

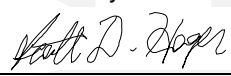
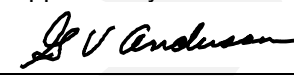
# TEST RESULT SUMMARY

## RTCA/DO-160E: 2004: Section 21 RF Radiated Emissions - Category M

COMPANY NAME	VBOX Incorporated
COMPANY ADDRESS	2342 East County Road J White Bear Lake MN 55110
EQUIPMENT DESCRIPTION	VBOX Trooper - Portable Oxygen Concentrator
MODEL NUMBER(S) TESTED	A-01050
SERIAL NUMBER(S) TESTED	DemoUnit-1
TEST REPORT NUMBER	NC1000473.1
TEST DATE(S)	04 August 2010

TÜV SÜD America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the requirements of RTCA/DO-160E Environmental Conditions and Test Procedures for Airborne Equipment, December 9, 2004, Section 21, RF Radiated Emissions, Category M.

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

Date:	24 September 2010	Tested by:		Approved by:	
Location:	New Brighton MN USA		Scott Hager EMC Technician		Gerald V Anderson Senior EMC Engineer

Not Transferable

## REVISION RECORD

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	23	24 September 2010	Initial Release



## TEST EQUIPMENT

Use of the calibrated equipment listed in this report ensures traceability to national and international standards.

Test #                      Test Description / Performed by  
 1                              RTCA/DO-160E Sec 21 RE / SDH

Test #	Mfr	Model	Serial	Description	Cal Code/ Due Date	Asset ID
1	AGT	E4440A	MY42510427	Spectrum Analyzer PSA	G 27 May 11	NBLE03366
1	AHS	200/550-1B	230	Ant .01-60 MHz Active Rod	B 05 Oct 10	NBLE02634
1	AHS	SAS-571	812	Antenna DRG Horn	G 17 Jun 11	NBLE10473
1	EM	6912	635	Antenna, Bicon 20 -300MHz	G 10 Aug 10	NBLE03346
1	HP	8447D	2727A05471	Preamp 0.1-1000 MHz	B 03 Mar 11	NBLE02672
1	MQ	AMF5D010180	390148	Pre-Amplifier 0.1-18 GHz	G 27 Oct 10	NBLE02610
1	TE	4106	2014	Ridge Guide Antenna	G 23 Mar 11	NBLE02355

## CALIBRATION CODES

Cal Code B = Calibration verification performed internally

Cal Code G = Calibration performed by an accredited outside source.

Cal Code Y = Calibration not required when used with other calibrated equipment.

## MANUFACTURER CODES

AGT    Agilent Technologies  
 AHS    AH Systems  
 EM     Electro-Metrics  
 HP     Hewlett-Packard  
 MQ     Miteq  
 TE     Tensor

Test-setup photo(s):  
RTCA/DO-160E - Sec 21 RF Radiated Emissions  
2 MHz to 25 MHz



Test-setup photo(s):  
RTCA/DO-160E - Sec 21 RF Radiated Emissions  
25 MHz to 200 MHz



Test-setup photo(s):  
RTCA/DO-160E - Sec 21 RF Radiated Emissions  
200 MHz to 1000 MHz



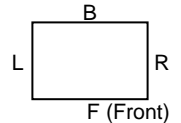
Test-setup photo(s):  
RTCA/DO-160E - Sec 21 RF Radiated Emissions  
1000 MHz to 6000 MHz



# Radiated Emissions



America



Test Report #: NC1000473      Test Area: 3  
 EUT Model #: A-01050      Date: 8/4/2010  
 EUT Serial #: DemoUnit-1      EUT Power: 8.4 VDC      Temperature: 23 °C  
 Test Method: RTCA/DO-160E Section 21 Radiated Emissions      Air Pressure: 98.1 kPa  
 Customer: VBOX      Relative Humidity: 48.9 %  
 EUT Description: Portable Oxygen Concentrator      Page: 1 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Report Number: 1

Frequency	Transducer	POL	Ant Dist	Side	EM Type	OP Mode	Notes:	P/F?
2.000 MHz - 10.000 MHz	Active Rod	V	1 m	Front	N/A	Ambient		Pass
10.000 MHz - 25.000 MHz	Active Rod	V	1 m	Front	N/A	Ambient		Pass
25.000 MHz - 30.000 MHz	Biconical	V	1 m	Front	N/A	Ambient		Pass
30.000 MHz - 100.000 MHz	Biconical	V	1 m	Front	N/A	Ambient		Pass
100.000 MHz - 200.000 MHz	Biconical	V	1 m	Front	N/A	Ambient		Pass
200.000 MHz - 400.000 MHz	DRG	V	1 m	Front	N/A	Ambient		Pass
400.000 MHz - 1.000 GHz	DRG	V	1 m	Front	N/A	Ambient		Pass
1.000 GHz - 6.000 GHz	DRG	V	1 m	Front	N/A	Ambient		Pass

Peak Over/Under Limit Value: -17.17dB @ 1080.000MHz

Tested by: Scott D Hager  
Printed

*Scott D. Hager*  
Signature

Reviewed by: Gerald V. Anderson  
Printed

*G V Anderson*  
Signature

Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc



# Radiated Emissions

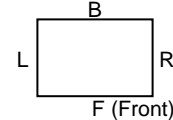


America

Test Report #: NC1000473

Test Area: 3

FACE DEFINITION  
(TOP VIEW)



