



## TEST REPORT

REGULATION : FCC Part 2, 90  
RSS-119 Issue 12

Applicant	Testing Laboratory
JVC KENWOOD Corporation  1-16-2, Hakusan, Midori-ku, Yokohama-shi Kanagawa, 226-8525 Japan Tel.: +81 45 939 6254 Fax.: +81 45 939 6261	Intertek Japan K.K. Kashima Laboratory URL: <a href="http://www.japan.intertek-etalsemko.com">http://www.japan.intertek-etalsemko.com</a> (Anechoic chamber) 298-6 Sada, Kashima, Ibaraki 314-0027 Japan Tel. +81 299 82 8464 (Open area test site) 3-2 Sunayama, Kamisu, Ibaraki 314-0255 Japan Tel. +81 479 40 1097

Equipment type	VHF DIGITAL BASE-REPEATER
Trademark	KENWOOD
FCC Model(s)	TKR-D710-K
IC Model(s)	TKR-D710-K
Serial No.	B4500007 No.3
FCC ID	K44422300
IC CN and UPN	282F-422300
Test Result	Complied
Report Number	15100017JKA-001
Original Issue Date	November 04, 2015
Revised Issue Date	November 11, 2015

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Approved by

Hideaki Kosemura  
[Technical Dept. Manager]

Tested by

Koichi Wagatsuma  
[Engineer]

**In Accordance with FCC Rules and Regulations, Volume II, Part 2 and 90**

**Sub-part 2.1033**

<b>Applicant and Manufacture Information</b>	
APPLICANT	
Company	: JVC KENWOOD Corporation
Address	: 1-16-2, Hakusan, Midori-ku, Yokohama-shi Kanagawa, 226-8525 Japan
Contact Person	: Tamaki Shimamura Manager, Communications Systems Business Unit
MANUFACTURER	
Company	: JVC KENWOOD Corporation
Address	: 1-16-2, Hakusan, Midori-ku, Yokohama-shi Kanagawa, 226-8525 Japan
<b>(c)(2) FCC ID</b>	
FCC ID	: K44422300
Model number	: TKR-D710-K
Serial number	: B4500007 No.3
<b>Instruction Manual(S)</b>	
Instruction manual(s)	: Please refer to attached Exhibits F
<b>Type of Emission</b>	
Emission Designation	: For FCC                    16K0F3E , 11K0F3E 8K30F1E / 8K30F1D / 8K30F7W 4K00F1E / 4K00F1D / 4K00F7W 4K00F2D 7K60FXE / 7K60FXD (add Emission Designation is 7K60FXE/FXD) (Test Emission Designation is 7K60FXE/FXD)  For IC                    16K0F3E , 11K0F3E 7K60FXE / 7K60FXD (add Emission Designation is 7K60FXE/FXD) (Test Emission Designation is 7K60FXE/FXD)
<b>Frequency range</b>	
Frequency Range	: FCC: 150 to 174 MHz IC: 138 to 144 MHz and 148 to 174 MHz
<b>Power Rating</b>	
Output Power	: 5 to 50 W
Type	: Continuously Variable
<b>Maximum Power Rating</b>	
Output Power	: 50W
<b>Voltages &amp; currents in all elements in final RF stage, including final transistor or solid-state device</b>	
Collector Current, A	: 13.0 A Maximum
Collector Voltage, Vdc	: 13.6 Vdc
Supply Voltage, Vdc	: 13.6 Vdc
<b>Other Information</b>	
Number of Channel	: 30 channels
Maximum Deviation	: $\pm 5$ kHz (16K0F3E), $\pm 2.5$ kHz (11K0F3E)
Frequency Stability	: 1.0 ppm
	: Antenna Impedance
Antenna Impedance	: 50 $\Omega$ Nominal
<b>Note</b>	

## TABLE OF CONTENTS

---

	Page
SECTION 1. GENERAL INFORMATION	4
SECTION 2. SUMMARY OF TEST RESULT	5
SECTION 3. TEST AND MEASUREMENT DATA	6
SECTION 4. INFORMATION ABOUT EUT AND SUPPORT EQUIPMENT(S)	7
SECTION 5. OPERATING CONDITION	8
SECTION 6. MEASUREMENT UNCERTAINTY	9
SECTION 7. TEST DATA	
7.1 Carrier Output Power (Conducted)	10
7.2 Unwanted Emissions (Transmitter Conducted)	13
7.3 Emission Masks (Occupied Bandwidth)	16
7.4 Necessary Bandwidth and Emission Bandwidth	22
7.5 99% Occupied Bandwidth	23
APPENDIX PHOTOGRAPHS	

---

## SECTION 1. GENERAL INFORMATION

### TEST PERFORMED

Location	Kashima No.1 Test Site		
EUT Received	October 01, 2015		
Date of Test	October 19, 2015	to	October 27, 2015
Standard Applied	FCC Part 2, 90 RSS-119 Issue 12		
Measurement Method	ANSI/TIA-603-D-2010 / RSS-119 Issue 12(2015), RSS-Gen Issue 4(2014)		
Deviation from Standard(s)	Not applicable		

### QUALIFICATIONS OF TESTING LABORATORY (Kashima Lab.)

ACCREDITATION	SCOPE	LAB. CODE	Remarks
VLAC	EMC Testing	VLAC-008-1	JAPAN
BSMI	EMC Testing	SL2-IN-E-6008	TAIWAN
<b>FILING</b>			
VCCI	EMC Testing	A-0126	JAPAN
FCC	EMC Testing	JP0008	USA
IC	EMC Testing	IC-2042K-3, IC-2042Q-12	CANADA
CB-Scheme	EMC Testing	TL222	IECEE

### ABBREVIATIONS

EUT	Equipment Under Test	DoC	Declaration of Conformity
AMN	Artificial Mains Network	ISN	Impedance Stabilization Network
LISN	Line Impedance Stabilization Network	Q-P	Quasi-peak
AMP	Amplifier	AVG	Average
ATT	Attenuator	PK	Peak
ANT	Antenna	Cal	Calibration
BBA	Broadband Antenna	N/A	Not applicable or Not available
DIP	Dipole Antenna	LCD	Liquid-Crystal Display
AE	Associated Equipment	4LEVEL FSK	4LEVEL Frequency Shift Key
GMSK	Gaussian Maximum Shift Key	CW ID	Continuously Repeating bit stream
FM	Frequency Modulation	C4FM	Constant envelope 4 Level FM
PTT	Push to Talk	AFC	Automatic frequency control

### Revision Summary

Revised Date	Section	Description of Changes
Nov 11, 2015	2 page	Revise the Emission Designation
Nov 11, 2015	7.2	Revise the text (Test was carried out for all the frequency band of section 10.1).
Nov 11, 2015	7.3	Revise the Adjust the spectrum analyzer for the following setting.

