HCT CO., LTD.

CERTIFICATION DIVISION
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EMI CERTIFICATION REPORT

Applicant:

LG Electronics MobileComm U.S.A., Inc.

1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue: August 27, 2013
Test Report No.: HCTE1308FE33

Test Site: HCT CO., LTD.
HCT FRN: 0005-8664-21

FCC ID: **ZNFD820**

Rule Part(s) / Standard(s)	: FCC PART 15 Subpart B Class B
Equipment Type	: GSM/CDMA/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC
Model Name	: LGD820
Additional Model Name	: D820, LG-D820
Port / Connector(s)	: USB Port / Headset Port
Date of Test	: August 23, 2013 - August 24, 2013

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003. (See Test Report if any modifications were made for compliance)
I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HCT certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

Report prepared by
: Gu-Cheol Yoon
Test Engineer of EMC Team

Approved by
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DOCUMENT HISTORY

The revision history for this document is shown in table.

Version	Date	Description
HCTE1308FE33	August 27, 2013	Initial Release

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ATTACHMENT: TEST SETUP PHOTOGRAPHS

1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test is **EUT type: GSM/CDMA/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC, Model Name: LGD820** manufactured by **LG Electronics MobileComm U.S.A., Inc**. Its basic purpose is used for communications.

Model Name	LGD820
Additional Model Name	D820, LG-D820
FCC ID	ZNFD820
E.U.T Type	GSM/CDMA/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC
TX Frequency	824.70 ㎒ to 848.31 ㎒ (CDMA BC0) 1 851.25 ㎒ to 1 908.75 ㎒ (CDMA BC1) 817.90 ㎒ to 823.10 ㎒ (CDMA BC10) 824.20 ㎒ to 848.80 ㎒ (GSM 850) 1 850.20 ㎒ to 1 909.80 ㎒ (GSM 1 900) 826.40 ㎒ to 846.60 ㎒ (WCDMA 850) 1 852.4 ㎒ to 1 907.6 ㎒ (WCDMA 1 900) 1712.4 ㎒ to 1752.6 ㎒ (AWS WCDMA 1 700) 1 850 ㎒ to 1 910 ㎒ (LTE B2) 1 710 ㎒ to 1 755 ㎒ (LTE B4) 824 ㎒ to 849 ㎒ (LTE B5) 704 ㎒ to 716 ㎒ (LTE B17) 1 850 ㎒ to 1 915 ㎒ (LTE B25) 814 ㎒ to 849 ㎒ (LTE B26) 2 496 ㎒ to 2 690 ㎒ (LTE B41)
RX Frequency	869.70 ㎒ to 893.31 ㎒ (CDMA BC0) 1 931.25 ㎒ to 1 988.75 ㎒ (CDMA BC1) 862.00 ㎒ to 894.00 ㎒ (CDMA BC10) 869.20 ㎒ to 893.80 ㎒ (GSM 850) 1 930.20 ㎒ to 1 989.80 ㎒ (GSM 1 900) 871.40 ㎒ to 891.60 ㎒ (WCDMA 850) 1 932.4 ㎒ to 1 987.6 ㎒ (WCDMA 1 900) 2 112.4 ㎒ to 2 152.6 ㎒ (AWS WCDMA 1 700) 1 930 ㎒ to 1 990 ㎒ (LTE B2) 2 110 ㎒ to 2 155 ㎒ (LTE B4) 869 ㎒ to 894 ㎒ (LTE B5) 734 ㎒ to 746 ㎒ (LTE B17) 1 930 ㎒ to 1 955 ㎒ (LTE B25) 859 ㎒ to 894 ㎒ (LTE B26) 2 496 ㎒ to 2 690 ㎒ (LTE B41)

1.2 Related Submittal(s) / Grant(s)

Original submittal only.

