



EMI TEST REPORT

Test Report No. : 24BE0140-HO-1

Applicant : NEC System Integration & Construction, Ltd.
Type of Equipment : Radio Equipment
Model No. : HX68-C
Test standard : FCC Part 90
FCC ID : RJGHX68C
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.
5. This test report does not constitute an endorsement by NIST/NVLAP or U.S. Government.

Date of test : September 29 - October 4 and October 19 , 20 , 22 and 27, 2003

Tested by :

Kenichi Adachi
EMC Service

Approved by :

Naoki Sakamoto
Group Leader of EMC Service

UL Apex Co., Ltd.

Head Office EMC Lab.

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SECTION 1: Client information

Company name : NEC System Integration & Construction, Ltd.
Brand name : NEC
Address : 1-39-9,HIGASHI-SHINAGAWA,SHINAGAWA-KU, TOKYO-TO,
140-8620 JAPAN
Telephone Number : +81 3 5463 7102
Facsimile Number : +81 3 5463 7112
Contact Person : Jun Arai

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Radio Equipment
Model No. : HX68-C
Serial No. : 1001
Rating : DC 13.8V
Country of Manufacture : Japan
Receipt Date of Sample : September 29, 2003
Condition of EUT : Production model

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2.2 Identification of equipment connected with HX68-C

Type of equipment : Combiner (Duplexer)
Model No. : HX69-C
Serial No. : 1003
Rating : N/A
Country of manufacturer : Japan
Receipt Date of Sample : September 29, 2003
Condition of EUT : Production model

*Note : Normally we use HX68-C independently. If we could use HX68-C in system, we use HX68-C with HX69-C.
Therefore, this report contains data measuring characteristics of HX68-C with HX69-C.

2.3 Product Description

NEC System Integration & Construction, Ltd. Model: HX68-C (referred to as the EUT in this report) is the Radio Equipment.

Equipment identification : Radio Equipment
Intended use/Purpose of the equipment : Selecting one of two ways. Alternate way of Rx / Tx and simultaneous way of Rx / Tx.
Equipment Type : Transceiver
Emission class : F3E
Frequency of Operation : 453.5125MHz
Other Clock Frequency : IF : 45.0MHz and 455kHz
Modulation : Frequency modulation
Bandwidth / Channel spacing : 12.5kHz
Transmit power or power range : 10W +20%, -50%
Method of Frequency Generation : Synthesized method

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SECTION 3: Test specification, procedures and results

3.1 Test Specification

Test Specification : FCC Part90
Title : PRIVATE LAND MOBILE RADIO SERVICES

3.2 Procedures and results

3.2.1 procedures and results of HX68-C

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	RF Output Power	Section 2.1046	Section 90.205	-	N/A	-	Complied
2	Modulation Characteristics	Section 2.1047(a) and (b)	-	-	N/A	-	Complied
3	Emission Bandwidth	Section 2.1049	Section 90.209	-	N/A	-	Complied
4	Spurious Emission at Antenna Terminals	Section 2.1051	Section 90.210	-	N/A	7.1dB 1360.54MHz	Complied
5	Field Strength of Spurious Emission	Section 2.1053	Section 90.210	-	N/A	1.9dB 3174.59MHz Horizontal	Complied
6	Frequency Stability Measurement	Section 2.1055	Section 90.213	-	N/A	-	Complied
7	Transient Frequency Behavior	TIA-603-B 2.2.19	Section 90.214	-	N/A	-	Complied

Note: UL Apex's EMI Work Test Procedure QPM05.

3.2.2 Procedures and result of HX68-C with HX69-C

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	RF Output Power	Section 2.1046	Section 90.205	-	N/A	-	Complied
3	Emission Bandwidth	Section 2.1049	Section 90.209	-	N/A	-	Complied
4	Spurious Emission at Antenna Terminals	Section 2.1051	Section 90.210	-	N/A	12.9dB 1360.54MHz	Complied
5	Field Strength of Spurious Emission	Section 2.1053	Section 90.210	-	N/A	2.6dB 3174.59MHz Horizontal	Complied

Note: UL Apex's EMI Work Test Procedure QPM05.

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3.3 Additions to Standards

No addition, deviation or exclusion has been made from standards.

3.4 Confirmation

UL Apex Co, Ltd. hereby confirms that E.U.T., in the configuration tested, complies with the specifications FCC Part 90.

3.5 Uncertainty

Spurious Emission(Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is $\pm 4.5\text{dB}$.

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is $\pm 5.2\text{dB}$.

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is $\pm 6.6\text{dB}$.

The result is within Head Office EMC Lab's uncertainty.

3.6 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. No.2 semi anechoic chamber, 7.5 x 5.8 x 5.2m. No.3 measurement room,
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This semi anechoic chamber has been fully described in a report submitted to FCC office, and listed on June 05, 2002.
(Registration number: No.2 :846015)

*NVLAP Lab. code: 200572-0

3.7 Test setup and test instruments

Refer to APPENDIX 1 and 2.

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SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

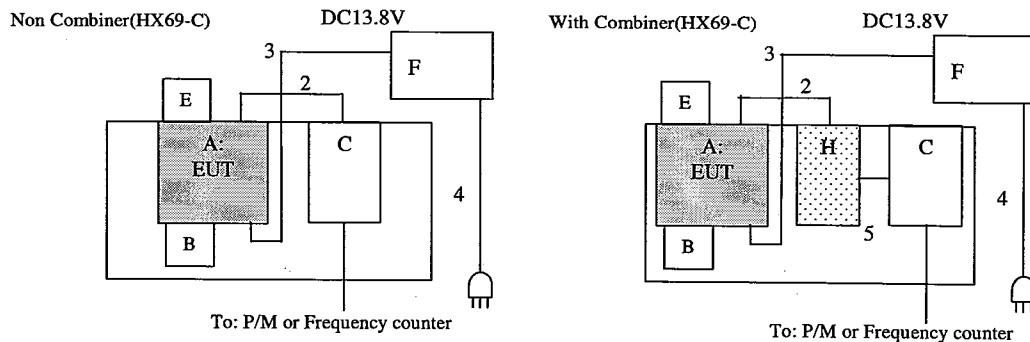
The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

The sequence is used : Continuous Transmitting mode

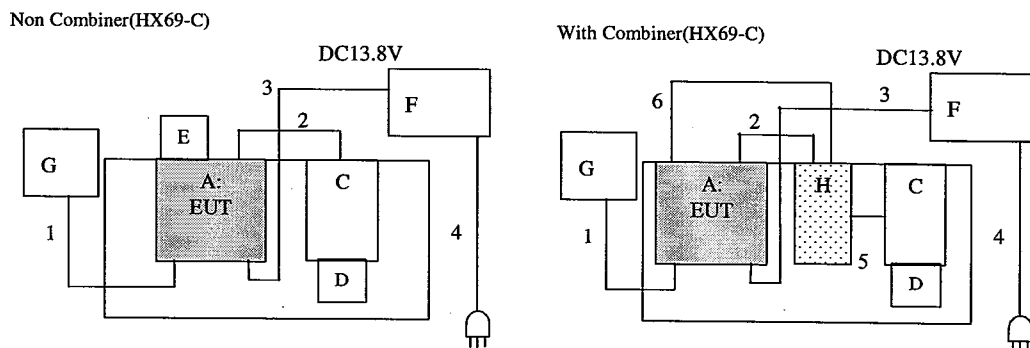
Justification : The system was configured in typical fashion (as a customer would normally use it) for testing.