## SECTION 2. SUMMARY OF TEST RESULT

FCC Part2	IC Part90	TEST ITEM	RESULTS	Comments
2.1046 (a)	-	5.4 Carrier Output Power (Conducted)	<b>PASS</b>	
2.1051	90.210	5.8 Unwanted Emissions (Transmitter Conducted)	<b>PASS</b>	
2.1053 (a)	90.210	5.8 Field Strength of Spurious Radiation	N/A	<b>See Note</b>
2.1049 (c) (1)	90.210	5.5 Emission Masks (Occupied Bandwidth)	<b>PASS</b>	
-	90.214	5.9 Transient Frequency Behavior	N/A	<b>See Note</b>
2.1047 (a)	-	- Audio Low Pass Filter (Voice Input)	N/A	<b>See Note</b>
2.1047 (a)	-	- Audio Frequency Response	N/A	<b>See Note</b>
2.1047 (b)	-	- Modulation Limiting	N/A	<b>See Note</b>
2.1055 (a) (1) (a)	90.213	5.3 Frequency Stability (Temperature Variation)	N/A	<b>See Note</b>
2.1055 (d) (1) (a)	90.213	5.3 Frequency Stability (Voltage Variation)	N/A	<b>See Note</b>
-	-	RSS-Gen 7.1 Receiver Spurious Emissions	N/A	<b>See Note</b>
-	90.203	- (j)(3) Certification required (FCC Part 90.203(j)(3))	<b>Complied</b>	
-	90.203	- (j)(4) Certification required (FCC Part 90.203(j)(4))	<b>Complied</b>	
-	90.203	- (j)(5) Certification required (FCC Part 90.203(j)(5))	<b>Complied</b>	
-	90.203	- (e) Certification required (FCC Part 90.203(e))	<b>Complied</b>	
-	-	5.5 99% Occupied Bandwidth	<b>PASS</b>	

### Note

Report is intended for Class 2 Permissive Change which is adding modulation bandwidths.  
 (add 7K60FXE/FXD)

This test is not applicable as the addition would not alter these measurements.

### Limitation on Results

The test result of this report is effective equipment under test itself and under the test configuration described on the report.

This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.

### Note:

As for the FCC Part 15 Subpart B-Unintentional Radiators, the EUT has been measured and declared as Verification by JVC Kenwood Corporation.

### SECTION 3. TEST AND MEASUREMENT DATA

All test and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J and Industry Canada as the following individual parts

FCC Rule	Test Item	Tested
Part 21	Domestic Public Fixed radio Services	N.A.
Part 22	Non Cellular	N.A.
Part 22	Public Mobile Services	N.A.
Part 22	Subpart H - Cellular Radiotelephone Service	N.A.
Part 22	Alternative technologies and auxiliary service	N.A.
Part 23	International Fixed Public Radiocommunication service	N.A.
Part 24	Personal Communications Services	N.A.
Part 74	Experimental Radio Auxiliary , Special Broadcast and Other Program Distributional Services	N.A.
Part 80	Stations in the Maritime Services	N.A.
Part 80	Subpart E - general Technical Standards	N.A.
Part 80	Subpart F - Equipment Authorization for Compulsory Ships	N.A.
Part 80	Subpart K - Private Coast Stations and Marine Utility Stations	N.A.
Part 80	Subpart S - Compulsory radiotelephone Installations for Small Passenger Boats	N.A.
Part 80	Subpart T - Radiotelephone Installation Required for Vessels on the Great Lakes	N.A.
Part 80	Subpart U - Radiotelephone Installations Required by the Bridge-to- Bridge Act	N.A.
Part 80	Subpart V - Emergency Position Indicating Radiobeacons (EPIRB'S)	N.A.
Part 80	Subpart W - Global Maritime Distress and Safety System (GMDSS)	N.A.
Part 80	Subpart X - Voluntary Radio Installations	
Part 87	Aviation Services	N.A.
<b>Part 90</b>	<b>Private Land Mobile radio Services</b>	<b>YES</b>
Part 94	Private Operational - Fixed Microwave Service	N.A.
Part 95	Subpart A - General Mobile radio Service	N.A.
Part 95	Subpart C - Radio Control (R/C) radio Service	N.A.
Part 95	Subpart D - Citizens Band (CB) Radio Service	N.A.
Part 95	Subpart E -Family radio Service	N.A.
Part 95	Subpart F -Interactive Video and Data Service (IVDS)	N.A.
Part 97	Amateur Radio Service	N.A.
Part 101	Fixed Microwave Service	N.A.

IC Rule	Test Item	Tested
<b>RSS-119</b>	<b>Radio Transmitters and Receivers Operating in the Land Mobile and Fixed Services in the Frequency Range 27.4-960 MHz</b>	<b>YES</b>
RSS-134	900MHz Narrowband Personal Communication Service	N.A.
RSS-Gen	General Requirements for Compliance of Radio Apparatus	YES

## SECTION 4. INFORMATION ABOUT EUT AND SUPPORT EQUIPMENT(S)

### 4.1 List of System Configuration

Symbol	Item	Model No.	Serial No.	Manufacture	Remarks
A	VHF DIGITAL BASE-REPEATER TKR-D710-K	B4500007 No.3		JVC KENWOOD Corporation	EUT
<b>Power Ratings of EUT :</b>	DC 10.8 to 15.6 V				13.0 A Maximum
<b>Power Supply :</b>	DC 13.6 V				
<b>Condition of Equipment</b>	Proto type				
<b>Type</b>	Rack Mount type				
<b>Suppression Devices</b>	No Modifications by the laboratory were made to the device				

### 4.2 Port(s)/Connector(s)

Port Name	Connector Type	Connector Pin	Remarks
RX IN	BNC	2pin	
MICROPHONE	RJ-45	8pin	
Control I/O	D-sub	25pin	
TX OUT	N	2pin	
TEST/SPKR	MOLEX 1625-15p	15pin	
SYNC 1	RJ-11	4pin	
SYNC 2	RJ-11	4pin	
DC 13.6V	JST VLR-02V	2pin	
REF IN	BNC	2pin	use for maintenance

### 4.3 Highest Frequency Oscillator(s)/Crystal(s)

Operating Frequency	Board Name	Remarks
233 MHz	TXRX UNIT	

## SECTION 5. OPERATING CONDITION

The EUT was operated under the following condition during the test.

