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## Annex to Test Report DocNo.: 75938097-04

August 3, 2017

Page 1 of 20

Nr. / No. TR-486871-90134-12 (Edition 1)

Applicant: Siemens AG  
Type of equipment: WLAN Access Point  
Type designation: MSN65-W1-M12-E2  
Order No.: ---  
Test standards: FCC Code of Federal Regulations,  
CFR 47, Part 15,  
Sections 15.107 (Class B)

Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 6 (Information Technology Equipment (ITE) - Limits and methods of measurement), Sections 5(a)(i) and 5(b)(i), Class B [only conducted emission has been tested]

### Note:

The test data of this report is related only to the individual item which has been tested. This report shall not be reproduced except in full extent without the written approval of the testing laboratory.



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BNetzA-CAB-16/21-15

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## 1 Description of the Equipment Under Test (EUT)

### General data of EUT

Type designation <sup>1</sup> :	MSN65-W1-M12-E2
Parts <sup>2</sup> :	Access Point
Serial number(s):	not serialised
Manufacturer:	Siemens AG
Type of equipment:	WLAN Access Point
Version:	HW: 1 / SW: 6.1
FCC ID:	LYHMSN65V1
Industry Canada ID:	267AA-MSN65V1
Additional parts/accessories:	---

### Technical data of EUT

Type of power supply:	DC supply
Specifications for power supply:	nominal voltage: 24 V

<sup>1</sup> Type designation of the system if EUT consists of more than one part.

<sup>2</sup> Type designations of the parts of the system, if applicable.



## 2 Administrative Data

### Application details

Applicant (full address):	Siemens AG 76181 Karlsruhe, Germany
Contact person:	Dr. Malgorzata JANSON
Order number:	---
Receipt of EUT:	Oct. 14, 2016
Date(s) of test:	July 26, 2017
Note(s):	---

### Report details

Report number:	TR-486871-90134-12
Edition:	1
Issue date:	August 03, 2017



### 3 Identification of the Test Laboratory

#### Details of the Test Laboratory

Company name:	TÜV SÜD Product Service GmbH
Address:	Aeussere Fruehlingstrasse 45 D-94315 Straubing Germany
Laboratory accreditation:	DAkKS Registration No. D-PL-11321-11-01
Laboratory recognition:	Registration No. BNetzA-CAB-16/21-15
Industry Canada test site registration:	3050A-2
Contact person:	Mr. Markus Biberger
	Phone: +49 9421 5522-0 Fax: +49 9421 5522-99



## 4 Summary

### Summary of test results

The tested sample complies with the requirements set forth in the



**Code of Federal Regulations CFR 47, Part 15, Sections 15.107 (Class B)**

of the Federal Communication Commission (FCC) and partly the

**Interference-Causing Equipment Standard ICES-003 Issue 6 (Information Technology Equipment (ITE) - Limits and methods of measurement), Sections 5(a)(i) and 5(b)(i), Class B [only conducted emission has been tested]**

of Industry Canada (IC).

Die Prüfergebnisse beziehen sich ausschließlich auf das zur Prüfung vorgestellte Prüfmuster. Ohne schriftliche Genehmigung des Prüflabors darf der Prüfbericht auszugsweise nicht vervielfältigt werden. *The test results relate only to the individual item which has been tested. Without the written approval of the test laboratory this report may not be reproduced in extracts.*

Datum / Date	Geprüft von / Tested by	Freigabe durch / Checked by
August 03, 2017	 Matthias Stumpe Responsible for testing	 Matthias Schmid Reviewer

Prüfergebnis / Test Result
<input checked="" type="checkbox"/> Erfüllt / Passed
<input type="checkbox"/> Nicht erfüllt / Not passed



## 5 Operation Mode and Configuration of EUT

### Operation Mode(s)

EUT operating as WLAN Accesspoint in 2.4 GHz Band

### Configuration(s) of EUT

One PC/Notebook connected to EUT on WLAN Interface. Second PC/Notebook is connected to EUT on LAN interface. Second PC/Notebook continuously sends ping-command to firstPC/Notebook.

