Lab Code: 200707-0

ETSI EN 301 406 V2.1.1 (2009-07)
MEASUREMENT AND TEST REPORT

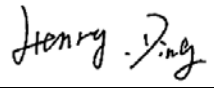
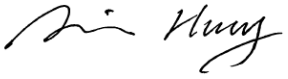
For

Yealink (Xiamen) Network Technology Co., Ltd.

4th-5th Floor, South Building, NO. 63 WangHai Road, 2nd Software Park, Xiamen, China

Model: W52P, W52Duo

Report Type:	**Product Type:**
Original Report	IP DECT Phone (Base Unit)

Test Engineer:	Henry Ding	
Report Number:	RSZ120919006-19FP	
Report Date:	2012-12-04	
Reviewed By:	Alvin Huang RF Leader	
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn	

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Yealink (Xiamen) Network Technology Co., Ltd.'s* product, model number: *W52P* (or the "EUT") in this report was a *base unit of IP DECT Phone*, which was measured approximately: 15.5 cm (L) x 11.0 cm (W) x 5.0 cm (H), input voltage: DC 5 V from adapter.

Adapter Information: AC/DC SWITCHING ADAPTER
Model: OH-1048A0500600U2-VDE
Input: 100-240V~50/60Hz 250mA
Output: 5VDC 600mA

Transmission channel(10CH)	Frequency(MHz)
0	1897.344
1	1895.616
2	1893.888
3	1892.160
4	1890.432
5	1888.704
6	1886.976
7	1885.248
8	1883.520
9	1881.792

Note: The product IP DECT Phone, the model W52P and W52Duo are different in model number due to different combinations, the base unit of these two models is the same, and W52P was selected to test, which was explained in the attached declaration letter.

** All measurement and test data in this report was gathered from production sample serial number: 1209094 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2012-09-19.*

Objective

The following test report is prepared on behalf of *Yealink (Xiamen) Network Technology Co., Ltd.* in accordance with ETSI EN 301 406 V2.1.1 (2009-07). Digital Enhanced Cordless Telecommunications (DECT); Harmonized EN for Digital Enhanced CordlessTelecommunications (DECT) covering essential requirements under article 3.2 of the R&TTE Directive; Generic radio.

The objective of the manufacturer is to determine compliance with ETSI EN 301 406 V2.1.1 (2009-07).

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ETSI EN 301 406 V2.1.1 (2009-07).

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).

NVLAP®
Lab Code: 200707-0

The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2007070.htm

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a TBR6 mode.

Equipment Modifications

No modification was made to the EUT tested.

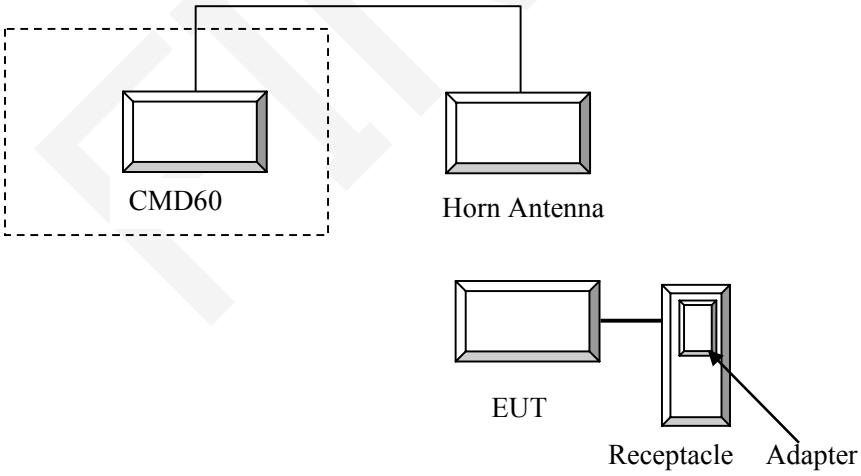
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R & S	Digital Radio Communication Tester	CMD60	829902/026

External I/O Cable

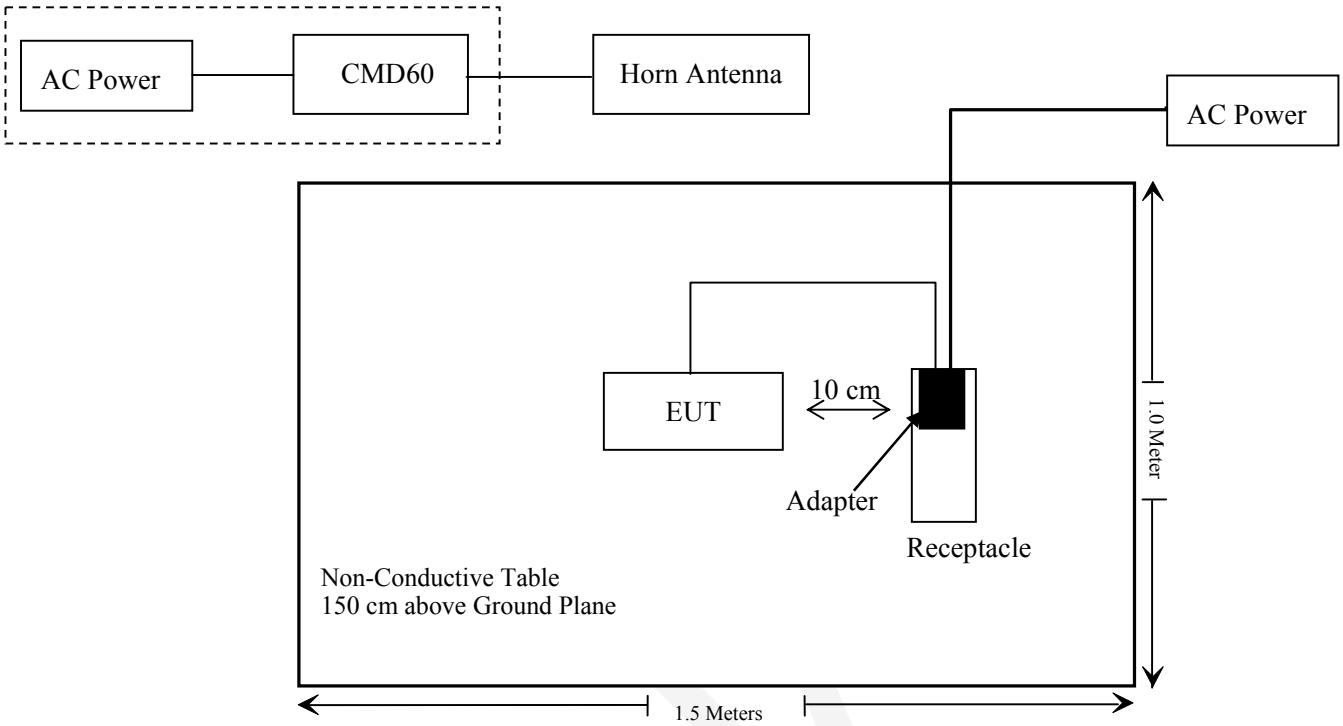
Cable Description	Length (m)	From/Port	To
Unshielded Detectable DC Power Cable	1.8	EUT	Adapter

Configuration of Test Setup

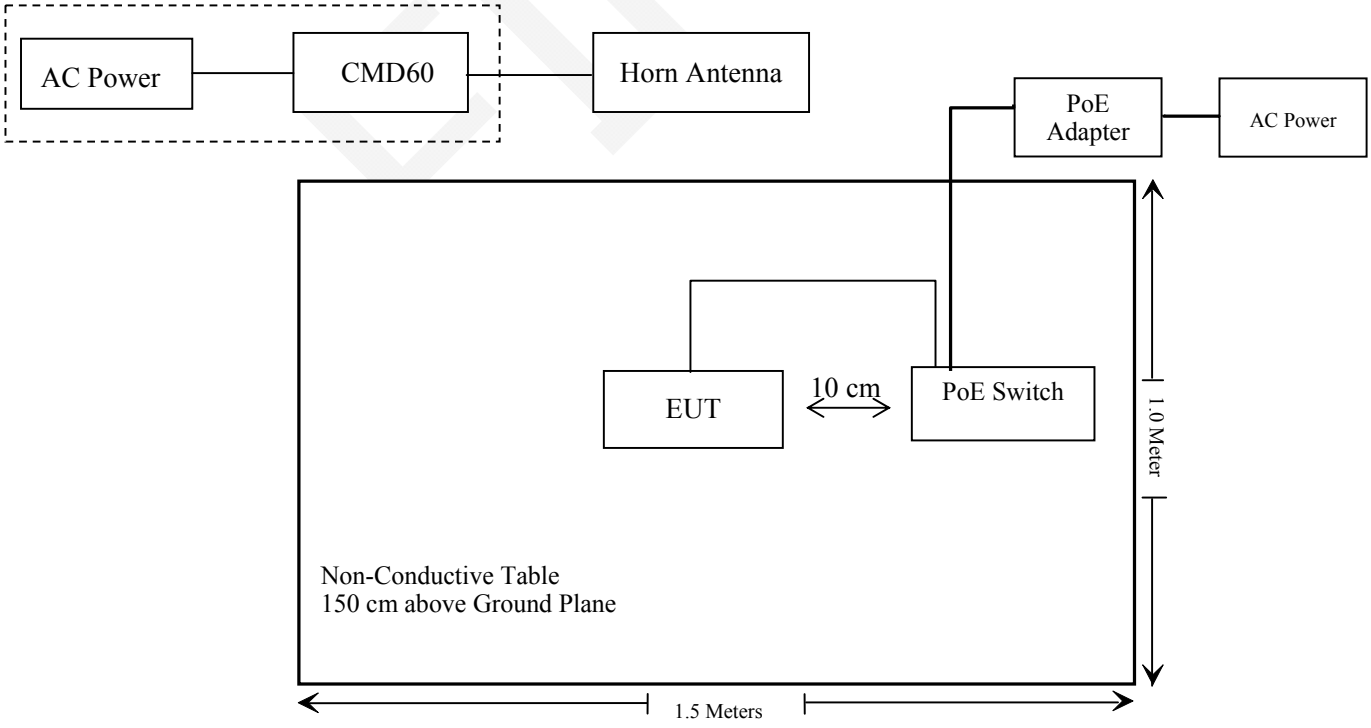


Block Diagram of Test Setup

Powered by AC Adapter:



Powered by PoE



SUMMARY OF TEST RESULTS

ETSI EN 301 406 V2.1.1 (2009-07)	Description of Test	Result
§4.5.1	Accuracy and stability of RF carriers	Compliance
§4.5.2	Timing jitter: slot -slot on the same channel	Compliance
§4.5.2	Reference timing accuracy of a RFP	Compliance*FP
§4.5.2	Measurement of packet timing accuracy	N/A*PP
§4.5.3	Transmission burst	Compliance
§4.5.4.1.1	Transmitted power (with an internal antenna) NTP	Compliance
§4.5.4.1.2	Transmitted power (PP and RFP with external connections for all antennas)	N/A
§4.5.5	RF carrier modulation	Compliance
§4.5.6.2	Emissions due to modulation	Compliance
§4.5.6.3	Emissions due to transmitter transients	Compliance
§4.5.6.4	Emissions due to intermodulation	N/A
§4.5.6.5	Spurious emissions when allocated a transmit channel	Compliance
§4.5.7.1	Radio receiver sensitivity	Compliance
§4.5.7.2	Radio receiver reference BER and FER	Compliance
§4.5.7.3	Radio receiver interference performance	Compliance
§4.5.7.4	Radio receiver blocking case 1	Compliance
§4.5.7.5	Radio receiver blocking case 2	Compliance
§4.5.7.6	Receiver intermodulation performance	Compliance
§4.5.7.7	Spurious emissions when the PP has no allocated transmit channel	N/A
§4.5.8	Synchronisation port	N/A
§4.5.9	Equipment identity verification /safeguards	Compliance**

ETSI EN 301 406 V2.1.1 (2009-07)	Description of Test	Result
§4.5.10	Efficient use of radio spectrum	Compliance**
§4.5.11	WRS	N/A
§4.5.12	PP to PP communication	N/A
§4.5.13	Direct communication	N/A
§4.5.14	Higher level modulation	N/A

Note: Compliance*FP: This measurement is necessary only for Fixed Part.
N/A*PP: This measurement is not necessary for Portable Part.
Compliance**: The manufacture should declare that based on EN300175-3, see attached decalaration etter.

