REPORT ON
CERTIFICATION MEASUREMENTS
OF
B8Q GCT390 DOOR OPERATOR TRANSMITTER

PREPARED BY:

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Each Button of this transmitter was measured for radiated emissions and bandwidth measurements. The results follow.

Radiated Measurements Performed By:.....L. Chop Kramer.....

Bandwidth Measurements Performed By:.....L. Chop Kramer.....

B8Q GCT390
TRINARY DATA
RADIATED EMISSIONS
BUTTON # 1

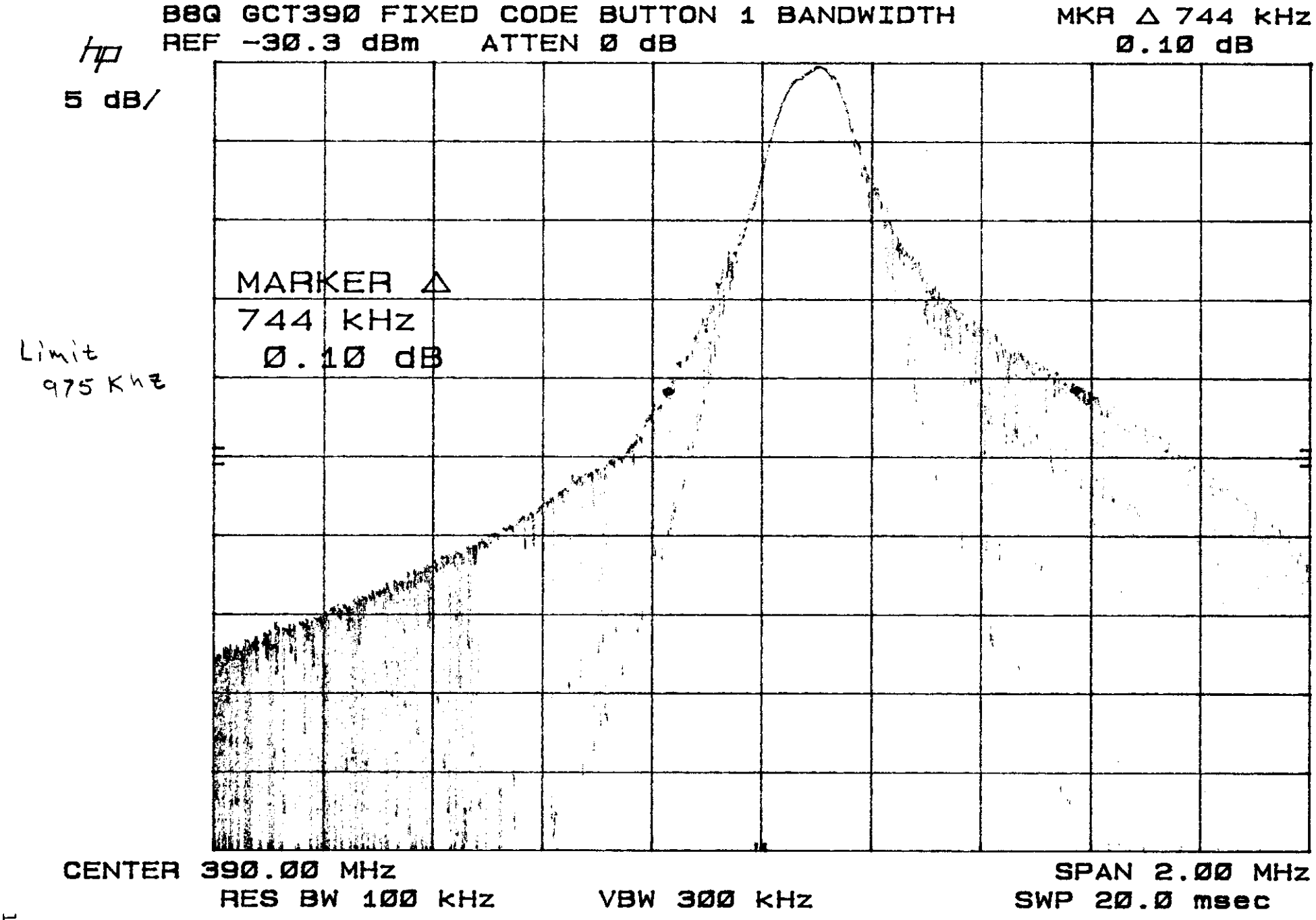
Scan /Div Mhz	Res. Bandwidth Khz	DUT Frequency (Mhz)	Meter Frequency (Mhz)	Meter Reading (dBm)	Antenna Factor (dB)	Coax Factor (dB)	Amplifier Gain (dB)	Measurement Distance (Meters)	Duty Cycle Correction (dB)	3 Meter Limit (uV/M)	Field Strength (uV/M)	Delta Limit (dB)
0.5	100	390	390	-18.7	20.8	4.2	26.78	3	-8.4	10083	8,053.78	-1.95
0.5	100	390	780	-67.4	25.9	6.3	25.48	3	-8.4	1008	78.70	-22.15
0.5	1000	390	1170	-46	25.4	8	35.14	3	-8.4	500	349.14	-3.12
0.5	1000	390	1560	-51.6	27.3	9.6	34.79	3	-8.4	500	285.43	-4.87
0.5	1000	390	1950	-55	29.2	10.9	34.44	3	-8.4	1008	290.40	-10.81
0.5	1000	390	2340	-62.2	29.4	12.1	35.4	3	-8.4	1008	133.35	-17.57
0.5	1000	390	2730	-63.8	30.6	13.4	35.5	3	-8.4	500	146.22	-10.68
0.5	1000	390	3120	-64.1	31.6	14.5	36.6	3	-8.4	1008	158.49	-16.07
0.5	1000	390	3510	-64	33.1	15.5	35.6	3	-8.4	500	239.88	-6.38
0.5	1000	390	3900	-64.3	34.7	16.5	35.3	3	-8.4	500	323.59	-3.78

