

FCC LABORATORY

MFA M. Flom Associates, Inc.
Global Compliance Center

3356 North San Marcos Place, Suite 107
Chandler, Arizona 85224-1571
(602) 926-3100 FAX: 926-3598
www.goodnet.com/~mflom

PLEASE NOTE:

** NEW PHONE NO. 480 926 3100 NEW FAX: 480 926 3598
NEW electronic addresses: www.mflom.com general@mflom.com

April 1st, 1999.

Federal Communications Commission,
Office of Eng'g & Technology,
7435 Oakland Mills Road,
Columbia, Maryland 21046.

Attention: Bill Inglis, Electronics Engineer
Applicant: JAPAN RADIO CO LTD.
Equipment: FCC ID: CKEJMA3910 EA92701 Corresp. 6571

Hi again Bill:

This is in reply to your e-mail message 03/15/99.

As with the CKEJMA3925, the attached Test Data Report for the
referenced equipment has been laser printed for clarity. We
trust this will now meet your requirements.

We look forward to an early approval.

Best personal regards,


MORTON FLOM, P. Eng.

mf;mgf
encs.
CERTIFIED MAIL, R.R.R.

Applicant advised

TEST DATA OF JMA-3910

Type	JMA-3910	Ser.No.	LS54966
Scanner Unit	NKE-1055	Ser.No.	LS35135
Display Unit	NCD-3780	Ser.No.	LS24966
Ship's Main	DC24V		

Date OCT. 28. 1998

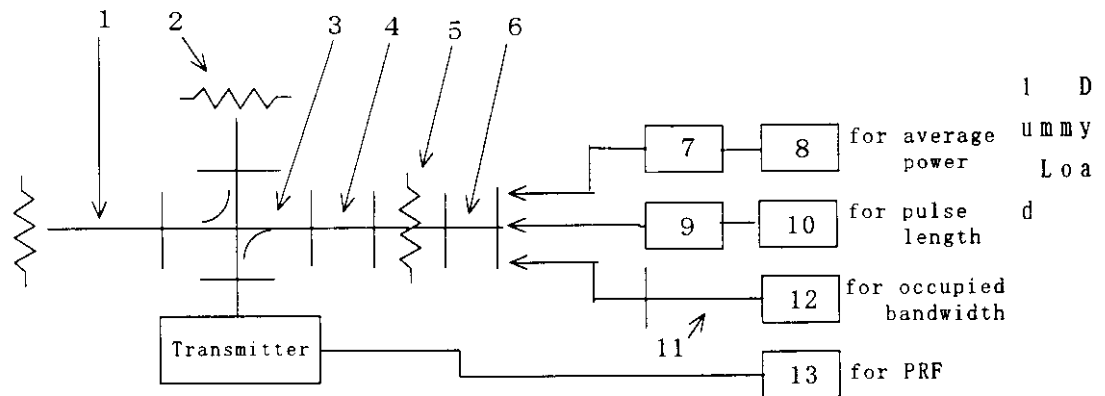
Section Chief

M. Sudik

Inspector

R. Guner

- 1. 3 Load Impedance
- (Sec. 2. 985) 1. 0 RF Power Output
- (Sec. 2. 989) 2. 0 Occupied Bandwidth



2	high power Dummy Load	4D371A	Shimada
3	Directional Coupler	5D351	Shimada
	Coupling	30 dB	
	Directivity	30 dB	
4	Frequency Meter	X532B	HP
5	Attenuator	X382A	HP
6	Adaptor	X281A	HP
7	Power Sensor	8481A	HP
8	Power Meter	435A	HP
9	Crystal Detector	423B	HP
10	Oscilloscope	465B	SONY/Tectronix
11	Coaxial Cable	MI-04	Takeda Riken
12	Spectrum Analyzer	8563A	Hewlett Packard
13	Frequency Counter	5300A	HP

Measurement Point ; Transmitter Output

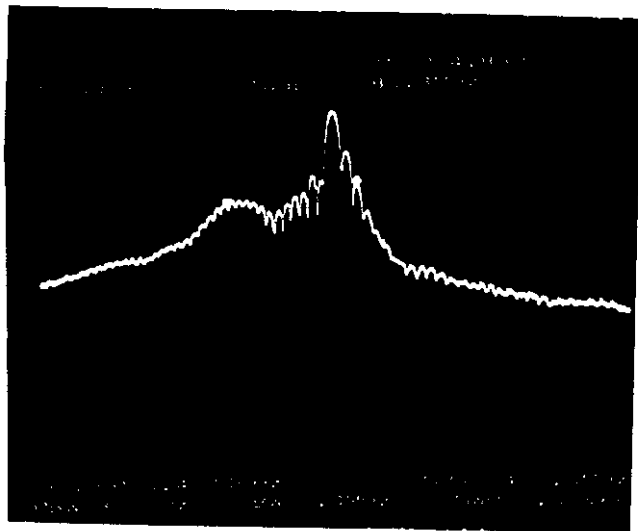
(Sec. 2.989)

2.0 Occupied Bandwidth

2.1 Short Pulse PRF 2083 Hz

Short Pulse Length 0.12 μ S

Scale
10dB/Div



RF Spectrum
Short Pulse

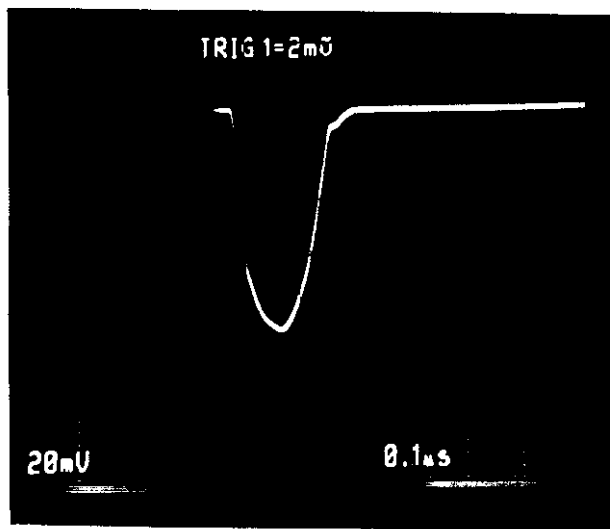
OBW=89.3 MHz

Scale 40 MHz/ Div

Center Frequency 9402 MHz

(Sec. 2.987)

Scale
20mV/Div



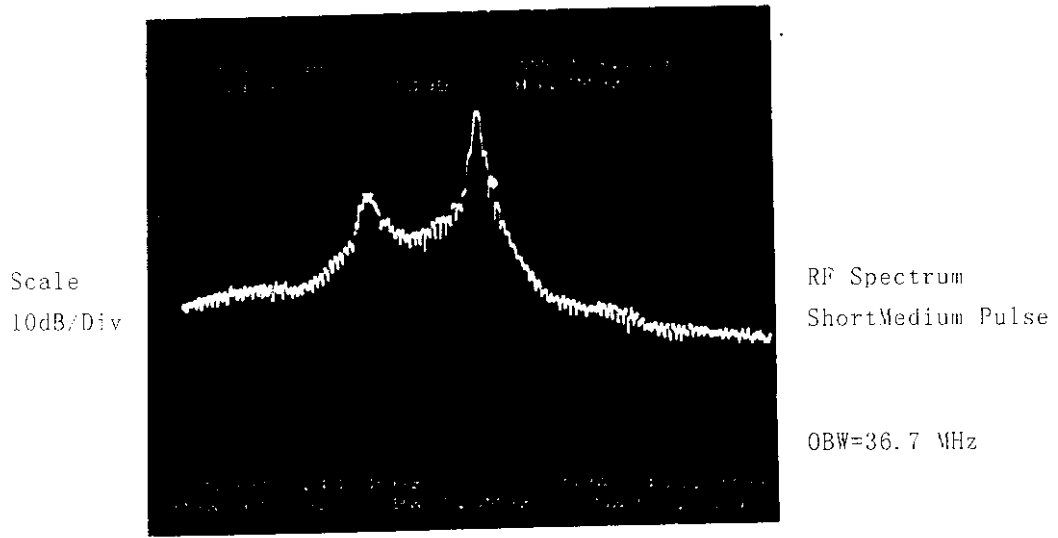
← 3dB

Detected RF
Pulse

Short Pulse

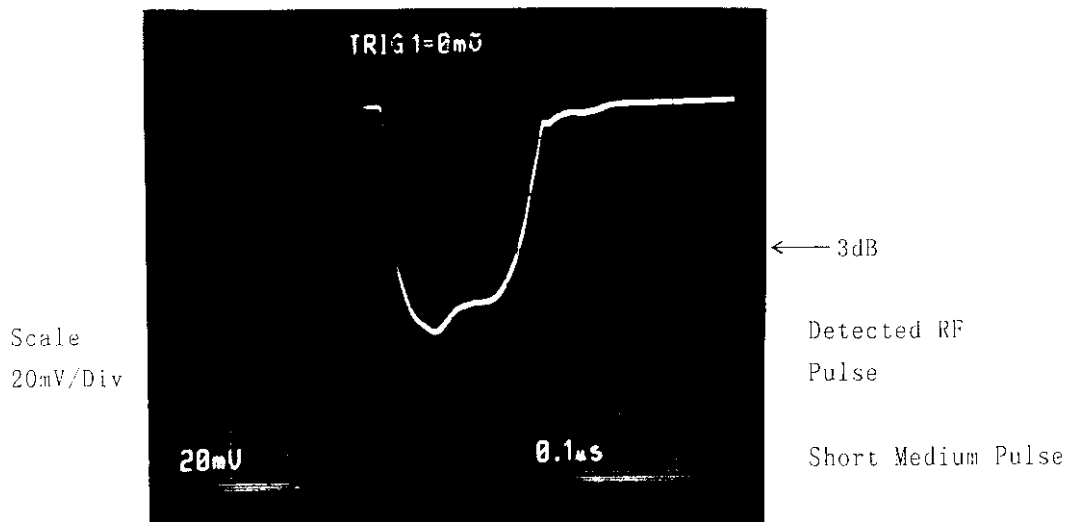
Scale 100nS/Div

(Sec. 2.989) 2.2 ShortMedium Pulse PRF 2083 Hz
ShortMedium Pulse Length 0.22 μ S



Scale 40 MHz/ Div
Center Frequency 9402 MHz

(Sec. 2.987)



Scale 100nS/Div

(Sec. 2.989)

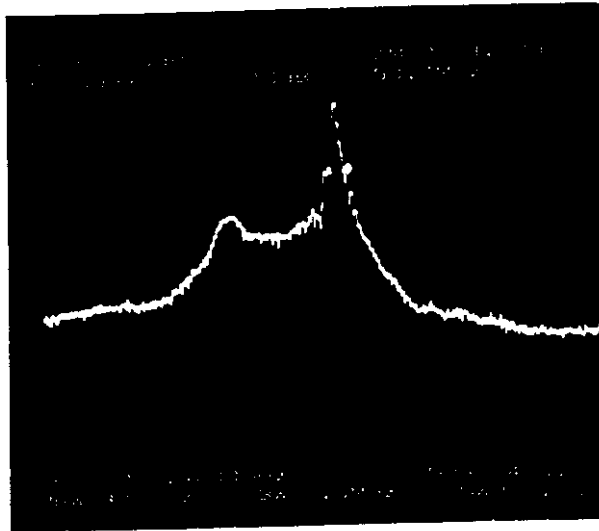
2.2 Medium Pulse PRF

1562 Hz

Medium Pulse Length

0.40 μ S

Scale
10dB/Div



RF Spectrum
Medium Pulse

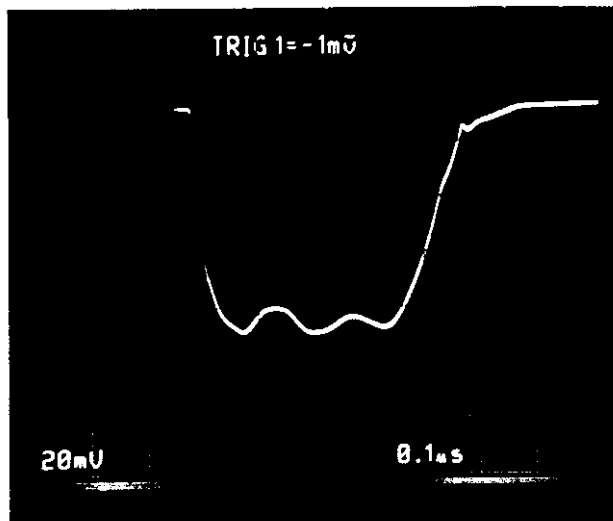
OBW=22.0 MHz

Scale 40 MHz/ Div

Center Frequency 9400 MHz

(Sec. 2.987)

Scale
20mV/Div



← 3dB

Detected RF
Pulse

Medium Pulse

Scale 100nS/Div

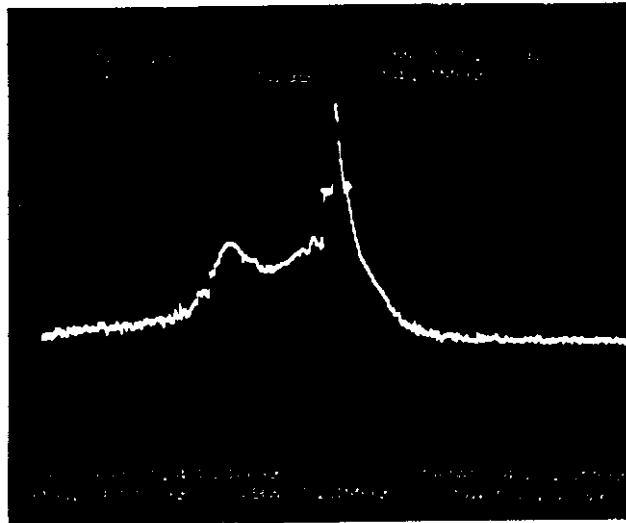
(Sec. 2.989)

2.3 Long Medium Pulse PRF
Long Medium Pulse Length

781 Hz

0.82 μ S

Scale
10dB/Div



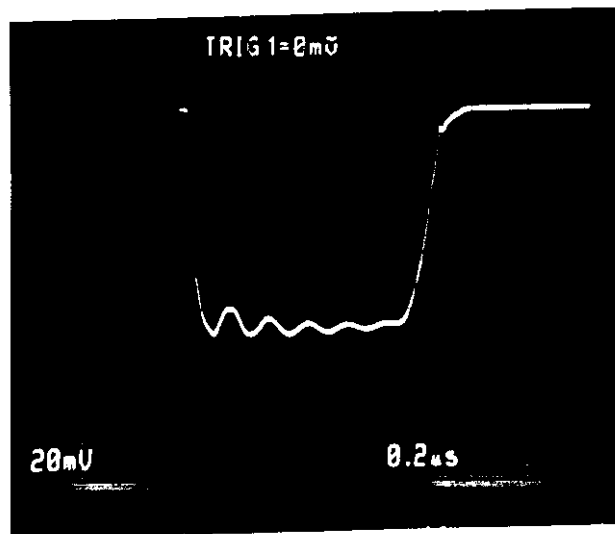
RF Spectrum
Long Medium Pulse

OBW=12.7 MHz

Scale 40 MHz/ Div
Center Frequency 9400 MHz

(Sec. 2.987)

Scale
20mV/Div



← 3dB

Detected RF
Pulse

Long Medium Pulse

Scale 200 ns/Div

(Sec. 2.989)

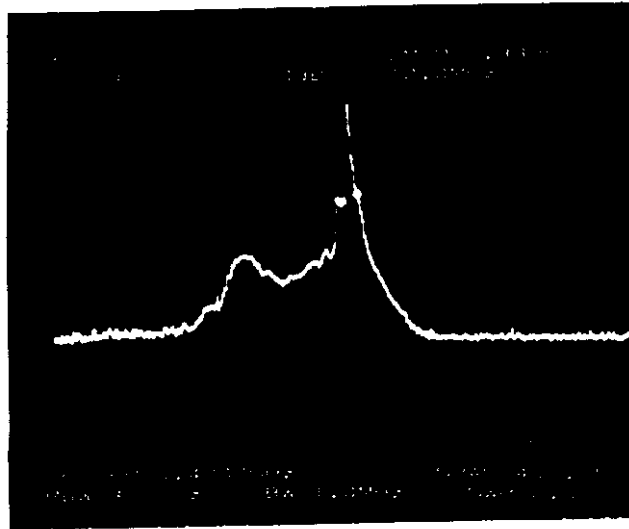
2.2 Long Pulse PRF

521 Hz

Long Pulse Length

1.16 μ S

Scale
10dB/Div



RF Spectrum
Long Pulse

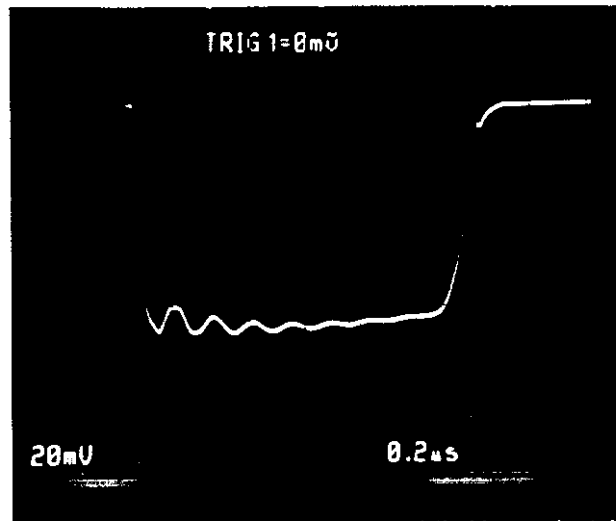
OBW=8.0 MHz

Scale 40 MHz/ Div

Center Frequency 9400 MHz

(Sec. 2.987)

Scale
20mV/Div



← 3dB

Detected RF
Pulse

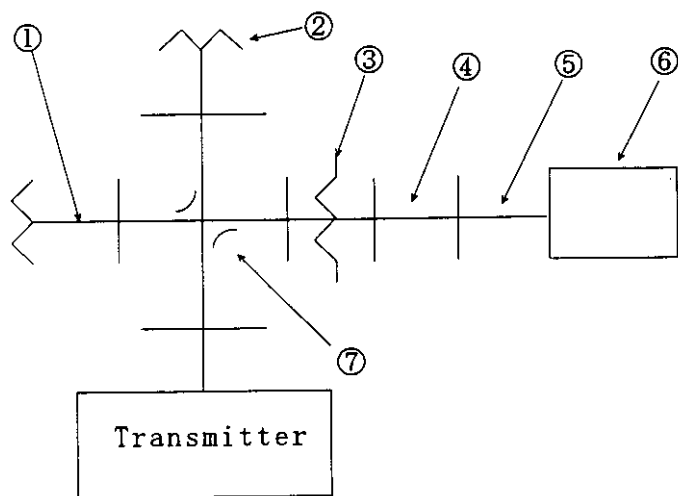
Long Pulse

Scale 200nS/Div

(Sec. 2. 991)

3.0 Spurious signals at antenna port

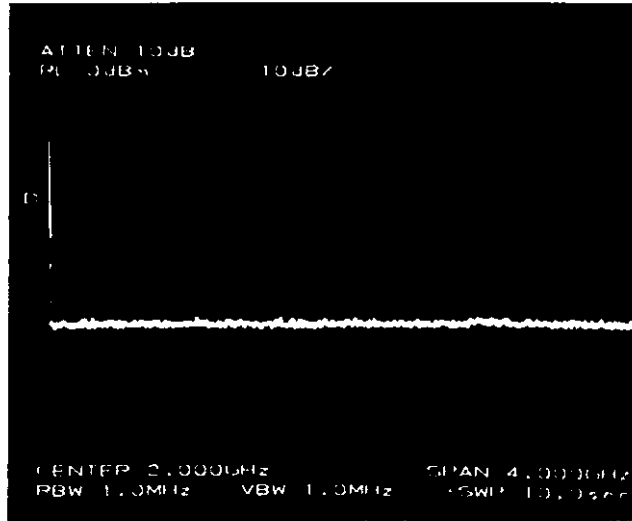
Condition 1: 0 to 20 GHz



1	Dummy Load	X910B	HP
2	High power Dummy Load	4D371A	Shimada
3	Attenuator	X382A	HP
4	Adaptor	X281A	HP
5	Coaxial Cable	MI-04	Takeda Riken
6	Spectrum Analyzer	8563E	HP
7	Directional Coupler	R11421	Shimada
	Coupling	30 dB	
	Directivity	30 dB	
★	Attenuation	3 ; 25dB	
★	Measurement Point;	Rotary Joint Output	

(Sec. 2.991)

Scale
↑ 10dB/Div
→ 400 MHz
/Div

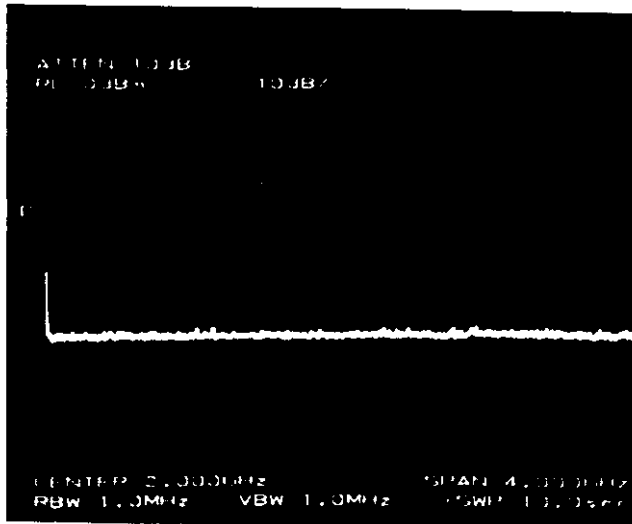


Spurious
Signals

OFF

0 to 3.6 GHz

Scale
↑ 10dB/Div
→ 400 MHz
/Div

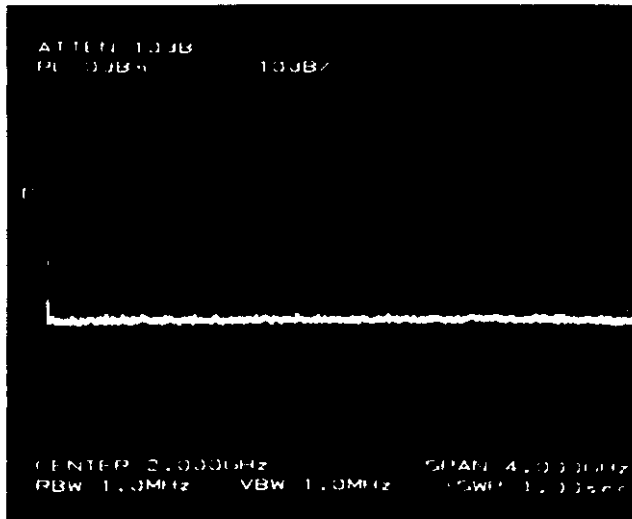


Spurious
Signals

Stand-By

0 to 3.6 GHz

Scale
↑ 10dB/Div
→ 400 MHz
/Div



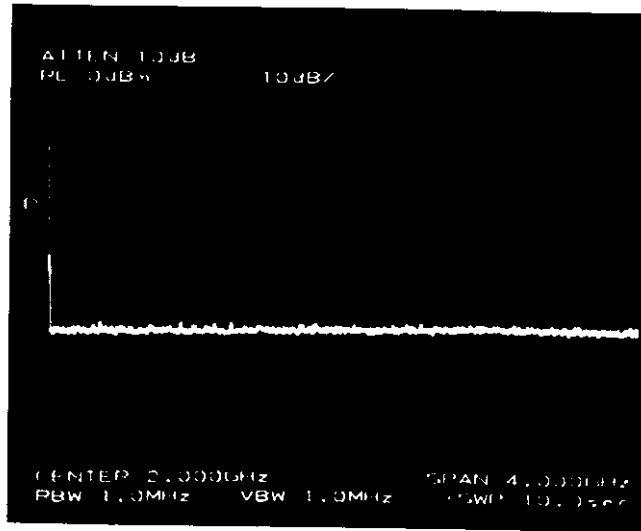
Spurious
Signals

Short Pulse

0 to 3.6 GHz

(Sec. 2.991)

