

EMI TESTING REPORT

EUT : TABLET

MODEL : CP-504/CP-604/MT-604N/MT-604FN

FCC ID : N3OCP-604

PREPARED FOR :

WINPAL ELECTRONICS CORP.

8FL. NO. 4, LANE 235, BAO CHIAO RD.,

HSIN TIEN, TAIPEI,

TAIWAN, R.O.C.

PREPARED BY :

SPECTRUM RESEARCH & TESTING LABORATORY INC.

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1. TEST REPORT CERTIFICATION

APPLICANT : WINPAL ELECTRONICS CORP.

ADDRESS : 8FL. NO. 4, LANE 235, BAO CHIAO RD.,
HSIN TIEN, TAIPEI,
TAIWAN, R.O.C.

EUT DESCRIPTION : TABLET

(A) POWER SUPPLY : 115/230V

(B) MODEL : CP-504/CP-604/MT-604N/MT-604FN

(C) FCC ID : N30CP-604

FINAL TEST DATE : 01/12/1999

MEASUREMENT PROCEDURE USED :

* PART 15 SUB PART B OF FCC RULES AND REGULATIONS (47 CFR PART 15)
FCC / ANSI C63.4 - 1992

We hereby show that :

The measurement shown in the attachment were made in accordance with the procedures indicated, and the energy emitted by the equipment was found to be within the limits applicable.

TESTING ENGINEER :



DATE

1.12/99.

Tom Chuang

SUPERVISOR :

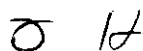


DATE

1 / 12 / 99

Jesse Ho

APPROVED BY :



DATE

1/12/99.

Johnson Ho

2. TEST STATEMENT

2.1 TEST STATEMENT

To whom it may concern,

This letter is to explain the test condition of this project.
The EUT be tested as the following status.

The data was shown in this report reflects the worst - case data for the condition as listed above.
Please disregard any other oricessir(s) speed shown in this user manual.

2.2 DEPARTURE FROM DOCUMENT POLICIES, PROCEDURE OR SPECIFICATIONS, THE STATEMENT

A. DID HAVE

Any departure from document policies & procedures or from specifications.

Yes , No ☒

If yes, the description as below.

B. The certificate and report shall not be reproduced except in full, without the written approval of SRT LABORATORY.

C. The report must not be used by the client to claim product endorsement by NVLAP or any agency the government.

3. EUT MODIFICATIONS

The following accessories were added to the EUT during testing :

- 1). THE MAIN BOARD MUST IMPROVE GROUND POINTS (CONTACT CHASSIS PLANE).
- 2). CABLE RS 232 MUST BE SHIELDED.
- 3). CHANGE THE VALUE OF R9 FROM 33 OHM TO 47 OHM SERIES A BEAD OF 300 OHM AT 100MHz.
(FBM-10-20120*9-301)
- 4). CHANGE THE VALUE OF C21,C22 FROM 30 OHM TO 10 OHM.
- 5). CHANGE THE VALUE OF R1,R20 FROM 0 OHM TO 10 OHM .
- 6). CANCEL C2, C34.
- 7). THE GROUND PLANE OF C19 CONTACT THE GROUND PLANE OF C10.
- 8). ADD A BEAD OF 300 OHM AT 100MHz (FBM-10-201209-301) BETWEEN R2,R3,R22,R23 AND THE POWER SOURCE.
- 9). ADD A CORE IN THE PEN AND MOUSE.
- 10). CHANGE THE VALUE OF BC1,BC2,BC3,BC4,BC5,BC6,BC8,BC9,BC10,BC11,BC12 TO THE BEAD OF 300 OHM AT 100MHz . (FBM-10-201209-301)
- 11). CHANGE THE VALUE OF BC7 TO THE BEAD FBM-10-201209-301.
- 12). PIN 87 AND PIN 88 OF U1 (WT 6402) SERIES THE BEAD FBM-11-160808-121 TO THE VCC.
- 13). PIN 17 OF U1 (WT 6402) SERIES THE INDUCTOR CI-321611-1ROK TO BC7.
- 14). ADD A CAP OF 0.1UF TO GROUND AT THE VCC OF D4 AND BC7.
- 15). ADD A CAP OF 180PF TO GROUND AT PIN3,4,5 OF CON1,CON2 AND AT PIN 1,2,3,5 OF CON3.
- 16). ADD A CAP OF 0.1UF TO GROUND AT PIN2 OF CON1,CON2 WILLIAM.

4. MODIFICATION LETTER

This section contains the following documents :

