



- The RvA is a signatory to the EA MLA.
- The RvA is a signatory to the ILAC MRA.
- The RvA is a signatory to the IAF MLA.
- FCC Registration Number: NL0002 / 375449
- ISED CABid: NL0003 / Company number: 27051

Test report No:  
2293759.0502A-RSM

## TEST REPORT

### USA FCC Part 15.207 & CANADA RSS-247, RSS-Gen

(*) Identification of item tested	Toplighting Force gen 2.0
(*) Trademark	Philips
(*) Model and /or type reference	TLF20 4160 3.6 RWLB 277-400V WC3 QB SP
(*) Features	Bluetooth LE, ZigBee
(*) Derived model(s)	TLF20 5000 3.6 RWLB 400V WC2 QB MP
(*) Applicant's name / address	Signify Netherlands N.V. HTC7, 5656AE Eindhoven The Netherlands
Test method requested, standard	USA FCC Part 15.207 (10-1-23) Edition: Conducted limits. CANADA RSS-247 Issue 3 (August 2023). CANADA RSS-Gen Issue 5 Amendment 1 (March 2019) and Amendment 2 (February 2021). ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Verdict Summary	IN COMPLIANCE (refer to chapter 4 for details)
Tested by (name / position & signature)	Valtteri Lehtisalo Technical Professional EMC&Wireless 
Supervised by (name / position & signature)	Jose Carlos Luque Technical Professional EMC&Wireless 
Approved by (name / position & signature)	Sedat Eser Technical Professional EMC&Wireless 
Date of issue	2025-05-13
Report template No	TRF_EMCA_FCC_ISED R2.0 (*) "Data provided by the applicant"

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## COMPETENCES AND GUARANTEES

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The DEKRA Certification B.V. EMC&Wireless laboratory has been designated by the “Radio communications Agency of the Netherlands” as a Conformity Assessment Body for all products addressed by Parts 15 and Part 18 of the FCC rules per designation AT-EZ/EU-USA/MRA002 since December 1, 2005.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

**IMPORTANT:** No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

## GENERAL CONDITIONS

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1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

## UNCERTAINTY

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For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in EN 55016-4-2 (CISPR 16-4-2) or a product standard, the measurement instrumentation uncertainty has been calculated and applied in accordance with these standards. For all other measurements where no guidance is available, the measurement instrumentation uncertainty has been calculated and applied in accordance with ISO/IEC Guide 98-3 document.

Uncertainties have been calculated according to the DEKRA internal document AMS#1167. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%. Refer to the Annex 1 for further information.

## CONFORMITY ASSESSMENT

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For all EMI (emission) tests (when included in this report), as measurement uncertainties ( $U_{LAB}$ ) are less than the values  $U_{CISPR}$  given in CISPR 16-4-2 (EN 55016-4-2) (Table-1), compliance with the limits is determined by comparing measurement results directly with corresponding limits without taking into consideration of measurement uncertainties.

## ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

## POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

## DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

<input checked="" type="checkbox"/> Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT.			
<input type="checkbox"/> Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT.			
Decimal separator used in this report	<input type="checkbox"/>	Comma (,)	<input checked="" type="checkbox"/> Point (.)

## ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test	Rx	: Receiver
QP	: Quasi-Peak	N/A	: Not Applicable
CAV	: CISPR Average	N/M	: Not Measured
AV	: Average	S#	: Sample number
PK	: Peak	OM#	: Operating mode number
CDN	: Coupling Decoupling Network	Conf#	: Configuration number
SAC	: Semi-Anechoic Chamber	V <sub>m</sub>	: Measured voltage
OATS	: Open Area Test Site	CF	: Correction factor
BW	: Bandwidth	V <sub>RX</sub>	: Voltage measured by the receiver
U <sub>N</sub>	: Nominal voltage	FS	: Field Strength
Tx	: Transmitter		

## DATA PROVIDED BY THE APPLICANT

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The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested", Features and "Derived model(s)").
2. Derived model tested. These models have been declared by the applicant as being the same as the model under test.
3. Identity declaration. See below.

DEKRA Certification B.V. declines any responsibility with respect to the information provided by the applicant and that may affect the validity of results.

# ⑥signify

Dekra

To: Jose Carlos Luque  
Meander 1051  
825 MJ Arnhem  
The Netherlands

Subject: Letter of similarity

Date: 11/12/2024

With this writing we confirm that all wireless versions of the TLF20 portfolio (indicated with WC2 or WC3 in the product name) use the same radio module, with the same settings and RF paths.

As example the 2 luminaires (TLF20 4160 3.6 RWLB 277-400V WC3 QB and the TLF20 5000 3.6 RWLB 400V WC2 QB) which have been tested by Dekra, comply with the above statement. We also confirm that both tested products make use of the same controlgear.

