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### 2.4 LTE Mode:

2.4.1 one signal input —Lower Edge



2.4.2 one signal input — Upper Edge





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2.4.3 two signal input -Lower Edge



<sup>2.4.4</sup> two signal input —Upper Edge



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2.5 intermodulation spurious emissioins

### For GSM mode:

### 2.5.1 Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=869.6MHz,f2=870.2MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=892.8MHz,f2=893.4MHz

base the 3<sup>rd</sup> product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

- c) in lower edge test,  $F1=2f1-(f1+\Delta f)=f1-\Delta f=$ lower edge frequency;
- d) in higher edge test, F2=2f2-(f2- $\Delta$ f)=f2+ $\Delta$ f=higher edge frequency.

F1=869MHz,F2=894MHz

base the 5<sup>rd</sup> product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

- c) in lower edge test,  $F1=3f1-2(f1+\Delta f)=f1-2\Delta f=$ lower edge frequency;
- d) in higher edge test, F2=3f2-2(f2- $\Delta$ f)=f2+2 $\Delta$ f=higher edge frequency.

F1=868.4MHz,F2=894.6MHz

base the 7<sup>rd</sup> product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

- c) in lower edge test,  $F1=4f1-3(f1+\Delta f)=f1-3\Delta f=$ lower edge frequency;
- d) in higher edge test, F2=4f2-3(f2- $\Delta$ f)=f2+3 $\Delta$ f=higher edge frequency.

F1=867.8MHz,F2=895.2MHz

### 2.5.2 Input power:-20dBm

measure frequency		product Value (dBm)	Limit (dBm)	Over limit (dB)
- rd	Lower:869MHz	-14.42		-1.42
3'	Higher:894MHz	-15.01	-13dBm	-2.01
_ rd	Lower:868.4MHz	-18.25		-5.25
5 <sup>14</sup>	Higher:894.6MHz	-18.96	-13dBm	-5.96
7 <sup>rd</sup>	Lower:867.8MHz	-19.48		-6.48
	Higher:895.2MHz	-19.37	-13dBm	-6.37

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For CDMA mode:

## 2.5.3 Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=871MHz,f2=873MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=890MHz,f2=892MHz

base the 3<sup>rd</sup> product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

- e) in lower edge test,  $F1=2f1-(f1+\Delta f)=f1-\Delta f=$ lower edge frequency;
- f) in higher edge test, F2=2f2-(f2- $\Delta$ f)=f2+ $\Delta$ f=higher edge frequency.

F1=869MHz,F2=894MHz

base the 5<sup>rd</sup> product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

- e) in lower edge test,  $F1=3f1-2(f1+\Delta f)=f1-2\Delta f=$ lower edge frequency;
- f) in higher edge test, F2=3f2-2(f2- $\Delta$ f)=f2+2 $\Delta$ f=higher edge frequency.

F1=867MHz,F2=896MHz

base the 7<sup>rd</sup> product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

- e) in lower edge test, F1=4f1-3(f1+ $\Delta$ f)=f1-3 $\Delta$ f=lower edge frequency;
- f) in higher edge test, F2=4f2-3(f2- $\Delta$ f)=f2+3 $\Delta$ f=higher edge frequency.

## F1=865MHz,F2=898MHz

2.5.4 Input power:-20dBm

measure frequency		product Value (dBm)	Limit (dBm)	Over limit (dB)
- rd	Lower:869MHz	-23.04		-10.04
3.	Higher:894MHz	-23.27	-13dBm	-10.27
-rd	Lower:867MHz	-26.52		-13.52
5 <sup>14</sup>	Higher:896MHz	-27.38	-13dBm	-14.38
7 <sup>rd</sup>	Lower:865MHz	-28.46		-15.46
	Higher:898MHz	-29.12	-13dBm	-16.12

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For WCDMA mode:

### 2.5.5 Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=872MHz,f2=875MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=888MHz,f2=891MHz

base the 3<sup>rd</sup> product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

- g) in lower edge test,  $F1=2f1-(f1+\Delta f)=f1-\Delta f=$ lower edge frequency;
- h) in higher edge test, F2=2f2-(f2- $\Delta$ f)=f2+ $\Delta$ f=higher edge frequency.

F1=869MHz,F2=894MHz

base the 5<sup>rd</sup> product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

- g) in lower edge test,  $F1=3f1-2(f1+\Delta f)=f1-2\Delta f=$ lower edge frequency;
- h) in higher edge test, F2=3f2-2(f2- $\Delta$ f)=f2+2 $\Delta$ f=higher edge frequency.

F1=866MHz,F2=897MHz

base the 7<sup>rd</sup> product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

- g) in lower edge test,  $F1=4f1-3(f1+\Delta f)=f1-3\Delta f=$ lower edge frequency;
- h) in higher edge test, F2=4f2-3(f2- $\Delta$ f)=f2+3 $\Delta$ f=higher edge frequency.

F1=863MHz,F2=900MHz

2.5.6 Input power:-20dBm

measure frequency		product Value (dBm)	Limit (dBm)	Over limit (dB)
ord	Lower:869MHz	-22.55		-9.55
3.3	Higher:894MHz	-21.46	-13dBm	-8.46
-rd	Lower:866MHz	-27.32		-14.32
5' <sup>a</sup>	Higher:897MHz	-28.15	-13dBm	-15.15
7 <sup>rd</sup>	Lower:863MHz	-29.39		-16.39
	Higher:900MHz	-29.47	-13dBm	-16.47

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For LTE mode:

## 2.5.7 Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=874MHz,f2=884MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=879MHz,f2=889MHz

base the  $3^{rd}$  product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

- i) in lower edge test,  $F1=2f1-(f1+\Delta f)=f1-\Delta f=$ lower edge frequency;
- j) in higher edge test, F2=2f2-(f2- $\Delta$ f)=f2+ $\Delta$ f=higher edge frequency.

F1=869MHz,F2=894MHz

base the 5<sup>rd</sup> product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

- i) in lower edge test,  $F1=3f1-2(f1+\Delta f)=f1-2\Delta f=$ lower edge frequency;
- j) in higher edge test, F2=3f2-2(f2- $\Delta$ f)=f2+2 $\Delta$ f=higher edge frequency.

F1=859MHz,F2=904MHz

base the 7<sup>rd</sup> product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

- i) in lower edge test, F1=4f1-3(f1+△f)=f1-3△f=lower edge frequency;
- j) in higher edge test, F2=4f2-3(f2- $\Delta$ f)=f2+3 $\Delta$ f=higher edge frequency.

