KTL Test Report:	9R01682.1
Applicant:	Ascom Systec Ltd. Gewerbepark Magenwil, Switzerland CH-5506
Equipment Under Test: **(E.U.T.)**	Barry Vox OPTO3000 Avalanche Beacon Transmitter
In Accordance With:	**FCC Part 15, Subpart C, Paragraph 15.209** General Limits For Low Power Transmitters
Tested By:	KTL Ottawa Inc. 3325 River Road, R.R. 5 Ottawa, Ontario K1V 1H2
Authorized By:	
	R. Grant, Wireless Group Manager
Date:	
Total Number of Pages:	18

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Section 1. Summary Of Test Results

Manufacturer:	Ascom Systec Ltd.
Model No.:	Barry Vox OPTO3000
Serial No.:	R0000083
Date Received In Laboratory:	September 17, 1999
KTL Identification No.:	Item 1

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15, Subpart C for low power devices. All tests were conducted using measurement procedure ANSI C63.4-1992. Radiated Emissions were made on an open area test site.

☒	New Submission	☒	Production Unit
☐	Class II Permissive Change	☐	Pre-Production Unit

D	C	D	Equipment Code

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See " Summary of Test Data".

NVLAP LAB CODE: 100351-0

TESTED BY: _____ DATE: _____
Kevin Rose, Test Technician

Summary Of Test Data

NAME OF TEST	PARA. NO.	RESULT
Powerline Conducted Emissions	15.207	Not Applicable
Radiated Emissions	15.209	Complies
Occupied Bandwidth	Not Specified	Complies (Refer To Plots)

Footnotes For N/A's:

Test Conditions:

Indoor	Temperature:	21 °C
	Humidity:	34 %
Outdoor	Temperature:	16 °C
	Humidity:	31 %

Section 2. General Equipment Specification

Frequency Range:	Fixed 457 kHz
Operating Frequency(ies) of Sample:	457 kHz
Modulation:	Unmodulated
Emission Designator:	3K20PON

	Yes	**No**
Integral Antenna	☒	☐

Note: *If antenna is not integral to transmitter explain method of attachment and type of unique connector:*

Description of Modification for Class II Permissive Change

NOT APPLICABLE

Modifications Made During Testing

NOT APPLICABLE

Section 3. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207
TESTED BY:	DATE:

Minimum Standard:

Frequency (MHz)	Maximum Powerline Conducted RF Voltage (μV)	(dBμV)
0.45 - 30.0	250	48

NOT APPLICABLE

Test Results: Complies / Does not comply. See attached graph(s).

Measurement Data: See attached graph(s).

Method of Measurement: (Procedure ANSI C63.4-1992)

Measurements were made using a spectrum analyzer with 10 kHz RBW, Peak Detector. Any emissions that are close to the limit are measured using a test receiver with 10 kHz bandwidth, CISPR Quasi-Peak Detector.

Powerline Conducted Photographs (Worst Case Configuration)

SIDE VIEW

NOT APPLICABLE

FRONT VIEW

Section 4. Radiated Emissions

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.209
TESTED BY: Kevin Rose	DATE: September 21, 1999

Minimum Standard: The field strength of emissions from the device shall not exceed the following limits.

Fundamental (MHz)	Field Strength (µV/m)	Field Strength (dBµV)
0.009 - 0.490	2400/F(kHz) @ 300m	—
0.490 - 1.705	24000/F(kHz) @ 30m	—
1.705 - 30	30 @ 30m	—
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

Test Results: Complies. The worst-case emission level is 7.3 dBµV/m @ 3m at 0.457 MHz. This is 7.1 dB below the specification limit.

Measurement Data: **(Procedure ANSI C63.4-1992)**

Maximizing Emission Levels:
For hand held equipment or equipment that may be mounted in a variety of positions, the E.U.T. was tested on three orthogonal axis to determine orientation of worst-case emission levels. Below 30 MHz an active loop antenna is used at a fixed height of 1 meter. The loop is rotated about it's vertical axis to obtain worst-case results.

Spectrum Searched:
The spectrum was searched from the lowest frequency generated in the E.U.T. up to 1000 MHz, or the 10^{th} harmonic of the fundamental emission.

Near-Field Measurement:
Emissions below 30 MHz are measured in the near-field and an extrapolation factor of 40 dB per decade is used to determine the limit.

Example: Measurement Distance = 10m
Specification Distance = 300m

10m Limit: Specified limit (at 300m) - (40 Log $\frac{10}{300}$)

Thus for measurement at 10m the specified limit is increased by 59 dB.

