

EN 301 489-1/-17 TEST REPORT

for

Protractor

Model No.: S22AXX

M07AXX

of

Applicant: 7burg UG (haftungsbeschränkt)
Address: Hansastr. 9A, 06118Halle, Germany

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

FCC Registration No.: TW1477, TW0020, TW1072

Industry Canada filed test laboratory Reg. No. IC 5679A-1, IC 5107A-1

A2LA Accredited No.: 2732.01



Report No.: W6D21804-18049-E-16

6F, NO. 58, LANE 188, RUEY-KUANG RD., NEIHU TAIPEI 114, TAIWAN, R.O.C.
TEL: 886-2-66068877 FAX: 886-2-66068879 E-mail: wts@wts-lab.com

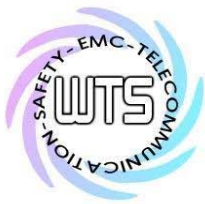
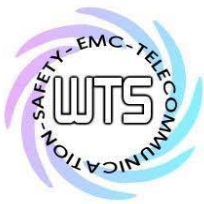


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1 General Information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample, which has passed all the relevant tests, conforms to a specification (only for telecommunication equipment).

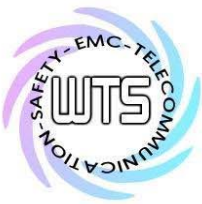
Neither is there any guarantee that such a test sample will interoperate with other genuinely open systems.

The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.6.

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1.2 Tester

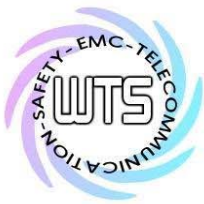
May 11, 2018 Rick Chen *Rick Chen.*

Date WTS-Lab. Test Engineer Signature

Technical responsibility for area of testing:

May 11, 2018 Kevin Wang *Kevin Wang*

Date WTS-Lab. Name Signature



1.3 Testing laboratory

1.3.1 Location

OATS

No.5-1, Lishui, Shuang Sing Village,
Wanli Dist., New Taipei City 207,
Taiwan (R.O.C.)

3 meter semi-anechoic chamber

No.35, Aly. 21, Ln. 228, Ankang Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

TEL:886-2-6613-0228

FAX:886-2-2791-5046

Company

Worldwide Testing Services (Taiwan) Co., Ltd.

6F, NO. 58, LANE 188, RUEY-KUANG RD.

NEIHU, TAIPEI 114, TAIWAN R.O.C.

Tel : 886-2-66068877

Fax : 886-2-66068879

1.3.2 Details of accreditation status

Accredited testing laboratory

A2LA accredited number: 2732.01

FCC filed test laboratory Reg. No. TW1477, TW0020, TW1072

Industry Canada filed test laboratory Reg. No. IC 5679A-1, IC 5107A-1

1.3.3 Test location, where different from Worldwide Testing Services (Taiwan) Co., Ltd.

Name: ./.

Accredited number: ./.

Street: ./.

Town: ./.

Country: ./.

Telephone: ./.

Fax: ./.

1.4 Details of applicant

Name: 7burg UG (haftungsbeschränkt)

Street: Hansastr. 9A,

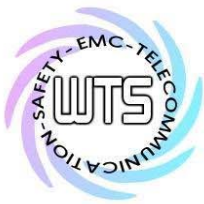
Town: 06118Halle,

Country: Germany

Telephone: 004934568206511

Fax: 004934568206512

Registration number: W6D21804-18049-E-16



1.5 Application details

Date of receipt of test item: ./.
Date of test: from May 02, 2018 to May 07, 2018

1.6 Test item

1.6.1 Description of test item

Type of Product: Protractor
Type identification: S22AXX
M07AXX
Multi-listing model number: 22xx, xx7x
Brand name: Girafus
Frequency band: 2401.2-2451.2 MHz
Additional information: ./.

1.6.2 Manufacturer: (if different from applicant in point 1.4)

Name: Ardi Technology Corp.
Street: 7F, No. 786-1, Zhongzhen Road, Zhonghe Dist.,
Town: New Taipei City,
Country: Taiwan, 235

1.7 Test standard

Technical standard: **EN 301 489-1 : V2.2.0 (2017)**
EN 301 489-17: V3.2.0 (2017)

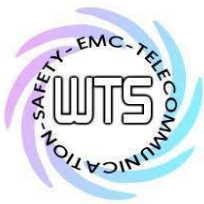
1.8 Test configuration

1. S22AXX was power up by battery 3Vd.c.(CR2032).
2. M07AXX was power up by battery 1.5Vd.c.*2.
3. The EUT kept working until the test finished.

Special Statement

1. This test report is based on the original test report no.: W6M21804-18048-E-16.
2. The relevant Circuitry, PCB Layout, Inner element, Appearance and Function is exactly the same as the one in original test report. The differences are the approval holder, brand name, product name and the model number. Therefore the test result is also based on the original test report no. W6M21804-18048-E-16 without re-testing.

Registration number: W6D21804-18049-E-16



2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the test performed.

or

The deviations as specified in 2.4 were ascertained in the course of the tests performed.

2.2 Test environment

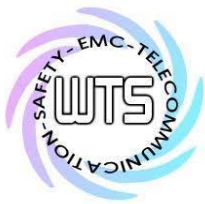
Temperature: 18°C - 24 °C

Relative humidity content: 20% - 75 %

Air pressure: 860 - 1060 hPa

Details of power supply: Battery 3Vd.c. (CR2032) (for S22AXX)
Battery 1.5Vd.c.*2 (for M07AXX)

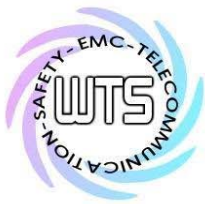
Other parameter: ./.



2.3 Test equipment utilized

No.	Test equipment	Type	Serial No.	Manufacturer	Cal. Date	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	2017/5/26	2018/5/25
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	Function Test	
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	2017/10/26	2018/10/25
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	2018/3/23	2019/3/22
ETSTW-CE 006	IMPULSBEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	2017/8/22	2018/8/21
ETSTW-CE 008	HF-EICHLITUNG RF STEP ATTENUATOR 139dB DPSP	334.6010.02	844581/024	R&S	Function Test	
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	2017/7/14	2018/7/13
ETSTW-CE 013	CISPR 22 TWO BALANCED TELECOM PAIRS IMPEDANCE STABILIZATION NETWORK	FCC-TLISN-T4-02	20242	FCC	2017/9/1	2018/8/31
ETSTW-CE 016	TWO-LINE V-NETWORK	ENV216	100050	R&S	2017/8/31	2018/8/30
ETSTW-CE 024	IMPEDANCE STABILIZATION NETWORK	ISN T800	29454	TESEQ	2017/6/19	2018/6/18
ETSTW-CE 027	COUPLING AND DECOUPLING NETWORK	CDN ST08AS	38087	TESEQ	Function Test	
ETSTW-CE 028	MXE EMI Receiver	N9038A	MY53220110	Agilent	2017/7/11	2018/7/10
ETSTW-CE 030	CISPR Passive probe	PMM SHC-1-1000	1021X30803	Narda S.T.S/PMM	2018/3/9	2019/3/8
ETSTW-CS 004	COUPLING AND DECOUPLING NETWORK	CDN M016	20053	SCHAFFNER	2017/8/7	2018/8/6
ETSTW-CS 005	RF Power Amplifier	100A250A	306547	AR	Function Test	
ETSTW-CS 010	6 dB Attenuator	SA3N1007-06	None	AISI	Function test	
ETSTW-CS 011	ESG Analog Signal Generator	E4428C	MY45280875	AGILENT	2017/7/11	2018/7/10
ETSTW-RE 003	EMI TEST RECEIVER	ESI 26	831438/001	R&S	2017/5/26	2018/5/25
ETSTW-RE 004	EMI TEST RECEIVER	ESI 40	832427/004	R&S	2017/5/17	2018/5/16
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	2017/8/25	2018/8/24
ETSTW-RE 010	ABSORBING CLAMP	MDS 21	03469	Schwarzbeck	2017/9/18	2018/9/17
ETSTW-RE 012	TUNABLE BANDREJECT FILTER	D.C 0309	146	K&L	Function Test	
ETSTW-RE 013	TUNABLE BANDREJECT FILTER	D.C 0336	397	K&L	Function Test	
ETSTW-RE 019	MICROWAVE HORN ANTENNA	22240-25	121074	FM	2018/4/9	2019/4/8
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	Function Test	
ETSTW-RE 027	Passive Loop Antenna	6512	00034563	ETS-Lindgren	2017/7/3	2018/7/2
ETSTW-RE 028	Log-Periodic Dipole Array Antenna	3148	34429	ETS-Lindgren	Function Test	
ETSTW-RE 029	Biconical Antenna	3109	33524	ETS-Lindgren	Function Test	
ETSTW-RE 030	Double-Ridged Guide Horn Antenna	3117	00035224	ETS-Lindgren	2018/3/26	2019/3/25
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	2017/9/8	2018/9/7