F1=849MHz,F2=914MHz

2.5.8 Input power:-20dBm

measure frequency		product Value (dBm)	Limit (dBm)	Over limit (dB)
- rd	Lower:869MHz	-22.06		-9.06
3''	Higher:894MHz	-22.32	-13dBm	-9.32
_ rd	Lower:859MHz	-33.42	-13dBm	-20.42
5 <sup>14</sup>	Higher:904MHz	-33.38		-20.38
7 <sup>rd</sup>	Lower:849MHz	-34.75		-21.75
	Higher:914MHz	-34.63	-13dBm	-21.63

### Remark:

No other intermodulation spurious emissioins of above 7<sup>rd</sup> have been found, so only record the test data about the 3<sup>rd</sup>, 5<sup>rd</sup> and 7<sup>rd</sup>

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### 3.Downlink: 1930MHz to 1995MHz(GSM,CDMA,WCDMA,LTE)

## 3.1 GSM Mode:

3.1.1 one signal input —Lower Edge

Marker	D1 59.00 AM Mar 09, 2011	ALIPHANTO	NEEDNTI	SEV.		nalyzer Swept SA F 1939 AC	Agilant Spectru Ja
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3.1.2 one signal input — Upper Edge





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### 3.1.3 two signal input —Lower Edge



3.1.4 two signal input —Upper Edge





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### 3.2 CDMA Mode:

3.2.1 one signal input —Lower Edge



3.2.2 one signal input — Upper Edge



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#### 3.2.3 two signal input ---Lower Edge



3.2.4 two signal input —Upper Edge





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### 3.3 WDMA Mode:

3.3.1 one signal input —Lower Edge



3.3.2 one signal input — Upper Edge





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3.3.3 two signal input -Lower Edge



3.3.4 two signal input —Upper Edge



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### 3.4 LTE Mode:

3.4.1 one signal input —Lower Edge



3.4.2 one signal input — Upper Edge



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#### 3.4.3 two signal input -Lower Edge



3.4.4 two signal input —Upper Edge



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3.5 intermodulation spurious emissioins

For GSM mode:

### 3.5.1Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=1930.6MHz,f2=1931.2MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=1994MHz,f2=1994.6MHz

base the 3<sup>rd</sup> product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

- k) in lower edge test, F1=2f1-(f1+ $\Delta$ f)=f1- $\Delta$ f=lower edge frequency;
- I) in higher edge test, F2=2f2-(f2- $\Delta$ f)=f2+ $\Delta$ f=higher edge frequency.

F1=1930MHz,F2=1995MHz

base the 5<sup>rd</sup> product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

- k) in lower edge test,  $F1=3f1-2(f1+\Delta f)=f1-2\Delta f=$ lower edge frequency;
- I) in higher edge test, F2=3f2-2(f2- $\Delta$ f)=f2+2 $\Delta$ f=higher edge frequency.

## F1=1929.4MHz,F2=1995.6MHz

base the  $7^{rd}$  product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

- k) in lower edge test, F1=4f1-3(f1+ $\Delta$ f)=f1-3 $\Delta$ f=lower edge frequency;
- I) in higher edge test, F2=4f2-3(f2- $\Delta$ f)=f2+3 $\Delta$ f=higher edge frequency.

### F1=1928.8MHz,F2=1996.2MHz

### 3.5.2 Input power:-20dBm

measure frequency		product Value (dBm)	Limit (dBm)	Magin (dB)
- rd	Lower:1930MHz	-15.39		2.39
3'	Higher:1995MHz	-17.28	-13dBm	4.28
- rd	Lower:1929.4MHz	-25.43		12.43
5'	Higher:1995.6MHz	-23.49	-13dBm	10.49
7 <sup>rd</sup>	Lower:1928.8MHz	-29.98		16.98
	Higher:1996.2MHz	-29.84	-13dBm	16.84

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For CDMA mode:

## 3.5.3Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=1930MHz,f2=1932MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=1991MHz,f2=1993MHz

base the 3<sup>rd</sup> product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

- m) in lower edge test, F1=2f1-(f1+ $\Delta$ f)=f1- $\Delta$ f=lower edge frequency;
- n) in higher edge test, F2=2f2-(f2- $\Delta$ f)=f2+ $\Delta$ f=higher edge frequency.

F1=1930MHz,F2=1995MHz

base the  $5^{rd}$  product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

m) in lower edge test,  $F1=3f1-2(f1+\Delta f)=f1-2\Delta f=$ lower edge frequency;

n) in higher edge test,  $F2=3f2-2(f2-\Delta f)=f2+2\Delta f=higher edge frequency.$ 

F1=1928MHz,F2=1997MHz

base the 7<sup>rd</sup> product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above, m) in lower edge test, F1=4f1-3(f1+ $\Delta$ f)=f1-3 $\Delta$ f=lower edge frequency;

- $\frac{1}{10} = \frac{1}{10} = \frac{1}{10}$
- n) in higher edge test, F2=4f2-3(f2- $\Delta$ f)=f2+3 $\Delta$ f=higher edge frequency.

F1=1926MHz,F2=1999MHz

### 3.5.4 Input power:-20dBm

measure frequency		product Value (dBm)	Limit (dBm)	Over limit (dB)
- rd	Lower:1930MHz	-15.61		-2.61
3.~	Higher:1995MHz	-18.78	-13dBm	-5.78
_rd	Lower:1928MHz	-27.64		-14.64
5'	Higher:1997MHz	-26.33	-13dBm	-13.33
7 <sup>rd</sup>	Lower:1926MHz	-29.49		-16.49
	Higher:1999MHz	-29.55	-13dBm	-16.55

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For WCDMA mode:

### 3.5.5Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=1933MHz,f2=1936MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=1989MHz,f2=1992MHz

base the 3<sup>rd</sup> product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

- o) in lower edge test,  $F1=2f1-(f1+\Delta f)=f1-\Delta f=$ lower edge frequency;
- p) in higher edge test, F2=2f2-(f2- $\Delta$ f)=f2+ $\Delta$ f=higher edge frequency.

F1=1930MHz,F2=1995MHz

base the 5<sup>rd</sup> product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

- o) in lower edge test,  $F1=3f1-2(f1+\Delta f)=f1-2\Delta f=$ lower edge frequency;
- p) in higher edge test,  $F2=3f2-2(f2-\Delta f)=f2+2\Delta f=higher edge frequency.$

F1=1927MHz,F2=1998MHz

base the  $7^{rd}$  product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

- o) in lower edge test, F1=4f1-3(f1+ $\Delta$ f)=f1-3 $\Delta$ f=lower edge frequency;
- p) in higher edge test, F2=4f2-3(f2- $\Delta$ f)=f2+3 $\Delta$ f=higher edge frequency.