1.3 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Model Name	Manufacturer	FCC ID / DoC	Connected To
E.U.T	LGD820	LG	ZNFD820	Notebook PC Headset
USB cable	EAD62330102	BROAD	-	E.U.T Notebook PC
Headset	EAB62729001	I-SOUND	-	E.U.T
Notebook PC	ProBook 6560b	H.P	DoC	E.U.T Notebook PC adaptor
Notebook PC adaptor	PPP009D	DELTA Electronics (JIANGSU)LTD	-	Notebook PC
Gateway	MV440	Axesstel	PH7MV440	Notebook PC, Adaptor
Mouse	Serial mouse	Radio shack	DoC	Notebook PC
Adaptor	DA-60M12	Yang Ming Industrial	-	Gateway
RJ45 cable	-	-	-	Notebook PC, Gateway

1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	Micro USB	Y	Y	(P,D)1.1
	Ear-phone	N/A	Y	(D)1.2
Notebook PC	RJ 45	N/A	N	(D)1.5
	Serial (Mouse)	N/A	Y	(D)1.8
	DC in	N	N/A	(P)1.8
Gateway	DC in	N	N/A	(P)1.8

* The marked "(D)" means the data cable and "(P)" means the power cable.

1.5 Noise Suppression Parts on Cable. (I/O cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
EUT	Micro USB	N	N/A	Y	Both End
	Ear-phone	N	N/A	Y	EUT End
Notebook PC	RJ 45	N	N/A	N	N/A
	Serial (Mouse)	N	N/A	Y	Notebook PC End

1.6 Test Methodology

Both Conducted and Radiated testing was performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to E.U.T distance of 3 ㎜

1.7 Test Facility

Chamber used to collect the test data is located at the 74, SEOICHEON-RO, 578BEON-GIL, MAJANG-MYEON, ICHEON-SI, GYEONGGI-DO, KOREA. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4.

Measurement Facilities	Reg. No.
Radiated Field strength measurement facility (3m)	90661(Mar. 02, 2011)
Radiated Field strength measurement facility (10m)	90661 (Sep. 03, 2010)

1.8 Frequency Range of Radiated Measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table

Highest frequency generated or used in the device or on which the device operates or tunes (㎒)	Upper frequency of measurement range (㎒)
Below 1.705	30
1.705 to 108	1 000
108 to 500	2 000
500 to 1 000	5 000
Above 1 000	5^{th} harmonic of the highest frequency or 40 ㎓, whichever is lower

2. SYSTEM TEST CONFIGURATION

2.1 Configuration of Test System

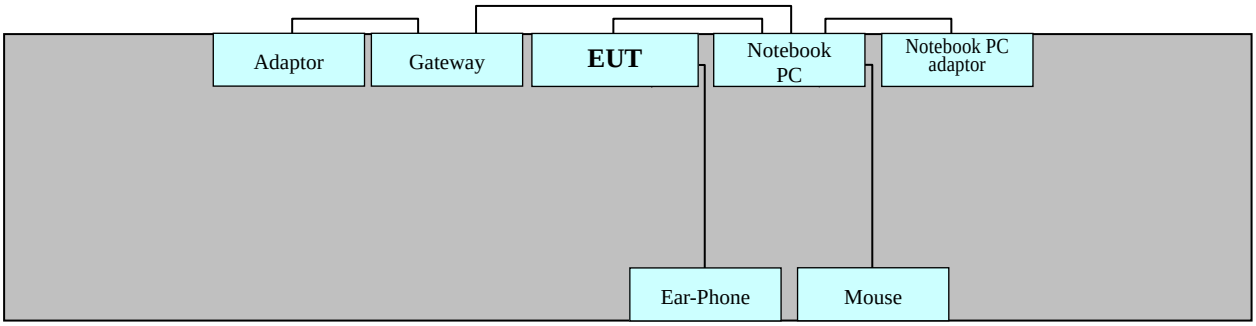
2.1.1 Conducted Emission Test

EUT was connected to LISN via Notebook PC adaptor and Base Station. Preliminary Power Line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worst operating conditions.

2.1.2 Radiated Emission Test

Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 10 m semi-anechoic chamber.