### 5.1 Operating Condition

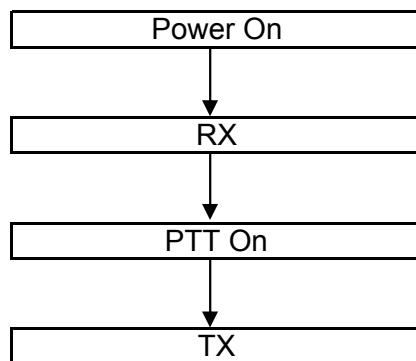
The test was carried out under Transmit mode.

(FCC:150.05MHz, 162.05MHz, 173.95MHz, RSS:138.05MHz, 158.05MHz, 173.95MHz)

(High Power : 50W, Low Power : 5 W)

### 5.2 Operating Flow [Transmit mode]

Following operations were performed continuously.



## SECTION 6. MEASUREMENT UNCERTAINTY

Carrier Output Power (Conducted)	$U_{lab}$	Utia-603-d	
	+/- 0.29dB ( $k = 2$ )	+/- 0.59	dB
Unwanted Emissions (Transmitter Conducted)			
	+/- 2.19 dB ( $k = 2$ )	+/- 1.1	dB
Field Strength of Spurious Radiation			
	+/- 2.78dB ( $k = 2$ )	+/- 3.3	dB
Emission Masks (Occupied Bandwidth)			
	+/- 0.5dB ( $k = 2$ )	+/- 2.1	dB
Transient Frequency Behavior			
	+/- 1.10% ( $k = 2$ )	+/- 21.6	%
Audio Low Pass Filter (Voice Input)			
	+/- 0.1dB ( $k = 2$ )	+/- 1.2	dB
Audio Frequency Response			
	+/- 0.1dB ( $k = 2$ )	+/- 1.2	dB
Modulation Limiting			
	+/- 1% ( $k = 2$ )	+/- 1.0	%
Frequency Stability (Temperature Variation)			
	+/- 10.1Hz ( $k=2$ )	+/-34.2	Hz
Frequency Stability (Voltage Variation)			
	+/- 10.1Hz ( $k=2$ )	+/-34.2	Hz
Receiver Spurious Emissions	$U_{lab}$	Ucispr	
30-1000MHz	+/- 4.43dB ( $k = 2$ )	+/- 6.3	dB
abobe 1GHz	+/- 4.44dB ( $k = 2$ )		

## SECTION 7. TEST DATA

### 7.1 Carrier Output Power (Conducted)

REGULATIONS	: FCC Part 2 Section 1046 (a) / RSS-119 Section 5.4
TEST METHOD/GUIDE	: ANSI/TIA-603-D Section 2.2.1.2 / RSS-119 Section 4.1

#### Test Procedure

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 The EUT was conducted to a resistive coaxial attenuator of normal load impedance.  
RF Power (dBm) = Power Meter reading (dBm) + Attenuator Loss (dB) + Cable Loss (dB)  
RF Power (W) =  $10^{(RF\ Power\ (dBm)/10)/1000}$
- 3 Modulate the transmitter with a 2.5 kHz sine wave at an input Level of 16 dB greater than that necessary to produce 50 % of rated system deviation.(Only as for the test of RSS)

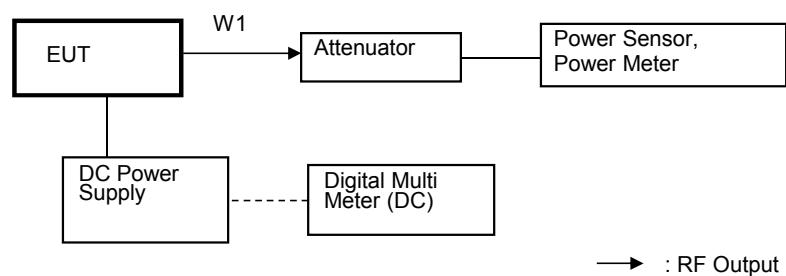
#### Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Power Meter	Hewlett Packard	E4418B	GB38410265	Jun. 09, 15	Jun. 30, 16
2	Power Sensor	Hewlett Packard	8482A	US37292237	Jun. 09, 15	Jun. 30, 16
3	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4357	Jun. 01, 15	Jun. 30, 16
4	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	Jun. 01, 15	Jun. 30, 16
5	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None
6	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 10, 15	Jul. 31, 16

#### Measuring Cables

No.	Cable	Manufacturer	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	F0000017	Jan. 23, 15	Jan. 31, 16

### Measuring Equipment Configuration



### Test Results

Test date	Oct 19, 2015		
Location	Kashima No.1 Test Site		
temperature	23.3	[degree C]	
Humidity Variation	60.0	[%]	
Atmospheric Pressure	100.4	[kPa]	
Test Engineer	Koichi Wagatsuma		

Test was carried out for all the Authorized Bandwidth.

State the worst case (below).

