

VHF/FM RADIO TELEPHONE JHS-500

TEST DATA

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Note * : Compliance with FCC(§ 1,2,15,80) and Canada(RS-182)

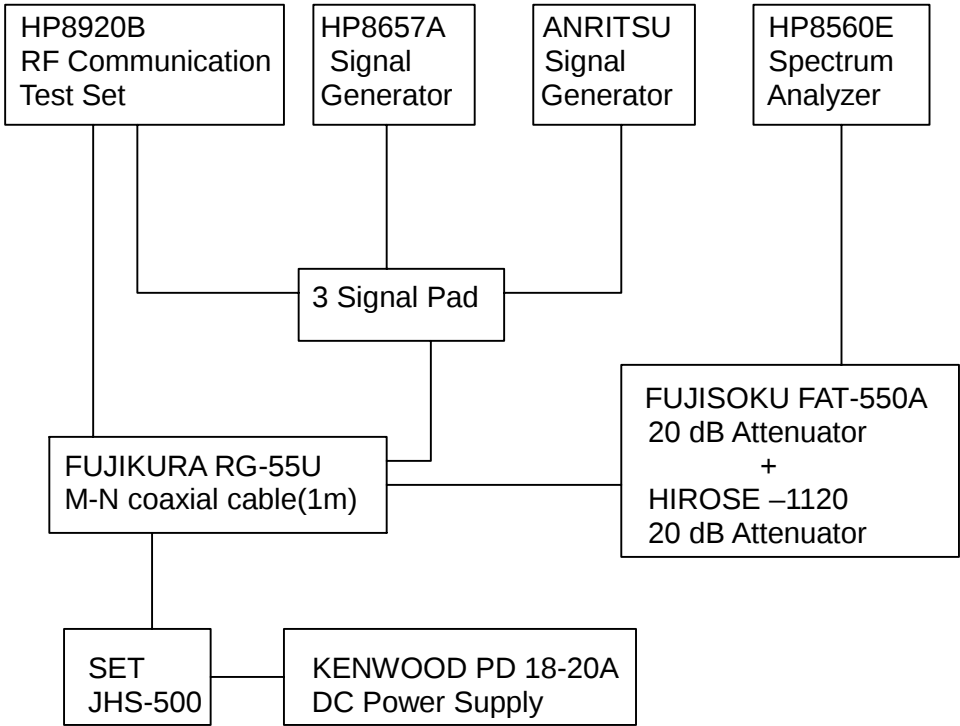
Data Measurement

Measured by HP8920B RF Communication Test Set

Based on NORTH AMERICAN FM TESTS Revision:B.01.00

Date:	October 25, 2000
Tested by:	Ryouichi Uchijima
Serial #:	003
Temperature:	Ambient
Supply Voltage:	13.8V

Test Setup



1. Transmitter

1-1: RF Output Power (Voltage Variation) and Current Drain

RF Output Power (Voltage Variation):

Test Channel 01,16,and 88
Cable Loss(dB) 0.4

Limit : 25W $\pm$ 1dB at 13.8V and Normal Temperature

Channel	01 (156.050MHz)			16 (156.800MHz)			88 (156.425MHz)		
Supply Volts(V)	11.7	13.8	16.0	11.7	13.8	16.0	11.7	13.8	16.0
High Power(W)	19.4	22.9	24.4	19.1	23.0	24.0	19.2	22.8	23.8
Low Power(W)	0.92	0.95	0.96	0.91	0.93	0.95	0.88	0.92	0.93

Current Drain:

Test Frequency: 16CH (156.800MHz)

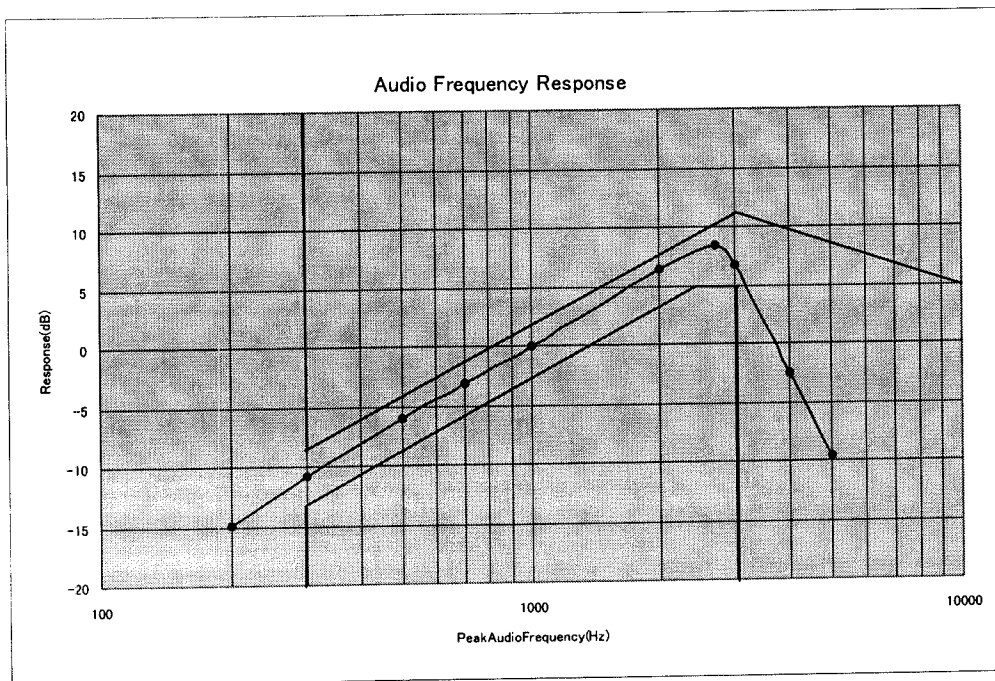
Current Drain: 4.6A (at 25W)
 1.05A (at 1W)