Scale
↑ 10dB/Div
→ 400 MHz
/Div

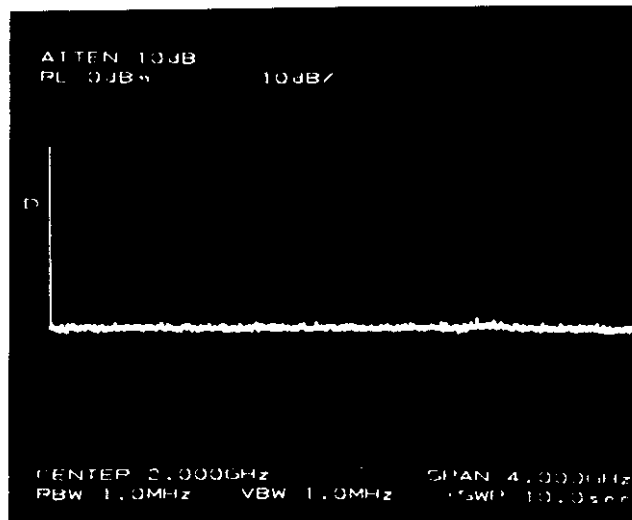


Spurious
Signals

Short Medium
Pulse

0 to 3.6 GHz

Scale
↑ 10dB/Div
→ 400 MHz
/Div

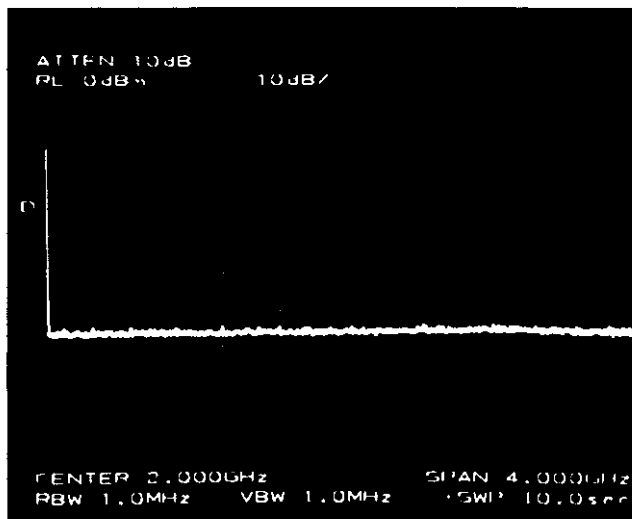


Spurious
Signals

Medium Pulse

0 to 3.6 GHz

Scale
↑ 10dB/Div
→ 400 MHz
/Div

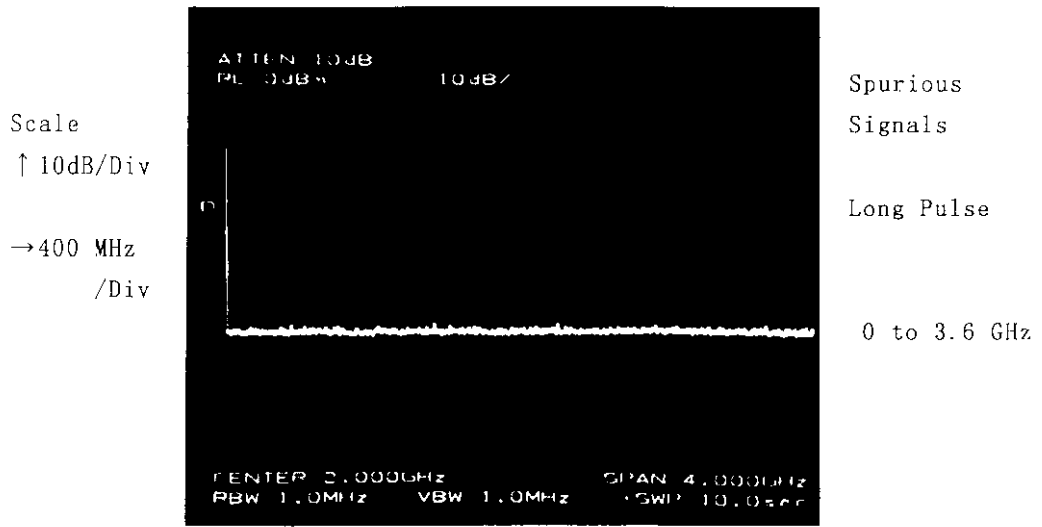


Spurious
Signals

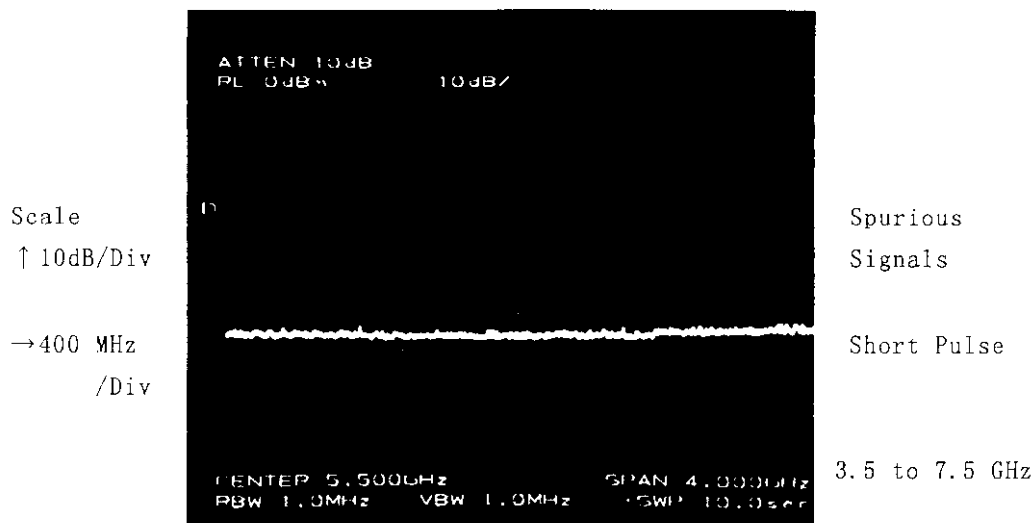
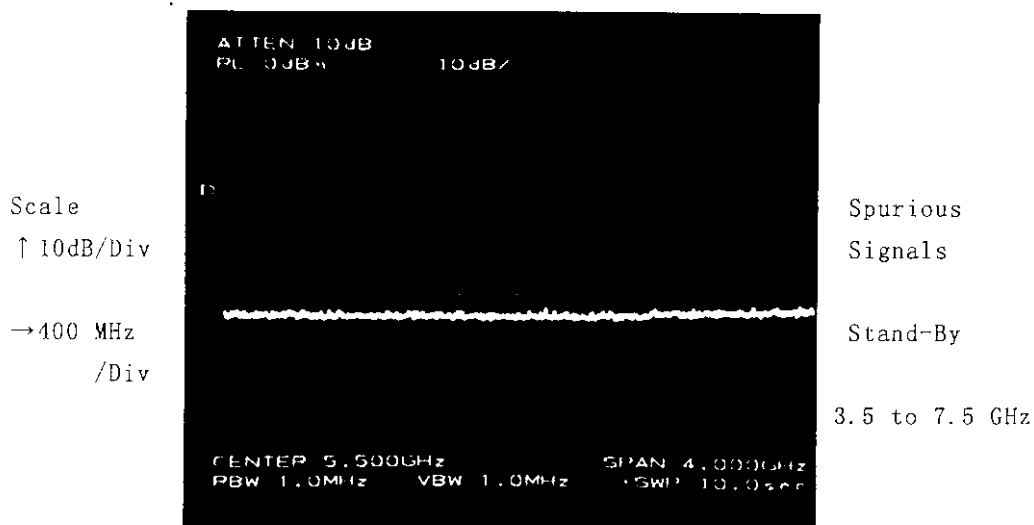
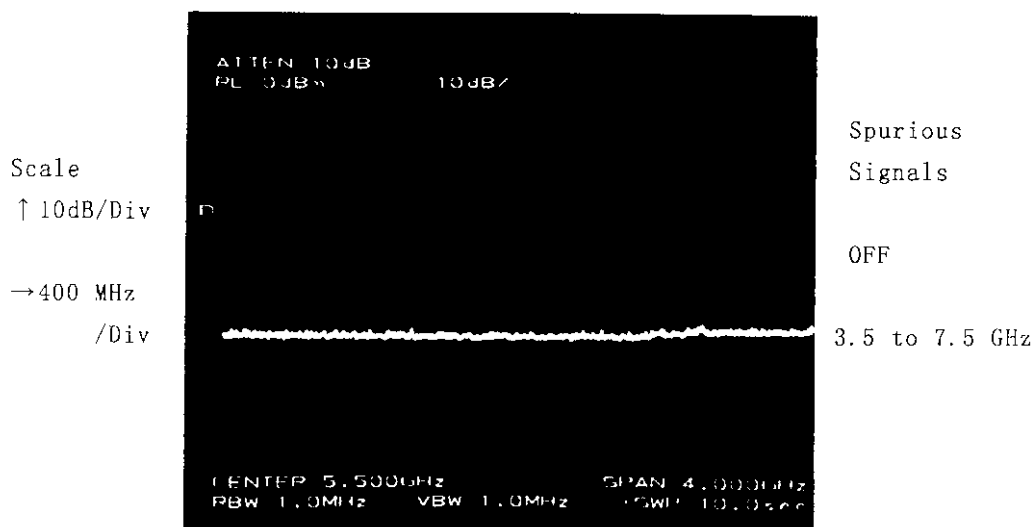
Long Medium Pulse

0 to 3.6 GHz

(Sec. 2.991)

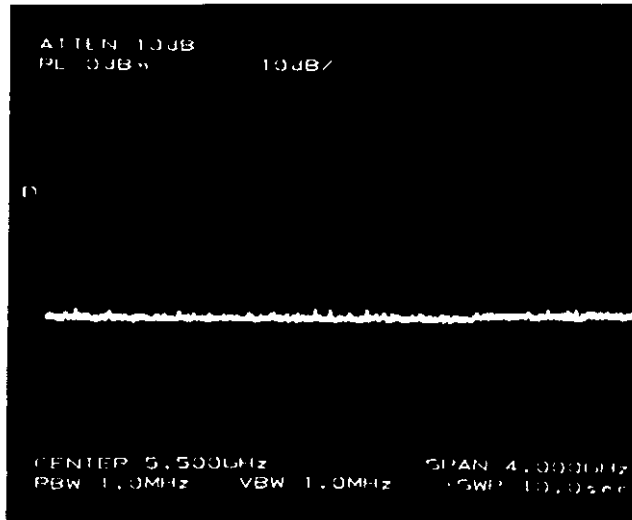


(Sec. 2.991)



(Sec. 2.991)

Scale
↑ 10dB/Div
→ 400 MHz
/Div

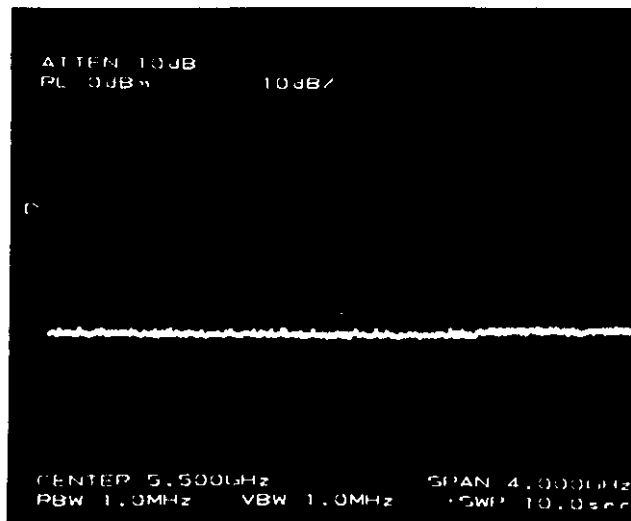


Spurious
Signals

Short Medium
Pulse

3.5 to 7.5 GHz

Scale
↑ 10dB/Div
→ 400 MHz
/Div

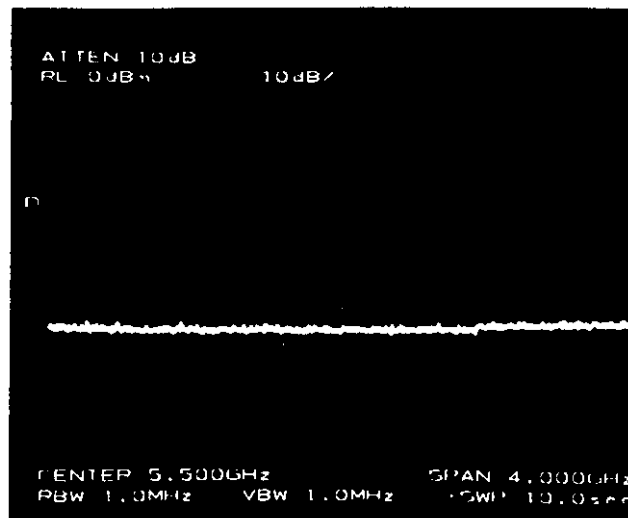


Spurious
Signals

Medium Pulse

3.5 to 7.5 GHz

Scale
↑ 10dB/Div
→ 400 MHz
/Div

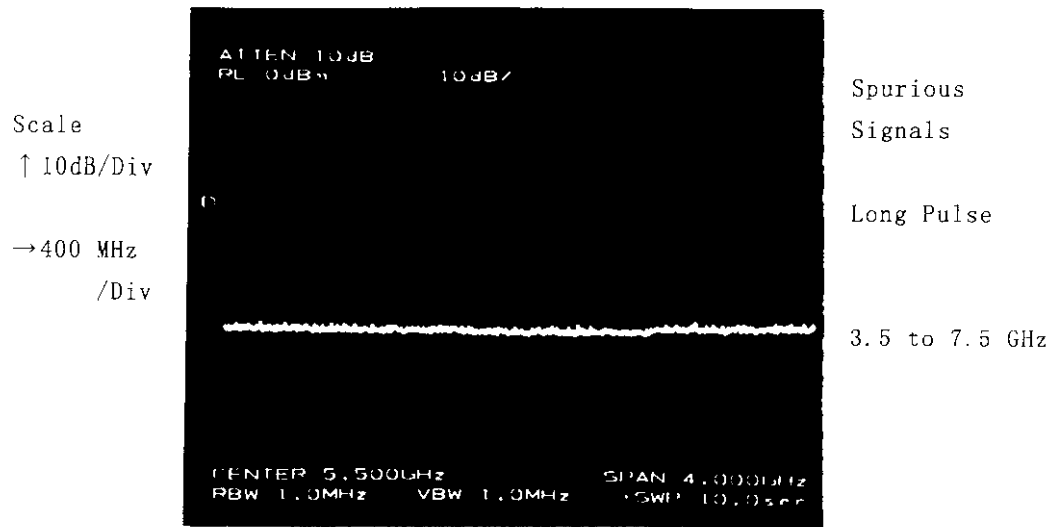


Spurious
Signals

Long Medium Pulse

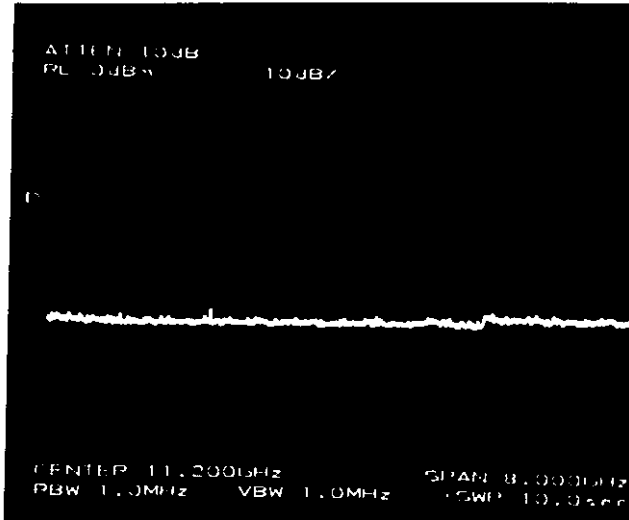
3.5 to 7.5 GHz

(Sec. 2.991)



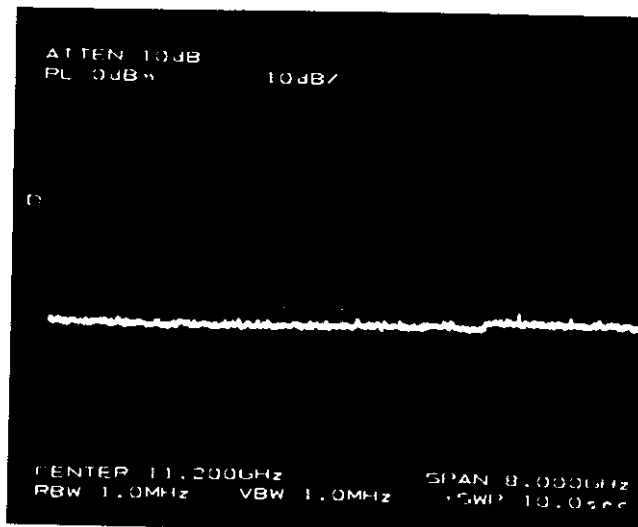
(Sec. 2.991)

Scale
↑ 10dB/Div
→ 800 MHz
/Div



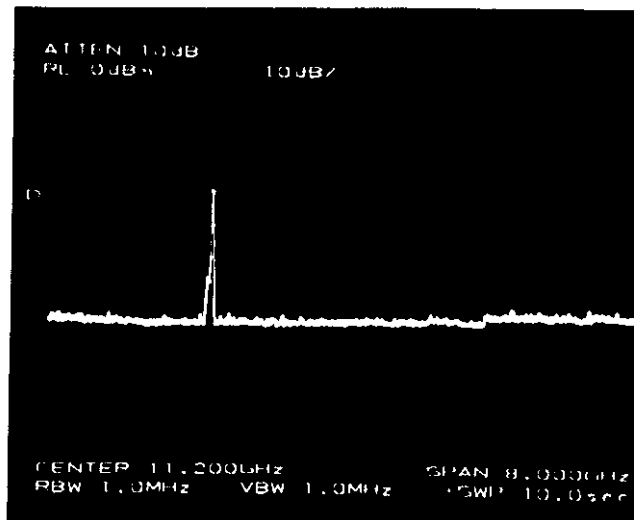
Spurious
Signals
OFF
7.2 to 15.2 GHz

Scale
↑ 10dB/Div
→ 800 MHz
/Div



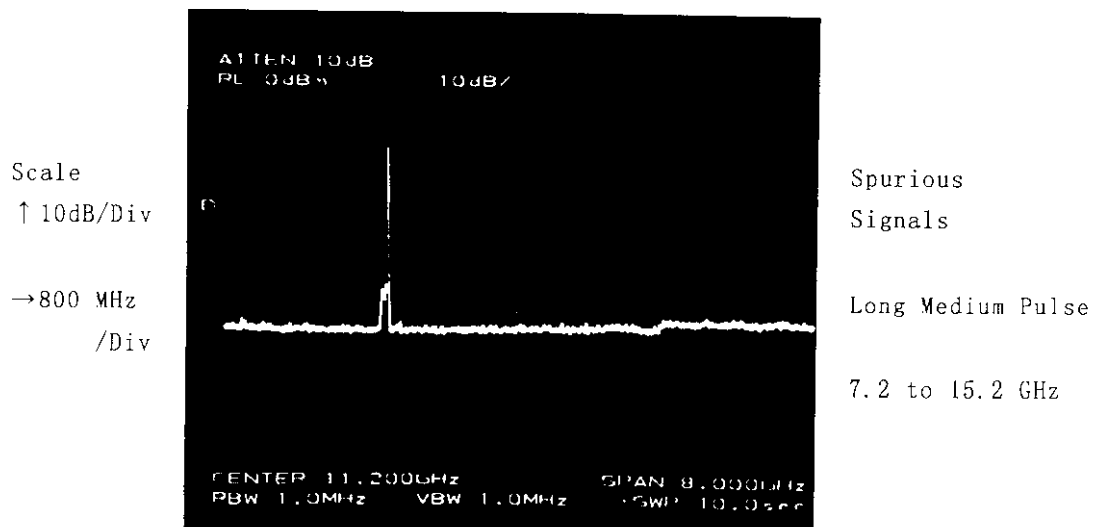
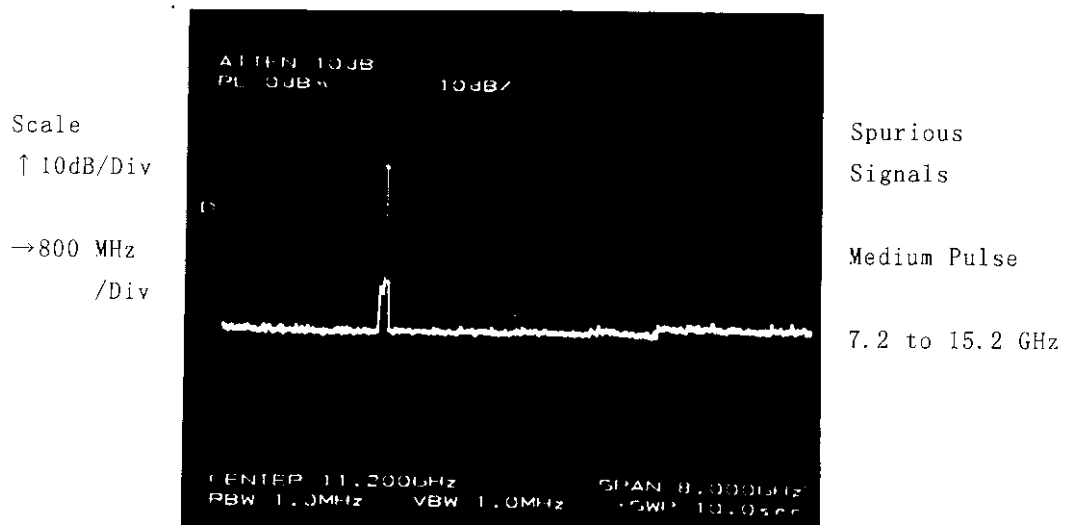
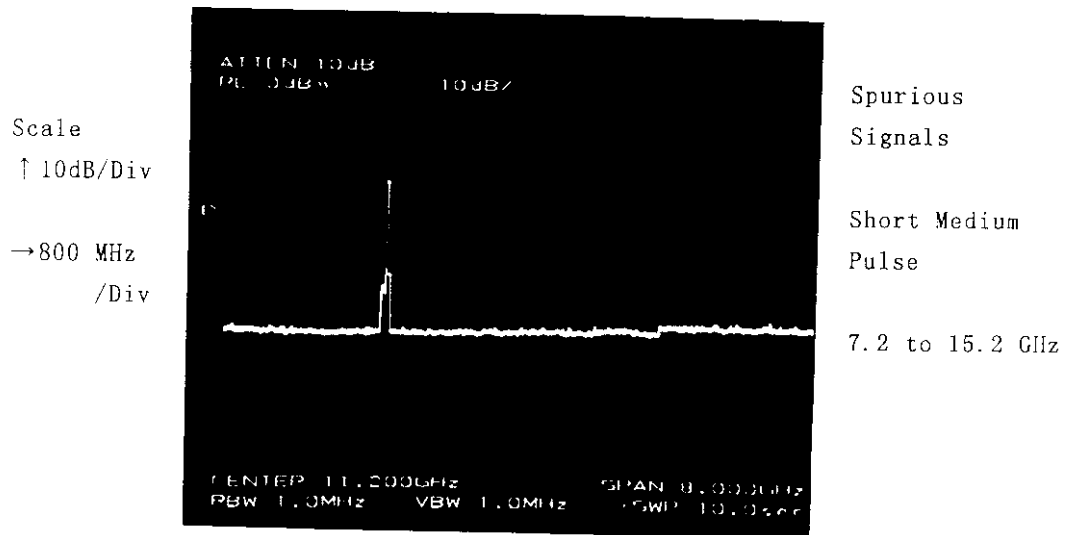
Spurious
Signals
Stand-By
7.2 to 15.2 GHz

Scale
↑ 10dB/Div
→ 800 MHz
/Div

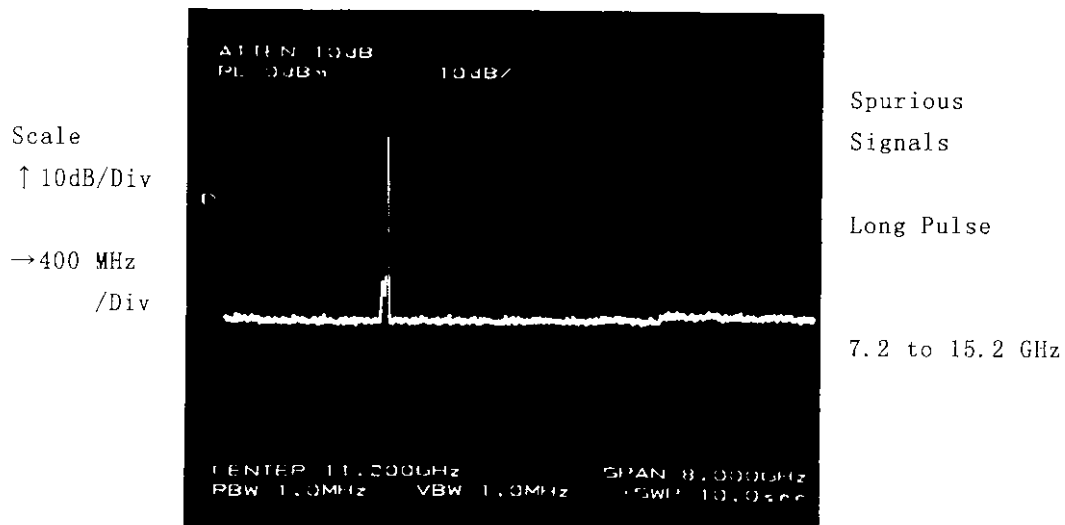


Spurious
Signals
Short Pulse
7.2 to 15.2 GHz

(Sec. 2.991)

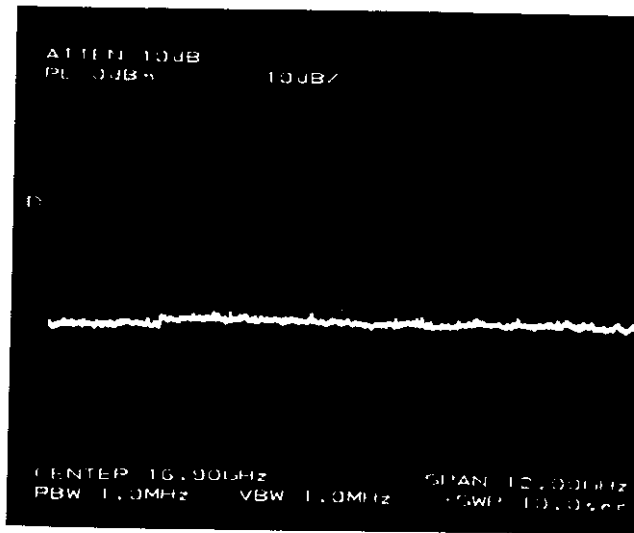


(Sec. 2.991)



(Sec. 2.991)