Kind Regards,

Tom Ceulemans



11/12/24

Insert appropriate legal text here

## DOCUMENT HISTORY

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Report nr.	Date	Description
2293759.0502-RSM	2024-12-18	First release.
2293759.0502A-RSM	2025-05-13	Second realease. Typos were corrected. This revision of the test report cancels and replaces the test report with a reference number 2293759.0502-RSM.

## CONCLUSION, REMARKS AND COMMENTS

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The equipment under test (EUT) described in this test report does meet the stated EMC requirements of the regulation/standard(s) given in this report.

## 1 GENERAL INFORMATION

### 1.1 General Description of the Item(s)

Description of the item.....	Toplighting Force gen 2.0				
Model / Type number .....	TLF20 5000 3.6 RWLB 400V WC2 QB MP TLF20 4160 3.6 RWLB 277-400V WC3 QB SP				
Serial number.....	929003965051 / 929003965044				
Trademark .....	Philips				
Manufacturer.....	Signify Netherlands BV				
Address .....	HTC7 , 5656AE Eindhoven, the Netherlands				

#### Model: TLF20 5000 3.6 RWLB 400V WC2 QB SP

Rated power supply.....	Voltage and Frequency	Power connection type				
		L1	L2	L3	N	PE
	<input checked="" type="checkbox"/> AC: 400 V, 50/60Hz	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/> DC 5V, to radio device					
Rated Power .....	1408W					
Clock frequencies.....	<100 kHz: Switching convertors <input checked="" type="checkbox"/> 16 and 32 MHz part Micro					
Other parameters.....	BLE Bluetooth 4.2 (5.1 compliant) + Zigbee 3.0.					
Software version .....	1.3.2 FW Radio board					
Hardware version.....	Integrated RF module V1					
Dimensions in cm (W x H x D) ....	25x16x2.5mm					
Mounting position .....	<input type="checkbox"/> <i>Table top equipment</i> <input type="checkbox"/> <i>Wall/Ceiling mounted equipment</i> <input type="checkbox"/> <i>Floor standing equipment</i> <input type="checkbox"/> <i>Hand-held equipment</i> <input checked="" type="checkbox"/> <i>Other: Via brackets in green house environment</i>					

#### Derived model: TLF20 4160 3.6 RWLB 277-400V WC2 QB SP

Rated power supply.....	Voltage and Frequency	Power connection type				
		L1	L2	L3	N	PE
	<input checked="" type="checkbox"/> AC: 277V, 50Hz/60Hz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/> AC 347V, 60Hz	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/> AC 400V, 50/ 60 Hz	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<input checked="" type="checkbox"/> DC 5V, to radio device					
Rated Power .....	1170W					

#### RF interface 1:

Technology .....	BLE Bluetooth 4.2 (5.1 compliant)
Frequency band / range(s) .....	2.402 - 2.480 GHz
Maximum conducted output power :	10dBm
Type of Modulation(s).....	Non-FHSS
Number of channel.....	11 (0-39)

Channel spacing .....	2 MHz
Channel bandwidth .....	BLE 1Mbit PHY:1MHz/ BLE 2Mbit PHY:2MHz
Type of antenna .....	Integrated
Antenna gain.....	-6dBi

**RF interface 2:**

Technology .....	Zigbee 3.0 (802.15.4)
Frequency band / range(s) .....	2.405 -2.480 GHz
Maximum conducted output power :	10dBm
Type of Modulation(s).....	Non-FHSS
Number of channel.....	6
Channel spacing .....	5 MHz
Channel bandwidth .....	2.4 MHz
Type of antenna .....	Integrated
Antenna gain.....	-6dBi

**Intended use of the Equipment Under Test (EUT)**

The new TLF2.0 range with integrated RF module V1.0 is to control light and light recipes in a green house environment. Once commissioned via BLE, the communication to a group of luminaires is done via Zigbee.

## Copy of marking plate:



GreenPower LED Module

FCC ID: 01234567891234

IC: 01234567891200

929003965051

P.O. 136658296

Made in Poland

TLF20 5000 3.6 RWLB 400V WC2 QB MP

400Vac 50/60Hz 1408W PF: $\geq 0.98$ 

ta: 0...+40°C IP66

Indoor use only; Suitable for wet locations

Tc.



Signify, I.B.R.S.10461,5600 VB,NL

A980.136658296.0016 24W40



GreenPower LED Module

UK Importer address: Signify

Commercial UK Limited 3, Guildford

Business Park, GU2 8XG

929003965044

P.O. 135546477

Made in Poland



Signify, I.B.R.S.10461,5600 VB,NL

A164.135546477.0027 24W20

## 2 DESCRIPTION OF TEST SETUP

### 2.1 Sample(s) used for tests

During the tests the following sample(s) has(have) been used.