### List of ports and cables

Port	Description	Classification <sup>3</sup>	Cable type	Cable length
1	DC power supply	dc power	Unshielded	
2	LAN Interface -1-	signal/control port	Shielded (STP)	5 m
3	LAN Interface -2-	signal/control port	Shielded (STP)	5 m

### List of devices connected to EUT

Item	Description	Type Designation	Serial no. or ID	Manufacturer
1	Power Supply	NGSM 32/10	192.0810.31	Rohe & Schwarz
2	PC/Notebook	Probook 4520s	2CE0511D19	hp

### List of support devices

Item	Description	Type Designation	Serial no. or ID	Manufacturer
3	Power Supply	NGSM 32/10	192.0810.31	Rohe & Schwarz
4	PC/Notebook	Probook 4520s	2CE0511D19	hp

<sup>3</sup> Ports shall be classified as ac power, dc power or signal/control port

## 6 Measurement Procedures

### 6.1 Conducted AC Powerline Emission

#### Measurement Procedure:

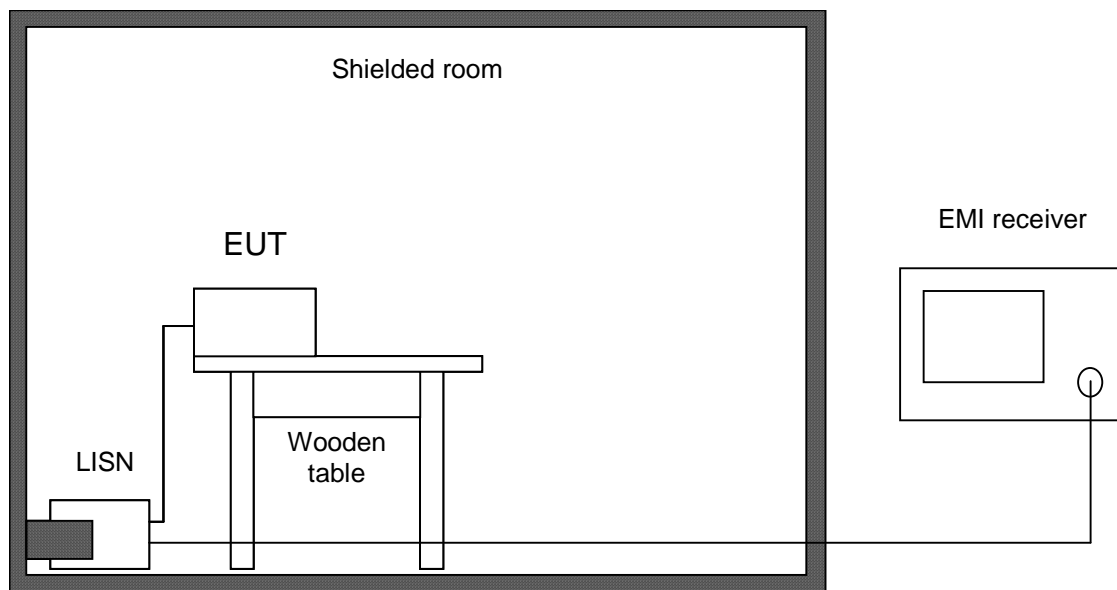
Rules and specifications: CFR 47 Part 15, section 15.107 (Class B)  
 IC ICES-003 Issue 6, section 5(a)(i), Class B

Guide: ANSI C63.4 / CISPR 22

Conducted emission tests in the frequency range 150 kHz to 30 MHz are performed using Line Impedance Stabilization Networks (LISNs). To simplify testing with quasi-peak and average detector the following procedure is used:

First the whole spectrum of emission caused by the equipment under test (EUT) is recorded with detector set to peak using CISPR bandwidth of 10 kHz. After that all emission levels having less margin than 10 dB to or exceeding the average limit are retested with detector set to quasi-peak.

If average limit is kept with quasi-peak levels no additional scan with average detector is necessary. In cases of emission levels between quasi-peak and average limit an additional scan with detector set to average is performed.