Scale
↑ 10dB/Div
→ 1.2 GHz
/Div

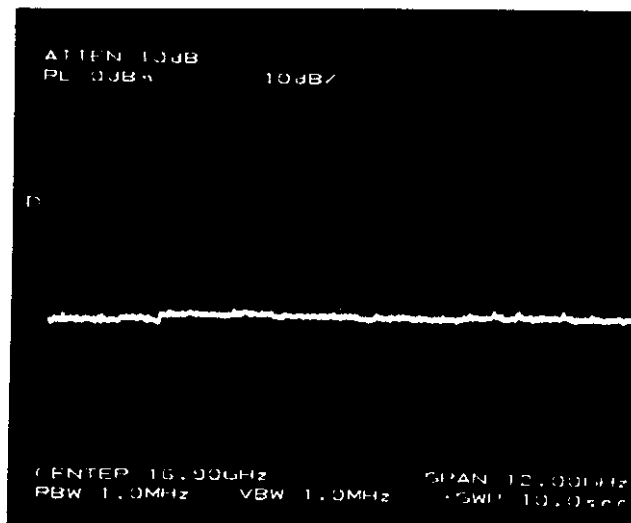


Spurious
Signals

OFF

10.9 to 20 GHz

Scale
↑ 10dB/Div
→ 1.2 GHz
/Div

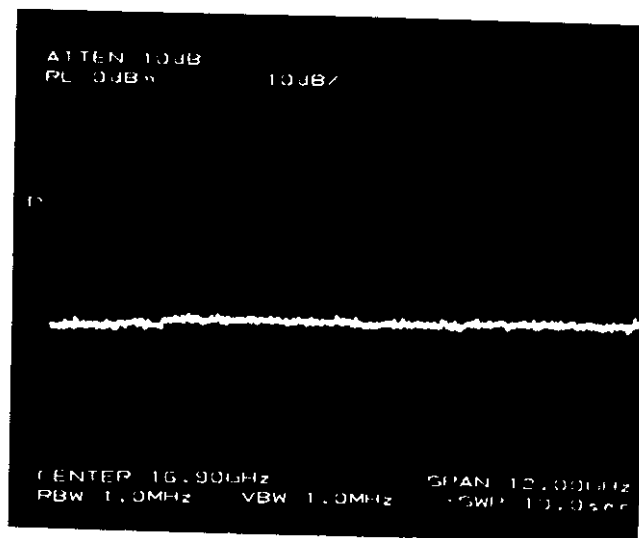


Spurious
Signals

Stand-By

10.9 to 20 GHz

Scale
↑ 10dB/Div
→ 1.2 GHz
/Div



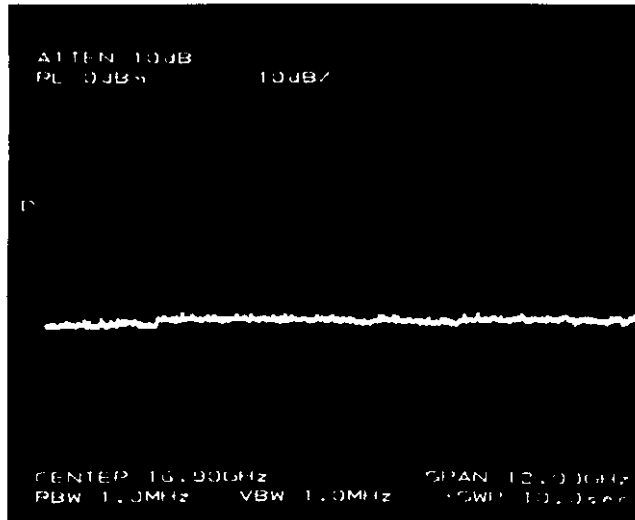
Spurious
Signals

Short Pulse

10.9 to 20 GHz

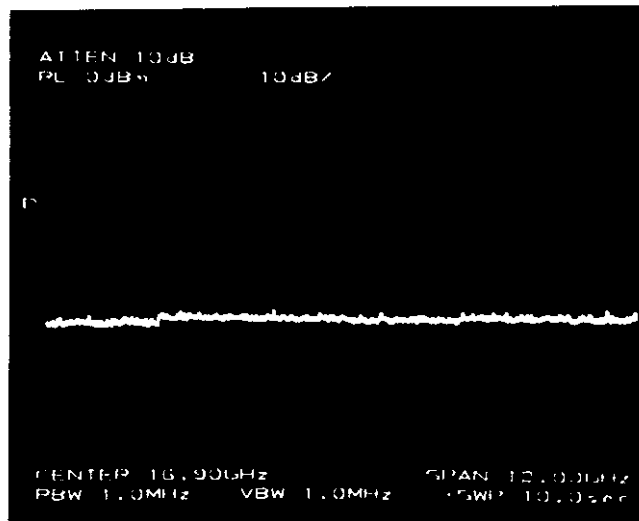
(Sec. 2.991)

Scale
↑ 10dB/Div
→ 1.2 GHz
/Div



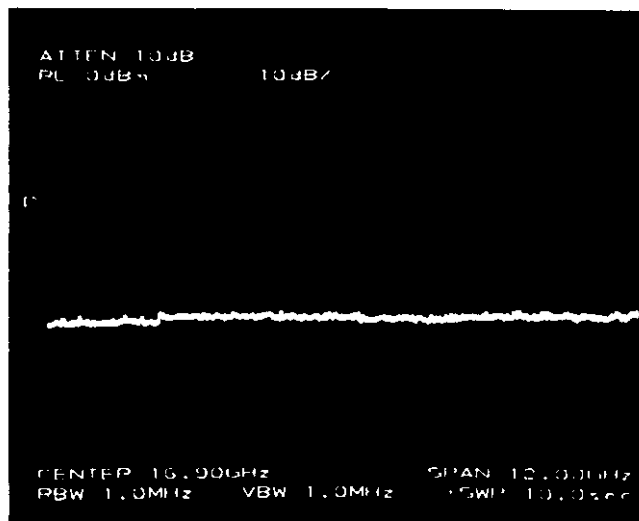
Spurious
Signals
Short Medium
Pulse
10.9 to 20 GHz

Scale
↑ 10dB/Div
→ 1.2 GHz
/Div



Spurious
Signals
Medium
Pulse
10.9 to 20 GHz

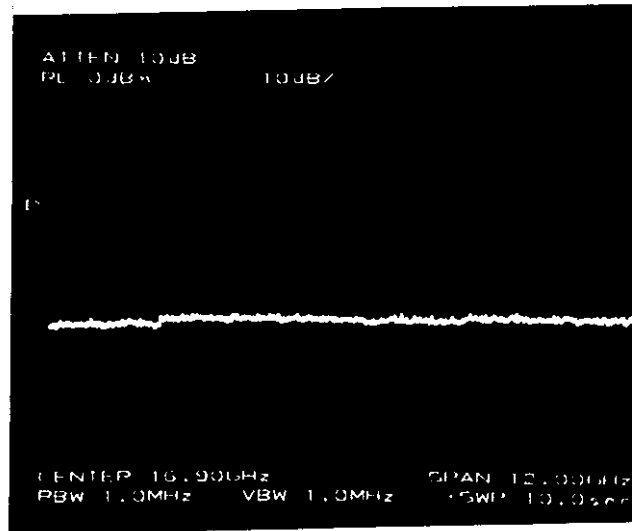
Scale
↑ 10dB/Div
→ 1.2 GHz
/Div



Spurious
Signals
Long Medium Pulse
10.9 to 20 GHz

(Sec. 2.991)

Scale
↑ 10dB/Div
→ 400 MHz
/Div



Spurious
Signals

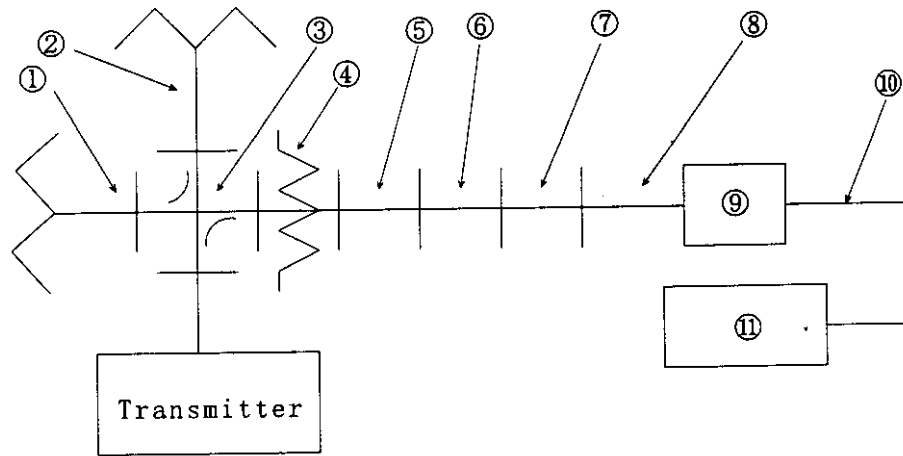
Long Pulse

10.9 to 20 GHz

(Sec. 2. 991)

3.0 Spurious signals at antenna port

Condition 2; 12.4 to 40 GHz



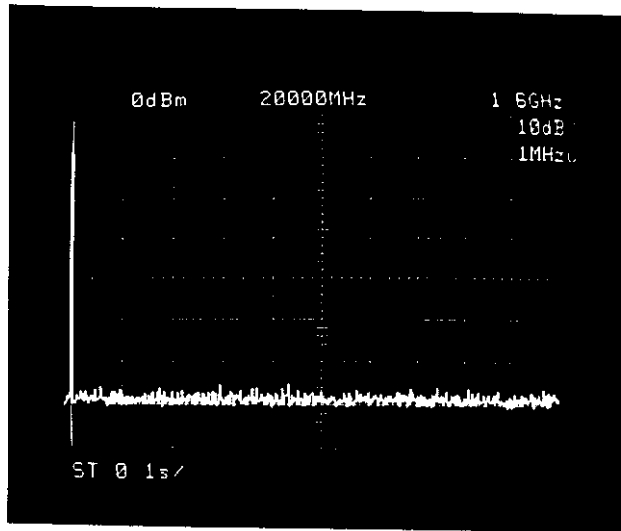
1	Dummy Load	X910B	HP
2	High power Dummy Load	4D371A	Shimada
3	Directional Coupler	R11421	Shimada
	Coupling	30 dB	
	Directivity	30 dB	
4	Attenuator	X382A	HP
5	Tapered W/G	195-X KU	AIRCOM
6	Tapered W/G	11818A	HP
7	Tapered W/G	11519A	HP
8	Tapered W/G	11520A	HP
9	External Mixer	11517A	HP
10	Coaxial Cable	10503A	HP
11	Spectrum Analyzer	TR4133B	Takeda Riken

★ Attenuation on ATT4 ; 50dB

★ Measurement Point ; Rotary Joint Output

(Sec. 2.991)

Scale
↑ 10dB/Div
→ 1.6 GHz
/Div

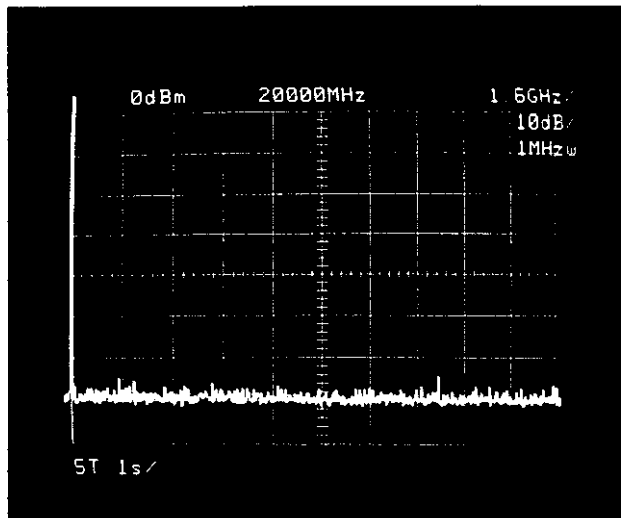


Spurious
Signals

OFF

12.4 to 28 GHz

Scale
↑ 10dB/Div
→ 1.6 GHz
/Div

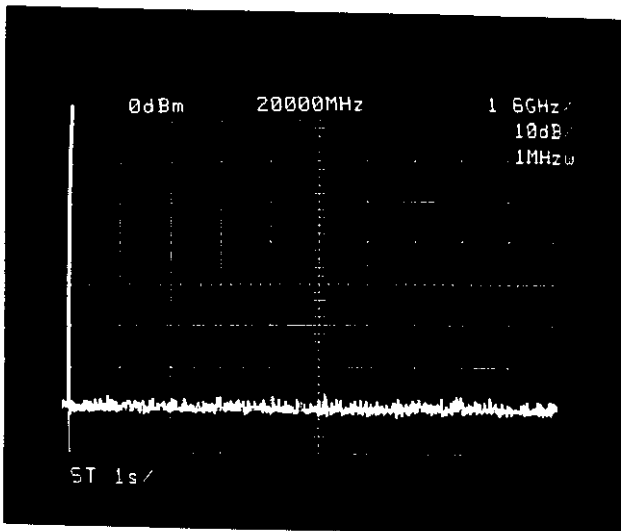


Spurious
Signals

Stand-By

12.4 to 28 GHz

Scale
↑ 10dB/Div
→ 1.6 GHz
/Div



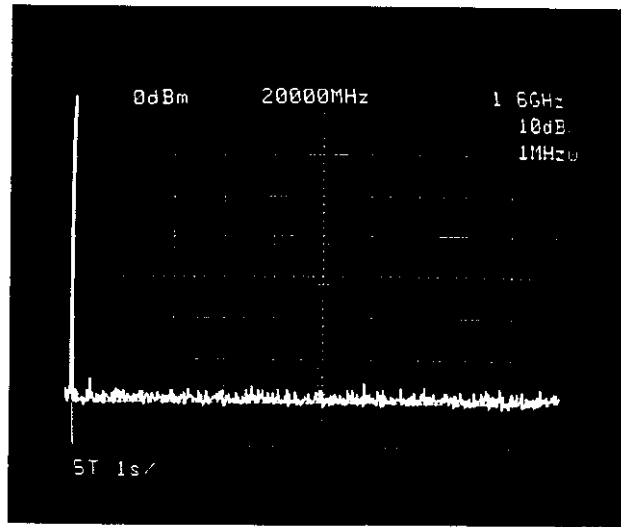
Spurious
Signals

Short Pulse

12.4 to 28 GHz

(Sec. 2.991)

Scale
↑ 10dB/Div
→ 1.6 GHz
/Div

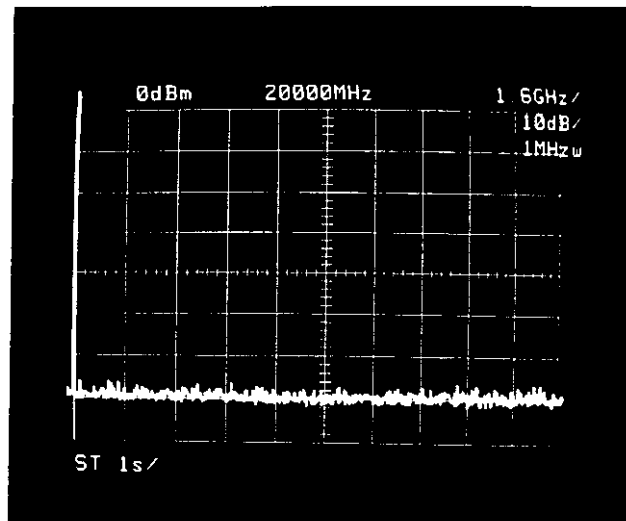


Spurious
Signals

Short Medium
Pulse

12.4 to 28 GHz

Scale
↑ 10dB/Div
→ 1.6 GHz
/Div

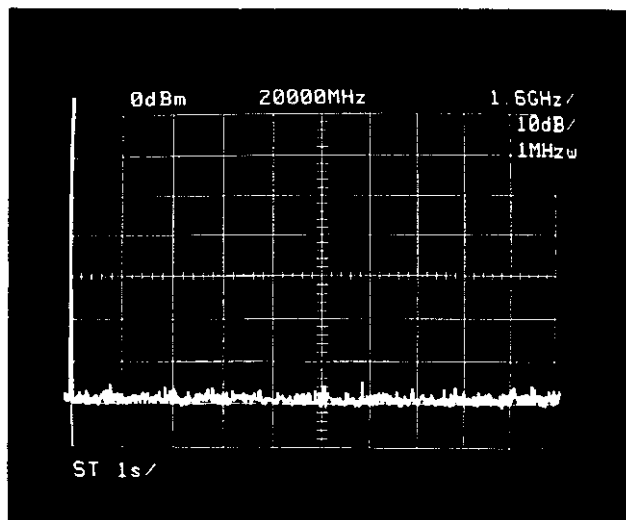


Spurious
Signals

Medium Pulse

12.4 to 28 GHz

Scale
↑ 10dB/Div
→ 1.6 GHz
/Div

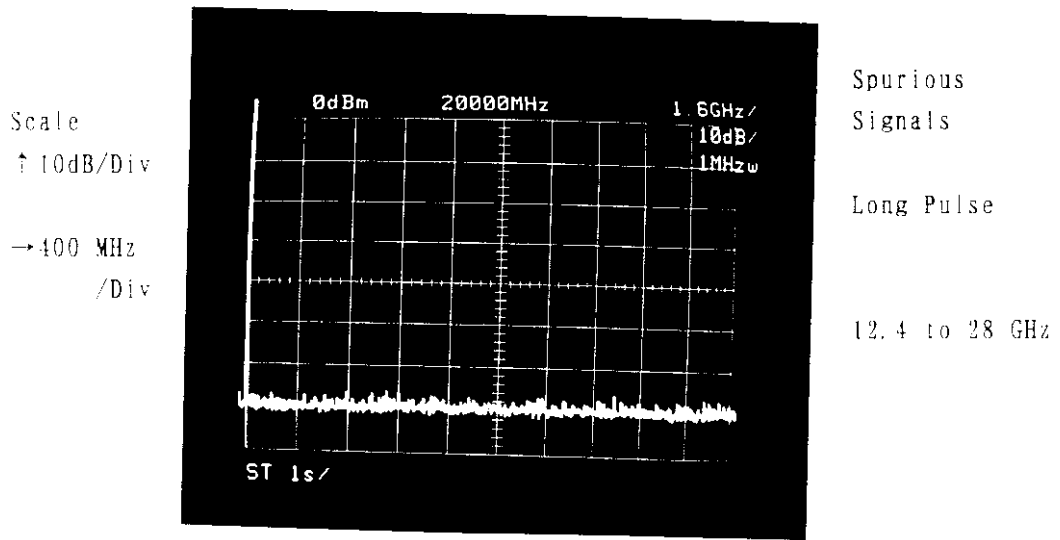


Spurious
Signals

Long Medium Pulse

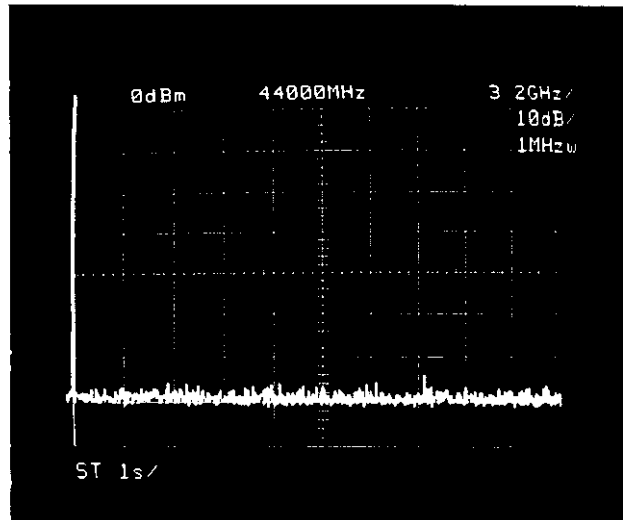
12.4 to 28 GHz

(Sec. 2.991)



(Sec. 2.991)

Scale
↑ 10dB/Div
→ 3.2 GHz
/Div

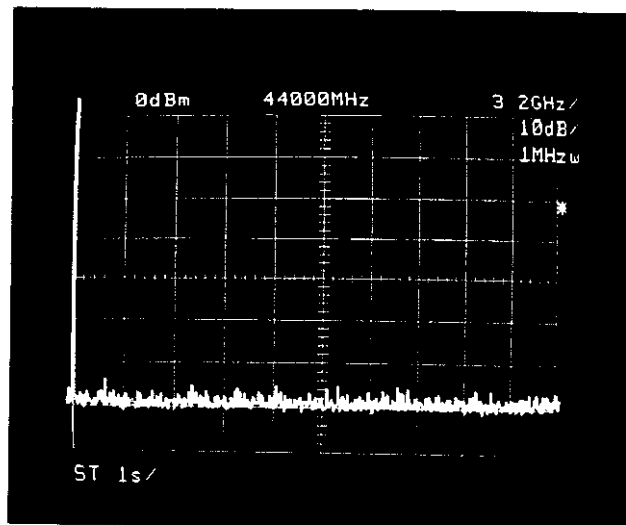


Spurious
Signals

OFF

28 to 60 GHz

Scale
↑ 10dB/Div
→ 3.2 GHz
/Div

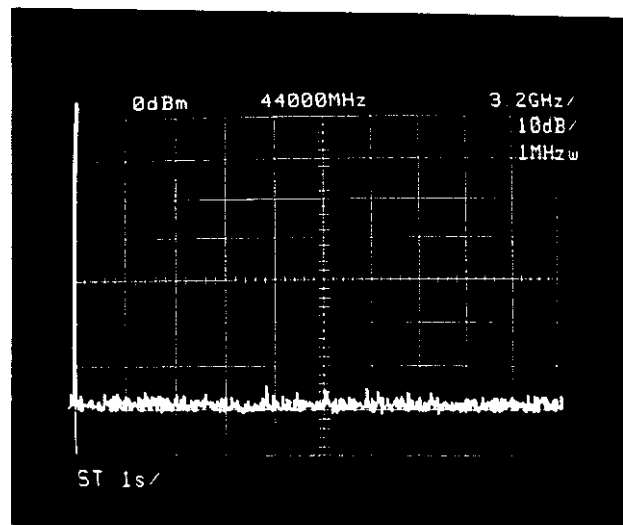


Spurious
Signals

Stand-By

28 to 60 GHz

Scale
↑ 10dB/Div
→ 3.2 GHz
/Div



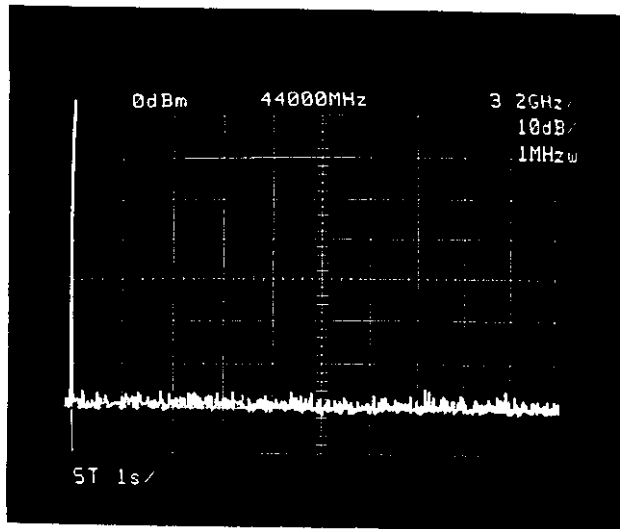
Spurious
Signals

Short Pulse

28 to 60 GHz

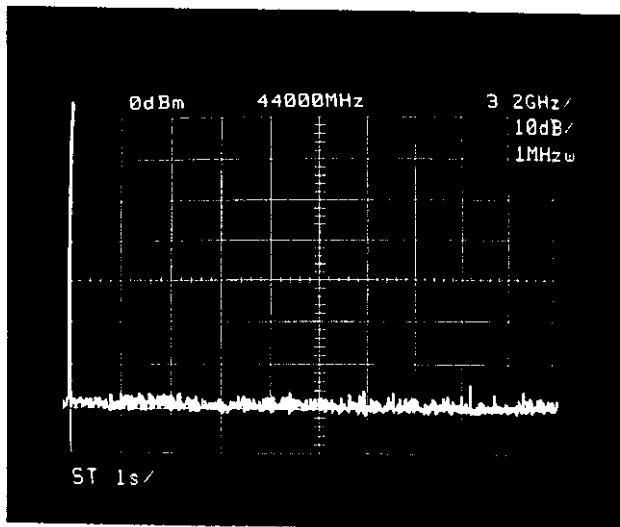
(Sec. 2.991)

Scale
↑ 10dB/Div
→ 3.2 GHz
/Div



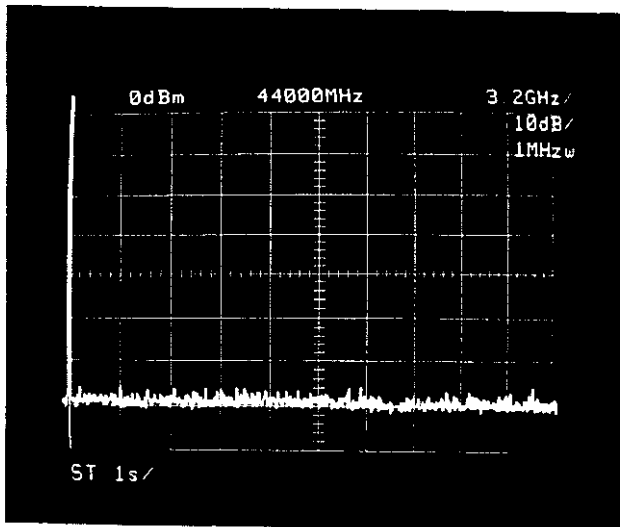
Spurious
Signals
Short Medium Pulse
28 to 60 GHz

Scale
↑ 10dB/Div
→ 3.2 GHz
/Div



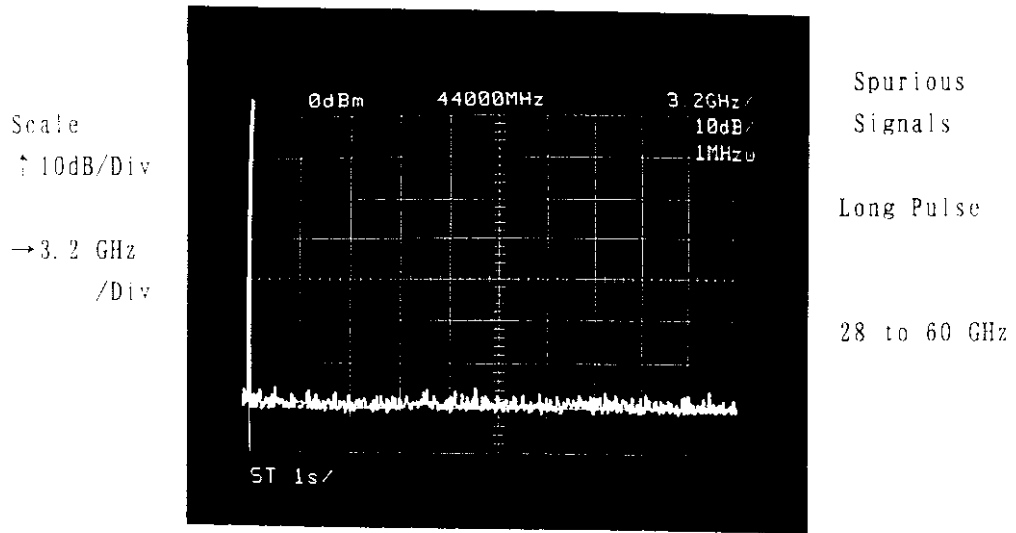
Spurious
Signals
Medium Pulse
28 to 60 GHz

