



CE RF Test Report

Project No.	:	2403G103
Equipment	:	Smart Video Phone
Brand Name	:	XONTEL
Test Model	:	XT-50G
Series Model	:	N/A
Applicant	:	XonTel Technology Trd. Co. W.L.L
Address	:	Office 21 - Justice Tower - Ali Al Salem St Qibla - Kuwait City - State
		Of Kuwait
Manufacturer	:	XonTel Technology Trd. Co. W.L.L
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		Of Kuwait
Date of Receipt	:	Aug. 13, 2021
Date of Test	:	Aug. 17, 2021 ~ Dec. 27, 2021
Issued Date	:	May 06, 2024
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG20210816158 for conducted,
		DG20210816159 for radiated.
Standard(s)	:	ETSI EN 300 328 V2.2.2 (2019-07)

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.(Dongguan).

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. BTL assumes no responsibility for the data provided by the customer, any statements, inferences or generalizations drawn by the customer or others from the reports issued by BTL.

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BTL's laboratory quality assurance procedures are in compliance with the ISO/IEC 17025: 2017 requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective. Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.



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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-ETSP-2-2403G103	R00	 This is a copy report which referencing test data are provided from test report (BTL-ETSP-2-2108C114). The device is identical to the original one recorded in the referencing report. 1. The brand name, model name, applicant and manufacturer information are changed. 2. Removed the factory information. Based on above described change which does not affect the test results. Other are kept the same. 	May 06, 2024	Valid

Remark: For the original report (BTL-ETSP-2-2108C114), the test data, data evaluation, and equipment configuration contained was accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).



1. RF EMISSIONS MEASUREMENT

1.1 TEST FACILITY

The test facilities used to collect the test data in this report is DG-CB15/TR17 at the location of No.3, Jinshagang 1st Road, Dalang, Dongguan, Guangdong, China.

1.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty figures shall be calculated according the methods described in the ETSI TR 100 028 and shall correspond to an expansion factor (coverage factor) k=1.96 or k=2(which provide confidence levels of respectively 95% and 95.45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).

Measurement Uncertainty for a Level of Confidence of 95.45%, $U=2\times u_c(y)$.

The BTL measurement uncertainty as below table:

Parameter	Uncertainty
Output Power	±0.95 dB
Occupied Channel Bandwidth	±3.8 %
Power Spectral Density	±0.86 dB
Conducted Spurious Emission	±2.71 dB
Spurious Emissions, Radiated $f \le 1$ GHz	±3.50 dB
Spurious Emissions, Radiated 1GHz < $f \le 12.75$ GHz	±3.54 dB
Temperature	±0.08 °C
Time	±0.58 %
Supply voltages	±0.3 %

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
RF Output Power	Normal & Extreme	51%	DC 12V	Mark Wu
Power Spectral Density	22.4°C	51%	DC 12V	Mark Wu
Occupied Channel Bandwidth	22.4°C	51%	DC 12V	Mark Wu
Transmitter unwanted emissions in the OOB domain	22.4°C	51%	DC 12V	Mark Wu
Transmitter unwanted emissions in the spurious domain	23°C	35%-44%	AC 230V/50Hz	Andrew Jiang
Receiver spurious emissions	23°C	44%	AC 230V/50Hz	Andrew Jiang
Receiver Blocking	22.4°C	51%	DC 12V	Mark Wu

1.4 TEST CHANNEL

Test Channel	EUT Channel	Test Frequency
low	CH00	2402 MHz
middle	CH19	2440 MHz
high	CH39	2480 MHz



1.5 TEST METHODOLOGY AND RESULT

Harmonised Standard ETSI EN 300 328						
	Essential Requirement Requirement Conditionality					
No	Description	Reference: Clause No	U/C	Condition	Result	
1	RF Output Power	4.3.1.2 or 4.3.2 2	U	-	Pass	
2	Power Spectral Density	4.3.2.3	С	Only for non-FHSS equipment	Pass	
3	Duty cycle, Tx-Sequence, Tx-gap	4.3.1.3 or 4.3.2.4	с	Only for non-Adaptive equipment	N/A	
4	Accumulated Transmit time, Frequency Occupation & Hopping Sequence	4.3.1.4	С	Only for FHSS equipment	N/A	
5	Hopping Frequency Separation	4.3.1.5	С	Only for FHSS equipment	N/A	
6	Medium Utilization	4.3.1.6 or 4.3.2.5	С	Only for non-Adaptive equipment	N/A	
7	Adaptivity	4.3.1.7 or 4.3.2.6	С	Only for Adaptive equipment	N/A	
8	Occupied Channel Bandwidth	4.3.1.8 or 4.3.2.7	U	-	Pass	
9	Transmitter unwanted emissions in the OOB domain	4.3.1.9 or 4.3.2.8	U	-	Pass	
10	Transmitter unwanted emissions in the spurious domain	4.3.1.10 or 4.3.2.9	U	-	Pass	
11	Receiver spurious emissions	4.3.1.11 or 4.3.2.10	U	-	Pass	
12	Receiver Blocking	4.3.1.12 or 4.3.2.11	U	-	Pass	
13	Geo-location capability	4.3.1.13 or 4.3.2.12	С	Only for equipment with geo-location capability	N/A	

Note:

(1) "U/C": Indicates whether the requirement is unconditionally applicable (U) or is conditional upon the manufacturer's claimed functionality of the equipment (C).



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Smart Video Phone
Brand Name	XONTEL
Test Model	XT-50G
Series Model	N/A
Model Difference(s)	N/A
Power Source	1# DC voltage supplied from AC adapter. Model: F18L16-120150SPAV (EU) Model: F18L18-120150SPAB (UK) 2# Supplied from PoE.
Power Rating	1# I/P: 100-240V~ 50/60Hz 0.6A O/P: 12.0V === 1.5A 2# DC 48V
Operation Frequency	2402 MHz ~ 2480 MHz
Modulation Type	GFSK
Bit Rate of Transmitter	1Mbps, 2Mbps
Max. e.i.r.p.	1Mbps: 6.33 dBm (4.30 mW) 2Mbps: 5.76 dBm (3.77 mW)
Categorization	□Receiver category 1 ⊠Receiver category 2 □Receiver category 3

Note:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- 2. Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480



3. Table for Filed Antenna:

2		r neu / interinu.				
	Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
	1	Dongguan YiJia Electronics Communication Technology Co.,Ltd.	YJL01.106.020. 301A	FPC	IPEX	3.0

Note: The antenna gain is provided by the manufacturer.



2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test Items	Modulation Type	Data Rate	Channel
RF Output Power Power Spectral Density	GFSK	1Mbps 2Mbps	00/19/39
Occupied Channel Bandwidth Transmitter unwanted emissions in the OOB domain	GFSK	1Mbps 2Mbps	00/39
Transmitter unwanted emissions in the spurious domain (30 MHz ~ 1 GHz)	GFSK	1Mbps	00/39
Transmitter unwanted emissions in the spurious domain (1 GHz ~ 12.75 GHz)	GFSK	1Mbps 2Mbps	00/39
Receiver spurious emissions (30 MHz ~ 1 GHz)	GFSK	1Mbps	00/39
Receiver spurious emissions (1 GHz ~ 12.75 GHz)	GFSK	1Mbps	00/39
Receiver Blocking	GFSK	1 Mbps	00/39

Note:

- 1) For radiated spurious emissions below 1 GHz and receiver spurious emissions above 1 GHz test, the 1Mbps channel 00/39 are found to be the worst case and recorded.
- 2) All adapters are differ in plug, so tested with EU plug.
- 3) For radiated emission test, every axis (X, Y, Z) are verified. The test results shown in the following sections represent the worst case emissions.

2.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

Test Software Version	ADB		
Frequency (MHz)	2402	2440	2480
1Mbps	default	default	default
2Mbps	default	default	default



2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model No.	Series No.
-	-	-	-	-

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC Cable	NO	NO	1.2m



3. RF OUTPUT POWER

3.1 APPLIED PROCEDURES / LIMIT

Clause	4.3.2.2
Test Item	RF output power
Limit	The RF output power for non-FHSS equipment shall be equal to or less than 20 dBm. Note: For Non-adaptive FHSS equipment, the manufacturer may have declared a reduced RF Output Power (see clause 5.4.1 m) and associated Duty Cycle (see clause 5.4.1 e) that will ensure that the equipment meets the requirement for the Medium Utilization (MU) factor further described in clause 4.3.2.5. This is verified by the conformance test referred to in clause 4.3.2.5.4. For non-adaptive non-FHSS equipment, where the manufacturer has declared an RF output power of less than 20 dBm e.i.r.p., the RF output power shall be equal to or less than that declared value. This limit shall apply for any combination of power level and intended antenna assembly.

3.2 TEST PROCEDURES

Refer to ETSI EN 300 328, chapter 5.4.2.2.1.

3.3 TEST SETUP LAYOUT

Normal Condition



EUT

Power Meter

Extreme Condition



3.4 TEST DEVIATION

There is no deviation with the original standard.

3.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

3.6 TEST RESULTS

Please refer to the Appendix A.



4. POWER SPECTRAL DENSITY

4.1 APPLIED PROCEDURES / LIMIT

Clause	4.3.2.3
Test Item	Power Spectral Density
Limit	The maximum Power Spectral Density for non-FHSS equipment is 10 dBm per MHz.

4.2 TEST PROCEDURES

Refer to ETSI EN 300 328, chapter 5.4.3.2.1.