Test instruments used:

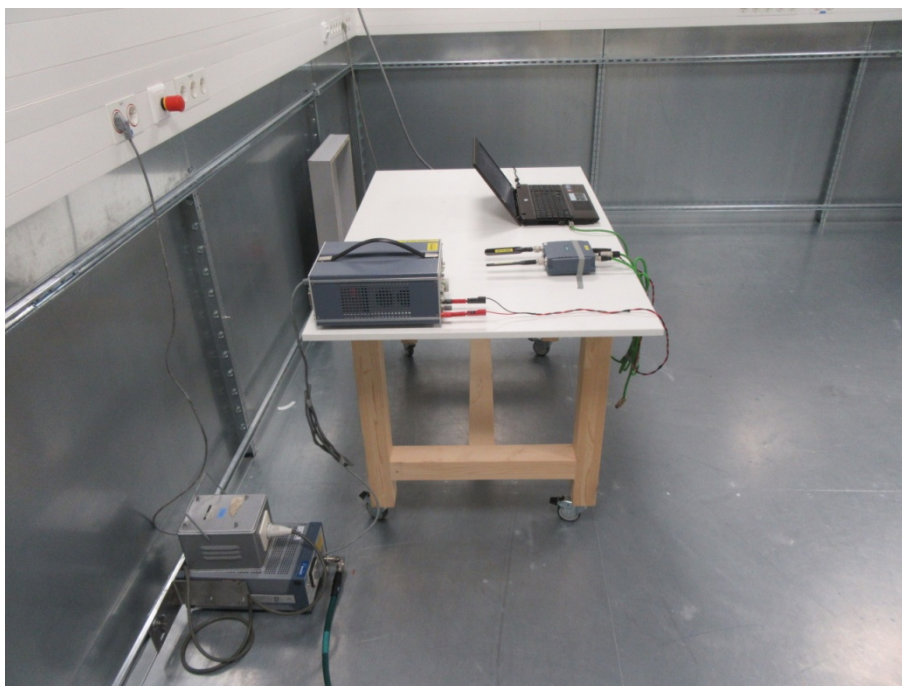
Type	Designation	Inv.-no.	Serial No. or ID	Manufacturer
<input checked="" type="checkbox"/> Test receiver	ESHS 10	1028	860043/016	Rohde & Schwarz
<input checked="" type="checkbox"/> V-network	ESH 3-Z5	1059	894785/005	Rohde & Schwarz
<input type="checkbox"/> V-network	ESH 3-Z5	1218	830952/025	Rohde & Schwarz
<input type="checkbox"/> Artificial mains network	ESH 2-Z5	1536	842966/004	Rohde & Schwarz
<input checked="" type="checkbox"/> Microwave cable	FB293C1080005050	2157	72110-02	Rosenberger Micro-Coax
<input type="checkbox"/> Coax cable	RG214 N/N 5m	1188	---	Senton
<input checked="" type="checkbox"/> Shielded room	No. 1	1451	---	Albatross
<input type="checkbox"/> Shielded room	No. 4	1454	3FD 100 544	Euroshield
<input checked="" type="checkbox"/> Measurement Software	EMC32_K1 V9.26.01	2230	100281	Rohde & Schwarz