EUT Model #: A-01050

Date: 8/4/2010

T = Top  
U = Under Side

EUT Serial #: DemoUnit-1

EUT Power: 8.4 VDC

Temperature: 23 °C

Test Method: RTCA/DO-160E Section 21 Radiated Emissions

Air Pressure: 98.1 kPa

Customer: VBOX

Relative Humidity: 48.9 %

EUT Description: Portable Oxygen Concentrator

Page: 2 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Report Number: 2

Frequency	Transducer	POL	Ant Dist	Side	EM Type	OP Mode	Notes:	P/F?
25.000 MHz - 30.000 MHz	Biconical	H	1 m	Front	N/A	Ambient		Pass
30.000 MHz - 100.000 MHz	Biconical	H	1 m	Front	N/A	Ambient		Pass
100.000 MHz - 200.000 MHz	Biconical	H	1 m	Front	N/A	Ambient		Pass
200.000 MHz - 400.000 MHz	DRG	H	1 m	Front	N/A	Ambient		Pass
400.000 MHz - 1.000 GHz	DRG	H	1 m	Front	N/A	Ambient		Pass
1.000 GHz - 6.000 GHz	DRG	H	1 m	Front	N/A	Ambient		Pass

Peak Over/Under Limit Value: -16.09dB @ 1085.000MHz

Tested by: Scott D Hager  
Printed

Signature

Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

Reviewed by: Gerald V. Anderson  
Printed

Signature

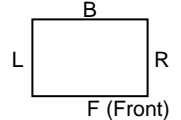
T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions



Test Report #: NC1000473 Test Area: 3  
 EUT Model #: A-01050 Date: 8/4/2010  
 EUT Serial #: DemoUnit-1 EUT Power: 8.4 VDC Temperature: 23 °C  
 Test Method: RTCA/DO-160E Section 21 Radiated Emissions Air Pressure: 98.1 kPa  
 Customer: VBOX Relative Humidity: 48.9 %  
 EUT Description: Portable Oxygen Concentrator Page: 3 of 16

FACE DEFINITION  
(TOP VIEW)



Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Report Number: 3

Frequency	Transducer	POL	Ant Dist	Side	EM Type	OP Mode	Notes:	P/F?
2.000 MHz - 10.000 MHz	Active Rod	V	1 m	Front	N/A	Fully OP		Pass
10.000 MHz - 25.000 MHz	Active Rod	V	1 m	Front	N/A	Fully OP		Pass
25.000 MHz - 30.000 MHz	Biconical	V	1 m	Front	N/A	Fully OP		Pass
30.000 MHz - 100.000 MHz	Biconical	V	1 m	Front	N/A	Fully OP		Pass
100.000 MHz - 200.000 MHz	Biconical	V	1 m	Front	N/A	Fully OP		Pass
200.000 MHz - 400.000 MHz	DRG	V	1 m	Front	N/A	Fully OP		Pass
400.000 MHz - 1.000 GHz	DRG	V	1 m	Front	N/A	Fully OP		Pass
1.000 GHz - 6.000 GHz	DRG	V	1 m	Front	N/A	Fully OP		Pass

Peak Over/Under Limit Value: -11.42dB @ 2.496MHz

Tested by: Scott D Hager  
Printed

*Scott D. Hager*  
Signature

Reviewed by: Gerald V. Anderson  
Printed

*G V Anderson*  
Signature

Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions

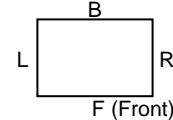


America

Test Report #: NC1000473

Test Area: 3

FACE DEFINITION  
(TOP VIEW)



EUT Model #: A-01050

Date: 8/4/2010

T = Top  
U = Under Side

EUT Serial #: DemoUnit-1

EUT Power: 8.4 VDC

Temperature: 23 °C

Test Method: RTCA/DO-160E Section 21 Radiated Emissions

Air Pressure: 98.1 kPa

Customer: VBOX

Relative Humidity: 48.9 %

EUT Description: Portable Oxygen Concentrator

Page: 4 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Report Number: 4

Frequency	Transducer	POL	Ant Dist	Side	EM Type	OP Mode	Notes:	P/F?
25.000 MHz - 30.000 MHz	Biconical	H	1 m	Front	N/A	Fully OP		Pass
30.000 MHz - 100.000 MHz	Biconical	H	1 m	Front	N/A	Fully OP		Pass
100.000 MHz - 200.000 MHz	Biconical	H	1 m	Front	N/A	Fully OP		Pass
200.000 MHz - 400.000 MHz	DRG	H	1 m	Front	N/A	Fully OP		Pass
400.000 MHz - 1.000 GHz	DRG	H	1 m	Front	N/A	Fully OP		Pass
1.000 GHz - 6.000 GHz	DRG	H	1 m	Front	N/A	Fully OP		Pass

Peak Over/Under Limit Value: -17.10dB @ 1025.000MHz

Tested by: Scott D Hager  
Printed

Signature

Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

Reviewed by: Gerald V. Anderson  
Printed

Signature

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions

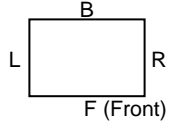


America

Test Report #: NC1000473

Test Area: 3

FACE DEFINITION  
(TOP VIEW)