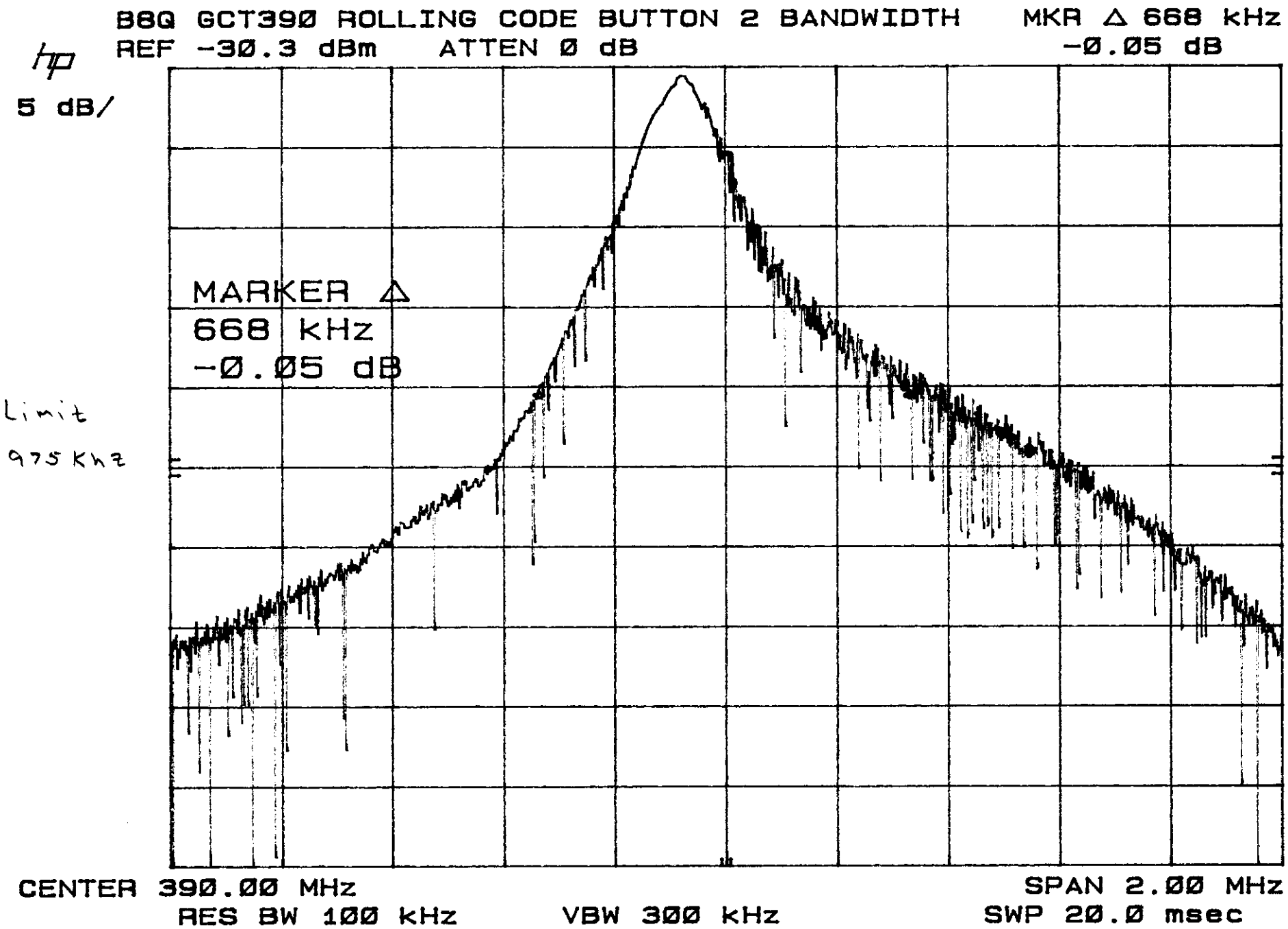
B8Q GCT390
ROLLING CODE DATA
RADIATED EMISSIONS
BUTTON # 2

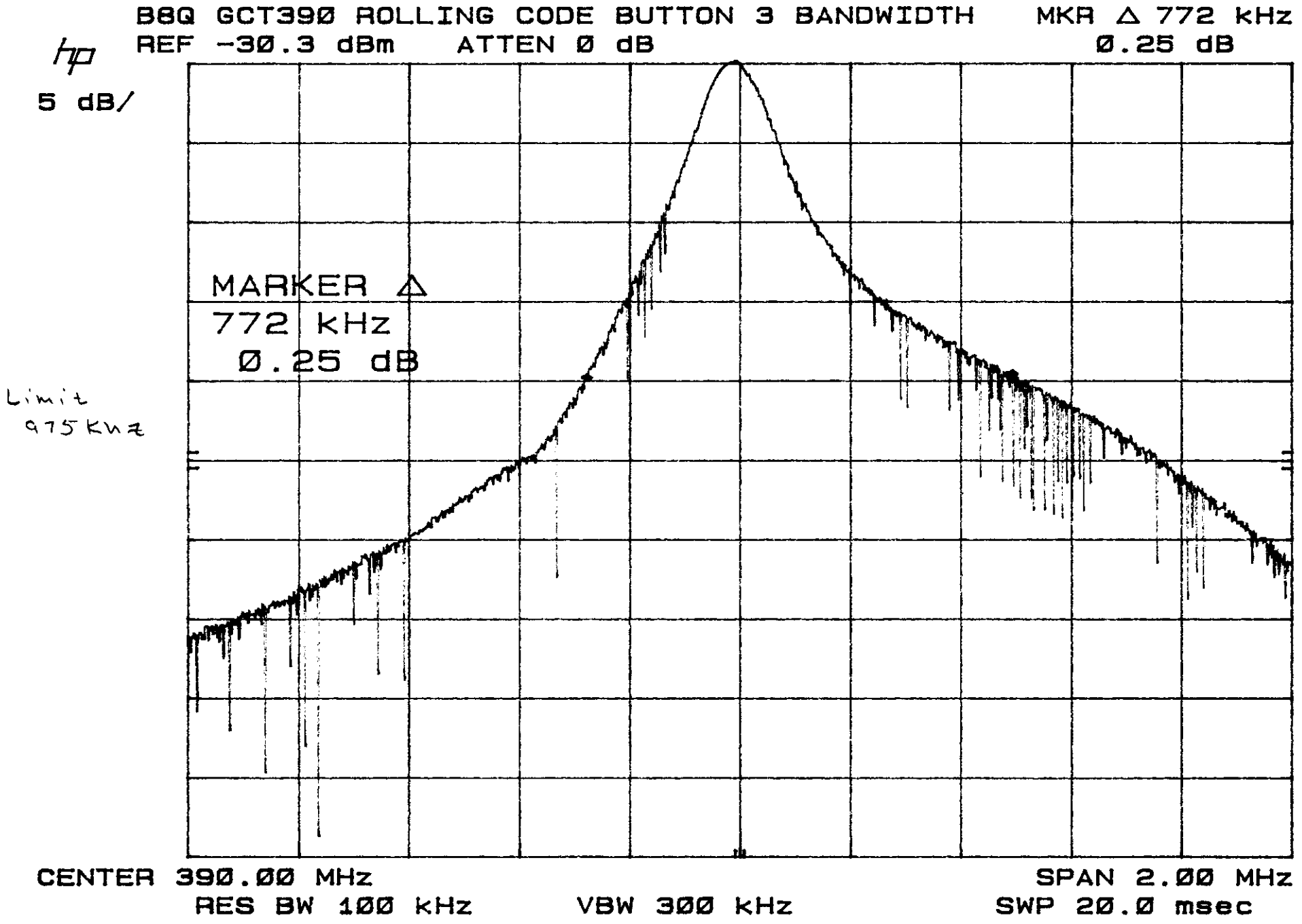
Scan /Div Mhz	Res. Bandwidth Khz	DUT Frequency (Mhz)	Meter Frequency (Mhz)	Meter Reading (dBm)	Antenna Factor (dB)	Coax Factor (dB)	Amplifier Gain (dB)	Measurement Distance (Meters)	Duty Cycle Correction (dB)	3 Meter Limit (uV/M)	Field Strength (uV/M)	Delta Limit (dB)
0.5	100	390	390	-18.3	20.8	4.2	26.78	3	-9	10083	7,870.46	-2.15
0.5	100	390	780	-65.1	25.9	6.3	25.48	3	-9	1008	95.72	-20.45
0.5	1000	390	1170	-51.9	25.4	8	35.14	3	-9	500	165.20	-9.62
0.5	1000	390	1560	-53.2	27.3	9.6	34.79	3	-9	500	221.56	-7.07
0.5	1000	390	1950	-55.9	29.2	10.9	34.44	3	-9	1008	244.34	-12.31
0.5	1000	390	2340	-61	29.4	12.1	35.4	3	-9	1008	142.89	-16.97
0.5	1000	390	2730	-62.8	30.6	13.4	35.5	3	-9	500	153.11	-10.28
0.5	1000	390	3120	-63.5	31.6	14.5	36.6	3	-9	1008	158.49	-16.07
0.5	1000	390	3510	-64.5	33.1	15.5	35.6	3	-9	500	211.35	-7.48
0.5	1000	390	3900	-65.4	34.7	16.5	35.3	3	-9	500	266.07	-5.48