Test Data - Radiated Emissions

Test Distance (meters) : 3		Range: A Tower		Receiver: 8565E		RBW(kHz): 10		Detector: Peak
Freq. (kHz)	Ant. *	Table (deg.)	RCVD Signal (dBµV/m)	Ant. Factor (dB)**	Dist. Corr. (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
457.0	L	3	67.3	20	-80.0	7.3	14.4	7.1
914.0	L	1	45.8	20	-59.1	6.7	28.4	21.7
1828.0	L	1	32.3	20	-59.1	-6.8	29.5	36.3
2285.0	L	1	34.2	20	-59.1	-4.9	29.5	34.4
2742.0	L	1	32.8	20	-59.1	-6.3	29.5	35.8
3199.0	L	1	26.5	20	-59.1	-12.6	29.5	42.1
3656.0	L	1	26.0	20	-59.1	-13.1	29.5	42.6
4113.0	L	1	30.0	20	-59.1	-9.1	29.5	38.6
4520.0	L	1	26.5	20	-59.1	-12.6	29.5	42.1

Notes:
B/C = Biconical, B/L = Biconilog, L/P = Log-Periodic, H = Horn, D/P = Dipole, L = Loop Antenna
* Re-measured using dipole antenna.
** Includes cable loss when amplifier is not used.
*** Includes cable loss.
( ) Denotes failing emission level.

Radiated Photographs (Worst Case Configuration)

Front View

Section 5. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: N/A
TESTED BY: Kevin Rose	DATE: September 21, 1999

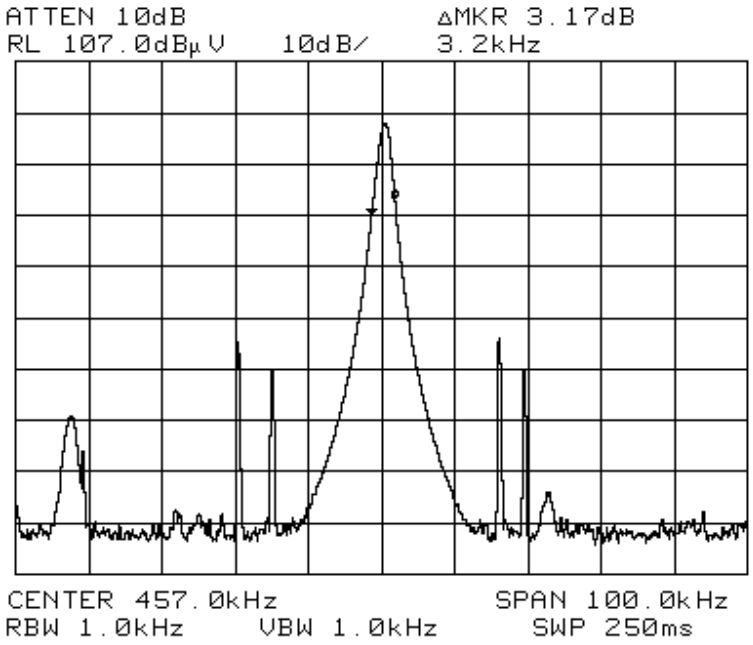
Minimum Standard: Not specified.

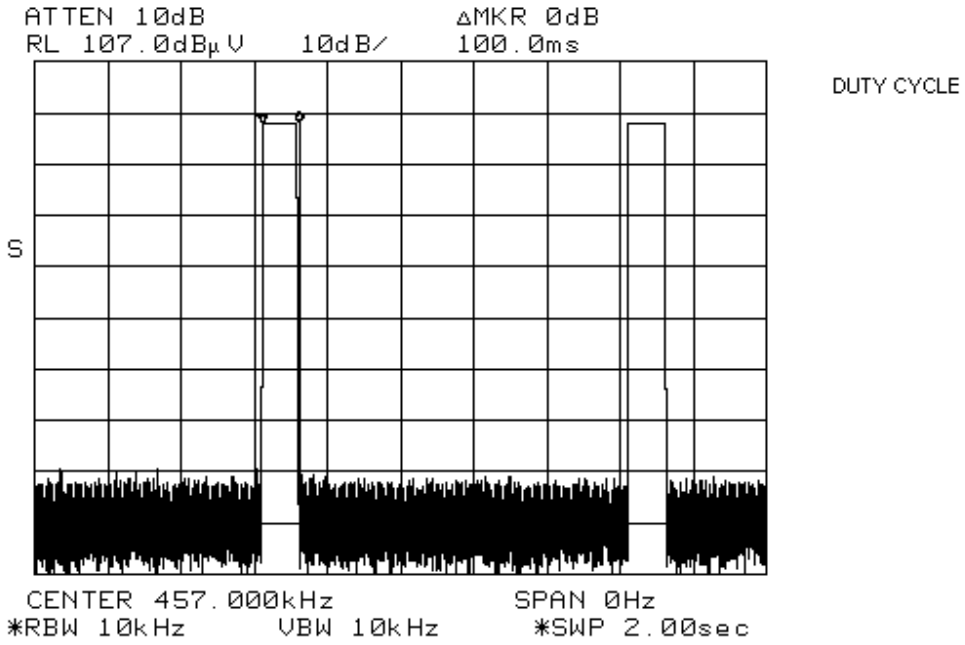
Test Results: The 99% power occupied bandwidth is 3.2 kHz.