A. Letter of modifications

5. CONDUCTED POWER LINE TEST

5.1 TEST EQUIPMENT

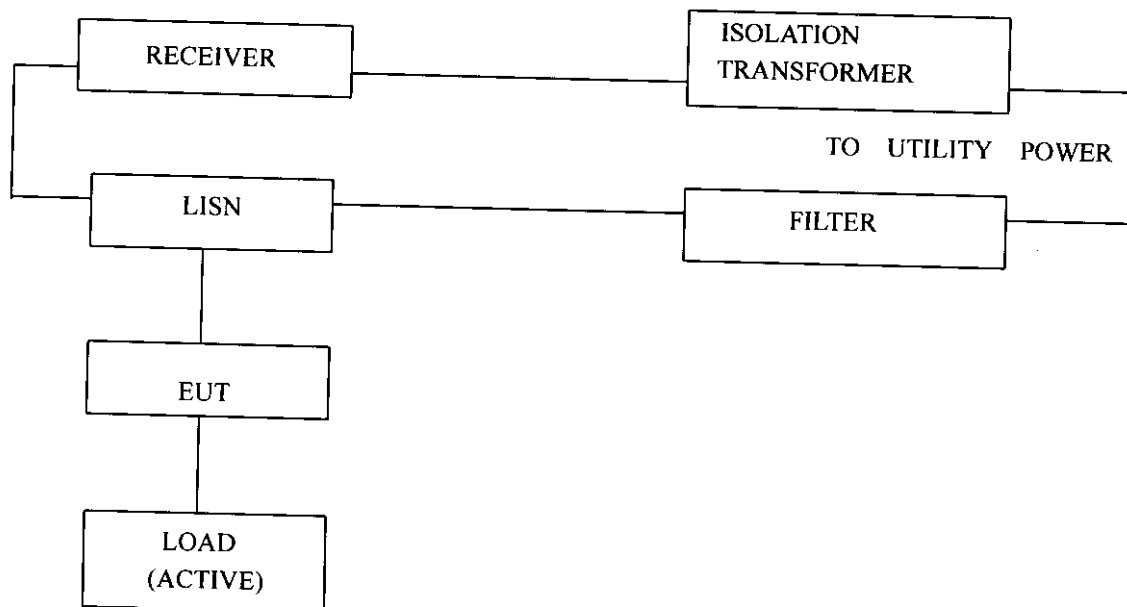
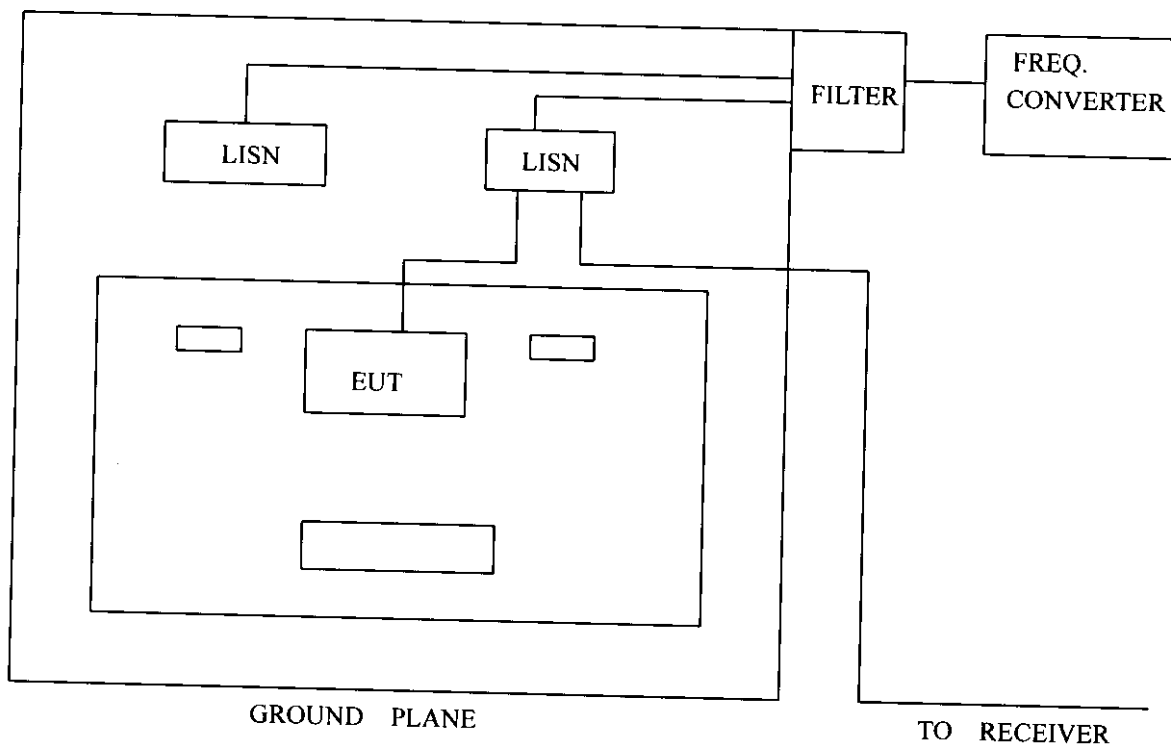
The following test equipment were used during the conducted power line test :

EQUIPMENT / FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL	DATE OF CALIBRATION	VALIDITY
SPECTRUM ANALYZER	9 KHz TO 1 GHz	HP	8590L/ 3624A01317	AUGUST, 1998 ETC	1Y
EMI TEST RECEIVER	9 KHz TO 30 MHz	ROHDE & SCHWARZ	ESHS30/ 826003/008	AUGUST, 1998 ETC	1Y
LISN	50 uH, 50 ohm	SOLAR ELECTRONICS	9252-50- R24-BNC/ 951315	AUGUST, 1998 ETC	1Y
LISN	50uH, 50 ohm	SOLAR ELECTRONICS	9252-50- R24-BNC/ 951315	AUGUST, 1998 ETC	1Y
SIGNAL GENERATOR	9 KHz TO 1080 MHz	ROHDE & SCHWARZ	SMY01/ 841104/019	APPIL, 1998 ITRI	1Y
POWER CONVERTER	0 TO 300 VAC VAC 47-500 Hz	AFC	AFC-1KW/ 850510	APPIL, 1998 SRT	1Y

5.2 TEST PROCEDURE

The EUT was tested according to ANSI C63.4 - 1992. The frequency spectrum from 0.45 MHz to 30 MHz was investigated. The LISN used was 50 ohm / 50 uHenry as specified by SECTION 5.1 of ANSI C63.4 - 1992. Cables and peripherals were moved to find the maximum emission levels for each frequency.

5.3 TEST SETUP



5.4 CONFIGURATION OF THE EUT

The EUT was configured according to ANSI C63.4 - 1992. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

TABLET	WINPAL ELECTRONICS CORP.	CP-504/CP-604/MT-604N /MT-604FN	N3OCP-604

B. INTERNAL DEVICES

C. PERIPHERALS

DEVICE	MANUFACTURER	MODEL / SERIAL	PORT / I/O	CABLE
MONITOR	PHILIPS	14B1320W	A3KM064	POWER-UNS DATA-S
PRINTER	HP	2225C	BS46XU2225C	POWER-UNS DATA-S
MODEM	TEAM	103/212A	EF56A5103/212A	POWER-UNS DATA-S
KEYBOARD	HP	SK-2502	GYUR41SK	DATA-UNS
PC	HP	D3803A	B94VECTRA500T	POWER-UNS

- REMARK :

- (1). cable - uns : unshielded
 s : shielded
- (2). cables - All 1m or greater in length – bundled according to
 ANSI C63.4 – 1992.

5.5 EUT OPERATING CONDITION

OPERATING CONDITION IS ACCORDING TO ANSI C63.4 - 1992.

1. EUT POWER ON.
2. "H" PATTERN SENT TO THE FOLLOWING PERIPHERALS :
 - MONITOR
 - PRINTER
 - MODEM

5.6 CONDUCTED POWER LINE EMISSION LIMIT

FREQUENCY RANGE (MHz)	CLASS A	CLASS B
0.45 - 1.705	1000 uV	250 uV
1.705 - 30	3000 uV	250 uV

NOTE : In the above table, the tougher limit applies at the band edges.

5.7 CONDUCTED POWER LINE TEST RESULT

The frequency spectrum from 0.45 MHz to 30 MHz was investigated. All readings are QUASI-PEAK VALUES with a resolution bandwidth of 9 KHz.

TEMPERATURE : 28 C

HUMIDITY : 78 %RH

QUASI-PEAK

FREQUENCY (MHz)	L1 (dBm)	L2 (dBm)	LIM1 (dBm)
0.46	51.28	18.62	250
0.77	15.84	*	250
2.48	*	5.956	250
8.28	11.88	10.96	250
15.7	61.65	39.35	250
23.6	131.8	120.2	250

REMARKS : (1). * = measurement does not apply for this frequency
 (2).uncertainty in conducted emission measured is <+/-2dB
 (3).any departure from specification : N/A
 (4). CP-504/CP-604

5.7 CONDUCTED POWER LINE TEST RESULT

The frequency spectrum from 0.45 MHz to 30 MHz was investigated. All readings are QUASI-PEAK VALUES with a resolution bandwidth of 9 KHz.