EUT Model #: A-01050

Date: 8/4/2010

T = Top  
U = Under Side

EUT Serial #: DemoUnit-1

EUT Power: 8.4 VDC

Temperature: 23 °C

Test Method: RTCA/DO-160E Section 21 Radiated Emissions

Air Pressure: 98.1 kPa

Customer: VBOX

Relative Humidity: 48.9 %

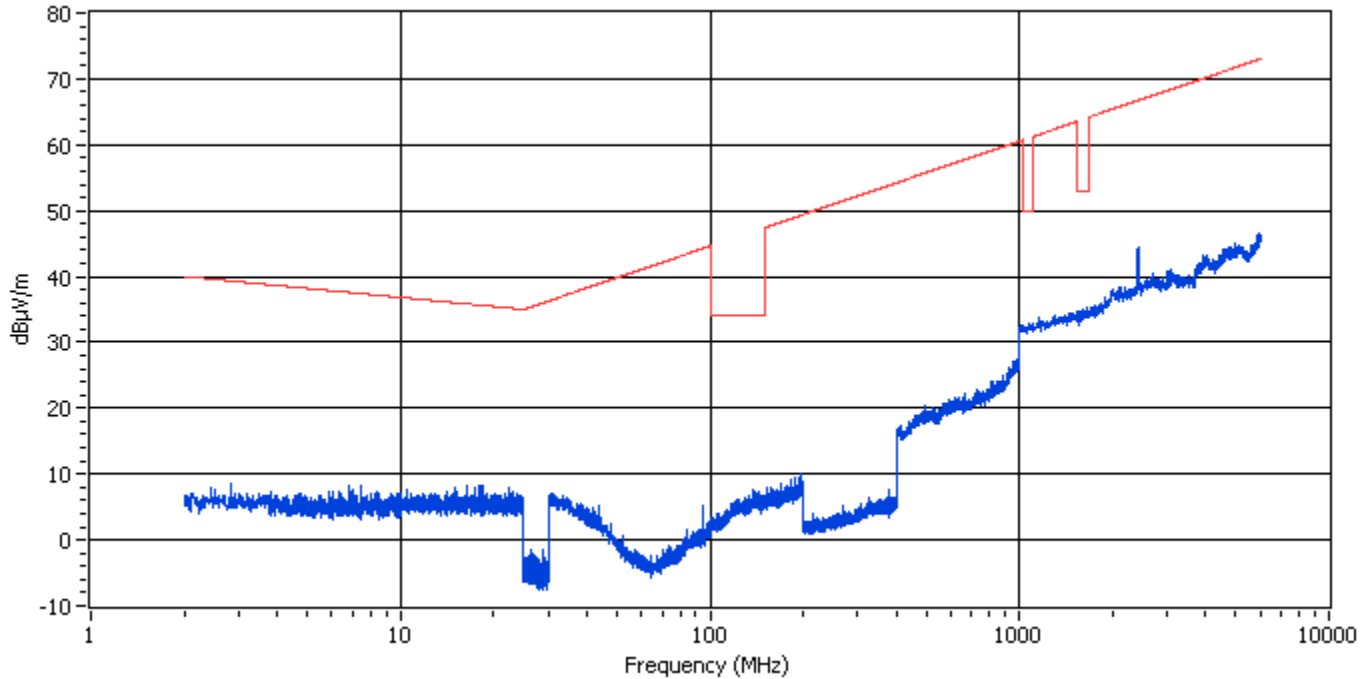
EUT Description: Portable Oxygen Concentrator

Page: 5 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Subreport Number: 1



Polarity: V  
Emission Type: N/A  
Mode of Operation: Ambient  
Notes:

Tested by: Scott D Hager  
Printed

*Scott D. Hager*  
Signature

Reviewed by: Gerald V. Anderson  
Printed

*G V Anderson*  
Signature

Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions

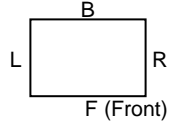


America

Test Report #: NC1000473 Test Area: 3  
 EUT Model #: A-01050 Date: 8/4/2010  
 EUT Serial #: DemoUnit-1 EUT Power: 8.4 VDC Temperature: 23 °C  
 Test Method: RTCA/DO-160E Section 21 Radiated Emissions Air Pressure: 98.1 kPa  
 Customer: VBOX Relative Humidity: 48.9 %  
 EUT Description: Portable Oxygen Concentrator Page: 6 of 16

FACE DEFINITION  
(TOP VIEW)

T = Top  
U = Under Side



Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Peak Tabular Data - Peak Definitions are:

6.0 dB drop for a peak.  
 All peaks within 12.0 dB of the limit.  
 There are no peaks within 12.0 dB of the limit.

Tested by: Scott D Hager  
 Printed

Signature

Reviewed by: Gerald V. Anderson  
 Printed

Signature

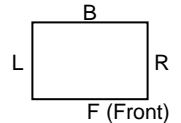
Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions



America



FACE DEFINITION  
(TOP VIEW)

T = Top  
U = Under Side

Test Report #: NC1000473

Test Area: 3

EUT Model #: A-01050

Date: 8/4/2010

EUT Serial #: DemoUnit-1

EUT Power: 8.4 VDC

Temperature: 23 °C

Test Method: RTCA/DO-160E Section 21 Radiated Emissions

Air Pressure: 98.1 kPa

Customer: VBOX

Relative Humidity: 48.9 %

EUT Description: Portable Oxygen Concentrator

Page: 7 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Equipment Description and Info:

Probe Type	Probe Model	Calibration File	Cal Due Date(YYYYMMDD)	Probe Description
Active Rod	SN-230	C:\EMC\XD\AR230.09	20101005	Active Rod Emissions Antenna
Active Rod	SN-230	C:\EMC\XD\AR230.09	20101005	Active Rod Emissions Antenna
Biconical	SN-0635	C:\EMC\XD\BCEM0635.09	20100810	Biconical Antenna
Biconical	SN-0635	C:\EMC\XD\BCEM0635.09	20100810	Biconical Antenna
Biconical	SN-0635	C:\EMC\XD\BCEM0635.09	20100810	Biconical Antenna
DRG	4106 SN2014	C:\EMC\XD\RG2014.10	20110323	Ridge Guide Antenna 200-1000MHz
DRG	4106 SN2014	C:\EMC\XD\RG2014.10	20110323	Ridge Guide Antenna 200-1000MHz
DRG	SAS 571 SN812	C:\EMC\XD\RGAH-812.10	20110617	Gold DRG Antenna

Preamp ID	Calibration File	Cal Due Date(YYYYMMDD)
None	c:\emc\emissions\preamps\zero.txt	22222222
None	c:\emc\emissions\preamps\zero.txt	22222222
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
Hi Freq - NBLE2610	c:\emc\emissions\preamps\2610_09.txt	20101027

Tested by: Scott D Hager  
Printed

Signature

Reviewed by: Gerald V. Anderson  
Printed

Signature

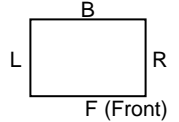
Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions



America



FACE DEFINITION  
(TOP VIEW)

T = Top  
U = Under Side

Test Report #: NC1000473

Test Area: 3

EUT Model #: A-01050

Date: 8/4/2010

EUT Serial #: DemoUnit-1

EUT Power: 8.4 VDC

Temperature: 23 °C

Test Method: RTCA/DO-160E Section 21 Radiated Emissions

Air Pressure: 98.1 kPa

Customer: VBOX

Relative Humidity: 48.9 %

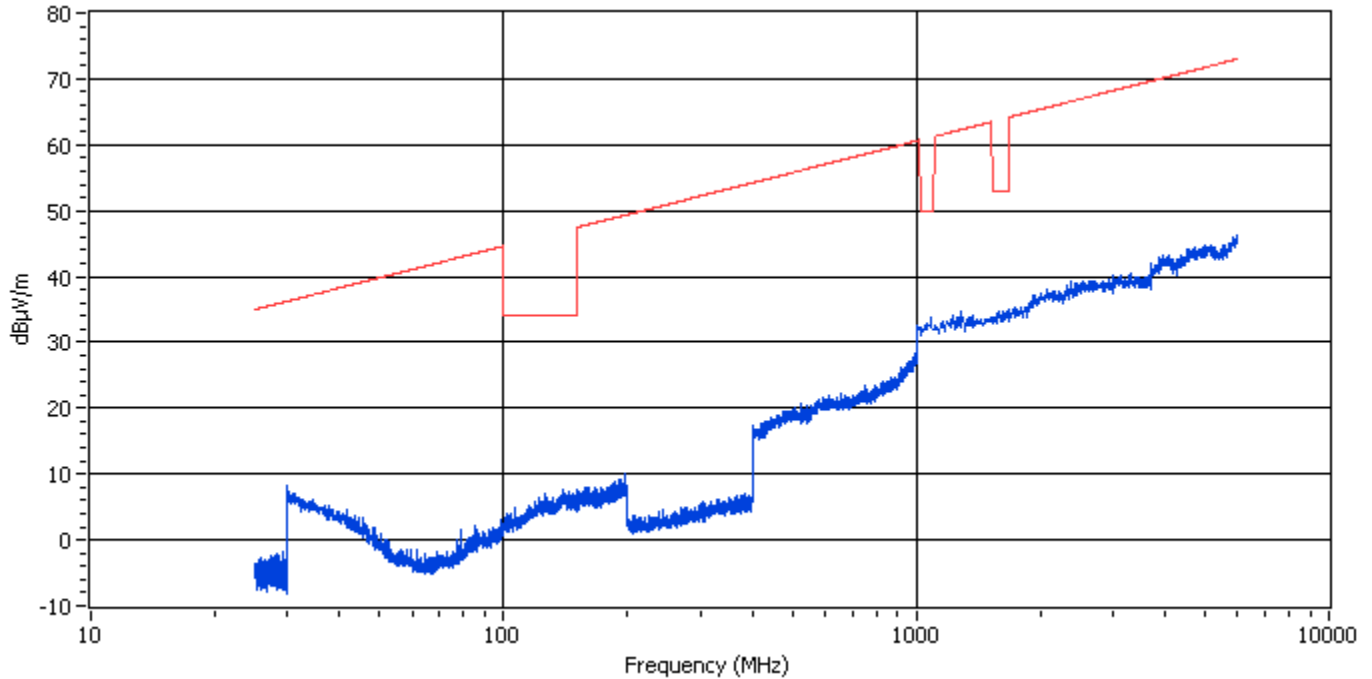
EUT Description: Portable Oxygen Concentrator

Page: 8 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Subreport Number: 2



Polarity: H  
Emission Type: N/A  
Mode of Operation: Ambient  
Notes:

Tested by: Scott D Hager  
Printed

*Scott D. Hager*  
Signature

Reviewed by: Gerald V. Anderson  
Printed

*G V Anderson*  
Signature

Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions

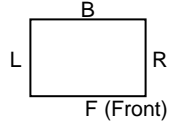


America

Test Report #: NC1000473

Test Area: 3

FACE DEFINITION  
(TOP VIEW)



EUT Model #: A-01050

Date: 8/4/2010

T = Top  
U = Under Side

EUT Serial #: DemoUnit-1

EUT Power: 8.4 VDC

Temperature: 23 °C

Test Method: RTCA/DO-160E Section 21 Radiated Emissions

Air Pressure: 98.1 kPa

Customer: VBOX

Relative Humidity: 48.9 %

EUT Description: Portable Oxygen Concentrator

Page: 9 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Peak Tabular Data - Peak Definitions are:

6.0 dB drop for a peak.

All peaks within 12.0 dB of the limit.

There are no peaks within 12.0 dB of the limit.

Tested by: Scott D Hager  
Printed

Signature

Reviewed by: Gerald V. Anderson  
Printed

Signature

Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

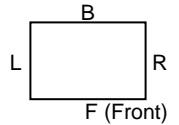
T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc



# Radiated Emissions



Test Report #: NC1000473 Test Area: 3 FACE DEFINITION (TOP VIEW)  
 EUT Model #: A-01050 Date: 8/4/2010 T = Top U = Under Side  
 EUT Serial #: DemoUnit-1 EUT Power: 8.4 VDC Temperature: 23 °C  
 Test Method: RTCA/DO-160E Section 21 Radiated Emissions Air Pressure: 98.1 kPa  
 Customer: VBOX Relative Humidity: 48.9 %  
 EUT Description: Portable Oxygen Concentrator Page: 10 of 16



Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Equipment Description and Info:

Probe Type	Probe Model	Calibration File	Cal Due Date(YYYYMMDD)	Probe Description
Biconical	SN-0635	C:\EMC\XD\BCEM0635.09	20100810	Biconical Antenna
Biconical	SN-0635	C:\EMC\XD\BCEM0635.09	20100810	Biconical Antenna
Biconical	SN-0635	C:\EMC\XD\BCEM0635.09	20100810	Biconical Antenna
DRG	4106 SN2014	C:\EMC\XD\RG2014.10	20110323	Ridge Guide Antenna 200-1000MHz
DRG	4106 SN2014	C:\EMC\XD\RG2014.10	20110323	Ridge Guide Antenna 200-1000MHz
DRG	SAS 571 SN812	C:\EMC\XD\RGAH-812.10	20110617	Gold DRG Antenna

Preamp ID	Calibration File	Cal Due Date(YYYYMMDD)
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
Hi Freq - NBLE2610	c:\emc\emissions\preamps\2610_09.txt	20101027

Tested by: Scott D Hager  
Printed

Signature

Reviewed by: Gerald V. Anderson  
Printed

Signature

Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions

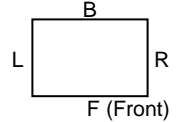


America

Test Report #: NC1000473

Test Area: 3

FACE DEFINITION  
(TOP VIEW)



EUT Model #: A-01050

Date: 8/4/2010

T = Top  
U = Under Side

EUT Serial #: DemoUnit-1

EUT Power: 8.4 VDC

Temperature: 23 °C

Test Method: RTCA/DO-160E Section 21 Radiated Emissions

Air Pressure: 98.1 kPa

Customer: VBOX

Relative Humidity: 48.9 %

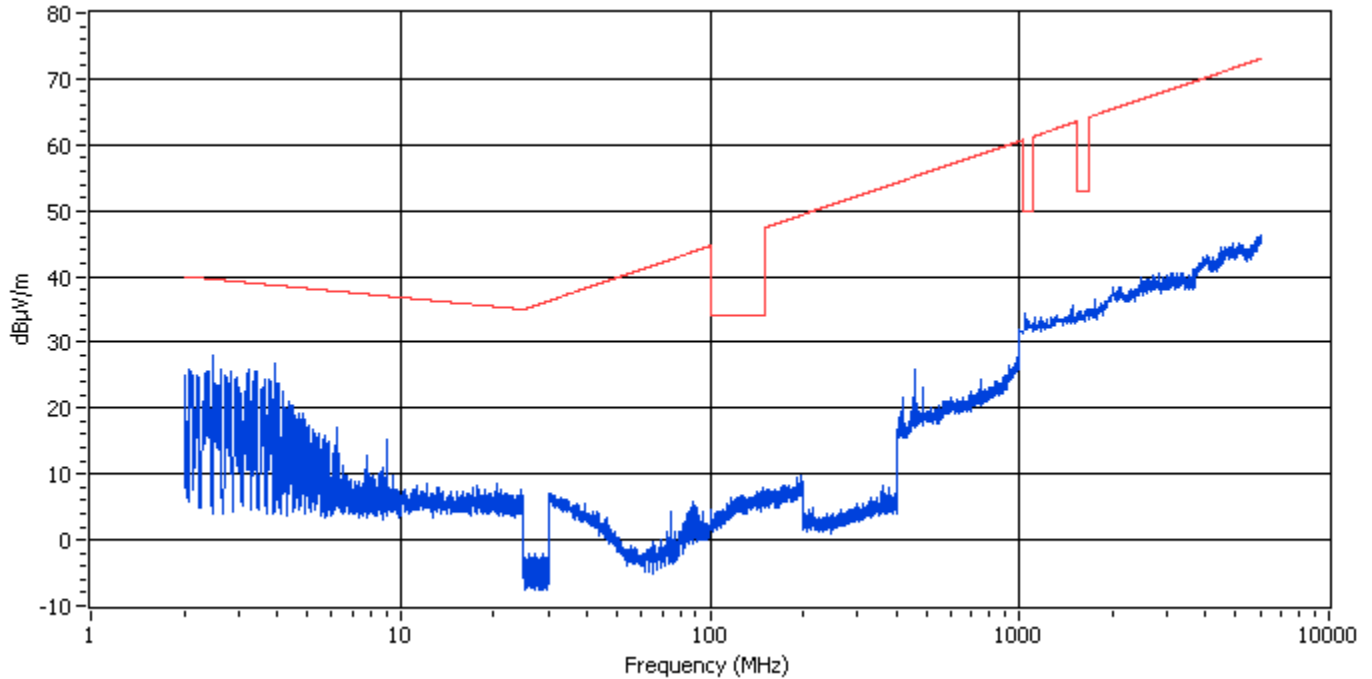
EUT Description: Portable Oxygen Concentrator

Page: 11 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Subreport Number: 3



Polarity: V  
Emission Type: N/A  
Mode of Operation: Fully OP  
Notes:

Tested by: Scott D Hager  
Printed

*Scott D. Hager*  
Signature

Reviewed by: Gerald V. Anderson  
Printed

*G V Anderson*  
Signature

Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions

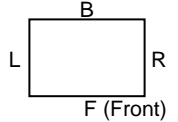


America

Test Report #: NC1000473

Test Area: 3

FACE DEFINITION  
(TOP VIEW)



EUT Model #: A-01050

Date: 8/4/2010

T = Top  
U = Under Side

EUT Serial #: DemoUnit-1

EUT Power: 8.4 VDC

Temperature: 23 °C

Test Method: RTCA/DO-160E Section 21 Radiated Emissions

Air Pressure: 98.1 kPa

Customer: VBOX

Relative Humidity: 48.9 %

EUT Description: Portable Oxygen Concentrator

Page: 12 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Peak Tabular Data - Peak Definitions are:

6.0 dB drop for a peak.

All peaks within 12.0 dB of the limit.