1-2: Modulation Characteristic

Test Frequency (MHz) 156.800

Audio filter setting (8920B): 50Hz HPF, 15KHz LPF, De-emphasis off
Reference: 20% of rated system deviation at tone 1KHz, peak + detector

Tone (Hz)	200	300	500	700	1.0K	2.0K	2.7K	3.0K	4.0K	5.0K
(dB)	-14.8	-10.8	-6	-3.0	0	6.4	8.5	7.4	-1.2	-8.6

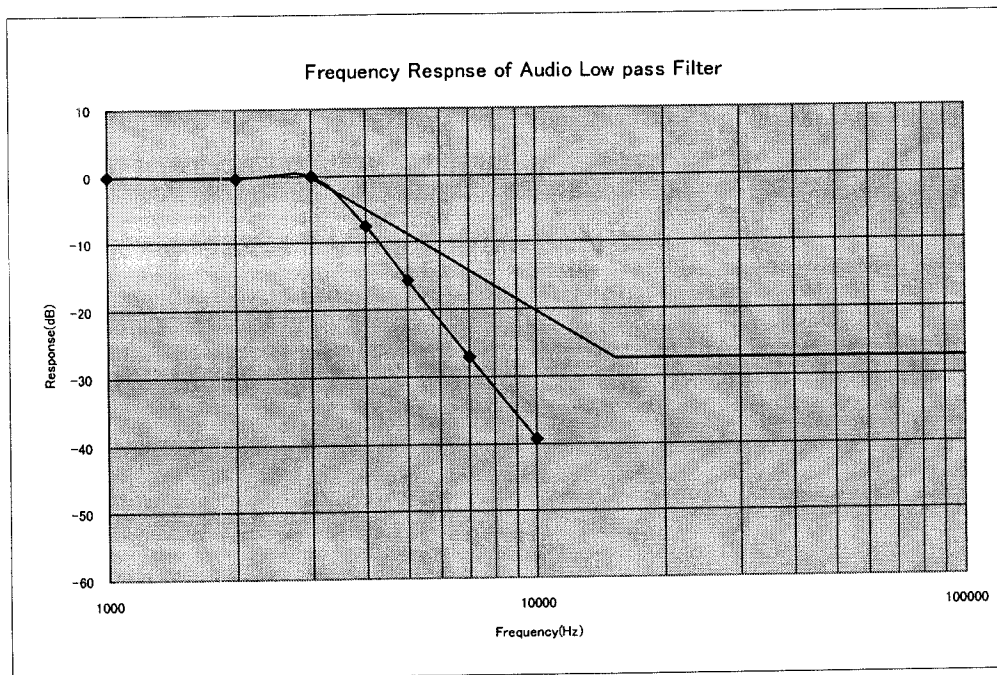


1-3: Modulation Amp Filtering Characteristic

HP8920B Audio Filter Setting : 50Hz HPF, 15KHz LPF, De-Emphasis off

Reference 1KHz

Tone (Hz)	1K	2K	3K	4K	5K	7K	10K
(dB)	0.0	0.2	0.0	7.6	15.8	27.1	39.1



1-4: Modulation Limiting

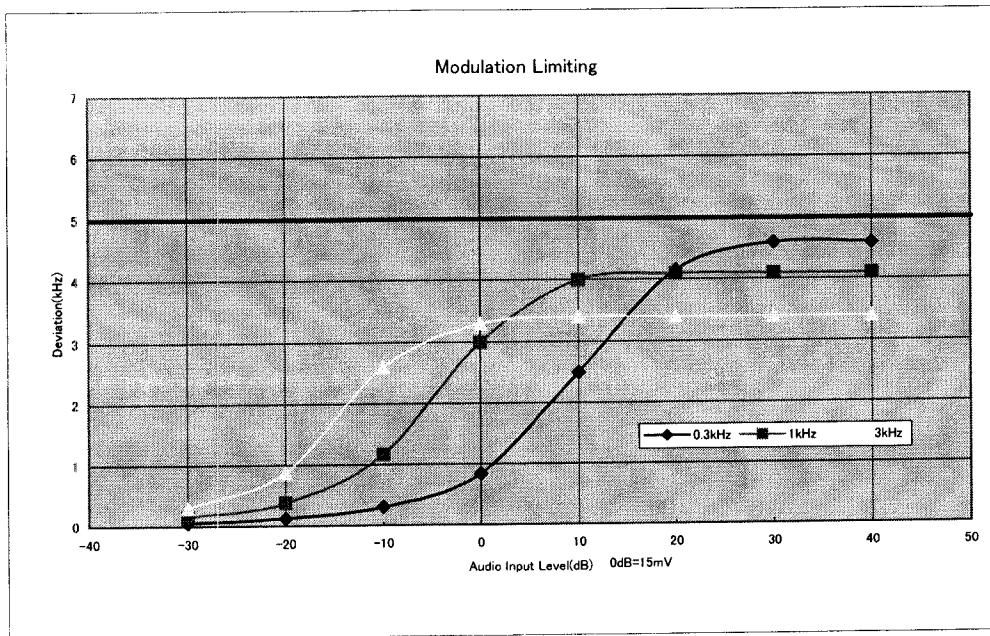