Scale
↑ 10dB/Div
→ 3.2 GHz
/Div

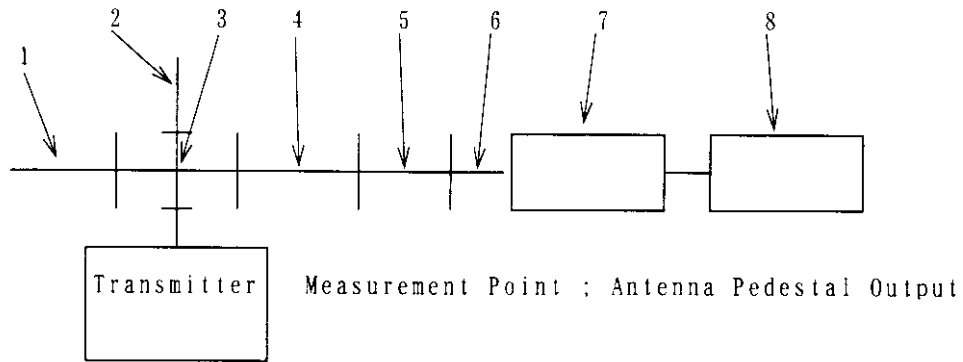


Spurious
Signals
Long Medium Pulse
28 to 60 GHz

(Sec. 2.991)



(Sec. 2. 995) 4.0 Frequency Stability



1 Dummy Load	X910B	HP
2 High Power Dummy Load	4D371A	Shimada
3 Directional Coupler	5D351	Shimada
Coupling	20 dB	
Directivity	20 dB	
4 Frequency Meter	X532B	HP
5 Attenuator	X382A	HP
6 Adapter	X281A	HP
7 Power Sensor	8481A	HP
8 Power Meter	435A	HP
Temperature Chamber		Onisi Netugaku

Measurement Procedure

- 1 The antenna pedestal and display unit were set up in the temperature chamber and the measurement equipment were set outside the temperature chamber.
- 2 With power removed, the temperature was decreased to 30 and permitted to stabilize for three hours. Power was applied and measured warm up time. After 30 minutes place the radar in X MIT, measured frequency at 21.6V, 24V, 26.4V
- 3 With power off, the temperature was raised in 10 steps. The sample was permitted to stabilize at each step for at least three hours. Power was applied and measured warm up time. After 30 minutes place the radar in X MIT, measured frequency at 21.6V, 24V, 26.4V

Temperature	Operating Frequency MHz									Warm Up Time
	Short Pulse			Medium Short Puls			Medium			
	21.6V	24.0V	26.4V	21.6V	24.0V	26.4V	21.6V	24.0V	26.4V	
-30	9419	9419	9419	9419	9419	9417	9416	9416	9417	1'30"
-20	9417	9417	9419	9416	9416	9419	9415	9413	9415	1'30"
-10	9417	9417	9417	9416	9416	9416	9414	9414	9414	1'30"
0	9417	9419	9417	9416	9419	9416	9413	9415	9413	1'30"
+10	9415	9416	9415	9415	9416	9416	9412	9413	9413	1'31"
+20	9412	9412	9412	9412	9412	9412	9411	9411	9412	1'31"
+30	9408	9408	9409	9408	9408	9408	9407	9408	9408	1'31"
+40	9405	9405	9406	9405	9405	9405	9404	9405	9405	1'31"
+50	9402	9403	9403	9402	9403	9403	9402	9402	9402	1'31"
+55	9401	9403	9403	9401	9403	9403	9401	9401	9403	1'31"

Temperature	Operating Frequency MHz						Warm Up Time
	Medium Long Puls			Long Pulse			
	21.6V	24.0V	26.4V	21.6V	24.0V	26.4V	
-30	9413	9413	9413	9415	9413	9412	1' 30"
-20	9412	9412	9413	9412	9412	9412	1' 30"
-10	9412	9412	9413	9412	9412	9412	1' 30"
0	9412	9413	9413	9411	9412	9412	1' 30"
+10	9411	9412	9412	9411	9411	9411	1' 31"
+20	9409	9409	9409	9408	9409	9409	1' 31"
+30	9407	9408	9408	9407	9407	9408	1' 31"
+40	9404	9404	9404	9404	9404	9403	1' 31"
+50	9401	9402	9402	9402	9402	9402	1' 31"
+55	9400	9401	9401	9400	9401	9401	1' 31"

SECTION 5

TEST: Spurious Emissions Field Strength

EQUIPMENT: JMA-3910 S/N LS 5 4 9 6 6

FCC SPECIFICATION: Sections 2.993 and 80.211.

MINIMUM STANDARD: Mean power of emissions originating in equipment lowest generated frequency to at least 40 GHz shall be attenuated below the mean power of the transmitter by at least 43 plus 10 log (mean power in watts) decibels. Since transmitter mean power is 9.14 watts maximum (long pulse) or 39.61 dBm:

$$\begin{aligned} \text{Emissions} &\leq 39.61\text{dBm} - [43 + 10 \log(9.14)] \text{ dBm} \\ &\leq -13.0 \text{ dBm} \end{aligned}$$

TEST RESULTS: No spurious emissions observed above minimum standard.

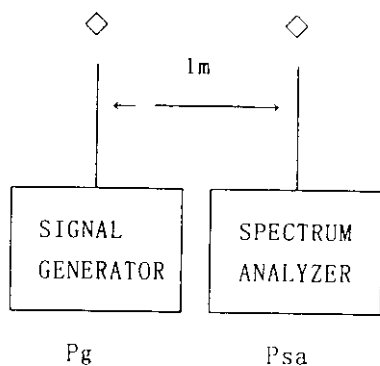
TEST CONDITIONS: Tamb = 20°C to 25°C RHamb = 40% ~ 60%
Euut input = 24 VDC
Stabilization: UUT energized for 10 minutes minimum.

TEST EQUIPMENT: JRC Original - Shielded Room
Other equipment - see test set-ups.

DATE: 9 - 10 OCT. 1998

TEST ENGINEER: K. YUASA.

CALIBRATION OF TESTS 1~5 (0~1 GHz)



A signal source of known amplitude was used as a calibrating signal with identical antennas on the generator and the spectrum analyzer. From previous testing in the shielded room, the antenna factors are considered much greater than path loss. Hence half of the difference in signals P_g and P_{sa} is due to each antenna.

The calibrating signal on the analyzer is therefore:

$$P_{cal} = P_{sa} - (P_{sa} - P_g) / 2 = (P_{sa} + P_g) / 2 \text{ dBm.}$$

The log ref level on the analyzer is adjusted so as to read other signals directly:

$$\text{LRL (adjusted)} = \text{LRL (set)} + P_{cal} - P_{sa} \text{ dBm.}$$

The calibrating signal used was selected on the basis of best average amplitude over the frequency range of interest.

TEST	CAL sig	P_{sa}	P_g	P_{cal}	LRL(set)	LRL(adj)
1	250 KHz	-89.3	0	-44.7	-10	34.6
2	2.5 MHz	-86.7	0	-43.4	-10	33.3
3	25 MHz	-50.7	0	-25.4	-10	15.3
4	250 MHz	-14.7	0	-7.4	-10	-2.6
5	500 MHz	-12.0	0	-6.0	-10	-4.0

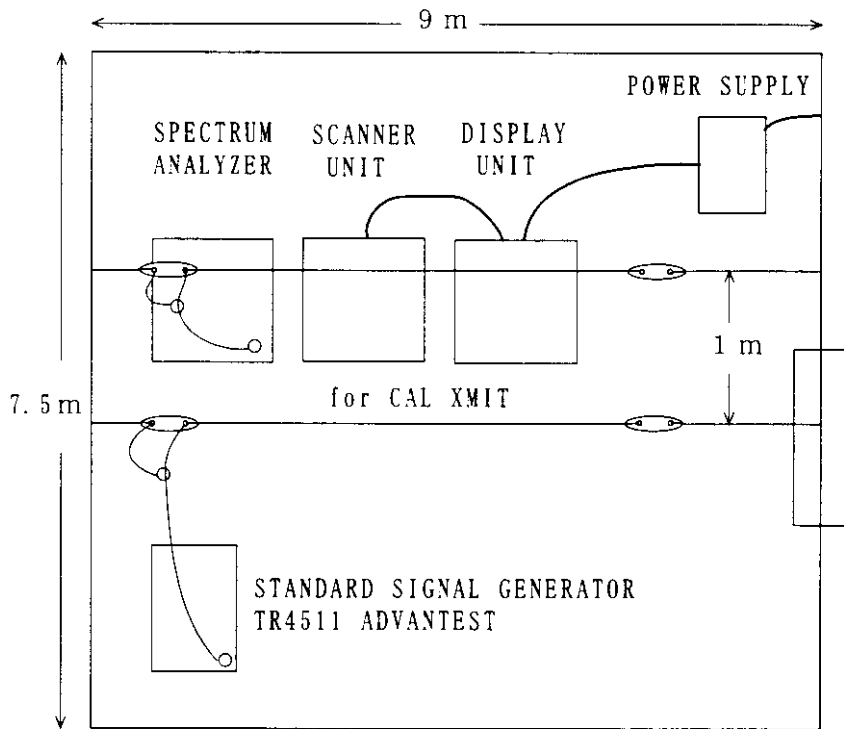
RFI TEST

TEST SET-UP #1(0~50MHz)