## F1=1924MHz,F2=2001MHz

### 3.5.6Input power:-20dBm

measure frequency		product Value (dBm)	Limit (dBm)	Over limit (dB)
- rd	Lower:1930MHz	-18.91		-5.91
3.~	Higher:1995MHz	-21.62	-13dBm	-8.62
_rd	Lower:1927MHz	-26.79		-13.79
5' <sup>a</sup>	Higher:1998MHz	-26.85	-13dBm	-13.85
7 <sup>rd</sup>	Lower:1924MHz	-28.36		-15.36
	Higher:2001MHz	-29.74	-13dBm	-16.74

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For LTE mode:

## 3.5.7 Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=1935MHz,f2=1945MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=1980MHz,f2=1990MHz

base the  $3^{rd}$  product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

- q) in lower edge test,  $F1=2f1-(f1+\Delta f)=f1-\Delta f=$ lower edge frequency;
- r) in higher edge test, F2=2f2-(f2- $\Delta$ f)=f2+ $\Delta$ f=higher edge frequency.

F1=1930MHz,F2=1995MHz

base the 5<sup>rd</sup> product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

- q) in lower edge test,  $F1=3f1-2(f1+\Delta f)=f1-2\Delta f=$ lower edge frequency;
- r) in higher edge test, F2=3f2-2(f2- $\Delta$ f)=f2+2 $\Delta$ f=higher edge frequency.

F1=1920MHz,F2=2005MHz

base the 7<sup>rd</sup> product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

- q) in lower edge test,  $F1=4f1-3(f1+\Delta f)=f1-3\Delta f=$ lower edge frequency;
- r) in higher edge test, F2=4f2-3(f2- $\Delta$ f)=f2+3 $\Delta$ f=higher edge frequency.

F1=1910MHz,F2=2015MHz

## 3.5.8 Input power:-20dBm

measure frequency		product Value (dBm)	Limit (dBm)	Over limit (dB)
- rd	Lower:1930MHz	-22.96		-9.96
3'	Higher:1995MHz	-23.12	-13dBm	-10.12
-rd	Lower:1920MHz	-34.49		-21.49
5 <sup>°°</sup>	Higher:2005MHz	-29.65	-13dBm	-16.65
7 <sup>rd</sup>	Lower:1920MHz	-35.38		-22.38
	Higher:2015MHz	-34.47	-13dBm	-21.47

### Remark:

No other intermodulation spurious emissioins of above 7<sup>rd</sup> have been found, so only record the test data about the 3<sup>rd</sup>, 5<sup>rd</sup> and 7<sup>rd</sup>

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### 4.Downlink: 2110MHz to 2155MHz(CDMA,WCDMA,LTE)

#### 4.1 CDMA Mode:

4.1.1 one signal input —Lower Edge



4.1.2 one signal input - Upper Edge





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### 4.1.3 two signal input —Lower Edge



4.1.4 two signal input —Upper Edge





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### 4.2 WDMA Mode:

4.2.1 one signal input —Lower Edge



4.2.2 one signal input — Upper Edge





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#### 4.2.3 two signal input —Lower Edge



4.2.4 two signal input —Upper Edge





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### 4.3 LTE Mode:

4.3.1 one signal input —Lower Edge



4.3.2 one signal input — Upper Edge





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#### 4.3.3 two signal input —Lower Edge



4.3.4 two signal input —Upper Edge



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4.4 intermodulation spurious emissioins

For CDMA mode:

### 4.5.1Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=2112MHz,f2=2114MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=2151MHz,f2=2153MHz

base the 3<sup>rd</sup> product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

- s) in lower edge test,  $F1=2f1-(f1+\Delta f)=f1-\Delta f=$ lower edge frequency;
- t) in higher edge test, F2=2f2-(f2- $\Delta$ f)=f2+ $\Delta$ f=higher edge frequency.

## F1=2110MHz,F2=2155MHz

base the 5<sup>rd</sup> product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

- s) in lower edge test,  $F1=3f1-2(f1+\Delta f)=f1-2\Delta f=$ lower edge frequency;
- t) in higher edge test, F2=3f2-2(f2- $\Delta$ f)=f2+2 $\Delta$ f=higher edge frequency.

## F1=2108MHz,F2=2157MHz

base the 7<sup>rd</sup> product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

- s) in lower edge test,  $F1=4f1-3(f1+\Delta f)=f1-3\Delta f=$ lower edge frequency;
- t) in higher edge test, F2=4f2-3(f2- $\Delta$ f)=f2+3 $\Delta$ f=higher edge frequency.

## F1=2106MHz,F2=2159MHz

## 4.5.2 Input power:-20dBm

measure frequency		product Value (dBm)	Limit (dBm)	Over limit (dB)
- rd	Lower:2110MHz	-20.39		-7.39
3''	Higher:2155MHz	-20.97	-13dBm	-7.97
-rd	Lower:2108MHz	-21.32		-8.32
5 <sup>'''</sup>	Higher:2157MHz	-22.51	-13dBm	-9.51
7 <sup>rd</sup>	Lower:2106MHz	-25.47		-12.47
	Higher:2159MHz	-24.35	-13dBm	-11.35

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For WCDMA mode:

## 4.5.3Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=2113MHz,f2=2116MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=2149MHz,f2=2152MHz

base the  $3^{rd}$  product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

- u) in lower edge test,  $F1=2f1-(f1+\Delta f)=f1-\Delta f=$ lower edge frequency;
- v) in higher edge test, F2=2f2-(f2- $\Delta$ f)=f2+ $\Delta$ f=higher edge frequency.

F1=2110MHz,F2=2155MHz

base the 5<sup>rd</sup> product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

- u) in lower edge test,  $F1=3f1-2(f1+\Delta f)=f1-2\Delta f=$ lower edge frequency;
- v) in higher edge test, F2=3f2-2(f2- $\Delta$ f)=f2+2 $\Delta$ f=higher edge frequency.

F1=2107MHz,F2=2158MHz

base the 7<sup>rd</sup> product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

- u) in lower edge test,  $F1=4f1-3(f1+\Delta f)=f1-3\Delta f=$ lower edge frequency;
- v) in higher edge test, F2=4f2-3(f2- $\Delta$ f)=f2+3 $\Delta$ f=higher edge frequency.

F1=2104MHz,F2=2161MHz

### 4.5.4Input power:-20dBm

measure frequency		product Value (dBm)	Limit (dBm)	Over limit (dB)
- rd	Lower:2110MHz	-21.77		-8.77
3'	Higher:2155MHz	-20.81	-13dBm	-7.81
-rd	Lower:2107MHz	-22.32		-9.32
5'°	Higher:2158MHz	-22.41	-13dBm	-9.41
7 <sup>rd</sup>	Lower:2104MHz	-23.23		-10.23
	Higher:2161MHz	-23.49	-13dBm	-10.49

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For LTE mode:

### 4.5.5Input frequency:

1)in lower edge test:f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency

f1=2115MHz,f2=2125MHz

2)in higher edge test:f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency

f1=2140MHz,f2=2150MHz

base the 3<sup>rd</sup> product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,

- w) in lower edge test,  $F1=2f1-(f1+\Delta f)=f1-\Delta f=$ lower edge frequency;
- x) in higher edge test, F2=2f2-(f2- $\Delta$ f)=f2+ $\Delta$ f=higher edge frequency.

