,84 MHz	–65,7 dBm / 3,84 MHz	–106,7 dBm / 3,84 MHz
CPICH_RSCP (notes 3 and 4)	–28,3 dBm	–69 dBm	–110 dBm
Primary CPICH DL TX power	+19 dBm	+28 dBm	+19 dBm
Simulated path loss = Primary CPICH DL TX power – CPICH_RSCP	+47,3 dB	+97 dB	+129 dB
UL interference	–75 dBm	–101 dBm	–110 dBm
Constant Value	–10 dB	–10 dB	–10 dB
Expected nominal UE TX power (note 5)	-37,7 dBm	-14 dBm	+9 dBm (note 2)

测量结果：



Minimum Requirements in 3GPP TS34.121

The deviation with respect to the Expected nominal UE TX power (table 5.4.1.3) shall not exceed the prescribed tolerance in table 5.4.1.1.

Table 5.4.1.1: Open loop power control tolerance

Normal conditions	±9 dB
Extreme conditions	±12 dB

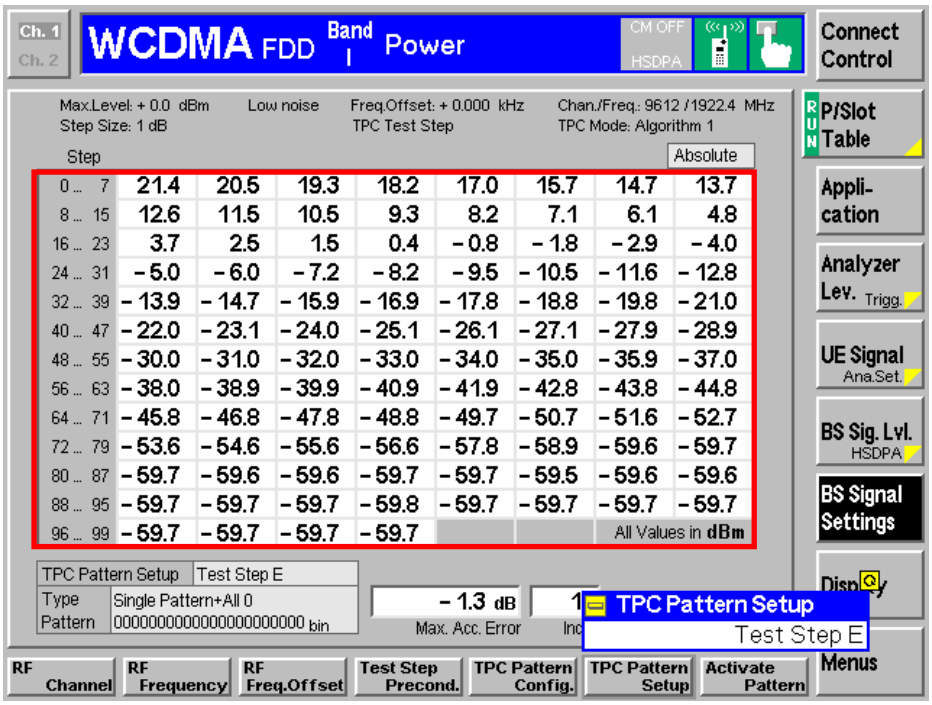
Test Requirements in 3GPP TS34.121

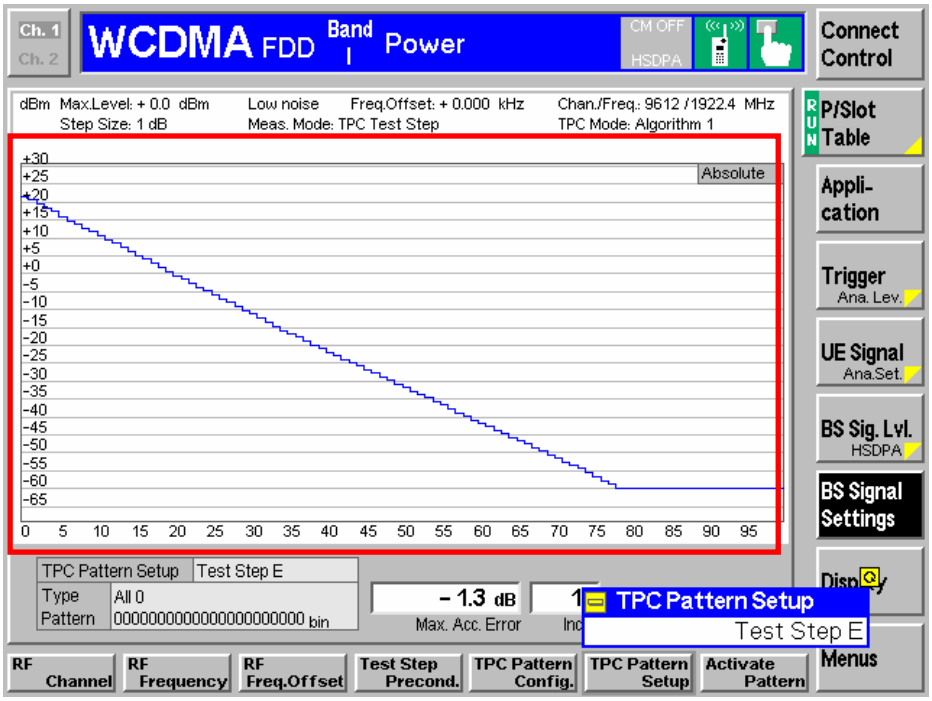
Same as the mininum requirements.

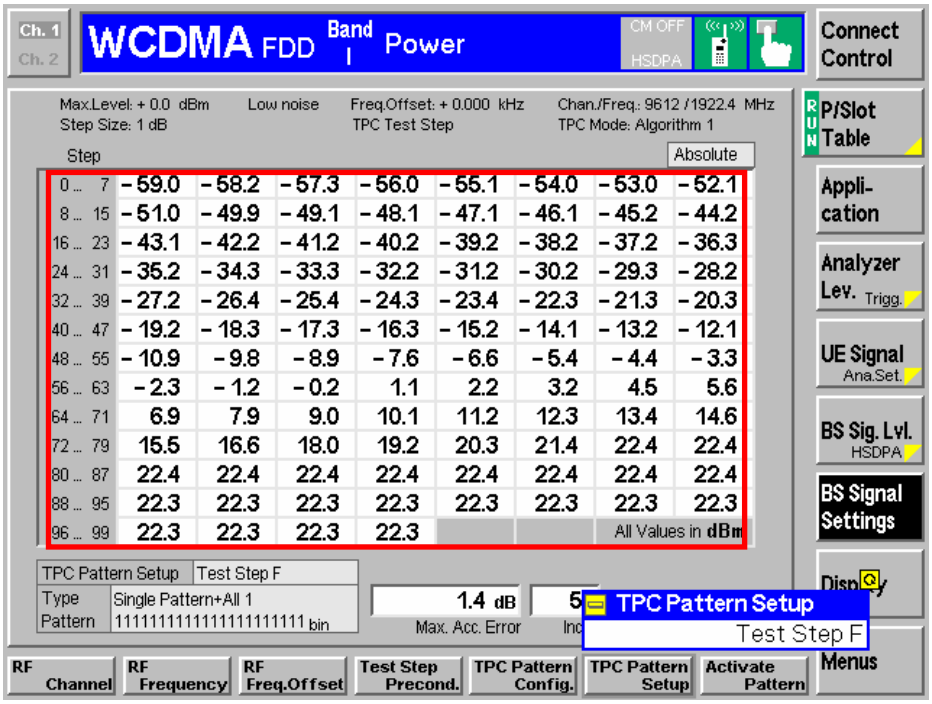
5.4.2 Inner Loop Power Control in the Uplink