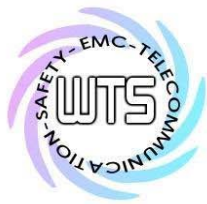
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ETSTW-RE 033	WaveRunner 6000A Serie Oscilloscope	WAVERUNNER 6100A	LCRY0604P14508	LeCroy	2017/7/17	2018/7/16
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	2017/9/8	2018/9/7
ETSTW-RE 042	Biconical Antenna	HK116	100172	R&S	2018/1/23	2019/1/22
ETSTW-RE 043	Log-Periodic Dipole Antenna	HL223	100166	R&S	2018/4/9	2019/4/8
ETSTW-RE 044	Log-Periodic Antenna	HL050	100094	R&S	2018/4/18	2019/4/17
ETSTW-RE 045	ESA-E SERIES SPECTRUM ANALYZER	E4404B	MY45111242	Agilent	Pre-test Use	
ETSTW-RE 048	Triple Loop Antenna	HXYZ 9170	HXYZ 9170-134	Schwarzbeck	2017/12/14	2018/12/13
ETSTW-RE 050	Attenuator 10dB	50HF-010-1	None	JFW	2018/3/1	2019/2/28
ETSTW-RE 051	Attenuator 6dB	50HF-006-1	None	JFW	2018/3/1	2019/2/28
ETSTW-RE 053	Attenuator 3dB	50HF-003-1	None	JFW	2018/3/1	2019/2/28
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2018/3/6	2019/3/5
ETSTW-RE 060	Attenuator 30dB	5015-30	F651012z-01	ATM	2018/3/1	2019/2/28
ETSTW-RE 061	Amplifier Module	CHC 1	None	ETS	2017/5/12	2018/5/11
ETSTW-RE 062	Amplifier Module	CHC 2	None	KMIC	2018/3/30	2019/3/29
ETSTW-RE 064	Bluetooth Test Set	MT8852B-042	6K00005709	Anritsu	Function Test	
ETSTW-RE 065	Amplifier	AMF-6F-18002650-25-10P	941608	MITEQ	2018/3/21	2019/3/20
ETSTW-RE 069	Double-Ridged Guide Horn Antenna	3117	00069377	ETS-Lindgren	Function Test	
ETSTW-RE 072	CELL SITE TEST SET	8921A	3339A00375	HP	2017/9/11	2018/9/10
ETSTW-RE 073	Power Meter	N1911A	MY45100769	Agilent	2018/1/22	2019/1/21
ETSTW-RE 074	Power Sensor	N1921A	MY45241198	Agilent	2018/1/22	2019/1/21
ETSTW-RE 091	Match Pad	MDCS1500	None	WOKEN	2018/4/9	2019/4/8
ETSTW-RE 099	DC Block	50DB-007-1	None	JFW	2018/2/23	2019/2/22
ETSTW-RE 112	AC POWER SOURCE	TFC-1005	T-0A023536	T-Power	Function test	
ETSTW-RE 115	2.4GHz Notch Filter	N0124411	473874	MICROWAVE CIRCUITS	2018/1/15	2019/1/14
ETSTW-RE 120	RF Player	MP9200	MP9210-111022	ADIVIC	Function test	
ETSTW-RE 122	SIGNAL GENERATOR	SMF100A	102149	R&S	2017/5/26	2018/5/25
ETSTW-RE 125	5GHz Notch filter	5NSL11-5200/E221.3-O/O	1	K&L Microwave	2017/8/9	2018/8/8
ETSTW-RE 126	5GHz Notch filter	5NSL12-5800/E221.3-O/O	1	K&L Microwave	2017/8/9	2018/8/8
ETSTW-RE 127	RF Switch Box	RFS-01	None	WTS	2018/2/27	2019/2/26
ETSTW-RE 128	5.3GHz Notch filter	N0153001	SN487233	Microwave Circuits	2017/8/9	2018/8/8
ETSTW-RE 129	5.5GHz Notch filter	N0555984	SN487234	Microwave Circuits	2017/8/9	2018/8/8
ETSTW-RE 130	Handheld RF Spectrum Analyzer	N9340A	CN0147000204	Agilent	Pre-test Use	
ETSTW-RE 133	EXA Signal Analyzer	N9010A	MY53470566	Agilent	2018/4/9	2019/4/8
ETSTW-RE 134	MXG Vector Signal Generator	N5182B	MY53050664	Agilent	2018/4/9	2019/4/8
ETSTW-RE 135	EXG Analog Signal Generator	N5171B	MY53050476	Agilent	2018/4/9	2019/4/8

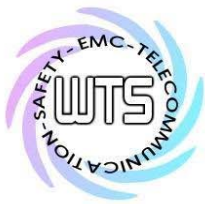
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ETSTW-RE 136	USB Wideband Power Sensor	U2021XA	MY54070006	Agilent	2018/4/18	2019/4/17
ETSTW-RE 137	USB Wideband Power Sensor	U2021XA	MY54020004	Agilent	2018/4/18	2019/4/17
ETSTW-RE 138	USB Wideband Power Sensor	U2021XA	MY54110003	Agilent	2018/4/18	2019/4/17
ETSTW-RE 139	USB Wideband Power Sensor	U2021XA	MY54110004	Agilent	2018/4/18	2019/4/17
ETSTW-RE 140	Simultaneous sampling DAQ	U2531A	TW56143501	Agilent	Function Test	
ETSTW-RE 142	Amplifier	8447D	2805A03378	Agilent	2018/3/30	2019/3/29
ETSTW-RE 146	Preamplifier	JPA-10M1G	15090004	JPT	2018/2/21	2019/2/20
ETSTW-RE 147	Bi-log Hybrid Antenna	MCTD 2786B	BLB16M04005	ETC	2018/3/23	2019/3/22
ETSTW-RE 148	Bi-log Hybrid Antenna	MCTD 2786B	BLB16M04006	ETC	2017/5/19	2018/5/18
ETSTW-RE 149	Blocking Test System	AD211	TW5451133	Keysight	Function Test	
ETSTW-RE 150	Blocking Test System	AD211	TW5451133	Keysight	Function Test	
ETSTW-RE 151	Thermohygrometer	608-h1	45104376	TESTO	2017/8/30	2018/8/29
ETSTW-EMI 001	HARMONICS 1000	HAR1000-1P	093	EMC-PARTNER	2018/2/6	2019/2/5
ETSTW-EMI 010	AC Power Source	PS3	0219	EMC PARTNER	2018/2/7	2019/2/6
ETSTW-EMI 011	USB Compact Modulator	SFC-U	101689	R&S	2017/5/10	2018/5/9
ETSTW-EMS 001	BASELSTRASSE 160 CH-4242 LAUFEN	CN-EFT1000	354	EMC-PARTNER	Function Test	
ETSTW-EMS 002	Frequency Converter	YF-6020	0308014	None	Function Test	
ETSTW-EMS 003	EMC Immunity Test System	TRA2000IN6	579	EMC-PARTNER	2017/8/31	2018/8/30
ETSTW-EMS 009	Magnetic Field Antenna	MF1000-1	104	EMC-PARTNER	Function Test	
ETSTW-EMS 010	Coupling De-coupling Network	CDN-UTP8	014	EMC-PARTNER	Function Test	
ETSTW-EMS 012	EM Injection Clamp	F-2031-23MM	476	FCC	2017/6/20	2018/6/19
ETSTW-EMS 016	EMF Tester	1390	071208732	TES	2017/8/28	2018/8/27
ETSTW-EMS 017	Multimeter	DM-1220	518614	HILA	2017/8/18	2018/8/17
ETSTW-EMS 019	Electrostatic Discharge Simulator	ESS-2002	ESS06Y6300	NoiseKen	2017/9/13	2018/9/12
ETSTW-EMS 022	Transient Test System	TRANSIENT -3000 S	1303	EMC-PARTNER	2017/8/28	2018/8/27
ETSTW-EMS 023	Electrostatic Discharge Simulator	NSG 435	6984	TESEQ	2017/6/16	2018/6/15
ETSTW-EMS 024	Humidity Temperature Meter	TES-1260	160304437	TES	2017/8/18	2018/8/17
ETSTW-EMS 025	10/700 Surge Generator	SG-728G	EC0631106	3Ctest	2017/8/30	2018/8/29
ETSTW-RS 003	RF Power Amplifier	30S1G3	306933	AR	Function Test	
ETSTW-RS 007	14" COLOR VIDEO MONITOR	HS-CM145A	0512011548	None	Function Test	
ETSTW-RS 009	SIGNAL GENERATOR	8648C	3642U01656	HP	2018/1/18	2019/1/17
ETSTW-RS 010	Broadband Field Meter	NBM-520	C-0195	Narda	2017/11/8	2018/11/7
ETSTW-RS 011	RF Power Amplifier	150W1000	0464490	AR	Function Test	
ETSTW-RS 012	Log-Periodic Antenna	ATL80M1G	0348244	AR	Function Test	
ETSTW-RS 013	Stacked Log Periodic Antenna	STLP9149	473	RS	Function Test	
ETSTW-RS 014	Power Amplifier	AS0860B	1078553	MILMEGA	Function Test	