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.1 - ACCURACY AND STABILITY OF RF CARRIERS

Applicable Standard

§4.5.1.1, §4.5.1.2&§4.5.1.3

Definition:

Ten RF carriers shall be placed into the frequency band 1 880 MHz to 1 900 MHz with centre frequencies Fc given by:

Fc = F0 - c x 1,728 MHz;

where F0 = 1 897,344 MHz

and c = 0,1, ..., 9.

Above this band, additional carriers are defined with centre frequencies Fc given by:

Fc = F9 + c x 1,728 MHz;

and c ⩾ 10 and RF band = 00001 (see EN 300 175-3 [6], clause 7.2.3.3).

The frequency band between Fc - 1,728/2 MHz and Fc + 1,728/2 MHz shall be designated RF channel c.
NOTE: A nominal DECT RF carrier is one whose centre frequency is generated by the formula:

Fg = F0 - g x 1,728 MHz,

Where g is any integer.

All DECT equipment shall be capable of working on all 10 RF channels, c = 0, 1... 9.

The requirements are given in EN 300 175-2 [4], clause 4.1.2.， At an RFP the transmitted RF carrier frequency corresponding to RF channel c shall be in the range Fc ±50 kHz at extreme conditions.

At a PP the centre frequency accuracy shall be within ±50 kHz at extreme conditions either relative to an absolute frequency reference or relative to the received carrier, except that during the first 1 s after the transition from the idle-locked state to the active-locked state the centre frequency accuracy shall be within ±100 kHz at extreme conditions relative to the received carrier.

NOTE: The above state transition is defined in EN 300 175-3 [3].

The maximum rate of change of the centre frequency at both the RFP and the PP while transmitting shall not exceed 15 kHz per slot.

Limit:

When the EUT is a RFP, The carrier frequencies as measured shall be within ±50 kHz of the appropriate nominal DECT carrier frequency Fc.

.
when the EUT is a PP

Case 1: When the measurement is made during the first 1 s of the EUT going into a transmit mode from a non-transmitting mode: The carrier frequencies as measured either relative to an absolute frequency reference or relative to the received carrier, shall be within ±100 kHz of the nominal DECT carrier frequency Fc.

Case 2: When the measurement is made at any other time: The carrier frequencies as measured either relative to an absolute frequency reference or relative to the received carrier, shall be within ±50 kHz of the nominal DECT carrier frequency Fc.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2012-11-02	2013-11-01
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Method of Measurement

a) The LT shall place the EUT in a mode whereby the EUT is positioned in a LT specified slot and RF channel c = 5. If so equipped, the handover function in the EUT shall be disabled (see clause 5.1.10.3 for the appropriate test message reference).

b) The EUT shall be placed in a test mode whereby it performs the loopback function as referenced in Clause 5.1.10.3.

c) The LT shall transmit a packet with a test sequence in the loopback field of the packet. This test

sequence shall be such that the sequence 0000 1111 0000 1111 is transmitted at the antenna of the EUT in the loopback field of the reply packet.

d) Using the sampling method described in clause 5.1.12.2.2, capture a representation of the EUT's transmitted RF signal after allowing the EUT to be in an active-locked state (see EN 300 175-3 [5]) for more than 1 s.

e) The EUT's carrier frequency for d) shall be assumed to be the average of the measured absolute frequencies of the loopback bits.

f) Steps c) to e) shall be repeated until the following number of measurements has been made:

Equipment type	Number of measurements
A-field only transmit	100
Half-slot transmit	40
Full-slot transmit	10
Variable length slot with j = 640 transmit	5
Double-slot transmit	5

The centre frequency of the EUT is taken to be the mean value of the measurements.

g) Steps c) to f) shall be repeated for all combinations of temperatures and power supply voltages allowed under extreme test conditions.

h) Steps c) to g) shall be repeated for RF channels c = 0 and 9.

i) When the EUT is a PP, then c) to h) shall be repeated, with the addition that the RF signal is sampled (in d)) during the first 1 s of the EUT going into a transmit mode from a non-transmitting mode. If necessary a) and b) may be repeated as required in order to make the number of measurements specified in f).

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	55 %
ATM Pressure:	100.1 kPa

** The testing was performed by Henry Ding on 2012-11-15.*

Test mode: TBR6

Please refer to the below tables:

Channel 0 : F= 1897.344MHz; Vnor = 230 V					
Test Condition			**Deviation (kHz)**	**Limit (kHz)**	**Result**
Temperature (℃)	**Power Supply**				
T_{nor} = +25	PoE Switch		+16	±50	Pass
T_{nor} = +25	AC Adapter (V_{AC})	230	+15	±50	Pass
T_{min} = +10		207	+14	±50	Pass
		253	+15	±50	Pass
T_{max} = +40		207	+15	±50	Pass
		253	+16	±50	Pass

Channel 5 : F= 1888.704MHz; Vnor = 230 V					
Test Condition			Deviation (kHz)	Limit (kHz)	Result
Temperature (℃)	Power Supply				
T_{nor} = +25	PoE Switch		+16	±50	Pass
T_{nor} = +25	AC Adapter (V_{AC})	230	+15	±50	Pass
T_{min} = +10		207	+13	±50	Pass
		253	+14	±50	Pass
T_{max} = +40		207	+16	±50	Pass
		253	+15	±50	Pass

Channel 9 : F= 1881.792MHz; Vnor = 230 V					
Test Condition			Deviation (kHz)	Limit (kHz)	Result
Temperature (℃)	Power Supply				
T_{nor} = +25	PoE Switch		+14	±50	Pass
T_{nor} = +25	AC Adapter (V_{AC})	230	+15	±50	Pass
T_{min} = +10		207	+14	±50	Pass
		253	+13	±50	Pass
T_{max} = +40		207	+17	±50	Pass
		253	+16	±50	Pass

Note: Measurement uncertainty: ± 1.2 kHz.

Test Result: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.2 – TIMING JITTER SLOT - SLOT ON THE SAME CHANNEL

Applicable Standard

The requirements are given in EN 300 175-2 [4], clauses 4.2.3& EN 301406 §5.3.2.

RFP transmission jitter

The nominal time when a packet should occur at the RFP antenna is (by this definition) synchronous to the RFP reference timer.

The jitter of a RFP packet transmission in a slot refers to the occurrence at the antenna of the start of symbol p0 of that packet. The jitter is defined in relation to the reference timer of that RFP.

The jitter of a packet transmission shall be less than ±1 µs at extreme conditions.

The jitter between p0 and every other symbol in a packet shall be within ±0,1 µs.

NOTE: 0,1 µs corresponds to 250 ppm.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2012-11-02	2013-11-01
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Test Procedure

Measurements of packet timing jitter

a) The LT shall place the EUT in a mode whereby the EUT is positioned in a LT specified slot and frequency. If so equipped, the handover function in the EUT shall be disabled (see clause 5.1.10.3 for the appropriate test message reference).

The applicant shall declare to the testing laboratory the time required for system synchronization by the EUT.

b) Using a sampling method, capture a representation of the RF signal transmitted by the EUT on the same slot position in 2 consecutive frames.

c) The LT shall determine the positions of p0 in the slots that were sampled in step b) above. See figure 32.

d) Steps b) and c) shall be repeated 1 000 times.

e) The reference time is the mean of the values measured in c) through d). The deviation of the maximum and minimum values from the mean is the packet timing jitter.

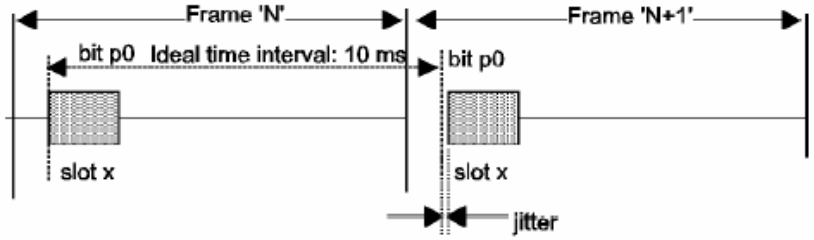


Figure 32: Jitter definition

The packet timing jitter, as measured, shall be less than ±1µs for the duration of this test.
The results obtained shall be compared to the limits in clause 4.5.2.2 in order to prove compliance with the requirement.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	55 %
ATM Pressure:	100.1 kPa

** The testing was performed by Henry Ding on 2012-11-15.*

Test mode: TBR6

Please refer to the below tables:

Timing jitter slot to slot on the same channel:

Channel 5 : F= 1888.704MHz; Vnor = 230 V						
Test Condition			**Timing jitter at channel 5 (µs)**		**Limit (µs)**	**Result**
Temperature (℃)	**Power Supply**		**Positive**	**Negative**		
T_{nor} = +25	PoE Switch		0.01	-0.01	±1	Pass
T_{nor} = +25	AC Adapter (V_{AC})	230	0.02	0.00	±1	Pass
T_{min} = +10		207	0.03	0.01	±1	Pass
		253	0.01	-0.01	±1	Pass
T_{max} = +40		207	0.02	0.00	±1	Pass
		253	0.03	0.01	±1	Pass

Note: Measurement uncertainty: ± 0.075µs

Test Result: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.2 – REFEREMCE TIMING ACCURACY OF A RFP

Applicable Standard

The requirements are given in EN 300 175-2 [4], clauses 4.2.2& EN 301406 §5.3.2.

Reference timer accuracy and stability

The reference timer of a RFP or a PP is a notional clock to which the timing parameters of the TDMA framing are related.

A PP shall have its reference timer stability and accuracy better than 25 ppm at extreme conditions. RFPs that can work with more than one duplex pair of physical channels per frame are known as multi-channel RFPs. Single channel RFPs can only work with one duplex pair of physical channels per frame (excluding handover situations).

A multi channel RFP shall have its reference timer stability and accuracy better than 5 ppm and better than 10 ppm at extreme conditions. A single channel RFP shall have reference timer stability and accuracy better than 10 ppm at extreme conditions.

Test Procedure

Measurements of packet timing jitter

a) The LT shall place the EUT in a mode whereby the EUT is positioned in a LT specified slot and frequency. If so equipped, the handover function in the EUT shall be disabled (see clause 5.1.10.3 for the appropriate test message reference).

The applicant shall declare to the testing laboratory the time required for system synchronization by the EUT.

b) Using a sampling method, capture a representation of the RF signal transmitted by the EUT on the same slot position in 2 consecutive frames.

c) The LT shall determine the positions of p0 in the slots that were sampled in step b) above. See figure 32.

d) Steps b) and c) shall be repeated 1 000 times.

e) The reference time is the mean of the values measured in c) through d). The deviation of the maximum and minimum values from the mean is the packet timing jitter.

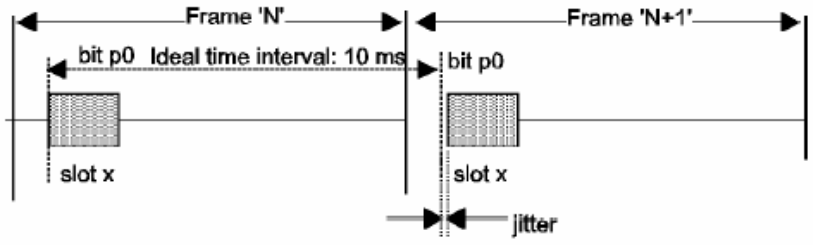


Figure 32: Jitter definition

The packet timing jitter, as measured, shall be less than ±1s for the duration of this test.
The results obtained shall be compared to the limits in clause 4.5.2.2 in order to prove compliance with the requirement.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2012-11-02	2013-11-01
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	55 %
ATM Pressure:	100.1 kPa

** The testing was performed by Henry Ding on 2012-11-15.*

Test mode: TBR6

Test data please refer to the below tables:

Type of EUT	Normal Condition	Extreme Condition
Multiple channel RFP	5ppm	10ppm
Single channel RFP	N/A	10ppm

Channel 5 : F= 1888.704MHz; Vnor = 230 V					
Test Condition			Timing accuracy (ppm)	Limit (ppm)	Result
Temperature (℃)	Power Supply				
T_{nor} = +25	PoE Switch		-2.10	5	Pass
T_{nor} = +25	AC Adapter (V_{AC})	230	-2.11	5	Pass
T_{min} = +10		207	-2.09	10	Pass
		253	-2.12	10	Pass
T_{max} = +40		207	-2.13	10	Pass
		253	-2.10	10	Pass

Note: Measurement uncertainty: ± 0.5 ppm
Test Result: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.2 – MEASUREMENT OF PACKET TIMING ACCURACY

This measurement is necessary only for portable part.