B8Q GCT390
ROLLING CODE DATA
RADIATED EMISSIONS
BUTTON # 3

Scan /Div Mhz	Res. Bandwidth Khz	DUT Frequency (Mhz)	Meter Frequency (Mhz)	Meter Reading (dBm)	Antenna Factor (dB)	Coax Factor (dB)	Amplifier Gain (dB)	Measurement Distance (Meters)	Duty Cycle Correction (dB)	3 Meter Limit (uV/M)	Field Strength (uV/M)	Delta Limit (dB)
0.5	100	390	390	-19.2	20.8	4.2	26.78	3	-9	10083	7,095.78	-3.05
0.5	100	390	780	-65.3	25.9	6.3	25.48	3	-9	1008	93.54	-20.65
0.5	1000	390	1170	-48.9	25.4	8	35.14	3	-9	500	233.35	-6.62
0.5	1000	390	1560	-51.7	27.3	9.6	34.79	3	-9	500	263.33	-5.57
0.5	1000	390	1950	-55.3	29.2	10.9	34.44	3	-9	1008	261.82	-11.71
0.5	1000	390	2340	-64.2	29.4	12.1	35.4	3	-9	1008	98.86	-20.17
0.5	1000	390	2730	-65.9	30.6	13.4	35.5	3	-9	500	107.15	-13.38
0.5	1000	390	3120	-67.5	31.6	14.5	36.6	3	-9	1008	100.00	-20.07
0.5	1000	390	3510	-68.1	33.1	15.5	35.6	3	-9	500	139.64	-11.08
0.5	1000	390	3900	-68	34.7	16.5	35.3	3	-9	500	197.24	-8.08