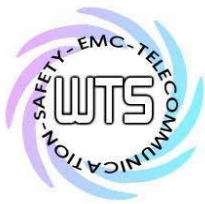
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ETSTW-RS 015	SIGNAL GENERATOR	ITS6006B	37669	TESEQ	2018/3/16	2019/3/15
ETSTW-RS 016	Power sensor	PMR6006	75617	TESEQ	2018/3/16	2019/3/15
ETSTW-RS 017	Power sensor	PMR6006	75618	TESEQ	2018/3/16	2019/3/15
ETSTW-GSM 002	Universal Radio Communication Tester	CMU 200	109439	R&S	2018/2/27	2019/2/26
ETSTW-GSM 003	Radio Communication Analyzer	MT8820C	6201342073	Anritsu	2018/3/2	2019/3/1
ETSTW-GSM 004	Wideband Radio Communication Tester	CMW500	128092	R&S	2017/10/16	2018/10/15
ETSTW-GSM 019	Band Reject Filter	WRCTF824/849-822/851-40/12+9SS	3	WI	2018/1/15	2019/1/14
ETSTW-GSM 020	Band Reject Filter	WRCD1747/1748-1743/1752-32/5SS	1	WI	2018/1/15	2019/1/14
ETSTW-GSM 021	Band Reject Filter	WRCD1879.5/1880.5-1875.5/1884.5-32/5SS	3	WI	2018/1/15	2019/1/14
ETSTW-GSM 022	Band Reject Filter	WRCT901.9/903.1-904.25-50/8SS	1	WI	2018/1/15	2019/1/14
ETSTW-GSM 023	Power Divider	4901.19.A	None	SUHNER	2017/9/13	2018/9/12
ETSTW-GSM 024	Radio Communication Analyzer	MT8821C	None	Anritsu	2018/3/7	2019/3/6
ETSTW-Cable 002	Microwave Cable	SUCOFLEX 104 (S_Cable 7)	238093	HUBER+SUHNER	2017/5/12	2018/5/11
ETSTW-Cable 003	Microwave Cable	SUCOFLEX 104 (S_Cable 11)	209953	HUBER+SUHNER	2017/5/12	2018/5/11
ETSTW-Cable 063	N type Cable (5m)	RG214/U	1249271	HUBER+SUHNER	Function Test	
ETSTW-Cable 016	BNC Cable	Switch Box	B Cable 1	Schwarz beck	2018/2/22	2019/2/21
ETSTW-Cable 017	BNC Cable	X Cable	B Cable 2	Schwarz beck	2018/2/22	2019/2/21
ETSTW-Cable 018	BNC Cable	Y Cable	B Cable 3	Schwarz beck	2018/2/22	2019/2/21
ETSTW-Cable 019	BNC Cable	Z Cable	B Cable 4	Schwarz beck	2018/2/22	2019/2/21
ETSTW-Cable 020	N TYPE Cable	OATS Cable 1	N30N30-L335-15M	JYE BAO CO.,LTD.	2017/7/3	2018/7/2
ETSTW-Cable 023	BNC Cable	BNC Cable 3	None	JYE BAO CO.,LTD.	Function Test	
ETSTW-Cable 024	BNC Cable	BNC Cable 4	None	JYE BAO CO.,LTD.	Function Test	
ETSTW-Cable 025	BNC Cable	BNC Cable 5	None	JYE BAO CO.,LTD.	Function Test	
ETSTW-Cable 026	Microwave Cable	SUCOFLEX 104	279075	HUBER+SUHNER	2018/2/27	2019/2/26
ETSTW-Cable 027	Microwave Cable	SUCOFLEX 104	279083	HUBER+SUHNER	2017/5/12	2018/5/11
ETSTW-Cable 030	Microwave Cable	SUCOFLEX 104 (S_Cable 9)	279067	HUBER+SUHNER	2018/2/27	2019/2/26
ETSTW-Cable 031	Microwave Cable	SUCOFLEX 104 (S_Cable 10)	238092	HUBER+SUHNER	2018/3/30	2019/3/29
ETSTW-Cable 039	Microwave Cable	SUCOFLEX 104	316739	HUBER+SUHNER	2017/5/12	2018/5/11
ETSTW-Cable 042	Microwave Cable	SUCOFLEX 104 (S_Cable 22)	279847	HUBER+SUHNER	Function Test	
ETSTW-Cable 043	Microwave Cable	SUCOFLEX 104	317576	HUBER+SUHNER	2018/3/30	2019/3/29
ETSTW-Cable 048	Microwave Cable	SUCOFLEX 104	325519	HUBER+SUHNER	2018/3/30	2019/3/29
ETSTW-Cable 051	BNC Cable	BNC Cable 6	None	JYE BAO CO.,LTD.	2018/3/7	2019/3/6
ETSTW-Cable 052	BNC Cable	Clamp Cable	None	Schwarz beck	2018/3/7	2019/3/6
ETSTW-Cable 058	Microwave Cable	SUCOFLEX 104	none	HUBER+SUHNER	2018/2/21	2019/2/20

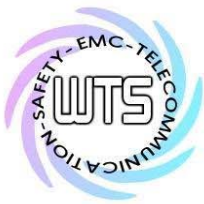
Registration number: W6D21804-18049-E-16



Worldwide Testing Services(Taiwan) Co., Ltd.

ETSTW-Cable 065	N type Cable (5m)	RG214	None	DRAKA	Function Test	
ETSTW-Cable 066	SMA type cable	32022	None	ASTROLAB	2017/8/31	2018/8/30
ETSTW-Cable 067	BNC Cable (1m)	RG213	None	ALLTESTEK	Function Test	
ETSTW-Cable 071	N TYPE CABLE	EMCCFD400-NM-NM-25000	170239	EMCI	2018/2/21	2019/2/20
WTSTW-SW 001	EMI TEST SOFTWARE	Harmonics-1000	None	EMC PARTNER	HARCS Version 4.20 Firmware Version 2.20	
WTSTW-SW 002	EMI TEST SOFTWARE	EZ_EMG	None	Farad	Version ETS-03A1	
WTSTW-SW 003	EMS TEST SOFTWARE	i2	None	AUDIX	Version 3.2007-8-17b	
WTSTW-SW 005	GSM Fading Level Correction	GSMFadLevCor	None	R&S	Version 1.66	
WTSTW-SW 006	EMI TEST SOFTWARE	e3	None	AUDIX	Version 9.161014	
WTSTW-SW 007	Keysight.EN300328.V191.Test	Keysight	None	Keysight	Version 1.0.0.0	
WTSTW-SW 008	Signal studio	Agilent	None	AUDIX	Version 2.0.0.1	

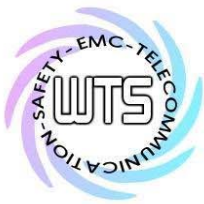
Registration number: W6D21804-18049-E-16



2.4 Test results acc. EN 301 489 - 1

1st test
 test after modification
 production test

Test case	Subclause	Required	Test passed	Test failed
Emission radiated	8.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Emission cond. DC	8.3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emission cond. AC	8.4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Harmonic current	8.5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voltage Fluctuations	8.6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RF Immunity	9.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Electrostatic Discharge	9.3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Fast transient com. Mode	9.4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radio frequ. com. mode	9.5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transient a. Surge in Vehicular environment	9.6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voltage Dips and Interr.	9.7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surges com. & diff. Mode	9.8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



2.4.1 Implemented emission tests

This test is only applicable to ancillary equipment not incorporated in the radio equipment and intended to be measured on a stand alone basis, as declared by the manufacturer. This test shall be performed on a representative configuration of the ancillary equipment.

This test is in accordance to subclause 8.2 of EN 301 489-1

2.4.1.1 Spurious Emission (EN 55032)

2.4.1.1.1 Test Equipment

a) EMI TEST RECEIVER (ESI 40)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-RE 004

b) Amplifier Module (CHC 2)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-RE 062

c) Preamplifier (JPA-10M1G)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-RE 146

d) Bi-log Hybrid Antenna (MCTD 2786B)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-RE 148

e) Double-Ridged Guide Horn Antenna (3117)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-RE 030

f) MXE EMI Receiver (N9038A)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-CE 028

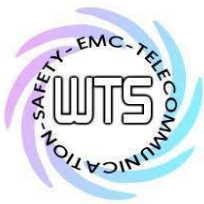
2.4.1.1.2 Test Procedures

- Test configuration

The test configuration corresponds to the standard EN 55032. The equipment under test is placed on a non metallic table with 0.8m height. The power supply and the RF connection points are close to the equipment under test at the floor inside a connection box. The cables to this connection box are shielded and below the double floor. The receiving antenna is placed in a height at 1.0 to 4.0m, in a distance of 10m(below 1GHz) and 3m(above 1GHz). The measurement receiver is placed in a special room. The observation of the equipment under test is realized by 3 video cameras and by a microphone.

- Test parameters and marginal conditions

The tests are carried out with horizontal and vertical polarisation of the antenna in a frequency range of 30 MHz to 6000 MHz. Further information please find in the test protocol.



2.4.1.2 Conducted Emission (EN 55032)

This test is applicable for base station and ancillary equipment for fixed use that may have DC cables longer than 3m and also applicable for base station and / or ancillary equipment for fixed use powered by AC mains.

This test is in accordance to subclause 8.3 and 8.4 of EN 301 489-1

2.4.1.2.1 Test Equipment

a) TWO-LINE V-NETWORK (ENV216)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-CE 016

b) EMI TEST RECEIVER (ESHS10)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-CE 001

c) ESA-E SERIES SPECTRUM ANALYZER (E4404B)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-RE 045

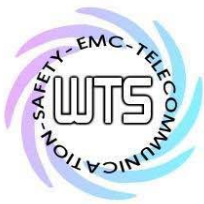
2.4.1.2.2 Test Procedures

- Test configuration

The test configuration is contained inside of a shielded chamber and corresponds to the standard EN55032. The equipment under test is placed in the facility on a wooden table 0.8m height. The equipment under test is connected with the artificial mains network (AMN) in a distance of 0.8m and also 0.8m from other subassembly and metallic area. The observation of the equipment under test is realized by 3 video cameras and by a microphone.

- Test parameters and marginal conditions

The test is carried out with nominal impedance by $50\Omega / 50\mu\text{H}$ of the AMN in a frequency range 150 kHz to 30 MHz. Further information please find in test report.