4.3 TEST SETUP LAYOUT



4.4 TEST DEVIATION

There is no deviation with the original standard.

4.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

4.6 TEST RESULTS

Please refer to the Appendix B.



5. DUTY CYCLE, TX-SEQUENCE, TX-GAP

5.1 APPLIED PROCEDURES / LIMIT

Clause	4.3.2.4
Test Item	Duty Cycle, Tx-sequence, Tx-gap
Limit	Non-FHSS equipment shall comply with the following: The Duty Cycle shall be equal to or less than the maximum value declared by the manufacturer. The Tx-sequence time shall be equal to or less than 10 ms. The minimum Tx-gap time following a Tx-sequence shall be equal to the duration of that proceeding Txsequence with a minimum of 3,5 ms. Note: For Non-adaptive FHSS equipment, the manufacturer may have declared a reduced RF Output Power (see clause 5.4.1 m) and associated Duty Cycle (see clause 5.4.1 e) that will ensure that the equipment meets the requirement for the Medium Utilization (MU) factor further described in clause 4.3.2.5. This is verified by the conformance test referred to in clause 4.3.2.5.4.

5.2 TEST PROCEDURES

Refer to ETSI EN 300 328, chapter 5.4.2.2.1.

5.3 TEST SETUP LAYOUT



5.4 TEST DEVIATION

There is no deviation with the original standard.

5.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

5.6 TEST RESULTS

Please refer to the Appendix C.



6. MEDIUM UTILIZATION (MU) FACTOR

6.1 APPLIED PROCEDURES / LIMIT

Clause	4.3.2.5
Test Item	Medium Utilization (MU) factor
Limit	The maximum Medium Utilization factor for non-adaptive non-FHSS equipment shall be 10 %.

6.2 TEST PROCEDURES

Refer to ETSI EN 300 328, chapter 5.4.2.2.1.

6.3 TEST SETUP LAYOUT



6.4 TEST DEVIATION

There is no deviation with the original standard.

6.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

6.6 TEST RESULTS

Please refer to the Appendix D.



7. ADAPTIVITY (ADAPTIVE EQUIPMENT USING MODULATIONS OTHER THAN FHSS)

7.1 APPLIED PROCEDURES / LIMIT

Clause	4.3.2.6		
Test Item	Adaptivity (adaptive equipment using modulations other than FHSS)		
Limit	 Adaptive non-FHSS using DAA Adaptive non-FHSS equipment usi minimum set of requirements: 1) During normal operation, the e signal on its current operating of present with a level above the channel shall be marked as 'ur 2) The channel(s) shall remain un which the channel may be cons 3) The total time during which an channel without re-evaluating t the Channel Occupancy Time. than 40 ms. Each such transm Period (no transmissions) of m with a minimum of 100 µs. After repeated. 4) The detection threshold shall b transmitter: for a 20 dBm e.i.r.p shall be equal to or less than -i assuming a 0 dBi (receive) an be corrected for the (receive) a beamforming gain (Y) shall not than 20 dBm e.i.r.p., the detect TL = -70 dBm/MHz + 10 x 5) The equipment shall comply wi of the present clause in the pre- in table 9. 	trive non-FHSS using DAA tive non-FHSS equipment using DAA shall comply with the following num set of requirements: During normal operation, the equipment shall evaluate the presence of a ignal on its current operating channel(s). If it is determined that a signal is irresent with a level above the detection threshold defined in step 5 that hannel shall be marked as 'unavailable'. The channel (s) shall remain unavailable for a minimum time equal to 1 s after which the channel may be considered again as an 'available' channel. The total time during which an equipment has transmissions on a given thannel without re-evaluating the availability of that channel, is defined as the Channel Occupancy Time. The Channel Occupancy Time shall be less than 40 ms. Each such transmission sequence shall be followed by an Idle Period (no transmissions) of minimum 5 % of the Channel Occupancy Time with a minimum of 100 μ s. After this, the procedure as in step 1 needs to be epeated. The detection threshold shall be proportional to the transmit power of the ransmitter: for a 20 dBm e.i.r.p. transmitter the detection threshold level (TL) hall be equal to or less than -70 dBm/MHz at the input to the receiver issuming a 0 dBi (receive) antenna assembly. This threshold level (TL) may be corrected for the (receive) antenna assembly gain (G); however, beamforming gain (Y) shall not be taken into account. For power levels less than 20 dBm e.i.r.p., the detection threshold level to: TL = -70 dBm/MHz + 10 × log ₁₀ (100 mW / Pout) (Pout in mW e.i.r.p.) The equipment shall comply with the requirements defined in step 1 to step 4 of the present clause in the presence of an unwanted CW signal as defined to table 9	
	Table 9: Unwa	anted Signal parame	ters
	Wanted signal mean power from companion device (dBm)	Unwanted signal frequency (MHz)	Unwanted CW signal power (dBm)
	-30	2 395 or 2 488,5	-35 (acc pate 2)
	NOTE 1: The highest frequency	shall be used for testing	(see note 2)
	within the range 2 400 frequency shall be use range 2 442 MHz to 2 NOTE 2: The level specified is th 0 dBi antenna assembl this level has to be con gain (G). In case of rac to a power flux density	MHz to 2 442 MHz, whil d for testing operating c 483,5 MHz. See clause he level at the UUT rece ly gain. In case of condu rected for the (in-band) a liated measurements, th in front of the UUT ante	e the lowest hannels within the 5.4.6.1. iver input assuming a icted measurements, antenna assembly is level is equivalent nna.



	Adaptive non-FHSS using LBT
	The present document defines two types of adaptive non-FHSS equipment that
	uses an LBT mechanism: Frame Based Equipment and Load Based Equipment.
	Adaptive non-FHSS equipment which is capable of operating as either Load
	Based Equipment or as Frame Based Equipment is allowed to switch
	dynamically between these types of operation.
	a. Frame Based Equipment
	Frame Based Equipment shall comply with the following requirements:
	1) Before transmission, the equipment shall perform a Clear Channel
	Assessment (CCA) check using energy detect. The equipment shall observe
	the operating channel for the duration of the CCA observation time which
	shall be not less than 18 µs. The channel shall be considered occupied if the
	energy level in the channel exceeds the threshold given in step 5 below. If
	the equipment finds the channel to be clear, it may transmit immediately. See
	figure 2.
	2) If the equipment finds the channel occupied, it shall not transmit on this
	channel during the next Frame Period.
	The equipment is allowed to switch to a non-adaptive mode and to continue
	transmissions on this channel providing it complies with the requirements
	applicable to non-adaptive equipment. See clause 4.3.2.6.1.
	Alternatively, the equipment is also allowed to continue Short Control
	Signalling Transmissions on this channel providing it complies with the
Limit	requirements given in clause 4.3.2.6.4.
	3) The total time during which an equipment has transmissions on a given
	channel without re-evaluating the availability of that channel, is defined as
	the Channel Occupancy Time. The Channel Occupancy Time shall be in the
	range 1 ms to 10 ms followed by an Idle Period of at least 5 % of the Channel
	Occupancy time used in the equipment for the current Frame Period. See
	Ilgure 2.
	for this equipment con skip CCA and immediately (ass also payt paragraph)
	nor units equipment can skip CCA and immediately (see also next paragraph)
	A consecutive sequence of such transmissions by the equipment without a
	new CCA shall not exceed the maximum Channel Occupancy Time
	For the purpose of multi-cast, the ACK transmissions (associated with the
	same data packet) of the individual devices are allowed to take place in a
	sequence
	5) The energy detection threshold for the CCA shall be proportional to the
	transmit power of the transmitter: for a 20 dBm e i r p, transmitter the CCA
	threshold level (TL) shall be equal to or less than -70 dBm/MHz at the input to
	the receiver assuming a 0 dBi (receive) antenna assembly. This threshold
	level (TL) may be corrected for the (receive) antenna assembly gain (G):
	however, beamforming gain (Y) shall not be taken into account. For power
	levels less than 20 dBm e.i.r.p. the CCA threshold level may be relaxed to:
	$TL = -70 \text{ dBm/MHz} + 10 \text{ x } \log_{10} (100 \text{ mW/P}_{out}) (P_{out} \text{ in mW } e.i.r.p.)$



6) The equipment shall comply with the requirements defined in step 1 to step 4 in the present clause in the presence of an unwanted CW signal as defined in table 10.