[Configuration of Tested System]



Non-Conductive Table
Power Line: 120 VAC

3. PRELIMINARY TEST

3.1 Conducted Emission Test

■ It was tested Data Communication mode, after connecting all peripheral devices.

Operation Mode: ☒ Data communication mode

3. 2 Radiated Emission Test

■ It was tested Data Communication mode, after connecting all peripheral devices.

Operation Mode: ☒ Data communication mode

4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

4.1 Conducted Emission Test

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Quasi-Peak, Average (6 dB Bandwidth: 9 ㎑)
Operation Mode : Data communication mode

Temperature : 24.6 °C
Humidity Level : 52.7 %
Test Date : August 23, 2013

Frequency	Transd	Conductor	Quasi-Peak			Average		
			Limit	Measurement Level	Result Level	Limit	Measurement Level	Result Level
(MHz)	(dB)		(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV]
0.150	10.0	N	66	42.0	52.0	56	-	-
0.154	9.8	H	66	40.3	50.1	56	-	-
0.194	10.0	N	64	46.8	56.8	54	-	-
0.198	9.8	H	64	47.6	57.4	54	-	-
0.202	9.8	H	64	-	-	54	29.0	38.8
0.258	10.0	N	62	39.8	49.8	52	-	-

※ **NOTE:** Refer to page 11 to page 14 for details.

1. Line H = Hot, Line N = Neutral
2. Transd = LISN factor + Cable Loss factor

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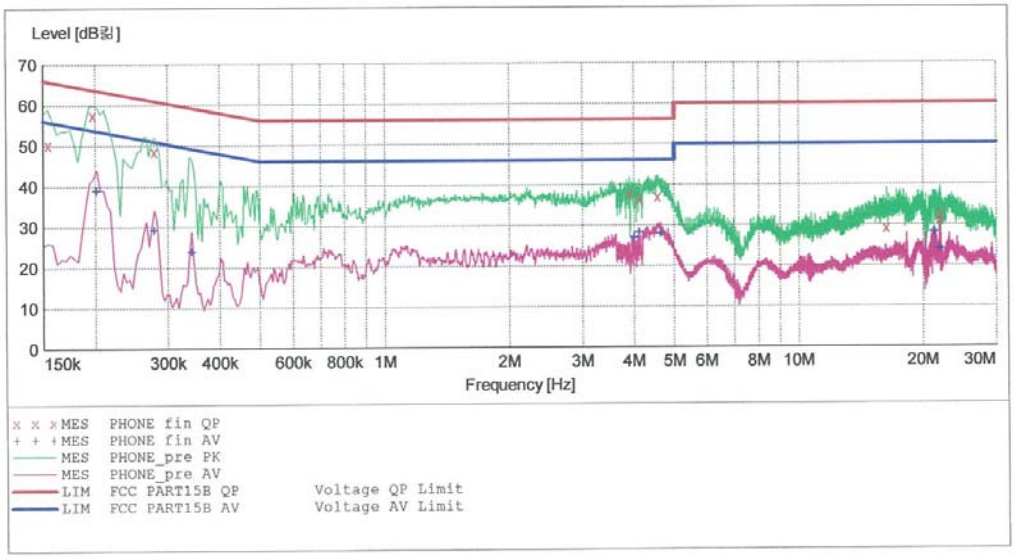
EUT: LGD820
Manufacturer: LG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: GC YOON
Test Specification: FCC PART15 B
Comment: H

SCAN TABLE: "FCC CLASS B(H)"

Short Description: KN22 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

2013-08-23 10:27오전

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.154001	50.10	9.8	66	15.6	---	---
0.198001	57.40	9.8	64	6.3	---	---
0.278001	48.50	9.8	61	12.4	---	---
3.904000	37.70	10.1	56	18.3	---	---
4.124000	36.20	10.1	56	19.8	---	---
4.568000	37.00	10.2	56	19.0	---	---
16.304000	29.20	10.8	60	30.8	---	---
21.908000	31.00	11.0	60	29.0	---	---
22.020000	32.50	11.0	60	27.5	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

