



ATTACHMENT: TEST PLANS



1 Test Environments

NOTE: The values used in tests may be stringent than that of declared.

Environment Parameter #	Temperature	Voltage	Relative Humidity
NTNV	Ambient	-48 VDC	Ambient
##_NV	##_ denotes the temperature specified by relevant rules/standards, e.g. -30 °C to +50 °C with step of 10 °C	-48 VDC	Ambient
20°C_85%NV	+20 °C	-36 VDC	---
20°C_100%NV	+20 °C	-48 VDC	---
20°C_115%NV	+20 °C	-56 VDC	---



2 Test Configurations

2.1 General

Configuration	Description
Test Antenna Ports	Until otherwise specified, <ul style="list-style-type: none">- All transmission tests are ONLY performed at the main transmission antenna port (e.g. ANT A, TRXA, TXA or similar) of the EUT, and- All receiving tests are ONLY performed at the main receiving antenna port (e.g. ANT A, TRXA, RXB or similar) of the EUT.
Multiple RF Sources	Until otherwise specified, the RF source(s) other than the tested RF source of the EUT are disabled or shutdown during measurements.

2.2 EUT Configurations

NOTE 1: In the following table, the column of

(A) For [1] to [7]:

[1] denotes the EUT configuration with an assigned name, and [2] – [7] are various parameters (carrier configurations) for [1].

[2] denotes antenna ports used for [1], in which “x,y” denotes ports x and y work independently (e.g. SISO) while “x+y” dependently (e.g. MIMO).

[3] denotes radio system of each carrier for [1], in which “G”=GSM, “U”=UMTS, “L”=LTE, “_” denotes non-contiguous spectrum against to succeeding carrier.

[4] denotes operating frequency of each carrier for [1].

[5] denotes channel bandwidth of each carrier for [1].

[6] denotes rated output power of each carrier for [1].

[7] denotes test mode (according to relevant radio technology specifications) of each carrier for [1].

(B) For [8] to [19]:

[8] – [19] indicate EUT configurations used by test items, for each test item the “●” denotes this test item is tested under relevant EUT configuration [1].

[8] (PWR, P) denotes the test item of “Channel Power, Total” of “Transmitter Output Power” under test environment “NTNV” (see §1).

[9] (PWR, PSD) denotes the test item of “Power Spectral Density” of “Transmitter Output Power” under test environment “NTNV” (see §1).

[10] (PWR, PAR) denotes the test item of “Peak-to-Average Ratio” of “Transmitter Output Power” under test environment “NTNV” (see §1).

[11] (BW, OBW) denotes the test item of “Occupied Bandwidth” of “Bandwidth” under test environment “NTNV” (see §1).

[12] (BW, EBW) denotes the test item of “Emission Bandwidth” of “Bandwidth” under test environment “NTNV” (see §1).

[13] (SEM) denotes the test item of “Band Edges Compliance / Emission Mask” under test environment “NTNV” (see §1).

[14] (CSE) denotes the test item of “Spurious Emission at Antenna Terminals” under test environment “NTNV” (see §1).

[15] (RE, FS) denotes the test item of “Field Strength of Spurious Radiation” of “Radiation Emission” under test environment “NTNV” (see §1).

See NOTE 2 for more detailed. Note, the EUT configuration that has maximum power density (based on the equivalent power level) may be only used.

[16] (RE, RSE) denotes the test item of “Radiated Measurements for Spurious Emissions at Antenna Terminals” of “Radiation Emission” under test environment “NTNV” (see §1). See NOTE 2 for more detailed. Note, the EUT configuration that has maximum power density based on the equivalent power level) may be only used.

[17] (FRE, ERR) denotes the test item of “Frequency Error” of “Frequency Stability” under test environment “##_NV”, and “20°C_85%NV”, “20°C_100%NV” and “20°C_115%NV” (see §1). Note, a representative EUT configuration may be only used since the un-modulation carrier configuration is required by the standards/rules.