B8Q GCT390 FIXED CODE BUTTON 1 BANDWIDTH
MKR Δ 744 kHz
REF -30.3 dBm
ATTEN 0 dB
0.10 dB
hp
5 dB/
MARKER Δ
744 kHz
0.10 dB
Limit
975 Khz
CENTER 390.00 MHz
SPAN 2.00 MHz
RES BW 100 kHz
VBW 300 kHz
SWP 20.0 msec


B8Q GCT390 ROLLING CODE BUTTON 2 BANDWIDTH
MKR Δ 668 kHz
REF -30.3 dBm
ATTEN 0 dB
-0.05 dB
5 dB/
MARKER Δ
668 kHz
-0.05 dB
Limit
975 Khz
CENTER 390.00 MHz
SPAN 2.00 MHz
RES BW 100 kHz
VBW 300 kHz
SWP 20.0 msec


B8Q GCT390 ROLLING CODE BUTTON 3 BANDWIDTH
MKR Δ 772 kHz
REF -30.3 dBm
ATTEN 0 dB
0.25 dB
hp
5 dB/
MARKER Δ
772 kHz
0.25 dB
Limit
975 KHz
CENTER 390.00 MHz
SPAN 2.00 MHz
RES BW 100 kHz
VBW 300 kHz
SWP 20.0 msec

NOTES ON RADIATED EMISSIONS

B8Q GCT390

July 7, 1999

1) The reported meter readings are the highest peak levels observed of six positions of the DUT and the antenna for each frequency.

2) The measurements up to 1 MHz were taken using the HP 8447D amplifier. The measurements above 1Mhz were taken using the HP 8449B amplifier.

3) The reading of -70 dBm is the lowest measurement possible with the equipment available. This level is below the allowed limit in each case.

4) Sample calculation: $uV/m = 10^{(107 + M + AF + CF - G - 9) / 20}$

M = -28.0
AF = 2.0 uV/m = 316
CF = 2.0
G = 27.0

5) For the trinary code, the actual duty cycle is a function of the transmitted code. The transmitted data has a worst-case duty cycle of 38% when all code switches are in the + position. This gives the –8.4dB correction factor in the equation below and in the Radiated Emissions calculations.

Correction = 20*log ((.88ms)+(2.7ms*9)/(66.82ms) = -8.4

The .88ms is the header pulse and is followed by 9.96ms off and 2.7ms on periods. There is also a 33ms dead time at the end of the word. This gives a total word time of 66.82ms.

6) For the rolling code the actual duty cycle is a function of the transmitted code. The transmitted data has a worst case duty cycle of 33%. This gives the -9dB correction factor in the above equation and in the Radiated Emissions calculations. Using the data times shown in the expository, the correction factor calculation is as follows:

correction = 20 * log ((7.99ms*.5)+(4.99ms*.5)+(41.95ms*.67)/100ms) = -9.2

7) The rolling code transmissions were modified to allow continuous transmission. (The transmissions have a normal maximum transmission time of 27 seconds while the transmit button is engaged. Transmission ceases when the button is released.)

8) The spectrum around the 1.8 MHz oscillator was surveyed and no emissions were detected.

9) The FCC identifier label is molded into the back of the plastic case.

10) All measurements were made using ANSI 63.4-1992.

TEST EQUIPMENT LIST

DEVICE	MODEL	SERIAL
Signal Generator	HP 8644A	2933A00424
Spectrum Analyzer	HP 8566B	2747A04964
Display		2816A15853
Quasi-Peak Adapter	HP 85650A	2524A00802
Amplifier	HP 8447D	2443A03986
Amplifier	HP 8449B	3008A00576
Active Loop	Emco 6502	2188
Dipole Set	CD "Robert's" Set	RAS0089
Horn Antenna	Emco 3115	2268
LISN	Emco 3825/2	9311-2157
Coax (100')	Belden 8214	N/A

All above equipment verified to be within manufacture specifications July 1999.

Site Description

Located at 22790 Lake Park Blvd. Alliance, Ohio. A complete description of the site is on file with the FCC.

TECHNICAL REPORT

MANUFACTURERS

The Genie Company
22790 Lake Park Blvd.
Alliance, Ohio 44601

MULTIPLE LISTINGS OF TRANSMITTERS

The Genie Company conducts business under the following trade names:

The Genie Company
The Alliance Manufacturing Company
GMI Professional Access Systems
The Overhead Door Corporation

Models	**Trade Name**
GCT-3	The GENIE Company
ODCT-3	The Overhead Door Corporation
XCT-3	