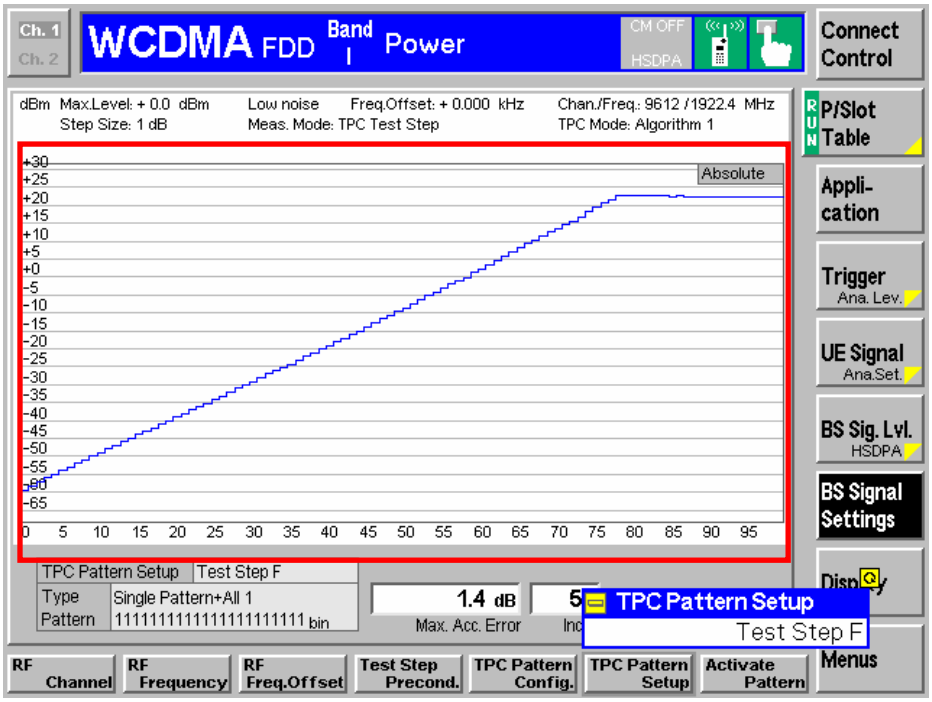
1. 确认手机已经进入连接状态。
2. 按“Menus”软键（右下），选择“Power”软键（下部），然后“Application”软键（右上），选择“Power/slot table”软键（下部）。
3. 按“UE Signal”软键（右部），设置“UL Target Power”为 -10dBm。
4. 按“BS signal setting”软键（右部），设置“TPC Pattern Setup”为“Test Step A”，按“Activate pattern”软键。
5. 读取Power/slot测量值。（提示：再按一次“P/Slot Table“，可以在“Display Mode“菜单（下部）中选择表格或图形显示测试结果）
6. 重复步骤4到6，其中步骤4的“TPC Pattern Setup”分别改为“Test Step B/C/D/E/F/G/H”。

测量结果：




Ch. 1
Ch. 2
WCDMA FDD Band I Power
CM OFF
HSDPA
Connect Control
dBm Max.Level: + 0.0 dBm
Step Size: 1 dB
Low noise
Meas. Mode: TPC Test Step
Freq.Offset: + 0.000 kHz
Chan./Freq.: 9612 / 1922.4 MHz
TPC Mode: Algorithm 1
RUN
P/Slot Table
Absolute
+30
+25
+20
+15
+10
+5
+0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95
Appli-cation
Trigger Ana. Lev.
UE Signal Ana.Set.
BS Sig. Lvl. HSDPA
BS Signal Settings
Display
TPC Pattern Setup
Test Step E
Type
All 0
Pattern
00000000000000000000 bin
- 1.3 dB
Max. Acc. Error
TPC Pattern Setup
Test Step E
Menus
RF Channel
RF Frequency
RF Freq.Offset
Test Step Precond.
TPC Pattern Config.
TPC Pattern Setup
Activate Pattern


Ch. 1
Ch. 2
WCDMA FDD Band I Power
CM OFF
HSDPA
Connect Control
Max.Level: + 0.0 dBm
Step Size: 1 dB
Low noise
Freq.Offset: + 0.000 kHz
TPC Test Step
Chan./Freq.: 9612 / 1922.4 MHz
TPC Mode: Algorithm 1
RUN
P/Slot Table
Step
Absolute
0 ... 7 - 59.0 - 58.2 - 57.3 - 56.0 - 55.1 - 54.0 - 53.0 - 52.1
8 ... 15 - 51.0 - 49.9 - 49.1 - 48.1 - 47.1 - 46.1 - 45.2 - 44.2
16 ... 23 - 43.1 - 42.2 - 41.2 - 40.2 - 39.2 - 38.2 - 37.2 - 36.3
24 ... 31 - 35.2 - 34.3 - 33.3 - 32.2 - 31.2 - 30.2 - 29.3 - 28.2
32 ... 39 - 27.2 - 26.4 - 25.4 - 24.3 - 23.4 - 22.3 - 21.3 - 20.3
40 ... 47 - 19.2 - 18.3 - 17.3 - 16.3 - 15.2 - 14.1 - 13.2 - 12.1
48 ... 55 - 10.9 - 9.8 - 8.9 - 7.6 - 6.6 - 5.4 - 4.4 - 3.3
56 ... 63 - 2.3 - 1.2 - 0.2 1.1 2.2 3.2 4.5 5.6
64 ... 71 6.9 7.9 9.0 10.1 11.2 12.3 13.4 14.6
72 ... 79 15.5 16.6 18.0 19.2 20.3 21.4 22.4 22.4
80 ... 87 22.4 22.4 22.4 22.4 22.4 22.4 22.4 22.4
88 ... 95 22.3 22.3 22.3 22.3 22.3 22.3 22.3 22.3
96 ... 99 22.3 22.3 22.3 22.3
All Values in dBm
Appli-cation
Analyzer Lev. Trigg.
UE Signal Ana.Set.
BS Sig. Lvl. HSDPA
BS Signal Settings
Display
TPC Pattern Setup
Test Step F
Type
Single Pattern+All 1
Pattern
11111111111111111111 bin
1.4 dB
Max. Acc. Error
TPC Pattern Setup
Test Step F
Menus
RF Channel
RF Frequency
RF Freq.Offset
Test Step Precond.
TPC Pattern Config.
TPC Pattern Setup
Activate Pattern