4.2. Configuration and peripherals

4.2.1. RF Power , Frequency Stability, Transient Frequency Behavior



4.2.2. Field Strength of Spurious Emission



* Cabling was taken into consideration and test data was taken under worst case conditions.

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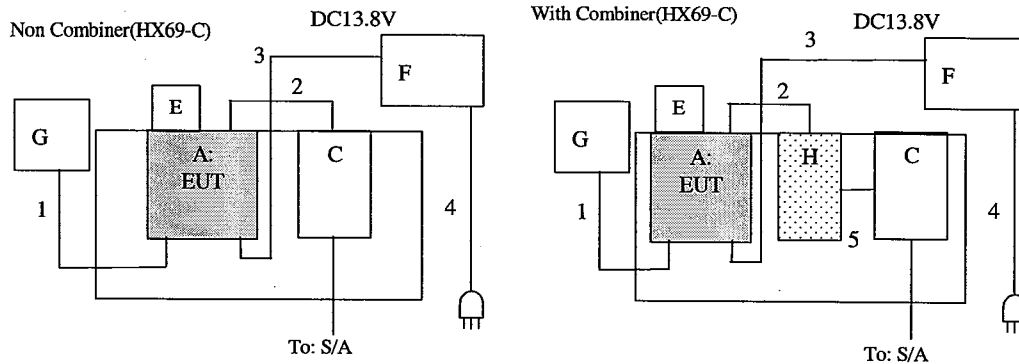
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4.2.3. Modulation Characteristics, Emission Mask , Bandwidth, Spurious emission at antenna terminals



Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID	Remark
A	Transceiver	HX68-C	1001	NEC		EUT
B	Dummy microphone	-	-	-	-	-
C	Attenuator (40dB)	53-40-33	MM131	Weinscel Corp	-	-
D	Terminator	NTRM-50	941513	MCL	-	-
E	Terminator	NTRM-50	932211	MCL	-	-
F	DC Supply	6642A	Agilent	MY40000358	-	-
G	Audio Analyzer	UPA	835837/004	Rohde & Schwarz	-	-
H	Combiner	HX69-C	1003	NEC	-	-

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	Coaxial Cable	3.0	Y	Polyvinyl chloride
2	Coaxial Cable	0.5	Y	Polyvinyl chloride
3	DC Cable	1.3	Y	Polyvinyl chloride
4	AC Cable	2.0	N	Polyvinyl chloride
5	Coaxial Cable	0.5	Y	Polyvinyl chloride
6	Coaxial Cable	1.5	Y	Polyvinyl chloride

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SECTION 5: RF Output power

5.1 Test Procedure : FCC Part 2.1046, Part 90.205

To achieve the maximum power output rating, measurement was taken with HX68-C with power supply 13.8V DC.

5.2 Test data

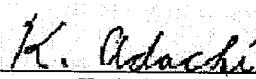
DATA OF RF OUTPUT POWER(CONDUCTED)

UL Apex Co., Ltd.

Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : NEC System Integration & Consruction, Ltd.
EQUIPMENT : Radio Equipment
MODEL : HX68-C
S/ N : 1001
FCC ID : RJGHX68C
IC Number : -
POWER : DC 13.8V
MODE : Tx : 453.5125MHz

REPORT NO : 24BE0140-HO
REGULATION : Fcc Part90 .205 / Part2.1046
TEST DISTANCE : -
DATE : 09/29/2003 10/04/2003
TEMPERATURE : 27deg.C 23deg.C
HUMIDITY : 41% 46%


Engineer : Kenichi Adachi

None HX69-C

Detect	FREQ [MHz]	P/M Reading [dBm]	Cable+ATT Loss [dB]	Result [dBm]
PK	453.513	0.0	40.1	40.1

with HX69-C

Detect	FREQ [MHz]	P/M Reading [dBm]	Cable+ATT Loss [dB]	Result [dBm]
PK	453.513	-7.6	40.1	32.5

Test Instruments : MPM-04 , MPSE-04 , MAT-13 (40dB) , MCC-07 , MTA-04 (50ohm) , MDPS-01

5.3 Test result : Pass

5.4 Test instruments : MPM-04, MPSE-04, MAT-13, MCC-07, MTA-04, MDPS-01

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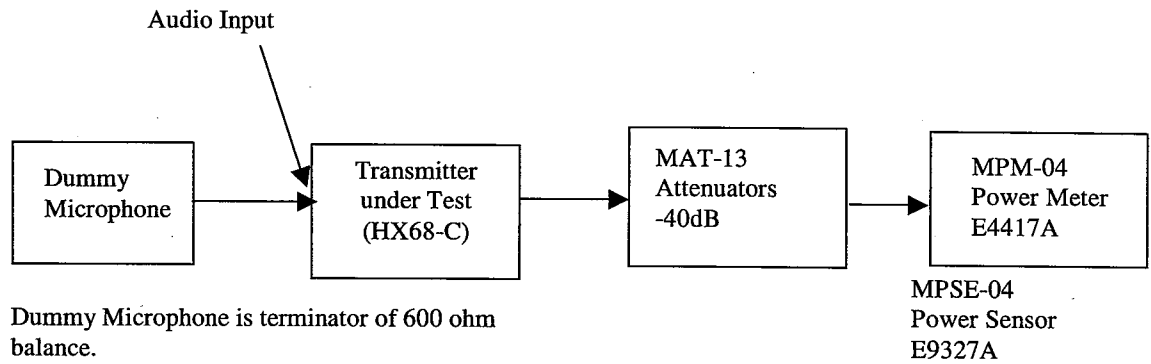
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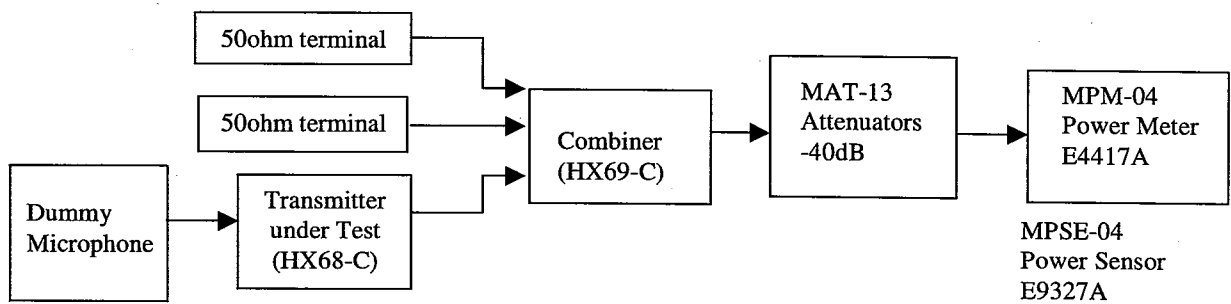
Facsimile : +81 596 24 8124

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5.5 Measurement Block Diagram of RF power output



RF Power Measurement (FCC Part 2.1046, FCC90.205)



RF Power Measurement of Transmitter with Combiner

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SECTION 6: Modulation Characteristics

6.1 Transmitter Deviation for Input Level and Modulation frequency

6.1.1 Test Procedure : FCC Part 2.1047

- 1) The HX68-C was aligned for transmitter operation on 453.5125MHz at full rated power.
- 2) When input Level from -24dBm to 20dBm is applied to audio (microphone) input of HX68-C each modulation frequency 300Hz, 1kHz and 3kHz, frequency deviation is measured with Model CMS54.