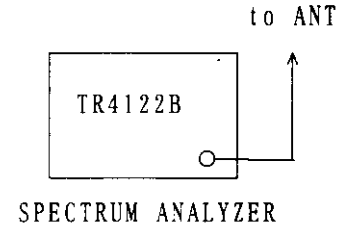
TEST #1 0~500 KHz

TEST #2 0~ 5 MHz

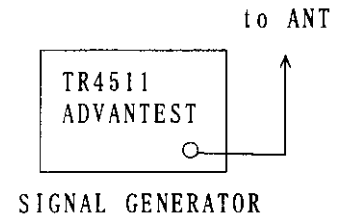
TEST #3 0~ 50 MHz



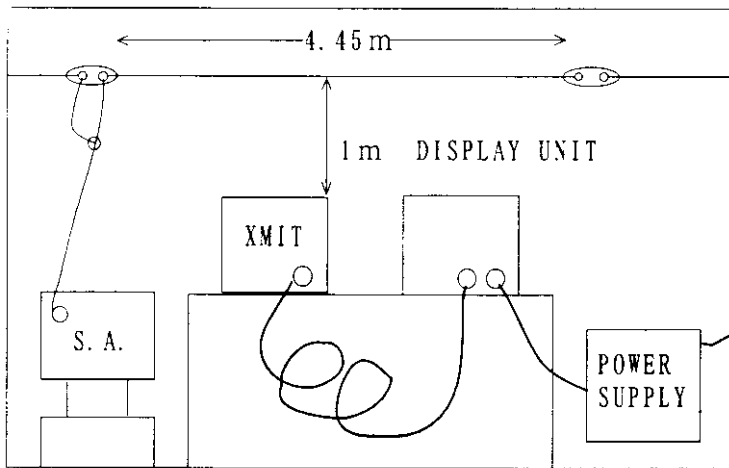
TEST EQUIPMENT



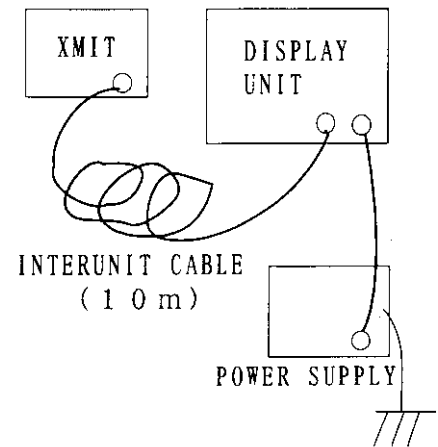
SPECTRUM ANALYZER



SIGNAL GENERATOR



JRC ORIGINAL
RF ANECHOIC CHAMBER: SIDE VIEW

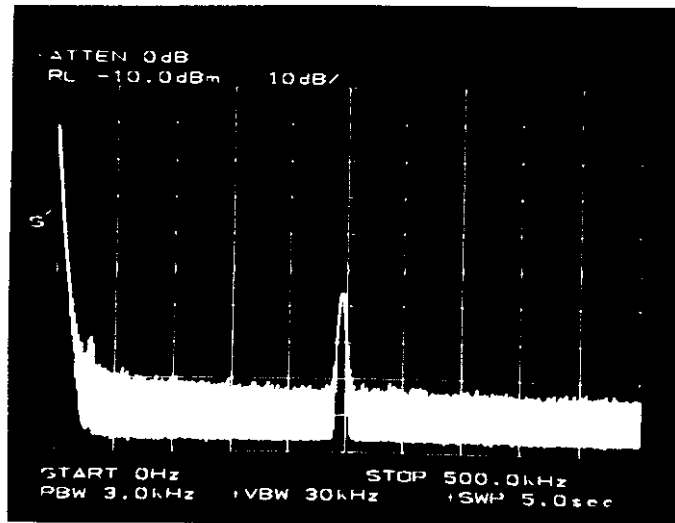


CABLE

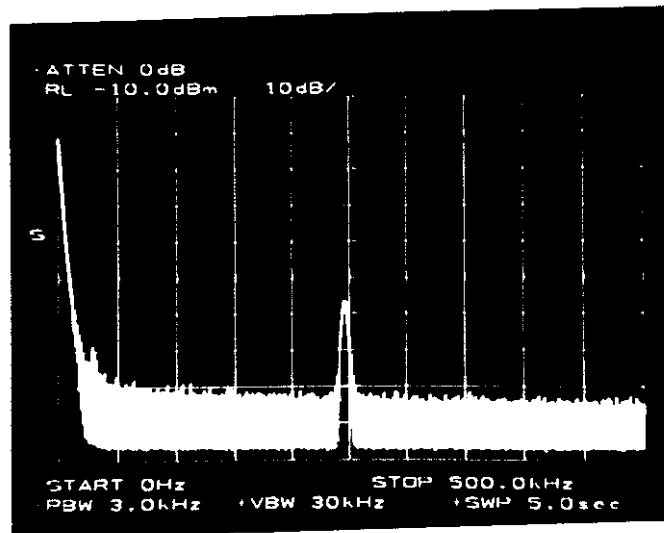
TEST #1

Frequency Band: 0 ~ 500 KHz

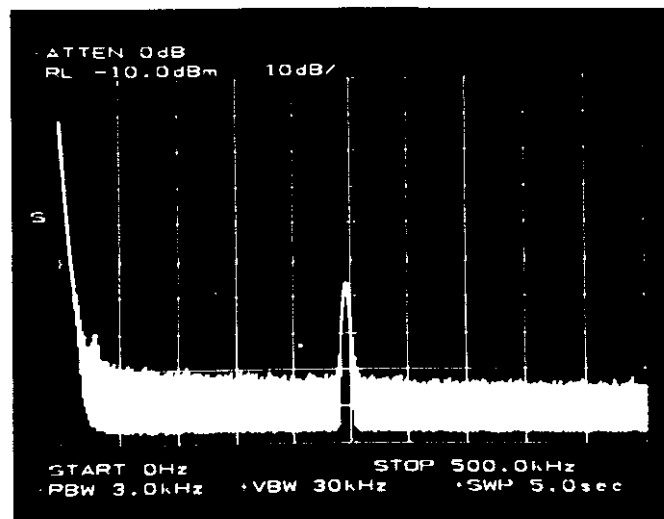
Log Ref. Level: 34.6 dBm



Addition



Stand-By

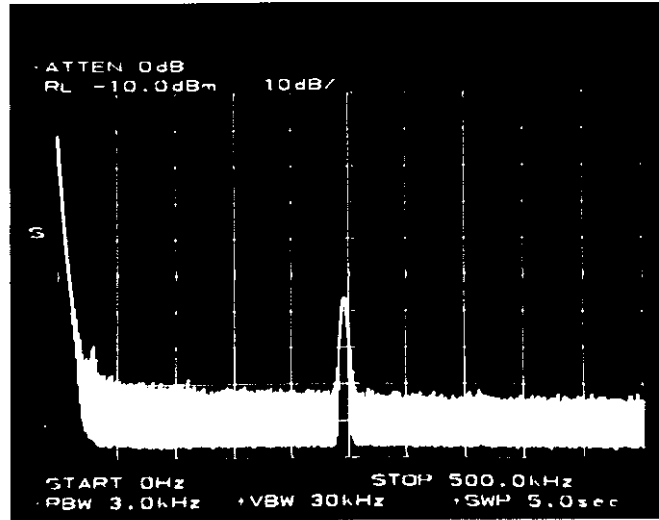


Start Pulse

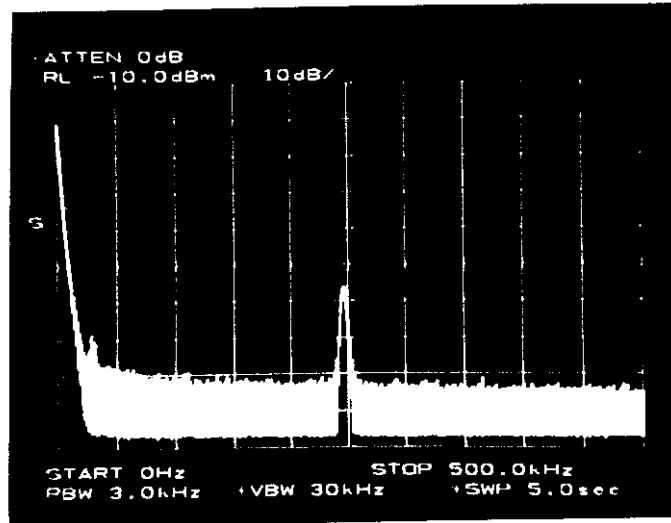
TEST #1

Frequency Band: 0~500 KHz

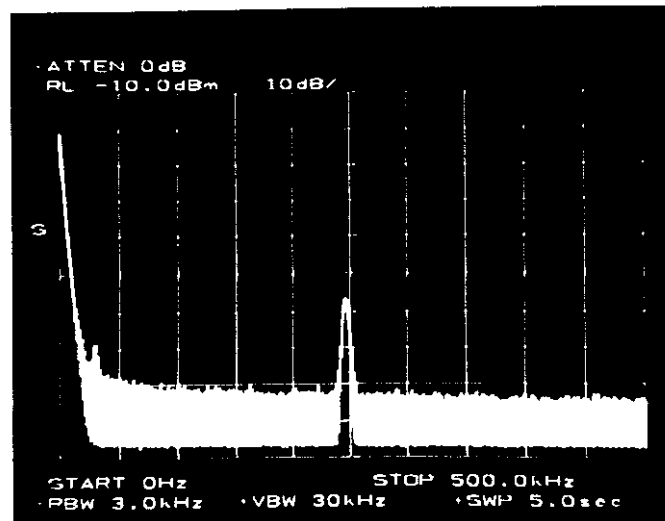
Log Ref. Level: 34.0 dBm



Medium
Short Pulse



Medium Pulse

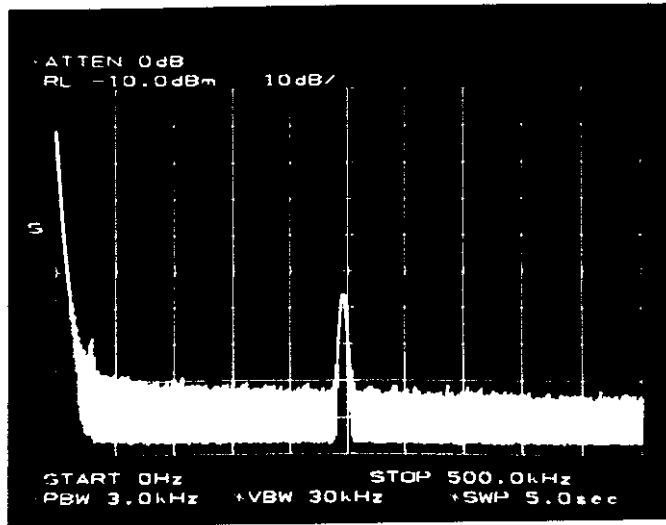


Long
Pulse

TEST #1

Frequency Band: 0~500 kHz

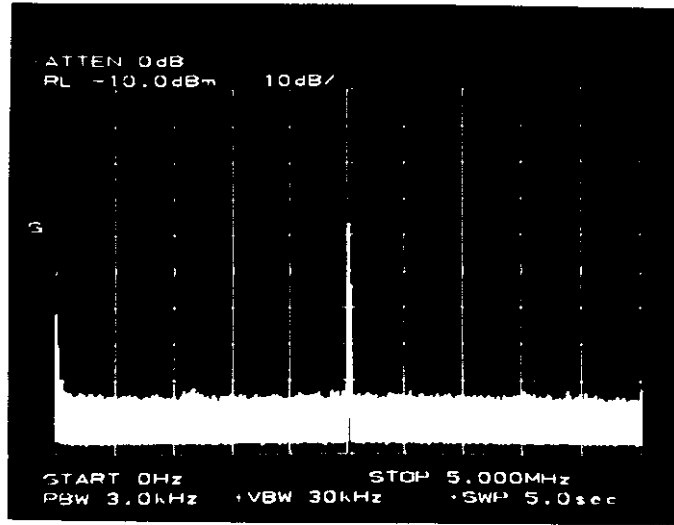
Log Ref. Level: 34.6 dBm



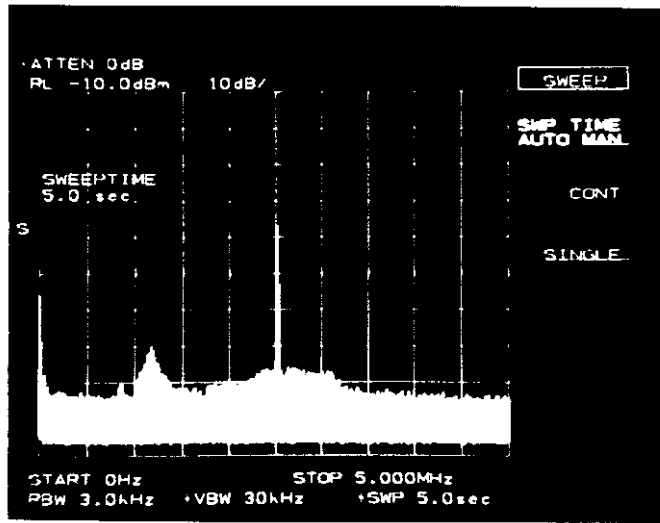
Long Pulse

Frequency Band: 0 ~ 5 MHz

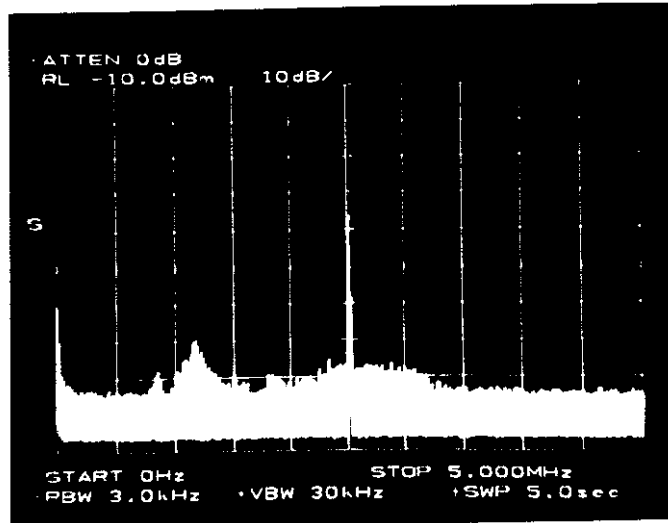
Log Ref. Level: 33.3 dBm



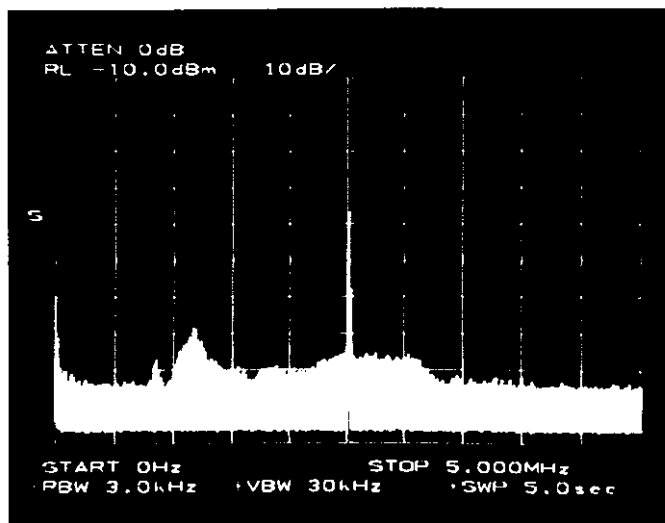
Amplitude



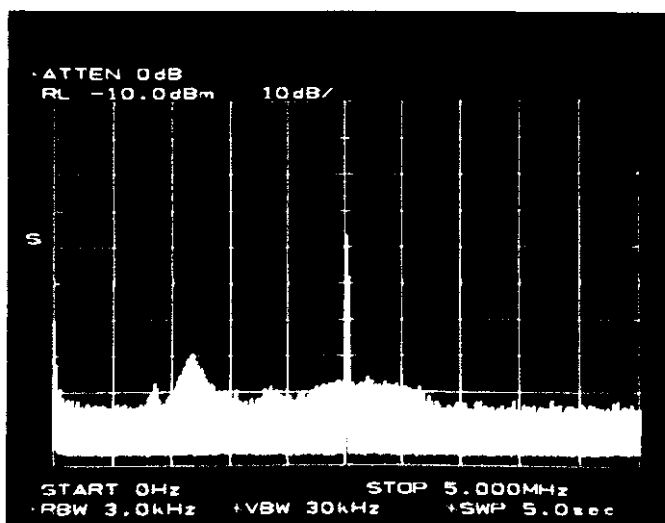
Stand By



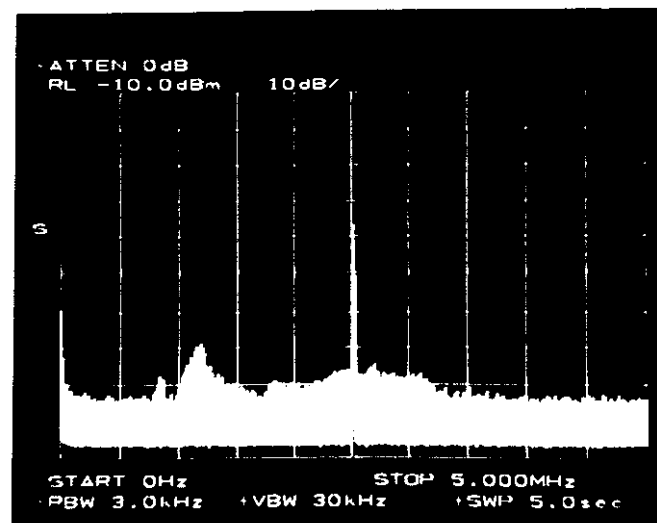
Stop Press



Medium Short Pulse



Medium Pulse

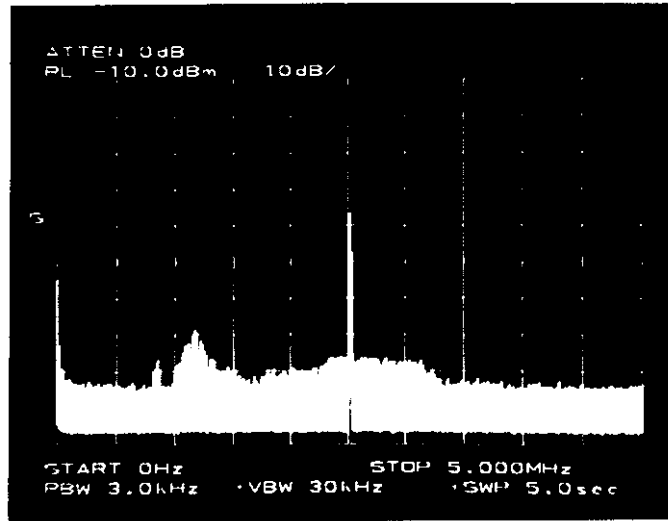


Medium Long Pulse

TEST #2

Frequency Band: 0 ~ 5 MHz

Log Ref. Level: 33.3 dBm

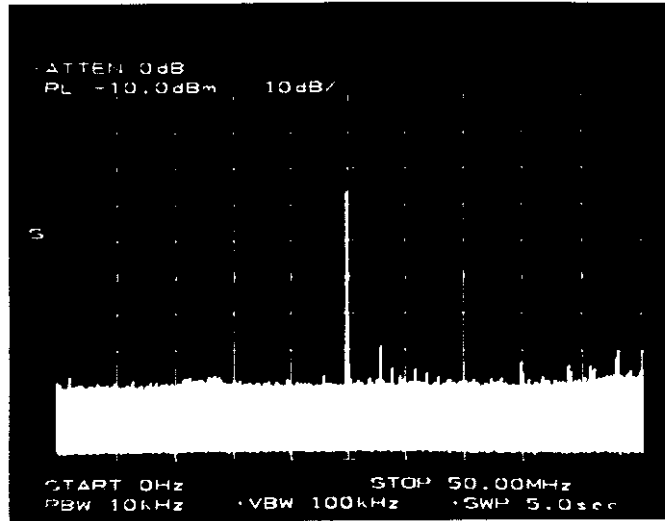


Long Pulse

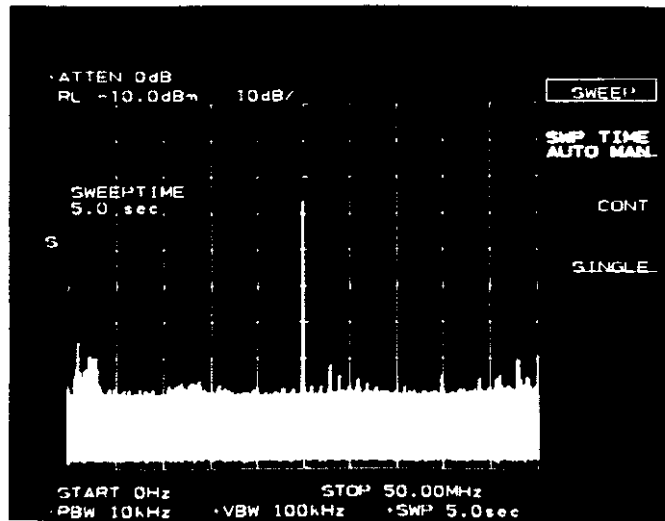
TEST #3

Frequency Band: 0~50 MHz

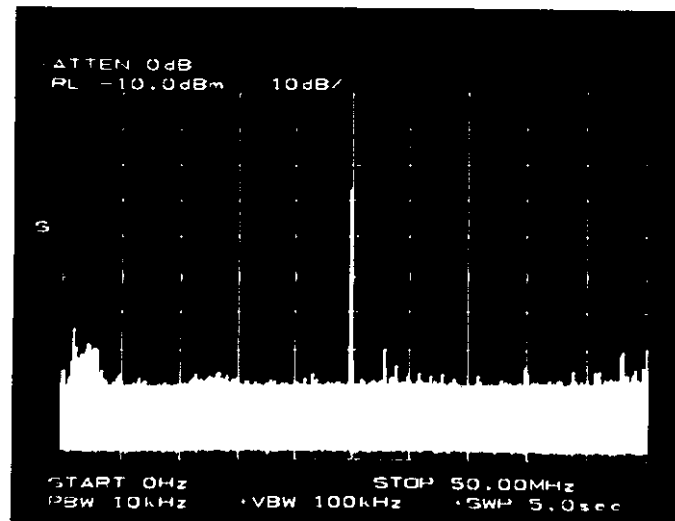
Log Ref. Level: 15.3 dBm



Ambient



Stand-By

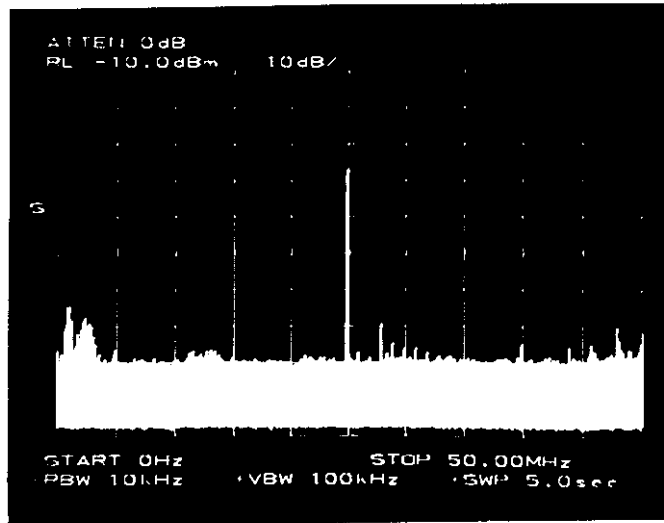


Short Pulse

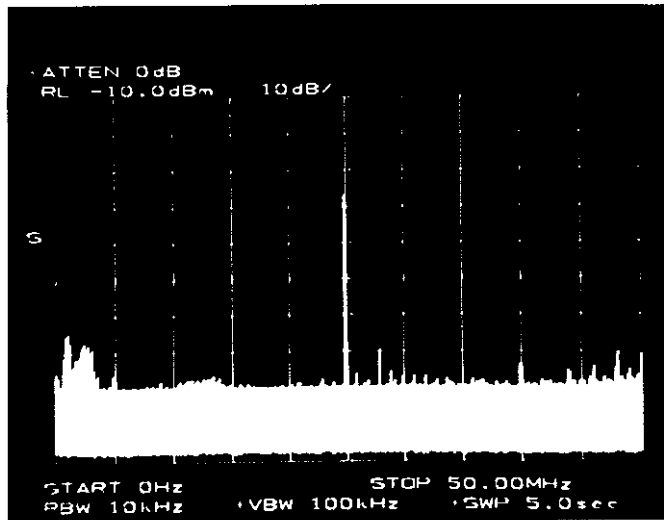
TEST #3

Frequency Band: 0~50 MHz

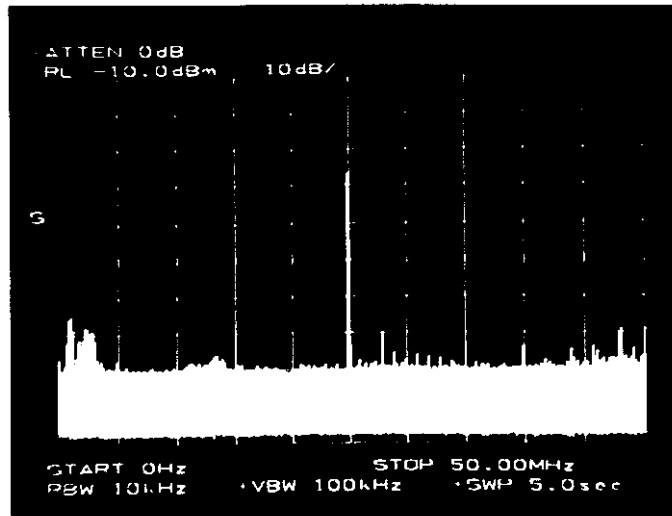
Log Ref. Level: 15.3 dBm



Medium
Short Pulse



Medium Pulse

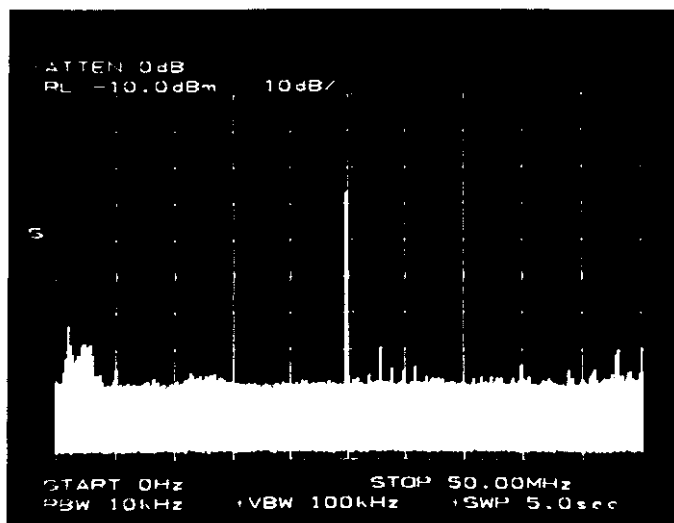


Medium
Long Pulse

TEST #3

Frequency Band: 0 ~ 50 MHz

Log Ref. Level: 15.3 dBm

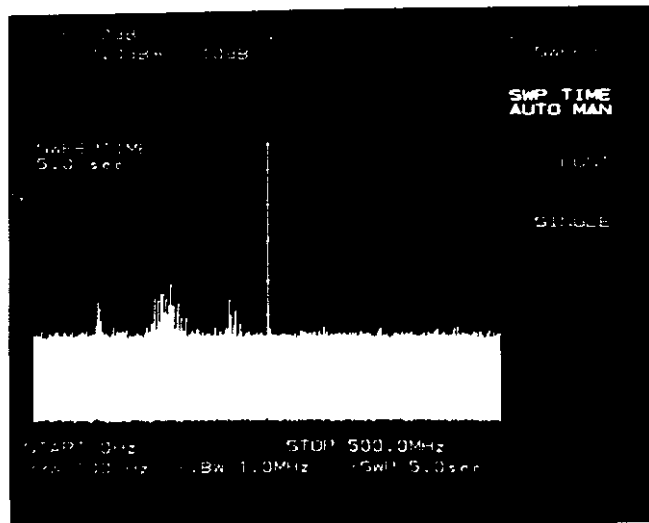
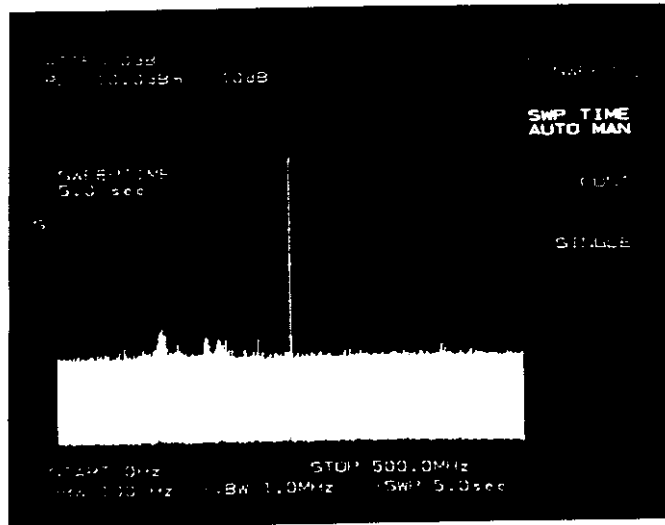
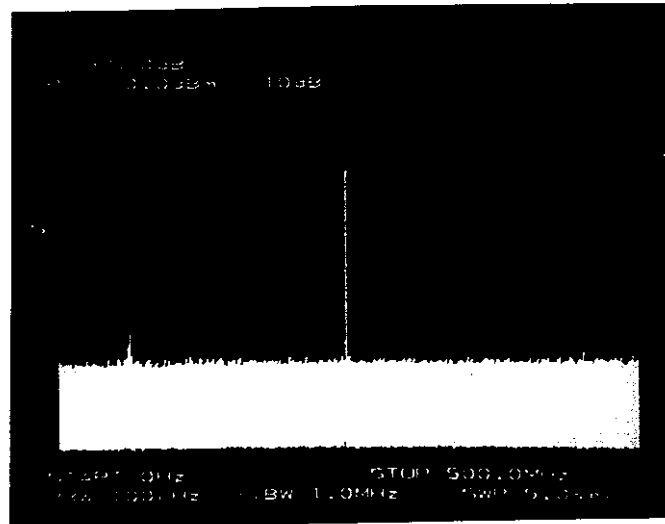