Sample	Logistics number	Model number	Serial number	Remark(s) / Changes
01	107043 / 1-2	TLF20 5000 3.6 RWLB 400V WC2 QB MP	929003965051	---
02	105042 / 1-0	TLF20 4160 3.6 RWLB 277- 400V WC3 QB SP	929003965044	---
<u>Supplementary information:</u>				
---				

### 2.2 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Operating mode	Operating mode description	Sup. Info / Remark
01	EUT ON. BLE 1Mbit GFSK TX continuous modulated carrier at 2440MHz.	---
02	EUT ON. ZigBee 250kBit OQPSK TX continuous modulated carrier at 2440MHz.	---
<u>Supplementary information:</u>		
---		

### 2.3 Port(s) of the EUT

Port name and description	Connected to / Termination	Cable			Sup. Info / Remark
		Length used during test [m]	Attached during test	Shielded	
Power port	AC mains	0.6	Yes	No	---
<u>Supplementary information:</u>					
---					

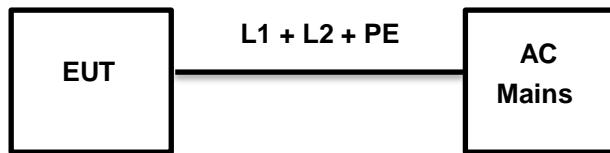
### 2.4 Support / Auxiliary equipment / unit / software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment / unit / software	Type / Version	Manufacturer	Supplied by
Laptop	5420	DELL	DEKRA B.V.
<u>Supplementary information:</u>			
Used for setting the EUT TX on.			

## 2.5 Test Configuration / Block diagram used for tests

The following test setup / configuration / block diagram has been used during the tests:



### 3 MEASUREMENT PROCEDURE

#### 3.1 Conducted emissions

In accordance with section 15.207 of 47CFR Part 15C, the conducted radio frequency disturbance voltages between each of the power lines (live and neutral) and the ground terminal have been determined over the frequency range from 150 kHz to 30 MHz using test configuration described at chapter 2.5. The test set-up was in accordance with the requirements of ANSI C63.10.

The measurement result/emission level ( $V_m$ ) is calculated by adding correction factor (CF) to the measured level ( $V_{RX}$ ) from the receiver. This correction factor includes cable loss ( $L_{CABLE}$ ) and the insertion loss (IL) of the LISN.

$$CF \text{ (dB)} = L_{CABLE} \text{ (dB)} + IL \text{ (dB)}$$

$$V_m \text{ (dB}\mu\text{V)} = V_{RX} \text{ (dB}\mu\text{V)} + CF \text{ (dB)}$$

Sample Calculation:

$$CF \text{ (dB)} : 1.2 \text{ dB} + 0.8 \text{ dB} = 2.0 \text{ dB}$$

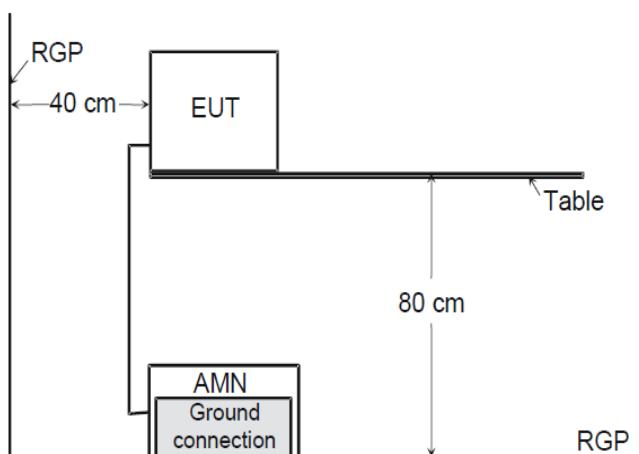
$$V_m \text{ (dB}\mu\text{V)} : 43.4 \text{ dB}\mu\text{V} + 2.0 \text{ dB} = 45.4 \text{ dB}\mu\text{V/m.}$$

**Important Note:** This is a sample calculation only for the purpose of demonstration, and does not reflect data in this report.

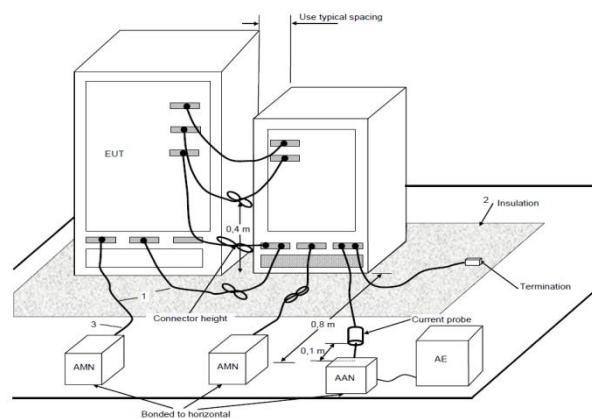
The AC power line conducted emission measurements were performed at the line voltage of 120 V<sub>AC</sub> and at the power frequency of 60 Hz.

The initial step in collecting conducted data was a peak scan measurement over the frequency range of interest. The significant peaks were marked and these peaks were re-measured using a quasi peak and average detectors.

This procedure was implemented by using EMI test receiver and control software (see used equipment section).



Test setup for "Table-top" EUT.



Test setup for "Floor-standing" EUT.