6.1.2 Test Data

DATA OF MODULATION CHARACTERISTICS

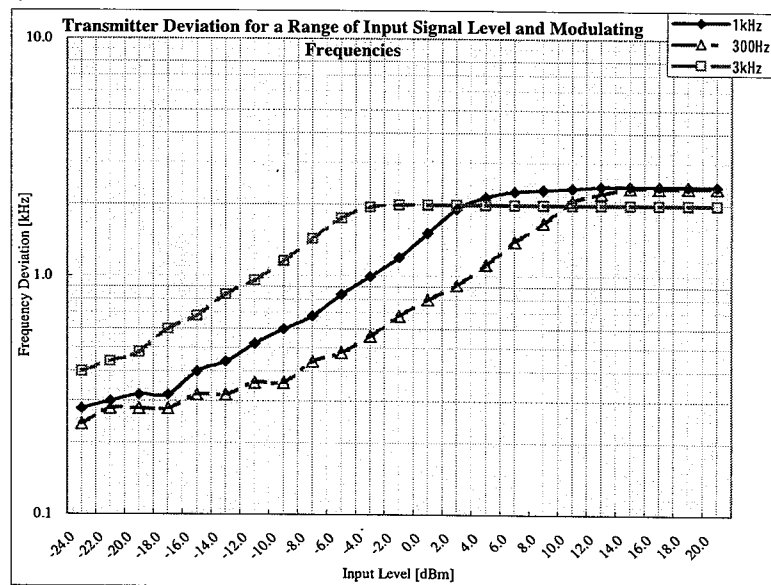
UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : NEC System Integration & Consruction, Ltd.
EQUIPMENT : Radio Equipment
MODEL : HX68-C
S/N : 1001
FCC ID : RJGHX68C
IC Number : -
POWER : DC 13.8V
MODE : Tx : 453.5125MHz

REPORT NO : 24BE0140-HO
REGULATION : FCC part 2.1047
TEST DISTANCE : -
DATE : 10/02/2003
TEMPERATURE : 25deg.C
HUMIDITY : 55%

Engineer : *K. Adachi*
Kenichi Adachi

Input [dBm]	Deviation [kHz](PK)	300Hz	1kHz	3kHz
-24.0	0.24	0.28	0.40	
-22.0	0.28	0.30	0.44	
-20.0	0.28	0.32	0.48	
-18.0	0.28	0.32	0.60	
-16.0	0.32	0.40	0.68	
-14.0	0.32	0.44	0.84	
-12.0	0.36	0.52	0.96	
-10.0	0.36	0.60	1.16	
-8.0	0.44	0.68	1.44	
-6.0	0.48	0.84	1.76	
-4.0	0.56	1.00	1.96	
-2.0	0.68	1.20	2.00	
0.0	0.80	1.52	2.00	
2.0	0.92	1.92	2.00	
4.0	1.12	2.16	2.00	
6.0	1.40	2.28	2.00	
8.0	1.68	2.32	2.00	
10.0	2.08	2.36	2.00	
12.0	2.24	2.40	2.00	
14.0	2.36	2.40	2.00	
16.0	2.36	2.40	2.00	
18.0	2.36	2.40	2.00	
20.0	2.36	2.40	2.00	



* Input Frequency : 300Hz , 1kHz , 3kHz
* Center frequency : 453.51235 MHz
* CMS54 setting : filter OFF

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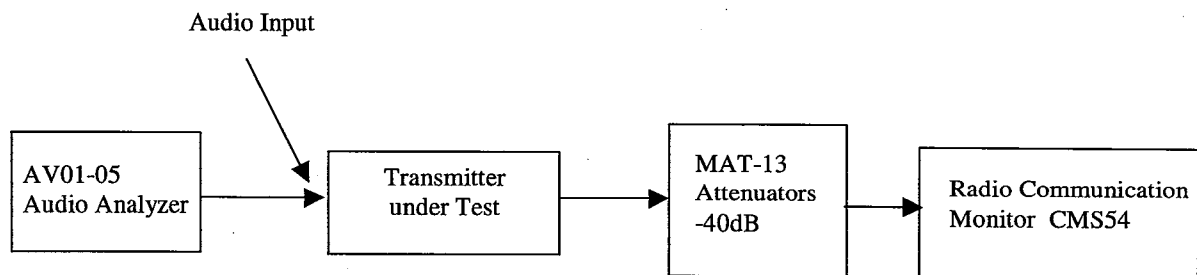
Facsimile : +81 596 24 8124

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6.1.3 Test Result : Pass

6.1.4 Test Instrument : AV01-05 , MST-01 , MCC-07 , MAT-13 , MCC-22 , CMS54 , MDPS-01

6.1.5 Measurement Block Diagram



Note: Modulation Domain Analyzer

Modulation Characteristics (FCC 2.1047)

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6.2 Transmitter Deviation for Input Frequency Response

6.2.1 Test Procedure : FCC Part 2.1047

- 1) The HX68-C was aligned for transmitter operation on 453.5125MHz at full rated power.
- 2) When frequency from 300Hz to 5kHz is applied to audio (microphone) input of HX68-C each input level -10dBm, -5dBm and 0dBm, frequency deviation is measured with Model CMS54.