2.4.1.3 Harmonic Current Emission /Voltage Fluctuations and Flicker (IEC/EN 61000-3-2/-3)

This test is in accordance to subclause 8.5 and 8.6 of EN 301 489-1

2.4.1.3.1 Test Equipment

a) HARMONICS 1000 (HAR 1000-1P)

For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-EMI 001

b) Coupling De-coupling Network (CDN-UTP8)

For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-EMS 010

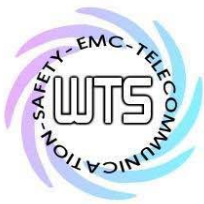
2.4.1.3.2 Test Procedures

- Test configuration

The test configuration is correspondence to the standard IEC/EN 61000-3-2/-3. The equipment under test is placed on a wooden table with a height of 0.8m in the EMC lab.

- Test parameters and marginal conditions

The harmonic test are carried out in according the classification A, B, C, D of the standard IEC/EN 61000-3-2. The flicker tests are carried out in according the time interval of the standard IEC/EN 61000-3-3. Both tests are carried out with above mentioned equipments with 230V and 50 Hz. Further information please find in test protocol.



2.4.2 Implemented immunity tests

2.4.2.1 RF Electromagnetic Field (80MHz~6000 MHz)

This test is applicable for base station, portable and ancillary equipment
This test is in accordance to subclause 9.2 of EN 301 489-1

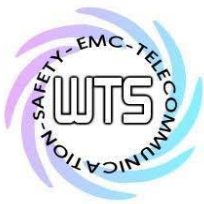
2.4.2.1.1 Test Equipment

- a) Broadband Field Meter (NBM-520)
For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-RS 010
- b) RF Power Amplifier (150W1000)
For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-RS 011
- c) Log-Periodic Antenna (ATL80M1G)
For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-RS 012
- d) Stacked Log Periodic Antenna (STLP9149)
For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-RS 013
- e) Power Amplifier (AS0860B)
For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-RS 014
- f) SIGNAL GENERATOR (ITS6006B)
For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-RS 015
- g) Power sensor (PMR6006)
For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-RS 016
- h) Power sensor (PMR6006)
For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-RS 017

2.4.2.1.2 Test Procedures

- Test configuration

The test configuration is contained inside of a shielded chamber and corresponds to the standard IEC/EN 61000-4-3 /3/. The equipment under test is placed in the facility on a wooden table 0.8m height on the centre axis of the chamber. The power supply and the RF connection points are close to the equipment under test at the floor of the chamber inside a connection box. The cables to this connection box are shielded and below the double floor. The transmitting antenna is placed in a height of 1.5m, in a distance of 3.0m. The RF-generators are placed in a special room adjacent to the chamber. The observation of the equipment under test is realized by 3 video cameras and by a microphone.



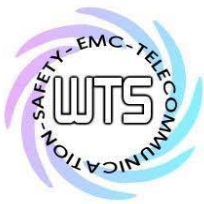
- Test parameters and marginal conditions

The tests are carried out with field strength by 3 V/m (measured in the un-modulated field) with amplitude modulated signal by a depth of 80 % by a sinusoidal audio signal of 1000 Hz. If the wanted signal is modulated with 1000Hz, then an audio signal of 400Hz shall be used. The logarithmic step was 1% and the remaining time was 1s. Further information please find in test protocol.

2.4.2.1.3 Test Result

- EUT operate as intended with no loss of primary and secondary user functions or stored data, as declared by the manufacturer, and the communication link have been maintained during the test.
- The communication link was lost during the test. But primary and secondary functions, which were lost during the test, were recoverable by operating the user control or reset functions.
- Ancillary equipment passed with the performance criteria CT acc. to /1/ subclause 6.4
- Ancillary equipment did not pass with the performance criteria CR acc. to /1/ subclause 6.4

The equipment under test fulfils the requirement in accordance with the criteria of the standard.



2.4.2.2 Electrostatic discharge

This test is applicable for base station, mobile, portable and ancillary equipment.

This test is in accordance to subclause 9.3 of EN 301 489-1

2.4.2.2.1 Test Equipment

a) Electrostatic Discharge Simulator (ESS-2002)

For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-EMS 019

b) Electrostatic Discharge Simulator (NSG 435)

For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-EMS 023

2.4.2.2.2 Test Procedures

- Test configuration

The test configuration is in correspondence to the standard IEC/EN 61000-4-2 /2/. The equipment under test is placed on a wooden table with one metal plate on its top and one metal plate under the table, which is grounded. Both plates are connected with two 470 k Ω resistor in series.

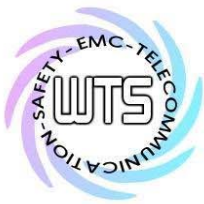
- Test parameters and marginal conditions

The test is carried out with ± 2 kV and ± 4 kV contact discharge and ± 2 kV, ± 4 kV and ± 8 kV air discharge. The tested points please find in the test protocol.

2.4.2.2.3 Test Result

- EUT operate as intended with no loss of primary and secondary user functions or stored data, as declared by the manufacturer, and the communication link have been maintained during the test.
- The communication link was lost during the test. But primary and secondary functions, which were lost during the test, were recoverable by operating the user control or reset functions.
- Ancillary equipment passed with the performance criteria CT acc. to /1/ subclause 6.4
- Ancillary equipment did not pass with the performance criteria CR acc. to /1/ subclause 6.4

The equipment under test fulfils the requirement in accordance with the criteria of the standard.



2.4.2.3 Fast Transients common mode

This test is applicable for base station and ancillary equipment.

This test is in accordance to subclause 9.4 of EN 301 489-1

2.4.2.3.1 Test Equipment

a) EMC Immunity Test System (TRA2000IN6)

For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-EMS 003

b) BASELSTRASSE 160 CH-4242 LAUFEN (CN-EFT1000)

For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-EMS 001

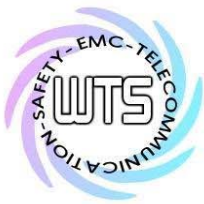
2.4.2.3.2 Test Procedures

- Test configuration

The test configuration is in correspondence to the standard IEC/EN 61000-4-4 /4/. The equipment under test is placed on a wooden table with a height of 0.8m ±0.08m. The table stands on metal plate which is grounded.

- Test parameters and marginal conditions

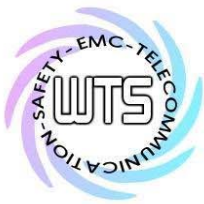
The tests are carried out with 0.5 kV open circuit voltage on signal, control and DC power ports and with 1 kV open circuit voltage on AC mains power input ports. The applied voltage please find in the test protocol.



2.4.2.3.3 Test Result

- EUT operate as intended with no loss of primary and secondary user functions or stored data, as declared by the manufacturer, and the communication link have been maintained during the test.
- The communication link was lost during the test. But primary and secondary functions, which were lost during the test, were recoverable by operating the user control or reset functions.
- Ancillary equipment passed with the performance criteria CT acc. to /1/ subclause 6.4
- Ancillary equipment did not pass with the performance criteria CR acc. to /1/ subclause 6.4

The equipment under test fulfils the requirement in accordance with the criteria of the standard.



2.4.2.4 Radio frequency common mode

This test is applicable for base station, mobile, and ancillary equipment.

This test is in accordance to subclause 9.5 of EN 301 489-1.

2.4.2.4.1 Test Equipment

a) RF Power Amplifier (100A250A)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-CS 005

b) COUPLING AND DECOUPLING NETWORK(CDN M016)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-CS 004

c) 6 dB Attenuator (SA3N1007-06)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-CS 010

d) ESG Analog Signal Generator (E4428C)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-CS 011

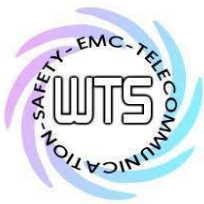
2.4.2.4.2 Test Procedures

- Test configuration

The test configuration is in correspondence to the standard IEC/EN 61000-4-6 /6/. The test was carried out on a wooden table with a grounded metal plate on its top. The equipment under test was placed on an insulating support of 0.1m height above this metal plate ,and all cables exiting the EUT was supported at a height of between 30mm and 50mm. Where coupling and/or decoupling devices are required, they was located between 0.1m and 0.3m from the EUT.

- Test parameters and marginal conditions

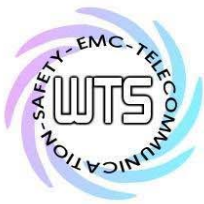
The tests are carried out with a Voltage of 3Vrms (measured un-modulated) with amplitude modulated signal by a depth of 80 % by a sinusoidal audio signal of 1000 Hz. If the wanted signal is modulated at 1000 Hz, then the test signal of 400 Hz shall be used. The frequency steps in the frequency rang 150 kHz – 5MHz are 50 kHz and in the frequency range 5MHz – 80MHz the frequency increments with 1 % of the actual frequency. The remaining time is 0.5s. The tested ports please find in the test protocol.



2.4.2.4.3 Test Result

- EUT operate as intended with no loss of primary and secondary user functions or stored data, as declared by the manufacturer, and the communication link have been maintained during the test.
- The communication link was lost during the test. But primary and secondary functions, which were lost during the test, were recoverable by operating the user control or reset function.
- Ancillary equipment passed with the performance criteria CT acc. to /1/ subclause 6.4
- Ancillary equipment did not pass with the performance criteria CR acc. to /1/ subclause 6.4

The equipment under test fulfils the requirement in accordance with the criteria of the standard.



2.4.2.5 Transients surge in vehicular environment

These tests are applicable to mobile radio and ancillary equipment intended for use in a vehicular environment.

This test is in accordance to subclause 9.6 of EN 301 489-1.