2013-08-23 10:27오전

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.202001	38.80	9.8	54	14.7	---	---
0.278001	29.20	9.8	51	21.7	---	---
0.342001	23.80	9.8	49	25.4	---	---
4.008000	26.90	10.1	46	19.1	---	---
4.124000	28.10	10.1	46	17.9	---	---
4.648000	27.90	10.2	46	18.1	---	---
21.240000	28.10	11.0	50	21.9	---	---
21.304000	28.00	11.0	50	22.0	---	---
21.908000	24.00	11.0	50	26.0	---	---

HCT

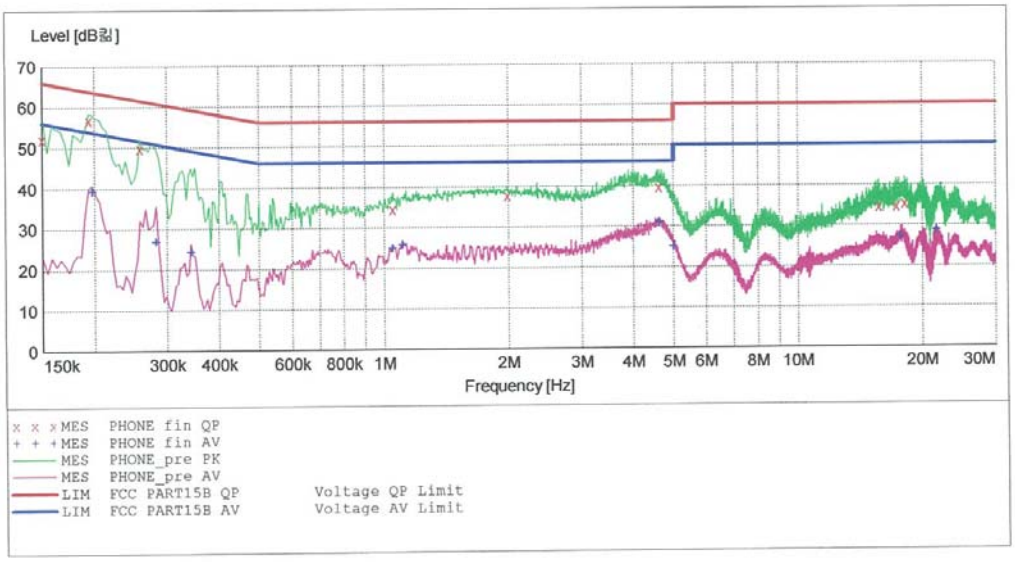
EMC

EUT: LGD820
Manufacturer: LG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: GC YOON
Test Specification: FCC PART15 B
Comment: N

SCAN TABLE: "FCC CLASS B(N)"

Short Description: KN22 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

2013-08-23 10:30오전

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.150001	52.00	10.0	66	14.0	---	---
0.194001	56.80	10.0	64	7.0	---	---
0.258001	49.80	10.0	62	11.7	---	---
1.052000	34.50	10.1	56	21.5	---	---
1.988000	37.70	10.1	56	18.3	---	---
4.616000	39.60	10.4	56	16.4	---	---
15.696000	34.50	11.1	60	25.5	---	---
17.328000	34.70	11.1	60	25.3	---	---
18.112000	35.20	11.2	60	24.8	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

2013-08-23 10:30오전

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.198001	39.20	10.0	54	14.5	---	---
0.282001	26.90	10.0	51	23.8	---	---
0.342001	24.30	10.0	49	24.8	---	---
1.052000	24.90	10.1	46	21.1	---	---
1.112000	25.80	10.1	46	20.2	---	---
4.632000	30.90	10.4	46	15.1	---	---
5.000000	25.00	10.4	46	21.0	---	---
17.696000	27.10	11.1	50	22.9	---	---
21.572000	28.70	11.3	50	21.3	---	---

