MEASUREMENT AND TECHNICAL REPORT

GTCO CALCOMP PERIPHERALS
14555 North 82nd Street
Scottsdale, AZ 85260

DATE: 05 August 2002

This Report Concerns:	Original Grant: X	Class II Change:
Equipment Type:	InterWrite MeetingPad 300, Model 36081	
Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?	Yes: **Defer until:**	No: X
Company Name **agrees to notify the Commission by:** **of the intended date of announcement of the product so that the grant can be issued on that date.**	N/A	
Transition Rules Request per 15.37?	Yes:	*No: X

(*) FCC Part 15, Paragraphs 15.249(a), (c); 15.209(a)); 15.109(a); 15.107(a)

Report Prepared by:

TÜV AMERICA, INC.
10040 Mesa Rim Road
San Diego, CA 92121-2912
Phone: 858 546 3999
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1 GENERAL INFORMATION

1.1 Product Description

EUT Description: Bluetooth Small graphics tablet

EUT Name: MeetingPad 300 (aka SchoolPad 300, ClassPad and StarPad)

Model No.: 36081 or 36082 Serial No.: N/a

Product Options: Just Different names for same product

Configurations to be tested: SchoolPad

Power Requirements

Voltage: 3vdc off 3 batteries

Current (Amps/phase(max)): 70mA

Other: Charger supplied with unit to charge batteries. 9VDC out @ 250 mA draw. Chargers are power supplies available in 120v and 120/230v 50/60 hz switchers

Typical Installation and/or Operating Environment

Business, Schools

EUT Power Cable

☒ Not Applicable

EUT Interface Ports and Cables

Interface				Shielding								
Type	Analog	Digital	Qty	Yes	No	Type	Termination	Connector Type	Port Termination	Length (in meters)	Removable	Permanent
Power to pen Ground &3.3v	☐	X	1	☐	☒					.5	☒	☐
Charger input 9vdc ground	☐	☒	1	☐	☐					2	☒	☐

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EUT Software.

Revision Level: Tablet Pic x0, Zeevo Bluetooth 3.3

Description: ETU has 2 micro in side. One controls the tablet and the other controls the Bluetooth interface

EUT Operating Modes to be Tested --

Connected to host computer via Bluetooth and running Interwrite Starter software.

EUT System Components

Description	Model #	Serial #	FCC ID #
Pen	Light touch 3400 pen	N/a	ECPPLTP

Support Equipment

Description	*Model #*	*Serial #*	*FCC ID #*
TDK USB adapter			

Oscillator Frequencies

Frequency	*Derived Frequency*	*Component # / Location*	*Description of Use*
3.6864 MHz	3.6864		Clock for Tablet Micro
12 MHz	--	Y1 Zeevo Bluestamp on Daughter board	Main clock for Bluetooth radio and micro in Zeevo chip
32 kHz	--	Y2 Zeevo Bluestamp on Daughter board	Main clock for Bluetooth radio and micro in Zeevo chip

Power Supply

Manufacturer	*Model #*	*Serial #*	*Type*
Oem	Ad-091ag	N/a	☐ Switched-mode: (Frequency) _____ ☒ Linear ☐ Other:
Ault	Sc1027a0903f 01	N/a	☒ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other:

Power Line Filters

Manufacturer	*Model #*	*Location in EUT*
N/A		

Critical EMI Components (Capacitors, ferrites, etc.)

Description	*Manufacturer*	*Part # or Value*	*Qty*	*Component # / Location*
N/A				

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1 GENERAL INFORMATION (continued)

1.2 Related Submittal/Grant

None

1.3 Tested System Details

The FCC IDs for all equipment, plus descriptions of all cables used in the tested system are:

None

1.4 Test Methodology

Purpose of Test: To demonstrate compliance with the ANSI C63.4 setup.

TEST	FCC CFR 47 #	PASS/FAIL
Radiated	15.249(a), (c)	Pass
Radiated Emissions	15.209(a)	Pass
Conducted Emissions	15.207(a)	N/A

Both Conducted and radiated testing were performed according to the procedures in FCC/ANSI C63.4 and CSA 108.8 - M1983. Radiated testing was performed at an antenna-to-EUT distance of 3 meters (1 - 25 GHz).

1.5 Test Facility

The open area test site and conducted measurement data were tested by:

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The Test Site Data and performance comply with ANSI 63.4 and are registered with the FCC, 7435 Oakland Mills Rd, Columbia Maryland 21046. All Measurement Data is acquired according to the content of FCC Measurement Procedure and ANSI C63.4, unless supplemented with additional requirements as noted in the test report.

2. SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was initially tested for FCC emission in the following configuration:

See Block Diagram.

2.2 EUT Exercise Software

None

2.3 Special Accessories

None

2.4 Modification

None

2.5 Configuration of Tested System

See Block Diagram.

3 RADIATED EMISSION EQUIPMENT/DATA, FCC Part 15, Paragraphs 15.249(a), (c); 209(a)

The following data lists the significant emission frequencies, measured levels, correction factor (which includes cable and antenna corrections), the corrected reading, and the limit.

See following page(s).

See test setup photos for radiated emissions test setup.

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Test Conditions: Emissions

Report No. SC203128

Photos taken? ■ Yes 7/23/02

■ Roof, 3-meter open site

Test Equipment Used:

	Model Number	Prop. #	Description	Manufacturer	Serial No.	Cal. Dates
■	hp8566B	407	Spectrum Analyzer	Hewlett Packard	2311A02209	11/13/02
■	PreAmp 2-20 GHZ	719	PreAmp	TUV PS	na	n.c.r.
■	3115	251	Antenna, Horn	Electro Mechanics Co	2595	12/1/03
■	Cable 1	732	30 ' cable	United Microwave Products	na	n.c.r.
■	Cable 2	6788	3" cable	United Microwave Products	na	n.c.r.

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Test Conditions: Emissions

Report No. SC203128

FCC 15.249(a)
FCC 15.249(c)
FCC 15.209(a)

Photos taken? ■ Yes 7/23/02

■ Roof, 3-meter open site

Test Equipment Used:

	Model Number	Prop. #	Description	Manufacturer	Serial No.	Cal. Dates
■	hp8566B	407	Spectrum Analyzer	Hewlett Packard	2311A02209	11/13/02
■	PreAmp 2-20 GHZ	719	PreAmp	TUV PS	na	n.c.r.
■	3115	251	Antenna, Horn	Electro Mechanics Co	2595	12/1/03
■	Cable 1	732	30 ' cable	United Microwave Products	na	n.c.r.
■	Cable 2	6788	3" cable	United Microwave Products	na	n.c.r.

FCC 15,109(a)

■ Canyon 2, 3- meter OATS

■	ESVS30	427	EMC Receiver	Rhode & Schwartz	8300350/006	12/8/02
■	LPB 2520 A	6722/739	Antenna, Bilog	Antenna Research	1170	5/3/03

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REPORT No: SC203128 TESTER: Alan Laudani SPEC: FCC 15.209(a) FCC 15.249(c)

CUSTOMER: GTG) CalComp TEST DIST: 3 Meters

E U T: Meeting Pad 300, Model 36081 TEST SITE: Roof

EUT MODE: Transmi BICONICAL: N/A

DATE: July 23, 2002 LOG: N/A

NOTES: Low, Med, High Channels OTHER: 251

above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG

No other spurious emissions evident

CF = Antenna Factor + Cable Loss - Preamplifier Gain

v.beta1a

FREQ (MHz)	VERTICAL (dBuv) pk	VERTICAL (dBuv) av	HORIZONTAL (dBuv) pk	HORIZONTAL (dBuv) av	CF (dB/m)	MAX LEVEL (dBuV/m) pk	MAX LEVEL (dBuV/m) av	SPEC LIMIT (dBuV/m) pk	SPEC LIMIT (dBuV/m) av	MARGIN (dB) pk	MARGIN (dB) av	EUT Rotation	Antenna Height
4803	53.0	35.9	59.9	37.3	0.19	**60.09**	**37.5**	74.0	54.0	-13.9	-16.5	20	1.8
7305.1	43.7	31.3	51.5	32.6	7.97	**59.47**	**40.6**	74.0	54.0	-14.5	-13.4	20	1.7
4883.7	52.2	35.5	59.2	36.7	0.40	**59.6**	**37.1**	74.0	54.0	-14.4	-16.9	20	1.4
7325.55	46.6	32.0	47.4	32.4	8.02	**55.42**	**40.4**	74.0	54.0	-18.6	-13.6	20	1.4
4959.6	51.7	35.2	60.4	36.7	0.59	**60.99**	**37.3**	74.0	54.0	-13.0	-16.7	15	1.3
7439.5	45.3	32.3	47.7	32.5	8.27	**55.97**	**40.8**	74.0	54.0	-18.0	-13.2	15	1.4