TEMPERATURE : 28 C

HUMIDITY : 78 %RH

QUASI-PEAK

FREQUENCY (MHz)	LINEL (dB)	LINEL (dB)	LINEL (dB)
0.46	53.70	21.62	250
1.00	3.090	*	250
4.74	10.00	7.161	250
15.7	49.54	41.68	250
29.8	*	7.413	250

REMARKS : (1). * = measurement does not apply for this frequency
 (2).uncertainty in conducted emission measured is <+/-2dB
 (3).any departure from specification : N/A
 (4). MT-604N/MT-604FN

SIGNED BY TESTING ENGINEER :



6. RADIATED EMISSION TEST

6.1 TEST EQUIPMENT

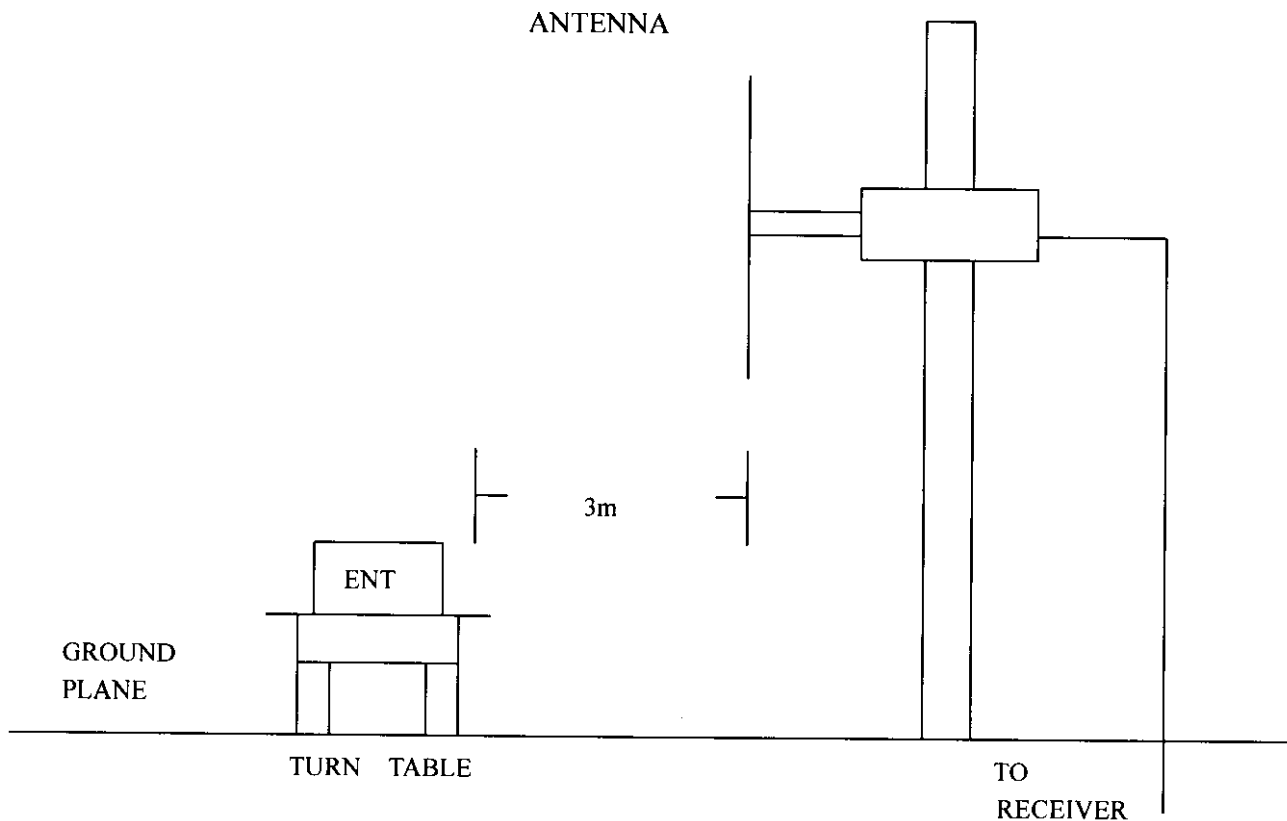
The following test equipment were used during the radiated emission test :

RECEIVER	20 MHz TO 1000 MHz	R & S	ESVS30/ 841977/03	APRIL, 1998 ITRI	1Y
SPECTRUM ANALYZER	100 Hz TO 1500 MHz	HP	8568B/ 3019A05294	OCT. , 1998 ETC	1Y
SPECTRUM ANALYZER	9 KHz TO 22 GHz	HP	8593E/ 3322A00670	APRIL, 1998 ITRI	1Y
SPECTRUM ANALYZER	100 Hz TO 1000 MHz	IFR	A-7550/ 2684/1248	JULY, 1998 ETC	1Y
SIGNAL GENERATOR	9 KHz TO 1080 MHz	ROHDE & SCHWARZ	SMY01/ 841104/019	APRIL, 1998 ITRI	1Y
DIPOLE ANTENNA	28 MHz TO 1000 MHz	EMCO	3121C/ 9003-535	SEP., 1998 SRT	1Y
DIPOLE ANTENNA	28 MHz TO 1000 MHz	EMCO	3121C/ 9611-1239	NOV., 1998 SRT	1Y
BI-LOG ANTENNA	26 MHz TO 2000 MHz	EMCO	3142/ 9608-1073	NOV., 1998 SRT	1Y
BI-LOG ANTENNA	26 MHz TO 1100 MHz	EMCO	3143/ 9509-1152	SEP., 1998 SRT	1Y
PRE-AMPLIFIER	0.1 MHz TO 1300 MHz	HP	8447D/ 2944A08402	APRIL, 1998 ITRI	1Y
PRE-AMPLIFIER	0.1 MHz TO 1300 MHz	HP	8447D/ 2944A06412	AUGUST, 1998 ETC	1Y
HORN ANTENNA	1 GHz TO 18 GHz	EMCO	3115/ 9612-3619	JAN, 1999 EMCO	1Y

6.2 TEST PROCEDURE

- (1).The EUT was tested according to ANSI C63.4 - 1992. The radiated test was performed at SRT LAB'S OPEN SITE. this site is on file with the FCC laboratory division, reference 31040/SRT.
- (2).The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table height 0.8 m. All set up is according to ANSI C63.4-1992.
- (3).The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are QUASI-PEAK values with a resolution bandwidth of 120 KHz. All readings are above 1 GHz, PEAK values with a resolution bandwidth of 1 MHz. Measurements were made at 3 METERS.
- (4).The antenna height were varied from 1 m to 4 m height to find the maximum emission for each frequency.
- (5).The antenna polarization : vertical polarization and horizontal polarization.