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.3 - TRANSMISSION BURST

Applicable Standard

The requirements are given in clause 5.2 of EN 300 175-2 [4] & EN 301406 §5.3.3.

Definition and limit:

The transmission requirements are defined in clauses 5.2.1 to 5.2.6 and graphically represented in figure 19.

Physical packets: Refers to all the bits transmitted by the DECT REP in one slot time. The timing of the physical packet relative to the power-time template shall be conditioned by the absolute packet timing measurement uncertainty in clause 5.2.

Transmitted power: This is the mean power delivered over one radio frequency cycle.

Normal Transmitted Power (NTP): The NTP is the transmitted power averaged from the start of bit p0 of the physical packet to the end of the physical packet.

Transmitter attack time: This is the time taken for the transmitted power to increase from 25 µ W to the time that the first bit of the physical packet, p0, starts transmission. The transmitter attack time shall be less than 10 µs extreme conditions.

.

Transmitter release time: This is the time taken from the end of the physical packet for the transmitted power to decrease to 25 µW.The transmitter release time shall be less than 10 µs at extreme conditions.

Minimum power: From the first symbol of the packet, p0, to the end of the physical packet, the transmitted power shall be greater than (NTP - 1 dB) at extreme conditions.

Maximum power: From 10 µs after the start of symbol p0 to 10 µs after the end of the physical packet, the transmitted power shall be less than (NTP + 1 dB) at extreme conditions.
From 10 µs before the start of symbol p0 to 10 µs after the start of symbol p0, the transmitted power shall be less than (NTP + 4 dB) and less than 315 mW at extreme conditions.

Maintenance of transmission after packet end: The transmitted power shall be maintained greater than (NTP - 6 dB) for 0.5 µs after the end of the physical packet at extreme conditions.

Transmitter idle power output: For the time period starting 27 µs after the end of the physical packet and finishing 27 µs before the next transmission of a data symbol p0, the transmitter idle power shall be less than 20 nW, except when p0 of the next transmitted packet occurs less than 54 µs after the end of the transmitted physical packet.

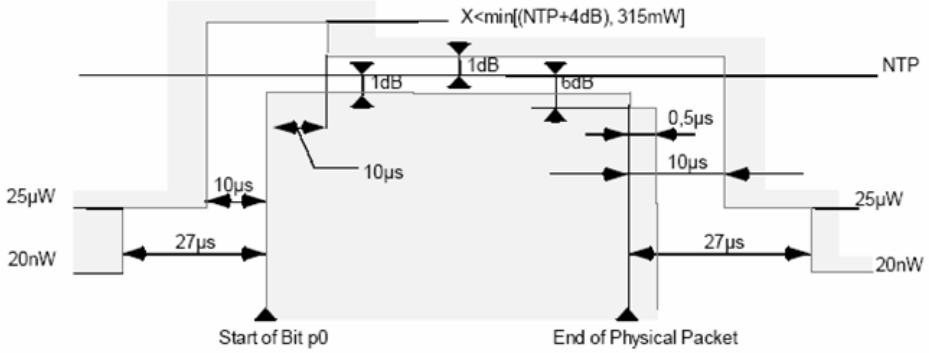


Figure 19: Physical packet power-time template

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2012-11-02	2013-11-01
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Method of Measurement

a) The LT shall place the EUT in a mode whereby the EUT is transmitting at a LT specified slot and RF channel c = 5. If so equipped, the handover function in the EUT shall be disabled (see clause 5.1.10.3 for the appropriate test message reference).

b) Using a sampling measurement method, capture a representation of the EUT's transmit burst's amplitude

and modulation. The measurement bandwidth for RF power shall be 1 MHz for the measurement of transmitter idle power (see clause 4.5.3.1.9) and ≥ 3 MHz for all other.

c) From the array of samples the LT shall calculate the position of bit p0 and the end of the physical packet in each sample to an accuracy of 0,1 µs.

d) Steps b) and c) are repeated 60 times with intervals of 1 s or longer.

e) Steps a) to d) shall be repeated for RF channels c = 0 and 9.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

** The testing was performed by Henry Ding on 2012-11-16.*

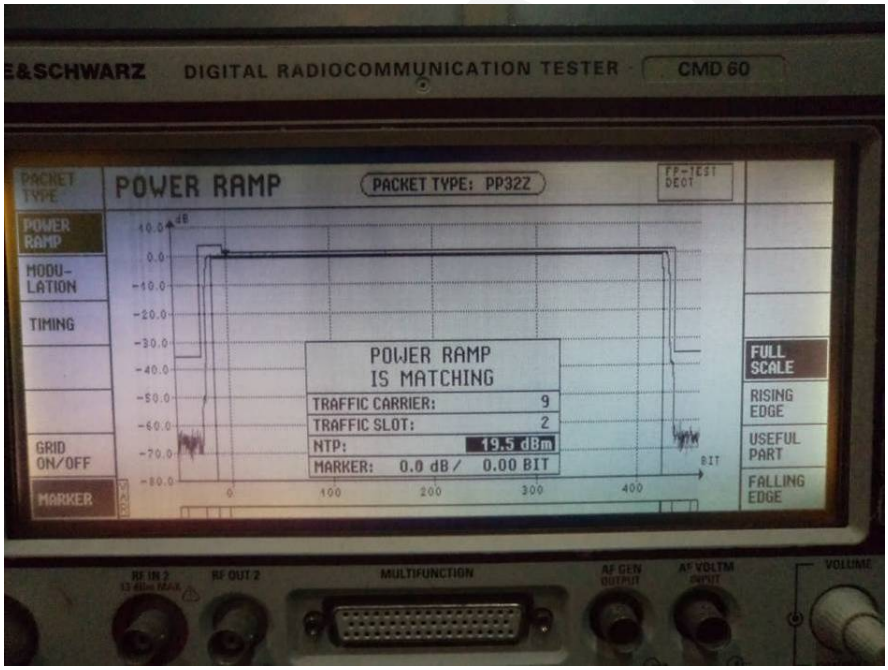
Test mode: TBR6

Test data please refer to the below plots:

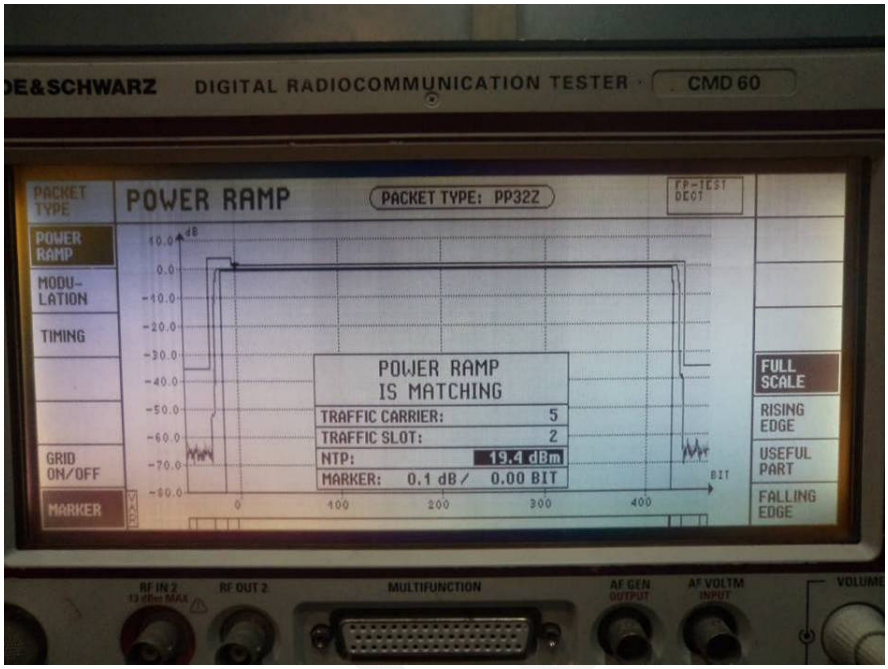
For PoE Switch Power Supply

Normal Condition

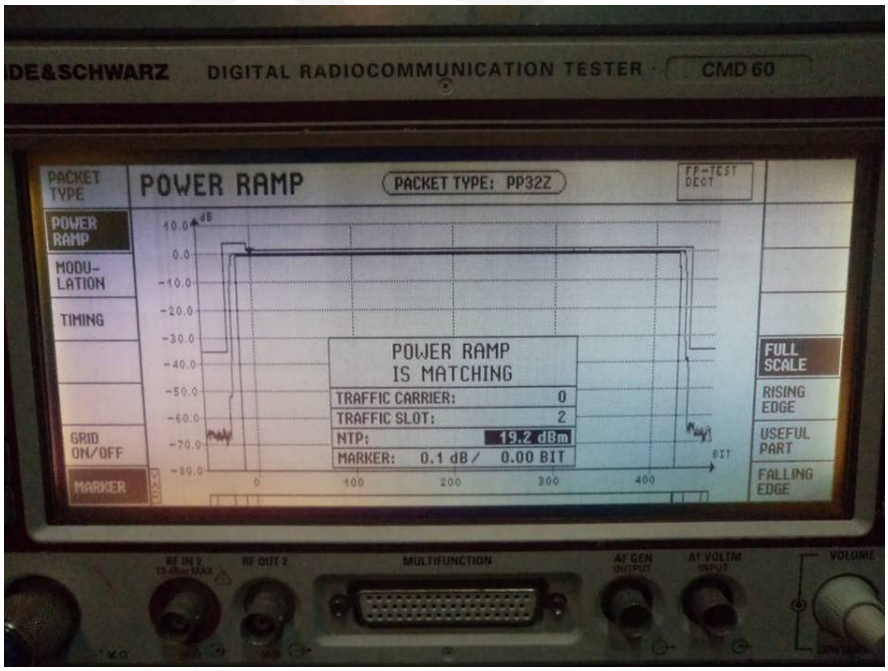
Normal temperature, normal voltage, channel 9