Test Frequency (MHz) 156.800

Audio Filter Setting (HP8920B): <20Hz HFP, 15KHz LPF, De-emphasis off,
Peak +/-

Reference: 3.0KHz Deviation @ 1KHz tone, Input Level 15mV

Input(dB) Tone(Hz)	0.3K	1K	3K
-30	0.06	0.15	0.3
-20	0.13	0.38	0.88
-10	0.3	1.17	2.6
0(15mV)	0.85	3.0	3.3
10	2.5	4.0	3.4
20	4.16	4.1	3.4
30	4.6	4.1	3.4
40	4.6	4.1	3.4

Limit : Not exceed 5kHz

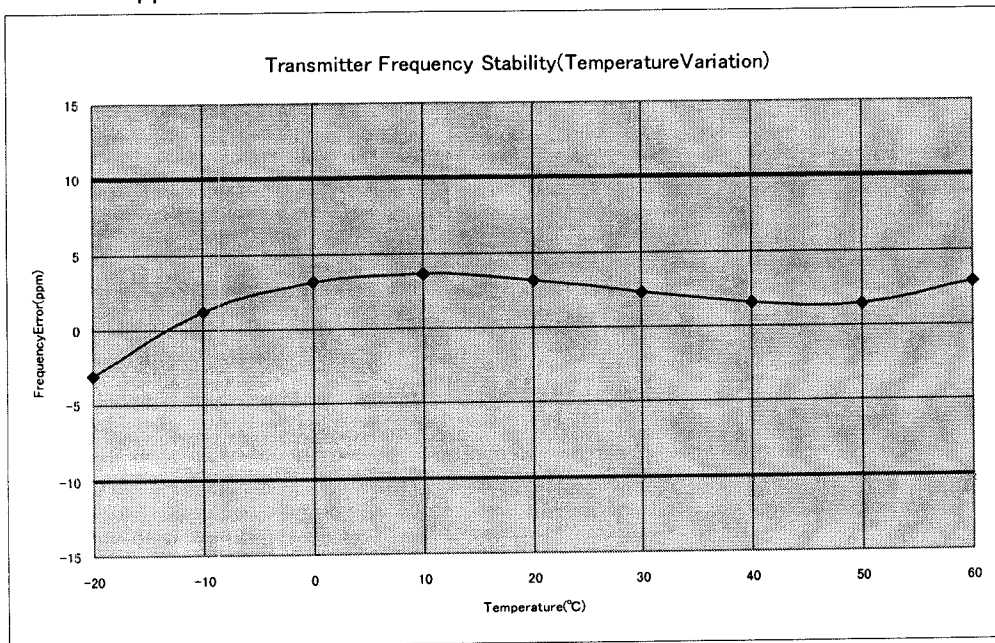


1-5: Transmitter Frequency Stability (Temperature Variation)

Test Frequency (MHz) 156.800

Temperature(C)	-20	-10	0	10	20	30	40	50	60
Frequency Error (ppm)	-3.02	1.17	3.1	3.58	3.16	2.25	1.55	1.48	2.89