6.3 RADIATED TEST SET-UP

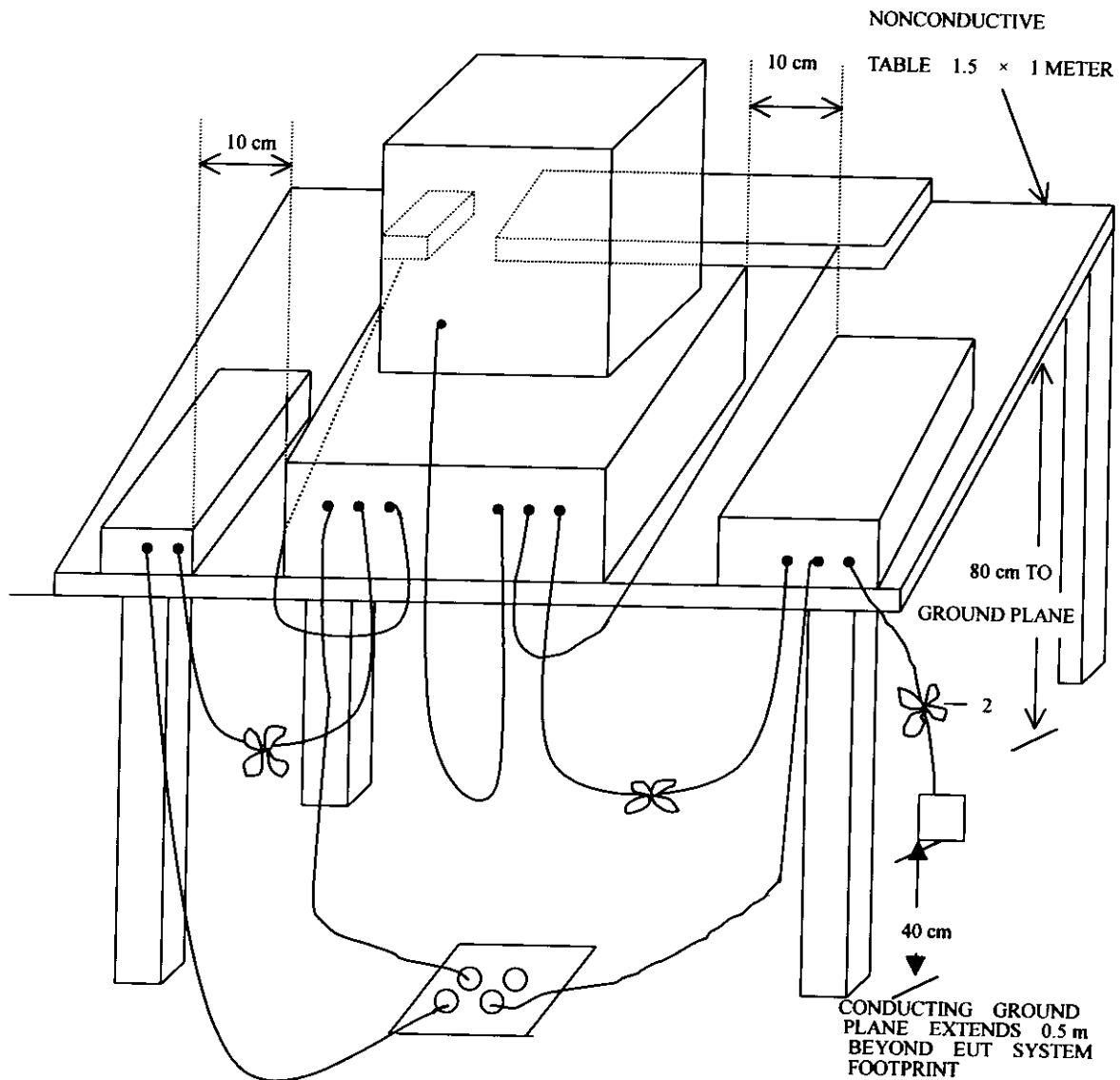


6.3 RADIATED TEST SET-UP

ANSI

ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE RANGE IN THE RANGE OF 9 KHz TO 40 GHz

C63.4-1992



6.4 CONFIGURATION OF THE THE EUT

Same as section 4.4 of this report

6.5 EUT OPERATING CONDITION

Same as section 4.5 of this report.

6.6 RADIATED EMISSION LIMIT

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below :

CLASS B

Frequency Range (MHz)	Shielding Factor (dB)	Field Strength Limit (dBμV/m)
30 - 88	3	100
88 - 216	3	150
216 - 960	3	200
ABOVE 960	3	500

CLASS B (OPEN CASE)

Frequency Range (MHz)	Shielding Factor (dB)	Field Strength Limit (dBμV/m)
30 - 88	3	199.5
88 - 216	3	298.5
216 - 960	3	398.1
ABOVE 960	3	

CLASS A

Frequency Range (MHz)	Shielding Factor (dB)	Field Strength Limit (dBμV/m)
30 - 88	3	316.3
88 - 216	3	473.2
216 - 960	3	613.0
ABOVE 960	3	1000.0

1. In the emission tables above, the tougher limit applies at the band edges.
2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.

6.7 RADIATED EMISSION TEST RESULT

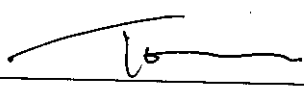
The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are QUASI-PEAK VALUES with a resolution bandwidth of 120 KHz. Measurements were made at 3 meters. The measurements above 1 GHz with a resolution bandwidth of 1 MHz are PEAK READING at a distance of 3 meters.

TEMPERATURE : 28 C

HUMIDITY : 78 %RH

171.5	0.8	7.90	10.59	*	28.84	*	150
198.9	1.2	12.2	13.33	14.09	62.37	69.18	150
215.3	1.2	12.2	*	4.216	*	19.72	150
464.3	1.8	17.4	*	6.025	*	54.95	200
731.9	2.4	21.6	5.688	4.265	90.15	67.60	200

- (1). *=measurement does not apply for this frequency.
 (2). the maximum condition was with the monitor power cord connected to the personal computer.
 (3). sample calculation
 $20 \text{ LOG(EMISSION) } U_v/m = \text{CABLE LOSS(dB)} + \text{FACTOR(dB)} + \text{READING (dBuV/m)}$
 (4). uncertainty in radiated emission measured is $< \pm 4\text{dB}$
 (5). any departure from specification : N/A
 (6). CP-504/CP-604

SIGNED BY TESTING ENGINEER : 

6.7 RADIATED EMISSION TEST RESULT

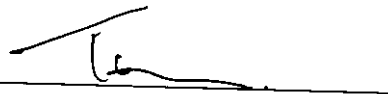
The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are QUASI-PEAK VALUES with a resolution bandwidth of 120 KHz. Measurements were made at 3 meters. The measurements above 1 GHz with a resolution bandwidth of 1 MHz are PEAK READING at a distance of 3 meters.