Measurement Data: See attached graph(s).

Method of Measurement:

A spectrum analyzer was used to measure the 99% power occupied bandwidth of the fundamental emission. This value is used as the bandwidth for the emission designator.


ATTEN 10dB
RL 107.0dBµV
10dB/
ΔMKR 3.17dB
3.2kHz
457KHZ TX 99% BANDWIDTH
CENTER 457.0kHz
SPAN 100.0kHz
RBW 1.0kHz
VBW 1.0kHz
SWP 250ms


ATTEN 10dB
RL 107.0dBµV
10dB/
ΔMKR 0dB
100.0ms
DUTY CYCLE
S
CENTER 457.000kHz
SPAN 0Hz
*RBW 10kHz
VBW 10kHz
*SWP 2.00sec

Section 6. Test Equipment List

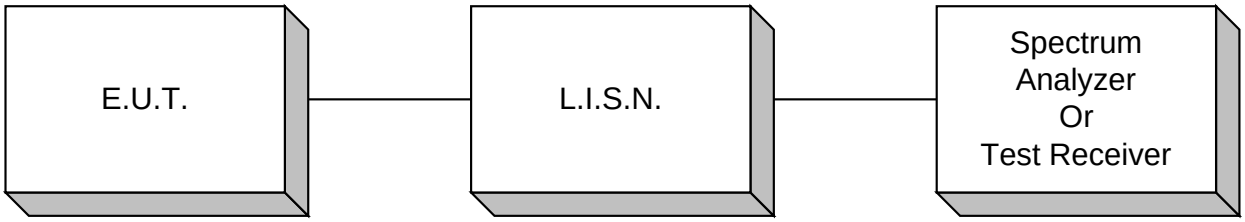
CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	June 16/99	June 16/00
1 Year	Receiver	Rohde & Schwarz	ESH3	892473/002	July 23/98	Sept. 24/99
	Biconilog Antenna	EMCO	3143	1038	NCR	NCR
2 Year	Active Loop Antenna	Rohde & Schwarz	HFH2-Z2	FA000631	Feb. 6/98	Feb. 6/00

NA: Not Applicable
NCR: No Cal Required
COU: CAL On Use

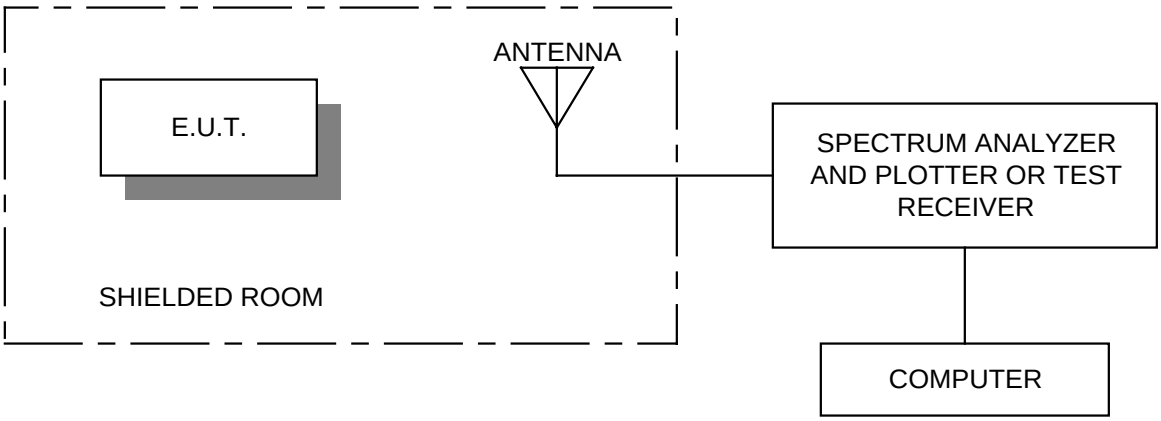
ANNEX A

TEST DIAGRAMS

Conducted Emissions



Radiated Prescan



Test Site For Radiated Emissions