Normal temperature, normal voltage, channel 5

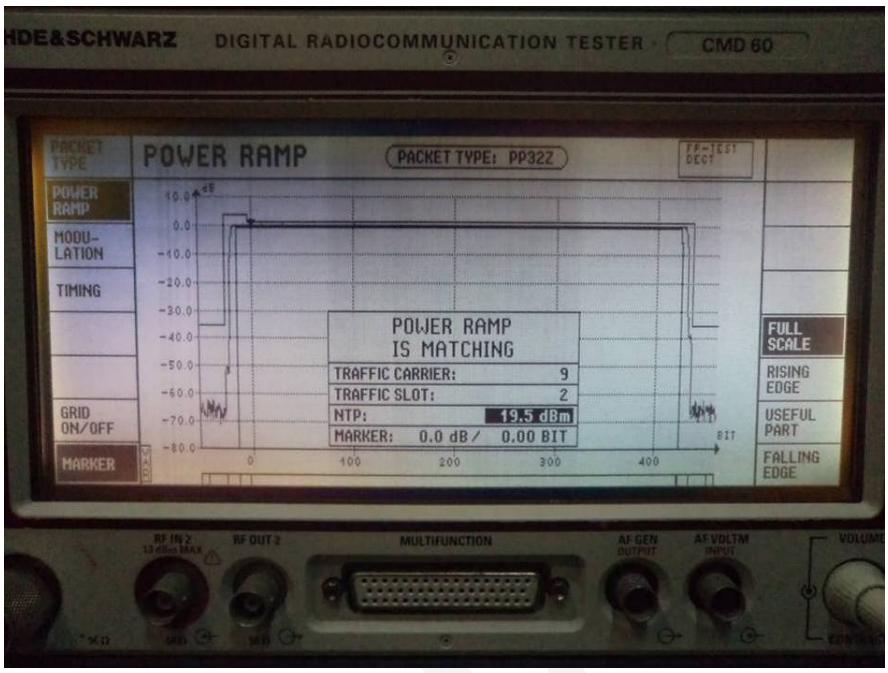


Normal temperature, normal voltage, channel 0

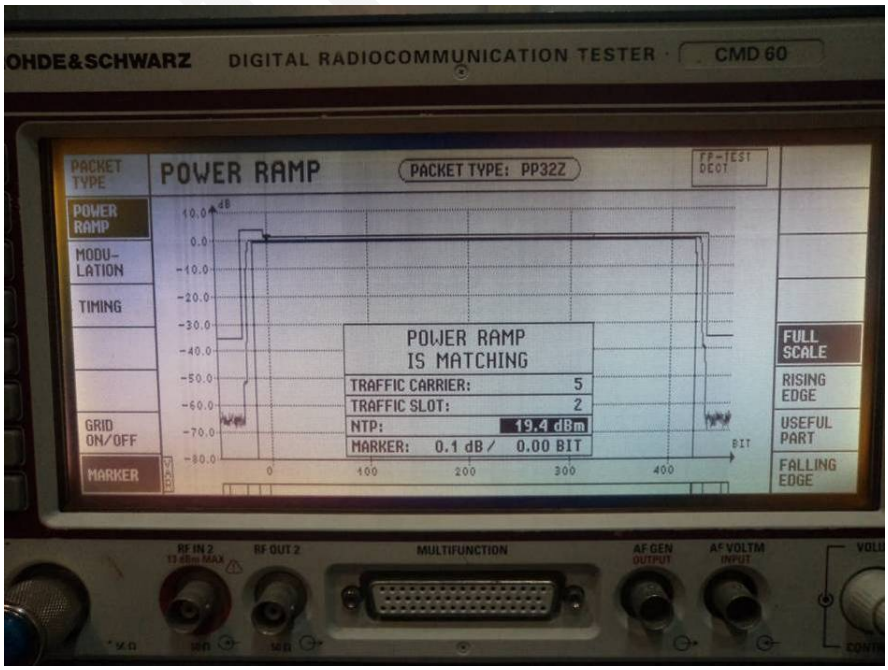


Extreme Condition

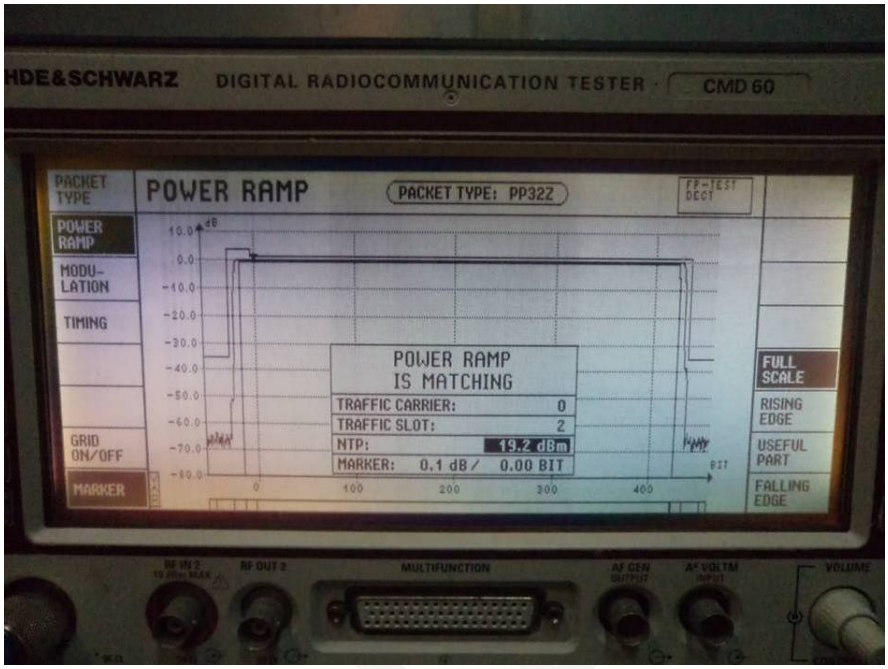
High temperature, Normal voltage, channel 9



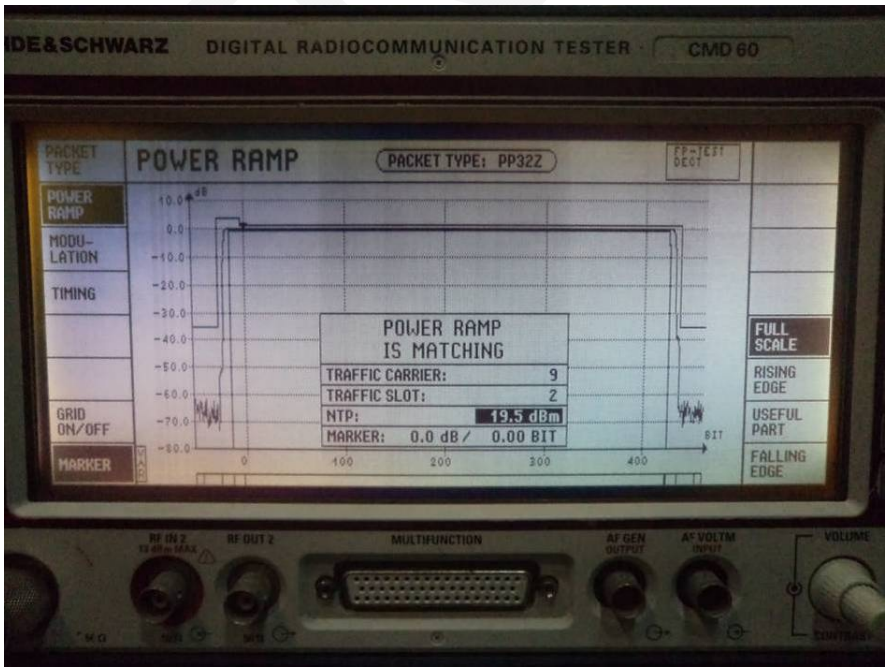
High temperature, Normal voltage, channel 5



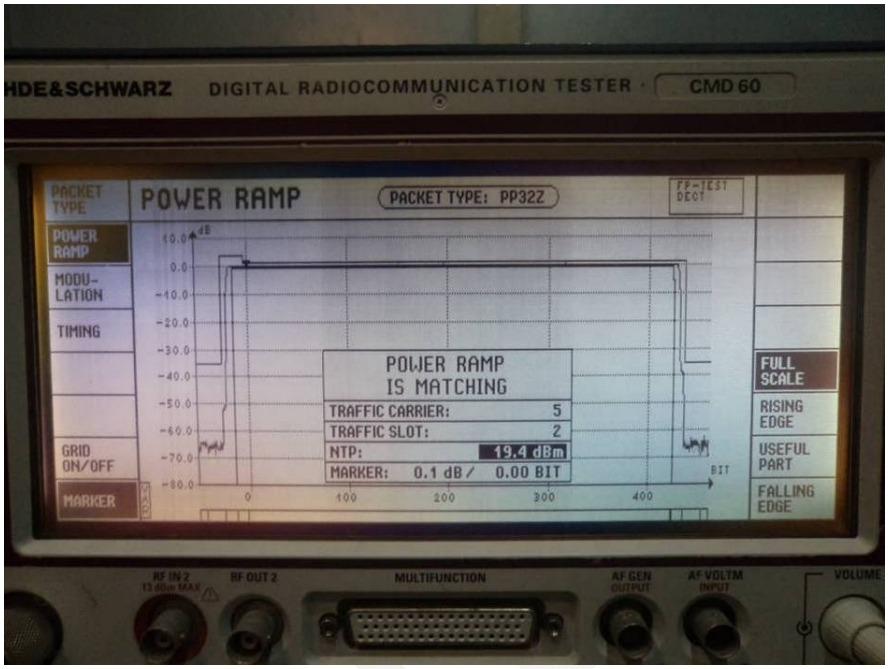
High temperature, Normal voltage, channel 0



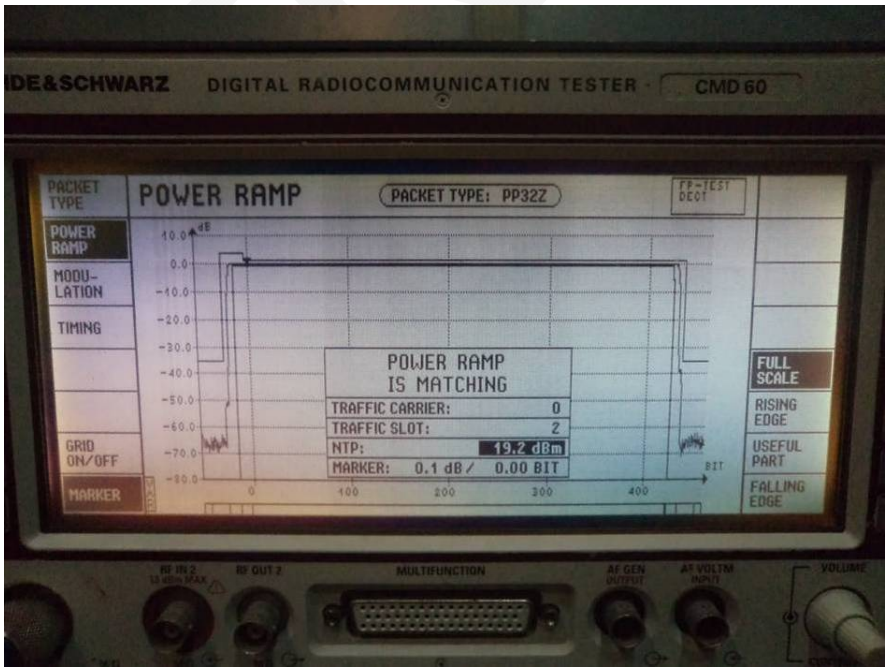
Low Temperature, Normal Voltage, channel 9



Low Temperature, Normal Voltage, channel 5



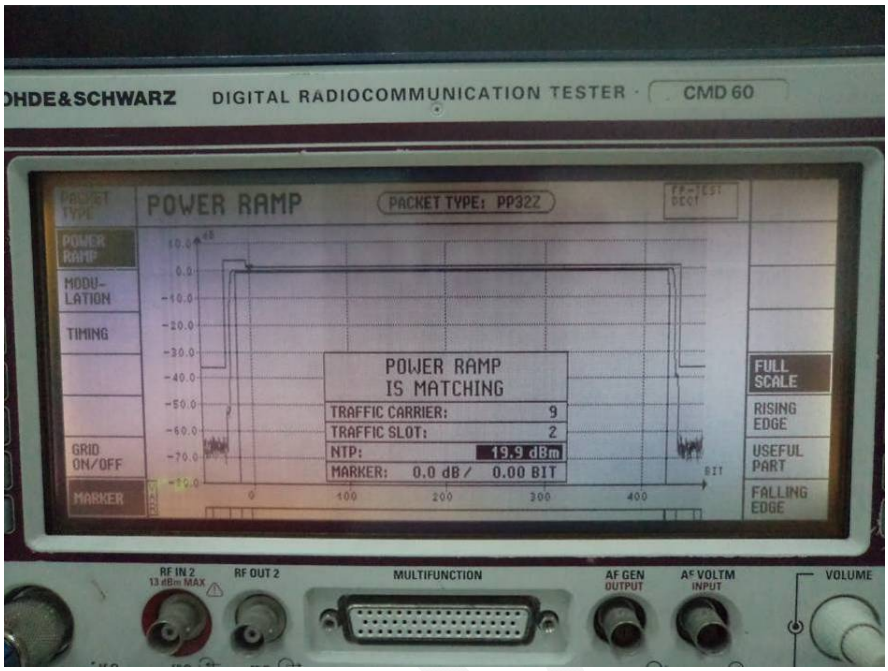
Low Temperature, Normal Voltage, channel 0