Minimum Requirements in 3GPP TS34.121

Table 5.4.2.1: Transmitter power control range

TPC_cmd	Transmitter power control range (all units are in dB)					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+0,5	+1,5	+1	+3	+1,5	+4,5
0	–0,5	+0,5	–0,5	+0,5	–0,5	+0,5
–1	–0,5	–1,5	–1	–3	–1,5	–4,5

Table 5.4.2.2: Transmitter aggregate power control tolerance

TPC_cmd group	Transmitter power control range after 10 equal TPC_cmd group (all units are in dB)				Transmitter power control range after 7 equal TPC_cmd groups (all units are in dB)	
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+8	+12	+16	+24	+16	+26
0	–1	+1	–1	+1	–1	+1
–1	–8	–12	–16	–24	–16	–26
0,0,0,0,+1	+6	+14	N/A	N/A	N/A	N/A
0,0,0,0,–1	–6	–14	N/A	N/A	N/A	N/A

Test Requirements in 3GPP TS34.121

Table 5.4.2.5.1: Transmitter power control range

TPC_cmd	Transmitter power control range (all units are in dB)					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+0,4	+1,6	+0,85	+3,15	+1,3	+4,7
0	–0,6	+0,6	–0,6	+0,6	–0,6	+0,6
–1	–0,4	–1,6	–0,85	–3,15	–1,3	–4,7

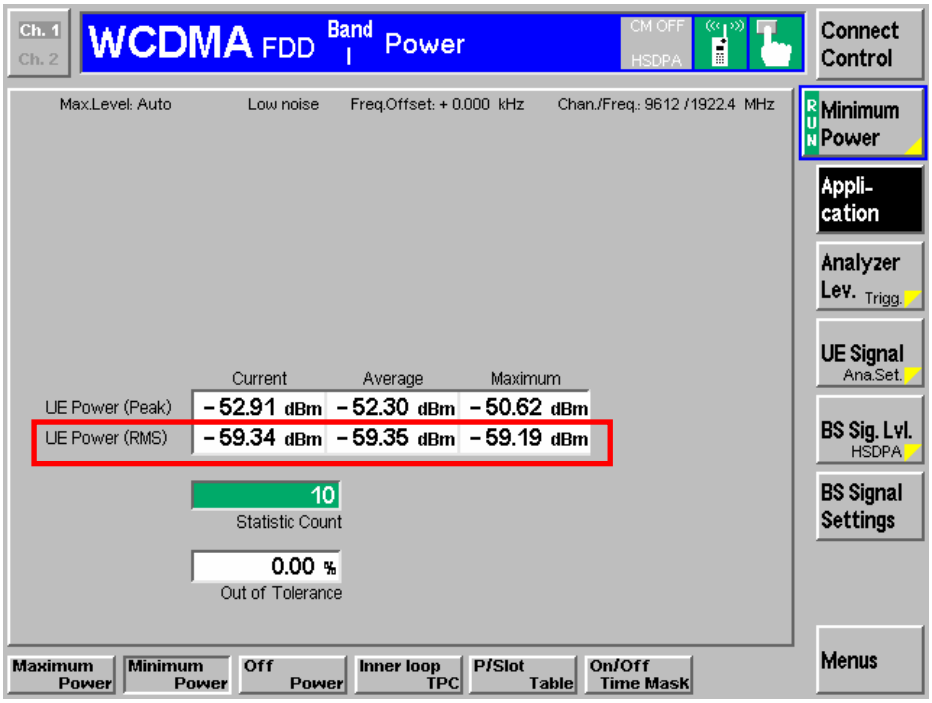
Table 5.4.2.5.2: Transmitter aggregate power control tolerance

TPC_cmd group	Transmitter power control range after 10 equal TPC_cmd group (all units are in dB)				Transmitter power control range after 7 equal TPC_cmd groups (all units are in dB)	
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+1	+7,7	+12,3	+15,7	+24,3	+15,7	+26,3
0	–1,1	+1,1	–1,1	+1,1	–1,1	+1,1
–1	–7,7	–12,3	–15,7	–24,3	–15,7	–26,3
0,0,0,0,+1	+5,7	+14,3	N/A	N/A	N/A	N/A
0,0,0,0,–1	–5,7	–14,3	N/A	N/A	N/A	N/A

5.4.3 Minimum Output Power

1. 确认手机已经进入连接状态。
2. 按“Menus”软键（右下），选择“Power”软键（下部），然后“Application”软键（右上），选择“Minimum Power”软键（下部）。
3. 读取Min power测量值（读取RMS值）。

测量结果：



Minimum Requirements in 3GPP TS34.121

The minimum output power is defined as the mean power in one timeslot. The minimum transmit power shall be less than –50 dBm.

Test Requirements in 3GPP TS34.121

The measured power shall be less than –49 dBm.

5.5.1 Transmit OFF Power

同5.5.2 Transmit ON/OFF Time mask，步骤5改为读取OFF Power即可。

Minimum Requirements in 3GPP TS34.121

The requirement for the transmit OFF power shall be less than –56 dBm.

Test Requirements in 3GPP TS34.121

The measured RRC filtered mean power shall be less than –55 dBm.

5.5.2 Transmit ON/OFF Time mask

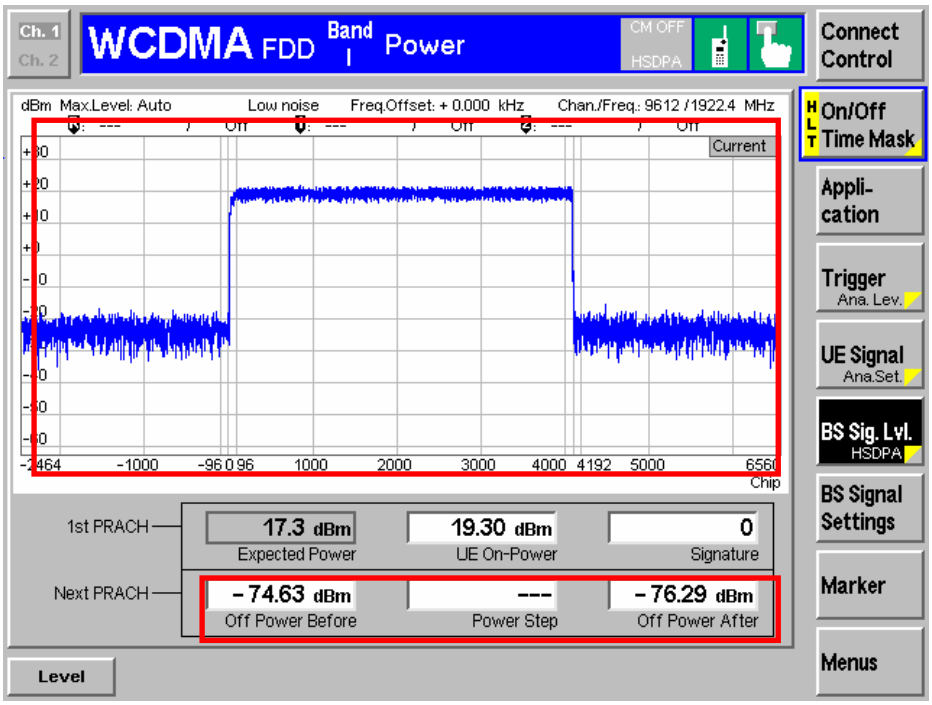
1. 关闭手机电源。
2. 按“UE signal”软键（下部），进入“Open Loop Power Control”设置如下参数：
   – “Primary CPICH DL Tx Power”设成19 dBm；
   – “Uplink Interference”设成 –98 dBm；
   – “Constant Value”设成 –10 dB；