Wanted signal mean power from companion device		al mean power Unwanted signal Unwanted signal po anion device frequency (dBm) (MHz)	
sufficier	t to maintain the link	2 395 or 2 488,5	-35
	(see note 2)	(see note 1)	(see note 3)
NOTE 1: The highest frequency shall be used for testing operating channels within range 2 400 MHz to 2 442 MHz, while the lowest frequency shall be used testing operating channels within the range 2 442 MHz to 2 483,5 MHz. S clause 5.4.6.1		t frequency shall be used for 2 MHz to 2 483,5 MHz. See	
clause 5.4.6.1. NOTE 2: A typical conducted val NOTE 3: The level specified is th antenna assembly gain be corrected for the (in measurements, this lev UUT antenna.		lue which can be used in the level at the UUT receiv a. In case of conducted me -band) antenna assembly vel is equivalent to a powe	most cases is -50 dBm/MHz. er input assuming a 0 dBi easurements, this level has to gain (G). In case of radiated er flux density in front of the

Table 10: Unwanted Signal parameters

b. Load Based Equipment

Load Based Equipment may implement an LBT based spectrum sharing mechanism based on the Clear Channel Assessment (CCA) mode using energy detect as described in IEEE 802.11[™] [i.3], clause 10 clause 11, clause 15, clause 16, clause 18 and clause 19, or in IEEE 802.15.4[™] [i.4], clause 5, clause 6 and clause 10 providing the equipment complies with the conformance requirements referred to in clause 4.3.2.6.3.4. Load Based Equipment not using any of the mechanisms referenced above shall comply with the following minimum set of requirements:

- Before a transmission or a burst of transmissions, the equipment shall perform a Clear Channel Assessment (CCA) check using energy detect. The equipment shall observe the operating channel for the duration of the CCA observation time which shall be not less than 18 µs. The channel shall be considered occupied if the energy level in the channel exceeds the threshold given in step 5 below. If the equipment finds the channel to be clear, it may transmit immediately.
- 2) If the equipment finds the channel occupied, it shall not transmit on this channel (see also the next paragraph). The equipment shall perform an Extended CCA check in which the channel is observed for a random duration in the range between 18 µs and at least 160 µs. If the extended CCA check has determined the channel to be no longer occupied, the equipment may resume transmissions on this channel. If the Extended CCA time has determined the channel still to be occupied, it shall perform new Extended CCA checks until the channel is no longer occupied.
 - NOTE: The Idle Period in between transmissions is considered to be the CCA or the Extended CCA check as there are no transmissions during this period.

The equipment is allowed to switch to a non-adaptive mode and to continue transmissions on this channel providing it complies with the requirements applicable to non-adaptive equipment. Alternatively, the equipment is also allowed to continue Short Control Signalling Transmissions on this channel providing it complies with the requirements given in clause 4.3.2.6.4.

Limit



	3) The to the Ch than 1	tal time that an equip iannel Occupancy Tir 3 ms, after which the	ment makes use of ne. This Channel O device shall perforr	a RF channel is defined a ccupancy Time shall be le n a new CCA as described	as ss d ir
	step 1	above.			
	4) The ed for this procee conse	 auipment, upon correst equipment can skip d with the transmissi cutive sequence of transmissi 	ct reception of a tran CCA and immediate ion of management ansmissions by the	nsmission which was inter ely (see also next paragra and control frames. A equipment without a new (nde ph CC
	shall n	ot exceed the maxim	um channel occupa	ncy time as defined in ste	p:
	above				
	For the same	Purpose of multi-case of multi-case data packet) of the in packet.	st, the ACK transmis dividual devices are	allowed to take place in a	e a
	5) The er	herav detection thres	hold for the CCA sha	all be proportional to the	
	transm	nit power of the transm	mitter: for a 20 dBm	e.i.r.p. transmitter the CC	A
	thresh	old level (TL) shall be	equal to or less that	n -70 dBm/MHz at the inp	ut
	the rec	ceiver assuming a 0 c	Bi (receive) antenn	a assembly. This threshold	d
	level (TL) may be corrected	for the (receive) an	itenna assembly gain (G);	~ "
	nowev	er, beamforming gair	r (Y) shall not be tak	en into account. For powe	er to
	levels less than 20 dBm e.i.r.p., the CCA threshold level may be relaxed t				
	levels	$\Gamma = -70 \text{ dBm/MHz} +$	$10 \times \log_{10} (100 \text{ mW})$	(Pourt) (Pourt in mW e irn)	iU
	6) The ed	$\Gamma L = -70 \text{ dBm/MHz} +$	10 x log ₁₀ (100 mW/	'P _{out}) (P _{out} in mW e.i.r.p).	er
Limit	6) The ed of the	TL = -70 dBm/MHz + quipment shall comply present clause in the	10 x log ₁₀ (100 mW) y with the requirement presence of an unv	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to ste vanted CW signal as defin	ep
Limit	6) The ed of the in table	TL = -70 dBm/MHz + quipment shall comply present clause in the e 11.	10 x log ₁₀ (100 mW) y with the requireme presence of an unv	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to ste vanted CW signal as defin	ep
Limit	6) The economic of the in table	FL = -70 dBm/MHz + quipment shall comply present clause in the e 11. Table 11:	10 x log ₁₀ (100 mW) y with the requireme presence of an unv Unwanted Signal par	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to ste vanted CW signal as defin ameters	ep
Limit	6) The economic of the in table wanted from	TL = -70 dBm/MHz + quipment shall comply present clause in the e 11. Table 11: d signal mean power companion device	10 x log ₁₀ (100 mW) y with the requireme presence of an unv Unwanted Signal par Unwanted signal frequency (MHz)	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to stevented CW signal as defined ameters Unwanted signal power (dBm)	
Limit	6) The economic of the in table wanted from suffici	TL = -70 dBm/MHz + quipment shall comply present clause in the e 11. Table 11: d signal mean power companion device ent to maintain the link	10 x log ₁₀ (100 mW/ y with the requireme presence of an unv Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to ste vanted CW signal as defin ameters Unwanted signal power (dBm) -35	
Limit	6) The economic of the in table Wanter from suffici	The second secon	10 x log ₁₀ (100 mW/ y with the requireme presence of an unv Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1)	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to stervanted CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3)	
Limit	6) The economic of the in table wanted from sufficient NOTE 1	The highest frequency range 2 400 MHz to 2 4	10 x log ₁₀ (100 mW/ y with the requireme presence of an unv Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1) shall be used for testing 442 MHz, while the lowest	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to stevented CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3) operating channels within the st frequency shall be used for	
Limit	6) The eco of the in table Wante from suffici NOTE 1	The highest frequency range 2 400 MHz to 2 companion device	10 x log ₁₀ (100 mW/ y with the requireme presence of an unv Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1) shall be used for testing 442 MHz, while the lowes hels within the range 2 44	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to stervanted CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3) operating channels within the st frequency shall be used for 42 MHz to 2 483,5 MHz. See	
Limit	6) The eco of the in table Wante from suffici NOTE 1	TL = -70 dBm/MHz + quipment shall comply present clause in the e 11. Table 11: d signal mean power n companion device ent to maintain the link (see note 2) The highest frequency range 2 400 MHz to 2 4 testing operating chanr clause 5.4.6.1. A typical conducted va	10 x log ₁₀ (100 mW/ y with the requireme presence of an unv Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1) shall be used for testing 442 MHz, while the lowes hels within the range 2 44 lue which can be used in	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to stervanted CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3) operating channels within the st frequency shall be used for 42 MHz to 2 483,5 MHz. See most cases is -50 dBm/MHz.	
Limit	6) The eco of the in table Wante from suffici NOTE 1 NOTE 2 NOTE 3	TL = -70 dBm/MHz + quipment shall comply present clause in the e 11. Table 11: d signal mean power n companion device ent to maintain the link (see note 2) The highest frequency range 2 400 MHz to 2 4 testing operating chant clause 5.4.6.1. A typical conducted va The level specified is th	10 x log ₁₀ (100 mW/ y with the requireme presence of an unv Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1) shall be used for testing 442 MHz, while the lowes hels within the range 2 44 lue which can be used in he level at the UUT recei	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to stervanted CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3) operating channels within the st frequency shall be used for 42 MHz to 2 483,5 MHz. See most cases is -50 dBm/MHz. ver input assuming a 0 dBi	
Limit	6) The eco of the in table Wante from suffici NOTE 1 NOTE 2 NOTE 3	The highest frequency range 2 400 MHz to 2 means of the second conducted va The level specified is the antenna assembly gair be corrected for the (in	10 x log ₁₀ (100 mW/ y with the requireme presence of an unv Unwanted Signal par Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1) shall be used for testing 442 MHz, while the lowes hels within the range 2 44 lue which can be used in he level at the UUT recein h. In case of conducted m -band) antenna assembl	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to sta- vanted CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3) operating channels within the st frequency shall be used for 12 MHz to 2 483,5 MHz. See most cases is -50 dBm/MHz. ver input assuming a 0 dBi neasurements, this level has to v gain (G). In case of radiated	
Limit	6) The eco of the in table Wante from suffici NOTE 1 NOTE 2 NOTE 3	TL = -70 dBm/MHz + quipment shall comply present clause in the e 11. Table 11: d signal mean power n companion device ent to maintain the link (see note 2) The highest frequency range 2 400 MHz to 2 4 testing operating chanr clause 5.4.6.1. A typical conducted va The level specified is tt antenna assembly gair be corrected for the (in measurements, this level	10 x log ₁₀ (100 mW/ y with the requireme presence of an unv Unwanted Signal par Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1) shall be used for testing 442 MHz, while the lowes hels within the range 2 44 lue which can be used in he level at the UUT recei h. In case of conducted m -band) antenna assemblivel is equivalent to a pow	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to stervanted CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3) operating channels within the st frequency shall be used for 42 MHz to 2 483,5 MHz. See most cases is -50 dBm/MHz. ver input assuming a 0 dBi neasurements, this level has to y gain (G). In case of radiated er flux density (PFD) in front of	
Limit	6) The eco of the in table Wante from suffici NOTE 1 NOTE 2 NOTE 3	It = -70 dBm/MHz + quipment shall compli- present clause in the e 11. Table 11: d signal mean power n companion device ent to maintain the link (see note 2) The highest frequency range 2 400 MHz to 2 4 testing operating chanr clause 5.4.6.1. A typical conducted va The level specified is th antenna assembly gair be corrected for the (in measurements, this leve the UUT antenna.	10 x log ₁₀ (100 mW/ y with the requireme presence of an unv Unwanted Signal par Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1) shall be used for testing 442 MHz, while the lowes hels within the range 2 44 lue which can be used in he level at the UUT recei h. In case of conducted m -band) antenna assemblivel is equivalent to a pow	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to stervanted CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3) operating channels within the st frequency shall be used for 42 MHz to 2 483,5 MHz. See most cases is -50 dBm/MHz. ver input assuming a 0 dBi- neasurements, this level has to y gain (G). In case of radiated er flux density (PFD) in front of	
Limit	6) The eco of the in table Wante from suffici NOTE 1 NOTE 2 NOTE 3	TL = -70 dBm/MHz + quipment shall comply present clause in the e 11. Table 11: rd signal mean power n companion device ent to maintain the link (see note 2) The highest frequency range 2 400 MHz to 2 4 testing operating chann clause 5.4.6.1. A typical conducted va The level specified is the antenna assembly gain be corrected for the (in measurements, this leve the UUT antenna.	10 x log ₁₀ (100 mW/ y with the requireme presence of an unv Unwanted Signal par Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1) shall be used for testing 442 MHz, while the lowes hels within the range 2 44 lue which can be used in he level at the UUT recei h. In case of conducted m -band) antenna assemblivel is equivalent to a pow	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to sta- vanted CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3) operating channels within the st frequency shall be used for 42 MHz to 2 483,5 MHz. See most cases is -50 dBm/MHz. ver input assuming a 0 dBi neasurements, this level has to y gain (G). In case of radiated er flux density (PFD) in front of	
Limit	6) The eco of the in table Wante from suffici NOTE 1 NOTE 2 NOTE 3	It = -70 dBm/MHz + quipment shall comply present clause in the e 11. Table 11: d signal mean power companion device ent to maintain the link (see note 2) The highest frequency range 2 400 MHz to 2 4 testing operating chann clause 5.4.6.1. A typical conducted va The level specified is th antenna assembly gair be corrected for the (in measurements, this level the UUT antenna.	10 x log ₁₀ (100 mW/ y with the requireme presence of an unv Unwanted Signal par Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1) shall be used for testing 442 MHz, while the lower hels within the range 2 44 lue which can be used in he level at the UUT recei h. In case of conducted m -band) antenna assembly rel is equivalent to a pow	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to sta- vanted CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3) operating channels within the st frequency shall be used for 42 MHz to 2 483,5 MHz. See most cases is -50 dBm/MHz. ver input assuming a 0 dBi heasurements, this level has to y gain (G). In case of radiated er flux density (PFD) in front of	
Limit	6) The eco of the in table Wante from suffici NOTE 1 NOTE 2 NOTE 3	It = -70 dBm/MHz + quipment shall comply present clause in the e 11. Table 11: d signal mean power n companion device ent to maintain the link (see note 2) The highest frequency range 2 400 MHz to 2 4 testing operating chanr clause 5.4.6.1. A typical conducted va The level specified is tt antenna assembly gair be corrected for the (in measurements, this lev the UUT antenna. Itrol Signalling Tran nted, Short Control S	10 x log ₁₀ (100 mW/ y with the requireme presence of an unv Unwanted Signal par Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1) shall be used for testing 42 MHz, while the lowes hels within the range 2 44 lue which can be used in he level at the UUT recei h. In case of conducted m -band) antenna assemblivel is equivalent to a pow smissions signalling Transmiss	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to star vanted CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3) operating channels within the st frequency shall be used for 42 MHz to 2 483,5 MHz. See most cases is -50 dBm/MHz. ver input assuming a 0 dBi beasurements, this level has to y gain (G). In case of radiated er flux density (PFD) in front of ions of adaptive non-FHSE	S
Limit	6) The eco of the in table Wante from suffici NOTE 1 NOTE 1 NOTE 2 NOTE 3	It = -70 dBm/MHz + quipment shall comply present clause in the e 11. Table 11: d signal mean power n companion device ent to maintain the link (see note 2) The highest frequency range 2 400 MHz to 2 4 testing operating chanr clause 5.4.6.1. A typical conducted va The level specified is th antenna assembly gair be corrected for the (in measurements, this leve the UUT antenna. the UUT antenna. trol Signalling Tran nted, Short Control S shall have a maximuments and a f 20 measurements and a f 20 measuremen	10 x log ₁₀ (100 mW/ y with the requirement presence of an unv Unwanted Signal par Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1) shall be used for testing 442 MHz, while the lowes hels within the range 2 44 lue which can be used in the level at the UUT recein . In case of conducted m -band) antenna assemblivel is equivalent to a pow signalling Transmiss um TxOn / (TxOn + T	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to sta- vanted CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3) operating channels within the st frequency shall be used for 12 MHz to 2 483,5 MHz. See most cases is -50 dBm/MHz. ver input assuming a 0 dBi- neasurements, this level has to y gain (G). In case of radiated er flux density (PFD) in front of fix off) ratio of 10 % within	Sa
Limit	6) The eco of the in table Wante from suffici NOTE 1 NOTE 2 NOTE 3 Short Cor If impleme equipment observatio	TL = -70 dBm/MHz + quipment shall comply present clause in the e 11. Table 11: d signal mean power i companion device ent to maintain the link (see note 2) The highest frequency range 2 400 MHz to 2 4 testing operating channe clause 5.4.6.1. A typical conducted va The level specified is the antenna assembly gaine be corrected for the (in measurements, this level the UUT antenna. htrol Signalling Tran nted, Short Control S shall have a maximu n period of 50 ms. ty Cycle is defined in	10 x log ₁₀ (100 mW/ y with the requirement presence of an unv Unwanted Signal par Unwanted Signal par Unwanted signal frequency (MHz) 2 395 or 2 488,5 (see note 1) shall be used for testing 442 MHz, while the lower hels within the range 2 44 lue which can be used in he level at the UUT recei h. In case of conducted m -band) antenna assemblivel is equivalent to a pow smissions signalling Transmiss im TxOn / (TxOn + T	(Pout) (Pout in mW e.i.r.p). ents defined in step 1 to sta- vanted CW signal as defined ameters Unwanted signal power (dBm) -35 (see note 3) operating channels within the st frequency shall be used for 42 MHz to 2 483,5 MHz. See most cases is -50 dBm/MHz. ver input assuming a 0 dBi neasurements, this level has to y gain (G). In case of radiated er flux density (PFD) in front of fxOff) ratio of 10 % within	Sa