[18] (FRE, RNG) denotes the test item of “Frequency Range” of “Frequency Stability” under test environment “NTNV” (see §1).

[19] (RXS) denotes the test item of Receiver Spurious Emissions” under test environment “NTNV” (see §1).

NOTE 2: For radiated measurements:

(1) According to FCC §2.1053 and KDB 971168 §6.1&§5.8, in the cases of the EUTs that are portable or hand-held devices utilizing one or more integral transmit antennas, measurements cannot be performed in a conducted measurement configuration, it becomes necessary to perform the described compliance measurements in a radiated test arrangement.

(2) According to FCC §2.1053 and KDB 971168, when antenna-port conducted measurements (i.e. Spurious Emission at Antenna Terminals measurement) are performed to demonstrate compliance to the applicable unwanted emission limits, a separate radiated measurement (i.e. Field Strength of Spurious Radiation measurement) is required to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation (, and with the transmit antenna port(s) terminated). Note that when radiated measurements for spurious emissions at antenna terminals are performed to demonstrate compliance to the unwanted emission limits (e.g., an EUT with integral transmit antenna), the field strength of spurious radiation measurement is not required.

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
EUT Config. #	ANT	SYS	FREQ [MHz]	BW [MHz]	P [dBm]	TM	PWR, P	PWR, PSD	PWR, PAR	BW, OBW	BW, EBW	SEM	CSE	RE, FS	RE, RSE	FRE, ERR	FRE, RNG	RXS
1L_5M_B_TM1	1	L	2498.5	5	40	TM1.1	●			●								
1L_5M_M_TM1	1	L	2593	5	40	TM1.1	●			●						●		
1L_5M_T_TM1	1	L	2687.5	5	40	TM1.1	●			●								
1L_10M_B_TM1	1	L	2501	10	43	TM1.1	●			●								
1L_10M_M_TM1	1	L	2593	10	43	TM1.1	●			●						●		
1L_10M_T_TM1	1	L	2685	10	43	TM1.1	●			●								
1L_15M_B_TM1	1	L	2503.5	15	44.77	TM1.1	●			●								
1L_15M_M_TM1	1	L	2593	15	44.77	TM1.1	●			●						●		
1L_15M_T_TM1	1	L	2682.5	15	44.77	TM1.1	●			●								
1L_20M_B_TM1	1	L	2506	20	46	TM1.1	●			●		●	●					
1L_20M_M_TM1	1	L	2593	20	46	TM1.1	●			●		●	●			●		
1L_20M_T_TM1	1	L	2680	20	46	TM1.1	●			●		●	●					
2L_10M_10M_B_TM1	1	L,L	2501,2641	10,10	46	TM1.1	●					●	●					



[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
EUT Config. #	ANT	SYS	FREQ [MHz]	BW [MHz]	P [dBm]	TM	PWR, P	PWR, PSD	PWR, PAR	BW, OBW	BW, EBW	SEM	CSE	RE, FS	RE, RSE	FRE, ERR	FRE, RNG	RXS
2L_10M_10M_T_TM1	1	L,L	2545,2685	10,10	46	TM1.1	●					●	●		●			
2L_10M_15M_B_TM1	1	L,L	2501,2638.5	10,15	46	TM1.1	●					●						
2L_10M_15M_T_TM1	1	L,L	2545,2682.5	10,15	46	TM1.1	●					●						
2L_20M_20M_B_TM1	1	L,L	2506,2636	20,20	46	TM1.1	●					●	●					
2L_20M_20M_T_TM1	1	L,L	2550,2680	20,20	46	TM1.1	●					●	●					
5L_20M_20M_20M_20M_20M_B_TM1	1	L,L,L,L,L	2506,2526,2546,2566,2586	20,20,20,20,20	46	TM1.1	●					●	●					
5L_20M_20M_20M_20M_20M_T_TM1	1	L,L,L,L,L	2600,2620,2640,2660,2680	20,20,20,20,20	46	TM1.1	●					●	●					



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