Table 5.5.2.3: Test parameters for Transmit ON/OFF Time mask (SS)

Parameter	Power Class 1	Power Class 2	Power Class 3	Power Class 4	Unit
$\hat{I}_{or}$ (note 1)	–106,7	–106,7	–106,7	–106,7	dBm / 3,84 MHz
CPICH_RSCP (notes 1 and 2)	–110	–110	–110	–110	dBm
Primary CPICH DL TX power	+19	+19	+19	+19	dBm
Simulated path loss = Primary CPICH DL TX power – CPICH_RSCP	+129	+129	+129	+129	dB
UL interference	–86	–92	–95	–98	dBm
Constant Value	–10	–10	–10	–10	dB
Expected nominal UE TX power (note 3)	+33	+27	+24	+21	dBm
NOTE 1: The power level of S-CCPCH should be defined because S-CCPCH is transmitted during Preamble RACH transmission period. The power level of S-CCPCH is temporarily set to –10,3 dB relative to I_{or}. However, it is necessary to check whether the above S-CCPCH level is enough to establish a connection with the reference measurement channels. NOTE 2: The purpose of this parameter is to calculate the Expected nominal UE TX power. NOTE 3: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.7 Open Loop Power Control of TS 25.331 [8].					

3. 按“Connection”软键（下部），根据下表设置“Downlink Power”（左边软键），设为-106.7dBm。
4. 按“Connect. Control”软键，切换到测量界面，按“Menus”软键（右下），选择“Power”软键（下部），然后“Application”软键（右上），选择“ON/OFF time mask”软键（下部）。
5. 打开手机电源，等待手机注册，读取ON/OFF time mask测量值。

测量结果：



Minimum Requirements in 3GPP TS34.121

The transmit power levels versus time shall meet the mask specified in figure 5.5.1 for PRACH preambles, and the mask in figure 5.5.2 for all other cases. The off signal is defined as the RRC filtered mean power.

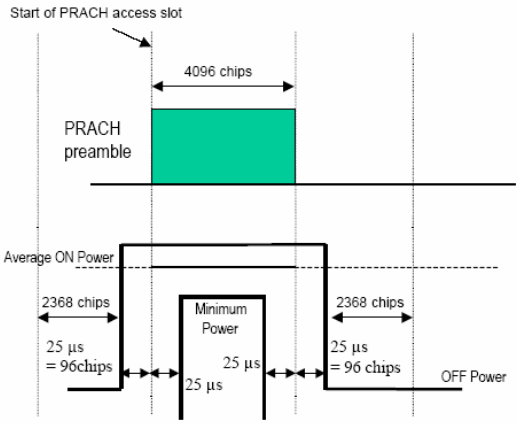


Figure 5.5.1: Transmit ON/OFF template for PRACH preambles

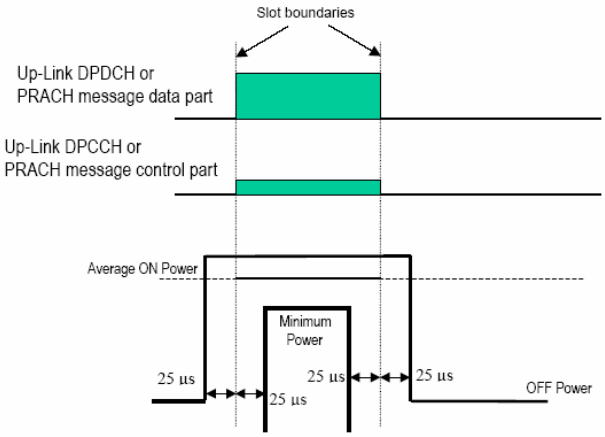
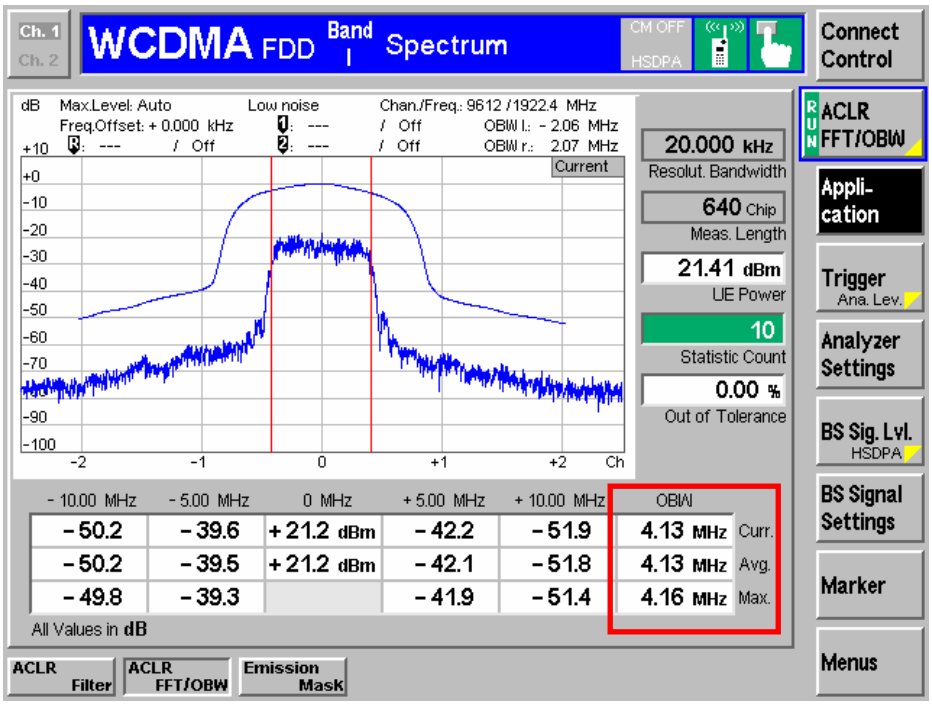


Figure 5.5.2: Transmit ON/OFF template for all other On/Off cases

5.8 Occupied Bandwidth(OBW)

1. 确认手机已经进入连接状态。
2. 按“Menus”软键（右下），选择“Spectrum”软键（下部），然后“Application”软键（右上），选择“ACLR FFT/OBW”软键（下部）。
3. 按“BS. Signal Settings”软键（右部），进入“TPC Pattern Config”（下部），设置“Set 2”中的“Pattern Type”为“All 1”；设置“TPC Pattern Setup”为“set 2”。
4. 读取OBW测量值。

测量结果：



Minimum Requirements in 3GPP TS34.121

The occupied channel bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps.