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REPORT No: SC203128 TESTER: Alan Laudani SPEC: FCC Part 15 para 15.249(a)

CUSTOMER: GTCO CalComp TEST DIST: 3 Meters

E U T: Meeting Pad 300, Model 36081 TEST SITE: Roof

EUT MODE: Transmitting BICONICAL: N/A

DATE: July 23,2002 LOG: N/A

NOTES: Output Power: Low, Mid, & High OTHER: 251

above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1 MHz and VBW 10Hz for AVG

CF = Antenna Factor + Cable Loss

v.beta1a

FREQ (MHz)	VERTICAL (dBuv) pk	av	HORIZONTAL (dBuv) pk	av	CF (dB/m)	MAX LEVEL (dBuV/m) pk	av	SPEC LIMIT (dBuV/m) pk	av	MARGIN (dB) pk	av	EUT Rotation	Antenna Height
2401.8	52.0	21.5	65.7	23.4	34.7	**100.4**	**58.1**	114.0	94.0	-13.6	-35.9	55	1.8
2440.8	54.1	22.0	66.2	23.4	34.8	**101.0**	**58.2**	114.0	94.0	-13.0	-35.8	50	1.8
2479.8	53.9	21.5	64.7	23.6	35.0	**99.7**	**58.6**	114.0	94.0	-14.3	-35.4	50	1.6

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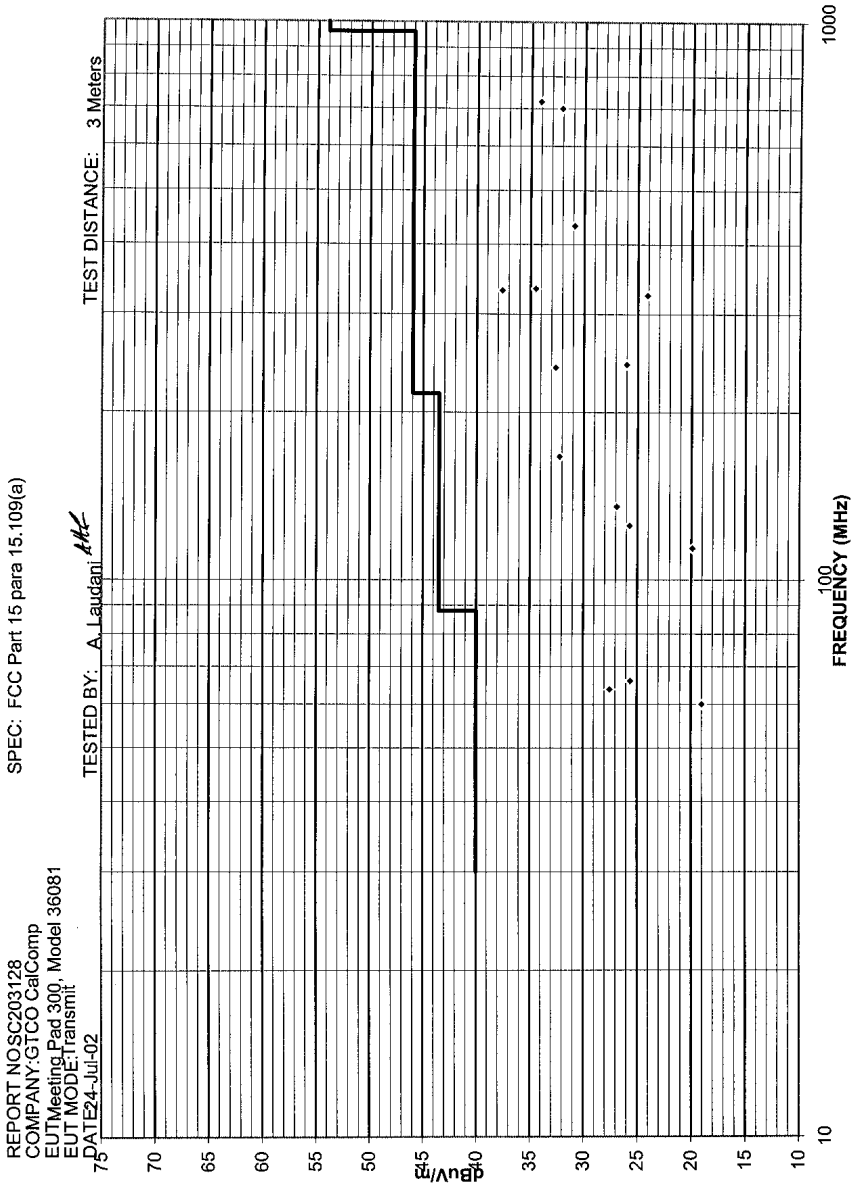