2.4.2.5.1 Test Equipment

a) EMC Immunity Test System (TRA2000IN6)

For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-EMS 003

b) Frequency Converter (YF-6020)

For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-EMS 002

2.4.2.5.2 Test Procedures

• Test configuration

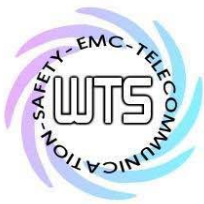
The test configuration is in correspondence to the standard ISO 7637-2 /8/. The test is carried out on a wooden table with a grounded metal plate on its top. The equipment under test is placed on an insulating support of 100 mm height above this metal plate.

• Test parameters and marginal conditions

The tests are carried out are the pulses according to subclause 9.6.2.1 of EN 301 489-1. And the special requirements of EN 301 489-7 subclause 7.2.2. The overview please find in the test protocol.

2.4.2.5.3 Test Result

- EUT operate as intended with no loss of primary and secondary user functions or stored data, as declared by the manufacturer, and the communication link have been maintained during the test.
- The communication link was lost during the test. But primary and secondary functions, which were lost during the test, were recoverable by operating the user control or reset functions.



2.4.2.6 Voltage dips and interruptions

This test is applicable for base station and fixed ancillary equipment, powered by AC mains.
This test is in accordance to subclause 9.7 of EN 301 489-1.

2.4.2.6.1 Test Equipment

a) EMC Immunity Test System (TRA2000IN6)

For your reference please find it in our test equipment list at page 7 to 11 as number : ETSTW-EMS 003

2.4.2.6.2 Test Procedures

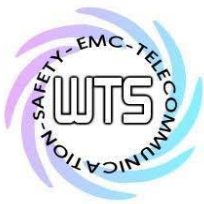
- **Test configuration**

The test configuration is in correspondence to the standard IEC/EN 61000-4-11 /7/. The equipment under

Test is placed on a wooden table with a height of 0.8 metre.

- **Test parameters and marginal conditions**

According to EN 301 489-1, the test levels shall be: voltage dip: 0 % residual voltage for 0.5 cycle;
voltage dip: 0 % residual voltage for 1 cycle; voltage dip: 70 % residual voltage for 25 cycles (at 50 Hz);
voltage interruption: 0 % residual voltage for 250 cycles (at 50 Hz).



2.4.2.6.3 Test Result

According to EN 301 489-1

For a voltage dip: 0 % residual voltage for 0.5 cycle :

- EUT operate as intended with no loss of primary and secondary user functions or stored data, as declared by the manufacturer, and the communication link have been maintained during the test.
- The communication link was lost during the test. But primary and secondary functions, which were lost during the test, were recoverable by operating the user control or reset function.
- Ancillary equipment passed with the performance criteria CT acc. to /1/ subclause 6.4
- Ancillary equipment did not pass with the performance criteria CR acc. to /1/ subclause 6.4

For a voltage dip: 0 % residual voltage for 1 cycle:

- EUT operate as intended with no loss of primary and secondary user functions or stored data, as declared by the manufacturer, and the communication link have been maintained during the test.
- The communication link was lost during the test. But primary and secondary functions, which were lost during the test, were recoverable by operating the user control or reset function.
- Ancillary equipment passed with the performance criteria CT acc. to /1/ subclause 6.4
- Ancillary equipment did not pass with the performance criteria CR acc. to /1/ subclause 6.4

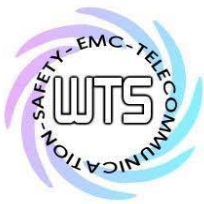
For a voltage dip: 70 % residual voltage for 25 cycles (at 50 Hz):

- EUT operate as intended with no loss of primary and secondary user functions or stored data, as declared by the manufacturer, and the communication link have been maintained during the test.
- The communication link was lost during the test. But primary and secondary functions, which were lost during the test, were recoverable by operating the user control or reset function.
- Ancillary equipment passed with the performance criteria CT acc. to /1/ subclause 6.4
- Ancillary equipment did not pass with the performance criteria CR acc. to /1/ subclause 6.4

For a voltage interruption: 0 % residual voltage for 250 cycles (at 50 Hz):

- The equipment was battery back-up powered and passes with the performance criteria TT acc. to /1/ subclause 6.5 or TR acc. To /1/ subclause 6.
- The equipment was not battery back-up powered but it did not lose user data.
- The equipment was battery back-up powered and it lost user data.

The equipment under test fulfils the requirement in accordance with the criteria of the standard.



2.4.2.7 Transients surge common and differential mode

This test is applicable for base station and fixed ancillary equipment.
This test is in accordance to subclause 9.8 of EN 301 489-1.

2.4.2.7.1 Test Equipment

- a) Coupling De-coupling Network (CDN-UTP8)
For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-EMS 010
- b) Transient Test System (TRANSIENT-3000 S)
For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-EMS 022
- c) 10/700 Surge Generator (SG-728G)
For your reference please find it in our test equipment list at page 7 to 11 as number: ETSTW-EMS 025

2.4.2.7.2 Test Procedures

- Test configuration

The test configuration is in correspondence to the standard IEC/EN 61000-4-5 /5/. The equipment under test is placed on a wooden table with a height of 0.8m. The table stands on metal plate which is grounded.

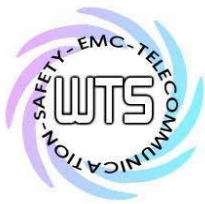
- Test parameters and marginal conditions

The tests are carried out with 1 kV open circuit voltage for common mode and with 0.5 kV open circuit voltage for differential mode. Further information please find in the test protocol.

2.4.2.7.3 Test Result

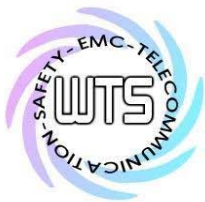
- EUT operate as intended with no loss of primary and secondary user functions or stored data, as declared by the manufacturer, and the communication link have been maintained during the test.
- The communication link was lost during the test. But primary and secondary functions, which were lost during the test, were recoverable by operating the user control or reset functions.
- Ancillary equipment passed with the performance criteria CT acc. to /1/ subclause 6.4
- Ancillary equipment did not pass with the performance criteria CR acc. to /1/ subclause 6.4

The equipment under test fulfils the requirement in accordance with the criteria of the standard.



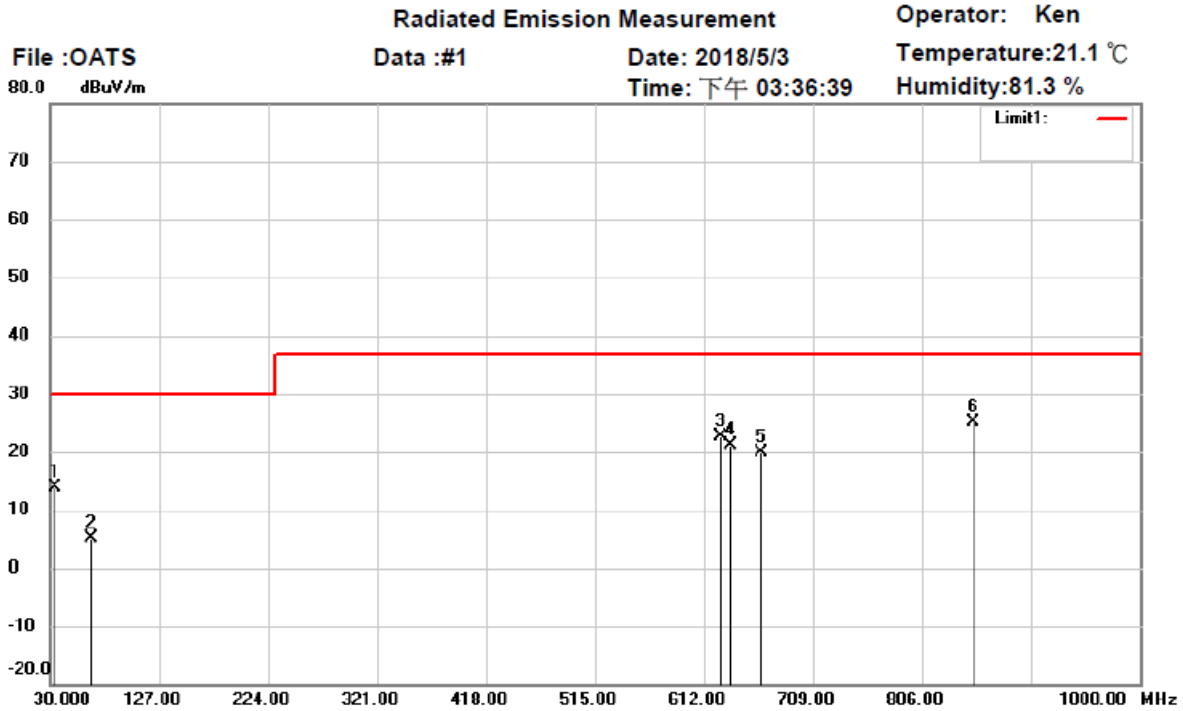
2.4.3 Test protocols

2.4.3.1 Radiated emission	28-31
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2.4.3.1

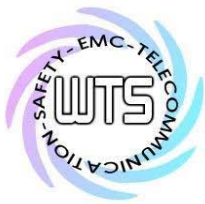
Radio Noise Field Strength Emission



Site : Open Area Test Site Polarization: *Horizontal*
 Condition : EN301489-1 RE-Class B 10M Power : 3 Vd.c.
 EUT : W6M21804-18048 Distance: 10m
 M/N:
 Test Mode :
 Note :