TEMPERATURE : 28 CHUMIDITY : 78 %RH

69.99	0.8	7.90	8.912	*	24.26	*	100
197.7	1.2	12.2	7.943	14.96	37.15	69.98	150
215.3	1.2	12.2	*	4.216	*	19.72	150
531.6	1.7	15.5	*	8.035	*	58.21	200
731.9	2.4	21.6	6.095	5.128	96.60	81.28	200

- REMARKS :
- (1). *=measurement does not apply for this frequency.
 - (2). the maximum condition was with the monitor power cord connected to the personal computer.
 - (3). sample calculation
 $20 \text{ LOG(EMISSION)Uv/m} = \text{CABLE LOSS(dB)} + \text{FACTOR(dB)} + \text{READING (dBuV/m)}$
 - (4). uncertainty in radiated emission measured is $< \pm 4\text{dB}$
 - (5). any departure from specification : N/A
 - (6). MT-604N/MT-604FN/MOUSE

SIGNED BY TESTING ENGINEER :



- **BARDWITH**

10: 31: 48 NOV 28, 1998

REF 107.0 dBμV #AT 10 dB

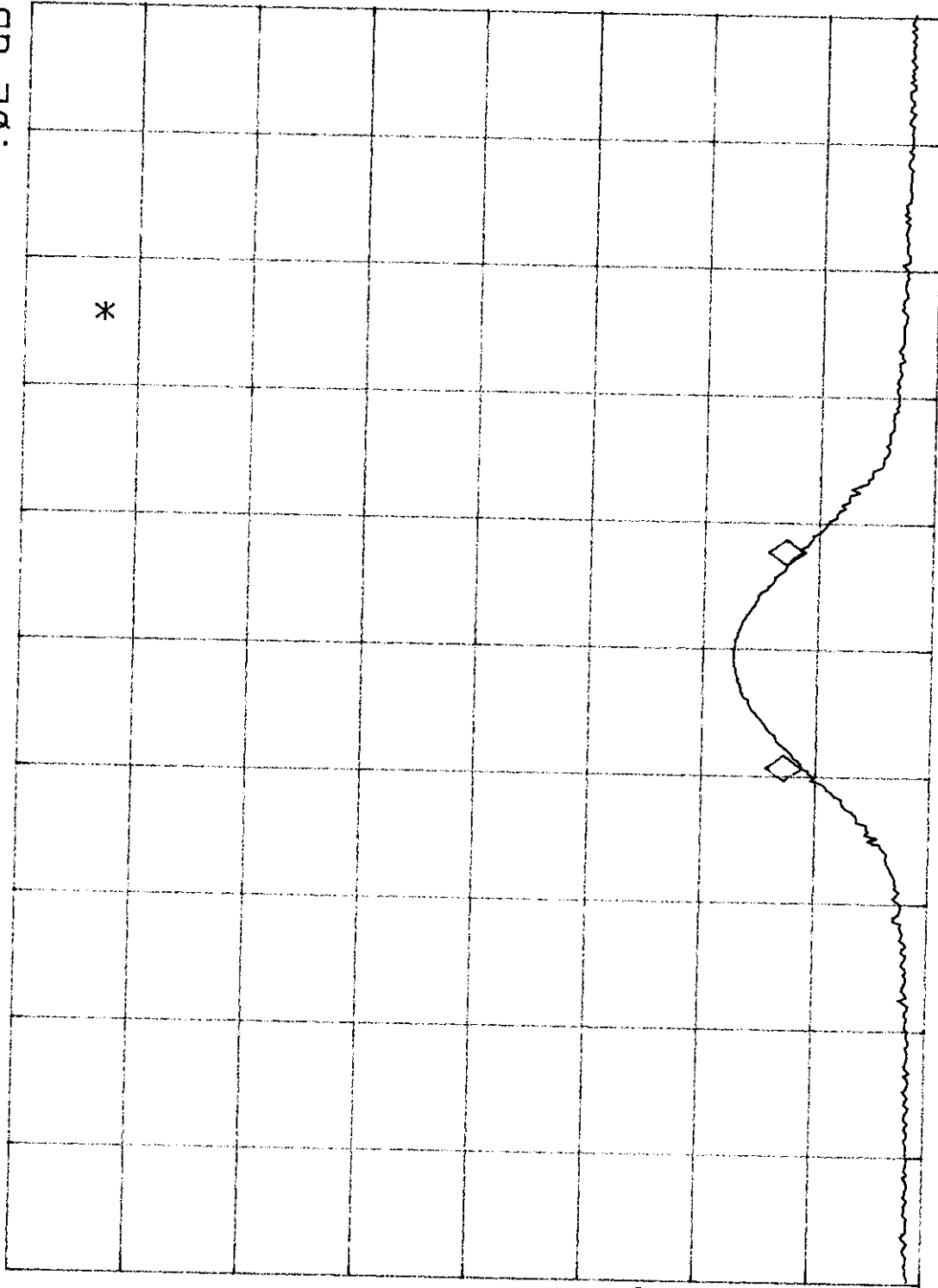
PEAK

LOG