Test Requirements in 3GPP TS34.121

The measured Occupied Bandwidth shall not exceed 5 MHz.

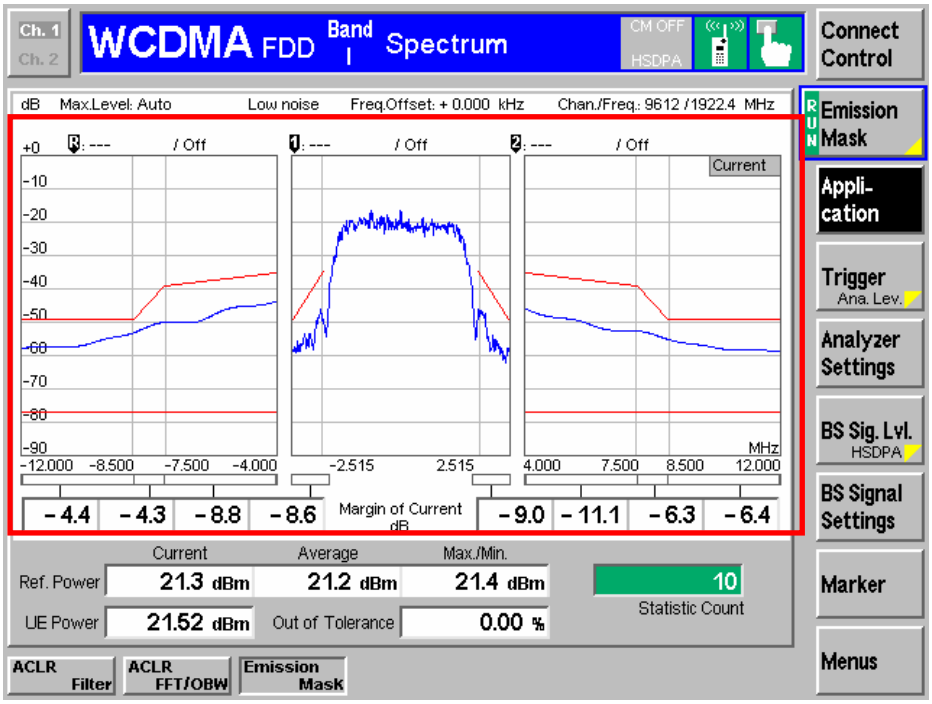
5.9 Spectrum emission mask

1. 确认手机已经进入连接状态。
2. 按“Menus”软键（右下），选择“Spectrum”软键（下部），然后“Application”软键（右上），选择“Emission Mask”软键（下部）。
3. 按“BS. Signal Settings”软键（右部），进入“TPC Pattern Config”（下部），设置“Set 2”中的

“Pattern Type”为“All 1”；然后设置“TPC Pattern Setup”（下部）为“Set 2”。

4. 读取Spectrum emission mask测量值。

测量结果：



Minimum Requirements in 3GPP TS34.121

Table 5.9.1: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	Minimum requirement Band I, II, III, V, VI	Additional requirements Band II and Band V	Measurement bandwidth
2,5 to 3.5	$\left\{-35-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-15 dBm	30 kHz (note 2)
3,5 to 7,5	$\left\{-35-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-13 dBm	1 MHz (note 3)
7,5 to 8,5	$\left\{-39-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-13 dBm	1 MHz (note 3)
8,5 to 12,5	–49 dBc	-13 dBm	1 MHz (note 3)

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter.

NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz and 3,485 MHz.

NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

The lower limit shall be –50 dBm/3,84 MHz or which ever is higher.

Test Requirements in 3GPP TS34.121

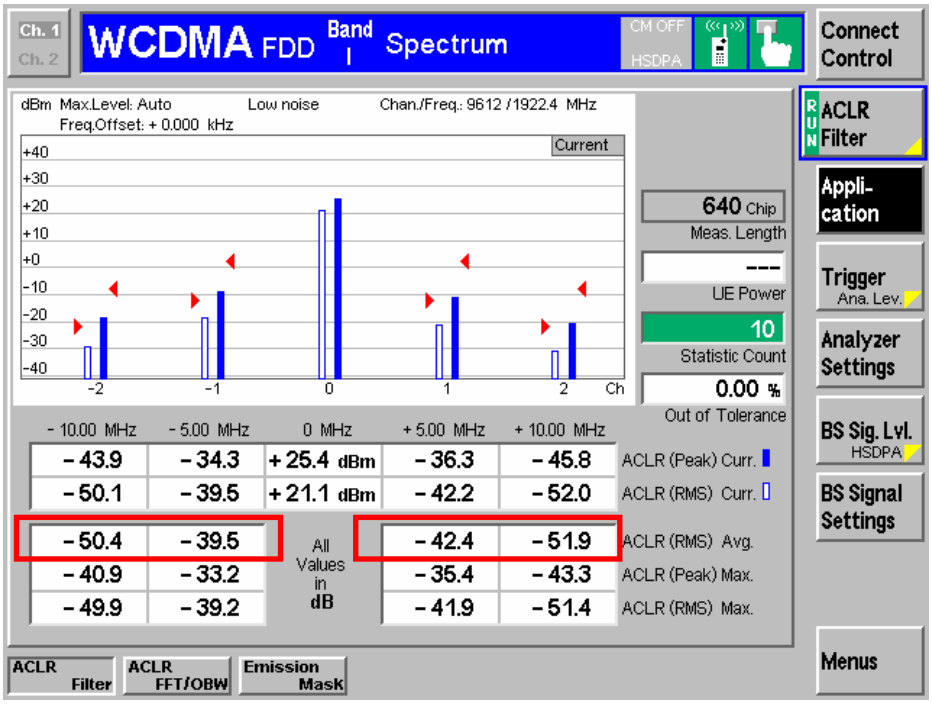
Table 5.9.2: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	Minimum requirement Band I, II, III, V, VI	Additional requirements Band II and Band V	Measurement bandwidth
2,5 to 3,5	$\left\{-33.5-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dB$	-15 dBm	30 kHz (note 2)
3,5 to 7,5	$\left\{-33.5-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dB$	-13 dBm	1 MHz (note 3)
7,5 to 8,5	$\left\{-37.5-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dB$	-13 dBm	1 MHz (note 3)
8,5 to 12,5	–47,5 dBc	-13 dBm	1 MHz (note 3)
NOTE 1: Δf is the separation between the carrier frequency and the centre of the measuring filter. NOTE 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz and 3,485 MHz. NOTE 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.			
The lower limit shall be –48,5 dBm/3,84 MHz or which ever is higher.			