## 4 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

### 4.1 Standards

Standard	Year	Description
FCC Part 15 Subpart C	10-1-23 Edition	FCC Rules and Regulations 47 CFR Chapter I Part 15 Subpart C - Radio Frequency Devices.
RSS-247	2023-08	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices.
RSS-Gen Issue 5 + Amendment 1 + Amendment 2	April 2018 + March 2019 + February 2021	General Requirements for Compliance of Radio Apparatus
ANSI C63.10	2013	American National Standard for Testing Unlicensed Wireless Devices

### 4.2 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards:

N/A

### 4.3 Overview of results

EMISSION TESTS			
Requirement – Test case	Basic standard(s)	Verdict	Remark
Conducted disturbance voltage – Mains port	ANSI C63.10	PASS	---
<u>Supplementary information:</u>			--

## 5 EMISSION TEST RESULTS

5.1	Conducted disturbance voltage – Mains port	VERDICT: PASS
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Standard	FCC Rules & Regulations 47 CFR Chapter I - Part 15 Subpart C Clause 15.207 / RSS-247 clause 3.1 & RSS-Gen 8.8
Basic standard	ANSI C63.10
<u>Supplementary information / Remark:</u>	
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### Limits

47 CFR Chapter I - Part 15 Subpart C Clause 15.207(a) / RSS Gen 8.8				
Frequency range [MHz]	Limit: QP [dB( $\mu$ V) <sup>1)</sup> ]	Limit: AV [dB( $\mu$ V) <sup>1)</sup> ]	IF BW	Detector(s)
0.15 - 0.5	66 to 56	56 to 46	9 kHz	QP, CAV
0.5 - 5	56	46	9 kHz	QP, CAV
5 - 30	60	50	9 kHz	QP, CAV

<sup>1)</sup> At the transition frequency, the lower limit applies.

### Performed measurements

The following configuration(s) and parameter(s) was/were used for testing:

Test set-up		Table-top. Equipment on a table of 80 cm height. 40 cm. distance to VGP.
	X	Table-top. Equipment on a table of 40 cm height. 40 cm. distance to HGP.
		Floor-standing. Equipment on the floor (insulated from ground plane).
		Artificial hand applied.
	Other:	

S#	OM#	Conf#	[V]/[Hz] (mains)	Detector	Frequency range	Port/Terminal	Method	P/F	Sup. Info/Remark
01	01	---	120/60	QP/CAV	150 kHz - 30 MHz	Power port/L1, L2	AMN/LISN	P	---
01	02	---	120/60	QP/CAV	150 kHz - 30 MHz	Power port/L1, L2	AMN/LISN	P	---
02	01	---	120/60	QP/CAV	150 kHz - 30 MHz	Power port/L1, L2	AMN/LISN	P	---
02	02	---	120/60	QP/CAV	150 kHz - 30 MHz	Power port/L1, L2	AMN/LISN	P	---

Supplementary information / Remark:

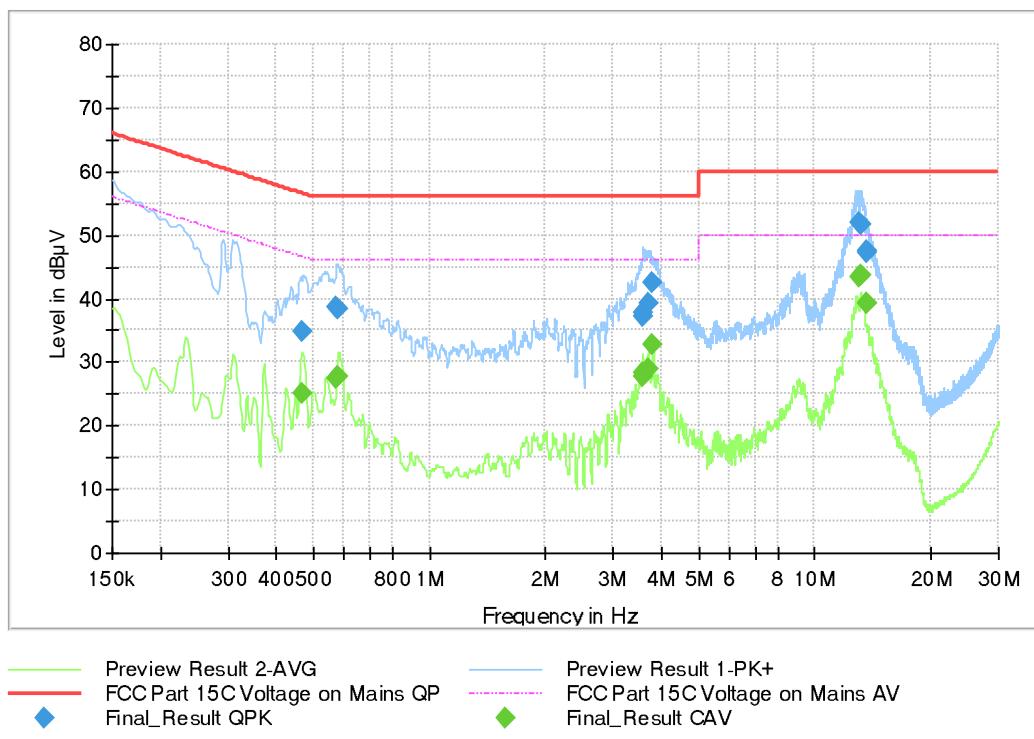
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Test equipment used				
Equipment	Manufacturer	Model	Dekra ID	Cal. Due
Artificial Mains Network	Rohde-Schwarz	ESH2-Z5	128201	2025-08
Coaxial Cable	Huber&Suhner	RG 223-U	128370	2025-20
EMI Test Receiver	Rohde&Schwarz	ESR 7	132185	2025-39
Pulse Limiter	Rohde&Schwarz	ESH3-Z2	116979	2025-44
Test-Control Software	Rohde-Schwarz	EMC32 V10.60.20	500005	---