F1=2110MHz,F2=2155MHz

base the 5<sup>rd</sup> product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,

w) in lower edge test,  $F1=3f1-2(f1+\Delta f)=f1-2\Delta f=$ lower edge frequency;

x) in higher edge test, F2=3f2-2(f2- $\Delta$ f)=f2+2 $\Delta$ f=higher edge frequency.

F1=2100MHz,F2=2165MHz

base the  $7^{rd}$  product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,

- w) in lower edge test, F1=4f1-3(f1+ $\Delta$ f)=f1-3 $\Delta$ f=lower edge frequency;
- x) in higher edge test, F2=4f2-3(f2- $\Delta$ f)=f2+3 $\Delta$ f=higher edge frequency.

## F1=2090MHz,F2=2175MHz

### 4.5.6 Input power:-20dBm

measure frequency		product Value (dBm)	Limit (dBm)	Over limit (dB)
ord	Lower:2110MHz	-21.57	10 10	-8.57
3''	Higher:2155MHz	-21.83	-13dBm	-8.83
5 <sup>rd</sup>	Lower:2100MHz	-27.25	-13dBm	-14.25
	Higher:2165MHz	-25.74		-12.74
7 <sup>rd</sup>	Lower:2090MHz	-33.26		-20.26
	Higher:2175MHz	-31.53	-13dBm	-18.53

#### Remark:

No other intermodulation spurious emissioins of above 7<sup>rd</sup> have been found, so only record the test data about the 3<sup>rd</sup>, 5<sup>rd</sup> and 7<sup>rd</sup>

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Remark:

For the test in two signal input or intermodulation, test input signal f1 and f2 will consider as follows conditions:

- 2) EUT frequency band span and the amount of channels;
- 3) f1 is the frequency lower, f2 is the frequency higher,  $\triangle f$  is the channel spacing;
- in lower edge test, f1 is the lower edge frequency +1 channel frequency, and f2 is +2 channel frequency;
- 5) in higher edge test, f1 is the higher edge frequency -2 channel frequency, and f2 is -1 channel frequency;
- 6) according to the amplifier characteristic, the 3<sup>rd</sup> product will appear when two signals input;
- 7) base the 3<sup>rd</sup> product frequency F1= 2f1-f2 and F2=2f2-f1, when the f1 and f2 frequency select above,
  - a) in lower edge test, F1=2f1-(f1+ $\triangle$ f)=f1- $\triangle$ f=lower edge frequency;
  - b) in higher edge test, F2=2f2-(f2- $\triangle$ f)=f2+ $\triangle$ f=higher edge frequency.
- 8) base the 5<sup>rd</sup> product frequency F1= 3f1-2f2 and F2=3f2-2f1, when the f1 and f2 frequency select above,
  - a) in lower edge test, F1=3f1-2(f1+ $\triangle$ f)=f1-2 $\triangle$ f=lower edge frequency;
  - b) in higher edge test, F2=3f2-2(f2- $\triangle$ f)=f2+2 $\triangle$ f=higher edge frequency.
- 9) base the 7<sup>rd</sup> product frequency F1= 4f1-3f2 and F2=4f2-3f1, when the f1 and f2 frequency select above,
  - a) in lower edge test, F1=4f1-3(f1+ $\triangle$ f)=f1-3 $\triangle$ f=lower edge frequency;
  - b) in higher edge test, F2=4f2-3(f2- $\triangle$ f)=f2+3 $\triangle$ f=higher edge frequency.



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## 7.2.4 Radiated Spurious Emissions

Test Date:	2013-03-19 and 2013-08-13							
Test Requirement:	FCC part 22.917(a) & FCC part 24.238(a) & FCC part 27.53(h) 22.917(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.							
	24.238(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$ .							
	27.53(h)For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log 10(P) dB$ .							
Test Method:	FCC part 2.1053							
	ANSI/TIA-603-C-2004							
EUT Operation:								
Status:	Drive the EUT to maximum output power.							
	Pre-test the EUT with the Maximum Rated Output Power 40W(46dBm) and 20W(43dBm), find the worse case as 40W(46dBm).							
Conditions:	Normal conditions							
Application:	Enclosure							
Test Configuration:								

9 kHz to 30 MHz emissions:





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30MHz to 1GHz emissions:







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Test Procedure:

1. Test the background noise level with all the test facilities;

2. Keep one transmitting path, all other connectors shall be connected by normal power or RF leads;

3. Select the suitable RF notch filter to avoid the test receiver or spectrum analyzer produce unwanted spurious emissions;

- 4. Keep the EUT continuously transmitting in max power;
- 5. Read the radiated emissioins of the EUT enclosure.

#### Radiated Emissions Test Procedure:



- a) Connect the equipment as illustrated.
- b) Adjust the spectrum analyzer for the following settings:

1) Resolution Bandwidth = 100 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1GHz.

2) Video Bandwidth = 300 kHz for spurious emissions below 1 GHz, and 3 MHz for spurious emissions above 1 GHz.

- 3) Sweep Speed slow enough to maintain measurement calibration.
- 4) Detector Mode = Positive Peak.

c) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into a nonradiating load that is placed on the turntable. The RF cable to this load should be of minimum length.

d) Measurements shall be made from 30 MHz to 10 tims of fundamental carrier, except for the region close to the carrier equal to  $\pm$  the carrier bandwidth.

e) Key the transmitter without modulation or normal modulation base the standard.

f) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Then the turntable should be rotated 360° to determine the maximum reading. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.

g) Repeat step f) for each spurious frequency with the test antenna polarized vertically.



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h) Reconnect the equipment as illustrated.

i) Keep the spectrum analyzer adjusted as in step b).

j) Remove the transmitter and replace it with a substitution antenna (the antenna should be halfwavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies, where

the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.

k) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to

obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

I) Repeat step k) with both antennas vertically polarized for each spurious frequency.

m) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps k) and l) by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole

antenna by the following formula:

Pd(dBm) = Pg(dBm) - cable loss (dB) + antenna gain (dB)

where:

Pd is the dipole equivalent power and

*Pg* is the generator output power into the substitution antenna.

NOTE: It is permissible to use other antennas provided they can be referenced to a dipole.

NOTE: Effective radiated power (e.r.p) refers to the radiation of a half wave tuned dipole instead of an isotropic antenna. There is a constant difference of 2.15 dB between e.i.r.p. and e.r.p. e.r.p (dBm) = e.i.r.p. (dBm) - 2.15



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#### 7.2.4.1 Measurement Record:

No emissions were detected within 20dB below the limit for the Downlink direction.

#### Remark:

The cabinet radiation was measured with the equipment transmitting a CW signal into a non-radiating 50 Ohm load at maximum output power on a signal frequency .

Measured were performed in the lowest, middle and hightest frequency for : the Downlink.