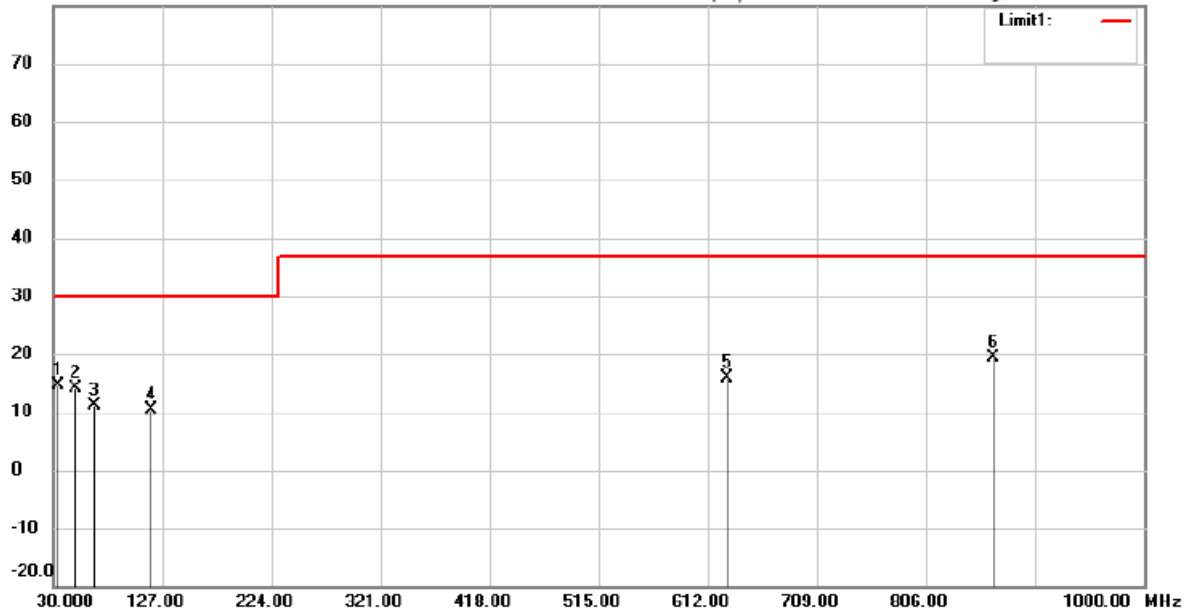
Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	34.3600	27.21	QP	-13.34	13.87	30.00	400	30	-16.13	
	66.3700	22.92	QP	-17.72	5.20	30.00	390	65	-24.80	
	624.6100	27.89	QP	-5.38	22.51	37.00	100	120	-14.49	
	634.7900	26.41	QP	-5.19	21.22	37.00	100	210	-15.78	
	661.4700	24.63	QP	-4.80	19.83	37.00	100	260	-17.17	
*	850.6200	26.61	QP	-1.43	25.18	37.00	100	310	-11.82	

Registration number: W6D21804-18049-E-16



Worldwide Testing Services(Taiwan) Co., Ltd.

Radiated Emission Measurement Operator: Ken
 File :OATS Data :#2 Date: 2018/5/3 Temperature:21.1 °C
 80.0 dBuV/m Time: 下午 03:58:56 Humidity:81.3 %

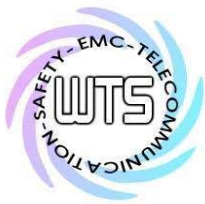


Site : Open Area Test Site
 Condition : EN301489-1 RE-Class B 10M
 EUT : W6M21804-18048
 M/N:
 Test Mode :
 Note :

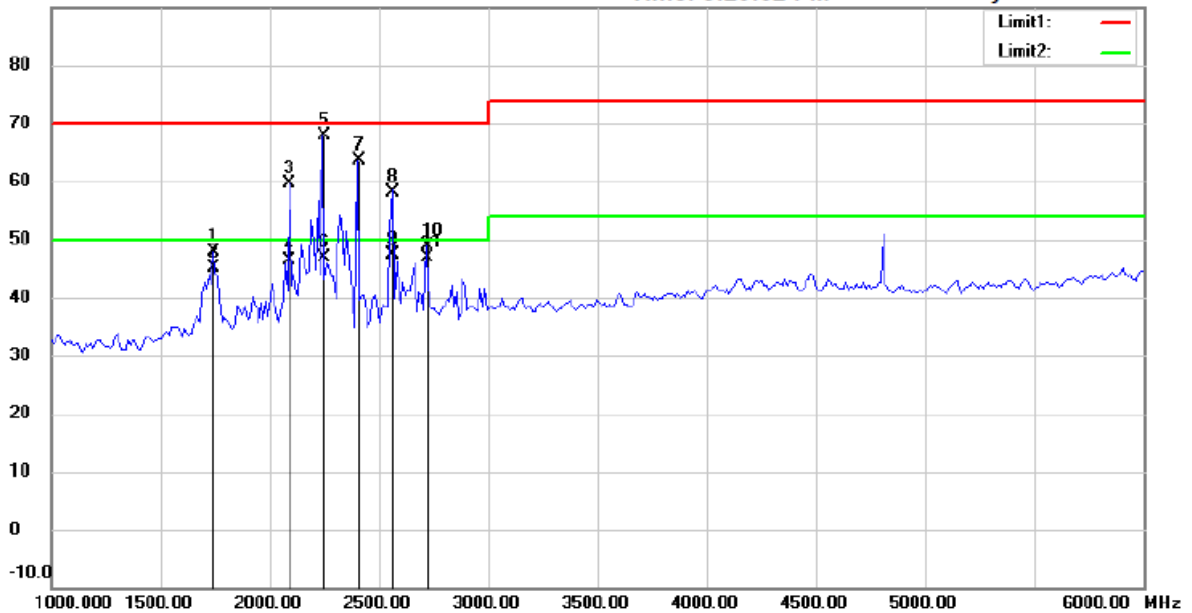
Polarization: *Vertical*
 Power : 3 Vd.c.
 Distance: 10m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	34.8500	28.09	QP	-13.41	14.68	30.00	100	50	-15.32	
	47.4600	28.68	QP	-14.67	14.01	30.00	110	75	-15.99	
	65.8900	28.75	QP	-17.62	11.13	30.00	120	115	-18.87	
	117.3000	22.40	QP	-11.93	10.47	30.00	100	140	-19.53	
	627.0300	21.13	QP	-5.33	15.80	37.00	400	225	-21.20	
	865.1700	20.79	QP	-1.32	19.47	37.00	400	270	-17.53	

Registration number: W6D21804-18049-E-16



Radiated Emission Measurement Operator: Sky
 File :3 Data :#1 Date: 5/3/2018 Temperature:22.3 °C
 90.0 dBuV/m Time: 8:20:52 PM Humidity:71.6 %



Site : 966 Chamber

Condition : EN301489-1 RE-Class B Above 1G PK

EUT : W6M21804-18048

M/N:

Test Mode :

Note :

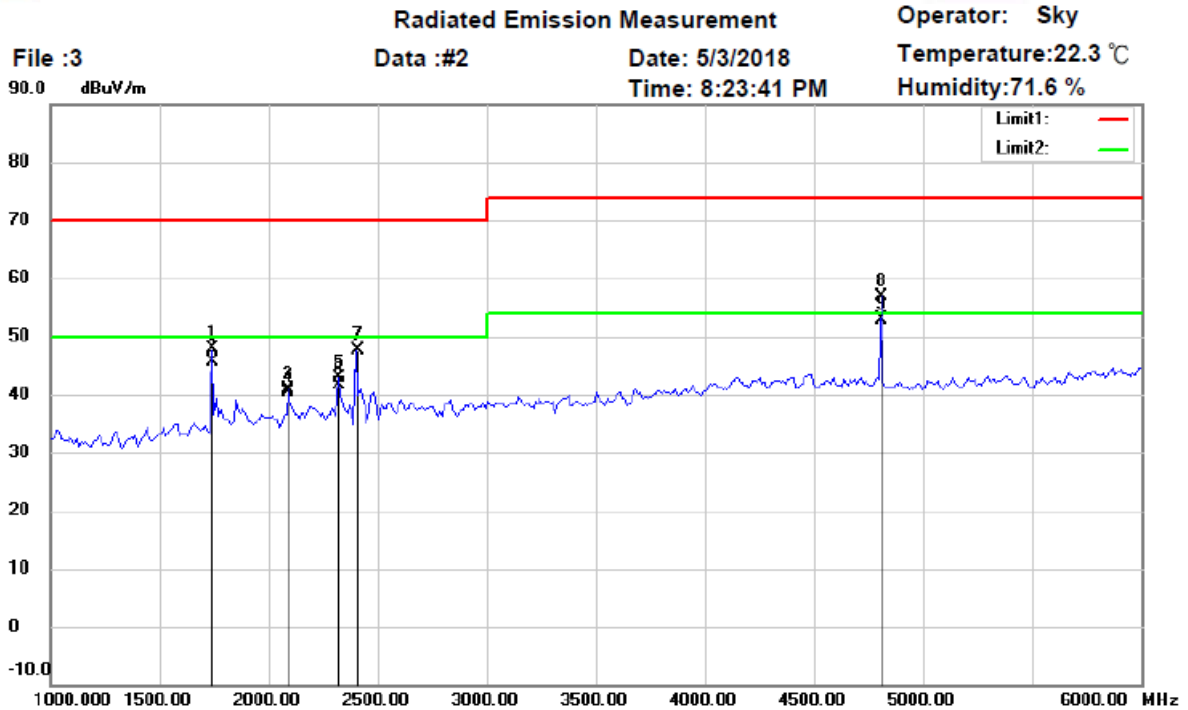
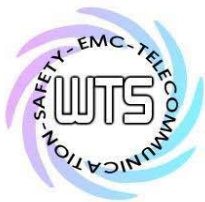
Polarization: *Horizontal*

Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	1741.483	54.93	peak	-7.03	47.90	70.00	100	110	-22.10	
	1741.483	52.11	AVG	-7.03	45.08	50.00	100	110	-4.92	
	2091.883	65.12	peak	-5.41	59.71	70.00	100	359	-10.29	
	2091.883	51.70	AVG	-5.41	46.29	50.00	100	359	-3.71	
*	2247.791	72.67	peak	-4.90	67.77	70.00	100	0	-2.23	
	2247.791	51.71	AVG	-4.90	46.81	50.00	100	0	-3.19	
	2402.806	67.78	peak	-4.13	63.65	70.00			-6.35	RF Power
	2563.126	61.55	peak	-3.46	58.09	70.00	100	355	-11.91	
	2563.126	50.72	AVG	-3.46	47.26	50.00	100	355	-2.74	
	2713.427	52.69	peak	-3.83	48.86	70.00	100	263	-21.14	
	2713.427	50.66	AVG	-3.83	46.83	50.00	100	263	-3.17	

Registration number: W6D21804-18049-E-16



Site : 966 Chamber

Condition : EN301489-1 RE-Class B Above 1G PK

EUT : W6M21804-18048

M/N:

Test Mode :

Note :

Polarization: *Vertical*

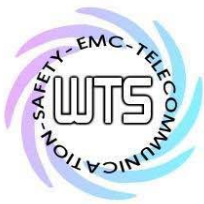
Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	1741.483	54.80	peak	-7.03	47.77	70.00	100	30	-22.23	
	1741.483	52.70	AVG	-7.03	45.67	50.00	100	30	-4.33	
	2092.184	46.34	peak	-5.41	40.93	70.00	100	225	-29.07	
	2092.184	45.70	AVG	-5.41	40.29	50.00	100	255	-9.71	
	2322.645	47.53	peak	-4.62	42.91	70.00	100	15	-27.09	
	2322.645	46.22	AVG	-4.62	41.60	50.00	100	15	-8.40	
	2402.806	51.73	peak	-4.13	47.60	70.00			-22.40	RF Power
	4807.615	56.21	peak	0.74	56.95	74.00	100	90	-17.05	
*	4807.615	52.11	AVG	0.74	52.85	54.00	100	90	-1.15	

- Note:**
1. Correction Factor = Antenna factor + Cable loss - Preamplifier
 2. The formula of measured value as: Test Result = Reading + Correction Factor
 3. Detector function in the form: PK = Peak, QP = Quasi Peak, AV = Average
 4. All not in the table noted test results are more than 20 dB below the relevant limits.
 5. Measurement uncertainty below 1GHz: 30-1000 MHz = ± 3.35 dB ;
 Measurement uncertainty above 1GHz: 1-18 GHz = ± 2.60 dB, 18-40 GHz = ± 2.58 dB ;
 Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.
 6. Up Line: PK Limit Line, Down Line: Ave Limit Line.

Registration number: W6D21804-18049-E-16



2.4.3.2

Conducted Emission

Emission

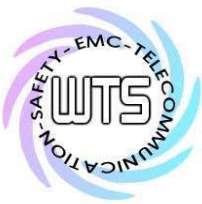
Model:	S22AXX	Date:	--	
	M07AXX			
Mode:	--	Temperature:	--	°C
Polarization:	--	Humidity:	--	%
Engineer:	--			

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result (dBuV)		Limit (dBuV)		Margin (dB)
	QP	Ave.		QP	Ave.	QP	Ave.	
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Polarization: --

Frequency (MHz)	Reading (dBuV)		Factor (dB) Corr.	Result (dBuV)		Limit (dBuV)		Margin (dB)
	QP	Ave.		QP	Ave.	QP	Ave.	
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

- Note:**
1. The formula of measured value as: **Test Result = Reading + Correction Factor**
 2. The **Correction Factor = Cable Loss + LISN Insertion Loss + Pulse Limit Loss**
 3. Detector function in the form: **PK = Peak, QP = Quasi Peak, AV = Average**
 4. All not in the table noted test results are more than 20 dB below the relevant limits.
 5. **Measurement uncertainty = ± 1.54 dB; Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.**
 6. **Up Line: QP Limit Line, Down Line: Ave Limit Line**
 7. **This test is not required because the EUT uses battery.**



2.4.3.3

Harmonics current

Harmonics

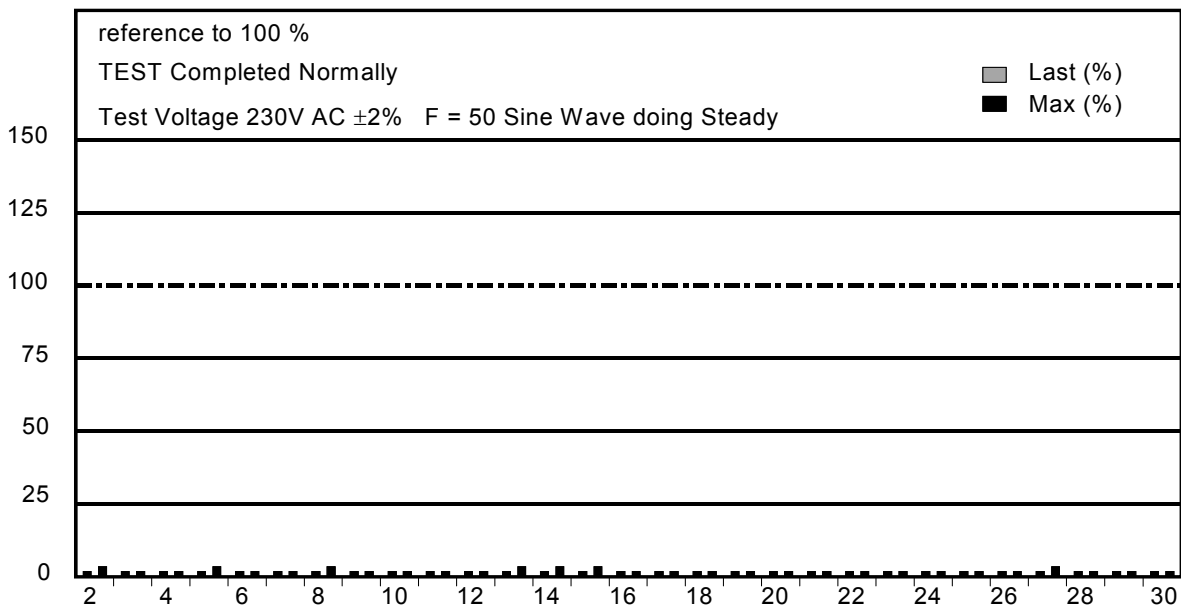
Standard : EN 301 489-1 subclause 8.5

Device : S22AXX
M07AXX

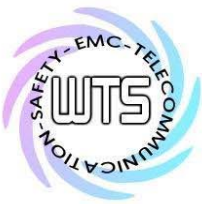
Date : --

Class : --

Temperature	: --	°C
Pressure	: --	hPa
Rel. humidity	: --	%



Passed : yes / no



2.4.3.4

Voltage Fluctuations

Flicker

Standard : EN 301 489-1 subclause 8.6

Device : S22AXX
M07AXX

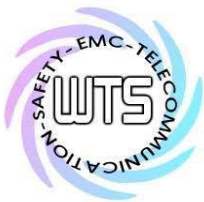
Date : --

Mode : --

Temperature	: --	°C
Pressure	: --	hPa
Rel. humidity	: --	%

$P_{st<1.0}$	--
P_{lt}	--
dt	--
d (max)	--
dc %	--

Passed : yes / no



2.4.3.5

Radio frequency electromagnetic field Immunity (80 MHz to 6000 MHz)