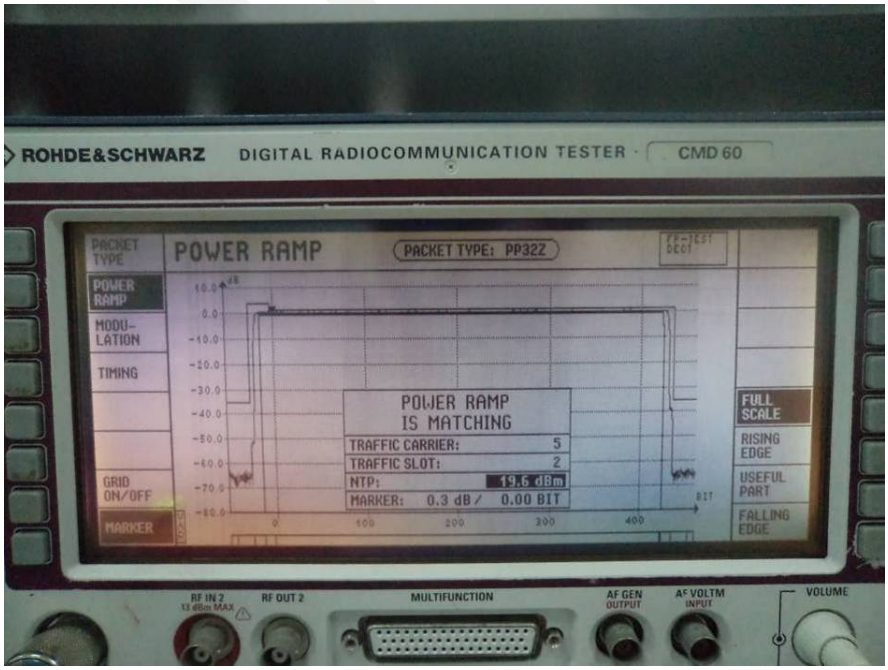
For AC Adapter Power Supply

Normal Condition

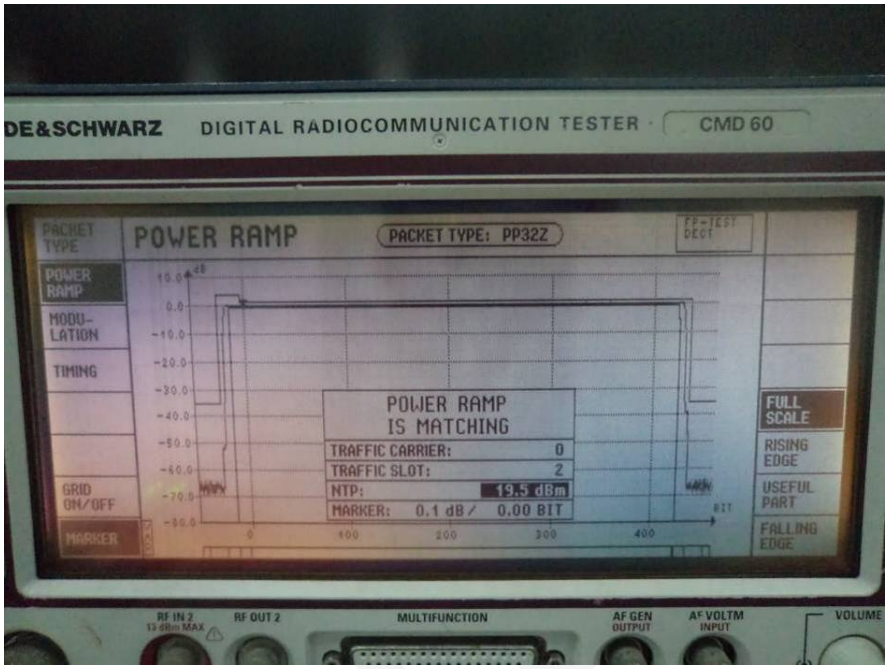
Normal temperature, normal voltage, channel 9



Normal temperature, normal voltage, channel 5

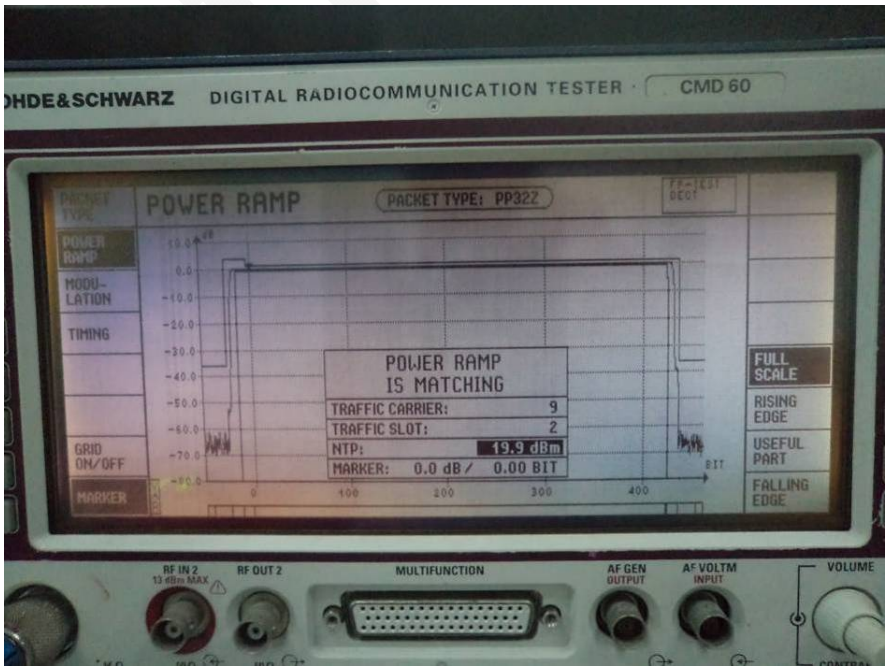


Normal temperature, normal voltage, channel 0

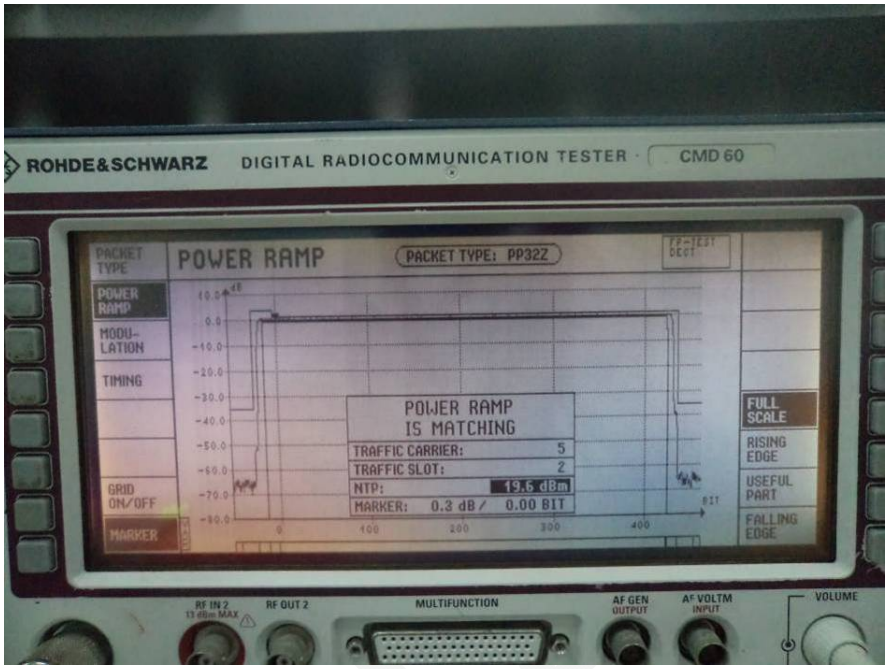


Extreme Condition

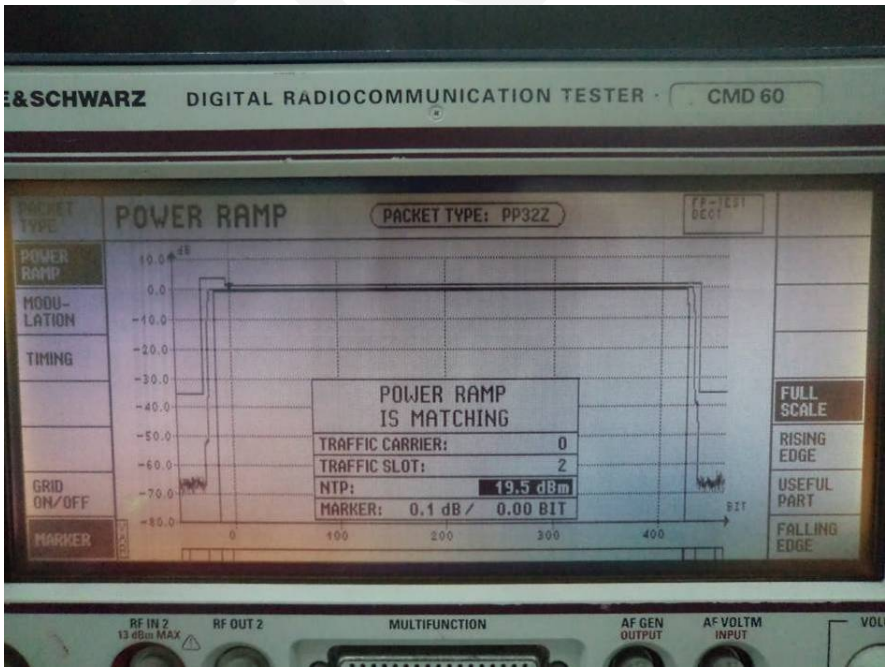
High temperature, Normal voltage, channel 9



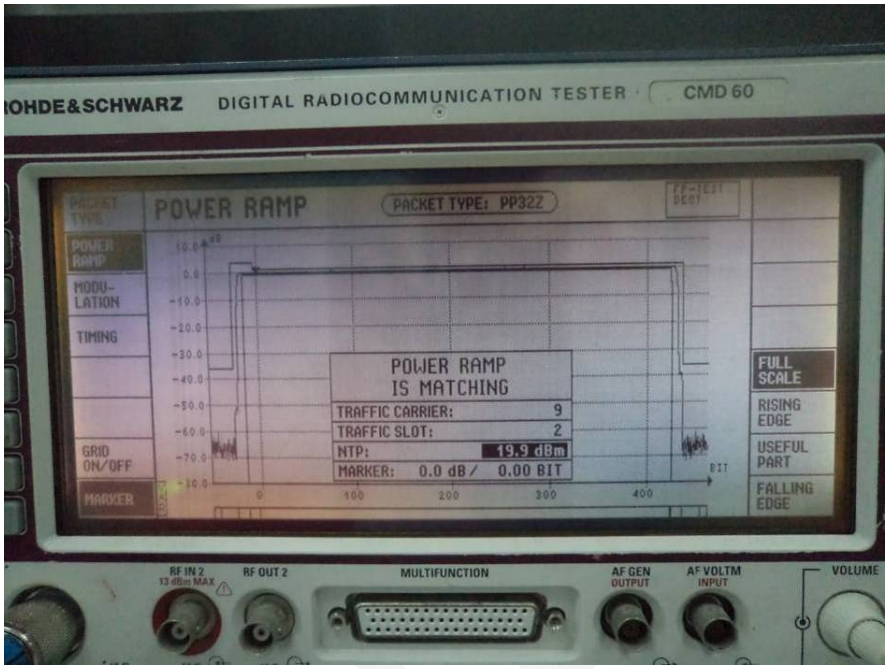
High temperature, Normal voltage, channel 5