5.10 Adjacent Channel Leakage Power Ratio(ACLR)

同 5.8 OBW，步骤4改为读取ACLR即可。

测量结果：



Minimum Requirements in 3GPP TS34.121

Table 5.10.1: UE ACLR

Power Class	UE channel	ACLR limit
3	+5 MHz or –5 MHz	33 dB
3	+10 MHz or –10 MHz	43 dB
4	+5 MHz or –5 MHz	33 dB
4	+10 MHz or –10 MHz	43 dB

Test Requirements in 3GPP TS34.121

Table 5.10.2: UE ACLR

Power Class	UE channel	ACLR limit
3	+5 MHz or –5 MHz	32,2 dB
3	+10 MHz or –10 MHz	42,2 dB
4	+5 MHz or –5 MHz	32,2 dB
4	+10 MHz or –10 MHz	42,2 dB

5.13.1 Error Vector Magnitude (EVM)

1. 确认手机已经进入连接状态。
2. 按“Menus”软键（右下），选择“Modulation”软键（下部），然后“Application”软键（右上），选择“Overview WCDMA”软键（下部）。
3. 按“BS. Signal Settings”软键（右部），进入“TPC Pattern Config”（下部），设置“Set 2”中的“Pattern Type”为“All 1”；然后设置“TPC Pattern Setup”（下部）为“Set 2”。
4. 读取EVM测量值（读取RMS值）。
5. 按“BS. Signal Settings”软键（右部），设置“TPC Pattern Setup”为“Set 1”。
6. 按“UE Signal/UL Target Power”软键（右部），设置“UL Target Power”为 -20dBm。
7. 重复步骤4。

Minimum Requirements in 3GPP TS34.121

The EVM shall not exceed 17,5 % for the parameters specified in table 5.13.1.

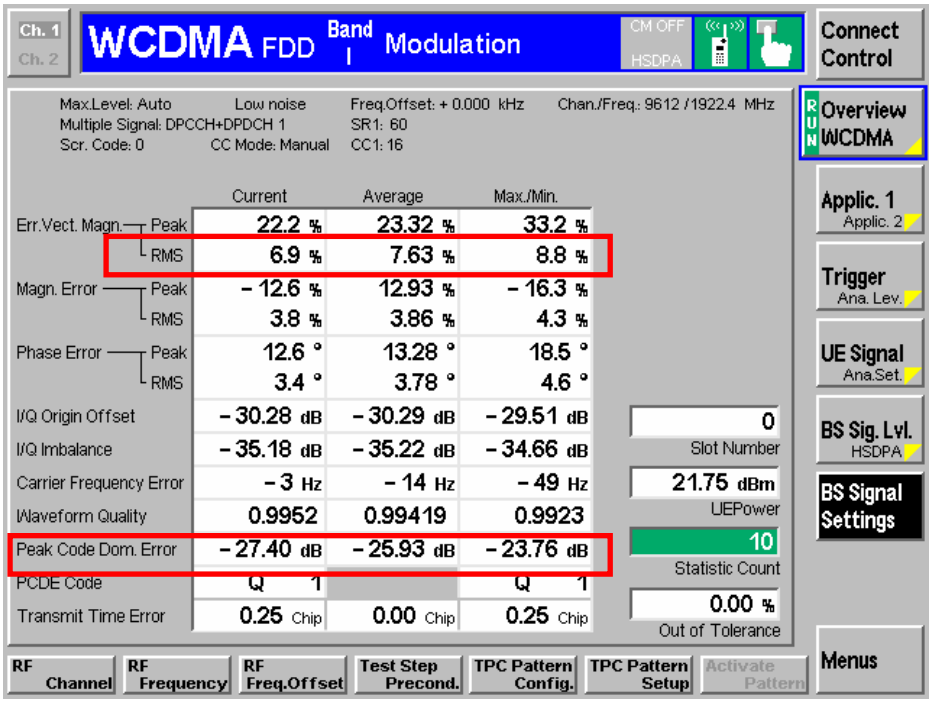
Table 5.13.1: Parameters for EVM

Parameter	Level / Status	Unit
Output power	≥ –20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

Test Requirements in 3GPP TS34.121

The measured EVM shall not exceed 17,5 %. for parameters specified in table 5.13.1 Parameters for EVM.

测量结果：



5.13.2 Peak code domain error

同 5.13.1 EVM，步骤4改为读取PCDE即可。

Minimum Requirements in 3GPP TS34.121

The peak code domain error shall not exceed -15 dB at spreading factor 4 for the parameters specified in table 5.13.3.

Table 5.13.3: Parameters for Peak code domain error

Parameter	Level / Status	Unit
Output power	≥ −20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

Test Requirements in 3GPP TS34.121

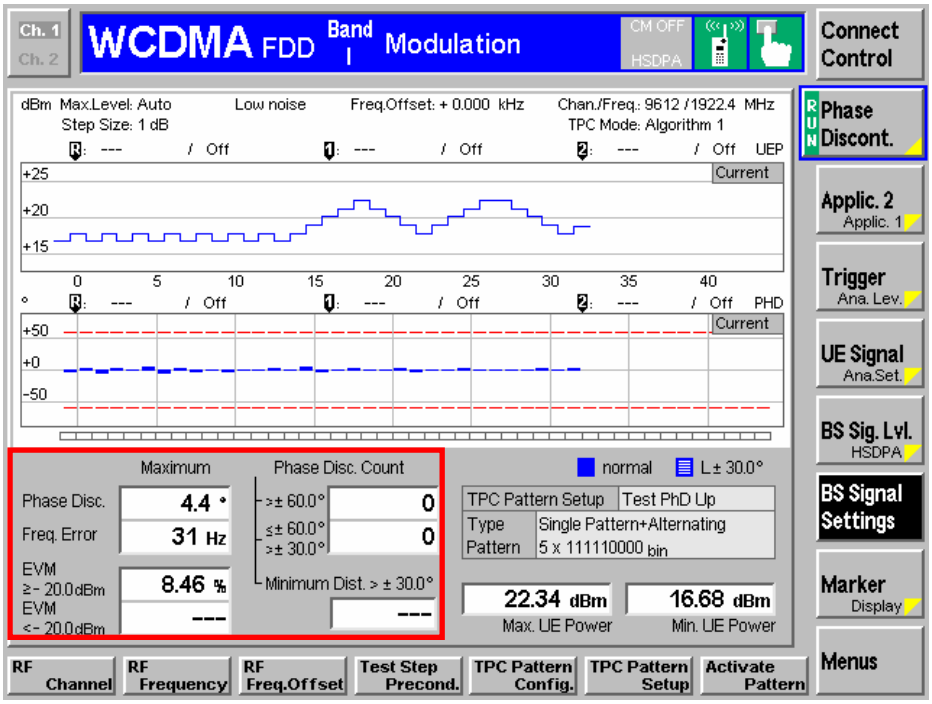
The measured Peak code domain error shall not exceed -14 dB.