7.2 TEST PROCEDURES

Refer to ETSI EN 300 328, chapter 5.4.6.2.1.

7.3 TEST SETUP LAYOUT



7.4 TEST DEVIATION

There is no deviation with the original standard.

7.5 EUT OPERATION DURING TEST

The measurements shall be performed during normal operation.

7.6 TEST RESULTS

Please refer to the Appendix E.



8. OCCUPIED CHANNEL BANDWIDTH

8.1 APPLIED PROCEDURES / LIMIT

Clause	4.3.2.7			
Test Item	Occupied Channel Bandwidth			
	The Occupied Channel Bandwidth shall be within the band given in table 1.			
	Table 1: Service frequency bands			
Lineit	Service frequency bands			
Limit	Transmit 2 400 MHz to 2 483,5 MHz			
	Receive 2 400 MHz to 2 483,5 MHz			
	In addition, for non-adaptive non-FHSS equipment with e.i.r.p. greater than 10			
	dBm, the Occupied Channel Bandwidth shall be equal to or less than 20 MHz.			

8.2 TEST PROCEDURES

Refer to ETSI EN 300 328, chapter 5.4.7.2.1.

8.3 TEST SETUP LAYOUT



8.4 TEST DEVIATION

There is no deviation with the original standard.

8.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

8.6 TEST RESULTS

Please refer to the Appendix F.



9. TRANSMITTER UNWANTED EMISSIONS IN THE OUT-OF-BAND DOMAIN

9.1 APPLIED PROCEDURES / LIMIT



9.2 TEST PROCEDURES

Refer to ETSI EN 300 328, chapter 5.4.8.2.1.

9.3 TEST SETUP LAYOUT



9.4 TEST DEVIATION

There is no deviation with the original standard.

9.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

9.6 TEST RESULTS

Please refer to the Appendix G.





10. TRANSMITTER UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

10.1 APPLIED PROCEDURES / LIMIT

Clause	4.3.2.9							
Test Item	Transmitter unwanted emissions in the spurious domain							
	Th va In the ra lin Gl	ne transmitter unwanted emissions ilues given in table 12. case of equipment with antenna c e antenna port (conducted). For en diated by integral antenna equipm hits are e.r.p. for emissions up to 1 Hz. Table 12: Transmitter	in the spurious doma onnectors, these limi nissions radiated by t ent (without antenna GHz and as e.i.r.p. fo limits for spurious	ain shall not exceed the ts apply to emissions at he cabinet or emissions connectors), these or emissions above 1 s emissions				
		Frequency range	Maximum power	Bandwidth				
Limit		30 MHz to 47 MHz	-36 dBm	100 kHz				
			47 MHz to 74 MHz	-54 dBm	100 kHz			
		74 MHz to 87,5 MHz	-36 dBm	100 kHz				
		87,5 MHz to 118 MHz	-54 dBm	100 kHz				
		118 MHz to 174 MHz	-36 dBm	100 kHz				
		174 MHz to 230 MHz	-54 dBm	100 kHz				
	230 MHz to 470 MHz -36 dBm 100 kHz							
	470 MHz to 694 MHz -54 dBm 100 kHz							
		694 MHz to 1 GHz	-36 dBm	100 kHz				
		1 GHz to 12,75 GHz	-30 dBm	1 MHz				

10.2 TEST PROCEDURES

Refer to ETSI EN 300 328, chapter5.4.9.2.2.