6.2.2 Test Data

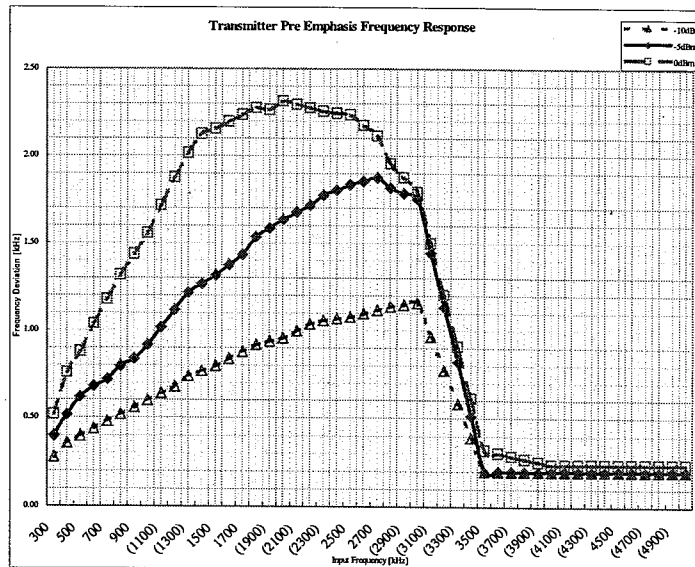
DATA OF MODULATION CHARACTERISTICS

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Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY	: NEC System Integration & Construction, Ltd.	REPORT NO	: 24BE0140-HO
EQUIPMENT	: Radio Equipment	REGULATION	: FCC part 2.1047
MODEL	: HX68-C	TEST DISTANCE	: -
S/N	: 1001	DATE	: 10/02/2003
FCC ID	: RJGHX68C	TEMPERATURE	: 25deg.C
IC Number	: -	HUMIDITY	: 55%
POWER	: DC 13.8V		
MODE	: Tx : 453.5125MHz		

Engineer : *K. Adachi*
Kenichi Adachi

Input Freq	Deviation [kHz]		
	-10dBm	-5dBm	0dBm
300	0.28	0.40	0.52
400	0.36	0.52	0.76
500	0.40	0.62	0.88
600	0.44	0.68	1.04
700	0.48	0.72	1.18
800	0.52	0.80	1.32
900	0.56	0.84	1.44
1000	0.60	0.92	1.56
(1100)	0.64	1.02	1.72
1200	0.68	1.12	1.88
(1300)	0.74	1.22	2.02
(1400)	0.77	1.27	2.13
1500	0.80	1.32	2.16
(1600)	0.84	1.38	2.20
1700	0.88	1.44	2.24
(1800)	0.92	1.54	2.28
(1900)	0.94	1.59	2.27
2000	0.96	1.64	2.32
(2100)	1.00	1.68	2.30
2200	1.04	1.72	2.28
(2300)	1.06	1.78	2.26
(2400)	1.07	1.81	2.25
2500	1.08	1.84	2.24
(2600)	1.10	1.86	2.18
2700	1.12	1.88	2.12
(2800)	1.14	1.82	1.96
(2900)	1.15	1.79	1.88
3000	1.16	1.76	1.80
(3100)	0.97	1.45	1.50
(3200)	0.77	1.13	1.21
(3300)	0.58	0.82	0.91
(3400)	0.39	0.51	0.61
3500	0.20	0.20	0.32



* Input level : -10dBm, -5dBm, 0dBm
* Center frequency : 453.51238 MHz
* CMS54 setting : filter OFF.
* note : Frequency's () is calculate data.

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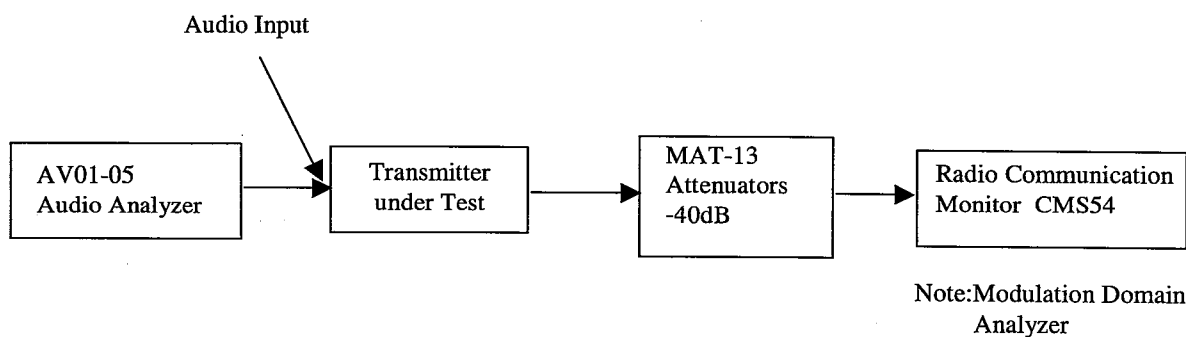
Facsimile : +81 596 24 8124

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6.2.3 Test Result : Pass

6.2.4 Test Instrument : AV01-05 , MST-01 , MCC-07 , MAT-13 , MCC-22 , CMS54 , MDPS-01

6.2.5 Measurement Block Diagram



Modulation Characteristics (FCC 2.1047)

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SECTION 7: Emission Bandwidth

Emission Bandwidth is measured with two kind of configuration, the one is with HX68-C only and the another is with HX68-C connected with HX69-C.

7.1 Test Procedure : FCC Part 2.1049 , Part 90.209

- 1) Set the reference level the spectrum analyzer to the unmodulation carrier level on the EUT
- 2) The Carrier is modulated by a 2.5kHz tone at an input level 16dB greater than that necessary to produce 50 percent modulation. The input level shall be established at the frequency of maximum response of the audio modulation.

7.2 Test Data

7.2.1 Test Data of HX68-C without HX69-C

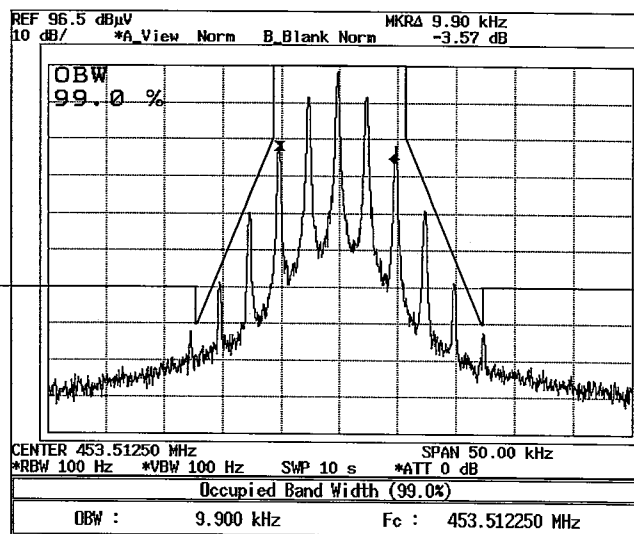
DATA OF EMISSION BANDWIDTH

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY	: NEC System Integration & Construction, Ltd.	REPORT NO	: 24BE0140-HO
EQUIPMENT	: Radio Equipment	REGULATION	: Fcc Part2.1049
MODEL	: HX68-C	TEST DISTANCE	: -
S/N	: 1001	DATE	: 10/04/2003
FCC ID	: RJGHX68C	TEMPERATURE	: 23deg.C
IC Number	: -	HUMIDITY	: 46%
POWER	: DC 13.8V		
MODE	: Tx : 453.5125MHz		

ENGINEER : Kenichi Adachi

99% Occupied Bandwidth



* 99% Occupied Bandwidth : 9.90 kHz Limit 11.25 kHz
Input Level : 8 dBm

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7.2.2 Test Data of HX68-C connected with HX69-C