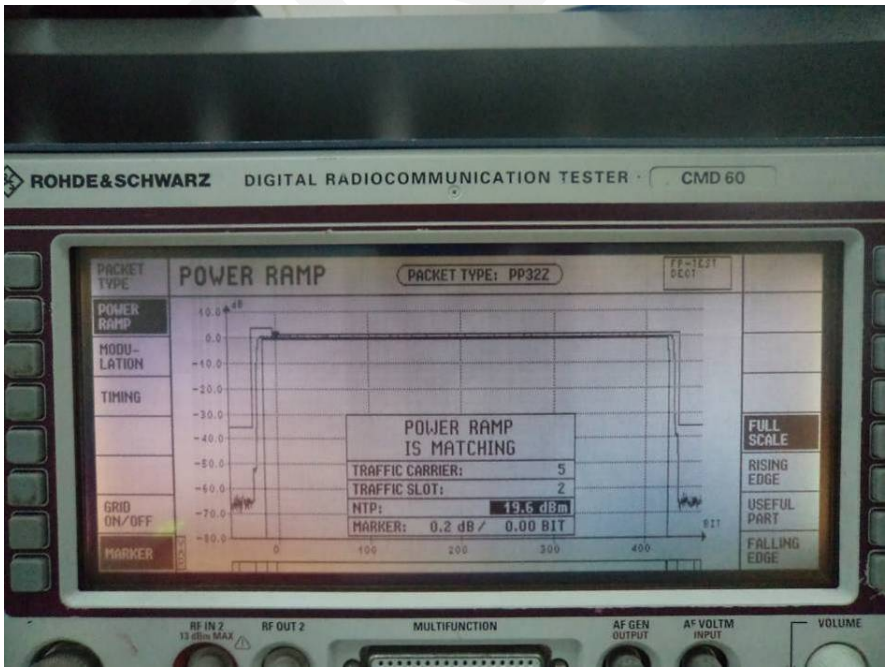
High temperature, Normal voltage, channel 0



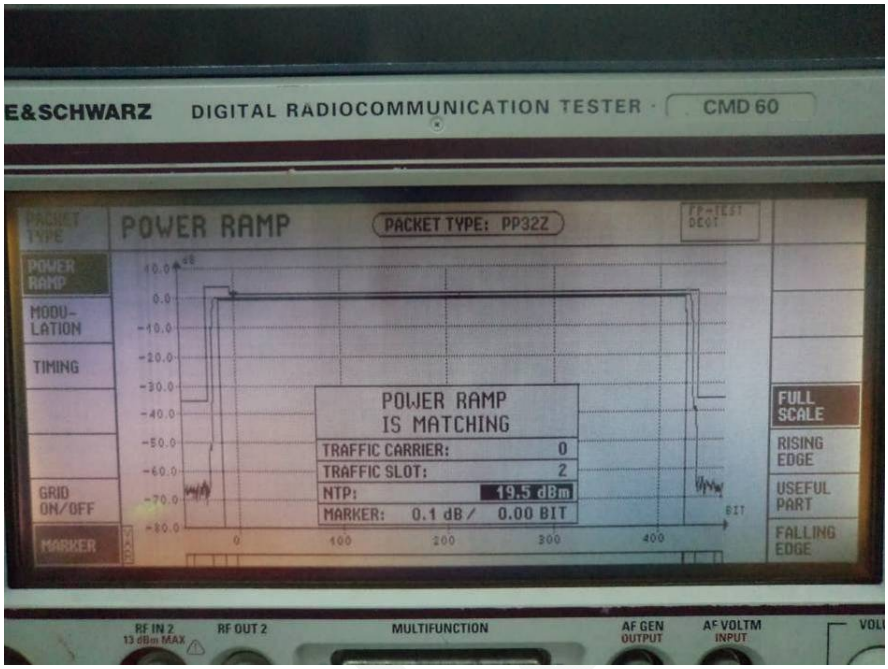
Low Temperature, Normal Voltage, channel 9



Low Temperature, Normal Voltage, channel 5



Low Temperature, Normal Voltage, channel 0



Note: Measurement uncertainty: Power: ±0.5dB, Time: ±0.075μs

Physical packet	TRAFFIC CARRIER		
	0	5	9
Attack time less than 10 μs 25 μW (-16 dBm) to bit p0	Pass	Pass	Pass
Release time less than 10 μs last bit to 25 μW (-16 dBm)	Pass	Pass	Pass
Minimum power greater than (NTP –1 dB) over whole packet	Pass	Pass	Pass
Maximum power less than (NTP +1 dB) from bit p0 +10 μs to end of packet +10 μs	Pass	Pass	Pass
10 μs either side of bit p0 less than (NTP +4 dB), and less than 315 mW (max.: 25 dBm +1 dB)	Pass	Pass	Pass
Packet end transmission greater than (NTP -6 dB) 0.5 μs after packet end	Pass	Pass	Pass
Transmitter idle power output less than 20 nW (-47 dBm) from the end of packet +27 μs to 27 μs before the next transmission of data bit p0	Pass	Pass	Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.4.1.1- TRANSMITTED POWER (PP AND RFP WITH INTEGRAL ANTENNA)

Applicable Standard

The requirements are given in EN 301406 §5.3.4.

The NTP shall be less than PNTP per simultaneously active transceiver at nominal conditions.The power measured at a temporary connector is the NTP.

Limit:

PNTP is 250 mW, equal to 24 dBm. The antenna gain of integral antennas shall be less than 12 + X dBi. X is the difference in dB between 24 dBm and the NTP expressed in dB for any one active transceiver.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Test Procedure

For the conducted power measurement, the EUT shall be equipped with a temporary antenna connector.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

** The testing was performed by Henry Ding on 2012-11-16.*

Test mode: TBR6

Test data please refer to the below table:

Test Condition			Transmitted power (dBm)		
Temperature (℃)	**Power Supply**		**CH 0**	**CH 5**	**CH 9**
T_{nor} = 25	PoE switch		19.2	19.4	19.5
T_{nor} = 25	AC Adapter (V_{AC})	230	19.5	19.6	19.9

Note: Measurement uncertainty: ± 0.5dB

Test Result: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.4.1.2- TRANSMITTED POWER (PP AND RFP WITH EXTERNAL CONNECTIONS FOR ALL ANTENNAS)

This measurement is necessary only for external antenna connection(s).

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.5 – RF CARRIER MODULATION

Applicable Standard

The requirements are given in EN 300 175-2 [4], clause 5.4.3& EN 301406 §5.3.5.

The modulation method shall be Gaussian Frequency Shift Keying (GFSK) with a bandwidth-bit period product of nominally 0,5 and a nominal peak deviation (f) of 288 kHz.

A binary "1" is encoded with a peak frequency deviation of (+f), giving a peak transmit frequency of (Fc + f), which is greater than the carrier frequency of (Fc). A binary "0" is encoded with a peak frequency deviation of (-f), giving a peak transmit frequency of (Fc - f). For High level modulation options, see clause 4.5.14.The requirements are given in EN 300 175-2 [4], clause 5.4.3.

Limits:

The achieved deviation in any given PP or RFP may vary from this nominal value as follows:

NOTE 1: These limits apply equally to positive and negative deviations.

Case A: Case A shall apply to the transmission of a repeating binary sequence of four "1"s and four "0"s: 00001111000011110000 1111...
The deviation limits for case A shall be:
- peak deviation greater than 259 kHz (90 % of nominal);
- peak deviation less than 403 kHz (140 % of nominal).

Case B: Case B shall apply to the transmission of all other binary sequences (sequences both longer and shorter than case A) that contain a maximum "digital sum variation" (see note 2) with an absolute value equal to or less than sixty-four.
The deviation limits for case B shall be:
- peak deviation greater than 202 kHz (70 % of nominal);
- peak deviation less than 403 kHz (140 % of nominal).

NOTE 2: Case B includes the case of a ".1010." sequence.

NOTE 3: "Digital Sum Variation" (DSV) is defined as the cumulative total of all transmitted symbols, counted from the start of the transmission burst. A binary "1" counts as (+1); a binary "0" as (-1). The DSV total indicates the cumulative DC balance of the transmitted symbols.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Test Procedure

Part 1"
a) Repeat parts a) to d) of clause 5.3.1.2.
b) Using the samples that were obtained from a), the LT shall calculate the peak frequency deviation within each bit period defined in clause 5.3.5.2.1 in the loopback field of the transmit burst of the EUT, relative to the measured carrier frequency that was calculated in clause 5.3.1. The measurement bandwidth shall be ⩾ 3 MHz.

c) Steps a) to b) shall be repeated until the following number of measurements has been made:

Equipment type	Number of measurements
A-field only transmit	100
Half-slot transmit	40
Full-slot transmit	10
Variable length slot with j = 640 transmit	5
Double-slot transmit	5

The peak frequency deviation as measured in part 1 shall be greater than ±259 kHz and less than ±403 kHz.

Part 2:

a) Steps a) to d) of clause 5.3.1.2 shall then be repeated using the appropriate sequence listed below:

Equipment type	Test pattern
A-field only transmit	Figure 35
Half-slot transmit	Figure 36
Full-slot transmit	Figure 37
Variable length slot with j = 640 transmit	Figure 37a
Double-slot	Figure 38

b) Using the samples that were obtained from part (a) above, the LT shall calculate the peak frequency deviation within each bit period defined in clause 5.3.5.2.1 in the loopback field of the transmit burst of the EUT, relative to the measured carrier frequency that was calculated in clause 5.3.1. The measurement bandwidth shall be ⩾ 3 MHz.

c) Steps a) to b) shall be repeated until the following number of measurements have been made:

Equipment type	Number of measurements
A-field only transmit	100
Half-slot transmit	40
Full-slot transmit	10
Variable length slot with j = 640 transmit	5
Double-slot transmit	5

The peak frequency deviation as measured in part 2 shall be greater than ±202 kHz and less than ±403 kHz.

Part 3

a) Steps a) to d) of clause 5.3.1.2 shall be repeated with the sequence "0101 0101 0101 0101".
b) using the samples that were obtained from part a) above, the LT shall calculate the peak frequency deviation within each bit period in the first 16 bits of the synchronization field (preamble) and the loopback field of the transmit burst of the EUT, relative to the measured carrier frequency that was calculated in clause 5.3.1. The measurement bandwidth shall be ⩾ 3 MHz.
c) Steps a) to b) shall be repeated until the following number of measurements have been made:

Equipment type	Number of measurements
A-field only transmit	100
Half-slot transmit	40
Full-slot transmit	10
Variable length slot with j = 640 transmit	5
Double-slot transmit	5

The peak frequency deviation as measured in part 3 shall be greater than ±202 kHz and less than ±403 kHz.

Part 4:

a) The LT shall place the EUT in a mode whereby the EUT is positioned in a LT specified slot and

frequency. If so equipped, the handover function in the EUT shall be disabled (see clause 5.1.10.3 for the appropriate test message reference).
b) The EUT shall be placed in a test mode whereby it performs the loopback function as referenced in clause 5.1.10.3.
c) The LT shall transmit a packet with a test sequence in the loopback field of the packet. This test sequence shall be such that the sequence 0101 0101 0101 0101..... is transmitted at the antenna of the

EUT in the loopback field of the reply packet.
d) Using the sampling method described in clause 5.1.12.2.2 capture a representation of the EUT's transmitted RF signal after allowing the EUT to be in an Active-locked state (see EN 300 175-3 [6]) for more than 1 s. The measurement bandwidth shall be ⩾ 3 MHz.
e) Using the samples that were obtained from d) above, the LT shall calculate the average frequency of the last 14 bits of the first 16 bits of the synchronization field.
f) Using the samples that were obtained from d) above, the LT shall calculate the average frequency of the first 14 bits of the last 16 bits of the loopback field.
g) Steps c) to f) shall be repeated until 200 measurements have been made. The frequency drift is the difference between the mean of the measurements taken in e) and the mean of the measurements taken in f).