10

dB/

MKR Δ -17.0 KHZ
- .02 dB



MA VB

SC FC

CORR

CENTER 232.0 KHZ

#RES BW 10 KHZ

#VBW 10 KHZ

SPAN 100.0 KHZ

#SWP 300 msec

pen, KHz

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

10:38:20 NOV 28, 1998

REF 107.0 dBμV #AT 10 dB

MKR Δ 17.0 KHz
-25 dB

PEAK

LOG
10
dB/
CISPR CLASS-A (-6dB)
HOC08 HORIZONTAL 3m

*

SRQ 140

VA VB
SC FC
CORR

CENTER 232.0 KHz
#RES BW 10 KHz

#VBW 10 KHz

SPAN 100.0 KHz
#SWP 300 msec

MARKER
→ CF

MARKER
Δ

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2

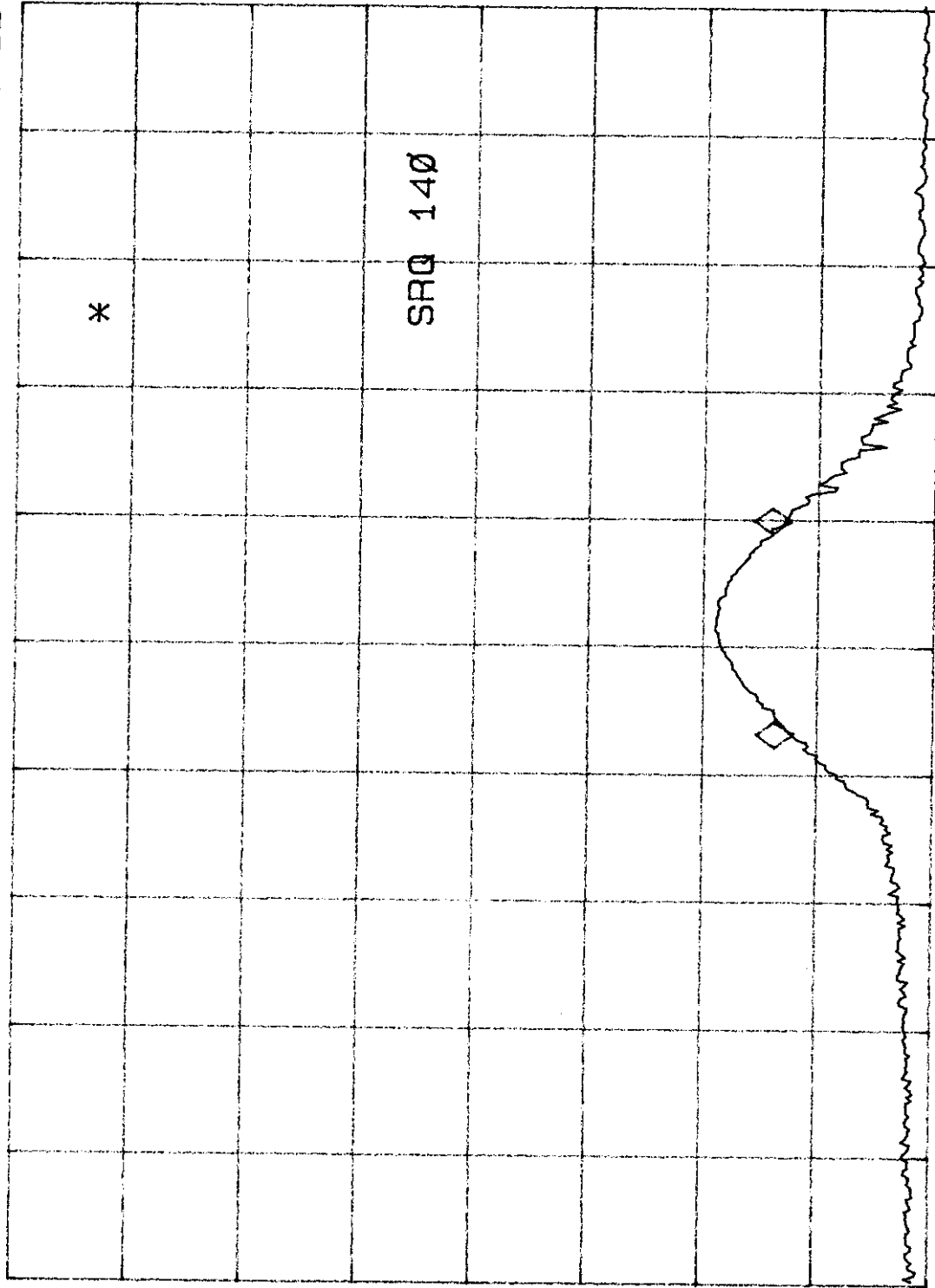
pen. 垂直

10:55:10 NOV 28, 1998

REF 107.0 dBμV #AT 10 dB

MKR Δ -16.8 KHz
-31 dB

PEAK
LOG
10
dB/



CENTER 457.5 KHz

#RES BW 10 KHz

#VBW 10 KHz

SPAN 100.0 KHz
#SWP 30.0 msec

MARKER
NORMAL

MARKER
Δ

MARKER
AMPTD

SELECT
1 2 3 4

MARKER 1
ON OFF

More
1 of 2

pen. 水平