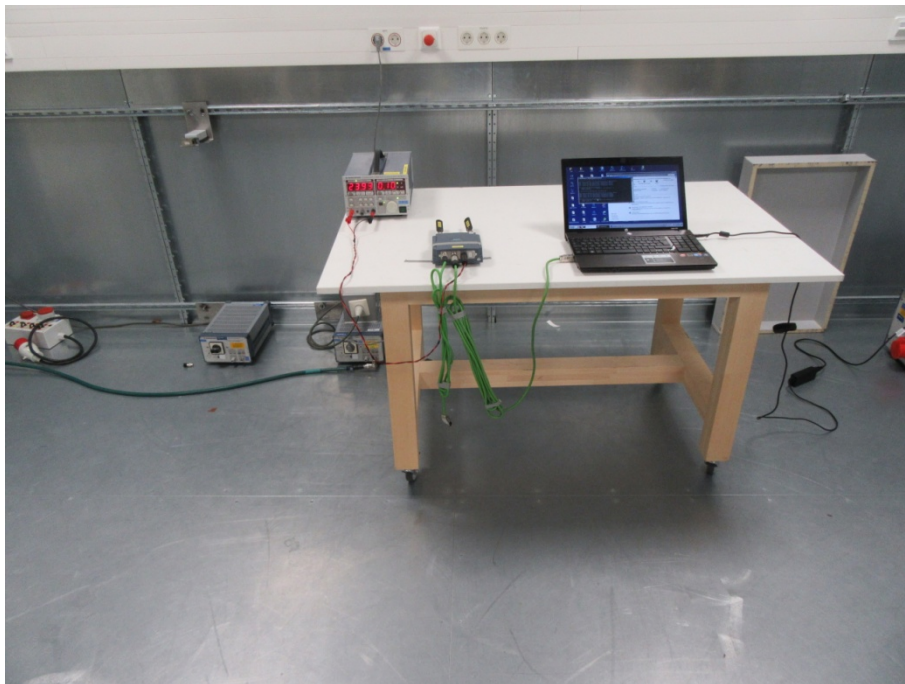
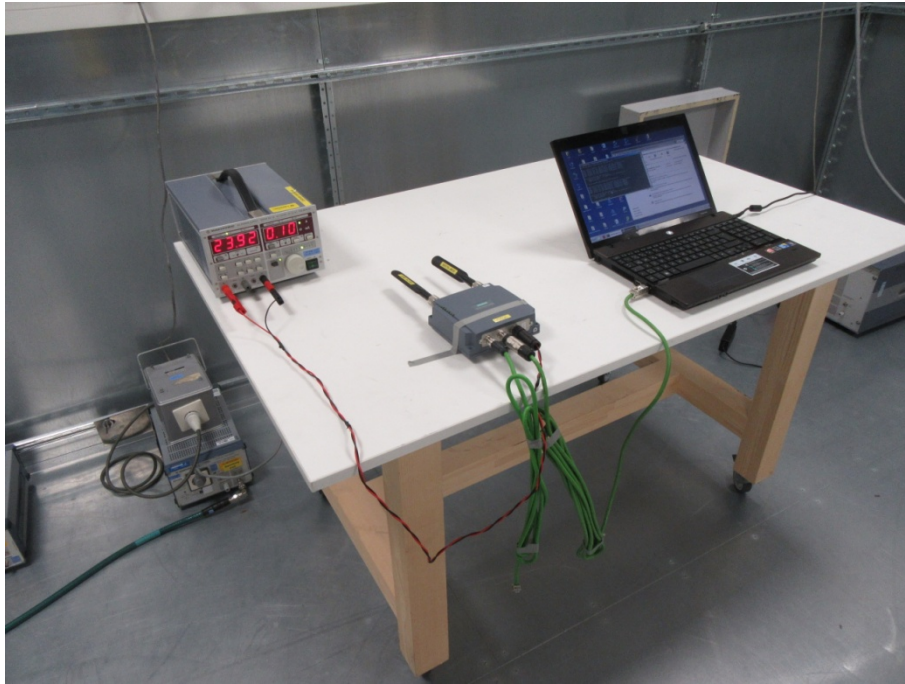
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## **7 Photographs Taken During Testing**

## Test setup for conducted AC powerline emission measurement



## Test setup for conducted AC powerline emission measurement - continued -





## 8 Test Results

<b>FCC CFR 47 Part 15 (Class B)</b>			
<i>Section(s)</i>	<i>Test</i>	<i>Page</i>	<i>Result</i>
15.107	Conducted AC powerline emission 150 kHz to 30 MHz	14	Test passed
15.109	Radiated emission 30 MHz to 1 GHz	---	Not performed

<b>IC ICES-003 Issue 6 (Class B)</b>			
<i>Section(s)</i>	<i>Test</i>	<i>Page</i>	<i>Result</i>
5	Power line conducted emissions 150 kHz to 30 MHz	14	Test passed
5	Radiated emissions 30 MHz to 1 GHz	---	Not performed



## 8.1 Conducted Powerline Emission Measurement 150 kHz to 30 MHz

Rules and specifications:	CFR 47 Part 15, section 15.107 (Class B) IC ICES-003 Issue 6, section 5(a)(i), Class B		
Guide:	ANSI C63.4 / CISPR 22		
Limit:	Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
		Quasi-peak	Average
	0.15 - 0.5	66 to 56	56 to 46
	0.5 - 5	56	46
	5 - 30	60	50
Measurement procedure:	Conducted AC Powerline Emission (6.1)		