The spectrum was searched from 9KHz to 26GHz (10th Harmonic) for downlink;



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7.2.5 Occupied Bandwidth

Test Date:	2013-03-13 to 2013-03-19								
Test Requirement:	2-11-04/EAB/RF								
Test Method:	FCC part 2.1049, 2-11-04/EAB/RF								
	The spectral shape of the output should look similar to input for all modulations.								
EUT Operation:									
Status:	Drive the EUT to maximum output power.								
	Pre-test the EUT with the Maximum Rated Output Power 40W(46dBm) and 20W(43dBm), find the worse case as 40W(46dBm).								
Conditions:	Normal conditions								
Application:	Cellular Band RF output ports								
Test Configuration:									
rest comgulation.									



Fig.2. Conducted Spurious Emissions test configuration

Test Procedure:

- a) Set the spectrum analyzer RBW 300 Hz or >1%&<2% emission bandwidth of carrier.
- b) Capture the trace of input signal;
- c) Connect the equipment as illustrated;
- d) Capture the trace of output signal;



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#### 7.2.5.1 Measurement Record:

### 1.Downlink:728MHz to 757MHz(LTE mode)

1.1 lowest frequency -- Input

LXI	RF 50 S	2 AC		SE	NSE:INT		ALIG	NAUTO	11:25:03 P	M Aug 27, 2012	Troo	Dotostor
PASS		Center F Trig: Fre #IFGain:Low Atten: 10			ˈreq: 733.000000 MHz ∙e Run Avg Hold:>10/10 ⊎dB (Elec 0)			Direction: BW: 10 Mi	Downlink Iz(50 RB)	TTAC	elbelector	
10 dB/div	Ref -8.0	0 dBm										
Log												
-28.0			made and a second second	an the man	evi-entrue mar	manne	south				C	Clear Write
-38.0												
-48.0								\				
-58.0												Average
-68.0												
-78.0												Max Hold
-88.0 <b>-88.0</b>	mountheme	warm						Ling-olym	the work and	no selective the stars		maxmora
-98.0												
										0.0.0.001		Min Hold
Center 733 MHz Span 20 MHz Span 20 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.533 ms												
Occu	pied Band	lwidth	1		Total P	ower		-2.62	2 dBm			Detector
8.9666 MHz										<u>Auto</u>	Average ► Man	
Transı	Transmit Freq Error 11.526 kł		kHz	OBW Power			99.00 %					
x dB E	Bandwidth		9.583	ЛНz	x dB			-26	00 dB			

1.2 lowest frequency-- Output





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### 1.3 middle frequency-- Input





Agilent Spectrum Analyzer - Occupied BW											
V RF 50 Ω AC S				Center F	NSE:INT SOU req: 742.500	RCE OFF A	10:57:05 / Radio Std	M Mar 08, 2013	Trac	e/Detector	
Cont	Trig: Free Run Avg Hold>10/10										
10 dB/	Ref Offset div <b>Ref 50.0</b>	:53.3 dB 0 dBm									
Log											
40.0			m. m. Martin	www.	an warden and	yonanon	~				Clear Write
30.0											
20.0											
10.0											Average
0.00											J
-10.0		Banada									
-20.0 🛃	repartmention of the state of the						under 1	honora	monwhite		Max Hold
-30.0											Muxitolu
-40.0											
											Min Hold
Center 742.5 MHz Span 20 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 2.533 ms										WIII HOIG	
Occurried Bondwidth				Total Power 5/18			8 dBm			Detector	
8.9480 MHz										<u>Auto</u>	Average ► Man
Transmit Freg Error 5.930 kHz			kHz	OBW P	ower	99.00 %					
x dB Bandwidth 9.502 MHz			AHz	x dB			-26.00 dB				


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#### 1.5 highest frequency—Input

		10		CENCEJINT		ALICN.	NUTO	11,06,50.0	M Aug 27, 2012		
Center Fr	eg 752.000	000 MHz	Cente	r Freq: 752.00	0000 MHz	ALIGN.	AUTO	11.20.32 P	M Aug 27, 2012	Trac	e/Detector
PASS			Trig: F	ree Run 40 dB (Elec 0	Avg Hold:	>10/10	D	Direction:	Downlink		
1400		#IFGair	:Low Atten.	ID GE (Elec 0	)			BW. IO MI	12(00 KB)		
10 dB/div	Ref -8.00 (	dBm				— <b>`</b> —					
-18.0											
		mm	make man the star		muchan	~~				(	Clear Write
-28.0											
-38.0											
-48.0											_
50 A											Average
-30.0											
-68.0											
-78.0											Max Hold
-88.0	al almantarasses	wed					hanny	human	a baland both and the sides		maxinoia
20.0											
-98.0											
Center 75	2 MHz							Sna	n 20 MHz		Min Hold
#Res BW	100 kHz		#	VBW 3001	kHz			Sweep	2.533 ms		
Occup	ied Bandw	/idth		Total F	ower		-2.65	dBm			Detector
		8.969	0 MHz							Auto	Average Man
				-			~ ~	~~~~			
Transm	Transmit Freq Error 8.133 kF		3.133 kHz	IZ OBW Power			99.00 %				
x dB Ba	andwidth	9	.567 MHz	x dB			-26.0	)0 dB			







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#### 2.Downlink: 869MHz to 894MHz(GSM,CDMA,WCDMA,LTE)

#### 2.1 GSM Mode:

2.1.1 lowest frequency- Input



2.1.2 lowest frequency-- Output





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#### 2.1.3 middle frequency-- Input



<sup>2.1.4</sup> middle frequency-- Output





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#### 2.1.5 highest frequency—Input



#### 2.1.6 highest frequency--Output





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#### 2.2 CDMA Mode:

#### 2.2.1 lowest frequency- Input



2.2.2 lowest frequency-- Output





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#### 2.2.3 middle frequency-- Input



#### 2.2.4 middle frequency-- Output





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#### 2.2.5 highest frequency—Input









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#### 2.3 WCDMA Mode:

#### 2.3.1 lowest frequency- Input



2.3.2 lowest frequency-- Output





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#### 2.3.3 middle frequency-- Input



2.3.4 middle frequency-- Output





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#### 2.3.5 highest frequency—Input









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#### 2.4 LTEMode:

2.4.1 lowest frequency- Input



2.4.2 lowest frequency-- Output





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#### 2.4.3 middle frequency-- Input