Limit : $\pm 10\text{ppm}$

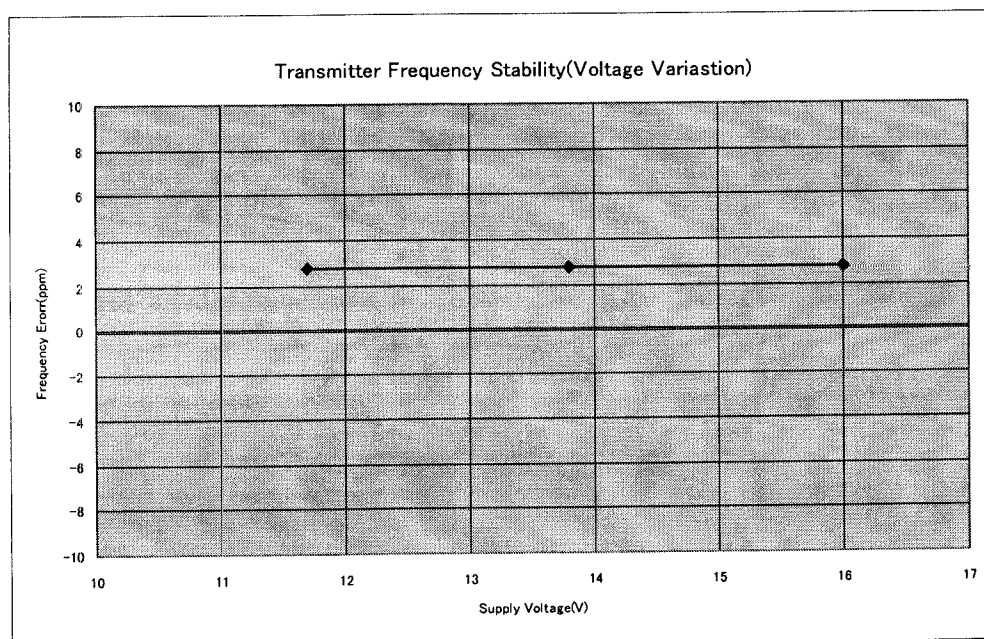


1-6: Transmitter Frequency Stability (Voltage Variation)

Test Frequency (MHz) 156.800
RF Power (W) 25

Supply Volt (V)	11.7(-15%)	13.8	16(+15%)
Frequency Error (ppm)	3.16	3.16	3.16

Limit : $\pm 10\text{ppm}$

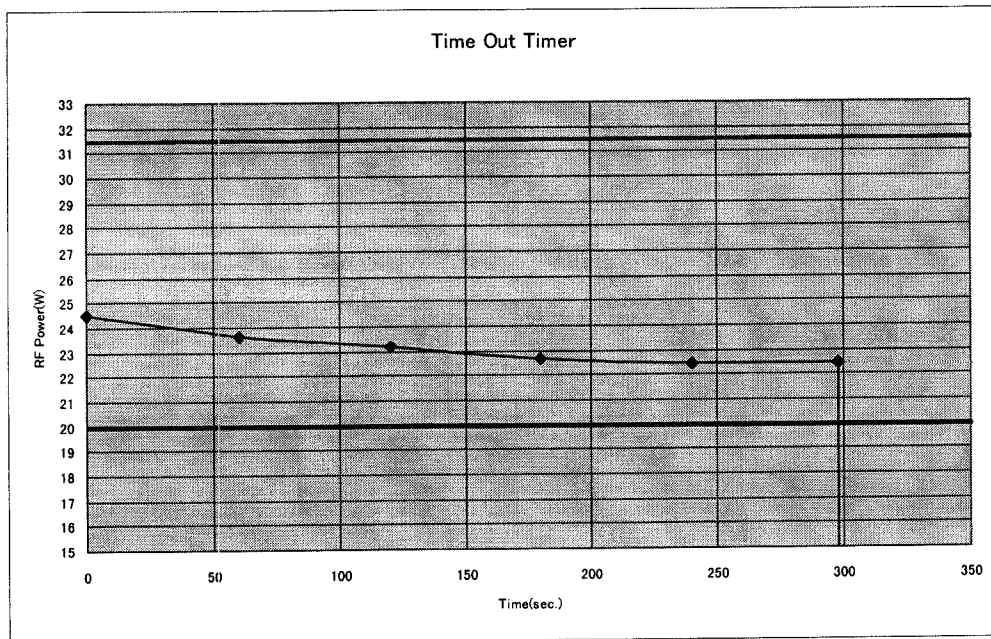


1-7: Time Out Timer

Test Frequency (MHz) 156.800

Time (sec)	0	60	120	180	240	298
RF power(W)	24.5	23.6	23.2	22.7	22.5	22.5

Limit : 5minutes $\pm$ 10%



1-8: Spurious Emission at Antenna Terminal

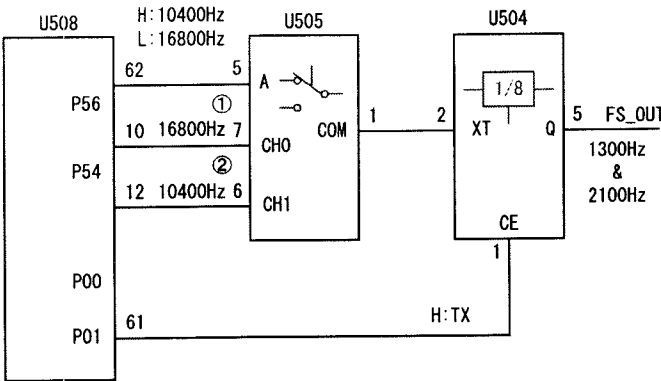
Test Frequency (MHz) 156.800

Harmonic spurious		Conductive (dBC)	
		25W	1W
2*f	313.600	< 70	< 70
3*f	470.400	< 70	< 70
4*f	627.200	< 70	< 70
5*f	784.000	< 70	< 70
6*f	940.800	< 70	< 70
7*f	1097.600	< 70	< 70
other		< 70	< 70