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REPORT No: SC203128 SPEC: FCC Part 15 para 15.109(a)

CUSTOMER: GTCO CalComp TEST DIST: 3 Meters

E U T: Meeting Pad 300, Model 36081 TEST SITE: 3

EUT MODE: Transmit BICONICAL: 739

DATE: 24-Jul-02 TESTED BY: A. Laudani LOG PERIODIC: 739

NOTES: Quasi-Peak with 120 KHz measurement bandwidth. RCVR: 427

120 Vac 60 Hz

Emissions found are evident from the Computer as supplied by CalComp

Temperature: 28 Relative Humidity: 42

EUT MARGIN -8.4 dB at 330.65 MHz ver 1.8a

FREQUENCY (MHz)	VERTICAL measured (dBuv)	HORIZONTAL measured (dBuV)	CORRECTION FACTOR (dB/m)	MAXIMUM CORRECTED (dBuV/m)	SPECIFIED LIMIT (dBuV/m)	EUT MARGIN (dB)	EUT ROTATION (degrees)	ANTENNA HEIGHT (meters)
60.00	5.6	4	13.4	**19.0**	40	-21.0	15	1
63.78	16	9.1	11.5	**27.5**	40	-12.5	130	1
66.00	15	8.1	10.6	**25.6**	40	-14.4	230	1
114.00	5.8	1	14.1	**19.9**	43.5	-23.6	180	1
125.30	11.5	5.5	14.2	**25.7**	43.5	-17.8	180	1
135.55	12.3	14	12.9	**26.9**	43.5	-16.6	100	2
166.52	20.5	18.8	11.7	**32.2**	43.5	-11.3	50	1
240.22	11	16.3	16.3	**32.6**	46	-13.4	125	2.5
243.40	9.6	5.4	16.4	**26.0**	46	-20.0	170	1.7
324.00	6	1	18.1	**24.1**	46	-21.9	145	4
330.65	15.5	19.2	18.4	**37.6**	46	-8.4	155	1
333.05	16	13	18.5	**34.5**	46	-11.5	155	2
432.06	9.8	4.2	21.1	**30.9**	46	-15.1	100	2.6
700.16	4.8	1.5	27.3	**32.1**	46	-13.9	170	1
719.65	6.8	4.1	27.3	**34.1**	46	-11.9	150	1

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Field Strength Calculation

If a preamplifier was used during the Radiated Emission Testing, it is required that the amplifier gain must be subtracted from the Spectrum Analyzer (Meter) Reading. In addition, a correction factor for the antenna , cable used and a distance factor, if any, must be applied to the Meter Reading before a true field strength reading can be obtained. In the automatic measurement, these considerations are automatically presented as a part of the print out. In the case of manual measurements and for greater efficiency and convenience, instead of using these correlation factors for each meter reading, the specification limit was modified to reflect these correlation factors at each frequency value so that the meter readings can be compared directly to the modified specification limit. This modified specification limit is referred to as the "Corrected Meter Reading Limit" or simply the CMRL, which is the actual field strength present at the antenna. The quantity can be derived in the following manner:

Corrected Meter Reading Limit (CMRL) = SAR + AF + CL - AG - DC

Where, SAR = Spectrum Analyzer Reading
AF = Antenna Factor
CL = Cable Loss
AG = Amplifier Gain (if any)
DC = Distance Correction (if any)

Assume the following situation: A meter reading of 29.4 dBuV was obtained from a Class A computing device measured at 83 MHz. Assume an antenna factor of 9.2 dB, a cable loss of 1.4 dB and amplifier gain of 20.0 dB at 83 MHz. The final field strength would be determined as follows:

CMRL = 29.4 dBuV + 9.2dB = 1.4 dB - 20 dB/M - 0.0 dB

CMRL = 20.0 dBuV/M

This result is well below the FCC and CSA Class A limit of 29.5 dbuV/m at 83 MHz.

For the manual mode of measurement, a table of corrected meter reading limit was used to permit immediate comparison of the meter reading to determine if the measure emission amplitude exceeded the specification limit at that specific frequency.