Frequency (MHz)	Receiver (dB)	Transducer (dB)	Cable Loss (dB)	Preamp (dB)	Final Data (dB)	Limit	Differential (dB)
2.496	27.38	0.60	0.16	0.00	28.14	39.56	-11.42
3.928	25.95	0.70	0.21	0.00	26.86	38.66	-11.80

Tested by: Scott D Hager  
Printed

Signature

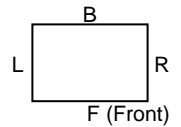
Reviewed by: Gerald V. Anderson  
Printed

Signature

Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions



Test Report #: NC1000473 Test Area: 3

EUT Model #: A-01050 Date: 8/4/2010

EUT Serial #: DemoUnit-1 EUT Power: 8.4 VDC Temperature: 23 °C

Test Method: RTCA/DO-160E Section 21 Radiated Emissions Air Pressure: 98.1 kPa

Customer: VBOX Relative Humidity: 48.9 %

EUT Description: Portable Oxygen Concentrator Page: 13 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Equipment Description and Info:

Probe Type	Probe Model	Calibration File	Cal Due Date(YYYYMMDD)	Probe Description
Active Rod	SN-230	C:\EMC\XD\AR230.09	20101005	Active Rod Emissions Antenna
Active Rod	SN-230	C:\EMC\XD\AR230.09	20101005	Active Rod Emissions Antenna
Biconical	SN-0635	C:\EMC\XD\BCEM0635.09	20100810	Biconical Antenna
Biconical	SN-0635	C:\EMC\XD\BCEM0635.09	20100810	Biconical Antenna
Biconical	SN-0635	C:\EMC\XD\BCEM0635.09	20100810	Biconical Antenna
DRG	4106 SN2014	C:\EMC\XD\RG2014.10	20110323	Ridge Guide Antenna 200-1000MHz
DRG	4106 SN2014	C:\EMC\XD\RG2014.10	20110323	Ridge Guide Antenna 200-1000MHz
DRG	SAS 571 SN812	C:\EMC\XD\RGAH-812.10	20110617	Gold DRG Antenna

Preamp ID	Calibration File	Cal Due Date(YYYYMMDD)
None	c:\emc\emissions\preamps\zero.txt	22222222
None	c:\emc\emissions\preamps\zero.txt	22222222
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
Hi Freq - NBLE2610	c:\emc\emissions\preamps\2610_09.txt	20101027

Tested by: Scott D Hager  
Printed

Signature

Reviewed by: Gerald V. Anderson  
Printed

Signature

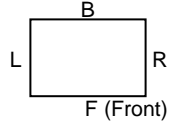
Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions



America



FACE DEFINITION  
(TOP VIEW)

T = Top  
U = Under Side

Test Report #: NC1000473

Test Area: 3

EUT Model #: A-01050

Date: 8/4/2010

EUT Serial #: DemoUnit-1

EUT Power: 8.4 VDC

Temperature: 23 °C

Test Method: RTCA/DO-160E Section 21 Radiated Emissions

Air Pressure: 98.1 kPa

Customer: VBOX

Relative Humidity: 48.9 %

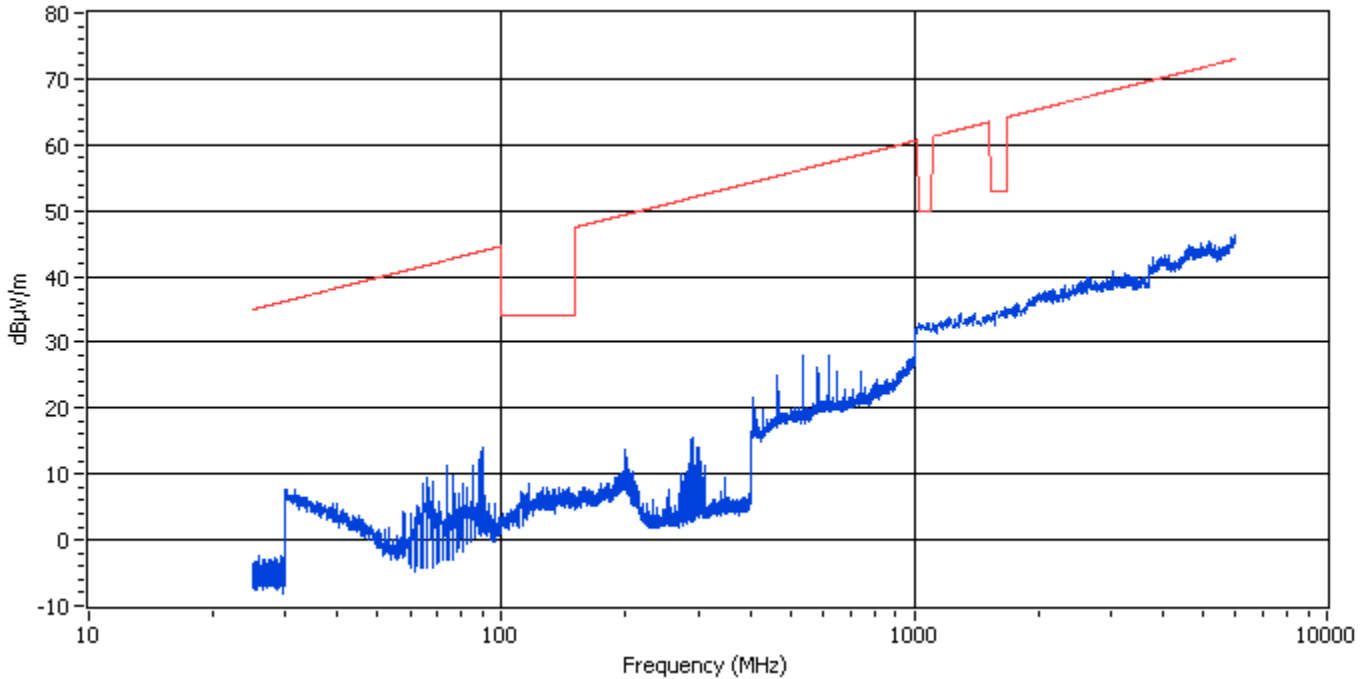
EUT Description: Portable Oxygen Concentrator