1-9: Frequency Stability of DSC Signal

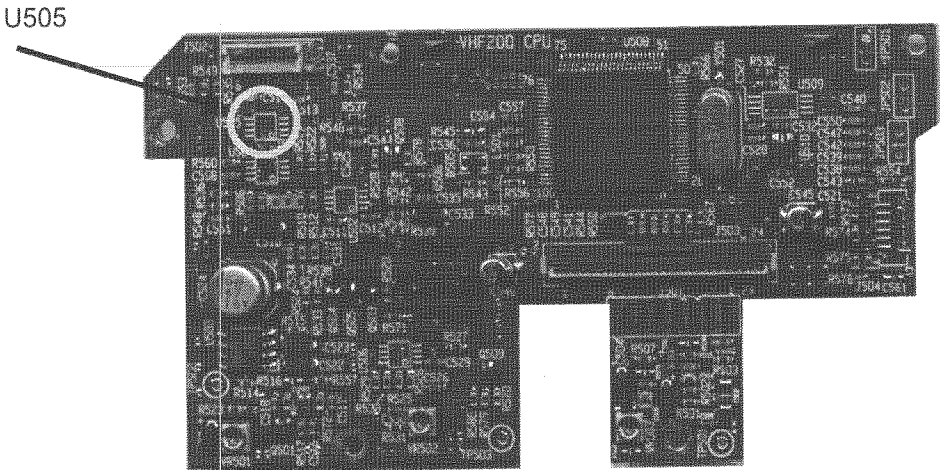
DSC Signal	Frequency(Hz)	Remark
Mark	1299.875	② / 8
Space	2099.75	① / 8