The rate of change as measured in part 4 shall not be greater than 15 kHz per slot plus the maximum measurement uncertainty calculated from the allowable uncertainty in the relative drift radio frequency measurements involved (see clause 5.2). This implies that the drift in slot shall be between -17 kHz per slot and +17 kHz per slot, as measured.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

** The testing was performed by Henry Ding on 2012-11-16.*

Test mode: TBR6

Test data refer to the below:

TRAFFIC CARRIER 5	Measured value		Limit
	Positive (kHz)	Negative (kHz)	
Part 1	+367	-370	±259 kHz≤Limit≤±403 kHz
Part 2	+372	-371	±202 kHz≤Limit≤±403 kHz
Part 3	+273	-275	±202 kHz≤Limit ≤±403 kHz
Part 4	-5 kHz / slot		-17 kHz/slot≤Limit ≤+17kHz/slot

Note: Measurement uncertainty: Part 1~4: ± 1.2 kHz

Test Result: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.6.2 – EMISSIONS DUE TO MODULATION

Applicable Standard

The requirements are given in EN 300 175-2 [4], clause 5.5.1& EN 301406 §5.3.6.2.

The unwanted emission(s) due to modulation is the power measured in any DECT RF channel other than the one in which the EUT is transmitting, integrated over a bandwidth of 1 MHz. The requirements are given in EN 300 175-2 [4], clause 5.5.1. With transmissions on physical channel Ra (K, L, M, N) in successive frames, the power in physical channel Ra (K, L, Y, N) shall be less than the values given in table 1.

Table 1: Emissions modulation

Emissions on RF channel "Y"	Maximum power level
Y = M ± 1	160 µW
Y = M ± 2	1 µW
Y = M ± 3	80 nW
Y = any other DECT channel	40 nW
NOTE: For Y = "any other DECT channel", the maximum power level shall be less than 40 nW except for one instance of a 500 nW signal.	

The power in RF channel Y is defined by integration over a bandwidth of 1 MHz centred on the nominal centre frequency, Fy, averaged over at least 60 % but less than 80 % of the physical packet, and starting before 25 % of the physical packet has been transmitted but after the synchronization word.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Method of Measurement

a) If the EUT has an external antenna connector then this shall be used to connect the EUT to the LT. Otherwise, the transmitted signal shall be applied to the LT via a coupling device which provides the appropriate signal level to the system. The analyzing system in the LT shall be operated under the following conditions:

- Frequency sweep: 1 MHz;

- Resolution bandwidth: 100 kHz;

- Video bandwidth: greater than resolution bandwidth;

- Integration: across the frequency sweep;

- Peak hold: on;

- Sweep time: greater than 12 seconds;

- Filtering type: synchronously tuned.

The centre frequencies of the DECT RF channels are defined in clause 4.3.1.1.
The total sample time used for measurement is 60 % to 80 % of the duration of the physical packet, starting before 25 % of the slot time has expired but after the transmission of the synchronization word. The LT shall determine the start of the physical packet (bit p0) transmitted by the EUT.

b) The LT shall place the EUT in a mode whereby the EUT is positioned in a LT specified slot and frequency. If so equipped, the handover function in the EUT shall be disabled. See clause 5.1.10.3 for the

appropriate test message reference.
c) The EUT shall be placed in a test mode whereby it performs the loopback function as referenced in clause 5.1.10.3.
d) A test modulation signal D-M2 (see clause 5.1.9.8) is generated by the LT.
e) Using the analyzing system, a measurement of the EUT's transmitted power on channel M is made during the sampling time. This power measurement shall be called Pref.

NOTE: This measurement becomes the reference power for the power measurements of the other channels.

f) Using the method described in e), a measurement on all the other DECT channels shall be made and recorded in dB as a value relative to Pref. These shall be called Prm - 2, Prm - 1, Prm + 1, Prm + 2, etc., corresponding to the measurements made on channels Y = M - 2, Y = M - 1, Y = M + 1 and Y = M + 2.
g) Using the measured value of transmitted power, NTP, from clause 5.3.4.2.2 for channel Y = M, the LT shall calculate the power emissions on each channel.

EXAMPLE: Emissions on channel Y = M + 1:
= NTP(dBm) + Prm + 1(dB).
h) The value calculated in g) shall be converted from dBm to Watts.
i) Steps b) through h) shall be performed with the EUT's transmitter placed on DECT RF channels c = 0, 5 and 9.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

** The testing was performed by Henry Ding on 2012-11-16.*

Test mode: TBR6

Test data refer to the below:

TRAFFIC CARRIER:	0	Measurement NTP:	19.53
CHANNEL No.		Integrated Power	
		Measurement values (dBm)	Limits (dBm)
0		19.53	N/A
1		-11.52	-8
2		-37.33	-30
3		-46.79	-41
4		-52.40	-44
5		-54.49	-44
6		-54.86	-44
7		-56.01	-44
8		-56.08	-44
9		-56.31	-44

TRAFFIC CARRIER:	5	Measurement NTP:	19.66
CHANNEL No.		Integrated Power	
		Measurement values (dBm)	Limits (dBm)
0		-54.68	-44
1		-53.27	-44
2		-46.33	-41
3		-42.06	-30
4		-12.20	-8
5		19.66	N/A
6		-12.37	-8
7		-42.35	-30
8		-47.10	-41
9		-53.42	-44

TRAFFIC CARRIER:	9	Measurement NTP:	19.91
CHANNEL No.		Integrated Power	
		Measurement values (dBm)	Limits (dBm)
0		-56.41	-44
1		-56.43	-44
2		-55.65	-44
3		-52.29	-44
4		-50.68	-44
5		-48.76	-44
6		-42.50	-41
7		-37.14	-30
8		-12.18	-8
9		19.91	N/A

Note: Measurenment uncertainty: ± 0.5dB

Test Result: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.6.3 – EMISSION DUE TO TRANSMITTER TRANSIENTS

Applicable Standard

The requirements are given in EN 300 175-2 [4], clause 5.5.2& EN 301406 §5.3.6.3.

TThe requirements are given in EN 300 175-2 [4], clause 5.5.2. The power level of all modulation products (including Amplitude Modulation (AM) products due to the switching on or off of a modulated RF carrier) arising from a transmission on RF channel M shall, when measured using a peak hold technique, be less than the values given in table 2. The measurement bandwidth shall be 100 kHz and the power shall be integrated over a 1 MHz bandwidth centred on the DECT frequency, Fy.

Table 2: Emissions due to transmitter transients

Emissions on RF channel "Y"	Maximum power level
Y = M ± 1	250 µW
Y = M ± 2	40 µW
Y = M ± 3	4 µW
Y = any other DECT channel	1 µW

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2012-08-08	2013-08-07
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Method of Measurement

a) If the EUT has an external antenna connector then this shall be used to connect the EUT to the LT. Otherwise, the transmitted signal shall be applied to the LT via a coupling device which provides the appropriate signal level to the system. The analyzing system in the LT shall be operated under the following conditions:
- Frequency sweep: 1 MHz;
- Resolution bandwidth: 100 kHz;
- Video bandwidth: greater than resolution bandwidth;
- averaging: none;
- Peak hold: on;
- Filtering type: 4 or 5 pole synchronously tuned.

The centre frequencies of the DECT RF channels are defined in clause 4.3.1.1.
b) The LT shall place the EUT in a mode whereby the EUT is positioned in a LT specified slot and frequency. If so equipped, the handover function in the EUT shall be disabled (see clause 5.1.10.3 for the appropriate test message reference).
c) The EUT shall be placed in a test mode whereby it performs the loopback function as referenced in clause 5.1.10.3. When testing a RFP, the test shall be performed either with the dummy bearer switched

off when the traffic bearer is active, or with the dummy bearer placed on the same RF carrier as the traffic bearer as referenced in clause 5.1.10.4.
d) A test modulation signal D - M2 (see clause 5.1.9.8) generated by the LT.
e) The analyzing system centre frequency is positioned at the centre of the DECT RF channel being measured.
f) The analyzing system shall initiate a power measurement procedure conforming to the limits specified in clause 5.2 table 6.
g) Using the measured values obtained from e) to f), the LT shall select the highest recorded value within the sweep. This value shall be compared with the verdict criteria.
h) Steps e) to g) are repeated for all DECT RF channels other than the one on which the EUT is transmitting.
i) Steps b) to h) shall then be repeated until measurements have been made with the EUT's transmitter placed on all 10 DECT RF channels.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

** The testing was performed by Henry Ding on 2012-11-16.*

Test mode: TBR6

Test data please refer to the following:

TRAFFIC CARRIER:	**0**		
CHANNEL No.	**Max. Power**		
	Measurement values (dBm)	**Limits (dBm)**	**Result**
0	19.53	N/A	Pass
1	-12.58	-6	Pass
2	-37.52	-14	Pass
3	-43.66	-24	Pass
4	-48.58	-30	Pass
5	-50.94	-30	Pass
6	-53.12	-30	Pass
7	-55.37	-30	Pass
8	-55.45	-30	Pass
9	-56.66	-30	Pass

TRAFFIC CARRIER:	1		
CHANNEL No.	Max. Power		
	Measurement values (dBm)	Limits (dBm)	Result
0	-12.97	-6	Pass
1	19.55	N/A	Pass
2	-12.53	-6	Pass
3	-37.17	-14	Pass
4	-43.83	-24	Pass
5	-48.59	-30	Pass
6	-50.22	-30	Pass
7	-53.31	-30	Pass
8	-56.17	-30	Pass
9	-56.49	-30	Pass

TRAFFIC CARRIER:	2		
CHANNEL No.	Max. Power		
	Measurement values (dBm)	Limits (dBm)	Result
0	-36.50	-14	Pass
1	-12.96	-6	Pass
2	19.58	N/A	Pass
3	-12.63	-6	Pass
4	-36.70	-14	Pass
5	-43.70	-24	Pass
6	-49.07	-30	Pass
7	-52.33	-30	Pass
8	-55.06	-30	Pass
9	-56.81	-30	Pass

TRAFFIC CARRIER:	3		
CHANNEL No.	Max. Power		
	Measurement values (dBm)	Limits (dBm)	Result
0	-42.19	-24	Pass
1	-36.77	-14	Pass
2	-12.37	-6	Pass
3	19.60	N/A	Pass
4	-16.57	-6	Pass
5	-38.79	-14	Pass
6	-42.69	-24	Pass
7	-47.54	-30	Pass
8	-51.08	-30	Pass
9	-54.66	-30	Pass

TRAFFIC CARRIER:	4		
CHANNEL No.	Max. Power		
	Measurement values (dBm)	Limits (dBm)	Result
0	-48.22	-30	Pass
1	-43.51	-24	Pass
2	-37.42	-14	Pass
3	-12.73	-6	Pass
4	19.63	N/A	Pass
5	-12.89	-6	Pass
6	-36.08	-14	Pass
7	-42.31	-24	Pass
8	-47.82	-30	Pass
9	-51.79	-30	Pass

TRAFFIC CARRIER:	5		
CHANNEL No.	Max Power		
	Measurement values (dBm)	Limits (dBm)	Result
0	-52.49	-30	Pass
1	-48.36	-30	Pass
2	-42.07	-24	Pass
3	-37.42	-14	Pass
4	-12.40	-6	Pass
5	19.66	N/A	Pass
6	-12.77	-6	Pass
7	-36.48	-14	Pass
8	-43.58	-24	Pass
9	-47.43	-30	Pass

TRAFFIC CARRIER:	6		
CHANNEL No.	Max. Power		
	Measurement values (dBm)	Limits (dBm)	Result
0	-55.15	-30	Pass
1	-52.16	-30	Pass
2	-46.51	-30	Pass
3	-44.13	-24	Pass
4	-37.73	-14	Pass
5	-12.80	-6	Pass
6	19.70	N/A	Pass
7	-12.58	-6	Pass
8	-36.19	-14	Pass
9	-44.52	-24	Pass

TRAFFIC CARRIER:	7		
CHANNEL No.	Max. Power		
	Measurement values (dBm)	Limits (dBm)	Result
0	-56.53	-30	Pass
1	-56.35	-30	Pass
2	-55.47	-30	Pass
3	-48.02	-30	Pass
4	-43.70	-24	Pass
5	-37.13	-14	Pass
6	-13.00	-6	Pass
7	19.77	N/A	Pass
8	-12.81	-6	Pass
9	-36.04	-14	Pass

TRAFFIC CARRIER:	8		
CHANNEL No.	Max. Power		
	Measurement values (dBm)	Limits (dBm)	Result
0	-56.77	-30	Pass
1	-56.65	-30	Pass
2	-55.64	-30	Pass
3	-52.27	-30	Pass
4	-47.28	-30	Pass
5	-43.66	-24	Pass
6	-37.42	-14	Pass
7	-12.75	-6	Pass
8	19.85	N/A	Pass
9	-12.71	-6	Pass

TRAFFIC CARRIER:	9		
CHANNEL No.	Max. Power		
	Measurement values (dBm)	Limits (dBm)	Result
0	-56.79	-30	Pass
1	-56.60	-30	Pass
2	-56.42	-30	Pass
3	-52.90	-30	Pass
4	-50.02	-30	Pass
5	-48.43	-30	Pass
6	-43.51	-24	Pass
7	-36.49	-14	Pass
8	-12.39	-6	Pass
9	19.91	N/A	Pass

Note: Measurement uncertainty: ± 2.5 dB

Test Result: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.6.4 – EMISSION DUE TO INTERMODULATION

Note: Not applicable. It is only for basestation with more than one transmitter.