No.	Frequency (MHz)	Band	Setting	RF Power (W)
1	138.05 (RSS)	Low	7K60FXE/FXD	High Power 50.03
2	150.05 (FCC)	Low	7K60FXE/FXD	High Power 49.97
3	158.05 (RSS)	Middle	7K60FXE/FXD	High Power 49.97
4	162.05 (FCC)	Middle	7K60FXE/FXD	High Power 50.03
5	173.95 (FCC/RSS)	High	7K60FXE/FXD	High Power 49.97
6	138.05 (RSS)	Low	7K60FXE/FXD	Low Power 5.00
7	150.05 (FCC)	Low	7K60FXE/FXD	Low Power 5.00
8	158.05 (RSS)	Middle	7K60FXE/FXD	Low Power 5.00
9	162.05 (FCC)	Middle	7K60FXE/FXD	Low Power 5.00
10	173.95 (FCC/RSS)	High	7K60FXE/FXD	Low Power 5.00

RF Power: Peak reading

## 7.2 Unwanted Emissions (Transmitter Conducted)

REGULATIONS : FCC Part 2 Section 1051, Part 90 Section 210 / RSS-119 Section 5.8

TEST METHOD/GUIDE : RSS-119 Section 4.2, RSS-Gen Section 4.9

### Test Procedure

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Modulate the transmitter with a 2.5 kHz sine wave at an input Level of 16 dB greater than that than that necessary to produce 50 % of rated system deviation.
- 3 Adjust the spectrum analyzer for the following setting:
  - a) RBW : 100 kHz (< 1 GHz), 1 MHz (> 1 GHz).
  - b) VBW : 300 kHz (< 1 GHz), 3 MHz (> 1 GHz).
  - c) Detector mode : Average power (FM Modulation) , Positive peak with peak hold (Digital Modulation)
- 4 The emissions were measured for the worst case as follows:
  - a) : within a band of frequencies defined by the carrier frequency plus and minus one channel.
  - b) : from the lowest frequency generated in the EUT and to at least the 10th harmonic of the carrier frequency, or 40 GHz, whichever is lower.

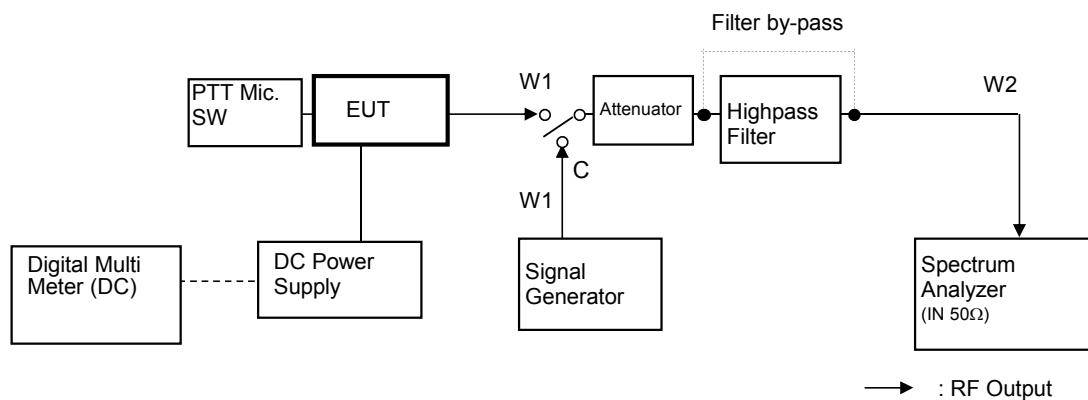
### Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4357	Jun. 01, 15	Jun. 30, 16
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	Jun. 01, 15	Jun. 30, 16
3	Highpass Filter	Anritsu	MP526B	6200220636	Jan. 20, 15	Jan. 31, 16
4	Signal Generator	Rohde&Schwarz	SMB 100A	105709	Mar. 18, 15	Mar. 31, 16
5	Spectrum Analyzer	Agilent	N9030A	US51350170	Mar. 12, 15	Mar. 31, 16
6	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None
7	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 10, 15	Jul. 31, 16

### Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	F0000017	Jan. 23, 15	Jan. 31, 16
W2	Coaxial Cable	Suhner	SUCOFLEX104	F0000018	Jan. 23, 15	Jan. 31, 16

### Measuring Equipment Configuration



**Test Results**

Test date	Oct 26, 2015
Location	Kashima No.1 Test Site
temperature	22 [degree C]
Humidity Variation	51 [%]
Atmospheric Pressure	102.0 [kPa]
Test Engineer	Koichi Wagatsuma

Test was carried out for all the frequency band of section 7.1

State the worst case (below).

State : High Power / Authorized Bandwidth 11.25 kHz

No.	Tuned Frequency (MHz)	Band	Spurious Frequency (MHz)	Correct Level (dBm)	Emission Level (dBc)	Mask D Limit (dBc)	Margin (dB)
1	138.05 (RSS)	Low	276.10	-35.23	<b>-82.22</b>	-67.0	15.2
2	150.05 (FCC)	Low	300.10	-33.95	<b>-80.94</b>	-67.0	13.9
3	158.05 (RSS)	Middle	316.10	-34.57	<b>-81.56</b>	-67.0	14.6
4	162.05 (FCC)	Middle	324.10	-36.25	<b>-83.24</b>	-67.0	16.2
5	173.95 (FCC/RSS)	High	347.90	-37.49	<b>-84.48</b>	-67.0	17.5

There is the margin of 20dB over except for the above points.

Mask D Limit (dBc) =  $-(50+10\log(P))$

Correct Level (dBm) = Substitute SG Level (dBm)

Emission Level (dBc) = Correct Level (dBm) -  $10\log(P*1000)$

P = Carrier Level (W)

" - " = Measurement Limit

State : Low Power / Authorized Bandwidth 11.25 kHz

No.	Tuned Frequency (MHz)	Band	Spurious Frequency (MHz)	Correct Level (dBm)	Emission Level (dBc)	Mask D Limit (dBc)	Margin (dB)
1	138.05 (RSS)	Low	276.10	-35.24	<b>-72.23</b>	-57.0	15.2
2	150.05 (FCC)	Low	300.10	-38.25	<b>-75.24</b>	-57.0	18.2
3	158.05 (RSS)	Middle	316.10	-36.03	<b>-73.02</b>	-57.0	16.0
4	162.05 (FCC)	Middle	324.10	-36.50	<b>-73.49</b>	-62.0	11.5
5	173.95 (FCC/RSS)	High	347.90	-36.33	<b>-73.32</b>	-62.0	11.3

There is the margin of 20dB over except for the above points.