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4 CONDUCTED EMISSION EQUIPMENT/DATA

Test Room

SR 3 Shielded Room, 12' x 20' x 8', Metal Chamber

Equipment:

Model #	Prop. #	Description	Manufacturer	Serial #	Cal Date
ESHS 20	6509	EMI Test Receiver	Rohde & Schwarz	837055/001	12/02
CAT-20	606	20 dB Attenuator	Mini-Circuits	--	NCR
9242-50-R-24-BNC	457	LISN	Solar Electronics Co.	941720	04/03
9242-50-R-24-BNC	458	LISN	Solar Electronics Co.	941719	04/03

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TUV Product Service
Conducted Emissions

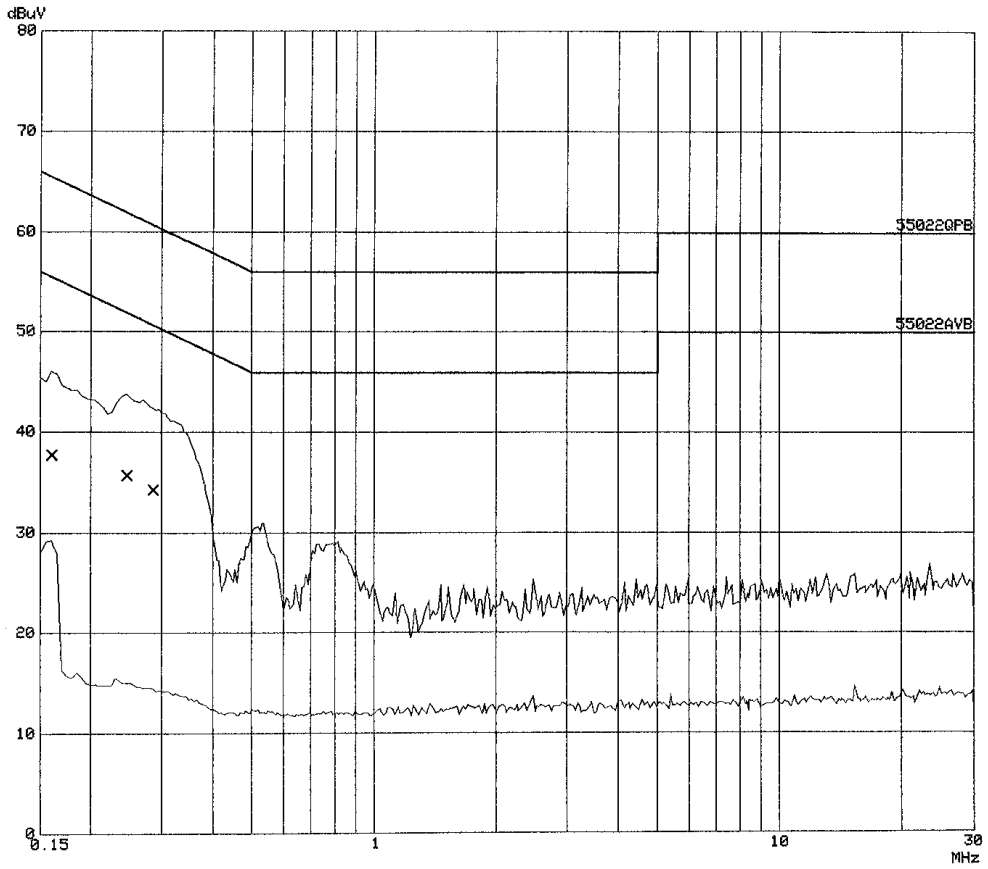
EUT: InterWrite Model ~~EZUSDO2002B173DGTK~~ DPX351338
Manuf: GTCO Calcompt
Op Cond: Normal
Operator: Cang Nguyen
Test Spec: EN 55022 Class B (a)
Comment: 110 Vac 60 Hz Line 1 2
SC-203128
Date: 02. Aug 02 11:22

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	9k	30M	20dBLISN

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 20dB



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TUV Product Service
Conducted Emissions

EUT: InterWrite Model ~~LZUSDO2002B173BGTK~~ OPx351338
Manuf: GTCO Calcompt
Op Cond: Normal
Operator: Cang Nguyen
Test Spec: EN 55022 Class B (c)
Comment: 110 Vac 60 Hz Line ~~1~~ 2
SC-203128
Date: 02. Aug 02 11:22

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.16000	37.8	65.5
0.24500	35.8	61.9
0.28500	34.3	60.7

Frequency MHz	AV Level dBuV	AV Limit dBuV

No Results

* limit exceeded

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TUV Product Service
Conducted Emissions