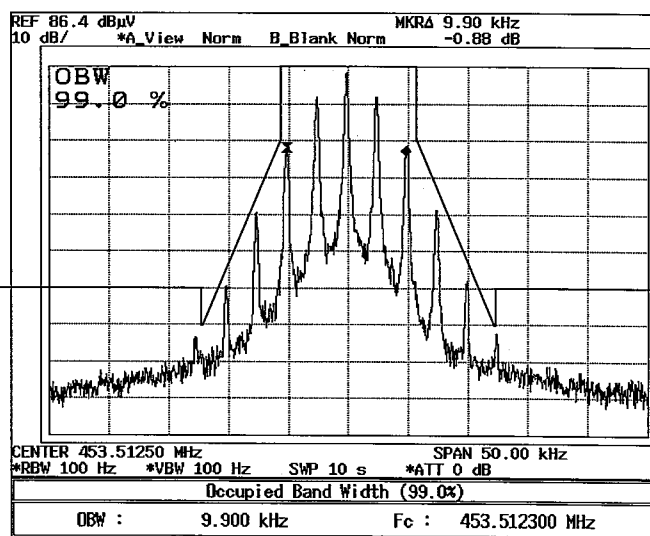
DATA OF EMISSION BANDWIDTH

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY	: NEC System Integration & Construction, Ltd.	REPORT NO	: 24BE0140-HO
EQUIPMENT	: Radio Equipment	REGULATION	: Fcc Part2.1049
MODEL	: HX68-C + HX69-C	TEST DISTANCE	: -
S/N	: 1001, 1003	DATE	: 10/04/2003
FCC ID	: RJGHX68C	TEMPERATURE	: 23deg.C
IC Number	: -	HUMIDITY	: 46%
POWER	: DC 13.8V		
MODE	: Tx : 453.5125MHz		

K. Adachi
ENGINEER : Kenichi Adachi

99% Occupied Bandwidth



*99% Occupied Bandwidth : 9.90 kHz Limit 11.25 kHz
Input Level : 8 dBm

7.3 Test Result

7.3.1 Test Result of HX68-C without HX69-C :Pass

7.3.2 Test result of HX68-C connected with HX69-C :Pass

7.4 Test Instrument : SA-07, MCC-22, MAT-13, MCC-07, MDPS-01, AV01-05

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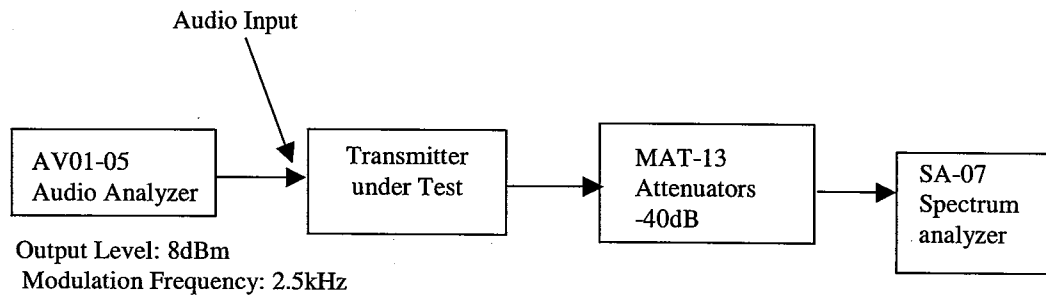
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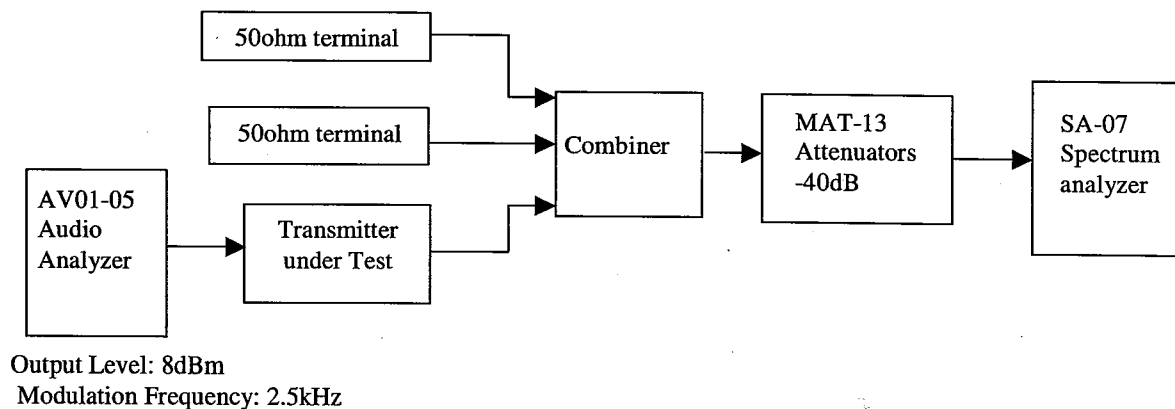
7.5 Measurement Block Diagram

7.5.1 Measurement Block Diagram of HX68-C without HX69-C



Emission Bandwidth (FCC Part 2.1049)

7.5.2 Measurement Block Diagram of HX68-C connected with HX69-C



Emission Bandwidth of transmitter with combiner

UL Apex Co., Ltd.

Head Office EMC Lab.

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SECTION 8: Spurious emission at Antenna Terminals

Spurious Emission at Antenna Terminals is measured with two kind of configuration, the one is with HX68-C only and the another is with HX68-C connected with HX69-C.

8.1 Test Procedure : FCC Part 2.1051

- 1) The HX68-C was aligned for transmitter operation on 453.5125MHz at full rated power.
- 2) The Carrier is modulated by a 2.5kHz tone at an input level 16dB greater than that necessary to produce 50 percent modulation. The input level shall be established at the frequency of maximum response of the audio modulation.
- 3) Output of HX68-C was connected with spectrum analyzer through dummy load attenuator 40dB.