Mask D Limit (dBc) =  $-(50+10\log(P))$

Correct Level (dBm) = Substitute SG Level (dBm)

Emission Level (dBc) = Correct Level (dBm) -  $10\log(P*1000)$

P = Carrier Level (W)

" - " = Measurement Limit

### 7.3 Emission Masks (Occupied Bandwidth)

REGULATIONS : FCC Part 2 Section 1049 (c) (1), Part 90 Section 210 / RSS-119 Section 5.5

TEST METHOD/GUIDE : ANSI/TIA-603-D Section 2.2.11.2 / RSS-119 Section 5.5

### Test Procedure

- 1 The EUT and test equipment were set up as shown on the following page.
- 2 For EUT supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for +/- 2.5 kHz deviation (or 50 % modulation). (FM modulation).
- 3 With level constant, the signal level was increased 16 dB.
- 4 For EUT supporting digital modulation, the digital modulation mode was operated to its maximum extent.
- 5 Adjust the spectrum analyzer for the following setting:
  - a) RBW : 100 Hz (Modulation , Authorized Band:11.25 kHz)
  - b) VBW : 10times the RBW (Modulation , Authorized Band 11.25 kHz).
  - c) RBW and VBW : 30 kHz (Non Modulation / Digital Modulation).
- 6 The occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

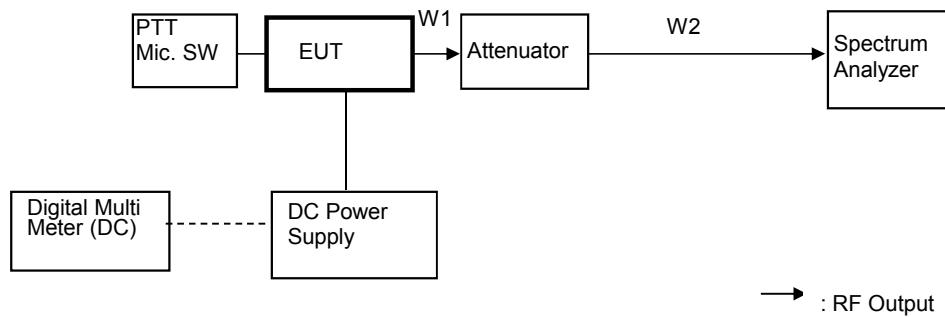
### Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4357	Jun. 01, 15	Jun. 30, 16
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	Jun. 01, 15	Jun. 30, 16
3	Spectrum Analyzer	Agilent	N9030A	US51350170	Mar. 12, 15	Mar. 31, 16
4	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None
5	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 10, 15	Jul. 31, 16

### Measuring Cables

No.	Cable	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
W1	Coaxial Cable	Suhner	SUCOFLEX104	F0000017	Jan. 23, 15	Jan. 31, 16
W2	Coaxial Cable	Suhner	SUCOFLEX104	F0000018	Jan. 23, 15	Jan. 31, 16

### Measuring Equipment Configuration



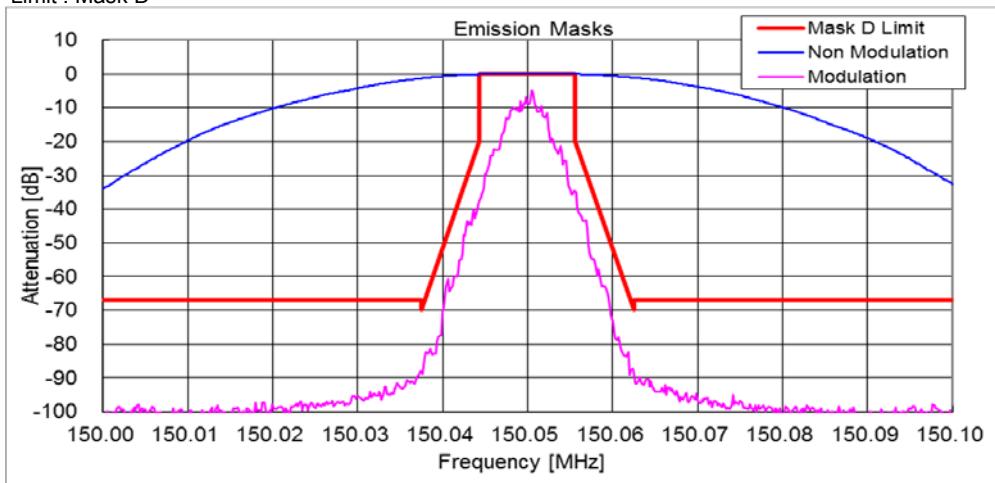
## Test Results

Test date	Oct 27, 2015
Location	Kashima No.1 Test Site
temperature	20 [degree C]
Humidity Variation	60 [%]
Atmospheric Pressure	101.6 [kPa]
Test Engineer	Koichi Wagatsuma

Test was carried out for all the frequency band of section 10.1  
State the worst case (below).

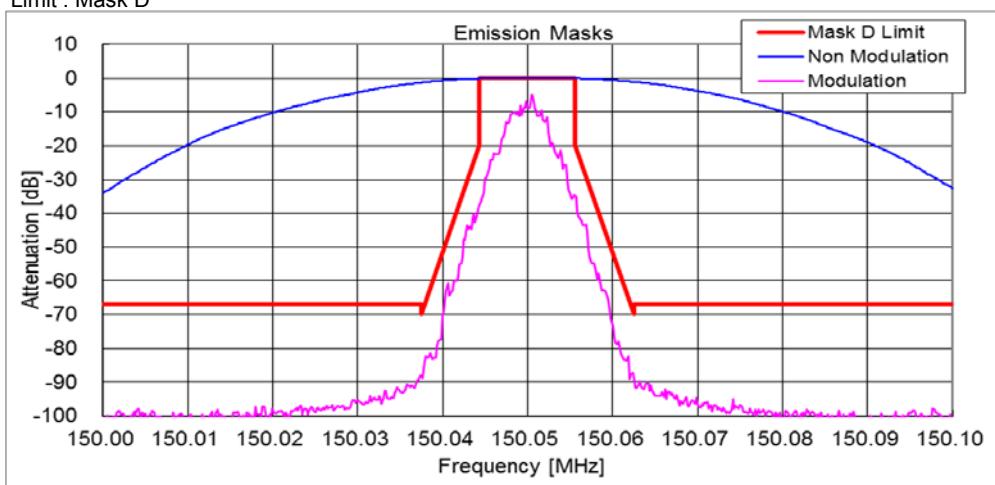
State : High Power / Authorized Bandwidth 11.25 kHz/ 7K60FXE / 150.05 MHz(FCC)