RF Field

Standard : EN 301 489-1 subclause 9.2

Device : S22AXX
M07AXX

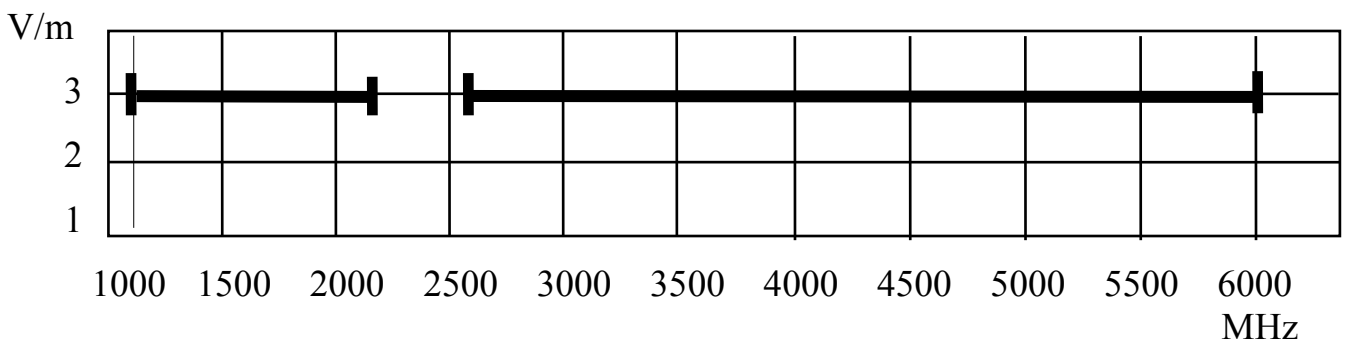
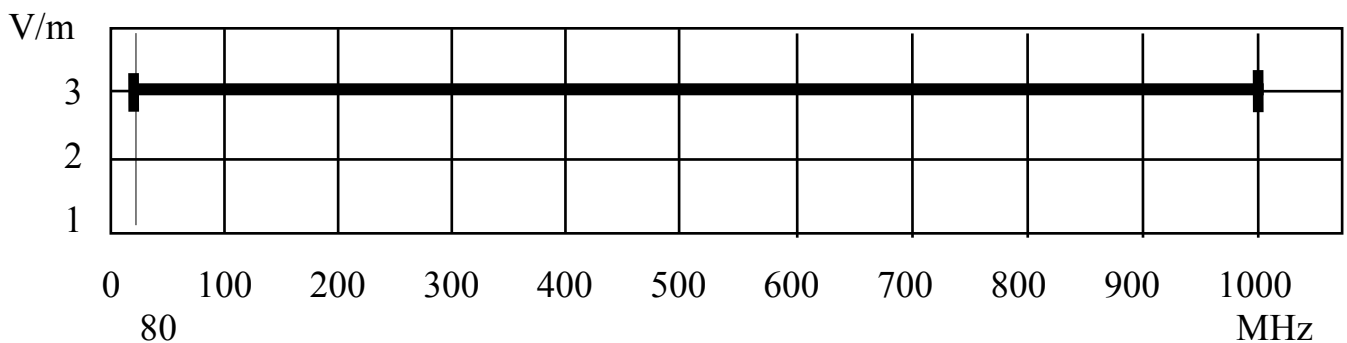
Date : May 03, 2018

Exclusion band: 2280 ~2603.675 MHz

Test equipment: Anechoic Chamber

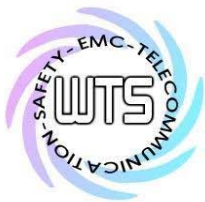
Severity Level : 2 (3 V/m)

Temperature	: 22.3 °C
Pressure	: 1018 hPa
Rel. humidity	: 71.6 %



Performance criteria:

- A : No loss of performance or function
- B : Temporary loss of function or performance which is self recoverable
- C : Temporary loss of function or perform. which req. operator intervention or system reset
- D : Loss of function which is not recoverable



2.4.3.6

Electrostatic Discharge

ESD

Standard : EN 301 489-1 subclause 9.3

Device : S22AXX
M07AXX

Date : May 02, 2018

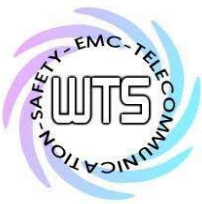
Temperature : 24.5 °C
Pressure : 990 hPa
Rel. humidity: 50 %

Test point	Table (T) Floor (F)	Contact (C) Air (A)	Voltage (kV)	Polarity (+ / -)	Performance criteria
Housing	T	A	2, 4, 8	+ / -	A
Housing	T	C	2, 4	+ / -	A
Indirect	T	C	2, 4	+ / -	A

ESD discharge points

S22AXX

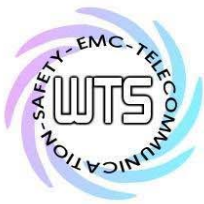




M07AXX



Registration number: W6D21804-18049-E-16

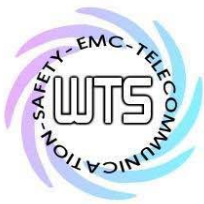


Performance criteria:

- A: Normal performance within the specification.
- B: Temporary degradation or less of function or performance which is self recoverable
- C: Temporary degradation or loss of function or perform. which requires. operate intervention or system reset

NA: Not Applicable

Explanation: ./.



2.4.3.7

Fast transients, common mode

Burst

Standard : EN 301 489-1 subclause 9.4

Device : S22AXX
M07AXX

Date : --

Mode : --

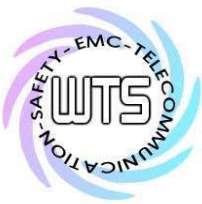
Temperature	: --	°C
Pressure	: --	hPa
Rel. humidity	: --	%

Testport	Voltage (kV)	Polarity (+ / -)	Waveform T _r / T _h	Repetition Frequency (kHz)	Performance criteria
AC-Power line	--	+/-	5/50 ns	5	--

Explanation: This test is not required because there is no AC power line or signal line for this EUT.

Performance criteria:

- A : No loss of performance or function
- B : Temporary loss of function or performance which is self recoverable
- C : Temporary loss of function or perform. which req. operate. intervention or system reset
- D : Loss of function which is not recoverable



2.4.3.8

Conducted Immunity

RF – common mode

Standard : EN 301 489-1 subclause 9.5

Device : S22AXX
M07AXX

Date : --

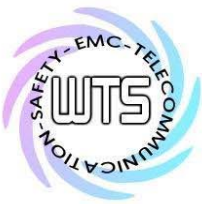
Temperature	: --	°C
Pressure	: --	hPa
Rel. humidity	: --	%

Test port	Voltage (Vrms)	Modulation Frequency (kHz)	Frequency Range	Performance criteria
AC-Power line	--	1 kHz	150 kHz – 80 MHz	--

Explanation: This test is not required because there is no AC power line or signal line for this EUT.

Performance criteria :

- A : No loss of performance or function
- B : Temporary loss of function or performance which is self recoverable
- C : Temporary loss of function or perform. which req. operate. intervention or system reset
- D : Loss of function which is not recoverable



2.4.3.9

Voltage dips and interruption

V - Dips

Standard : EN 301 489-1 subclause 9.7

Device : S22AXX
M07AXX

Date : --

Mode : --

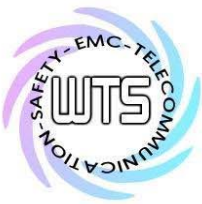
Temperature	: --	°C
Pressure	: --	hPa
Rel. humidity	: --	%

Reduction of supply voltage of	Voltage in % (in V)	Duration in parts of period (in ms)	Performance criteria
Dips (100 %)	0% (0 V)	0.5 (10 ms)	--
Dips (100 %)	0% (0 V)	1 (20 ms)	--
Dips (30 %)	70 % (161 V)	25 (500 ms)	--
Interruption (100 %)	0% (0 V)	250 (5000 ms)	--

Explanation: This test is not required because there is no AC power line or signal line for this EUT.

Performance criteria:

- A : No loss of performance or function
- B : Temporary loss of function or performance which is self recoverable
- C : Temporary loss of function or perform. which req. operate. intervention or system reset
- D : Loss of function which is not recoverable



2.4.3.10

Surges common & different mode

Surges

Standard : EN 301 489-1 subclause 9.8

Device : S22AXX
M07AXX

Date : --

Mode : --

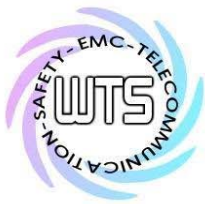
Temperature	: --	°C
Pressure	: --	hPa
Rel. humidity	: --	%

Test mode	Voltage (kV)	Waveform T _r / T _h	Performance criteria
AC-line to line	--	1.2/50 μs	--

Explanation: This test is not required because there is no AC power line or signal line for this EUT.

Performance criteria:

- A : No loss of performance or function
- B : Temporary loss of function or performance which is self recoverable
- C : Temporary loss of function or perform. which req. operate. intervention or system reset
- D : Loss of function which is not recoverable



3 Normative references

- /1/ EN 301 489-17 : V3.2.0 (2017)
ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17:
Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering
the essential requirements of article 3.1(b) of Directive 2014/53/EU
- /2/ EN 55032 (2012/AC:2013)
„Electromagnetic compatibility of multimedia equipment - Emission Requirements “.
- /3/ IEC/EN 61000 - 4 - 2 (2009)
„Electromagnetic Compatibility (EMC); Part 4: Testing and measurements techniques - Section
2: Electrostatic discharge immunity test. Basic EMC publication“.
- /4/ IEC/EN 61000 - 4 - 3 (2006+A2: 2010)
„Electromagnetic Compatibility - Basic immunity standard - Radiated, radio-frequency
electromagnetic field. Immunity test“.
- /5/ IEC/EN 61000 - 4 - 4 (2012)
„Electromagnetic Compatibility (EMC); Part 4: Testing and measurements techniques - Section
4: Electrical fast transient/burst immunity test. Basic EMC publication“.
- /6/ IEC/EN 61000 - 4 - 5 (2014)
„Electromagnetic Compatibility - Basic immunity standard. Surge immunity Test“.
- /7/ IEC/EN 61000 - 4 - 6 (2014)
„Electromagnetic Compatibility - Basic immunity standard - Conducted disturbances induced by
Radio-frequency fields
- /8/ IEC/EN 61000 - 4 - 11 (2004)
„Electromagnetic Compatibility (EMC); Part 4: Testing and measurements techniques - Section
11: Voltage dips, short interruptions and voltage variations immunity tests - Basic EMC
publication“.
- /9/ IEC/EN 61000 - 3 - 2 (2014)
„Disturbances in supply systems caused by household appliances and similar electrical
equipment
Part 2: Harmonics“
- /10/ IEC/EN 61000 - 3 - 3 (2013)
„Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply
systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional
connection “
- /11/ EN 301 489 - 1 V2.2.0 (2017)
ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1:
Common technical requirements; Harmonised Standard covering the essential requirements of
article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive
2014/30/EU