Limit : Mark 1300±10Hz
 Space 2100±10Hz



Logic Circuit

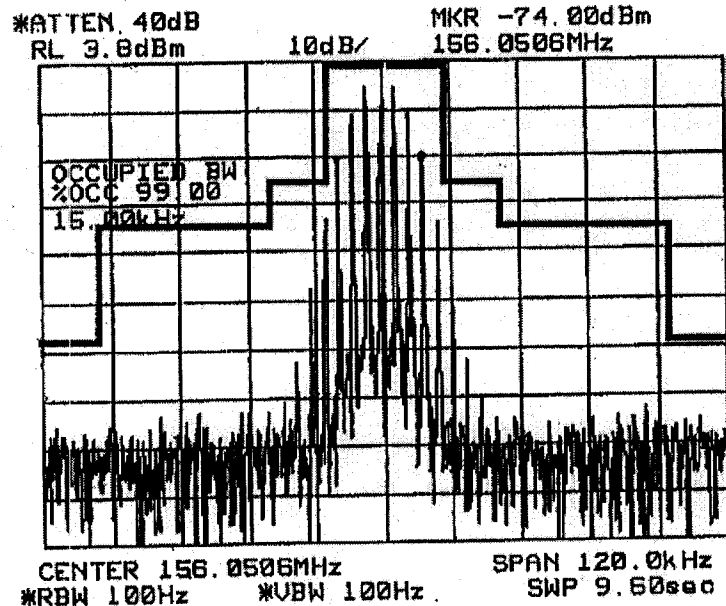
Fig. Measurement Point



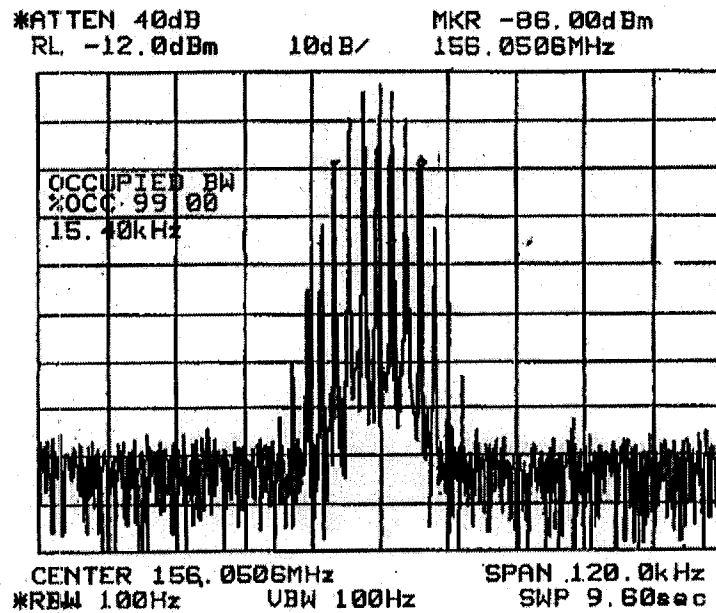
1-10: Occupied Bandwidth

Limit : Not exceed 16kHz

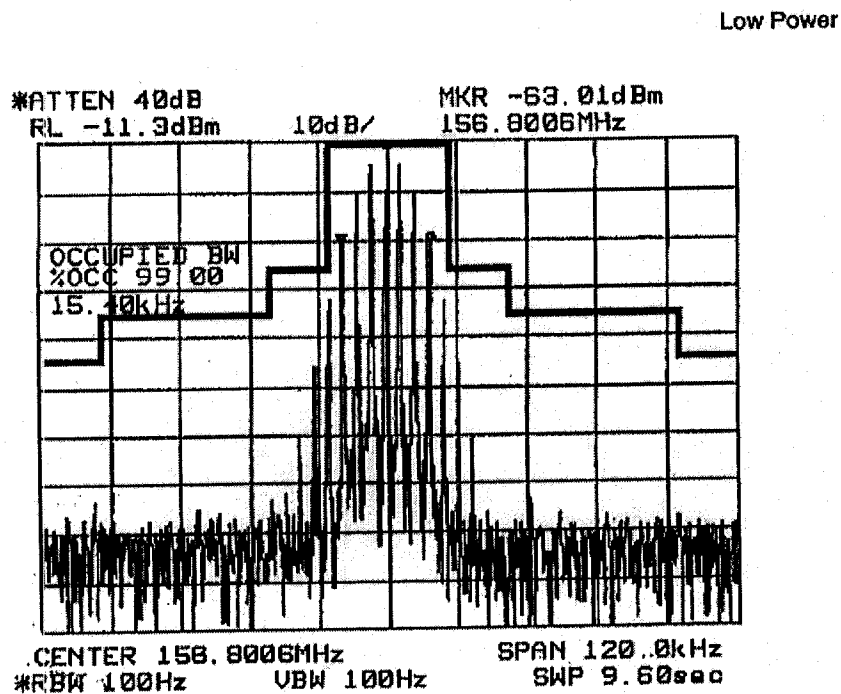
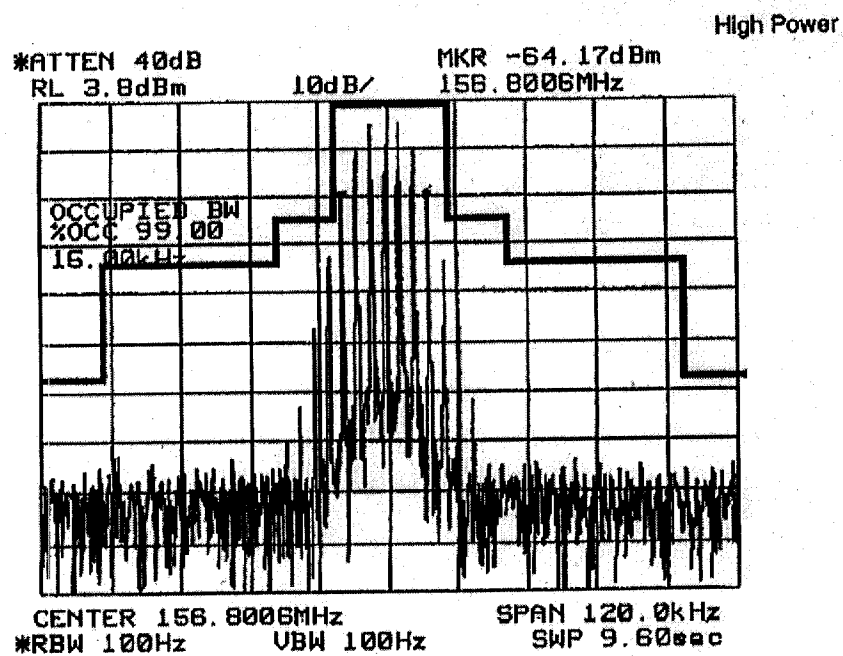
High Power