10: 44: 24 NOV 28, 1998

REF 107.0 dBμV #AT 10 dB

MKR Δ 16.8 kHz
.02 dB

PEAK
LOG
10
dB/

MARKER
→ CF

MARKER
Δ

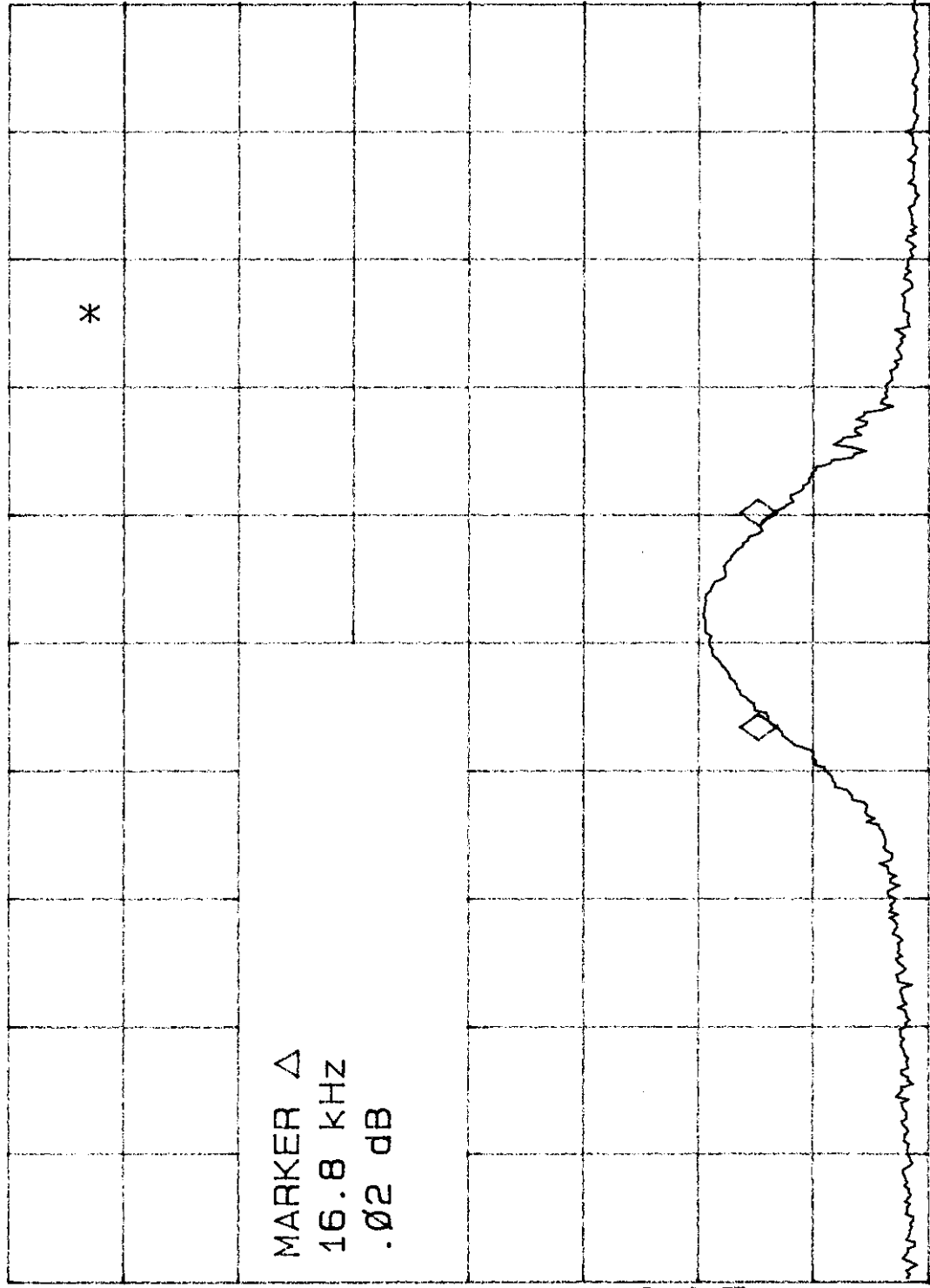
MARKER Δ
16.8 kHz
.02 dB

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2



VA VB
SC FC
CORR

CENTER 454.5 kHz SPAN 100.0 kHz
#RES BW 10 kHz #VBW 10 kHz #SWP 30.0 msec

pen, 垂直

11:30:59 NOV 28, 1998

REF 107.0 dBμV #AT 10 dB

MKR Δ 16.0 KHZ
.00 dB

PEAK

LOG

10

dB/

CISPR CLASS-A (-6dB)
HOC08 HORIZONTAL 3m

*

SRQ 140

VA VB

SC FC

CORR

CENTER 460.5 KHZ

#RES BW 10 KHZ

#VBW 10 KHZ

SPAN 100.0 KHZ
#SWP 30.0 msec

MARKER
→ CF

MARKER
Δ

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2

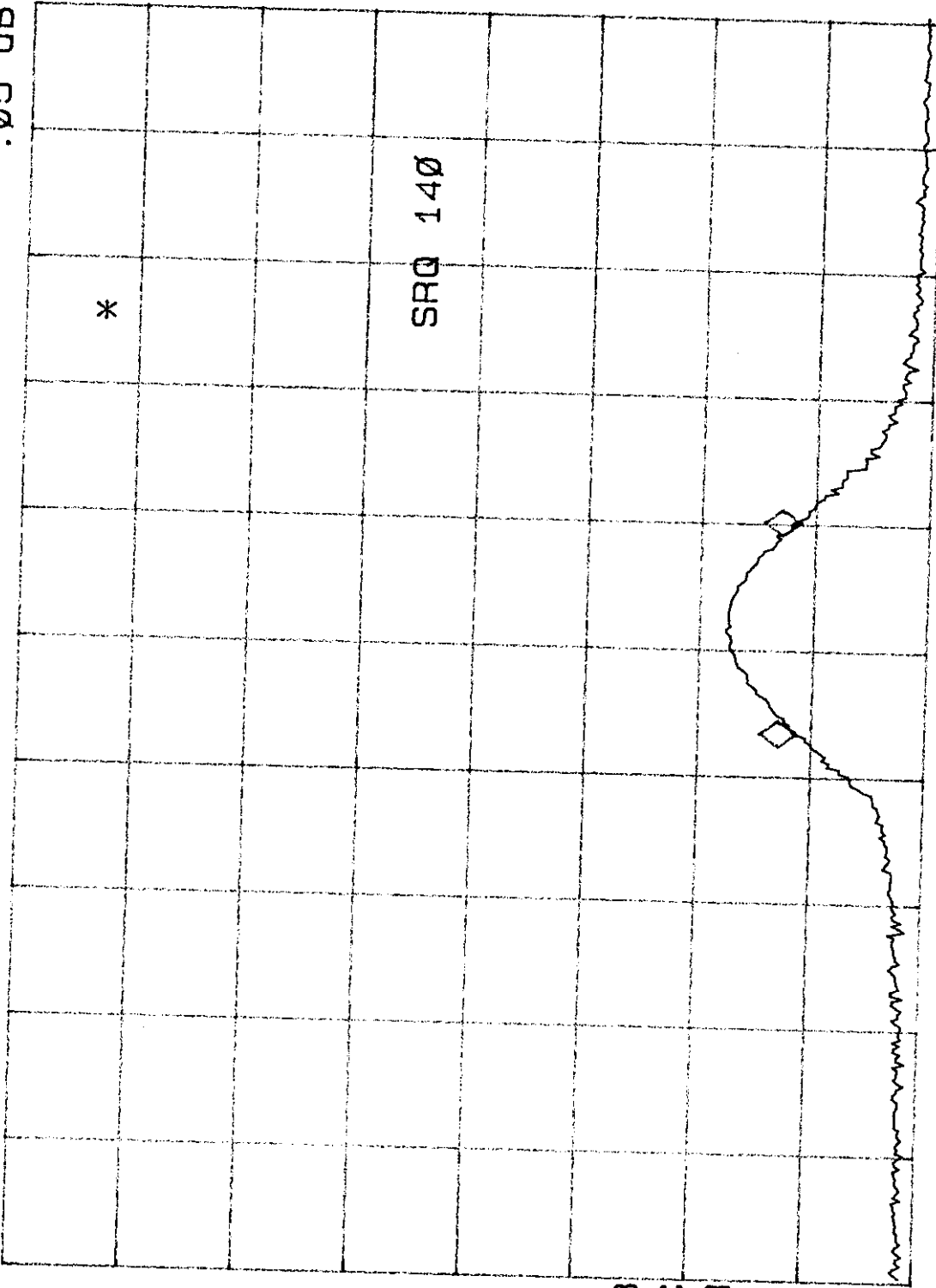
Mouse, >K P

11: 26: 15 NOV 28, 1998

REF 107.0 dBμV #AT 10 dB

PEAK
LOG
10
dB/

MKR Δ 16.8 KHZ
- .05 dB



SRQ 140