Limit : Mask D

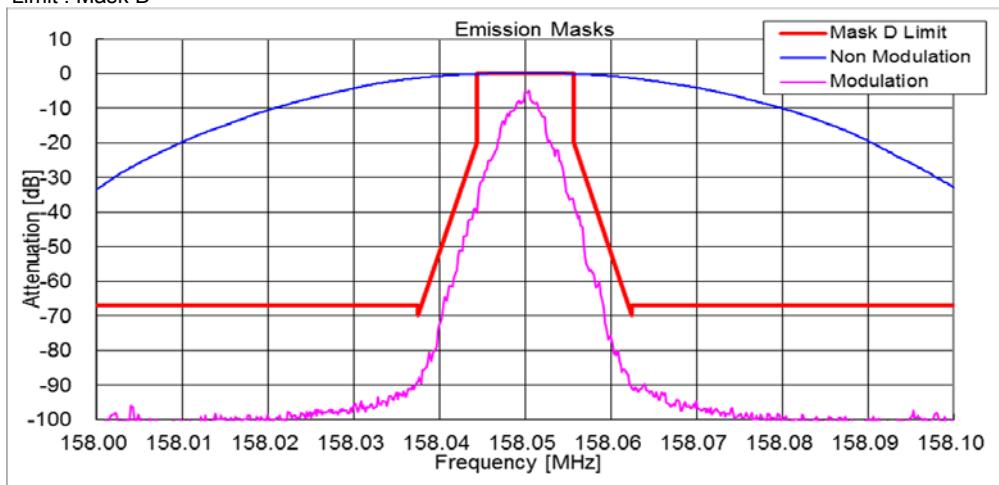


State : High Power / Authorized Bandwidth 11.25 kHz/ 7K60FXD / 150.05 MHz(FCC)

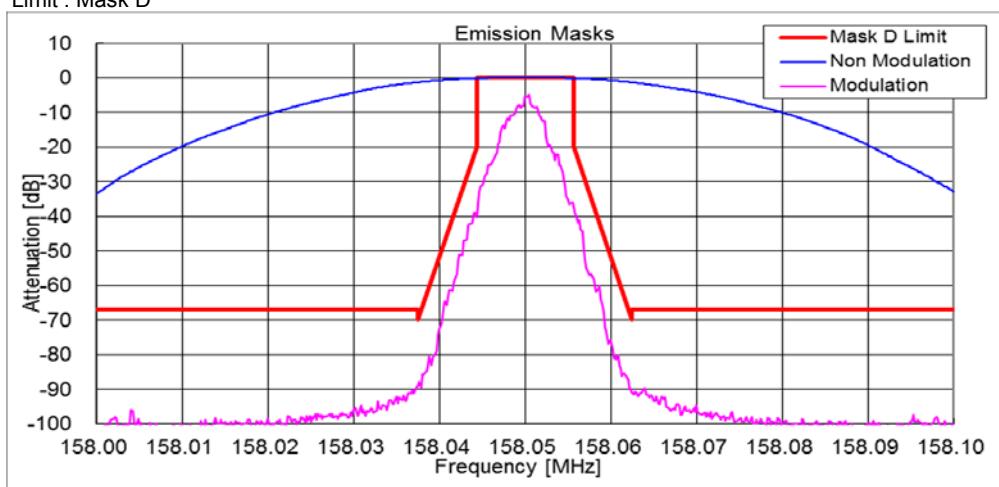
Limit : Mask D



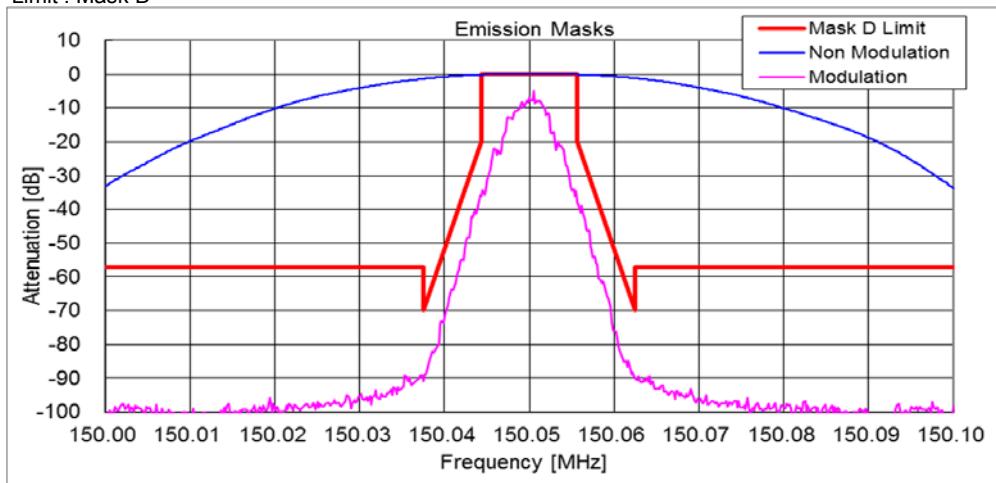
State : High Power / Authorized Bandwidth 11.25 kHz/ 7K60FXE / 158.05 MHz(RSS)  
Limit : Mask D



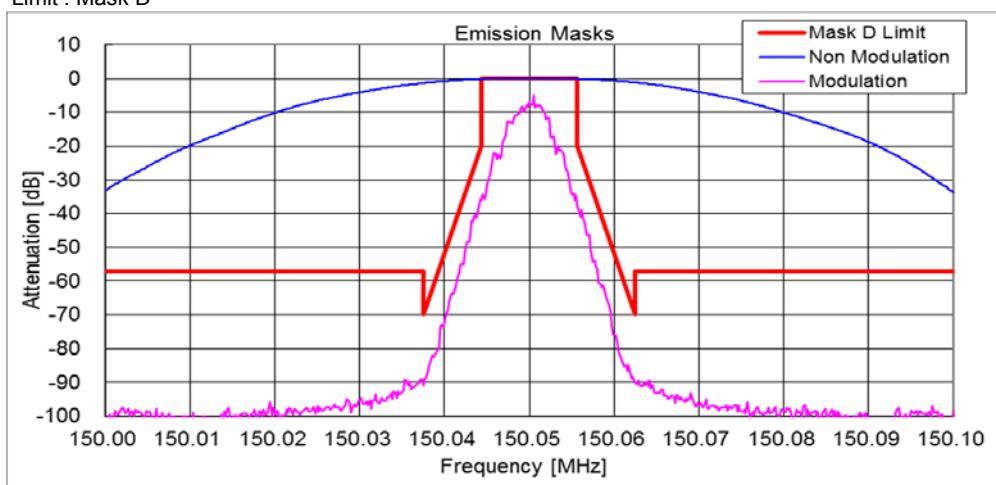
State : High Power / Authorized Bandwidth 11.25 kHz/ 7K60FXD / 158.05 MHz(RSS)  
Limit : Mask D