5.13.3 UE phase discontinuity

1. 确认手机已经进入连接状态。
2. 按“Menus”软键（右下），选择“Modulation”软键（下部），按“Applic.1”软键两次（右上）以进入“Applic.2”，选择“PHDisc”软键（下部）。
3. 按“BS. Signal Settings”软键（右部），进入“TPC Pattern Config”（下部），设置“Set 2”中的“Pattern Type”为“All 1”；然后设置“TPC Pattern Setup”（下部）为“Set 2”。
4. 等待手机到达最大发射功率后，设置“TPC Pattern Setup”为“PhD Down”。
5. 按“Activate Pattern”软键，读取UE phase discontinuity测量值。
6. 重复步骤5直到手机到达最小功率。
7. 设置“TPC Pattern Setup”为“Test PhD Up”。

8. 按“Activate Pattern”软键，读取UE phase discontinuity测量值。
9. 重复步骤5直到手机到达最大功率。

测量结果：



Minimum Requirements in 3GPP TS34.121

The rate of occurrence of any phase discontinuity on an uplink DPCH for the parameters specified in table 5.13.1 shall not exceed the values specified in table 5.13.2. Phase shifts that are caused by changes of the UL transport format combination (TFC) and compressed mode are not included. When calculating the phase discontinuity, the requirements for frequency error and EVM in subclauses TS 25.101 [1] 6.3 and TS 25.101 [1] 6.8.2 for each timeslot shall be met.

Table 5.13.1: Parameters for Phase discontinuity

Parameter	Unit	Level
Power control step size	dB	1

Table 5.13.2: Phase discontinuity minimum requirement

Phase discontinuity Δθ in degrees	Maximum allowed rate of occurrence in Hz
$\Delta\theta \leq 30$	1500
$30 < \Delta\theta \leq 60$	300
$\Delta\theta > 60$	0

Test Requirements in 3GPP TS34.121

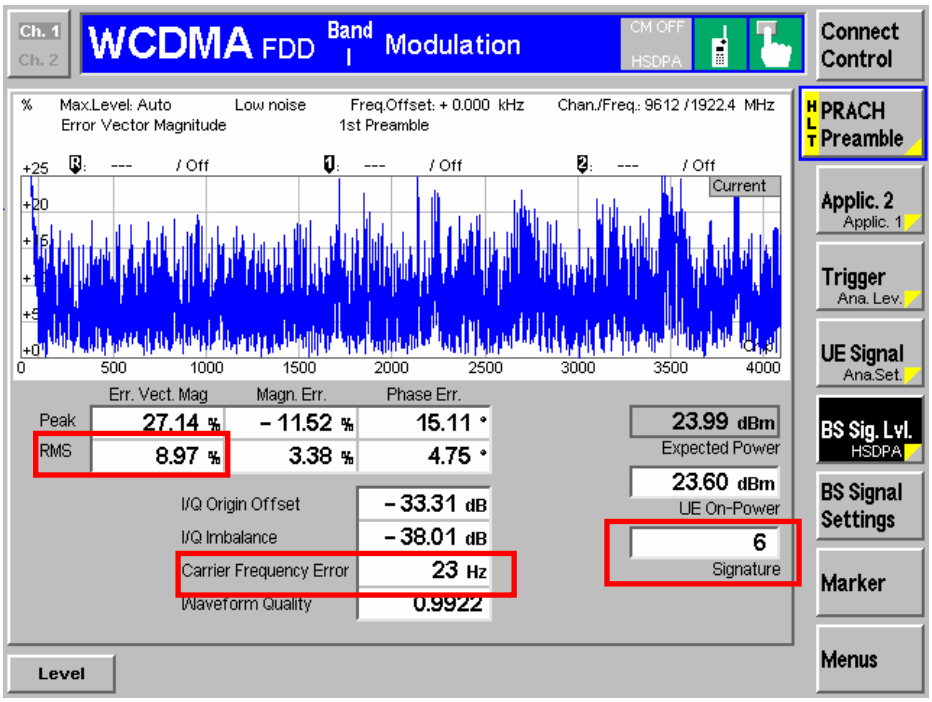
a) The EVM of every measured slot which is above –20 dBm shall not exceed 17.5%
b) The Frequency error of every measured slot shall not exceed 0.1 PPM.
c) The phase discontinuity measurements made between any two adjacent slots shall be less than or equal to 30 degrees. If a phase discontinuity measurement is greater than 30

degrees and less than or equal to 60 degrees then the next four measurements shall be less than or equal to 30 degrees. No measurement shall exceed 60 degrees.

5.13.4 PRACH preamble quality

1. 关闭手机电源。
2. 按“UE signal”软键（下部），进入“Open Loop Power Control”设置如下参数：
   – “Primary CPICH DL Tx Power”设成24 dBm；
   – “Uplink Interference”设成 –98 dBm；
   – “Constant Value”设成 –10 dB；
3. 按“Connection”软键（下部），根据下表设置“Downlink Power”（左边软键），设为-101.7dBm。
4. 按“Connect. Control”软键，切换到测量界面，按“Menus”软键（右下），选择“Modulation”软键（下部），按“Applic.1”软键两次（右上）以进入“Applic.2”，选择“PRACH”软键（下部）。
5. 打开手机电源，等待手机注册，读取PRACH preamble quality测量值。

测量结果：



Minimum Requirements in 3GPP TS34.121

The EVM of the PRACH preamble observed over the interval of 3904 chips (i.e. excluding the transient periods) shall not exceed 17.5%.

The UE modulated carrier frequency used to transmit the PRACH preamble observed over the interval of 3904 chips (i.e. excluding the transient periods) shall be within ± 0.1 PPM compared to the carrier frequency received from the Node B.

The PRACH preamble shall be transmitted in the correct access slot using the correct signature as defined by the parameters signalled to the UE.

Test Requirements in 3GPP TS34.121

1) The EVM shall not exceed 17,5 %.
2) The frequency error shall not exceed ±(0,1 ppm + 10 Hz).
3) The detected access slot and signature shall be correct according to the physical random access procedure defined in 3GPP TS 25.214.