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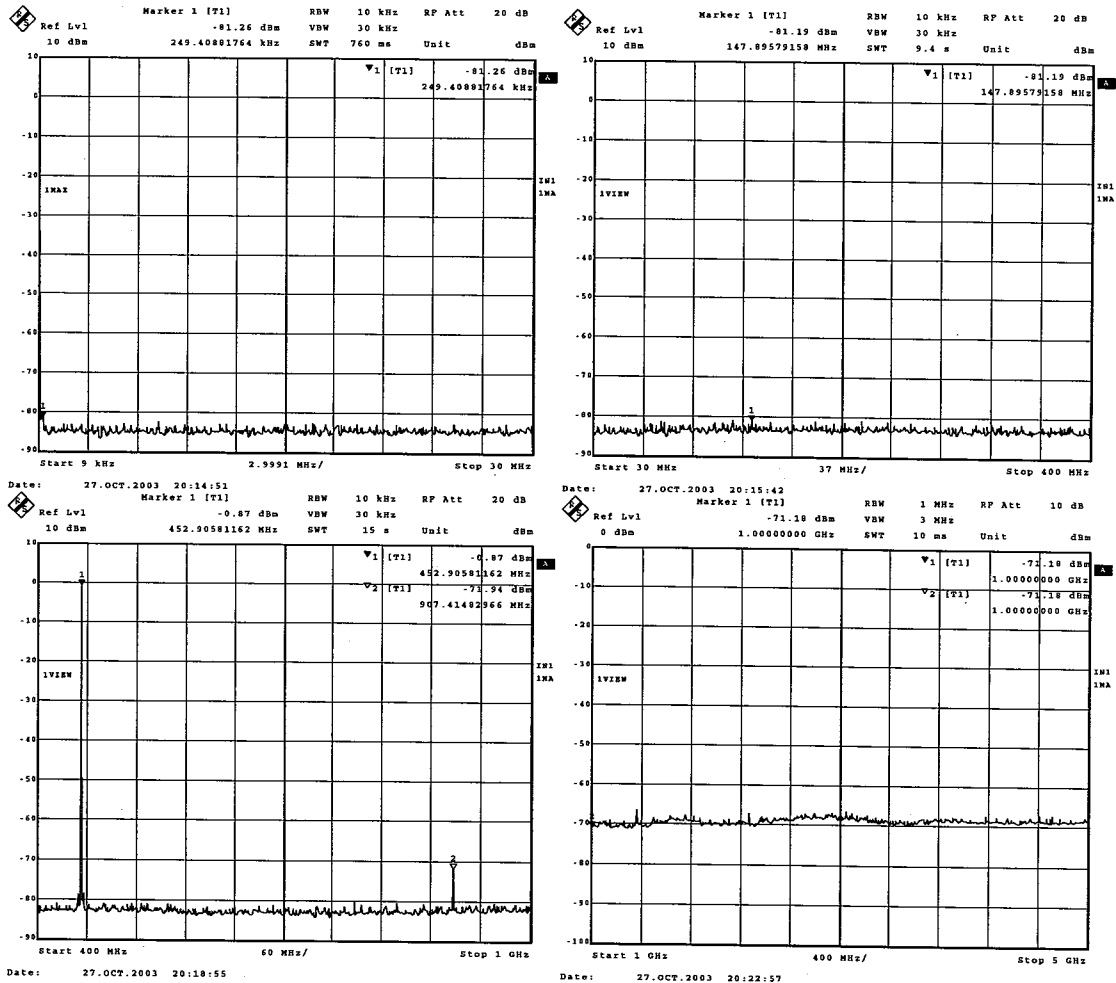
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8.2 Test Data

HX68-C (Transmitting) Spuripous Emission(Conducted)



DATA OF CONDUCTED EMISSIONS

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY	: NEC System Integration & Construction, Ltd.	REPORT NO	: 24BE0140-HO
EQUIPMENT	: Radio Equipment	REGULATION	: Fcc Part 2 Section 2.1051 / Part 90 Section 90.210
MODEL	: HX68-C	TEST DISTANCE	: -
S/N	: 1001	DATE	: 10/27/2003
FCC ID	: RJGHX68C	TEMPERATURE	: 23 deg.C
IC Number	: -	HUMIDITY	: 40%
POWER	: DC 13.8V		
MODE	: Tx : 453.5125MHz (Input : 8dBm , 2.5kHz)		

K. Adachi
ENGINEER : Kenichi Adachi

(Carrier Frequency)
453.51

(Spurious Below 1GHz) (RBW: 10kHz, VBW:30kHz, ATT 20dB, SWP :auto)

No.	FREQ [MHz]	S/A READING [dBm]	ATT Factor [dB]	HPF Loss [dB]	Cable Loss [dB]	RESULT Conducted [dBm]	Limit [dBm]	MARGIN Conducted [dB]
2	410.71	-81.6	40.0	0.0	0.3	-41.3	-20.0	21.3
3	498.51	-83.4	40.0	0.0	0.1	-43.3	-20.0	23.3
4	907.03	-71.5	40.0	0.0	0.3	-31.2	-20.0	11.2

(Spurious Above 1GHz) (RBW: 1MHz, VBW:3MHz, ATT 10dB, SWP: auto)

No.	FREQ [MHz]	S/A READING [dBm]	ATT Factor [dB]	HPF Loss [dB]	Cable Loss [dB]	RESULT Conducted [dBm]	Limit [dBm]	MARGIN Conducted [dB]
5	1360.54	-67.0	40.0	0.0	0.1	-27.0	-20.0	7.0
6	1814.05	-69.0	40.0	0.0	0.0	-29.0	-20.0	9.0
7	2267.56	-68.6	40.0	0.0	0.0	-28.6	-20.0	8.6
8	2721.08	-68.0	40.0	0.0	0.1	-28.0	-20.0	8.0
9	3628.10	-69.1	40.0	0.0	0.1	-28.9	-20.0	8.9
10	4081.61	-68.9	40.0	0.0	0.2	-28.7	-20.0	8.7
11	4535.13	-68.5	40.0	0.0	0.2	-28.2	-20.0	8.2

REMARKS

CALCULATION RESULT=Reading + ATT Factor + LOSS (Cable)

*Except for the above table : All other spurious emissions were less than 20dB for the limit.

Carrier Power = 40.1dBm

- Attenuation limits = 50 + 10log(Carrier Power) = 60.1dB(-20.0dBm)

- Attenuation = Carrier Power - Spurious Power > 60.1dB(-20.0dBm)

- Below 1GHz : SA PK(RBW:10kHz / VBW:30kHz) Above 1GHz : S/A PK(RBW/VBW:1MHz)