4.2 Radiated Emission Test

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

-For measurement below 1 ㎓

Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Quasi-Peak (6 ㏈ Bandwidth: 120 ㎑)
Operation Mode : Data communication mode

Temperature : 21.9 °C
Humidity Level : 52.4 %
Test Date : August 24, 2013

Frequency (MHz)	Reading (dBuV)	Polarity (H/V)	Antenna Height (m)	Correction Factor		Limit (dBuV/m)	Level (dBuV/m)	Margin (dB)
				Antenna (dB/m)	Cable (dB)			
80.9	20.75	H	2.5	9.12	1.64	40.0	31.51	8.49
100.1	22.33	H	1.0	8.26	1.82	43.5	32.41	11.09
196.0	19.46	H	1.0	9.76	2.54	43.5	31.76	11.74
240.3	23.53	H	1.2	11.17	2.81	46.0	37.52	8.48
278.7	21.11	H	1.0	12.58	3.03	46.0	36.72	9.28
720.5	10.87	H	1.5	21.41	4.99	46.0	37.27	8.73

-For measurement above 1 ㎓

Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Peak mode: Peak (RBW: 1 ㎒, VBW: 1 ㎒)
: Average mode: Peak (RBW: 1 ㎒, VBW: 10 ㎐)

Temperature : 21.9 °C
Humidity Level : 52.4 %
Test Date : August 24, 2013

Frequency (㎓)	Peak			POL	Average		
	Total (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)		Total (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
1.9981	50.0	74	24.0	V	28.7	54	25.3
2.6568	50.6	74	23.4	V	30.8	54	23.2

※ NOTE:

1. Measurement above 1 ㎓ was performed from 1 ㎓ to the 5th harmonic of highest fundamental frequency. Test was measured by 12 ㎓.

5. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the antenna factor and cable factor.
The basic equation with a sample calculation is as follows:

FS = RA + AF + CF

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dBμV is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dBμV/m value is mathematically converted to its corresponding level in μV/m.

FS = 21.5 + 7.4 + 1.1 = 30 dBμV/m

[Radiated Emission Limits]

Frequency of Emission (㎒)	Field Strength	
	μV/m	dBμV/m
30 to 88	100	40.0
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

6. TEST EQUIPMENT

	Type	Manufacturer	Model Name	Serial Number	Calibration Cycle	Next CAL Date
Conducted Emission						
☐	EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	2014.04.25
☒	EMI Test Receiver	Rohde & Schwarz	ESCI	100033	1 year	2014.06.23
☒	LISN	EMCO	3816/2SH	9706-1070	1 year	2014.04.26
☒	LISN	Rohde & Schwarz	ENV216	100073	1 year	2014.02.06
Radiated Emission						
-For measurement below 1 ㎓						
☒	EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	2014.07.01
☒	Trilog Antenna	Schwarzbeck	VULB9168	185	2 year	2015.04.16
☒	Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
☒	Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
☐	EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2014.04.16
☐	Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	2014.12.17
☐	Antenna master	HD GmbH	MA240	240/520	N/A	-
☐	Turn Table	HD GmbH	2090	9702/1224	N/A	-
-For measurement above 1 ㎓						
☒	EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	2014.07.01
☒	Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
☒	Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
☐	EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2014.04.16
☐	Antenna master	HD GmbH	MA240	240/520	N/A	-
☐	Turn Table	HD GmbH	2090	9702/1224	N/A	-
☒	Power Amplifier	CERNEX	CBLU1183540	21691	1 year	2014.07.24
☒	Horn Antenna	Schwarzbeck	BBHA 9120D	296	2 year	2014.12.13

7. CONCLUSION

The data collected shows that the **E.U.T Type: GSM/CDMA/WCDMA/LTE Phone with Bluetooth, WLAN(2.4GHz & 5GHz) and NFC, Model: LGD820, FCC ID: ZNFD820** complies with §15.107 and §15.109 of the FCC rules.