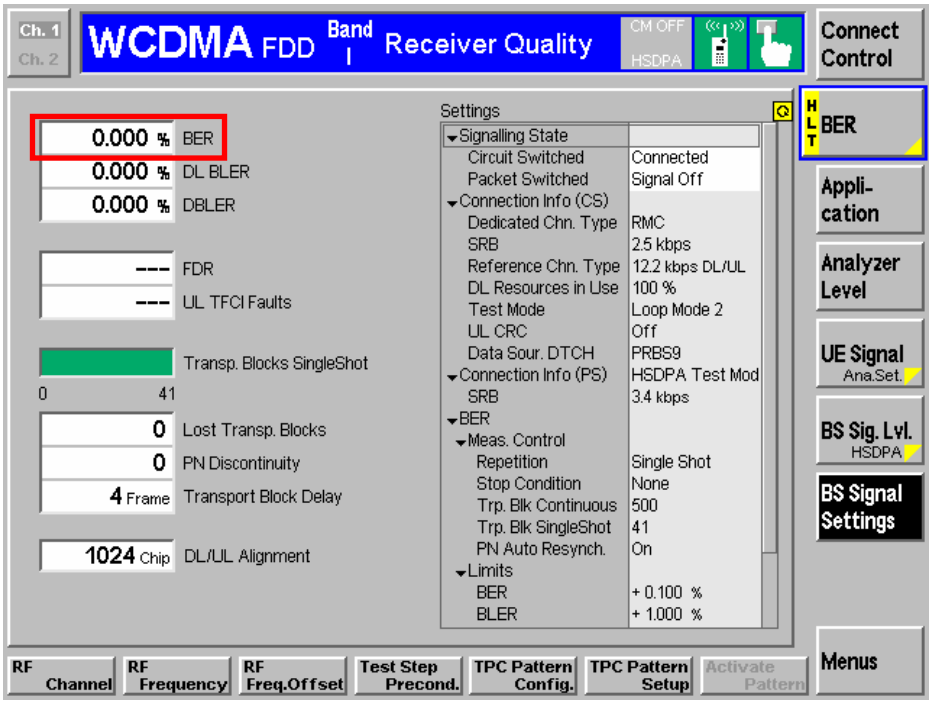
6. 接收机测试项目：

- ✓ **6.2 Reference Sensitivity Level**
- ✓ **6.3 Maximum Input Level**

6.2 Reference Sensitivity Level

1. 确认手机已经进入连接状态。
2. 按“Menus”软键（右下），选择“Receiver Quality”软键（下部），按“Application”软键，选择“BER”软键（下部）。
3. 按 ”BER” 软键（右部），设置“Transp. Blocks” 软键（下部）中的“Single shot”为41，“Repetition”软键（下部）为“Single Shot”。
4. 按“BS. Sig.Lvl”软键（右部），选择“Level”软键（下部），设置“Channel Power”为-106.7dBm，并设置“DPCH Power”为-10.3dB。
5. 按“BS. Signal Settings”软键（右部），进入“TPC Pattern Config”（下部），设置“Set 2”中的“Pattern Type”为“All 1”；然后设置“TPC Pattern Setup”（下部）为“Set 2”。
6. 按“On/Off”键，启动一次BER测量，读取测量值。

测量结果：



Minimum Requirements in 3GPP TS34.121

The BER shall not exceed 0,001 for the parameters specified in table 6.2.1.

Table 6.2.1: Test parameters for Reference Sensitivity Level

Operating Band	Unit	DPCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>
I, VI	dBm/3.84 MHz	-117	-106.7
II	dBm/3.84 MHz	-115	-104.7
III	dBm/3.84 MHz	-114	-103.7
V	dBm/3.84 MHz	-115	-104.7
1. For Power class 3 this shall be at the maximum output power 2. For Power class 4 this shall be at the maximum output power			

Test Requirements in 3GPP TS34.121

The measured BER, derived in step 2), shall not exceed 0,001.

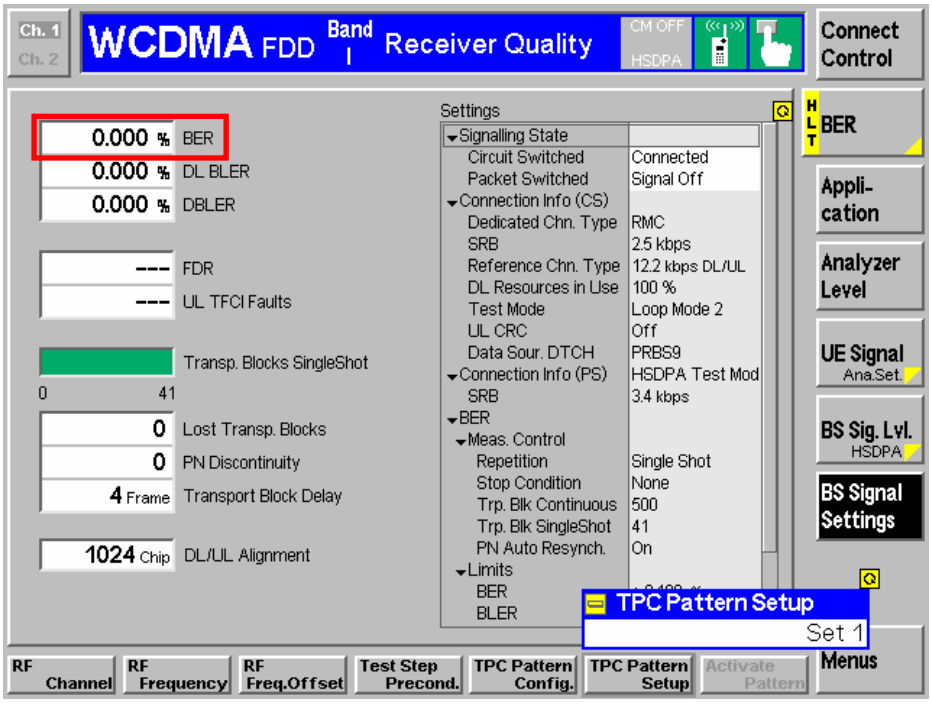
Table 6.2.2: Test parameters for Reference Sensitivity Level

Operating Band	Unit	DPCH_Ec <REFSENS>	<REF$\hat{I}_{or}$>
I, VI	dBm/3.84 MHz	-116.3	-106
II	dBm/3.84 MHz	-114.3	-104
V	dBm/3.84 MHz	-114.3	-104
III	dBm/3.84 MHz	-113.3	-103
3. For Power class 3 this shall be at the maximum output power 4. For Power class 4 this shall be at the maximum output power			

6.3 Maximum Input Level

1. 确认手机已经进入连接状态。
2. 按“Menus”软键（右下），选择“Receiver Quality”软键（下部），按“Application”软键，选择“BER”软键（下部）。
3. 按 ”BER” 软键（右部），设置“Transp. Blocks” 软键（下部）为41，“Repetition”软键（下部）为“Single Shot”。
4. 按“BS. Sig.Lvl”软键（右部），选择“Level”软键（下部），设置“Channel Power”为-25dBm，并设置“DPCH Power”为-19dB。
5. 按“BS. Signal Settings”软键（右部），设置“TPC Pattern Setup”为“set 1”。
6. 按“UE Signal”软键（右部），设置“UL Target Power”为20dBm（class 3 手机） 或者18dBm（class 4 手机）。
7. 按“On/Off”键，启动一次BER测量，读取测量值。

测量结果：



Test Requirements in 3GPP TS34.121

The measured BER shall not exceed 0,001.

Table 6.3.3: Test requirements for Maximum Input Level

Parameter	Level / Status	Unit
$\hat{I}_{or}$	–25.7	dBm / 3,84MHz
$\frac{DPCH\_E_c}{I_{or}}$	–19	dB
UE transmitted mean power	20 (for Power class 3) 18 (for Power class 4)	dBm