10.3 TEST SETUP LAYOUT





Radiated Measurement Test Set-Up Frequency Above 1 GHz



10.4 TEST DEVIATION

There is no deviation with the original standard.

10.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously transmitting.

10.6 TEST RESULTS

Please refer to the Appendix H



11. RECEIVER SPURIOUS EMISSIONS

11.1 APPLIED PROCEDURES / LIMIT

Clause	4.3.2.10			
Test Item	Receiver spurious emissions	6		
Limit	The spurious emissions of th 13. In case of non-FHSS equipmemissions at the antenna po or for emissions radiated by connectors), these limits are emissions above 1 GHz.	ne receiver shall not ex nent with antenna con rt (conducted). For em integral antenna equip e.r.p. for emissions up	ceed the values given in table nectors, these limits apply to issions radiated by the cabinet oment (without antenna o to 1 GHz and e.i.r.p. for	
	Table 13: Sp	ourious emission limit	s for receivers	
	Frequency range	Maximum power	Bandwidth	
	30 MHz to 1 GHz	-57 dBm	100 kHz	
	1 GHz to 12,75 GHz	-47 dBm	1 MHz	

11.2 TEST PROCEDURES

Refer to ETSI EN 300 328, chapter5.4.10.2.2.

11.3 TEST SETUP LAYOUT

Please refer to clause 10.3.

11.4 TEST DEVIATION

There is no deviation with the original standard.

11.5 EUT OPERATION DURING TEST

The measurements shall be performed during continuously receiving.

11.6 TEST RESULTS

Please refer to the Appendix I.



12. RECEIVER BLOCKING

12.1 APPLIED PROCEDURES / LIMIT

0.4400				
Test Item	Receiver Blocking			
	 While maintaining the minimum perf 4.3.2.11.3, the blocking levels at spe greater than the limits defined for the table 14, table 15 or table 16. Receiver Category 1 Table 14 contains the Receiver Bloc equipment. 	formance cr ecified frequ e applicable sking parame	iteria as defir ency offsets receiver cate eters for Rece	ied in clause shall be equal to egory provided eiver Category
	Table 14: Receiver Blocking para	ameters for Re	eceiver Catego	ry 1 equipment
	Wanted signal mean power from companion device (dBm) (see notes 1 and 4) (-133 dBm + 10 × log (OCBW)) or -68 dBm	Blocking sign frequency (MHz)	al Blocking sig power (dBi (see note	gnal Type of m) blocking 4) signal
	whichever is less (see note 2)	2 380 2 504		
	(-139 dBm + 10 × log ₁₀ (OCBW)) or -74 dBm whichever is less (see note 3)	2 300 2 330 2 360 2 524 2 584 2 674	-34	CW
	absence of any blocking signal. NOTE 3: In case of radiated measurements of signal from the companion device of using a wanted signal up to P _{min} + 3	using a compani annot be detern 20 dB where P _m	ion device and the nined, a relative te _{in} is the minimum	e level of the wanted est may be performed level of wanted signa
Limit	absence of any blocking signal. NOTE 3: In case of radiated measurements of signal from the companion device of using a wanted signal up to P _{min} + 3 required to meet the minimum perfor absence of any blocking signal. NOTE 4: The level specified is the level at the assembly gain. In case of conducter (in-band) antenna assembly gain (O equivalent to a power flux density (I configured/positioned as recorded in	using a compani annot be detern 20 dB where P _m ormance criteria e UUT receiver d measurement G). In case of rac PFD) in front of i n clause 5.4.3.2	ion device and the nined, a relative te in is the minimum as defined in clau input assuming a s, this level has to diated measurement the UUT antenna .2.	e level of the wanted est may be performed level of wanted signa use 4.3.1.12.3 in the 0 dBi antenna b be corrected for the ents, this level is with the UUT being
Limit	absence of any blocking signal. NOTE 3: In case of radiated measurements of signal from the companion device of using a wanted signal up to P _{min} + 3 required to meet the minimum perfor absence of any blocking signal. NOTE 4: The level specified is the level at the assembly gain. In case of conducte (in-band) antenna assembly gain (C equivalent to a power flux density (I configured/positioned as recorded i Receiver Category 2 Table 15 contains the Receiver Block equipment. Table 15: Receiver Blocking pa Wanted signal mean power from companion device (dBm) (see notes 1 and 3) (130 dBm + 10 × log. (OCDW) + 10 dD)	using a compani annot be detern 20 dB where P _m ormance criteria e UUT receiver d measurement 3). In case of rac PFD) in front of i n clause 5.4.3.2 cking parame arameters rec Blocking signal frequency (MHz) 2 380	ion device and the nined, a relative te in is the minimum as defined in clau input assuming a s, this level has to diated measurement the UUT antenna .2. etters for Reco reters for Reco signal power (dBm) (see note 3)	e level of the wanted est may be performed level of wanted signal use 4.3.1.12.3 in the 0 dBi antenna be corrected for the ents, this level is with the UUT being eiver Category 2 y 2 equipment Type of blocking signal
Limit	absence of any blocking signal. NOTE 3: In case of radiated measurements of signal from the companion device of using a wanted signal up to P _{min} + 3 required to meet the minimum perfor absence of any blocking signal. NOTE 4: The level specified is the level at the assembly gain. In case of conducte (in-band) antenna assembly gain (O equivalent to a power flux density (I configured/positioned as recorded in Receiver Category 2 Table 15 contains the Receiver Block equipment. Table 15: Receiver Blocking pa Wanted signal mean power from companion device (dBm) (see notes 1 and 3) (-139 dBm + 10 × log ₁₀ (OCBW) + 10 dB) or (-74 dBm + 10 dB) whichever is less (see note 2)	using a compani annot be detern 20 dB where P _m ormance criteria e UUT receiver d measurement 3). In case of rac PFD) in front of i n clause 5.4.3.2 cking parame arameters rec Blocking signal frequency (MHz) 2 380 2 504 2 300 2 584	ion device and the nined, a relative te in is the minimum as defined in clau input assuming a s, this level has to diated measurement the UUT antenna .2. etters for Reco server Category Blocking signal power (dBm) (see note 3) -34	e level of the wanted est may be performed level of wanted signal use 4.3.1.12.3 in the 0 dBi antenna be corrected for the ents, this level is with the UUT being eiver Category 2 y 2 equipment Type of blocking signal CW



	Table 16 contains the Receiver Blockin equipment. Table 16: Receiver Blocking par	ng paramete r <mark>ameters rec</mark>	ers for Receive eiver Category	r Category 3 v 3 equipment
	Wanted signal mean power from companion device (dBm) (see notes 1 and 3)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 3)	Type of blocking signal
Limit	(-139 dBm + 10 × log ₁₀ (OCBW) + 20 dB) or (-74 dBm + 20 dB) whichever is less (see note 2)	2 380 2 504 2 300 2 584	-34	CW
	 NOTE 1: OCBW is in Hz. NOTE 2: In case of radiated measuremer wanted signal from the compani may be performed using a want minimum level of wanted signal criteria as defined in clause 4.3. NOTE 3: The level specified is the level a assembly gain. In case of condu for the (in-band) antenna assem this level is equivalent to a powe with the UUT being configured/p 	nts using a con ion device can ed signal up to required to me 1.12.3 in the a t the UUT rece ucted measure bly gain (G). In er flux density positioned as r	npanion device a not be determine P _{min} + 30 dB wh eet the minimum bsence of any blo eiver input assum ments, this level n case of radiated (PFD) in front of t ecorded in clause	nd the level of the d, a relative test here P _{min} is the performance ocking signal. ing a 0 dBi antenna has to be corrected d measurements, he UUT antenna e 5.4.3.2.2.

12.2 TEST PROCEDURES

Refer to ETSI EN 300 328, chapter 5.4.11.2.1

12.3 TEST SETUP LAYOUT



12.4 TEST DEVIATION

There is no deviation with the original standard.

12.5 EUT OPERATION DURING TEST

The measurements shall be performed during normal receiving.

12.6 TEST RESULTS

Please refer to the Appendix J.