## Measurement data:

## Common Information

EUT/Sample # / OM# : TLF20 5000 3.6 RWLB 400V WC2 QB MP / 01 / 01  
 Voltage/Frequency : 120 V / 60Hz  
 Port/Terminal under test : AC Main port  
 Remark/Comment : EUT ON. BLE TX on at 2440MHz.



## Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.467250	---	25.07	46.56	21.49	3000.0	9.000	L2	GND	10.0
0.467250	34.75	---	56.56	21.82	3000.0	9.000	L2	GND	10.0
0.575250	---	27.46	46.00	18.54	3000.0	9.000	L2	GND	10.0
0.575250	38.65	---	56.00	17.35	3000.0	9.000	L2	GND	10.0
0.579750	---	27.61	46.00	18.39	3000.0	9.000	L2	GND	10.0
0.579750	38.46	---	56.00	17.54	3000.0	9.000	L2	GND	10.0
3.567750	---	27.84	46.00	18.16	3000.0	9.000	L2	GND	10.2
3.567750	37.31	---	56.00	18.69	3000.0	9.000	L2	GND	10.2
3.574500	---	28.42	46.00	17.58	3000.0	9.000	L2	GND	10.2
3.574500	37.70	---	56.00	18.30	3000.0	9.000	L2	GND	10.2
3.718500	---	28.83	46.00	17.17	3000.0	9.000	L2	GND	10.2
3.718500	39.22	---	56.00	16.78	3000.0	9.000	L2	GND	10.2

## Measurement data:

3.806250	---	32.86	46.00	13.14	3000.0	9.000	L2	GND	10.2
3.806250	42.37	---	56.00	13.63	3000.0	9.000	L2	GND	10.2
13.116750	---	43.45	50.00	6.55	3000.0	9.000	L1	GND	10.4
13.116750	51.84	---	60.00	8.16	3000.0	9.000	L1	GND	10.4
13.150500	---	43.61	50.00	6.39	3000.0	9.000	L1	GND	10.4
13.150500	51.81	---	60.00	8.19	3000.0	9.000	L1	GND	10.4
13.706250	---	39.25	50.00	10.75	3000.0	9.000	L1	GND	10.4
13.706250	47.38	---	60.00	12.62	3000.0	9.000	L1	GND	10.4
13.708500	---	39.20	50.00	10.80	3000.0	9.000	L1	GND	10.4
13.708500	47.38	---	60.00	12.62	3000.0	9.000	L1	GND	10.4