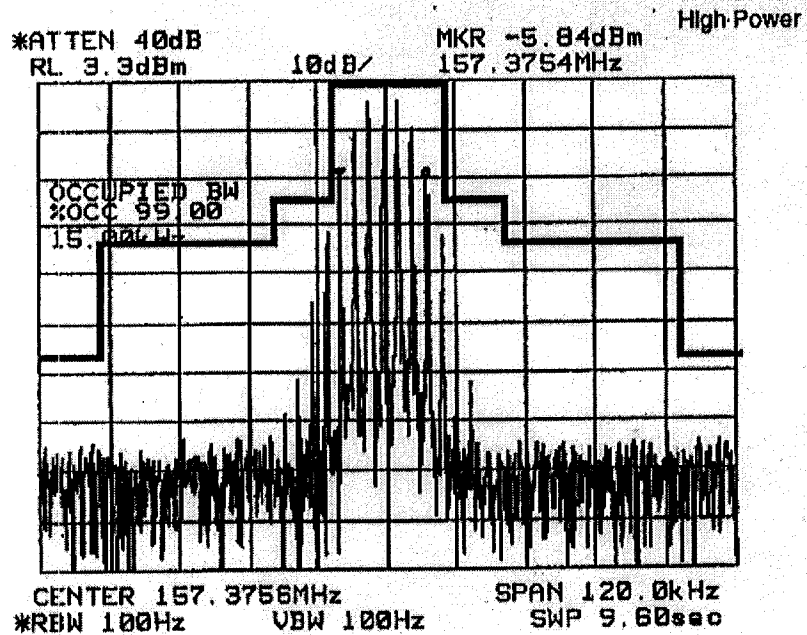
Low Power



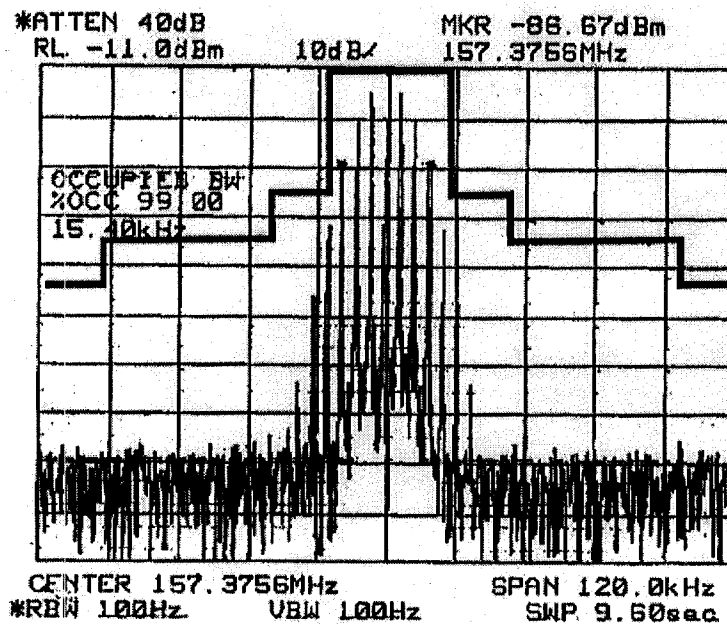
1ch : 156.050 MHz
Occupied Bandwidth



**16ch : 156.800 MHz
Occupied Bandwidth**



Low Power



87ch : 157.375 MHz
Occupied Bandwidth

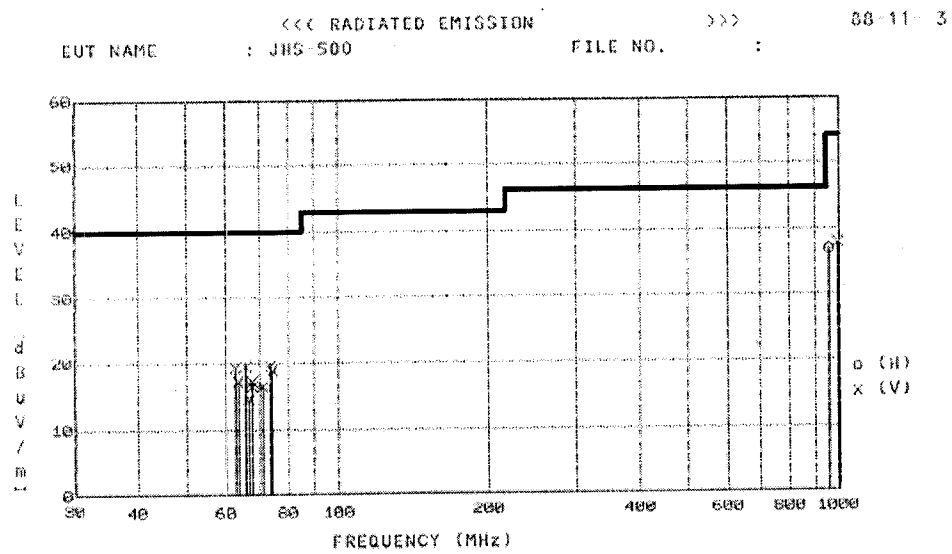


70ch: 156.525MHz
Occupied Bandwidth (DSC mode)

2. Interference

2-1: Radiated Emission Data

Frequency 30MHz to 1GHz



2-1: Radiated Emission Data(contd.)

1)Transmitter Output : 25W

Test Frequency : CH16 (156.8MHz)

Test voltage : DC24V

Limit : $43 + 10\log_{10}(\text{power out in watt}) = 57\text{dB}$ (at 25W)

Attenuation = $10\log_{10}(\text{TX power in watt} / 0.001) - \text{Spurious emission level}$

Frequency	Spurious emission level (dBm)	Attenuation (Result) (dB)
2f 313.600MHz	-41.5	85.5
3f 470.400MHz	-50.3	94.3
4f 627.200MHz	-48.7	92.7
5f 784.000MHz	-49.1	93.1
6f 940.800MHz	-48.6	92.6
7f 1097.600MHz	-52.3	96.3
Other	-55 or less	99 or more

2)Transmitter Output : 1W

Test Frequency : CH16 (156.8MHz)