13. MEASUREMENT INSTRUMENTS LIST

	RF Output Power							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until			
1	Cable	emci	EMC104-SM-SM-9 000(0.01GHz- 26.5GHz)	N/A	N/A			
2	Power Sensor	Agilent	U2021XA	MY53320006	Feb. 08, 2022			
3	Power Sensor	Agilent	U2021XA	MY53340001	Feb. 08, 2022			
4	Power Sensor	Agilent	U2021XA	MY53340005	Feb. 08, 2022			
5	Power Sensor	Agilent	U2021XA	MY53340007	Feb. 08, 2022			
6	Const Temp. & Humi dity Chamber	CEPREI	CEEC-M64T-40	15-008	Feb. 27, 2022			
7	Measurement Software	BTL	EN300328	N/A	N/A			

	Power Spectral Density & Occupied Channel Bandwidth & Transmitter Unwanted Out Of Band Domain							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until			
1	EXA Spectrum Analyzer	Agilent	N9010A	MY54200164	Feb. 28, 2022			
2	Cable	emci	EMC104-SM-SM-9 000(0.01GHz- 26.5GHz)	N/A	N/A			
3	Measurement Software	BTL	EN300328	N/A	N/A			

	Receiver Blocking							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until			
1	POWER SPLITTER	Mini-Circuits	ZFRSC-183-S+	SF601301339-2	Feb. 28, 2022			
2	wideband radio communication tester	R&S	CMW500	152372	Feb. 27, 2022			
3	MXG Vector Signal Generator	Agilent	N5182A	MY49060447	Feb. 28, 2022			



	Transmitter and Receiver Spurious Emission (Radiated Measurement)							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until			
1	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	587	Nov. 08, 2022			
2	DRG Horn Antenna	ETS	3117-PA	221576	Mar. 23, 2022			
3	Amplifier	HP	8447D	2944A11203	Feb. 28, 2022			
4	Preamplifier	ETS	3117-PA	221576	Feb. 28, 2022			
5	EXA Spectrum Analyzer	Agilent	N9010A	MY50520044	Feb. 28, 2022			
6	Controller	Innco Systems Gmbh	CO3000-4port	CO3000/1155/4 5430119/P	N/A			
7	Cable	Talent microwave	L6-NMNM-3M	19052129	N/A			
8	Cable	Talent microwave	A81-SMAMSMAM- 2M	19052134	N/A			
9	Cable	Talent microwave	A81-SMAMSMAM- 12.5M	19052135	N/A			
10	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A			

Remark: "N/A" denotes no model name, serial no. or calibration specified. All calibration period of equipment list is one year.



14. EUT TEST PHOTO

Radiated Emissions Test Photos









APPENDIX A - RF OUTPUT POWER



Test Mode: TX Mode_1Mbps

Test Canditions		e.i.r.p.(dBm)			Number Of Bursts		
Test Condition	UNS	2402 MHz	2440 MHz	2480 MHz	2402 MHz	2440 MHz	2480 MHz
T nom (°C)	22.4	5.64	6.32	6.33	12	12	12
T min (°C)	0	5.47	6.15	6.16	12	12	12
T max (°C)	45	5.39	6.07	6.08	12	12	12
Max. e.i.r.	Э.		6.33		Min N	umber	12
Limits			20dBm			≥ 10	
Result Complies Co			Complies				

Test Mode: TX Mode_2Mbps

Test Conditions		e.i.r.p.(dBm)			Number Of Bursts		
		2402 MHz	2440 MHz	2480 MHz	2402 MHz	2440 MHz	2480 MHz
T nom (°C)	22.4	5.61	5.76	5.60	11	11	11
T min (°C)	0	5.44	5.59	5.43	11	11	11
T max (°C)	45	5.36	5.51	5.35	11	11	11
Max. e.i.r.p.		5.76			Min Number 11		
Limits		20dBm			≥ 10		
Result		Complies			Complies		

Note: e.i.r.p. = Conducted output power + G (Ant Gain)



APPENDIX B - POWER SPECTRAL DENSITY



Test Mode: TX Mode_1Mbps								
Frequency	Power Spectral Density	Max Limit (dBm/MHz)	Regult					
(MHz)	(dBm/MHz)		Neoun					
2402	5.56	10.00	Pass					
2440	6.24	10.00	Pass					
2480	6.24	10.00	Pass					

TX Mode_2402 MHz Power Spectral Density








Test Mode: T	X Mode_2Mbps		
			
Frequency	Power Spectral Density		Desult
(MHz)	(dBm/MHz)	Max. Limit (dbm/mhz)	Result
2402	3.61	10.00	Pass
2440	3.78	10.00	Pass
2480	3.64	10.00	Pass

TX Mode_2402 MHz





3L





APPENDIX C - DUTY CYCLE, TX-SEQUENCE, TX-GAP

Test Mode: N/A

Note: "N/A" denotes test is not applicable to this device.



APPENDIX D - MEDIUM UTILIZATION (MU) FACTOR

Test Mode: N/A

Note: "N/A" denotes test is not applicable to this device.



APPENDIX E - ADAPTIVITY

Test Mode: N/A

Note: "N/A" denotes test is not applicable to this device.



APPENDIX F - OCCUPIED CHANNEL BANDWIDTH



Test Mode:	TX Mode_1Mbps			
Frequency (MHz)	Occupied Channel Bandwidth (MHz)	F∟at 99% BW (MHz)	F⊢at 99% BW (MHz)	Result
2402	1.057	2401.53	-	
2480	1.058	-	2480.59	Pass
	N/A	F∟> 2400	Fн < 2483.5	

TX Mode_2402 MHz

Keysight Spectrum Analyzer - O	ccupied BW				
LX/ RL RF 50 S	2 DC	SENSE:INT		02:33:14 PM Nov 09, 2	2021
Center Freq 2.4020	00000 GHz	Center Freq: 2.40200	0000 GHz	Radio Std: None	Frequency
	÷	📑 Trig: Free Run	Avg Hold: 10/10		
	#IFGain:Low	#Atten: 30 dB		Radio Device: BTS	
			Mkr	1 2 401527 C	
Ref Offse	t 12 dB		IVINI	00 750 45	
10 dB/div Ref 10.0	00 dBm			-26.750 dE	
Log					
0.00					Center Fred
10.0					2 402000000 CU
-10.0		L~~~			2.40200000 GHz
-20.0			- ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		
~			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	×.	
-30.0					
-40.0					
-50.0					
-60.0					
70.0					
-70.0					
-80.0					
Center 2402 GHz				Snan 2 M	HZ
#Pac BM 24 kHz		#V/D1M 75 PH	17	#Swoon	CF Step
#Res BW 24 KHz		#VDVV /JKE	12	#aweep	200.000 kHz
					Auto Man
Occupied Band	dwidth	Total P	ower -0.8	7 dBm	
	4 0507 14				
	1.0567 M	HZ			Freg Offset
					0.44
Transmit Freq Er	ror 55.386	kHz % of OE	3W Power 9	9.00 %	0 H2
x dB Bandwidth	1.190	MHz xdB	-20	.00 dB	
			÷		
MSG			STATI	US	
Occupied Bandwidth(MHz):	1.057				
Left Frequency(MHz):2401	.53 Right Fr	equency(MHz):2402.58			
Limit:>2400WHz	Test Res	ult Page			
An	1001 100	THE R P PROPERTY AND A PROPERTY AND			

TX Mode_2480 MHz

Keysight Spect	trum Analyzer - Occupied B\	W								- CP - E
X/RL	RF 50 Ω DC		- Contor	ENSE:INT			02:38:43	PM Nov 09, 2021	Freque	ncv
Center Fre	eq 2.480000000	GHZ	Tria: Fr	rreq: 2.4800 ee Run	AvalHold:	10/10	Radio Sto	1: None		
		#IFGain:Low	#Atten:	30 dB	J		Radio De	vice: BTS		
						Mkr1	2.4805	948 GHz		
10 dBidiv	Ref Offset 12 dB	'n					-24.7	'54 dBm		
Log	itor roiot abi						- \			
0.00		+							Cente	er Fre
10.0		+		~					2.4800000	000 GH
20.0		~~~		~~~	~~~~		<u> </u>			
30.0						~				
40.0										
40.0	~~~ /							\sim		
50.0								Y		
-60.0		+								
70.0										
80.0										
Center 2.4	8 GHz						Sp	oan 2 MHz	С	F Ste
≇Res BW ∶	24 kHz		#V	BW 75 k	HZ		#8	weep 1s	200.0	000 kH
Occurs	ind Pondwid	th.		Total F	ower	0.5	1 dBm		Auto	Ma
Occup	led Bandwid	.m 		rotarr	Ower	0.0				
	1.	.0577 M	Hz						Frea	Offse
T	it Eners Emer	6E 020	1.11-	0/ -50	DW/ D	- 0	0 00 0/			0 -
ITalisii	IL FIEL EITOI	05.929	KIIZ	% 01 0	DVV FOWe	1 S	9.00 %			
x dB Ba	ndwidth	1.189	MHz	x dB		-20	0.00 dB			
100						OTAT	110			_
156						STAT	05			
Occupied Ban	dwidth(MHz):1.058									
eft Frequen	cy(MHz):2479.54	Right Fr	equency(M	Hz):2480.59						
limit: <2483	. 5MHz	Test Res	sult:Pass							



Test Mode: TX	X Mode_2Mbps			
Frequency (MHz)	Occupied Channel Bandwidth (MHz)	F∟at 99% BW (MHz)	Fн at 99% BW (MHz)	Result
2402	2.155	2400.99	-	
2480	2.156	-	2481.15	Pass
	N/A	F∟> 2400	F _H < 2483.5	

TX Mode_2402 MHz

Keysight Spectrum Analyzer - Occupied E	w						
(X RL RF 50Ω DC		SENS	E:INT		02:40:36 P	M Nov 09, 2021	Fraguenes
Center Freg 2.40200000	0 GHz	Center Free	q: 2.402000000	GHz	Radio Std	None	Frequency
	→	🛄 Trig: Free I	Run Avı	g Hold: 10/10			
	#IFGain:Low	#Atten: 30	dB		Radio Dev	ice: BTS	
				Mke	1 2 4000	06 CU-	
Ref Offset 12 de	8			IVINI	2.4003	SO GHZ	
10 dB/div Ref 10.00 dB	m				-29.0	24 dBm	
Log							
0.00							Center Free
							Concerned
-10.0		/	\				2.402000000 GH:
-20.0	1 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	$\sim\sim\sim$	how	~			
	· · · · ·			$\sim \sim \sim$			
-30.0					~		
10.0							
man /						$\sim \sim \sim$	
-50.0					\rightarrow	L	
-80.0							
-70.0							
-80.0							
Center 2.402 GHz					Sp	an 4 MHz	CE Stor
#Res BW 47 kHz		#VBV	V 150 kHz		#S	weep 1s	CF Slep
							400.000 KH
			Tetel Deur	- 20	6 dD		Auto Mar
Occupied Bandwid	an		rotal Powe	-2.9	оавт		
2	4550 M						
2	. 1992 IVI	ΠZ					Freq Offse
Transmit Freq Error	63.543	kHz ^e	% of OBW I	Power 9	9.00 %		011.
x dB Bandwidth	2.311	MHZ >	K dB	-20	.00 dB		
MSG				STATI	US		
Occupied Bandwidth(MHz):2.155							
Left Frequency (WHz) - 2400 00	Right Fr	equency (WHz)	·2403-14				
Leit Lequency (miz/, 2400, 35	NIGHT PP	cquercy (mfiz)					
L1m1t:>2400#Hz	Test Res	uit:Pass					