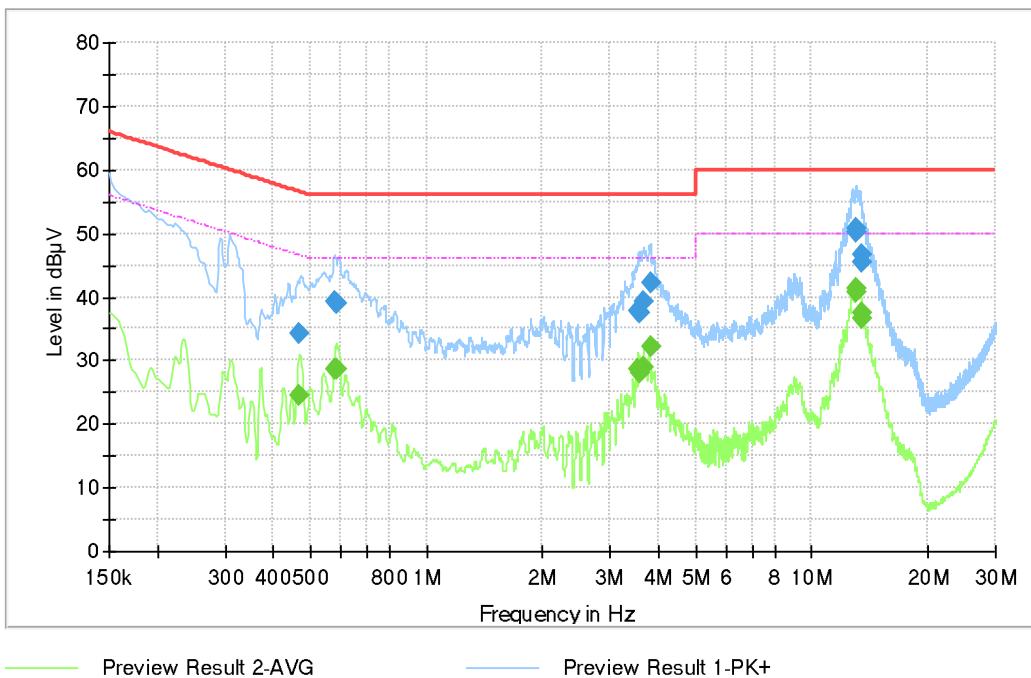
**Supplementary information:**

- The "Margin" is with reference to the emissions limit. A positive number indicates that the emission measurement is below the limit. A negative number indicates that the emission measurement exceeds the limit.
- The given graph is the combination of max-hold function of each line.

## Measurement data:

## Common Information

EUT/Sample # / OM# : TLF20 5000 3.6 RWLB 400V WC2 QB MP / 01 / 02  
 Voltage/Frequency : 120 V / 60Hz  
 Port/Terminal under test : AC Main port  
 Remark/Comment : EUT ON. ZigBee TX on at 2440MHz.



## Final\_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.469500	---	24.52	46.52	22.00	3000.0	9.000	L2	GND	10.0
0.469500	34.30	---	56.52	22.22	3000.0	9.000	L2	GND	10.0
0.577500	---	28.54	46.00	17.46	3000.0	9.000	L2	GND	10.0
0.577500	39.27	---	56.00	16.73	3000.0	9.000	L2	GND	10.0
0.582000	39.07	---	56.00	16.93	3000.0	9.000	L2	GND	10.0
0.582000	---	28.61	46.00	17.39	3000.0	9.000	L2	GND	10.0
3.554250	---	28.64	46.00	17.36	3000.0	9.000	L2	GND	10.2
3.554250	37.82	---	56.00	18.18	3000.0	9.000	L2	GND	10.2
3.561000	37.59	---	56.00	18.41	3000.0	9.000	L2	GND	10.2
3.561000	---	28.02	46.00	17.98	3000.0	9.000	L2	GND	10.2
3.662250	---	28.94	46.00	17.06	3000.0	9.000	L2	GND	10.2
3.662250	39.20	---	56.00	16.80	3000.0	9.000	L2	GND	10.2
3.808500	42.29	---	56.00	13.71	3000.0	9.000	L2	GND	10.2

## Measurement data:

3.808500	---	32.16	46.00	13.84	3000.0	9.000	L2	GND	10.2
12.984000	---	40.61	50.00	9.39	3000.0	9.000	L1	GND	10.4
12.984000	50.05	---	60.00	9.95	3000.0	9.000	L1	GND	10.4
13.074000	---	41.41	50.00	8.59	3000.0	9.000	L1	GND	10.4
13.074000	50.70	---	60.00	9.30	3000.0	9.000	L1	GND	10.4
13.551000	---	37.48	50.00	12.52	3000.0	9.000	L1	GND	10.4
13.551000	46.74	---	60.00	13.26	3000.0	9.000	L1	GND	10.4
13.566750	45.60	---	60.00	14.40	3000.0	9.000	L1	GND	10.4
13.566750	---	36.49	50.00	13.51	3000.0	9.000	L1	GND	10.4