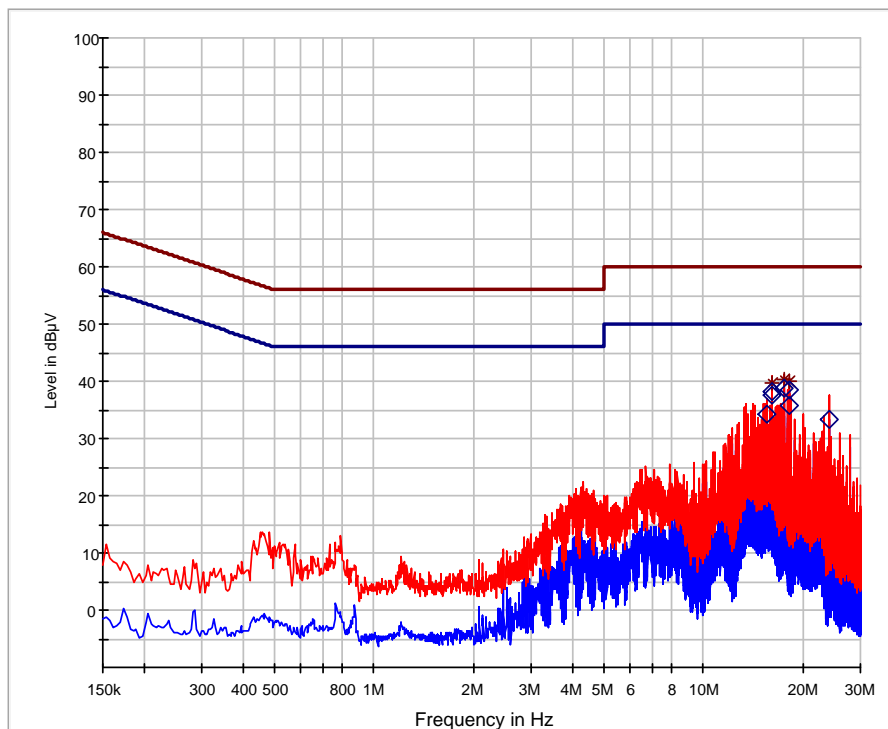
Comment:	---
Date of test:	July 14, 2017
Test site:	Shielded room, cabin no. 4

Test Result:	Test passed
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Tested on:

L1



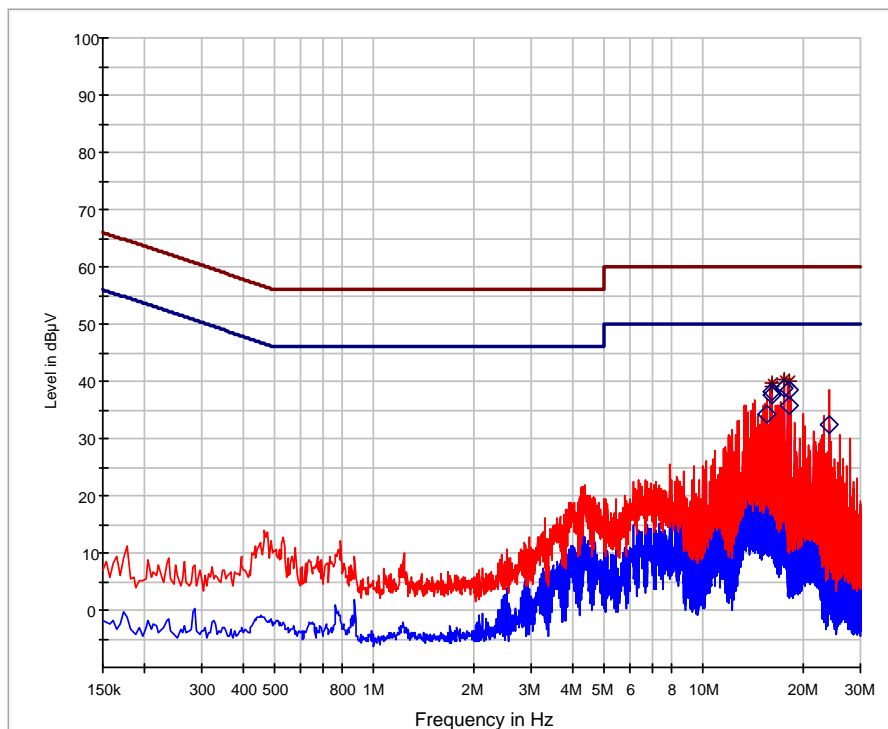
— Preview Result 2-AVG  
— FCC 15.207 AV  
— Preview Result 1-PK+  
\* Final\_Result QPK  
— FCC 15.207 QP  
◇ Final\_Result AVG