Long Pulse

TEST #4

Frequency Band: 0 ~ 500 MHz

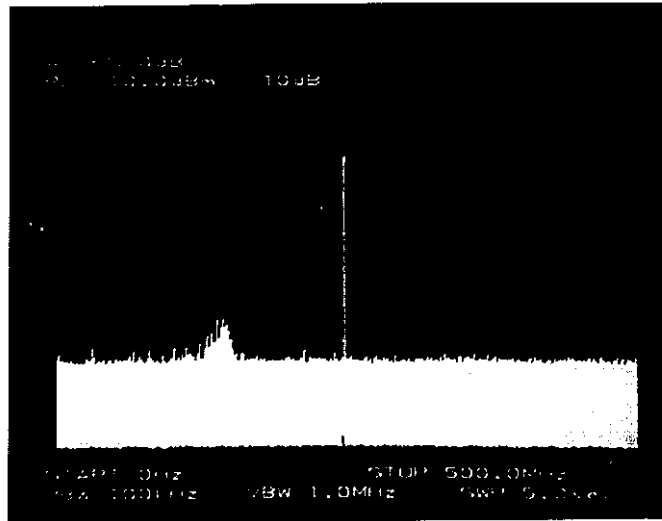
Log Ref. Level: -2.6 dBm



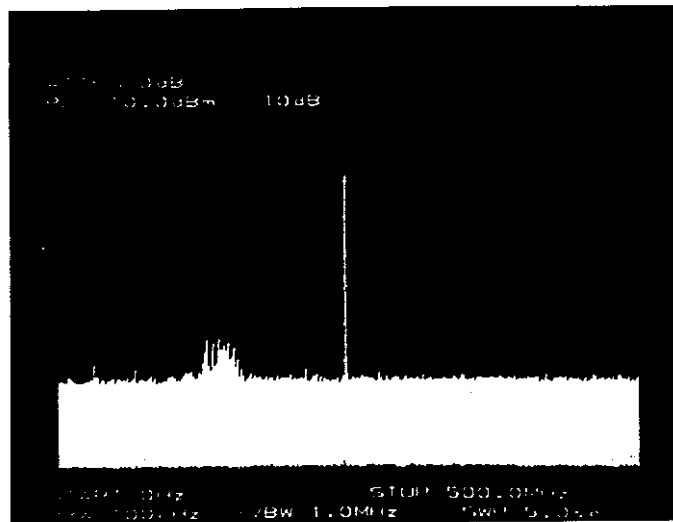
TEST #4

Frequency Band: 0~500 MHz

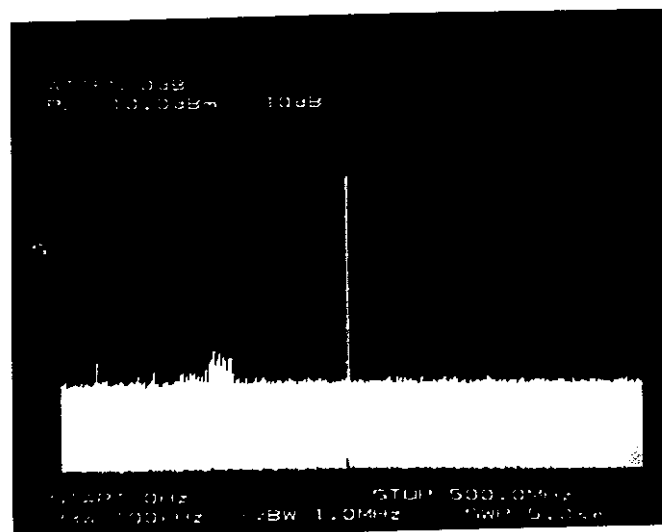
Log Ref. Level: -2.6 dBm



Medium
Short Pulse



Medium Pulse

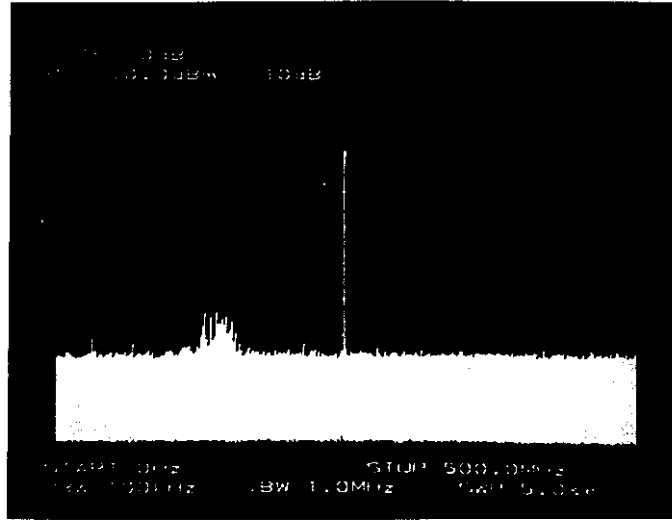


Medium
Long Pulse

TEST #4

Frequency Band: 0 ~ 500 MHz

Log Ref. Level: -2.6 dBm

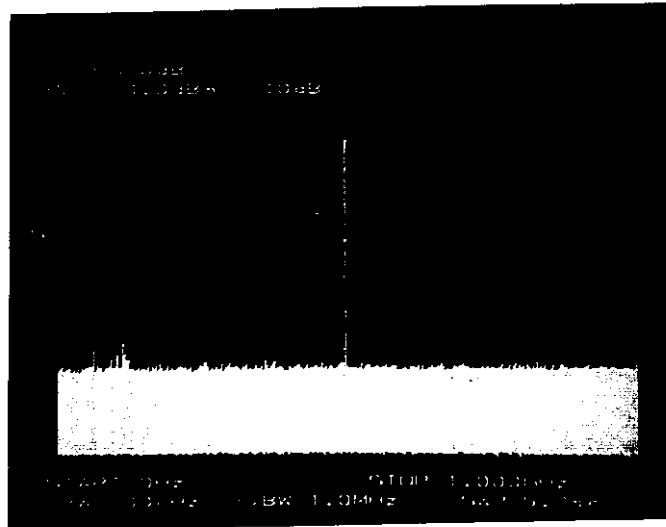


Long Pulse

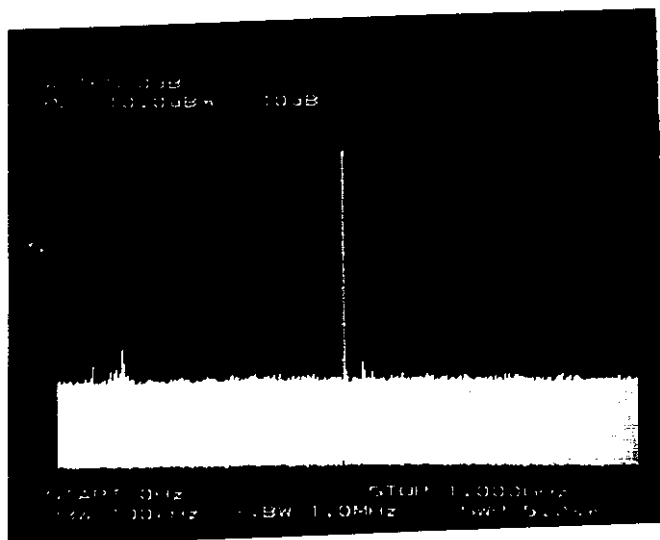
TEST #5

Frequency Band: 0~1 GHz

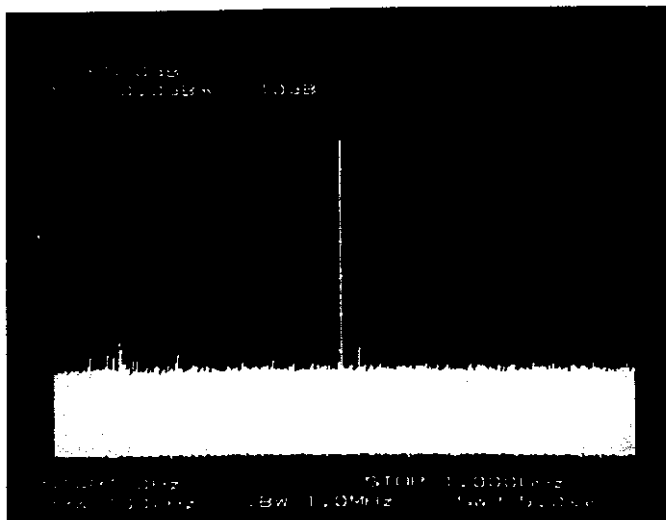
Log Ref. Level: -1.0 dBm



Ambient



Stand-By

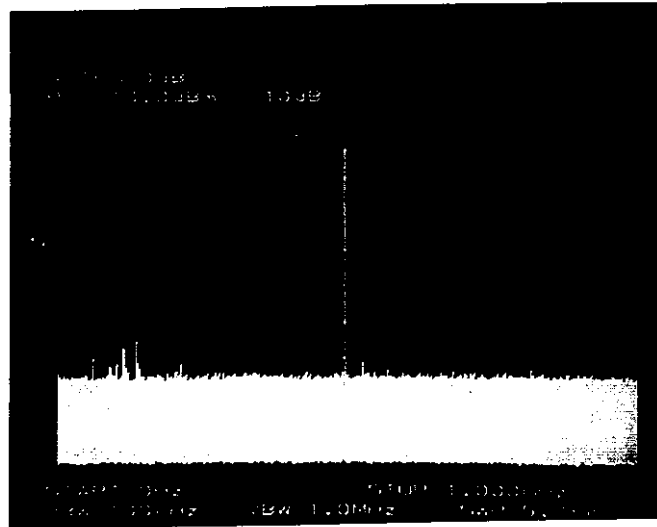


Short Pulse

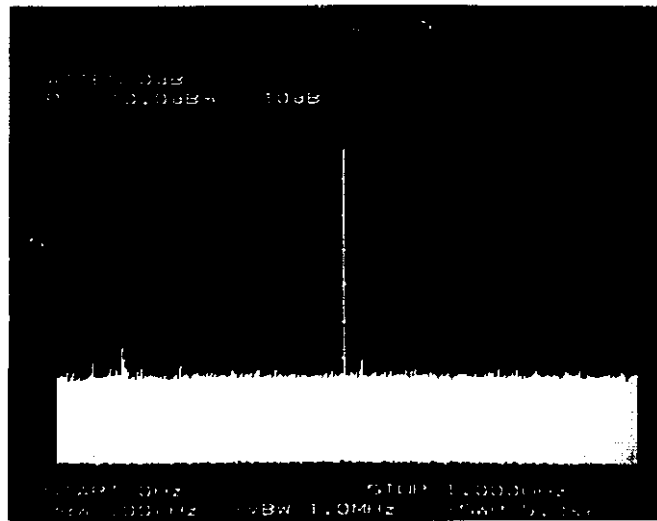
TEST #5

Frequency Band: 0~1 GHz

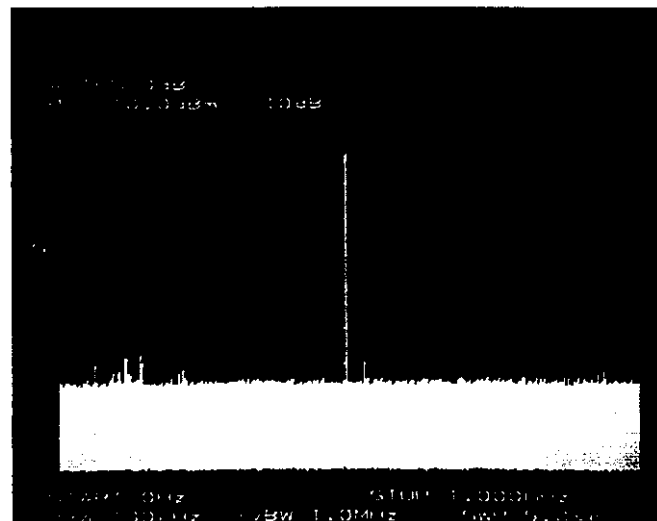
Log Ref. Level: -4.0 dBm



Medium
Short Pulse



Medium Pulse

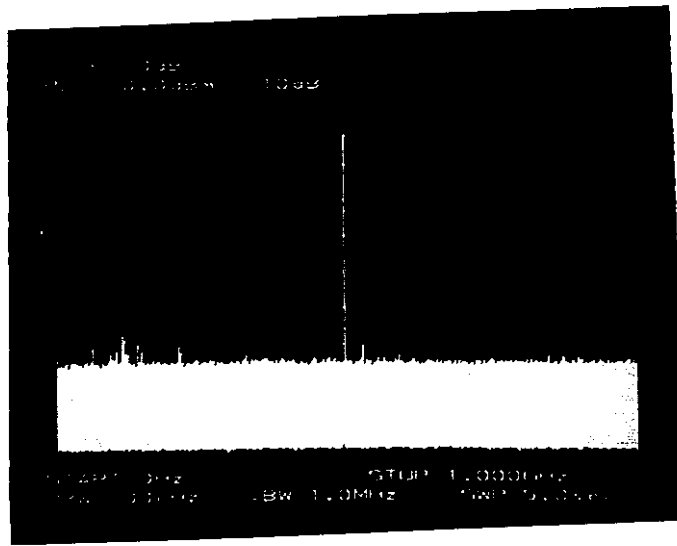


Medium
Long Pulse

TEST #5

Frequency Band: 0~1 GHz

Log Ref. Level: -4.0 dBm



Long Pulse

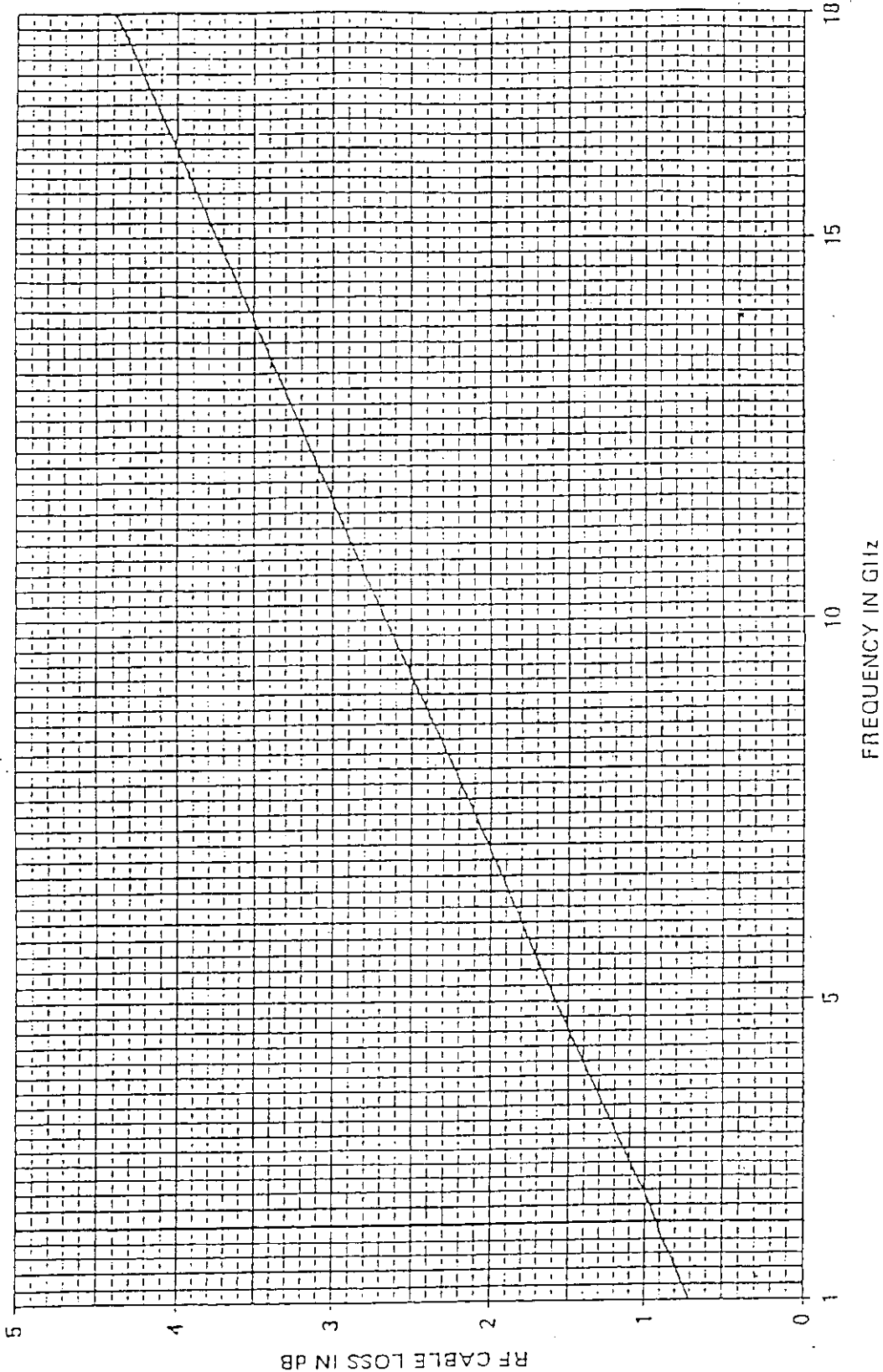


Figure 4-2. Model 94615-1 RF Cable Loss Chart

EATON

TITLE Model 94612-1 Log Periodic Antenna Instructions

DWG NO. 1-500783-344
SHEET 4 OF 6

52
14

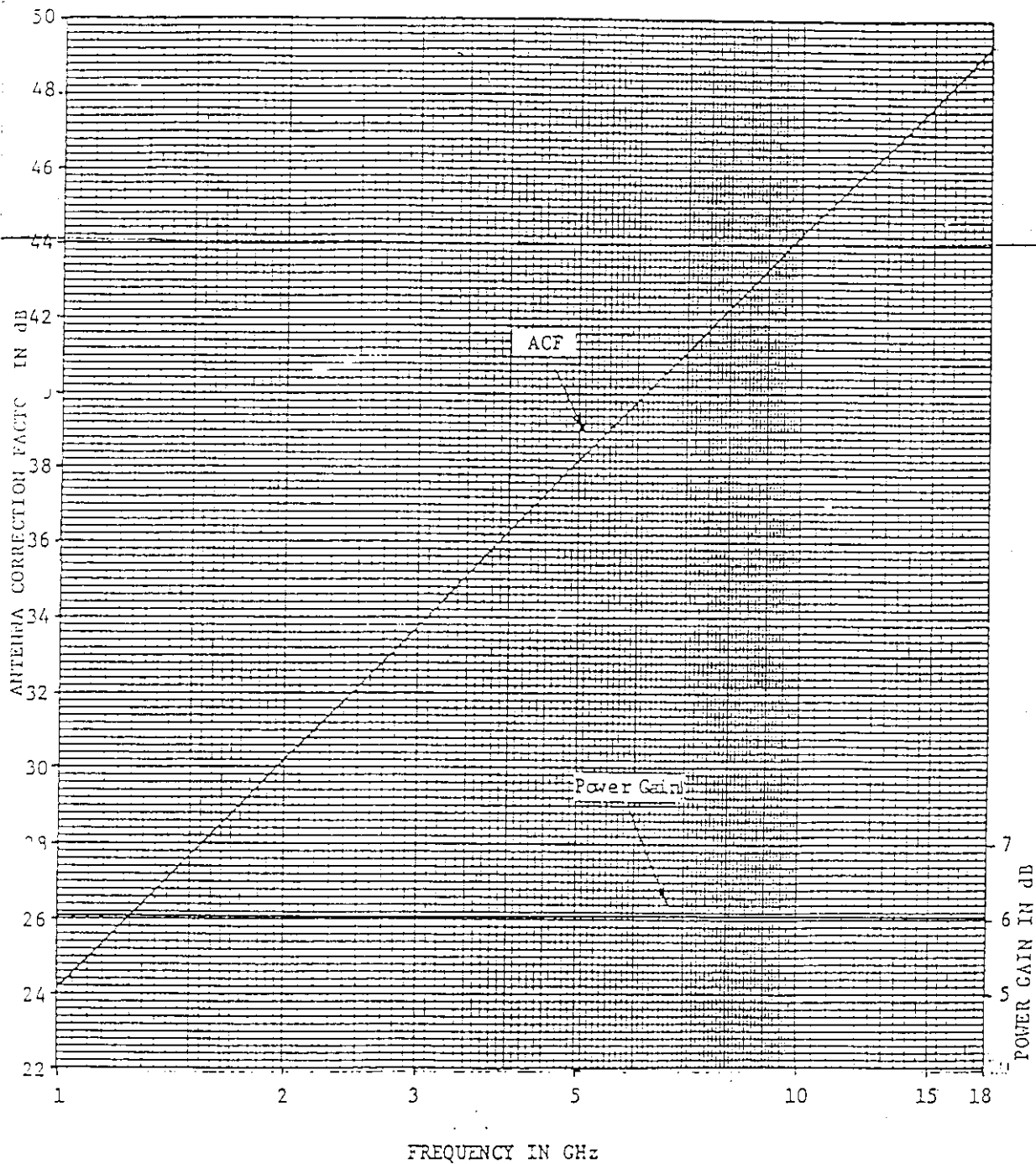


Figure 4-1. Antenna Correction Factor and Power Gain, Model 94612-1 Antenna

EATON

TITLE Model 94612-1 Log Periodic Antenna
Instructions

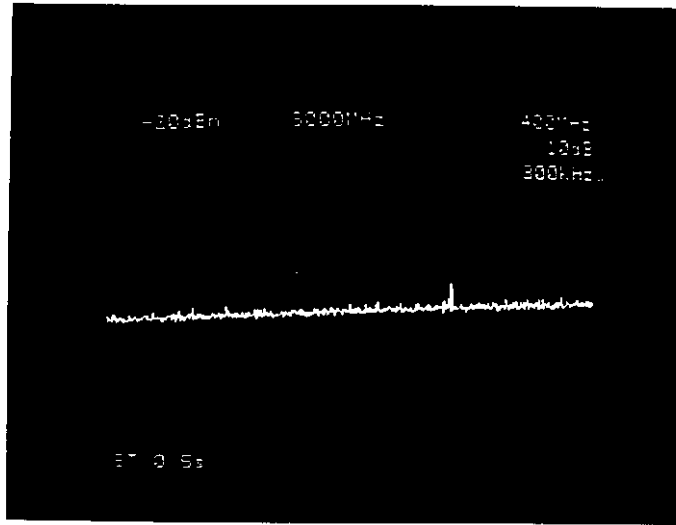
DWG NO.
1- 500783-344
SHEET 2 OF 6

TEST #6

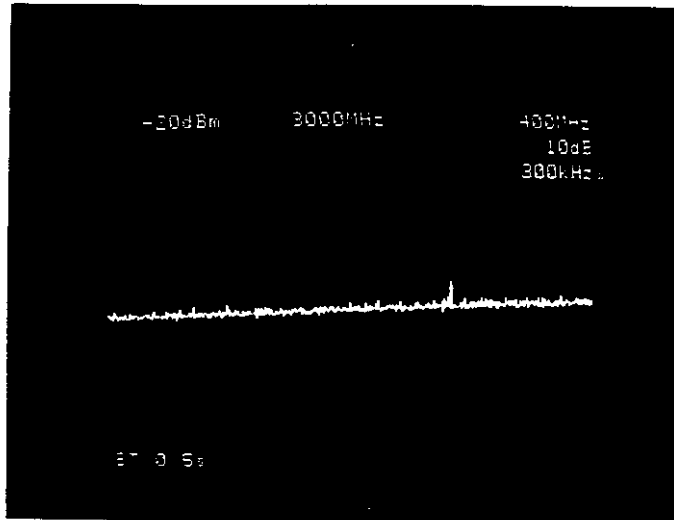
Frequency Band: 1~5GHz

Log Ref. Level: 0 dBm

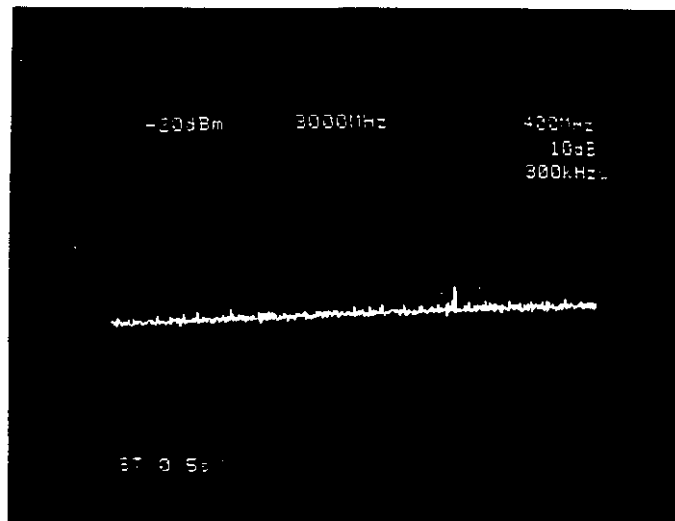
Maximum Spurious Signal Observed: (See Calibration Procedure for Test 6~13)



Ambient



Stand-By



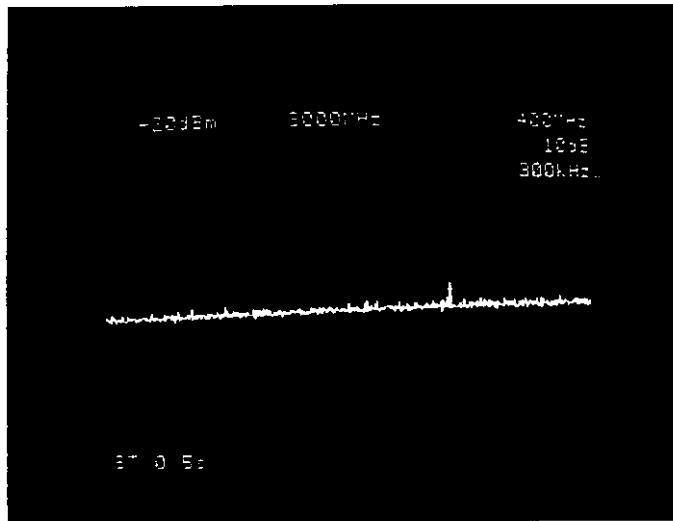
Short Pulse

TEST #6

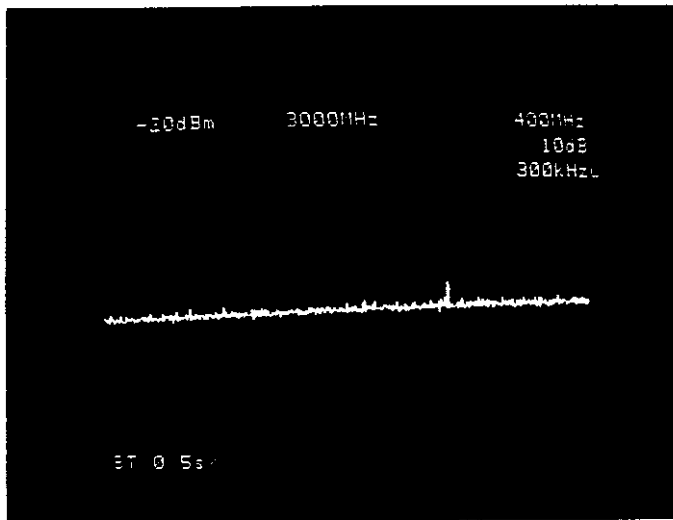
Frequency Band: 1~5 GHz

Log Ref. Level: 0 dBm

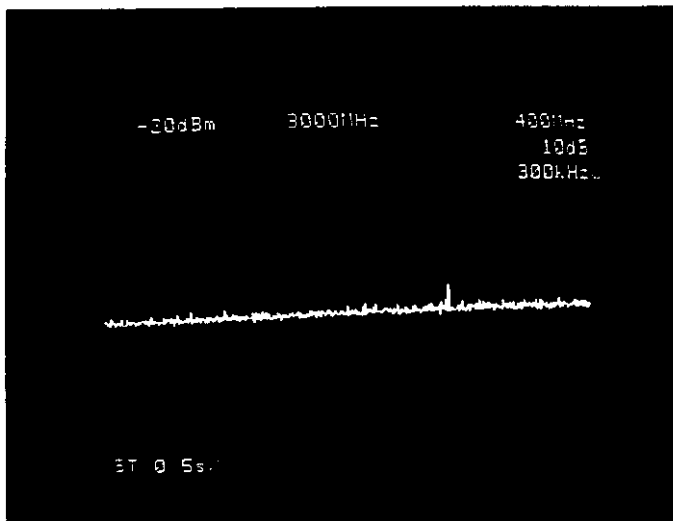
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Short-
Medium Pulse



Medium Pulse



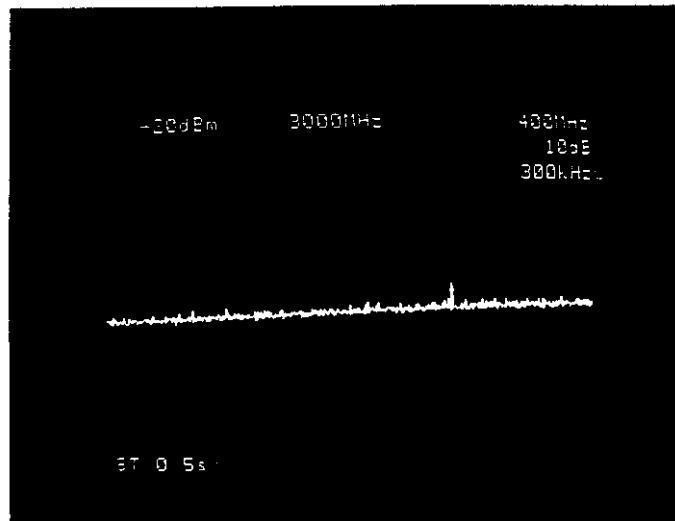
Medium-
Long Pulse

TEST #6

Frequency Band: 1~5 GHz

Log Ref. Level: 0 dBm

Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



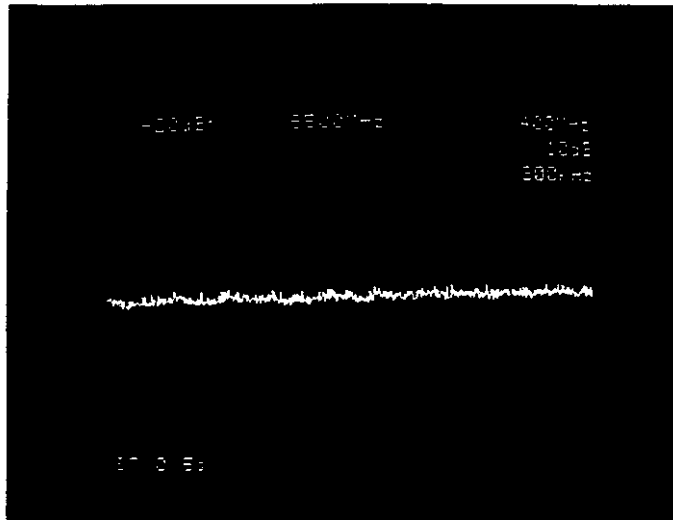
Long Pulse

TEST #7

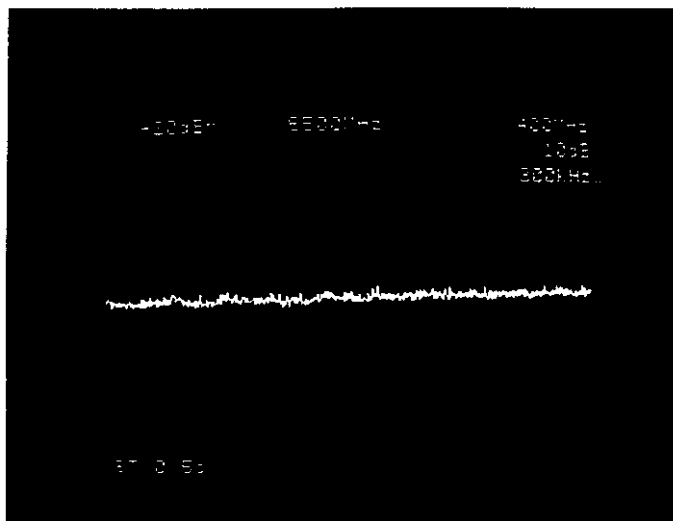
Frequency Band: 4.5~8.5 GHz

Log Ref. Level: 0 dBm

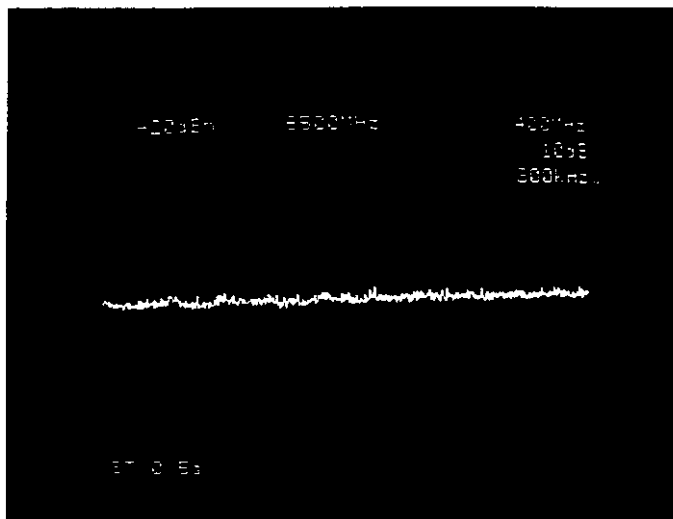
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Ambient



Stand-By



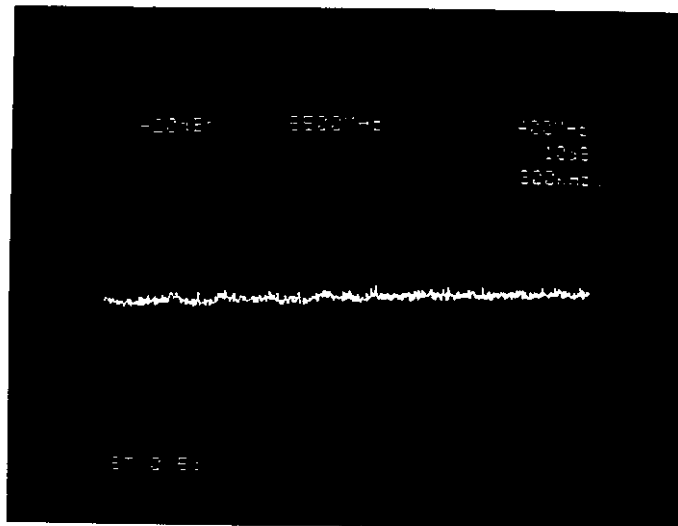
Short Pulse

TEST #7

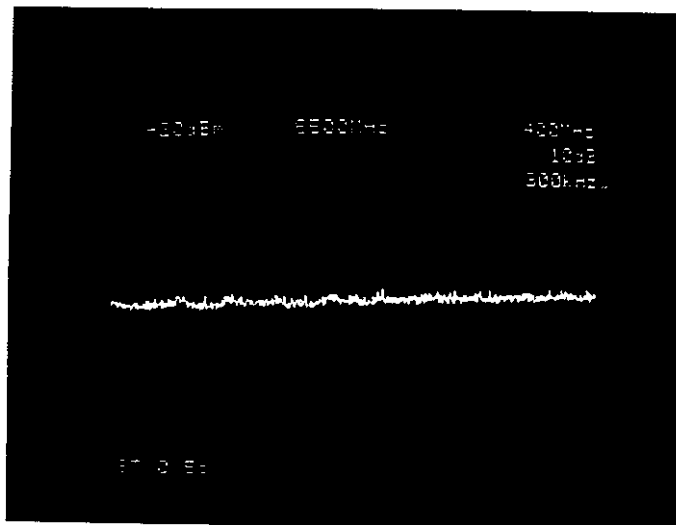
Frequency Band: 4.5~8.5 GHz

Log Ref. Level: 0 dBm

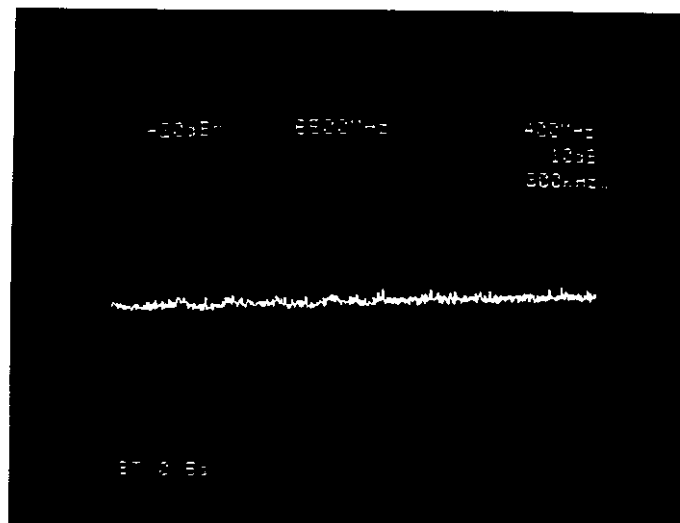
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Short-
Medium Pulse



Medium Pulse



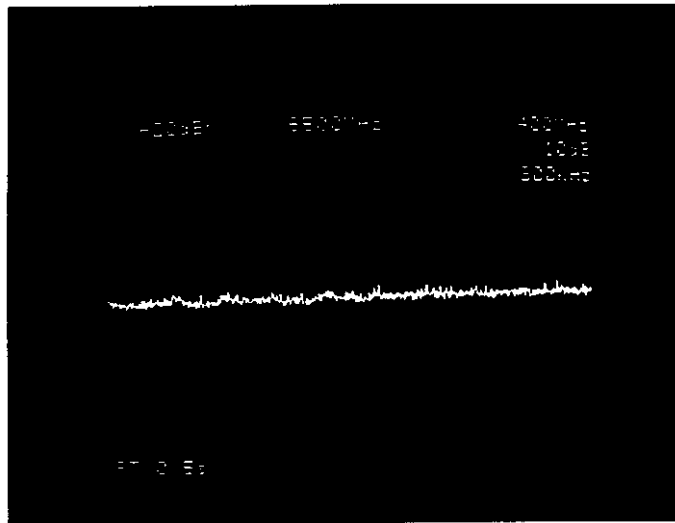
Medium-
Long Pulse

TEST #7

Frequency Band: 4.5 ~ 8.5 GHz

Log Ref. Level: 0 dB μ

Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6 ~ 13)