Center Freq 88 PASS	50 B AC 1.500000 M	IFGain:Lew Atten	SENSE INT) ar Freq: 881.500000 MHz Free Run Avgitte : 10 dB (Elec 0)	Direction:	1 Aug 27, 2012 Dewnlink Iz(60 RB)	Frequency	
10 dB/div Ref	-8.00 dBm						
-8.0		19 Martin and a grand a grant of the A	ريرميدا سينايه العداد والمساور المناور	enti			Center Freq 881.500000 MHz
-80	/						
-88.0 -68.0 79.0							
000 miles	initiantrail			her	distriction of	Margana	
Center 881.5 MH #Res BW 100 kH	12 12		VBW 300 kHz		Spar Sweep	n 20 MHz 2.533 ms	CF Step 5.000000 MHz Aute Man
Occupied B	andwidth 8.9	534 MHz	Total Power	-3.1	1 dBm		
Transmit Fre x dB Bandwid	q Error İth	13.257 kHz 9.516 MHz	OBW Power x dB	-26	9.00 % 5.00 dB		

#### 2.4.4 middle frequency-- Output

Agilent Spectrum	Analyzer - Occup	ied BW										
💴 Center Fred	RF 50Ω	ac   00 MHz	,	Center F	NSE:INT SOU req: 881.500	RCE OFF A	ALIGN	I OFF	12:46:15 Radio Std	M Mar 08, 2013 : None	Trac	e/Detector
		#IFC	jain:Low	Trig: Fre #Atten: 1	e Run 0 dB	Avg Hold:	>10/10	)	Radio Dev	rice: BTS		
	Ref Offset 53	9 dB										
10 dB/div	Ref 48.90 (	iBm										
18 9												
10.0		land.	one-leave-graphing	ware and	very-monodation	and some the second	1					Clear Write
10.0												
10.9							٦\					
4.40												Average
-1.10												
-11.1												
-21.1 <b>manymentels</b>	And and a sub-								Ard are block by	a show the state of the		Max Hold
-31.1											_	
-41.1												
Center 881.	5 MHz								Spa	n 20 MHz		Min Hold
#Res BW 10	00 kHz			#VE	3W 300 K	Hz			Sweep	2.533 ms		
Occupie	d Bandw	idth			Total P	ower		54.9	dBm			Detector
		8.95	87 MH	Ηz							<u>Auto</u>	Average ► Man
Transmit	Freq Error		-6.003	κHz	OBW P	ower		99	.00 %			
x dB Ban	dwidth		9.555 N	IHz	x dB			-26.0	00 dB			



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#### 2.4.5 highest frequency—Input









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#### 3.Downlink: 1930MHz to 1995MHz(GSM,CDMA,WCDMA,LTE)

#### 3.1 GSM Mode:

3.1.1 lowest frequency- Input



3.1.2 lowest frequency-- Output





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#### 3.1.3 middle frequency-- Input



3.1.4 middle frequency-- Output





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#### 3.1.5 highest frequency—Input



#### 3.1.6 highest frequency--Output



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#### 3.2 CDMA Mode:

#### 3.2.1 lowest frequency– Input



3.2.2 lowest frequency-- Output





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#### 3.2.3 middle frequency-- Input



#### 3.2.4 middle frequency-- Output





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#### 3.2.5 highest frequency—Input



#### 3.2.6 highest frequency--Output





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#### 3.3 WCDMA Mode:

#### 3.3.1 lowest frequency- Input



3.3.2 lowest frequency-- Output



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#### 3.3.3 middle frequency-- Input



#### 3.3.4 middle frequency-- Output





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#### 3.3.5 highest frequency—Input



<sup>3.3.6</sup> highest frequency--Output





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#### 3.4 LTE Mode:

3.4.1 lowest frequency– Input



3.4.2 lowest frequency-- Output





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#### 3.4.3 middle frequency-- Input

-									
Center	RF 50 Ω AC		Center Fred	::INF 1: 1.962500000	) GHz	IGNAUTO	11:31:46 F	M Aug 27, 2012	Frequency
PASS	1.3023000		Trig: Free R	un Av	/g Hold:>1	0/10	Direction	Downlink	
FA35		#IFGain:Low	Atten: 10 dE	(Elec 0)			BW: 10 M	HZ(50 RB)	
10 dB/div Log	Ref -8.00 dE	m,				·			
-18.0									Center Fred
		pertarbadation of	have been the work	monomound	warman				1 962500000 GHz
-28.0									1.902300000 GHz
-38.0						t			
-48.0						<u> </u>			
-58.0									
co 0									
-00.0									
-78.0	den al durada and darante	<u>,</u>					n	en alterated a de land	
-88.0	Also Control Managements of the							alla an aireadh Anla	
-98.0									
									CF Step
Center 1	.963 GHz						Spa	n 20 MHz	Auto Man
#Res BW	100 KHZ		#VBM	300 KHZ			Sweep	2.533 ms	
Occu	nied Bandwig	lth	T	otal Pow	er	-3.8	6 dBm		
	C		1-						
		5.3040 IVI	12						
Trans	mit Freq Error	9.732	(Hz C	BW Pow	er	9	9.00 %		
x dB E	Bandwidth	9.530 N	IHz x	dB		-26	.00 dB		

#### 3.4.4 middle frequency-- Output





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#### 3.4.5 highest frequency—Input









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#### 4.Downlink: 2110MHz to 2155MHz(CDMA,WCDMA,LTE)

#### 4.1 CDMA Mode:

4.1.1 lowest frequency- Input



4.1.2 lowest frequency-- Output



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4.1.3 middle frequency-- Input



4.1.4 middle frequency-- Output



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#### 4.1.5 highest frequency—Input









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#### 4.2 WCDMA Mode:

#### 4.2.1 lowest frequency- Input



4.2.2 lowest frequency-- Output



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#### 4.2.3 middle frequency-- Input



#### 4.2.4 middle frequency-- Output

Agilent Spectrum	Analyzer - Oc	cupied BW										
Center Fred	RF 50 Ω <b>2.1325</b> 0	AC   00000 G #II	Hz FGain:Low	Center Fi Trig: Free #Atten: 16	NSE:INT SOUF req: 2.13250 ≥ Run 5 dB	RCE OFF // 100000 GHz Avg Hold:>	ALIO 10/	3N OFF 10	11:59:28 / Radio Std Radio Dev	M Mar 08, 2013 : None vice: BTS	Trac	e/Detector
10 dB/div	Ref Offset Ref 54.0	54.8 dB 0 dBm										
44.0												
34.0			monormany	Mon more way	wer and	monener	_					Clear Write
24.0		/					N.					
14.0							$\square$					Average
4.00												Average
-6.00							_					
-16.0	den Muse Metalland	manand					╞	man	hanhadu a	ten mand a ba		Max Hold
-26.0												
-36.0							$\vdash$					
Center 2.13 #Res BW 62	3 GHz 2 kHz			#VE	3W 200 k	(Hz			Spa Swee	n 10 MHz p 3.2 ms		Min Hold
Occupie	d Band	width			Total P	ower		56.	8 dBm			Detector
		4.10	368 MI	Hz							<u>Auto</u>	Average ► Man
Transmit	Freq Err	or	347	' Hz	OBW Power			99.00 %				
x dB Ban	dwidth		4.646 N	ЛНz	x dB			-26	00 dB			