**Final Results:**

Frequency MHz	QuasiPeak dBµV	Average dBµV	Limit dBµV	Margin dB
15,618000	0,00	34,18	50,00	15,82
16,166000	0,00	37,57	50,00	12,43
16,226000	39,69	0,00	60,00	20,31
16,226000	0,00	38,23	50,00	11,77
17,694000	0,00	38,79	50,00	11,21
17,694000	40,39	0,00	60,00	19,61
18,242000	0,00	38,52	50,00	11,48
18,242000	40,03	0,00	60,00	19,97
18,302000	0,00	35,84	50,00	14,16
23,998000	0,00	33,22	50,00	16,78

Tested on:

N



— Preview Result 2-AVG  
— FCC 15.207 AV  
— Preview Result 1-PK+  
\* Final\_Result QPK  
— FCC 15.207 QP  
◇ Final\_Result AVG

**Final Results:**

Frequency MHz	QuasiPeak dBµV	Average dBµV	Limit dBµV	Margin dB
15,618000	0,00	34,21	50,00	15,79
16,166000	0,00	37,59	50,00	12,41
16,166000	39,08	0,00	60,00	20,92
16,226000	0,00	38,24	50,00	11,76
16,226000	39,68	0,00	60,00	20,32
17,694000	0,00	38,76	50,00	11,24
17,694000	40,37	0,00	60,00	19,63
18,242000	0,00	38,47	50,00	11,53
18,242000	39,97	0,00	60,00	20,03
18,302000	0,00	35,79	50,00	14,21
23,998000	0,00	32,30	50,00	17,70



## 9 Referenced Regulations

All tests were performed with reference to the following regulations and standards:

<input type="checkbox"/>	CFR 47 Part 2	Code of Federal Regulations Part 2 (Frequency allocation and radio treaty matters; General rules and regulations) of the Federal Communication Commission (FCC)	October 1, 2014
<input checked="" type="checkbox"/>	CFR 47 Part 15	Code of Federal Regulations Part 15 (Radio Frequency Devices) of the Federal Communication Commission (FCC)	October 1, 2014
<input checked="" type="checkbox"/>	ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	June 13, 2014 (published on June 20, 2014)
<input type="checkbox"/>	ANSI C63.10	American national Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	June 27, 2013 (published on September 13, 2013)
<input type="checkbox"/>	RSS-Gen	Radio Standards Specification RSS-Gen Issue 4 containing General Requirements for Compliance of Radio Apparatus, published by Industry Canada	November 2014
<input type="checkbox"/>	RSS-210	Radio Standards Specification RSS-210 Issue 9 for Licence-Exempt Radio Apparatus: Category I Equipment, published by Industry Canada	August 2016
<input type="checkbox"/>	RSS-310	Radio Standards Specification RSS-310 Issue 3 for Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category II Equipment, published by Industry Canada	December 2010
<input type="checkbox"/>	RSS-102	Radio Standards Specification RSS-102 Issue 5: Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands), published by Industry Canada	March 2015
<input checked="" type="checkbox"/>	ICES-003	Interference-Causing Equipment Standard ICES-003 Issue 6: Information Technology Equipment (Including Digital Apparatus) – Limits and methods of measurement, published by Industry Canada	January 2016
<input checked="" type="checkbox"/>	CISPR 22	Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment – Radio Disturbance Characteristics – Limits and Methods of Measurement"	1997
<input checked="" type="checkbox"/>	CAN/CSA CISPR 22-10	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement (Adopted IEC CISPR 22:2008, sixth edition, 2008-09)	2010



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TRC-43

Designation of Emissions, Class of Station and Nature of Service, published by Industry Canada

November 2012



## 10 Test Equipment List with Calibration Data

<i>Type</i>	<i>Inv.-No.</i>	<i>Type Designation</i>	<i>Serial Number</i>	<i>Manufacturer</i>	<i>Calibration Organization</i>	<i>Last Calibration</i>	<i>Next Calibration</i>
EMI test receiver	1863	ESCI3	100008	Rohde & Schwarz	Rohde & Schwarz	10/2016	10/2017
V-network	1059	ESH3-Z5	894785/005	Rohde & Schwarz	Rohde & Schwarz	10/2016	10/2019

Note 1: No calibration required.

Note 2: Not calibrated separately but with the whole test system when recording calibration data.

Note 3: No calibration required. Devices are checked before use.

Note 4: No calibration required. Devices are checked by calibrated equipment during test.

## 11 Revision History

Revision History			
<i>Edition</i>	<i>Date</i>	<i>Issued by</i>	<i>Modifications</i>
1	Aug.03, 2017	M. Stumpe	First Edition