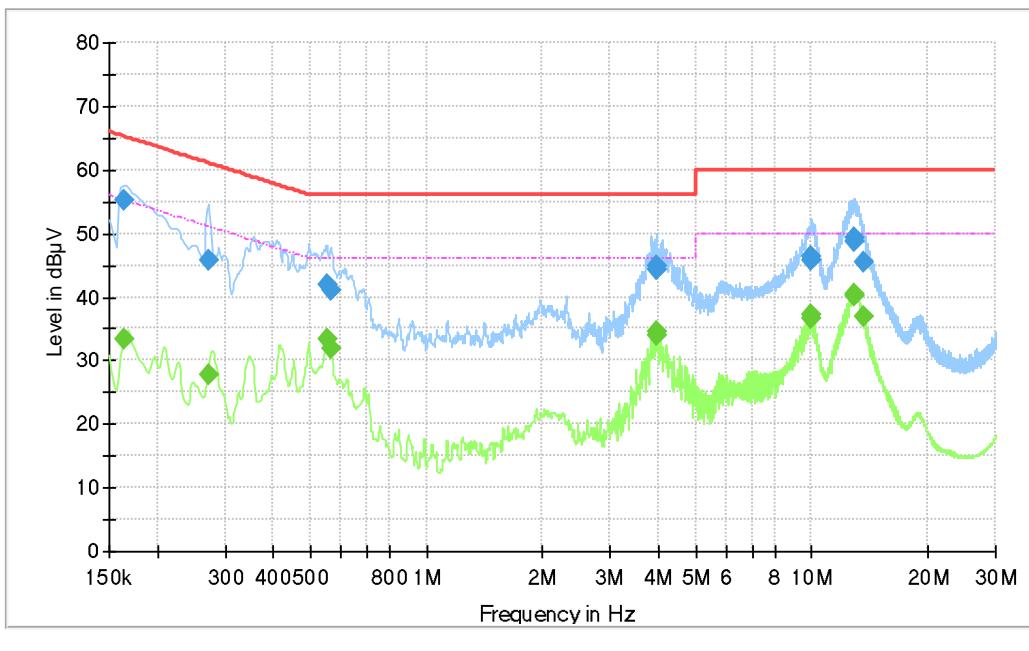
**Supplementary information:**

- The "Margin" is with reference to the emissions limit. A positive number indicates that the emission measurement is below the limit. A negative number indicates that the emission measurement exceeds the limit.
- The given graph is the combination of max-hold function of each line.

## Measurement data:

## Common Information

EUT/Sample # / OM# : TLF20 4160 3.6 RWLB 277-400V WC3 QB SP / 02 / 01  
 Voltage/Frequency : 120 V / 60Hz  
 Port/Terminal under test : AC Main port  
 Remark/Comment : EUT ON. BLE TX on at 2440MHz.



Preview Result 2-AVG  
 FCC Part 15C Voltage on Mains QP  
 Final\_Result QPK

Preview Result 1-PK+  
 FCC Part 15C Voltage on Mains AV  
 Final\_Result CAV

## Final\_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.163500	---	33.28	55.28	22.00	3000.0	9.000	L2	GND	10.0
0.163500	55.25	---	65.28	10.04	3000.0	9.000	L2	GND	10.0
0.271500	---	27.89	51.07	23.18	3000.0	9.000	L2	GND	10.0
0.271500	45.77	---	61.07	15.31	3000.0	9.000	L2	GND	10.0
0.550500	41.83	---	56.00	14.17	3000.0	9.000	L2	GND	10.0
0.550500	---	33.32	46.00	12.68	3000.0	9.000	L2	GND	10.0
0.566250	40.91	---	56.00	15.09	3000.0	9.000	L2	GND	10.0
0.566250	---	31.79	46.00	14.21	3000.0	9.000	L2	GND	10.0
3.950250	---	33.91	46.00	12.09	3000.0	9.000	L1	GND	10.2
3.950250	44.20	---	56.00	11.80	3000.0	9.000	L1	GND	10.2
3.963750	---	34.56	46.00	11.44	3000.0	9.000	L1	GND	10.2
3.963750	45.00	---	56.00	11.00	3000.0	9.000	L1	GND	10.2
9.973500	46.22	---	60.00	13.78	3000.0	9.000	L2	GND	10.3

## Measurement data:

9.973500	---	37.19	50.00	12.81	3000.0	9.000	L2	GND	10.3
9.982500	45.84	---	60.00	14.16	3000.0	9.000	L2	GND	10.3
9.982500	---	36.60	50.00	13.40	3000.0	9.000	L2	GND	10.3
12.878250	49.27	---	60.00	10.73	3000.0	9.000	L2	GND	10.4
12.878250	---	40.44	50.00	9.56	3000.0	9.000	L2	GND	10.4
12.959250	---	40.16	50.00	9.84	3000.0	9.000	L1	GND	10.4
12.959250	48.80	---	60.00	11.20	3000.0	9.000	L1	GND	10.4
13.602750	45.32	---	60.00	14.68	3000.0	9.000	L1	GND	10.4
13.602750	---	36.94	50.00	13.06	3000.0	9.000	L1	GND	10.4