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#### 4.2.5 highest frequency—Input







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#### 4.3 LTEMode:

#### 4.3.1 lowest frequency– Input



4.3.2 lowest frequency-- Output



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#### 4.3.3 middle frequency-- Input

<u> </u>	,												
LXI	RF 50 Ω	AC			SE	INSE:INT		ALIO	GN AUTO	11:29:18 P	M Aug 27, 2012	Trac	e/Detector
Center Fr	eq 2.1325	00000	GHz		Center F	req: 2.13250 • Pun	Availed	4~10	/10	Direction	Downlink	mac	
PASS			#IFGain:L	_w⊊	Atten: 10	dB (Elec 0)	- A Bli I A	4.2 10		BW: 10 MI	Iz(50 RB)		
						, ,					, í		
		dBm											
Loa I	Rel -8.00	ивт						-					
-18.0													
10.0			mound	mand	wany	www.www.		-				(	Clear Write
-28.0													
-38.0		ļ							\				
		1							Υ				
-48.0													Average
-58.0									-}				_
-68.0													
00.0													
-78.0								$\rightarrow$		1.616.14.1			Max Hold
-88.0		01 W.C.								Aut dans in the first of			
00.0													
-96.0													
Center 2	133 CH7									Sna	n 20 MHz		Min Hold
#Res BW	100 kHz				#\/F	3W 300 k	Hz			Sween	2 533 ms		
miles Bh	TOORINE				<i>"</i> •					oncep	2.000 1113		
Occur	ied Band	width	1			Total P	ower		-3.49	dBm (			Detector
		0.0											Average►
		8.3	1220	IVI	ΗZ							<u>Auto</u>	Man
Transn	nit Freq Err	or	6.	033 I	кНz	OBW P	ower		9	9.00 %			
x dB_B	andwidth		9.5	560 B	/IHz	x dB			-26	00 dB			

#### 4.3.4 middle frequency-- Output

Agilent Spectrum A	Analyzer - Occupied BW							
Center Freq	RF 50Ω AC 2.132500000 (	GHz Ce Tr IFGain:Low #A	sense:INT SOU Inter Freq: 2.13250 ig: Free Run tten: 16 dB	RCE OFF AL D0000 GHz Avg Hold:>10	IGN OFF 12:04:20 Radio Sto 0/10 Radio De	PM Mar 08, 2013 I: None vice: BTS	Trace	/Detector
10 dB/div	Ref Offset 54.8 dB Ref 46.00 dBm							
36.0 26.0		vl.Adabaranyasanyadpunna	altanyinyaratahiyiyilyi	qualitation and the			c	lear Write
16.0	/							
-4.00								Average
-24.0	hten fallen fan de state fan de s				by by the providence of the second se	angunthe-lacherry		Max Hold
-44.0								Min Hold
Center 2.133 #Res BW 10	3 GHz 0 kHz		#VBW 3001	(Hz	Spa Sweep	an 20 MHz 2.533 ms		MITHOID
Occupie	d Bandwidth 8.9	560 MHz	Total P	ower	55.7 dBm		<u>Auto</u>	Detector Average ► Man
Transmit	Freq Error	-3.767 kHz	OBW F	ower	99.00 %			
x dB Ban	dwidth	9.539 MHz	x dB		-26.00 dB			



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#### 4.3.5 highest frequency—Input

-														
	tor Era	RF 50:	Ω AC			Center F	NSE:INT	0000 GHz	ALIG	INAUTO	11:29:58 F	M Aug 27, 2012	Trac	e/Detector
PAS	S	-q 2.150	00000	#IFC	ain:Low	Trig: Fre Atten: 10	e Run dB (Elec 0)	Avg Hold	>10/	10	Direction: BW: 10 Mi	Downlink Iz(50 RB)		
10 dE	3/div	Ref -8.0	0 dBm											
<sup>Log</sup>														
-18.0				ملمحير		De Chile - Mar annu	- m m-		. 1.					Clear Write
-28.0														
-38 N														
10.0										4				
-48.U														Average
-58.0			(											
-68.0										\				
70.0														
-70.0	مىمىرىي <del>.</del> 14-14-14	an protessand	wardown							have	allon out the	man		Max Hold
-88.0														
-98.0									$\vdash$					
_														Min Hold
Cent #Res	ter 2.1 s BW 1	5 GHz 100 kHz				#VE	3W 300 k	Hz			Spa Sweep	n 20 MHz 2.533 ms		
0	ccupi	ed Band	dwidt	h			Total P	ower		-3.52	2 dBm			Detector
		Det Det I	0	05	OC M	LI								Average►
			8.	90	90 IVI	ΠZ							Auto	Man
Tr	ansmi	t Freq Er	ror		10.513	kHz	OBW P	ower		99	9.00 %			
x	dB Ba	ndwidth			9.561	٧Hz	x dB			-26.	00 dB			

#### 4.3.6 highest frequency--Output

Agilent Spectrum	Analyzer Occ   RF 50 Ω   q 2.15000	Cupied BW AC   00000 (	GHz	Center F Trig: Fre #Atten: 1	ENSE:INT   SOU Freq: 2.15000 e Run 16 dB	RCE OFF 1 00000 GHz Avg Hold:>	ALIGN OFF	12:04:01 Radio Std Radio Dev	PM Mar 08, 2013 : None vice: BTS	Trac	e/Detector
10 dB/div	Ref Offset Ref 46.0	54.8 dB 0 dBm	in Gam.cow								
26.0		/	มา40 <mark>5 โดยคุณหน้าเขา<sub>ช่อ</sub>าคุม</mark>	Anaforatora	᠂ᢅᠣᡏᠯᡵᡅᢂᢛᠬᡀᡘᠴᠯᡪᡰᢏ	high-ml-ant-mhanne	сЛ.				Clear Write
16.00 6.00 -4.00											Average
-14.0 -24.0	ndlaftellephonen	mau					Longo	Maulundarmanner	Networn-maktion and here and		Max Hold
-44.0 Center 2.15 #Res BW 1	o GHz 00 kHz			#VI	BW 3001	٢Hz		Spa Sweep	n 20 MHz 2.533 ms		Min Hold
Occupi	ed Band	width 8.9	655 M	Hz	Total P	ower	54.	3 dBm		<u>Auto</u>	Detector Average ► Man
Transmit Freq Error-8.329 kHzx dB Bandwidth9.557 MHz			kHz MHz	OBW Power 9 x dB -26			9.00 % .00 dB				



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#### 7.2.6 Out of Band Rejection

Test Date:	2013-03-17
Test Requirement:	2-11-04/EAB/RF
	Test for rejection of out of band signals. Filter freq. response plots are acceptable.
Test Method:	2-11-04/EAB/RF
EUT Operation:	
Status:	Drive the EUT to maximum output power.
	Pre-test the EUT with the Maximum Rated Output Power 40W(46dBm) and 20W(43dBm), find the worse case as 40W(46dBm).
Conditions:	Normal conditions
Application:	Cellular Band RF output ports
Test Configuration:	



Fig.4. Out of Band rejection test configuration

Test Procedure:

- 1. Connect the equipment as illustrated;
- 2. Test the background noise level with all the test facilities;

3. Keep one transmitting path, all other connectors shall be connected by normal power or RF leads;

4. Select the attenuator to avoid the test receiver or spectrum analyzer being destroied;

5. Keep the EUT continuously transmitting in max power;

6. Signal generator sweep from the frequency more lower than the product frequency to the frequency more higher than it, find the product band filter characteristic;

- · CW signal rather than typical signal is acceptable (for FM).
- · Multiple band filter will need test each other.