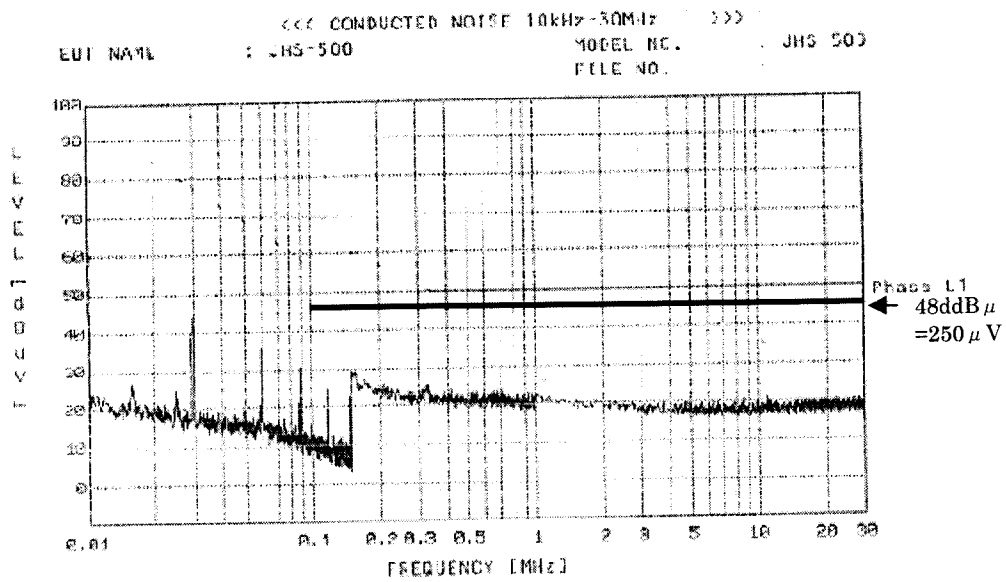
Limit : $43 + 10\log_{10}(\text{power out in watt}) = 43\text{ dB}$ (at 1W)

Attenuation (dB)= $10\log_{10}(\text{TX power in watt} / 0.001) - \text{Spurious emission level}$

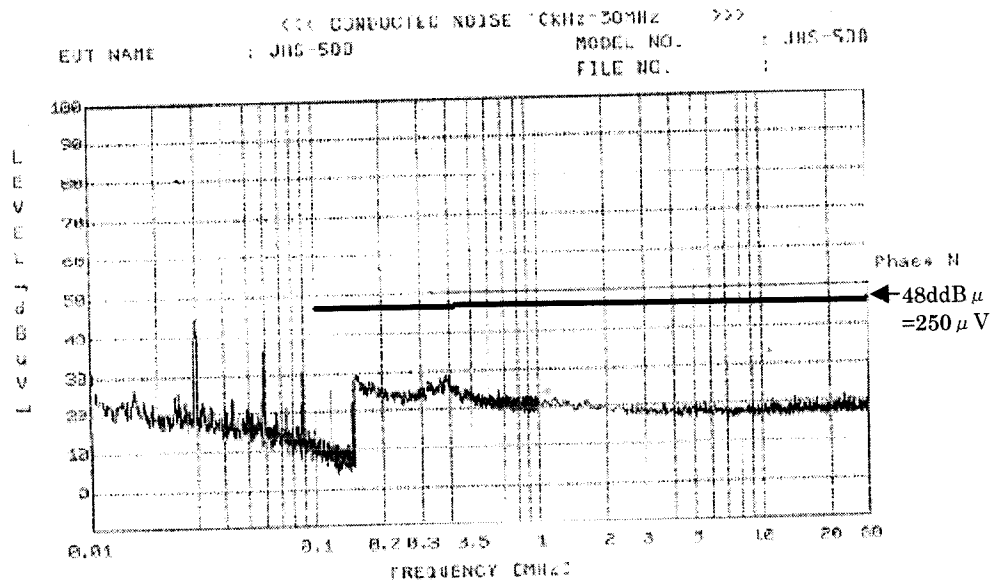
Frequency	Spurious emission level (dBm)	Attenuation (Result) (dB)
2f 313.600MHz	-48.3	78.3
3f 470.400MHz	-56.5	86.5
4f 627.200MHz	-55.3	85.3
5f 784.000MHz	-55.6	85.6
6f 940.800MHz	-54.9	84.9
7f 1097.600MHz	-58.6	88.6
Other	-60 or less	90 or more

2-2: Power Line Conducted Data

Phase L



Phase N



2-3. Maximum Permissible Exposure

Test Frequency: CH16(156.8MHz)

Transmitter Output: 25W

Electric field Strength: 27.5 V/m *Note

Magnetic field Strength: 0.073 A/m *Note

Power Density: 0.2 mW/cm² *Note

Averaging Time: 30min *Note

*Note: Limits for MPE in CFR47 Section1.1310 & Table 1(b)

Typical example of Antenna	Antenna Gain (dB)	Needed Separation Distance	
		(m)	(ft.)
Half-wave dipole	2.15	1.3	4.2
Collinear phased 5/8-wave	6	2.0	6.6
Collinear array phased 1/2-wave	10	3.2	10.4