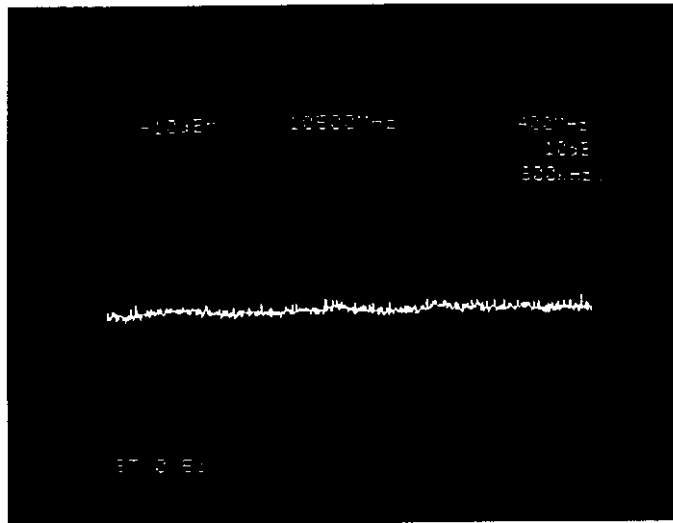
Long Pulse

TEST #8

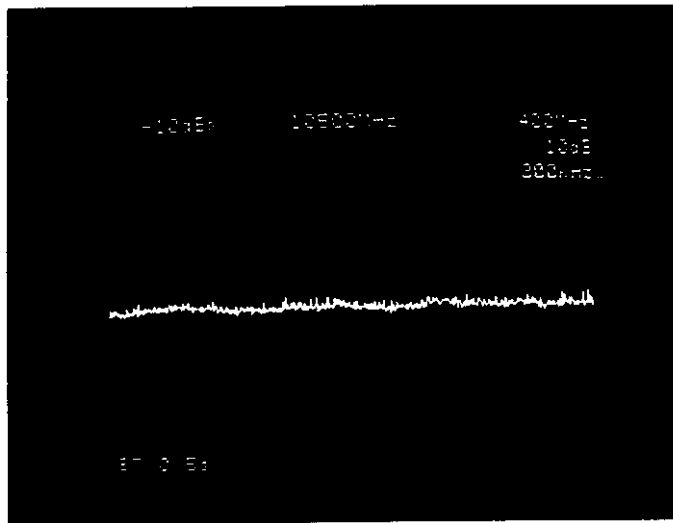
Frequency Band: 8.5~12.5 GHz

Log Ref. Level: 0 dBm

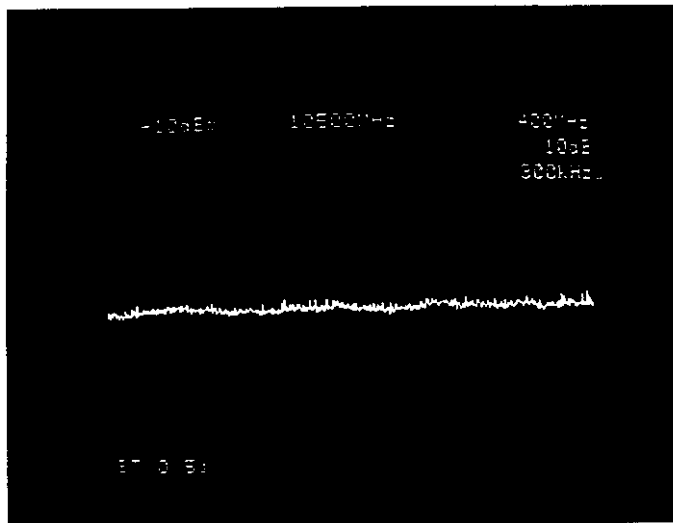
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Ambient



Stand-By



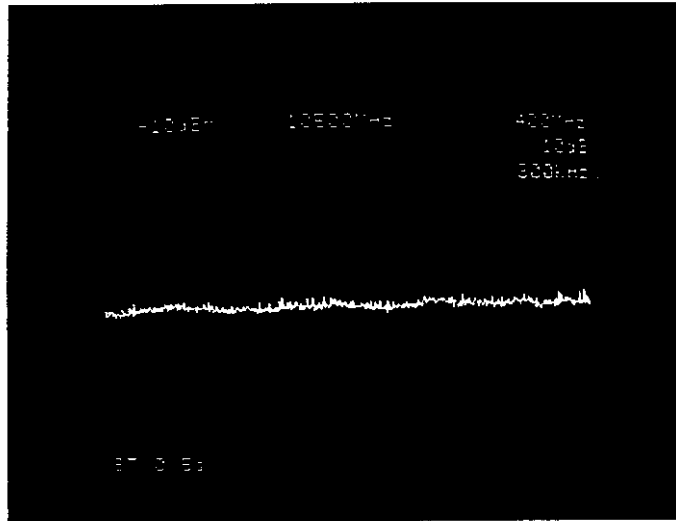
Short Pulse

TEST #8

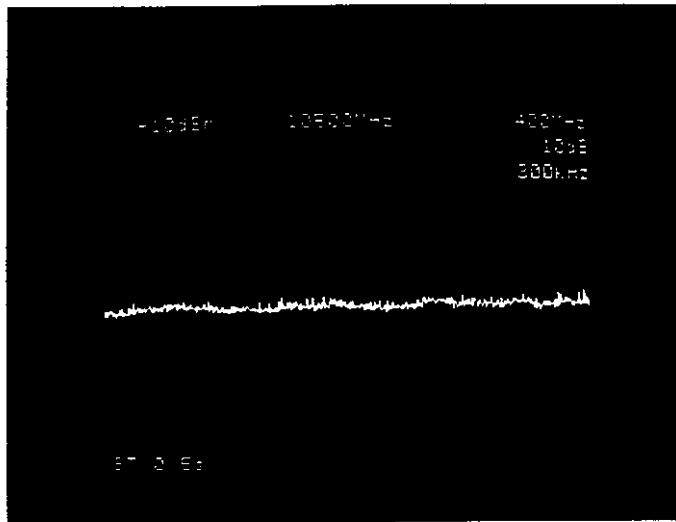
Frequency Band: 8.5~12.5 GHz

Log Ref. Level: 0 dBm

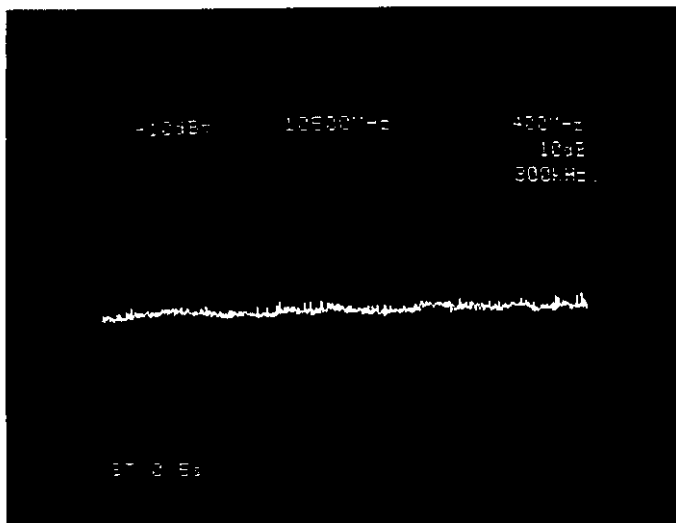
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Short-
Medium Pulse



Medium Pulse



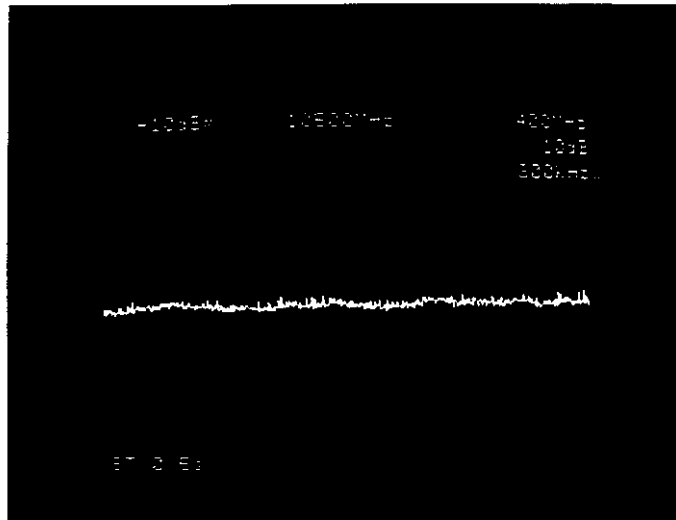
Medium-
Long Pulse

TEST #8

Frequency Band: 8.5~12.5 GHz

Log Ref. Level: 0 dBm

Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



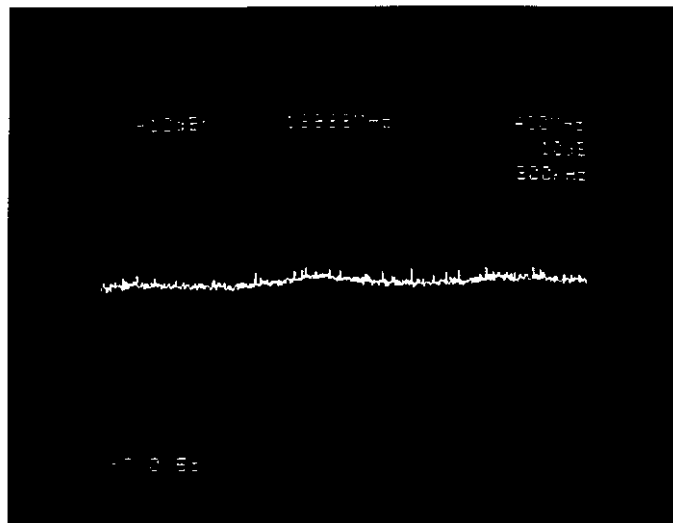
Long Pulse

TEST #9

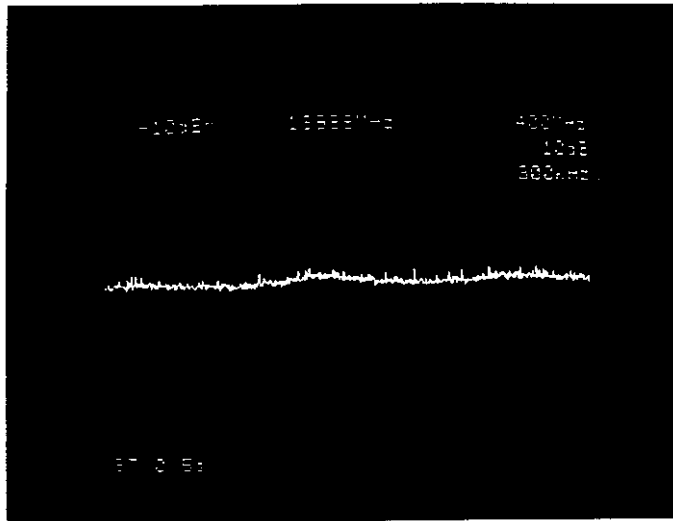
Frequency Band: 12~16 GHz

Log Ref. Level: 0 dBm

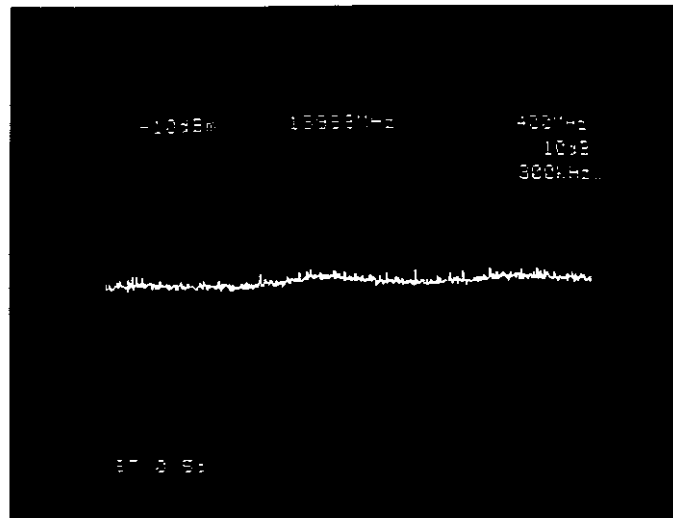
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Ambient



Stand-By



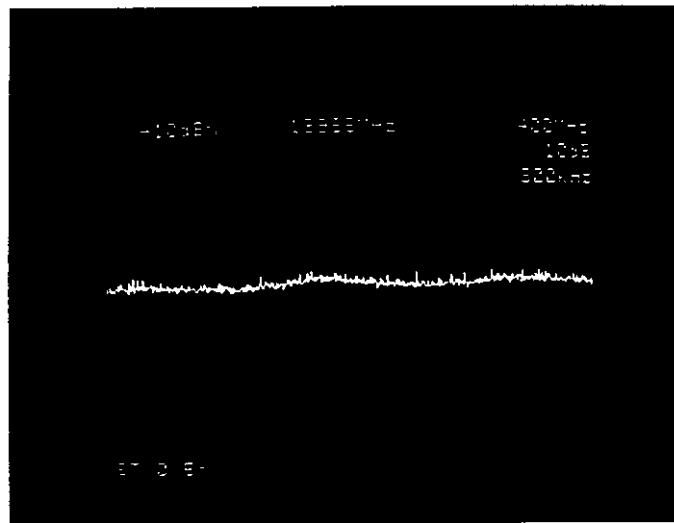
Short Pulse

TEST #9

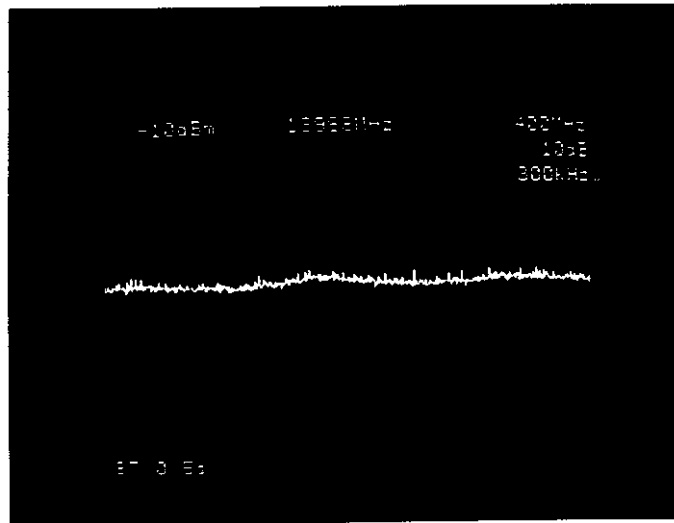
Frequency Band: 12~16 GHz

Log Ref. Level: 0 dBm

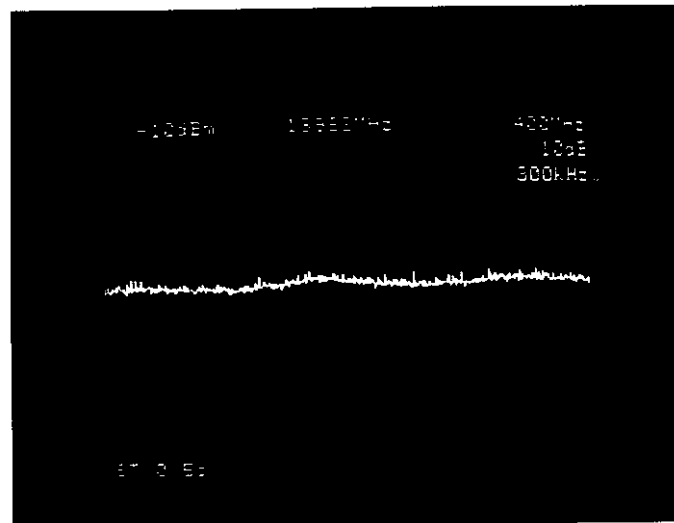
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Short-
Medium Pulse



Medium Pulse



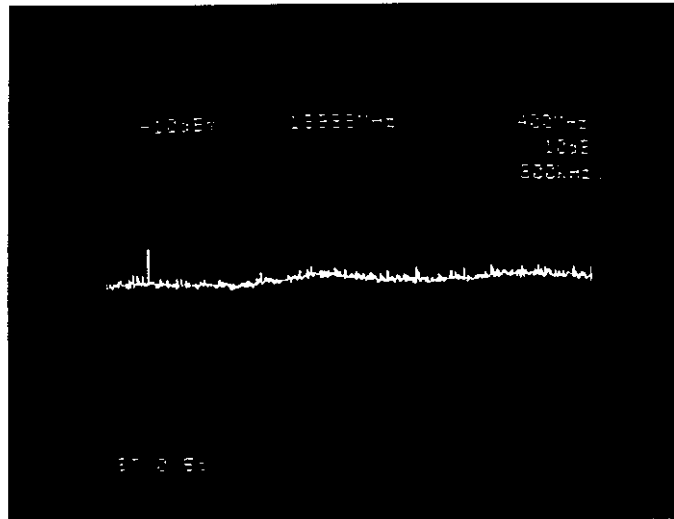
Medium-
Long Pulse

TEST #9

Frequency Band: 12~16 GHz

Log Ref. Level: 0 dBm

Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



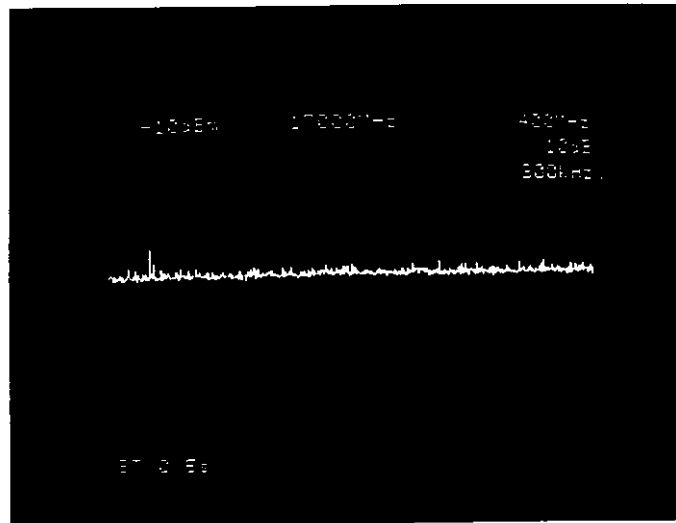
Long Pulse

TEST #10

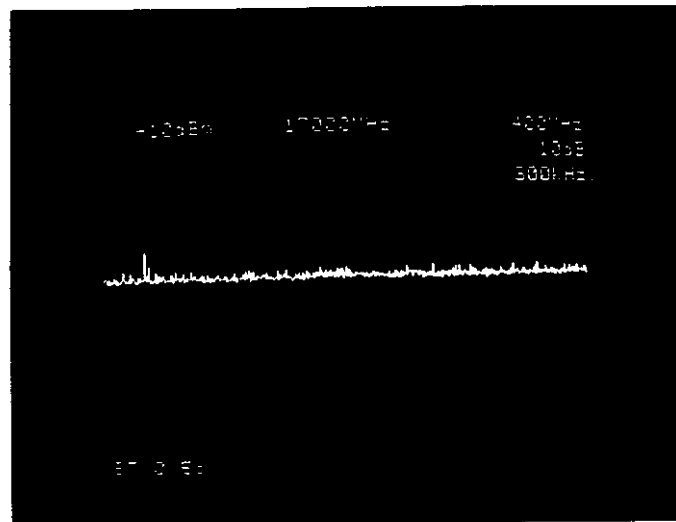
Frequency Band: 15~19 GHz

Log Ref. Level: 0 dBm

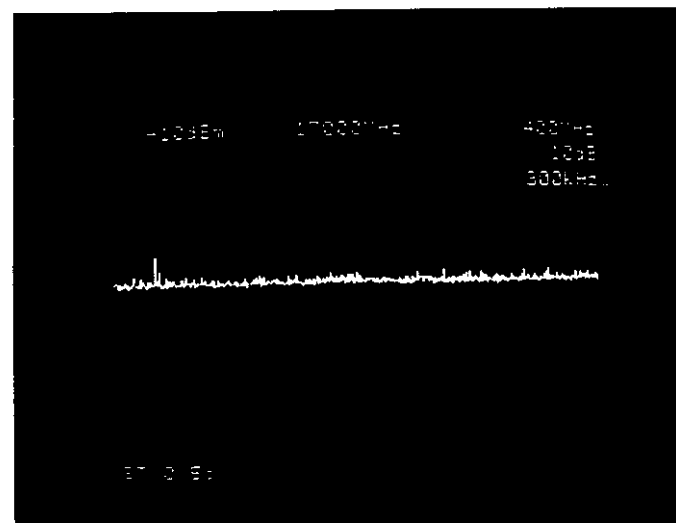
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Ambient



Stand-By



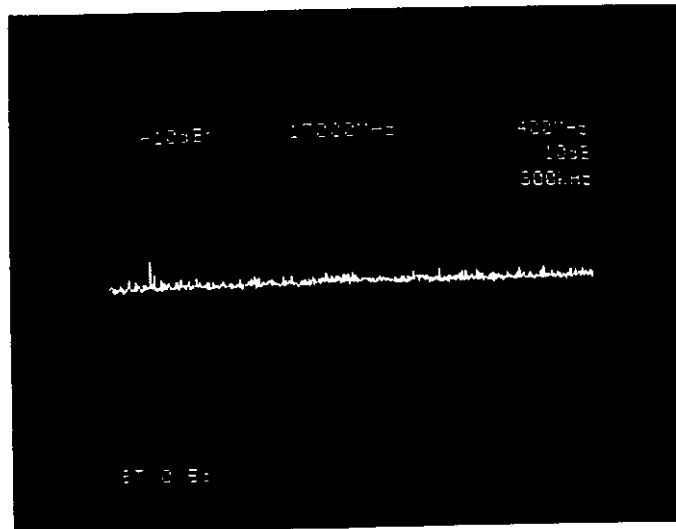
Short Pulse

TEST #10

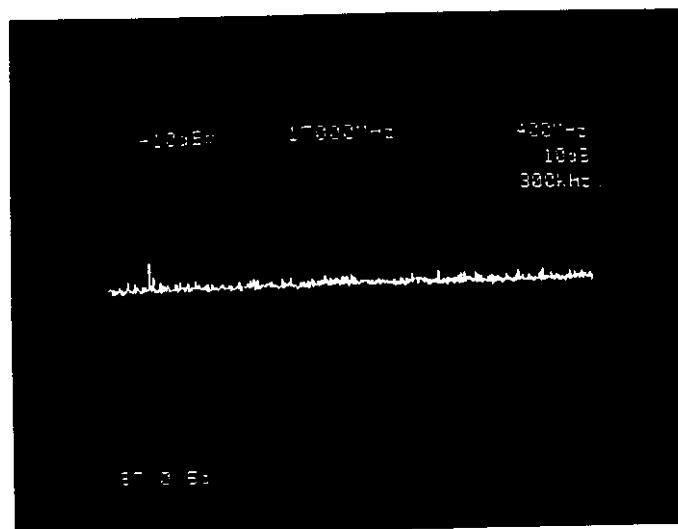
Frequency Band: 15~19 GHz

Log Ref. Level: 0 dBm

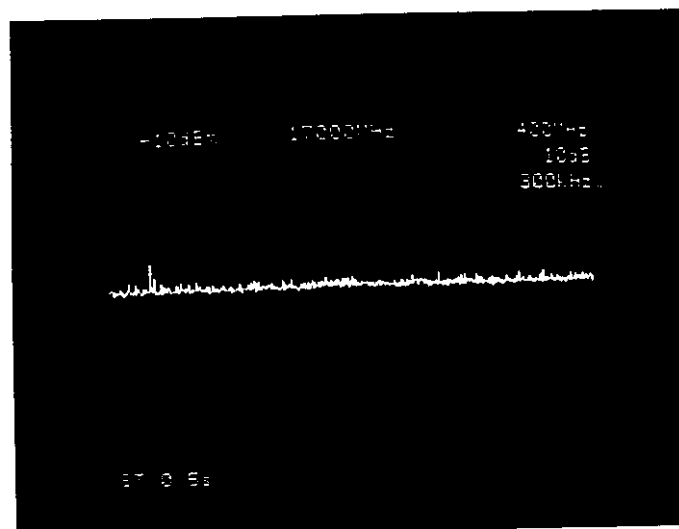
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Short-
Medium Pulse



Medium Pulse



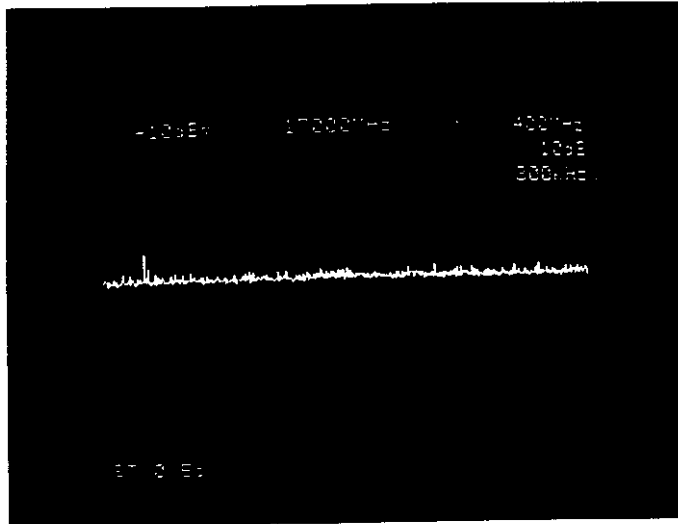
Medium-
Long Pulse

TEST #10

Frequency Band: 15~19 GHz

Log Ref. Level: 0 dBm

Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



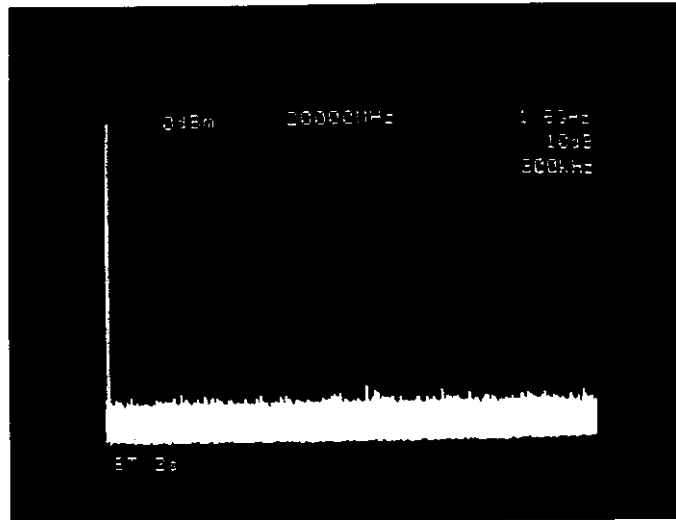
Long Pulse

TEST #11

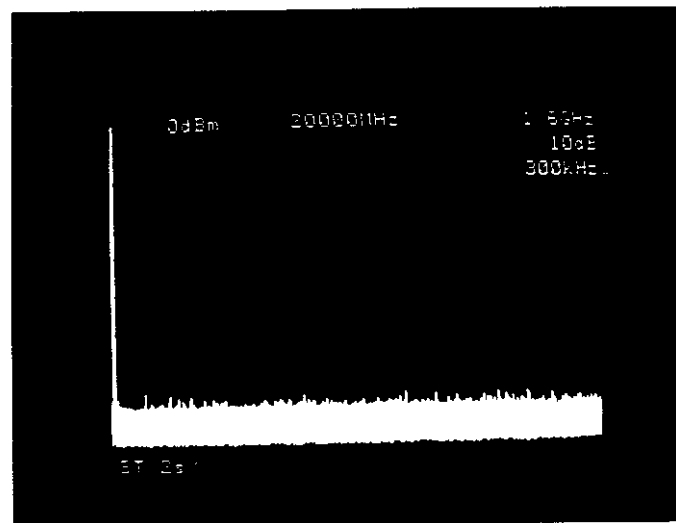
Frequency Band: 12.4~28 GHz

Log Ref. Level: 0 dBm

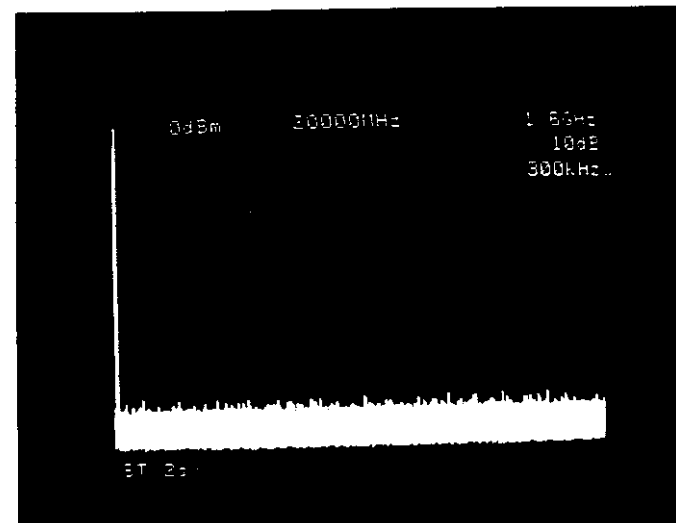
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Ambient