VA VB
SC FC
CORR

CENTER 460.5 KHZ
#RES BW 10 KHZ

#VBW 10 KHZ

SPAN 100.0 KHZ
#SWP 30.0 msec

MARKER
→ CF

MARKER
Δ

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2

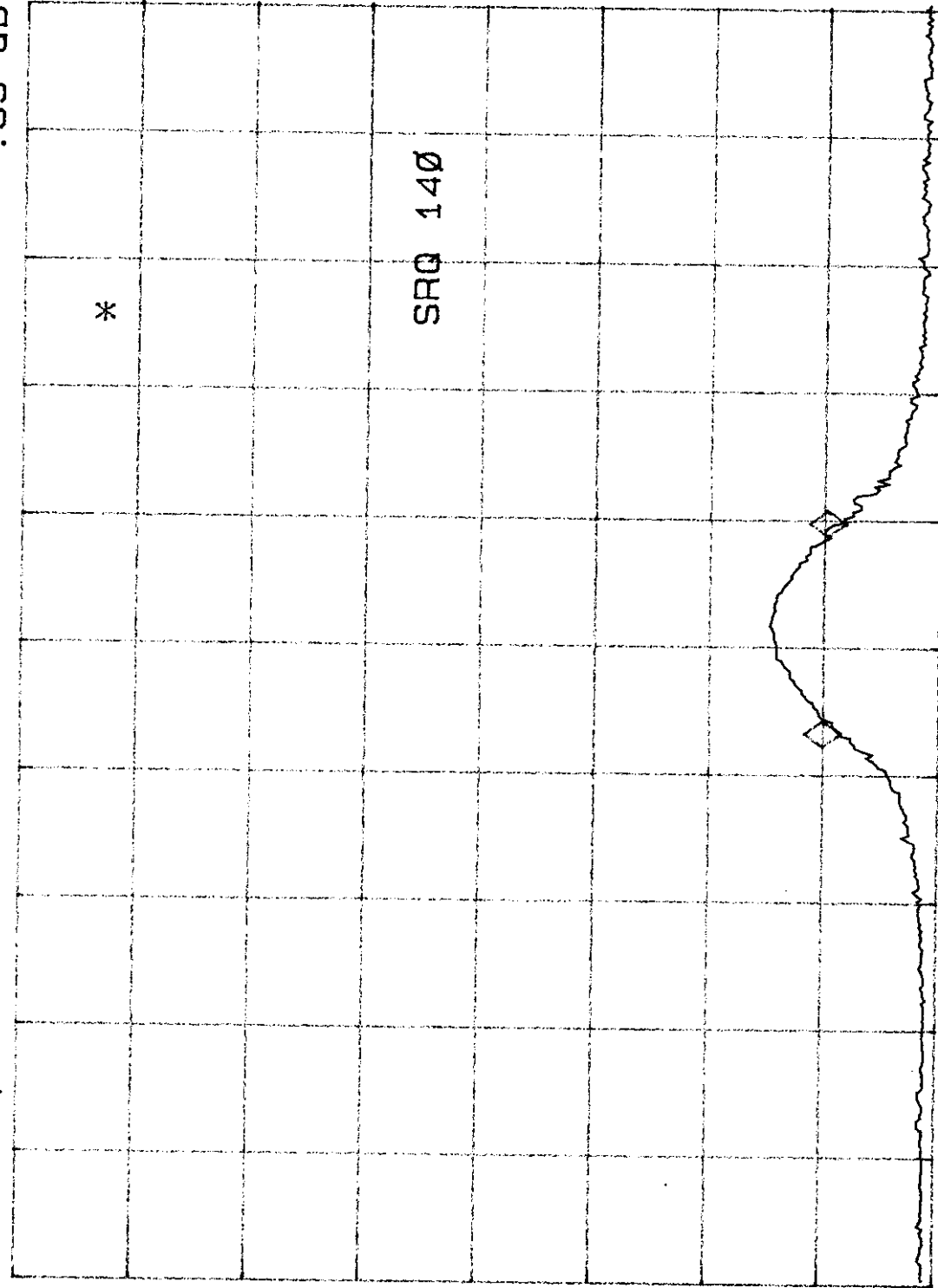
Mouse, 垂直

11:06:48 NOV 28, 1998

REF 107.0 dBμV #AT 10 dB

MKR Δ 16.5 kHz
- .33 dB

PEAK
LOG
10
dB/



VA VB
SC FC
CORR

CENTER 230.0 KHZ
#RES BW 10 KHZ

#VBW 10 KHZ

SPAN 100.0 KHZ
#SWP 30.0 msec

MARKER
→ CF

MARKER
Δ

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2

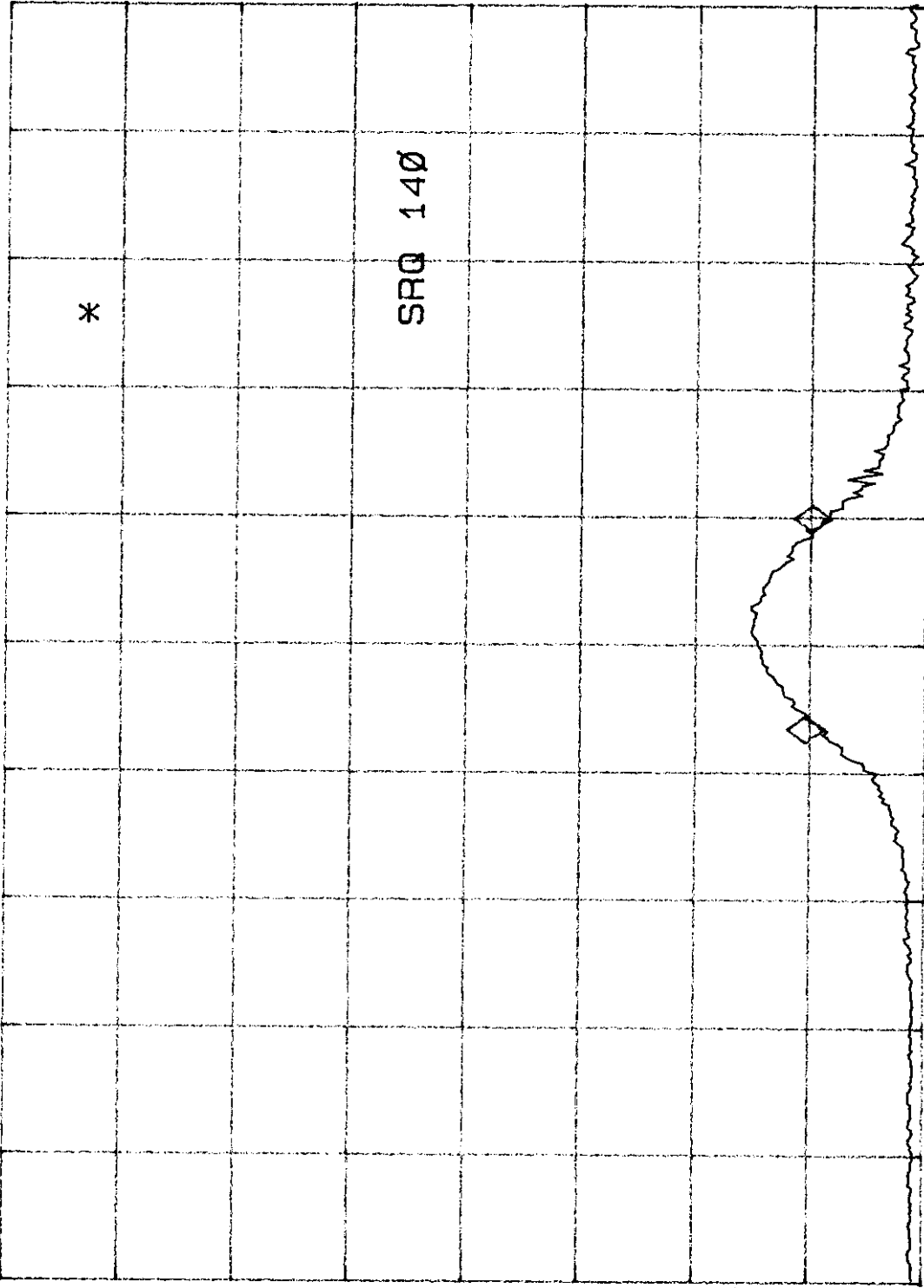
Mouse, skip

11: 13: 28 NOV 28, 1998

REF 107.0 dBμV #AT 10 dB

MKR Δ 16.5 KHZ
-53 dB

PEAK
LOG
10
dB/



VA VB
SC FC
CORR

CENTER 227.5 KHZ

#RES BW 10 KHZ

#VBW 10 KHZ

SPAN 100.0 KHZ
#SWP 30.0 msec

MARKER
NORMAL

MARKER
Δ

MARKER
AMPTD

SELECT
1 2 3 4

MARKER 1
ON OFF

More
1 of 2

Mouse, 垂直