TX Mode_2480 MHz





APPENDIX G - TRANSMITTER UNWANTED EMISSIONS IN THE OOB DOMAIN











APPENDIX H - TRANSMITTER UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN





no.	Pieq.	Level	Factor	ment	LIMIC	Maigin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	43.8710	-60. 45	-1. 59	-62.04	-36. 00	-26. 04	RMS	
2 *	104. 9810	-62.39	-9.16	-71.55	-54.00	-17.55	RMS	
3	213. 7180	-68. 70	-7. 0 8	-75. 78	-54. 00	-21.78	RMS	
4	256. 3980	-68. 51	-3.99	-72. 50	-36. 00	-36. 50	RMS	
5	341.9520	-67.62	-2.65	-70.27	-36.00	-34.27	RMS	
6	427. 5060	-67.21	-1.36	-68.57	-36. 00	-32.57	RMS	





	IICq.	Level	Factor	ment	LIMIC	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	41. 4460	-66.11	-3. 0 8	-69.19	-36.00	-33. 19	RMS	
2 *	111. 1890	-62. 93	-8.74	-71.67	-54.00	-17.67	RMS	
3	213. 7180	-69.12	-6. 46	-75. 58	-54.00	-21. 58	RMS	
4	256. 4950	-69. 03	- 4 . 51	-73. 54	-36.00	-37. 54	RMS	
5	299.1750	-68.27	-3.84	-72.11	-36.00	-36.11	RMS	
6	427. 5060	-65. 31	-1. 38	-66. 69	-36.00	-30. 69	RMS	





		Level	Factor	ment				
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	42.9010	-61.01	-1.93	-62.94	-36. 00	-26. 94	RMS	
2 *	105. 6600	-60.81	-9.10	-69.91	-54.00	-15.91	RMS	
3	256. 4950	-68.20	-3. 98	-72. 18	-36. 00	-36. 18	RMS	
4	299. 2720	-67.21	-3.79	-71.00	-36. 00	-35.00	RMS	
5	341.9520	-68.25	-2.65	-70.90	-36.00	-34. 90	RMS	
6	427. 4090	-68. 05	-1.35	-69. 40	-36. 00	-33. 40	RMS	





no.	Freq.	Level	Factor	ment	ыши	Maigin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	42. 4160	-64.28	-2. 9 5	-67.23	-36. 00	-31.23	RMS	
2 *	111.7710	-63. 40	-8. 66	-72 . 06	-54.00	-18. 06	RMS	
3	213. 7180	-67.37	-6.46	-73.83	-54.00	-19.83	RMS	
4	256. 4950	-68.74	- 4 . 51	-73.25	-36. 00	-37.25	RMS	
5	299.1750	-68.27	-3. 84	-72.11	-36.00	-36.11	RMS	
6	427. 4090	-66. 33	-1.37	-67.70	-36.00	-31.70	RMS	



t Mo	ode	TX Mod	e 2402 MHz	_1Mbps	Pola	rization	Vertical	
20 d	Bm							
20 G								
⊢								
Ļ								
╞								
-								
				1				
0				X				
0								
000	0.00 2175.00	3350.00	4525.00 57	700.00 6875	.00 8050.	00 9225.0	0 10400.00	12750.00 (MHz)
	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment



	Jae	I X Moo	de 2402 MH	z_1Mbp	S	Polariz	zation	Horizonta	al
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-20 de	Brn								
-									
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-									
_									
				1					
-60 -				-×					
-									
\vdash									
\vdash									
1000	00 2175.00	3350.00	4525.00 5	200.00	6875.00	8050.00	1 9225.0	0 10400.00	12750.00
1000.	30 Z110.00	0000.00	-102.03.00 S		0010.00	0000.00	5 522.J.U		(MHz)
0.	Freq.	Reading Level	Correct Factor	Meas ment	ure L	imit	Margin		
	MHz	dBm	dB	dBm	d	Bm	dB	Detector	Comment



est Mode		TX Mod	de 2480 MHz	z_1Mbps	Pola	arization	Vertical	
20 -	10m							
- 20 a								
				1				
-60				×				
100								
1000	0.00 2175.00	3350.00	4525.00 5	700.00 6	875.00 8050	0.00 9225.	00 10400.00	12750.00 (MHz)
lo.	Freq.	Reading Level	g Correct Factor	Measur ment	e Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
*	5430. 925	0 -64.44	4.37	-60. 07	-30. 00	-30. 07	RMS	



st M	lode	TX Mod	e 2480 MHz	_1Mbps	Pola	rization	Horizontal	
20.4	18m							
-200								
~			1					
-60			X					
100								
100	0.00 2175.00	3350.00	4525.00 5	700.00 6875	.00 8050	.00 9225.0	0 10400.00	12750.00 (MHz)
lo.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
*	4367.550	0 -64.32	4.91	-59.41	-30. 00	-29.41	RMS	



st Mo	ode	TX Mod	e 2402 MHz	_2Mbps	Pola	rization	Vertical	
-20 d	Bm							
200								
┝								
ŀ					_			
20				1				
00 -				×				
00	00 0475.00	3350.00	4525.00 5	700.00 0077	00 0050	00 0005 4	10400.00	40760.00
1000	.00 2173.00	3330.00	4929.00 9	100.00 0873	0.00 00.00.	00 9223.	0 10400.00	(MHz)
) .	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
*	5447. 9620	0 -64.60	4. 36	-60. 24	-30.00	-30. 24	RMS	201110110



est Mode		TX Mod	le 2402 MHz	_2Mbps	Pola	rization	Horizontal	
-20 d	Bm							
F								
			1					
-60			×					
100								
1000	0.00 2175.00	3350.00	4525.00 57	700.00 6875	.00 8050.	.00 9225.0	00 10400.00	12750.00 (MHz)
lo.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment



st M	ode	TX Mod	e 2480 MHz	_2Mbps	Pola	rization	Vertical	
-20 d	IBm		1			1	1	
-								
-								
				1				
-60				X				
-								
100	0.00 0175.00	3350.00	4626.00	00.00 607	00 0050	00 0005	00 40400.00	40760.00
1000	00.2175.00	3300.00	4525.00 57	00.00 087:	0008 00.0	.00 9225.	00 10400.00	12750.00 (MHz)
lo.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment



est Mode		TX Mod	e 2480 MHz	_2Mbps	Pola	rization	Horizontal	
-20 d	Rm							
-								
-								
			1					
-60			X					
100								
1000	0.00 2175.00	3350.00	4525.00 57	700.00 6875	.00 8050.	00 9225.0	0 10400.00	12750.00
								(MHz)
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
*	4779.975	0 -64.96	5.38	-5 9. 58	-30. 00	-29. 58	RMS	



APPENDIX I - RECEIVER SPURIOUS EMISSIONS





NO.	Freq.	Level	Factor	ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	41.7370	-67.61	-3. 04	-70.65	-57.00	-13.65	RMS	
2	104. 8840	-62.13	- 9. 90	-72.03	-57.00	-15.03	RMS	
3	213. 7180	-67.96	-6.46	-74.42	-57.00	-17.42	RMS	
4	299. 2720	-67.68	-3.84	-71.52	-57.00	-14. 52	RMS	
5	341.9520	-68.29	-2.82	-71.11	-57.00	-14.11	RMS	
6 *	427. 4090	-66.47	-1.37	-67.84	-57.00	-10.84	RMS	





NO.	Freq.	Level	Factor	ment	LIMIU	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	42. 2220	-67.77	-2.97	-70. 74	-57.00	-13.74	RMS	
2	111. 0920	-62.07	-8.75	- 70. 82	-57.00	-13. 82	RMS	
3	213. 7180	-69. 57	-6.46	-76.03	-57.00	-19.03	RMS	
4	256. 4950	-68. 53	-4. 51	-73. 04	-57.00	-16. 04	RMS	
5	299.1750	-68.25	-3.84	-72 . 09	-57.00	-15. 09	RMS	
6 *	427. 5060	-65. 81	-1.38	-67.19	-57.00	-10. 19	RMS	