Stand-By



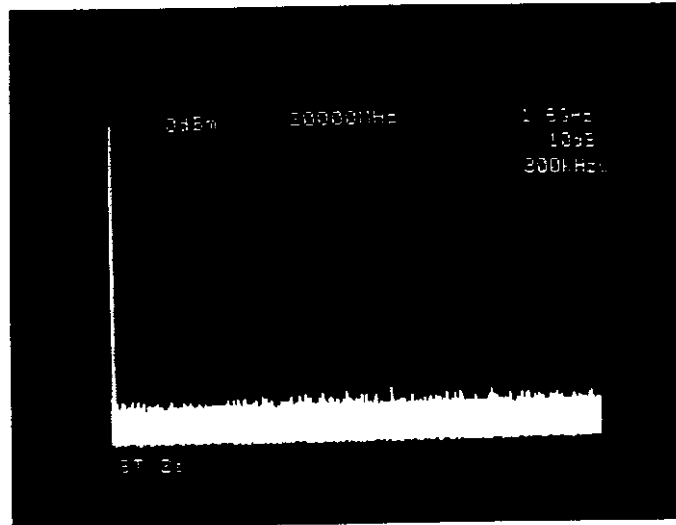
Short Pulse

TEST #11

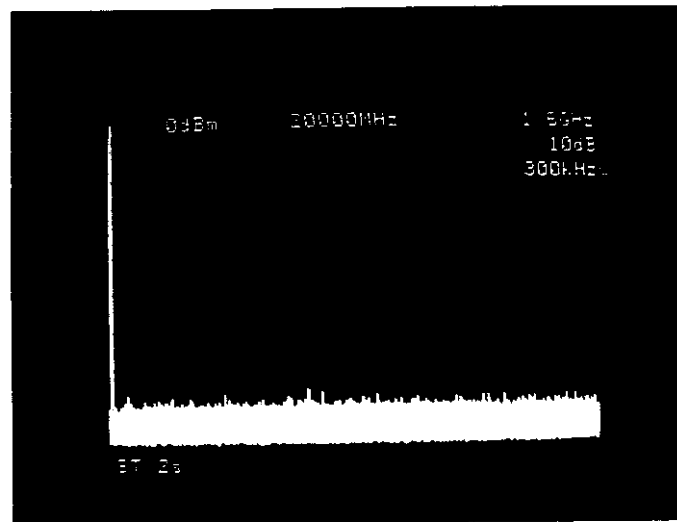
Frequency Band: 12.4~28 GHz

Log Ref. Level: 0 dBm

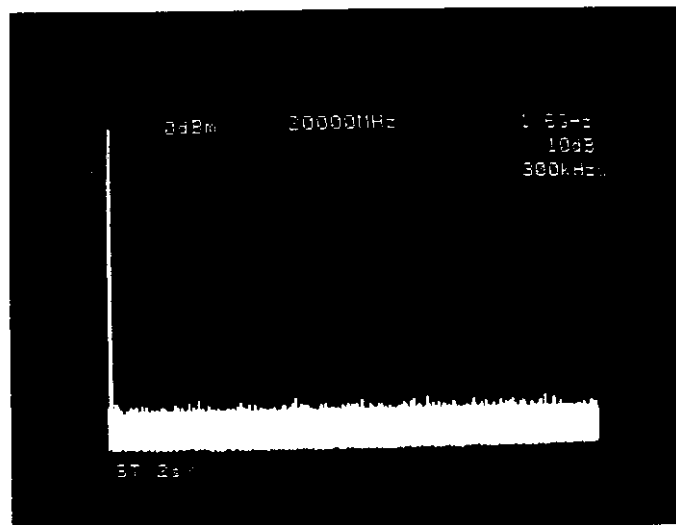
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Short-
Medium Pulse



Medium Pulse



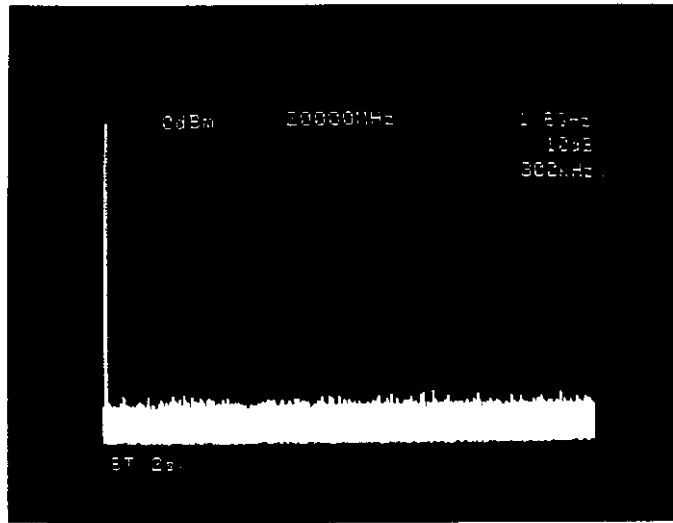
Medium-
Long Pulse

TEST #11

Frequency Band: 12.4~28 GHz

Log Ref. Level: 0 dBm

Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



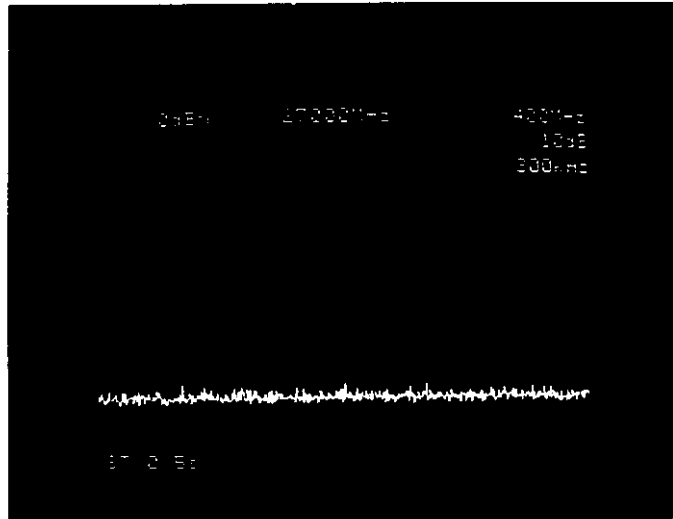
Long Pulse

TEST #12

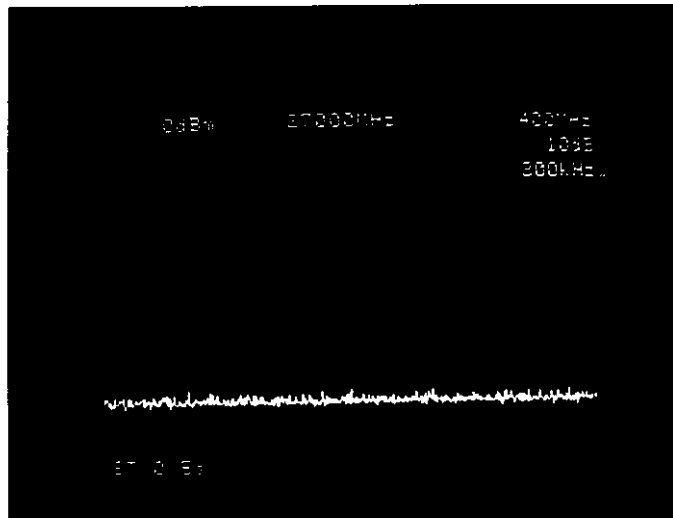
Frequency Band: 25~29 GHz

Log Ref. Level: 0 dBm

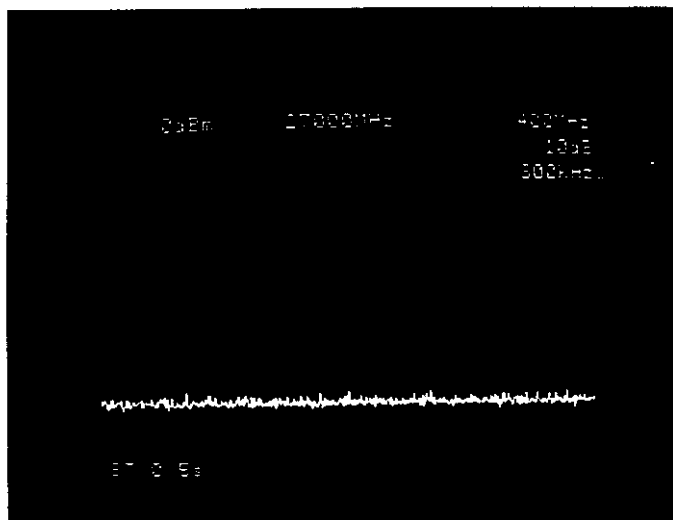
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Ambient



Stand-By



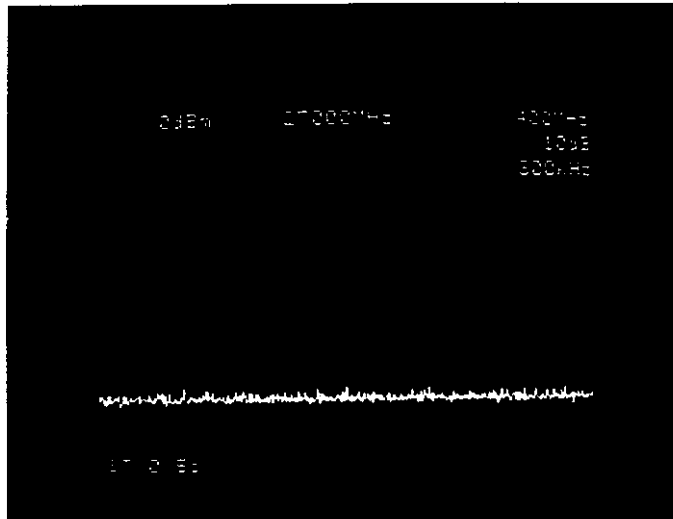
Short Pulse

TEST #12

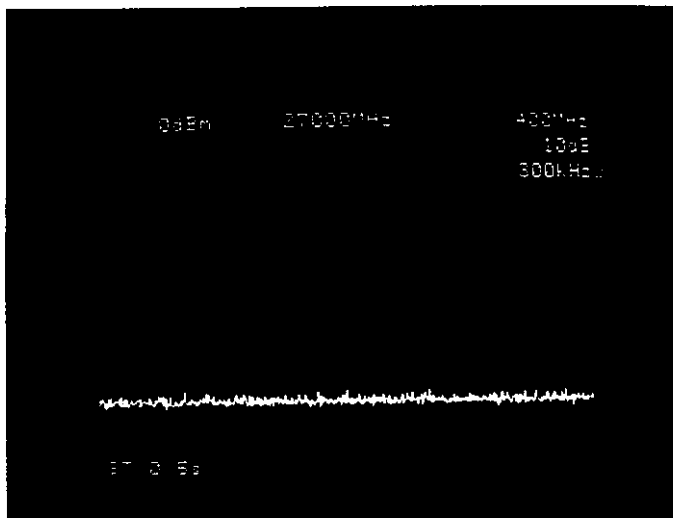
Frequency Band: 25~29 GHz

Log Ref. Level: 0 dBm

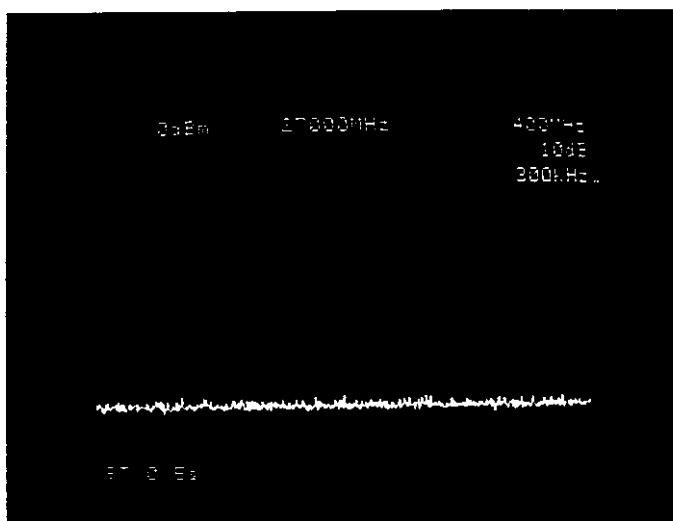
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Short-
Medium Pulse



Medium Pulse



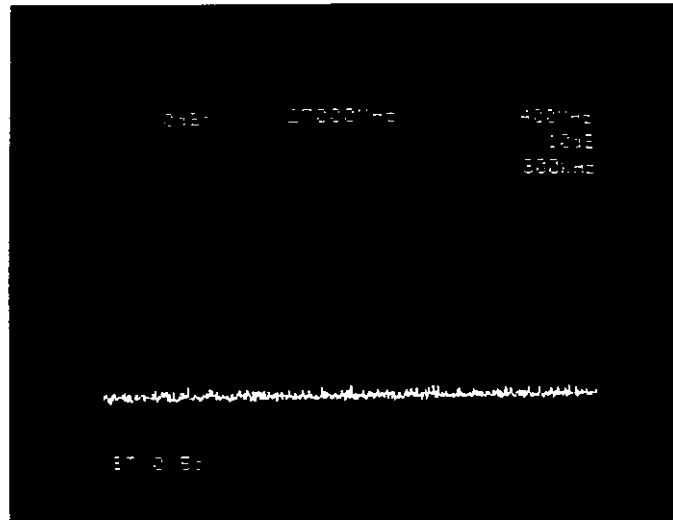
Medium-
Long Pulse

TEST #12

Frequency Band: 25~29 GHz

Log Ref. Level: 0 dBm

Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



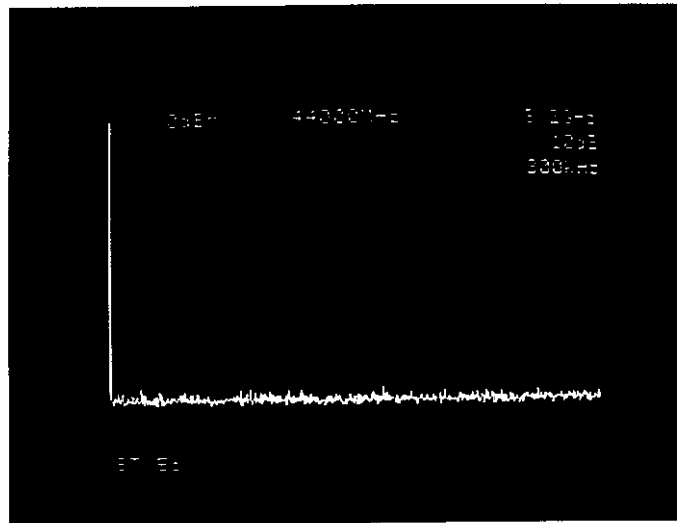
Long Pulse

TEST #13

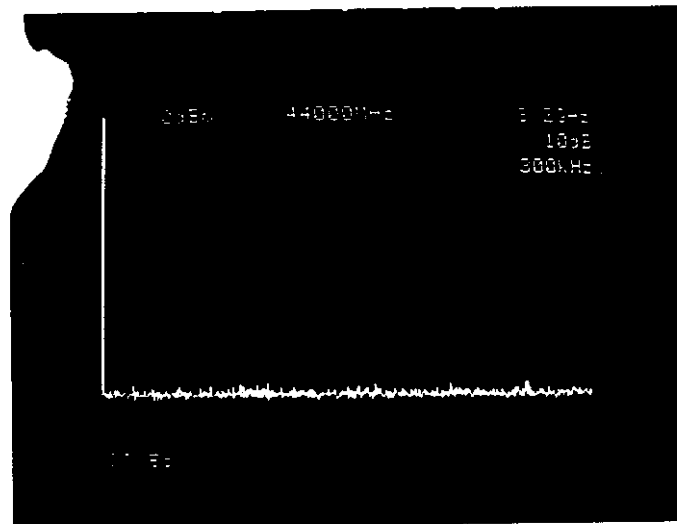
Frequency Band: 28~60 GHz

Log Ref. Level: 0 dBm

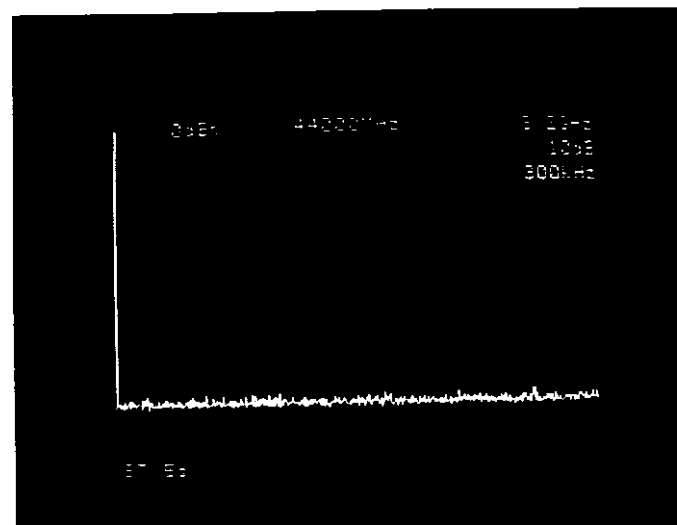
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Ambient



Stand-By



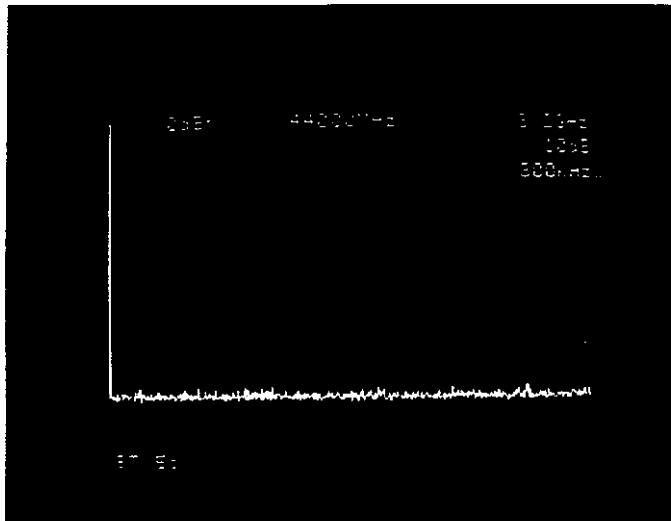
Short Pulse

TEST #13

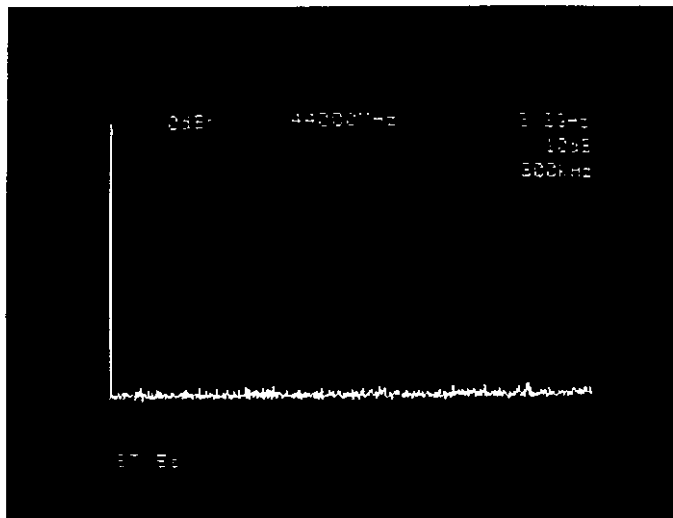
Frequency Band: 28~60 GHz

Log Ref. Level: 0 dBm

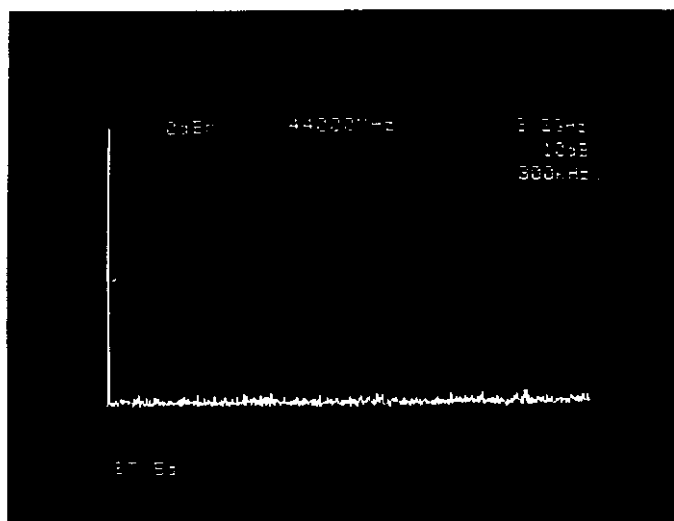
Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Short-
Medium Pulse



Medium Pulse



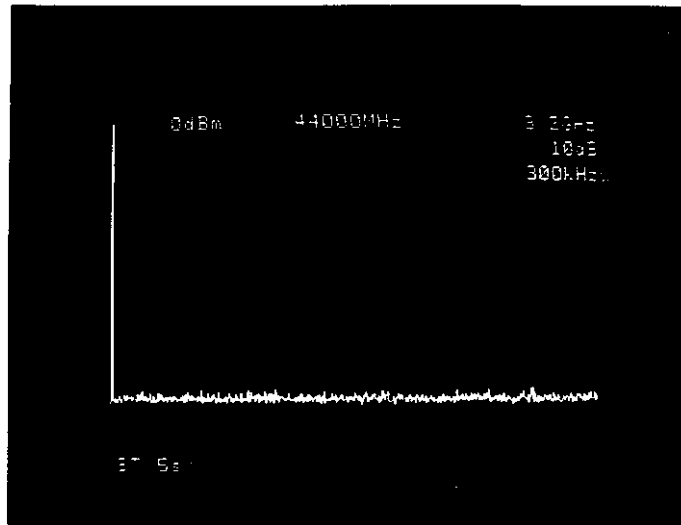
Medium-
Long Pulse

TEST #13

Frequency Band: 28~60 GHz

Log Ref. Level: 0 dBm

Maximum Spurious Signal Observed: (See Calibration Procedure
for Test 6~13)



Long Pulse

·CKEJMA3910

NAME OF TEST: RECEIVER RADIATED EMISSIONS

PARAGRAPHS:

- 15.109: RADIATION INTERFERENCE LIMITS
- 15.231(b): FIELD STRENGTH OF EMISSIONS FROM INTENTIONAL RADIATORS
- 15.33: FREQUENCY RANGE OF RADIATED MEASUREMENTS
- 80.217: SUPPRESSION OF INTERFERENCE ABOARD SHIPS

GUIDE: SEE MEASUREMENT PROCEDURE BELOW

TEST CONDITIONS: STANDARD TEMPERATURE & HUMIDITY

TEST EQUIPMENT: AS PER ATTACHED PAGE

SEARCH ANTENNAS:

- 1GHz - 18 GHz: LOGPERIODIC ANTENNA 94612-1
- 18GHz - 26.5 GHz: HORN ANTENNA 94626-1
- 26.5GHz - 40 GHz: HORN ANTENNA 94627-1

MEASUREMENT PROCEDURE

1. At first, bench tests were performed to locate the spurious emissions at the antenna terminals.
2. In the field, tests were conducted over the range shown. The test sample was set up on a wooden turntable above ground, and at a distance of three meters from the antenna connected to the Spectrum Analyzer.
3. In order to obtain the maximum response at each frequency, the turntable was rotated, and the search antennas were raised and lowered. The E.U.T. was also adjusted for maximum response. Tests conducted in Horizontal & Vertical polarization modes.
4. The field strength was calculated from:
$$E \cdot V/m @ 3 m = \frac{\text{LOG}_{10}^{-1}(\text{dBm} + 107 + \text{A.F.} + \text{C.L.})}{20}$$
5. MEASUREMENT RESULTS: ATTACHED FOR WORST CASE CONDITIONS.

·CKEJMA3910

MEASUREMENT RESULTS: RECEIVER RADIATED EMISSIONS

SPECTRUM SEARCHED = 0 to 10 x Fc
WORST CASE = V
LIMITS = 15.109(a)
RESTRICTED BAND MEASUREMENTS = 15.205
ALL OTHER EMISSIONS = \geq 20 dB BELOW LIMIT

TESTS WERE CONDUCTED WITH:

- a. All controls and switches operated.
- b. Half-wave dipole antenna or manufacturer/applicant supplied antenna.
 - a.

SAMPLE CALCULATION:

EMISSION FREQUENCY, MHz = Less than noise level
LEVEL = $\text{LOG}_{10}^{-1} \left(\frac{-64.2 + 107 + 45}{20} \right)$
LEVEL, $\mu\text{V/m}$ @ 3 m = 24547.1
LEVEL, $\mu\text{V/m}$ @ 1 N.M. = 39.7

RESULTS

RADIATED RECEIVER SPURIOUS EMISSIONS

All other emissions in the range specified by rule 15.33 (b) were that 20dB below the limits of 15.109(a).

TUNED, MHz	EMISSION, MHz	PEAK	RBW, kHz	VBW, kHz	METER, dB μ V	A. F. C. L. dB	μ V/m @3m	μ V/m @1N. M.
9400	9384	P	30.0	30.0	35.1	45	24547.1	39.7