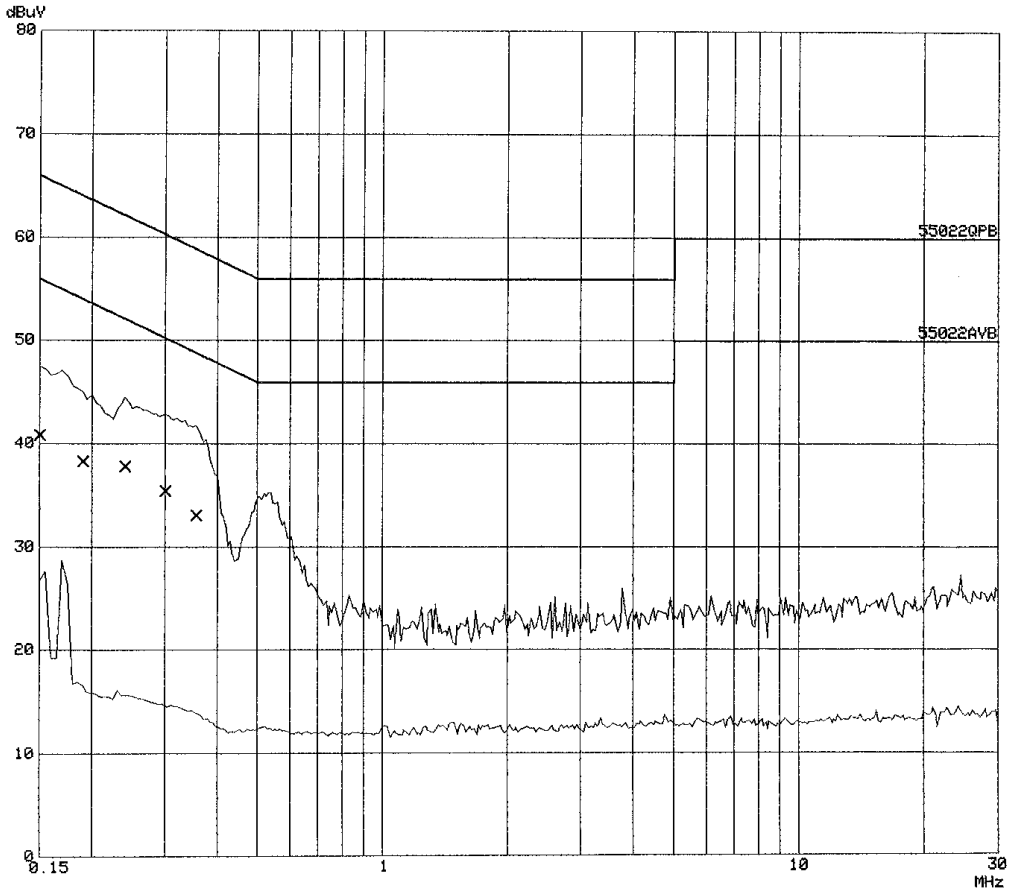
EUT: InterWrite Model ~~LZUSB02002B172BCTK~~ DPx 351338
Manuf: GTCO Calcompt
Op Cond: Normal
Operator: Cang Nguyen
Test Spec: EN 55022 Class B
Comment: 110 Vac 60 Hz Line 1
SC-203128
Date: 02. Aug 02 12:13

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	9k	30M	20dBLISN

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 20dB



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TUV Product Service
Conducted Emissions

EUT: InterWrite Model ~~LZUSD02002B173B0TK~~ DAX361338
Manuf: GTCO Calcompt
Op Cond: Normal
Operator: Cang Nguyen
Test Spec: EN 55022 Class B
Comment: 110 Vac 60 Hz Line 1
SC-203128
Date: 02. Aug 02 12:13

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	40.8	66.0
0.19000	38.2	64.1
0.24000	37.8	62.1
0.30000	35.4	60.2
0.35500	33.1	58.8

Frequency MHz	AV Level dBuV	AV Limit dBuV

No Results

* limit exceeded

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ATTESTATION STATEMENT

GENERAL REMARKS:

SUMMARY:

All tests were performed per FCC CFR 47, *Part 15, Paragraphs 15.249(a), (c); 15.209(a); 15.109(a); 15.107(a)*

■ - Performed

The Equipment Under Test

■ - **Fulfills** the requirements of FCC CFR 47, *Part 15, Paragraphs 15.249(a), (c); 15.209(a)); 15.109(a); 15.107(a)*

- TÜV PRODUCT SERVICE, INC. -

Responsible Engineer:

EMC Engineer

Responsible Engineer:

EMC Engineer

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