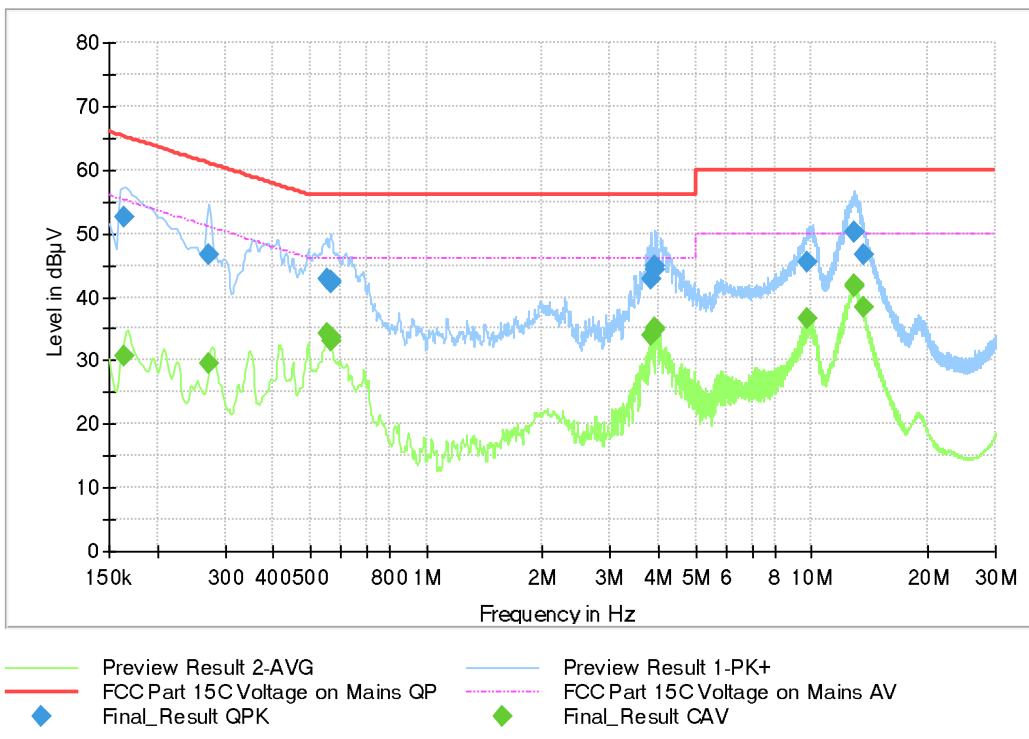
**Supplementary information:**

- The "Margin" is with reference to the emissions limit. A positive number indicates that the emission measurement is below the limit. A negative number indicates that the emission measurement exceeds the limit.
- The given graph is the combination of max-hold function of each line.

## Measurement data:

## Common Information

EUT/Sample # / OM# : TLF20 4160 3.6 RWLB 277-400V WC3 QB SP / 02 / 02  
 Voltage/Frequency : 120 V / 60Hz  
 Port/Terminal under test : AC Main port  
 Remark/Comment : EUT ON. ZigBee TX on at 2440MHz.



## Final\_Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.163500	---	30.67	55.28	24.61	3000.0	9.000	L2	GND	10.0
0.163500	52.52	---	65.28	12.77	3000.0	9.000	L2	GND	10.0
0.273750	---	29.58	51.00	21.43	3000.0	9.000	L2	GND	10.0
0.273750	46.66	---	61.00	14.34	3000.0	9.000	L2	GND	10.0
0.550500	42.83	---	56.00	13.17	3000.0	9.000	L2	GND	10.0
0.550500	---	34.28	46.00	11.72	3000.0	9.000	L2	GND	10.0
0.564000	42.50	---	56.00	13.50	3000.0	9.000	L2	GND	10.0
0.564000	---	33.64	46.00	12.36	3000.0	9.000	L2	GND	10.0
0.566250	---	33.02	46.00	12.98	3000.0	9.000	L2	GND	10.0
0.566250	42.27	---	56.00	13.73	3000.0	9.000	L2	GND	10.0
3.817500	42.76	---	56.00	13.24	3000.0	9.000	L1	GND	10.2
3.817500	---	33.92	46.00	12.08	3000.0	9.000	L1	GND	10.2
3.914250	---	35.10	46.00	10.90	3000.0	9.000	L1	GND	10.2

## Measurement data:

3.914250	44.92	---	56.00	11.08	3000.0	9.000	L1	GND	10.2
3.925500	44.38	---	56.00	11.62	3000.0	9.000	L1	GND	10.2
3.925500	---	34.82	46.00	11.18	3000.0	9.000	L1	GND	10.2
9.750750	45.45	---	60.00	14.55	3000.0	9.000	L2	GND	10.3
9.750750	---	36.67	50.00	13.33	3000.0	9.000	L2	GND	10.3
12.860250	50.31	---	60.00	9.69	3000.0	9.000	L2	GND	10.4
12.860250	---	41.82	50.00	8.18	3000.0	9.000	L2	GND	10.4
12.864750	---	41.68	50.00	8.32	3000.0	9.000	L2	GND	10.4
12.864750	50.25	---	60.00	9.75	3000.0	9.000	L2	GND	10.4
13.591500	---	38.25	50.00	11.75	3000.0	9.000	L1	GND	10.4
13.591500	46.70	---	60.00	13.30	3000.0	9.000	L1	GND	10.4

**Supplementary information:**

- The "Margin" is with reference to the emissions limit. A positive number indicates that the emission measurement is below the limit. A negative number indicates that the emission measurement exceeds the limit.
- The given graph is the combination of max-hold function of each line.

## 6 ANNEX 1 - MEASUREMENT UNCERTAINTIES

The table(s) below show(s) the measurement uncertainties of the EMC test set-ups. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%.

Emission tests	Uncertainty	Ucispr
RF Conducted disturbance (mains port) 150 kHz–30 MHz / AMN: R&S ESH2-Z5	2.15 dB	3.40 dB

## 7 ANNEX 2 - TEST PHOTOS

The photographs show the tested device.



Test Photo(s):

Conducted emissions test set-up



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End of the Test report