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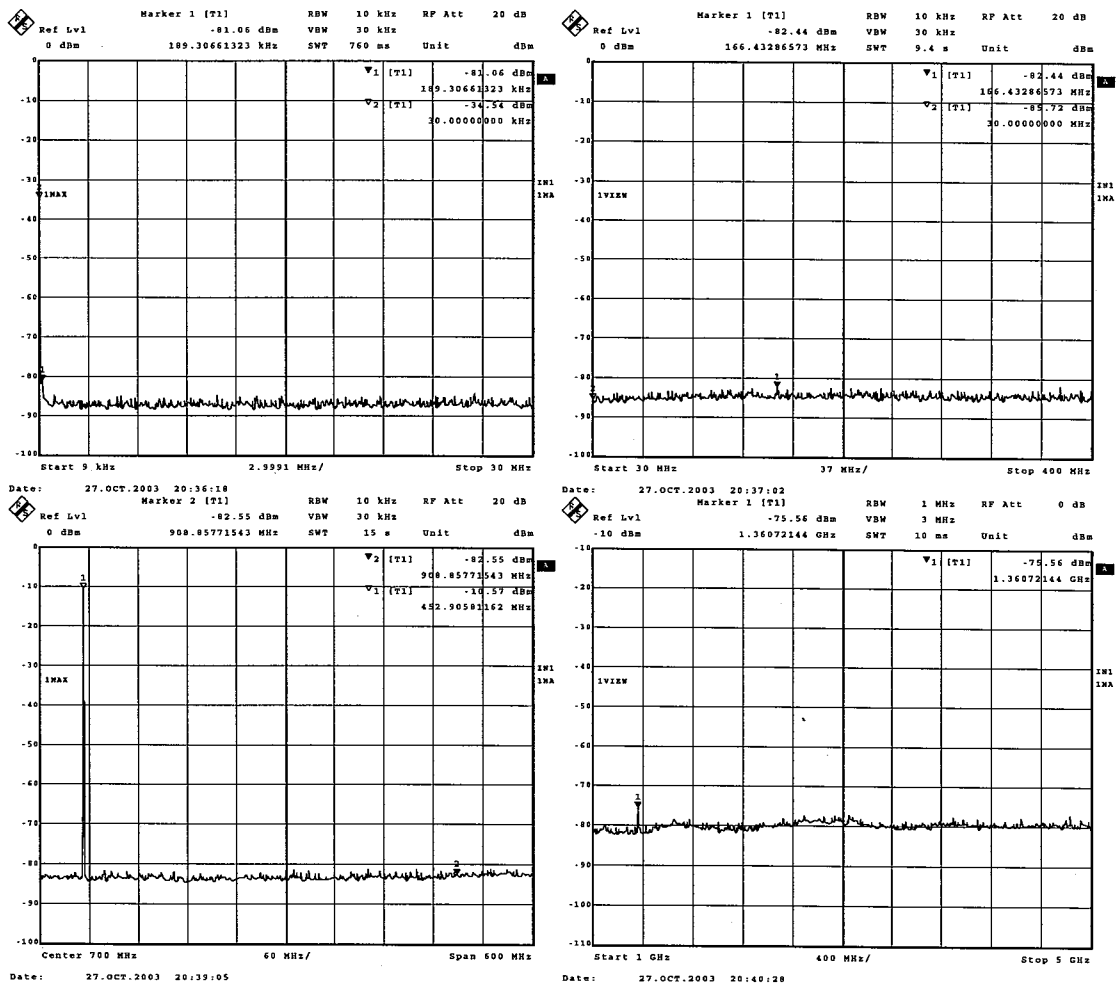
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HX68-C + HX69-C (Transmitting) **Spuripous Emission(Conducted)**



DATA OF CONDUCTED EMISSIONS

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY	: NEC System Integration & Consruction, Ltd.	REPORT NO	: 24BE0140-HO
EQUIPMENT	: Radio Equipment	REGULATION	: Fcc Part 2 Section 2.1051 / Part 90 Section 90.210
MODEL	: HX68-C + HX69-C	TEST DISTANCE	: -
S/N	: 1001, 1003	DATE	: 10/27/2003
FCC ID	: RJGHX68C	TEMPERATURE	: 23 deg.C
IC Number	: -	HUMIDITY	: 40%
POWER	: DC 13.8V		
MODE	: Tx : 453.5125MHz (Input : 8dBm, 2.5kHz)		

K. Adachi
ENGINEER : Kenichi Adachi

(Carrier Frequency)
453.51

(Spurious Below 1GHz) (RBW: 10kHz, VBW:30kHz, ATT 20dB, SWP :auto)

No.	FREQ [MHz]	S/A READING [dBm]	ATT Factor [dB]	HPF Loss [dB]	Cable Loss [dB]	RESULT Conducted [dBm]	Limit [dBm]	MARGIN Conducted [dB]
2	410.71	-87.5	40.0	0.0	0.3	-47.2	-20.0	27.2
3	498.51	-84.5	40.0	0.0	0.1	-44.3	-20.0	24.3
4	907.03	-81.1	40.0	0.0	0.3	-40.8	-20.0	20.8

(Spurious Above 1GHz) (RBW: 1MHz, VBW:3MHz, ATT 0dB, SWP: auto)

No.	FREQ [MHz]	S/A READING [dBm]	ATT Factor [dB]	HPF Loss [dB]	Cable Loss [dB]	RESULT Conducted [dBm]	Limit [dBm]	MARGIN Conducted [dB]
5	1360.54	-72.9	40.0	0.0	0.1	-32.9	-20.0	12.9
6	1814.05	-79.0	40.0	0.0	0.0	-39.0	-20.0	19.0
7	2267.56	-79.4	40.0	0.0	0.0	-39.4	-20.0	19.4
8	2721.08	-78.1	40.0	0.0	0.1	-38.0	-20.0	18.0
9	3628.10	-78.9	40.0	0.0	0.1	-38.8	-20.0	18.8
10	4081.61	-77.3	40.0	0.0	0.2	-37.1	-20.0	17.1
11	4535.13	-76.8	40.0	0.0	0.2	-36.6	-20.0	16.6

REMARKS

CALCULATION RESULT=Reading + ATT Factor + LOSS (Cable)

*Except for the above table : All other spurious emissions were less than 20dB for the limit.

Carrier Power = 32.5dBm

- Attenuation limits = $50 + 10\log(\text{Carrier Power}) = 52.5\text{dB}(-20.0\text{dBm})$
- Attenuation = Carrier Power - Spurious Power > 52.5dB(-20.0dBm)
- Below 1GHz : SA PK(RBW:10kHz / VBW:30kHz), Above 1GHz : SA PK(RBW/VBW:1MHz)

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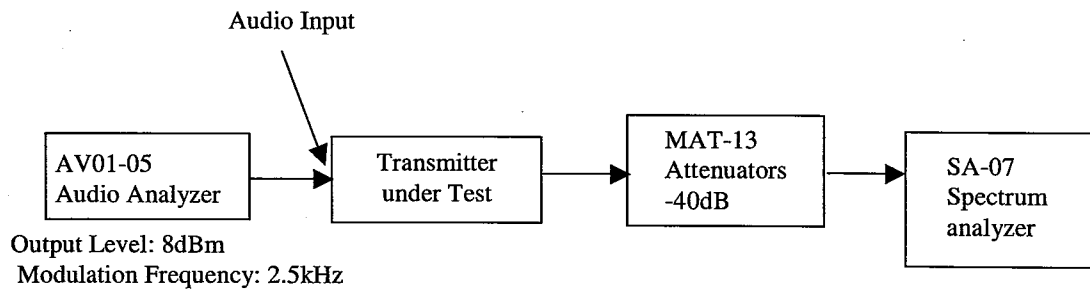
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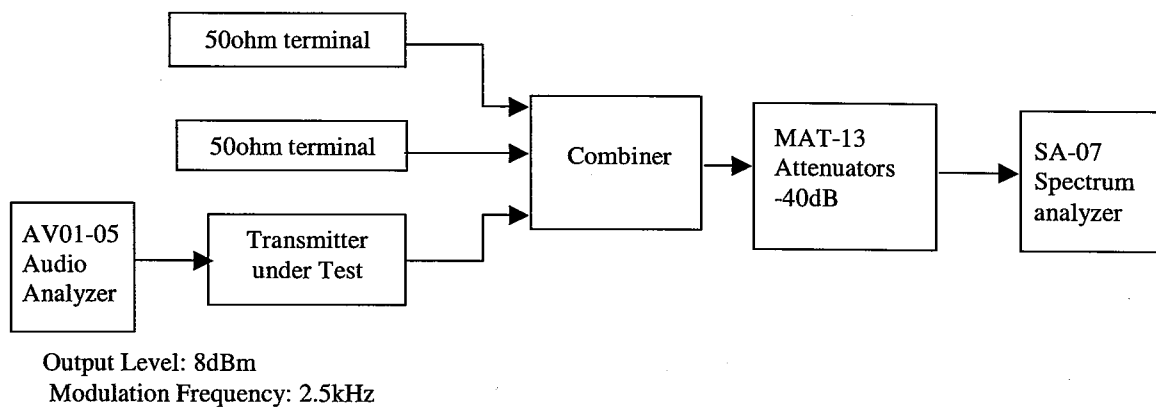
8.3 Test result : Pass