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#### 7.2.6.1 Measurement Record:





#### 2. Test for Downlink: 869MHz to 894MHz




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### 7.2.7 Frequency Stability

Test Date:	2013-03-19
Test Requirement:	FCC part 22.355 & FCC part 24.235 & FCC part 27.54
	The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.
Test Method:	FCC part 2.1055
EUT Operation:	
Status:	Drive the EUT to maximum output power.
	Pre-test the EUT with the Maximum Rated Output Power 40W(46dBm) and 20W(43dBm), find the worse case as 40W(46dBm).
Conditions:	Temperature conditions, voltage conditions
Application:	Cellular Band RF output ports
Test Procedure:	1. Temperature conditions:
	a) The RF output port of the EUT was connected to Frequency Meter;
	b) Set the working Frequency in the middle channel;
	<li>c) record the 20 °C and norminal voltage frequency value as reference point;</li>
	d) vary the temperature from -40 $^{\circ}$ C to 50 $^{\circ}$ C with step 10 $^{\circ}$ C
	<ul> <li>e) when reach a temperature point, keep the temperature banlance at least 1 hour to make the product working in this status;</li> </ul>
	f) read the frequency at the relative temperature.
	2. Voltage conditions:
	<ul> <li>a) record the 20 °C and norminal voltage frequency value as reference point;</li> </ul>
	<li>b) vary the voltage from -15% norminal voltage to +15% voltage;</li>
	c) read the frequency at the relative voltage.



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#### 7.2.7.1 Measurement Record:

#### 1) Frequency Stability vs temperature:

1.1) Test for Downlink: 728~757MHz (middle channel 742.5MHz)

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
50	742.5000029	0.000942761
40	742.5000023	0.000134680
30	742.5000024	0.000269360
20	742.5000022	Reference
10	742.5000026	0.000538721
0	742.5000028	0.000808081
-10	742.5000021	-0.000134680
-20	742.5000031	0.000121212
-30	742.5000029	0.000942761
-40	742.5000026	0.000538721

1.2) Test for Downlink: 869~894MHz (middle channel 881.5MHz)

Temperature(℃)	Frequency(MHz)	Tolerance(ppm)
50	881.5000037	0.000680658
40	881.5000035	0.000453772
30	881.5000032	0.000113443
20	881.5000031	Reference
10	881.5000029	-0.000226886
0	881.5000032	0.000113443
-10	881.5000039	0.000907544
-20	881.5000024	-0.000794101
-30	881.5000032	0.000113443
-40	881.5000029	-0.000226886

1.3) Test for Downlink: 1930~1995MHz (middle channel 1962.5MHz)

Temperature(℃)	Frequency(MHz)	Tolerance(ppm)
50	1962.5000029	0.0000509555
40	1962.5000031	0.0001528660
30	1962.5000029	0.0000509555
20	1962.5000028	Reference
10	1962.5000031	0.0001528660
0	1962.5000032	0.000203820
-10	1962.5000029	0.0000509555
-20	1962.5000027	-0.0000509553
-30	1962.5000029	0.0000509555
-40	1962.5000032	0.000203820



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1.4) Test for Downlink: 2110~2155MHz (middle channel 2132.5MHz)

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
50	2132.5000032	-0.0000468935
40	2132.5000031	-0.0000937867
30	2132.5000035	0.0000937865
20	2132.5000033	Reference
10	2132.5000028	-0.000234467
0	2132.5000034	0.0000468932
-10	2132.5000035	0.0000937865
-20	2132.5000036	0.000140680
-30	2132.5000032	-0.0000468935
-40	2132.5000029	-0.000187573

#### 2) Frequency Stability vs voltage:

#### 2.1) For AC supplied:

2.1.1) Test for Downlink:728~757MHz (middle channel 742.5MHz)

Voltage(V AC)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	742.5000023	0.000134680
120	742.5000022	Reference
138 (120*1.15)	742.5000031	0.000121212

2.1.2) Test for Downlink: 869~894MHz (middle channel 881.5MHz)

Voltage(V AC)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	881.5000039	0.000907544
120	881.5000031	Reference
138 (120*1.15)	881.5000032	0.000113443

#### 2.1.3) Test for Downlink: 1930~1995MHz (middle channel 1962.5MHz)

Voltage(V AC)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	1962.5000029	0.0000509555
120	1962.5000028	Reference
138 (120*1.15)	1962.5000031	0.0001528660

2.1.4) Test for Downlink: 2110~2155MHz (middle channel 2132.5MHz)

Voltage(V AC)	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	2132.5000032	-0.0000468935
120	2132.5000033	Reference
138 (120*1.15)	2132.5000036	0.000140680



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#### 2.2) For DC supplied:

2.2.1) Test for Downlink:728~757MHz (middle channel 742.5MHz)

Voltage(V DC)	Frequency(MHz)	Tolerance(ppm)
-40.8 (-48.0*0.85)	742.5000024	0.000269360
-48.0	742.5000022	Reference
-55.2 (-48.0*1.15)	742.5000023	0.000134680

2.2.2) Test for Downlink: 869~894MHz (middle channel 881.5MHz)

Voltage(V DC)	Frequency(MHz)	Tolerance(ppm)
-40.8 (-48.0*0.85)	881.5000032	0.000113443
-48.0	881.5000031	Reference
-55.2 (-48.0*1.15)	881.5000029	-0.000226886

2.2.3) Test for Downlink: 1930~1995MHz (middle channel 1962.5MHz)

Voltage(V DC)	Frequency(MHz)	Tolerance(ppm)
-40.8 (-48.0*0.85)	1962.5000031	0.0001528660
-48.0	1962.5000028	Reference
-55.2 (-48.0*1.15)	1962.5000027	-0.0000509553

2.2.4) Test for Downlink: 2110~2155MHz (middle channel 2132.5MHz)

Voltage(V DC)	Frequency(MHz)	Tolerance(ppm)
-40.8 (-48.0*0.85)	2132.5000035	0.0000937865
-48.0	2132.5000033	Reference
-55.2 (-48.0*1.15)	2132.5000031	-0.0000937867

--The End of Report--