Page: 14 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Subreport Number: 4



Polarity: H  
Emission Type: N/A  
Mode of Operation: Fully OP  
Notes:

Tested by: Scott D Hager  
Printed

*Scott D. Hager*  
Signature

Reviewed by: Gerald V. Anderson  
Printed

*G V Anderson*  
Signature

Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions

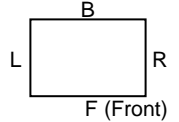


America

Test Report #: NC1000473

Test Area: 3

FACE DEFINITION  
(TOP VIEW)



EUT Model #: A-01050

Date: 8/4/2010

T = Top  
U = Under Side

EUT Serial #: DemoUnit-1

EUT Power: 8.4 VDC

Temperature: 23 °C

Test Method: RTCA/DO-160E Section 21 Radiated Emissions

Air Pressure: 98.1 kPa

Customer: VBOX

Relative Humidity: 48.9 %

EUT Description: Portable Oxygen Concentrator

Page: 15 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Peak Tabular Data - Peak Definitions are:

6.0 dB drop for a peak.

All peaks within 12.0 dB of the limit.

There are no peaks within 12.0 dB of the limit.

Tested by: Scott D Hager  
Printed

Signature

Reviewed by: Gerald V. Anderson  
Printed

Signature

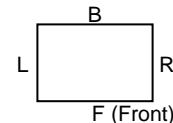
Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc

# Radiated Emissions



America



FACE DEFINITION  
(TOP VIEW)

T = Top  
U = Under Side

Test Report #: NC1000473

Test Area: 3

EUT Model #: A-01050

Date: 8/4/2010

EUT Serial #: DemoUnit-1

EUT Power: 8.4 VDC

Temperature: 23 °C

Test Method: RTCA/DO-160E Section 21 Radiated Emissions

Air Pressure: 98.1 kPa

Customer: VBOX

Relative Humidity: 48.9 %

EUT Description: Portable Oxygen Concentrator

Page: 16 of 16

Notes: \_\_\_\_\_

Data File Name: T:\04xx\0473\Data\RE\0473RE01-New.dat

## Equipment Description and Info:

Probe Type	Probe Model	Calibration File	Cal Due Date(YYYYMMDD)	Probe Description
Biconical	SN-0635	C:\EMC\XD\BCEM0635.09	20100810	Biconical Antenna
Biconical	SN-0635	C:\EMC\XD\BCEM0635.09	20100810	Biconical Antenna
Biconical	SN-0635	C:\EMC\XD\BCEM0635.09	20100810	Biconical Antenna
DRG	4106 SN2014	C:\EMC\XD\RG2014.10	20110323	Ridge Guide Antenna 200-1000MHz
DRG	4106 SN2014	C:\EMC\XD\RG2014.10	20110323	Ridge Guide Antenna 200-1000MHz
DRG	SAS 571 SN812	C:\EMC\XD\RGAH-812.10	20110617	Gold DRG Antenna

Preamp ID	Calibration File	Cal Due Date(YYYYMMDD)
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
NBLE02672	c:\emc\emissions\preamps\NBLE02672_3-3-10.txt	20110303
Hi Freq - NBLE2610	c:\emc\emissions\preamps\2610_09.txt	20101027

Tested by: Scott D Hager  
Printed

Signature

Reviewed by: Gerald V. Anderson  
Printed

Signature

Mode of Operation Key	
#	Description
1	
2	
3	
4	
5	

T:\04xx\0473\Rpt\_Docs\0473RE01-SDH-gva.doc



## EMC Test Plan and Constructional Data Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE. IF TESTING RESULTS IN MODIFICATIONS TO THE EQUIPMENT, PLEASE SUBMIT A REVISED TP/CDF INDICATING THOSE MODIFICATIONS.  
**NOTE: This information will be input into your test report as shown below. Press the F1 key at any time to get HELP for the current field selected.**

Company: VBOX Inc  
 Address: 2342 East County Road J  
White Bear Lake, MN 55110  
 Contact: Ted Jagger Position: Regulatory & Test  
 Phone: 651-407-6206 Fax: \_\_\_\_\_  
 E-mail Address: vboxinc@qwestoffice.net

**General Equipment Description -- NOTE: This information will be input into your test report as shown below.**

EUT Description Portable Oxygen Concentrator  
 EUT Name VBOX Trooper  
 Model No.: A-01050 Serial No.: DemoUnit-1  
 Product Options: Std  
 Configurations to be tested: Device w/ Battery and Devcie with Pwr Supply

**Equipment Modification (If applicable, indicate modifications since EUT was last tested. If modifications are made during this testing, submit revised TP/CDF after testing is complete.)**

Modifications since last test: NA  
 Modifications made during test: NA

**Test Objective(s): Please indicate the tests to be performed, entering the applicable standard(s) where noted.**

- |   |  |
|---|--|
| <input type="checkbox"/> EMC Directive 2004/108/EC (EMC)<br>Std: _____  | <input type="checkbox"/> FCC: Class <input type="checkbox"/> A <input type="checkbox"/> B Part _____         |
| <input type="checkbox"/> Machinery Directive 89/392/EEC (EMC)<br>Std: _____   | <input type="checkbox"/> VCCI: Class <input type="checkbox"/> A <input type="checkbox"/> B                   |
| <input checked="" type="checkbox"/> Medical Device Directive 93/42/EEC (EMC)<br>Std: <u>60601-1-2</u>                           | <input type="checkbox"/> BSMI: Class <input type="checkbox"/> A <input type="checkbox"/> B (Separate Report) |
| <input type="checkbox"/> Vehicle Directive: <input type="checkbox"/> 2001/3/EC (EMC) <input type="checkbox"/> 2004/104/EC (EMC) | <input type="checkbox"/> Canada: Class <input type="checkbox"/> A <input type="checkbox"/> B                 |
| <input type="checkbox"/> FDA Reviewers Guidance for Premarket Notification Submissions (EMC)                                    | <input type="checkbox"/> Australia: Class <input type="checkbox"/> A <input type="checkbox"/> B              |
|   | <input type="checkbox"/> Other: _____  |