8.4 Test Instrument : MTR-02, SA-07, MCC-10, MAT-13, MCC-07, MCC-08, AV01-05, MDPS-01

8.5 Measurement Block Diagram



Spurious Emission at Antenna Terminals (FCC Part 2.1051)



Spurious Emission at Antenna Terminals of transmitter with combiner

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SECTION 9: Field Strength of Spurious Emission

Field Strength of Spurious Emission is measured with two kind of configuration, the one is with HX68-C only and the another is with HX68-C connected with HX69-C.

9.1 Test Procedure FCC 2.1053

- 1) The HX68-C was aligned for transmitter operation on 453.5125MHz at full rated power.
- 2) The Carrier is modulated by a 2.5kHz tone at an input level 16dB greater than that necessary to produce 50 percent modulation. The input level shall be established at the frequency of maximum response of the audio modulation.
- 4) Output of HX68-C was connected with dummy load attenuator 40dB.
- 5) Tune-up the transmitter (EUT).
- 6) Device Vertical: Place the device so that it's longest axis of antenna is vertical.
- 7) For each spurious measurement the receiving antenna is adjusted to the correct length for the frequency involved. These measurements are made from the lowest radio frequency generated in the EUT or 30MHz to the tenth harmonics of the carrier.
- 8) For each spurious frequency, raise and lower the receiving antenna to obtain a maximum reading on the spectrum analyzer with the antenna at horizontal polarity. Then the turntable is rotated to further increase this maximum reading. Repeat this procedure of raising and lower the antenna and rotating the turntable until highest possible signal has been obtain.
Record this maximum reading.
- 9) Repeat Step8 for each spurious frequency with the antennae polarized vertically.
- 10) Device Horizontal : Place the device so that it's longest axis of antenna is horizontal.
- 11) Repeat Step6, Step7, and Step8.

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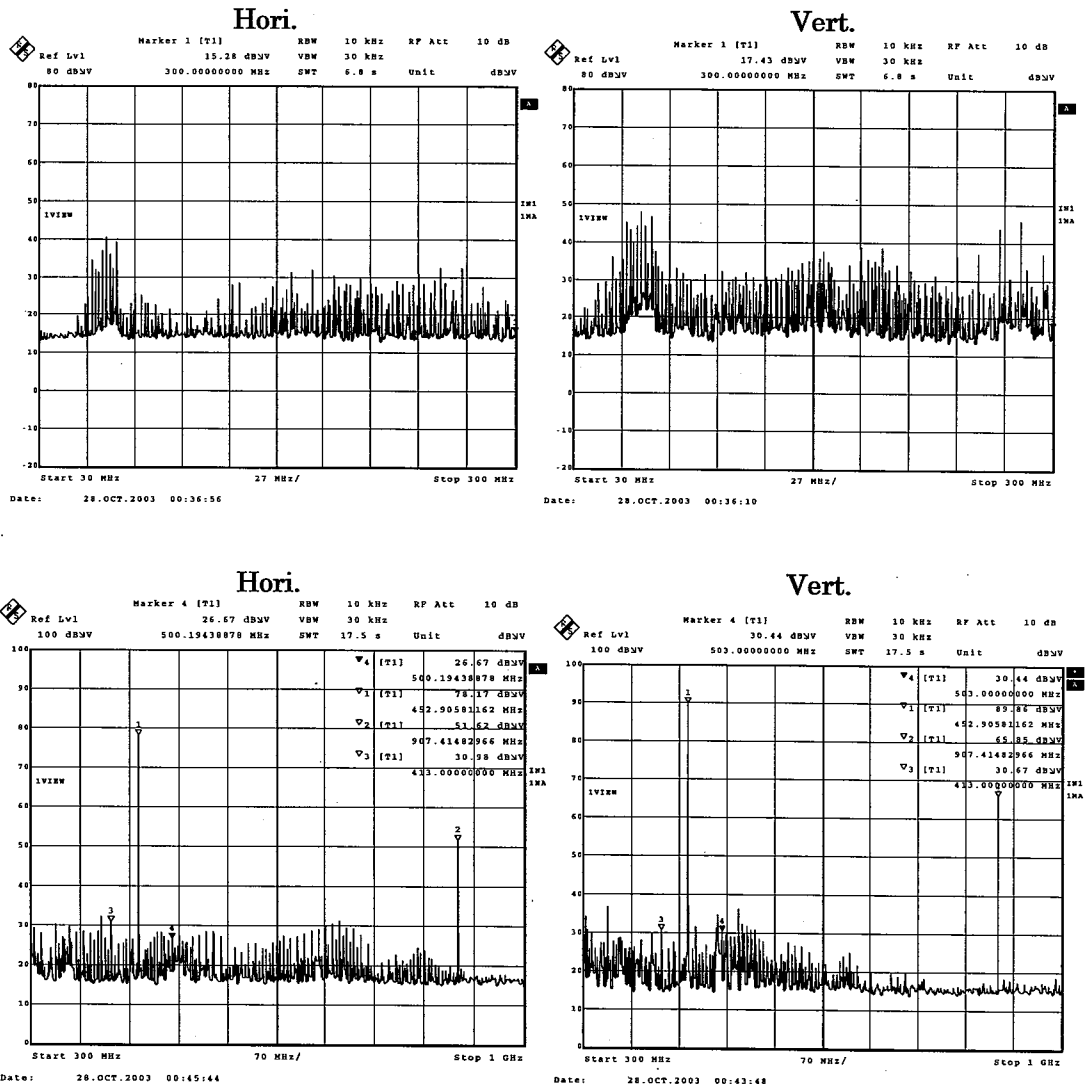
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MF060b(10.04.03)

9.2 Test Data

HX68-C (Transmitting) Spuripous Emission(Radiated)(below 1GHz)



HX68-C (Transmitting)
Spurious Emission(Radiated) (Above 1GHz-)