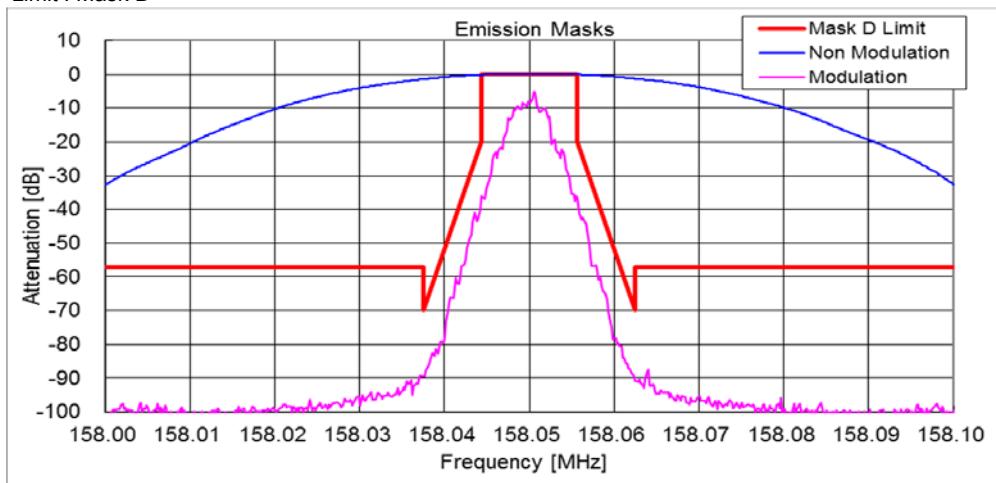
State : Low Power / Authorized Bandwidth 11.25 kHz/ 7K60FXE / 150.05 MHz(FCC)  
Limit : Mask D



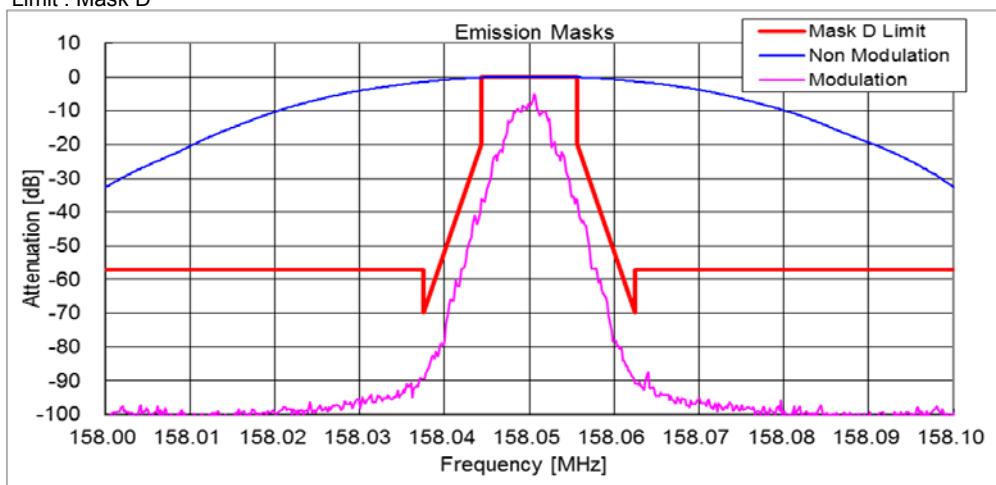
State : Low Power / Authorized Bandwidth 11.25 kHz/ 7K60FXD / 150.05 MHz(FCC)  
Limit : Mask D



State : Low Power / Authorized Bandwidth 11.25 kHz / 7K60FXE / 158.05 MHz(RSS)  
Limit : Mask D



State : Low Power / Authorized Bandwidth 11.25 kHz/ 7K60FXD / 158.05 MHz(RSS)  
Limit : Mask D



#### 7.4 Necessary Bandwidth and Emission Bandwidth

REGULATIONS	: FCC Part 2 Section 202 (g) & Federal Register/ Vol.68, No236
	TRC 43

#### Calculation Results

State : 7K60FXE / 7K60FXD (9600bps, Authorized Bandwidth 11.25 kHz)

Item	Mark		
Digital information rate	(R)	9600	bps
Peak frequency deviation	(D)	3.024	kHz
Signaling states	(S)	4	
Numerical factor	(K)	0.463	
Necessary Bandwidth	(Bn)	7.6	kHz

$$Bn = (R/\log_2 S) + 2xDxK$$

## 7.5 99% Occupied Bandwidth

REGULATIONS	:	RSS-119 Section 5.5
TEST METHOD/GUIDE	:	RSS-Gen Section 6.6

### Test Procedure

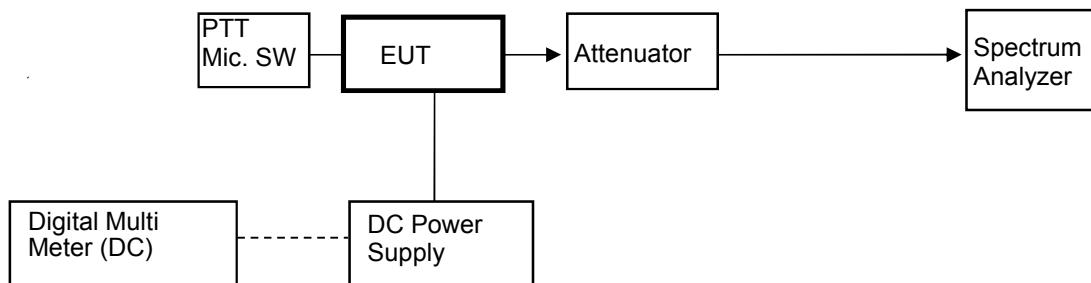
- 1 The EUT and test equipment were set up as shown on the following page.
- 2 Adjust the test instrument for the following setting:
 