**Third Party Certification, if applicable (\*Signature on Page 6 Required)**

- |   |   |
|---|---|
| <input type="checkbox"/> Attestation of Conformity (AoC)*   | <input type="checkbox"/> EMC Certification (used with Octagon Mark)*                                  |
| <input type="checkbox"/> Statement of Compliance (previously CoC)*<br>Protection Class (N/A for vehicles) | <input type="checkbox"/> Compliance Document*   |
| (Press F1 when field is selected to show additional information on Protection Class.)                     | <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III |
| <input type="checkbox"/> FCC / TCB Certification  | <input type="checkbox"/> Industry Canada / FCB Certification  |
| <input type="checkbox"/> E-Mark Certification   | <input type="checkbox"/> Taiwan Certification   |





## EMC Test Plan and Constructional Data Form

### Attendance

Test will be:  Attended by the customer  Unattended by the customer

### Failure - Complete this section if testing will not be attended by the customer.

If a failure occurs, TÜV SÜD America should:

- Call contact listed above, if not available then stop testing. (After hrs phone): \_\_\_\_\_
- Continue testing to complete test series.
- Continue testing to define corrective action.
- Stop testing.

### EUT Specifications and Requirements

Length: 7inch      Width: 3inch      Height: 6inch      Weight: 4 lb

### Power Requirements

*Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)*

Voltage: 90-240 (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: 1

Current (Amps/phase(max)): 5      Current (Amps/phase(nominal)): \_\_\_\_\_

Other \_\_\_\_\_

### Other Special Requirements

Tested with Battery 8.4 VDC (Li-Ion Battery Pack) and Tested with PWR supply 8.4 VDC output

### Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)  
Residential, Hospital, Vehicle, Airplane, Where ever a person lives.

### EUT Power Cable

- Permanent      OR       Removable      Length (in meters): 2
- Shielded      OR       Unshielded
- Not Applicable



## EMC Test Plan and Constructional Data Form

EUT Interface Ports and Cables														
Type	Analog	Digital	During Test		Qty	Shielding		Termination	Connector Type	Port Termination	Length tested (in meters)	Removable	Permanent	
			Active	Passive		Yes	No							Type
<b>EXAMPLE:</b> RS232	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Foil over braid	Coaxial	Metallized 9-pin D-Sub	Characteristic Impedance	6	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>



## EMC Test Plan and Constructional Data Form

### EUT Software.

Revision Level: V7-10

Description: VBOX O2 Assembly language program on a 18F6722 chip.

**Equipment Under Test (EUT) Operating Modes to be Tested --** list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Device battery powered 8.4VDC
  
2. Device PWR supply powered 8.4 VDC
  
- 3.

**Equipment Under Test (EUT) System Components --** List and describe all components which are part of the EUT. For FCC & Taiwan testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc)

Description	Model #	Serial #	FCC ID #
PWR Supply- CUI	DTM090500UC-P128-C1	1026	
Charger Battery-CellCon	452541-LB	1309	



## EMC Test Plan and Constructional Data Form

**Support Equipment** -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)  
This information is required for FCC & Taiwan testing.

<i>Description</i>	<i>Model #</i>	<i>Serial #</i>	<i>FCC ID #</i>

### Oscillator Frequencies

<i>Manufacturer</i>	<i>Frequency</i>	<i>Derived Frequency</i>	<i>Component # / Location</i>	<i>Description of Use</i>

### Power Supply

<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Type</i>
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____

### Power Line Filters

<i>Manufacturer</i>	<i>Model #</i>	<i>Location in EUT</i>



## EMC Test Plan and Constructional Data Form

<b>Critical EMI Components (Capacitors, ferrites, etc.)</b>				
<i>Description</i>	<i>Manufacturer</i>	<i>Part # or Value</i>	<i>Qty</i>	<i>Component # / Location</i>

**EMC Critical Detail** -- Describe other EMC Design details used to reduce high frequency noise.

PLEASE ENTER NAMES BELOW (INSERT ELECTRONIC SIGNATURE IF POSSIBLE)

**Authorization (Signature Required if a Third Party Certification is checked on pg 1)**

\_\_\_\_\_  
Customer authorization to perform tests according to this test plan.

\_\_\_\_\_  
Date

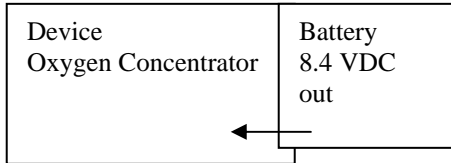
\_\_\_\_\_  
Test Plan/CDF Prepared By (please print)

\_\_\_\_\_  
Date

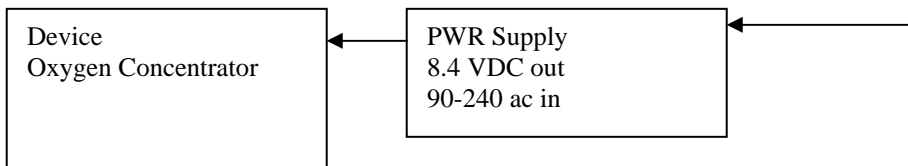


# EMC Block Diagram Form

**System Configuration Block Diagram** -- Provide a line drawing identifying the EUT, simulators, support equipment, I/O cables, power cables, and any other pertinent components to be used during testing. Use a dashed line to separate the equipment in the testing field versus equipment outside testing field.



or



## Authorization Signatures

\_\_\_\_\_  
Customer authorization to perform tests according to this test plan.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Test Plan/CDF Prepared By (please print)

\_\_\_\_\_  
Date