NO.	rieq.	Level	Factor	ment	гтштг	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	42.7792	-67.25	-1. 9 8	-69.23	-57.00	-12.23	RMS	
2	94. 0199	-61.22	-9. 50	-70.72	-57.00	-13.72	RMS	
3	213. 7180	-67.84	-7.08	-74. 92	-57.00	-17. 9 2	RMS	
4	256. 4950	-67.27	-3. 98	-71.25	-57.00	-14.25	RMS	
5	341. 9520	-68.08	-2.65	-70.73	-57.00	-13.73	RMS	
6 *	427. 4090	-66. 48	-1.35	-67.83	-57.00	-10.83	RMS	



est Mode RX Mode 2480 MHz				MHz_1I	Vbps	Polar	ization	Horizontal	
-20 dE	Brn								
_									
_									
-60									
					5				
⇒	× 2	3	4		×		6		
		×							
F									
100	407.00				EAE				
30.00) 127.00	224.00	321.00	418.00	515.	JU 612.00	J 709.00	806.00	1000.00 (MHz)
lo.	Freq.	Reading Level	Corre Facto	ct Me	asure nt	Limit	Margin		

		Level	Factor	ment	Dimit			
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1	42.6100	-67. 53	-2 . 04	-69. 57	-57.00	-12.57	RMS	
2	106. 1450	-61.12	- 9. 0 5	-70.17	-57.00	-13.17	RMS	
3	213. 3300	-66. 43	-7.11	-73. 54	-57.00	-16. 54	RMS	
4	299. 1750	-68.23	-3. 79	-72.02	-57.00	-15.02	RMS	
5 *	427. 4090	-65.77	-1.35	-67.12	-57.00	-10.12	RMS	
6	683. 8770	-74.14	2.53	-71.61	-57.00	-14.61	RMS	



est M	ode	RX Mod	le 2402 MHz	z_1Mbps	Pola	rization	Vertical	
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100	0.00 2175.00	3350.00	4525.00 5	700.00 6875	00 8050.	00 9225.0	0 10400.00	12750.00 (MHz)
о.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
*	4264.150	0 -62.80	4.88	-57. 92	-47.00	-10. 92	RMS	



st M	t Mode RX Mod		le 2402 MHz	_1Mbps	Polarization		Horizontal		
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100	00 2175 00	2250.00	4525.00 53	700 00 697E	00 0050	00 0005 0	10400.00	10750.00	
1000	1.00 2175.00	3330.00	4525.00 57	C180 UU.UU	.00 8030.	00 9225.	00 10400.00	1∠r∋0.00 (MHz)	
о.	Freq.	Reading	Correct	Measure	Limit	Margin			
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment	
*	4816, 400	0 -64, 55	5. 39	-59, 16	-47.00	-12, 16	RMS		



st Mode		RX Mode 2480 MHz_1Mbps			Polarization		Vertical		
- 20 d	Bm								
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			1						
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00	00 0475 00	3350.00	4525.00	100.00 0075	00 0050	00 0005 0	0 40400 00	40750.00	
1000	.00 2175.00	2220.00	4525.00 5	ruu.uu 0875.	UU 8050.	00 9225.0	0 10400.00	12750.00 (MHz)	
D.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin			
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment	



t Mode RX Mode		de 2480 MHz	_1Mbps	Polarization		Horizontal		
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20 abm								
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60		×						
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1000.00 2175	.00 3350.00	4525.00 5	700.00 6875	.00 8050	.00 9225.	00 10400.00	12750.00	
	-						(MHZ)	
o. Freq.	Reading	Correct	Measure	Limit	Margin			
MHz	dBm	dB	dBm	dBm	dB	Detector	Comment	
* 4965.6	6250 -64.83	5.40	-59.43	-47.00	-12.43	RMS		



APPENDIX J - RECEIVER BLOCKING



Receiver Blocking Result										
	Operation	Wanted Signal Mean Power	Blocking Signal	Blocking Signal	Blocking Signal					
Modulation Mode	Erog	from Companion Device	Freq.	Power	Power + Max. Ant.	PER				
	(MHz)	(dBm)	(MHz)	(dBm)	Gain	(%)				
		(See Note 1)	(See Note 2)	(See Note 1)	(dBm)					
	2402	CE 70	2380	-34	-31	0.20				
1 Mana		-05.76	2300	-34	-31	0.00				
a mps	2490	65 76	2504	-34	-31	0.60				
	2460	-05.76	2584	-34	-31	0.20				
Limit	PER(Packet Error Rate) ≤ 10%									
Result	Pass									

Note:

The levels had been corrected by the actual antenna assembly gain.
The test report did not use the shift of blocking frequencies with the standard Clause 5.4.11.2.1 Step 5.


APPENDIX K - INFORMATION AS REQUIRED BY EN 300 328 V2.2.2, CLAUSE 5.4.1





In accordance with ETSI EN 300 328, clause 5.4.1, the following information is provided by the manufacturer.
a) The type of wideband data transmission equipment:
⊠ non-FHSS
b) In case of FHSS:
(1) In case of non-Adaptive FHSS equipment:
The number of Hopping Frequencies: <u>N/A</u>
(2) In case of Adaptive FHSS equipment:
The maximum number of Hopping Frequencies: <u>N/A</u>
The minimum number of Hopping Frequencies: <u>N/A</u>
(3) The (average) dwell time: <u>N/A</u>
c) Adaptive / non-adaptive equipment:
non-adaptive Equipment
\boxtimes adaptive Equipment without the possibility to switch to a non-adaptive mode
adaptive Equipment which can also operate in a non-adaptive mode
 d) In case of adaptive equipment: The maximum Channel Occupancy Time implemented by the equipment: <u>N/A</u> ms
The equipment has implemented an LBT mechanism
* In case of non-FHSS equipment:
The equipment is Frame Based equipment
The equipment is Load Based equipment
The equipment can switch dynamically between Frame Based and Load Based
equipment
The CCA time implemented by the equipment: <u>N/A</u> μ s
The equipment has implemented a DAA mechanism
The equipment can operate in more than one adaptive mode



f) The worst case operational mode for each of the following tests:
(1) RF Output Power: 6.33 dBm
(2) Power Spectral Density: 6.24 dBm/MHz
(3) Duty cycle, Tx-Sequence, Tx-gap: N/A
(4) Accumulated Transmit time, Frequency Occupation & Hopping Sequence (only for FHSS
equipment): <u>N/A</u>
(5) Hopping Frequency Separation (only for FHSS equipment): <u>N/A</u>
(6) Medium Utilization: <u>N/A</u>
(7) Adaptivity: <u>N/A</u> , Receiver Blocking: <u>0.60</u> %
(8) Nominal Channel Bandwidth: <u>2.156</u> MHz
(9) Transmitter unwanted emissions in the OOB domain: <u>-30.76</u> dBm
(10) Transmitter unwanted emissions in the spurious domain: <u>-69.91</u> dBm
(11) Receiver spurious emissions: <u>-67.12</u> dBm
g) The different transmit operating modes (tick all that apply):
Operating mode 1: Single Antenna Equipment
Equipment with only one antenna
Equipment with two diversity antennas but only one antenna active at any moment in time
Smart Antenna Systems with two or more antennas, but operating in a (legacy) mode
where only one antenna is used (e.g. IEEE 802.11™ legacy mode in smart antenna systems)
Operating mode 2: Smart Antenna Systems - Multiple Antennas without beam forming
☐ Single spatial stream/Standard throughput (e.g. IEEE 802.11™ legacy mode)
☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 1
High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 2
NOTE: Add more lines if more channel bandwidths are supported.
Operating mode 3: Smart Antenna Systems - Multiple Antennas with beam forming
☐ Single spatial stream/Standard throughput (e.g. JEEE 802 11™ legacy mode)
\square High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 1
☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 2
NOTE: Add more lines if more channel bandwidths are supported.



L)	In case of Smort Antonno Systems, N/A
11)	(1) The number of Poseive chains:
	(1) The number of Transmit chains:
	asymmetrical power distribution
	In case of beam forming, the maximum (additional) beam forming gain:dB
	NOTE: The additional beam forming gain does not include the basic gain of a single antenna.
i)	Operating Frequency Range(s) of the equipment:
	(1) Operating Frequency Range 1: <u>2402</u> MHz to <u>2480</u> MHz
	NOTE: Add more lines if more Frequency Ranges are supported.
j)	Nominal Channel Bandwidth(s):
	(1) Nominal Channel Bandwidth 1: <u>2.156</u> MHz
	NOTE: Add more lines if more channel bandwidths are supported.
k)	Type of Equipment (stand-alone, combined, plug-in radio device, etc.):
	⊠ Stand-alone
	Combined Equipment
	Plug-in radio device
	Other
n	The extreme operating conditions that apply to the equipment:
-,	Operating temperature range: 0 ° C to 45 ° C
	Details provided are for the: 🖂 stand-alone equipment
	Combined equipment
	□ test iig



n) The nominal voltages of the stand-alone radio equipment or the nominal voltages of the			
combined equipment or test jig in case of plug-in devices:			
Details provided are for the: 🖂 stand-alone equipment			
□ combined equipment			
□ test jig			
Supply Voltage 🖾 AC mains State AC voltage <u>100-240</u> V			
DC State DC voltage V			
In case of DC, indicate the type of power source			
Internal Power Supply			
External Power Supply or AC/DC adapter			
Battery			
□ Other:			
a) Describe the test modes available which can facilitate testing.			
The recommendation of the sector and during continuously transmitting and sector and sector			
The measurements shall be performed during continuously transmitting and normal operation.			
p) The equipment type (e.g. Bluetooth®, IEEE 802.11™, IEEE 802.15.4™, proprietary, etc.):			
Bluetooth [®]			
s) Geo-location capability supported by the equipment:			
□ Yes			
☐ The geographical location determined by the equipment as defined in clause 4.3.1.13.2 or			
clause 4.3.2.12.2 is not accessible to the user			
⊠ No			

End of Test Report