RBW	:	1 % to 5 % of the Necessary bandwidth
VBW	:	at least 3 times the RBW
Detector	:	Peak
Sweep Time	:	Auto
Trace mode	:	Max Hold
- 3 Allow trace to fully stabilize.
- 4 Use "Occupied Bandwidth Measurement" function to measure the 99% Occupied Bandwidth.
- 5 Modulate the transmitter with a 2.5 kHz sine wave at an input Level of 16 dB greater than that necessary to produce 50 % of rated system deviation.(Only 16K0F3E, 11K0F3E)

### Measuring Equipments

No.	Equipment	Manufacture	Model No.	Serial No.	Cal Date	Cal Exp.
1	Attenuator (20dB)	Aeroflex/Wenshel	66-20-34	BY4357	Jun. 01, 2015	Jun. 30, 2016
2	Attenuator (30dB)	Weinschel	WA-29-30-34	8923	Jun. 01, 2015	Jun. 30, 2016
3	Spectrum Analyzer	Agilent	N9030A	US51350170	Mar. 12, 2015	Mar. 31, 2016
4	DC Power Supply	Daiichi denpa kogyo	GZV4000	90290931	None	None
5	Digital Multi Meter	FLUKE	8846A	9642018	Jul. 10, 2015	Jul. 31, 2016
6	Coaxial Cable	Suhner	SUCOFLEX104	F0000017	Jan. 23, 2015	Jan. 31, 2016
7	Coaxial Cable	Suhner	SUCOFLEX104	F0000018	Jan. 23, 2015	Jan. 31, 2016

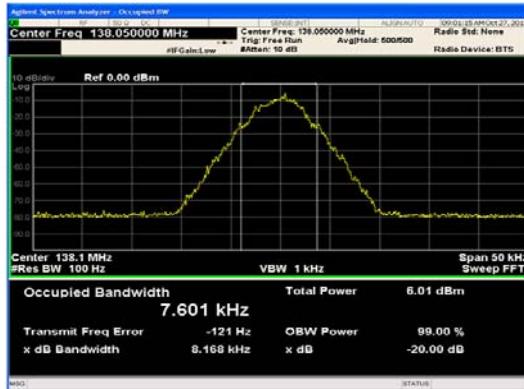
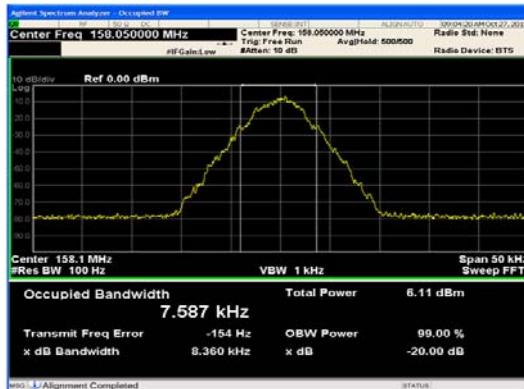
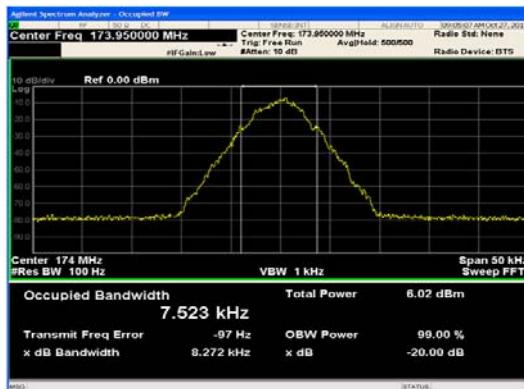
### Measuring Equipment Configuration



**Test Results**

Test date	Oct 27, 2015
Location	Kashima No.1 Test Site
temperature	20 [degree C]
Humidity Variation	60 [%]
Atmospheric Pressure	101.2 [kPa]
Test Engineer	Koichi Wagatsuma

Emission Designation	Frequency (MHz)	99% Occupied Bandwidth (kHz)	Authorized bandwidth (kHz)
7K60FXD/FXE	138.05	7.601	
	158.05	7.587	
	173.95	7.523	11.25

Ferquency (MHz)	Emission Designation	
	7K60FXD/FXE	
138.05	 <p>Center Freq: 138.050000 MHz      Center Freq: 138.050000 MHz      Trig: Free Run      AvgHold: 500000      Radio Std: None      #IFGainLow      #Attenu: 10 dB      Radio Device: BTS</p> <p>10 dB/div Ref 0.00 dBm      Log      Center 138.1 MHz Res BW 100 Hz VBW 1 kHz Span 50 kHz Sweep FFT</p> <p>Occupied Bandwidth 7.601 kHz Total Power 6.01 dBm      Transmit Freq Error -121 Hz OBW Power 99.00 %      x dB Bandwidth 8.168 kHz x dB -20.00 dB</p> <p>MSG: Alignment Completed STATUS:</p>	
158.05	 <p>Center Freq: 158.050000 MHz      Center Freq: 158.050000 MHz      Trig: Free Run      AvgHold: 500000      Radio Std: None      #IFGainLow      #Attenu: 10 dB      Radio Device: BTS</p> <p>10 dB/div Ref 0.00 dBm      Log      Center 158.1 MHz Res BW 100 Hz VBW 1 kHz Span 50 kHz Sweep FFT</p> <p>Occupied Bandwidth 7.587 kHz Total Power 6.11 dBm      Transmit Freq Error -154 Hz OBW Power 99.00 %      x dB Bandwidth 8.360 kHz x dB -20.00 dB</p> <p>MSG: Alignment Completed STATUS:</p>	
173.95	 <p>Center Freq: 173.950000 MHz      Center Freq: 173.950000 MHz      Trig: Free Run      AvgHold: 500000      Radio Std: None      #IFGainLow      #Attenu: 10 dB      Radio Device: BTS</p> <p>10 dB/div Ref 0.00 dBm      Log      Center 174 MHz Res BW 100 Hz VBW 1 kHz Span 50 kHz Sweep FFT</p> <p>Occupied Bandwidth 7.523 kHz Total Power 8.02 dBm      Transmit Freq Error -97 Hz OBW Power 99.00 %      x dB Bandwidth 8.272 kHz x dB -20.00 dB</p> <p>MSG: STATUS:</p>	