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.6.5 - SPURIOUS EMISSIONS WHEN ALLOCATED A TRANSMIT CHANNEL

Applicable Standard

The requirements are given in EN 300 175-2 [4], clause 5.5.4 & EN 301406 §5.3.6.5. The peak power level of any RF emissions outside the radio frequency band allocated to DECT, as defined in clause 4.1.1, when a radio end point has an allocated physical channel, shall not exceed 250 nW at frequencies below 1 GHz and 1 µ W at frequencies above 1 GHz. The power shall be defined in the bandwidths given in table 3. If a radio end point has more than one transceiver, any out of band transmitter intermodulation products shall also be within these limits.

Table 3: Spurious emissions

Frequency offset, fo From edge of band	Measurement bandwidth
0 MHz ≤ fo < 2 MHz	30 kHz
2 MHz ≤ fo < 5 MHz	30 kHz
5 MHz ≤ fo < 10 MHz	100 kHz
10 MHz ≤ fo < 20 MHz	300 kHz
20 MHz ≤ fo < 30 MHz	1 MHz
30 MHz ≤ fo < 12,75 GHz	3 MHz

Measurements shall not be made for transmissions on the RF channel closest to the nearest band edge for frequency offsets of up to 2 MHz.
In addition, not regarding up to 2 instances of a continuous-wave spurious signal for PPs for which the total peak power level shall be less than 250 nW as measured in a 3 MHz measurement bandwidth, the peak power level shall be less than 20 nW in a 100 kHz measuring bandwidth for the following broadcast bands:

- 47 MHz to 74 MHz;
- 87,5 MHz to 108 MHz;
- 108 MHz to 118 MHz;
- 174 MHz to 230 MHz;
- 470 MHz to 862 MHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2011-11-24	2012-11-23
HP	Amplifier	8447E	1937A01046	2011-11-24	2012-11-23
Mini-Circuits	Amplifier	ZVA-213+	N/A	2011-11-24	2012-11-23
HP	Signal Generator	8341B	2624A00116	2012-05-17	2013-05-16
A.H. System	Horn Antenna	SAS-200/571	135	2012-02-11	2013-02-10
SUNOL SCIENCES	Horn Antenna	DRH-118	A052304	2011-12-01	2012-11-30
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15
COM POWER	Dipole Antenna	AD-100	041000	2012-06-05	2013-06-04
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2012-11-27

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Test Procedure

The peak power level of any RF emissions outside the radio frequency band allocated to DECT when a radio endpoint has been allocated a transmit channel. If a REP has more than one transceiver, any out of band transmitter intermodulation products shall also be included.

The limits and conformance requirements cover radiated emissions, radiated spurious emissions.

Method of radiated spurious emissions:

a) The analyzing system in the LT shall be operated under the following conditions:
- Frequency sweep: as required for frequency range;
- Resolution bandwidth: refer to table 12;
- Display bandwidth: greater than resolution bandwidth;
- Averaging: refer to table 12;
- Peak hold: refer to table 12;
- Filtering type: synchronously tuned.

The sweep time shall be chosen to be slow enough to ensure that the LT is capable of capturing at least one burst spurious signal for every measurement point.

NOTE: This may be achieved by using the following formula:

$$\text{sweep time} > \frac{2 \times (\text{PRI} \times \text{frequency span})}{\text{resolution bandwidth}}$$

where PRI = pulse repetition interval = 10 ms.

Measurements shall not be made for transmissions on the RF channel closest to the nearest band edge for frequency offsets of up to 2 MHz.
The centre frequencies of the DECT RF channels are defined in clause 4.5.1.1.

b) The LT shall place the EUT in a mode whereby the EUT is positioned in a LT specified slot and frequency. If so equipped, the handover function in the EUT shall be disabled (see clause 5.1.10.3 for the appropriate test message reference).

c) The EUT shall be placed in a test mode whereby it performs the loopback function as referenced in clause 5.1.10.3. When testing a RFP, the test shall be performed either with the dummy bearer switched off when the traffic bearer is active, or with the dummy bearer placed on the same RF carrier as the traffic bearer as referenced in clause 5.1.10.4.

d) A test modulation signal D - M2 (see clause 5.1.9.5) is generated by the LT.

e) The LT shall initiate a power measurement procedure conforming to the limits specified in table 7 using the methods described in annex B.

f) The test shall be carried out over the RF ranges from 30 MHz to 12,75 GHz and the power measurements shall be performed using the resolution bandwidth as indicated in table 12.

Table 12: Measurement parameter settings

Frequency offset from edge of band: f	Resolution Bandwidth	Peak Hold	Averaging
$f < 5$ MHz	30 kHz	on	none
5 MHz $\leq f <$ 10 MHz	100 kHz	on	none
10 MHz $\leq f <$ 20 MHz	300 kHz	on	none
20 MHz $\leq f <$ 30 MHz	1 MHz	on	none
$f \geq$ 30 MHz	3 MHz	on	none

The spurious emissions, as measured, shall not be greater than 250 nW at frequencies below 1 GHz and 1 µW at frequencies above 1 GHz.

In addition, not regarding up to 2 instances of a continuous - wave spurious signal for PPs for which the total peak power level shall be less than 250 nW as measured in a 3 MHz measurement bandwidth, the peak power level shall be less than 20 nW in a 100 kHz measuring bandwidth for the following broadcast bands:

- 47 MHz to 74 MHz;

- 87.5 MHz to 108 MHz;

- 108 MHz to 118 MHz;

- 174 MHz to 230 MHz;

- 470 MHz to 862 MHz.

Method of conducted spurious emissions:

a) The EUT shall be connected to the LT via the permanent external antenna connector.
b) The tests a) to f) in clause 5.3.6.5.1.2, except test e), shall be carried out by using the methods described in annex C (conducted spurious emissions)..The power measurements shall be performed using the resolution bandwidth as indicated in table 13.

Table 13: Measurement parameter settings

Frequency offset from edge of band: *f*	Resolution Bandwidth	Peak Hold	Averaging
f < 5 MHz	30 kHz	on	none
5 MHz ≤ *f* < 10 MHz	100 kHz	on	none
10 MHz ≤ *f* < 20 MHz	300 kHz	on	none
20 MHz ≤ *f* < 30 MHz	1 MHz	on	none
f ≥ 30 MHz	3 MHz	on	none

The spurious emissions, as measured, shall not be greater than 250 nW at frequencies below 1 GHz and 1 µ W at frequencies above 1 GHz.
In addition, not regarding up to 2 instances of a continuous - wave spurious signal for PPs for which the total peak power level shall be less than 250 nW as measured in a 3 MHz measurement bandwidth, the peak power level shall be less than 20 nW in a 100 kHz measuring bandwidth for the following broadcast bands:

. 47 MHz to 74 MHz;

. 87,5 MHz to 108 MHz;

. 108 MHz to 118 MHz;

. 174 MHz to 230 MHz;

. 470 MHz to 862 MHz.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Ding on 2012-11-16.

Test Mode: TBR6

Please refer to below the data.

Radiated spurious emissions:

30MHz – 12.75GHz:

Frequency	Receiver	TurnTable	Receiving Antenna		Substituted			Absolute Level (dBm)	EN 301406	
(MHz)	Reading (dBµV)	Angle Degree	Height (m)	Polar (H/V)	SG Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
CH5										
9444.3	44.97	158	1.9	H	-42.7	3.34	13.3	-32.74	-30	2.74
9444.3	43.50	311	1.8	V	-43.9	3.34	13.3	-33.94	-30	3.94
3777.3	52.71	39	1.9	V	-42.0	2.96	10.4	-34.56	-30	4.56
5666.5	43.53	73	1.8	V	-46.1	3.39	11.7	-37.79	-30	7.79
7555.7	42.39	55	1.6	V	-47.2	3.07	12.0	-38.27	-30	8.27
3777.3	48.43	65	1.6	H	-47.7	2.96	10.4	-40.26	-30	10.26
7555.7	39.22	229	1.6	H	-50.6	3.07	12.0	-41.67	-30	11.67
5666.5	40.55	68	1.6	H	-53.9	3.39	11.7	-45.59	-30	15.59
44.03	43.71	160	1.2	V	-52.7	0.21	0	-52.91	-36	16.91
137.86	30.31	170	1.9	H	-67.5	0.27	0	-67.77	-36	31.77

Measurement uncertainty: ± 4 dB

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.7.1 – RADIO RECEIVER SENSIVITITY

Applicable Standard

The requirements are given in EN 300 175-2 [4], clause 6.2& EN 301406 §5.3.7.1.

The radio receiver sensitivity is defined as the power level at the receiver input at which the Bit Error Ratio (BER) is 0,001. The radio receiver sensitivity shall be 60 dB µ V/m (-83 dBm) or better.
The requirements are given in EN 300 175-2 [4], clause 6.2. The radio receiver sensitivity is defined as the power level at the receiver input at which the Bit Error Rate (BER) is 0,001 in the D-field. The radio receiver sensitivity shall be -83 dBm (i.e. 60 dB µ V/m), or better. This limit shall be met for a reference DECT radio end point transmitted frequency error of ±50 kHz for PPs and RFPs. This requirement shall be met with the radio end point under test operating in time division duplex mode with a reference DECT radio end point.

Before using a DECT physical channel for transmission or reception, the receiver shall be able to measure the strength of signals on that physical channel, that are received stronger than -93 dBm (i.e. 50 dBµV/m) and weaker than -33 dBm (i.e. 110 dBµV/m) with a resolution of better than 6 dB. Signals that are received weaker than -93 dBm shall produce a result equal to, or less than that produced by a signal of -93 dBm. Signals that are received stronger than -33 dBm shall produce a result equal to, or greater than that produced by a signal of -33 dBm.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Method of Measurement

a) The EUT shall be oriented in the reference position as determined in clause 5.1.12.3 if no antenna connector is available.
b) The LT shall be programmed to set its RF transmission to a power level such that 60 dB µ V/m (-83 dBm) shall be present at the input of the EUT receiver.
c) The LT shall place the EUT in a mode whereby the EUT is positioned in a LT specified slot and RF channel c = 5. If so equipped, the handover function in the EUT shall be disabled (see clause 5.1.10.3 for the appropriate test message reference).
d) The EUT shall be placed in a test mode whereby it performs the loopback function as referenced in clause 5.1.10.3.
e) A test modulation signal D - M2 (see clause 5.1.9.4.4) is generated by the LT.
f) The LT shall calculate the BER of the EUT as determined in clause 5.1.12.4 and annexes E and F.
g) The LT shall offset the frequency of the test signal by 50 kHz and repeat parts b) to f). This sequence of steps shall be repeated twice to include both positive and negative frequency offsets.
h) Steps b) to f) shall be repeated for RF channels c = 0 and 9.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Ding on 2012-11-16.

Test mode: TBR6

Test data please refer to the following data

The received signal is set to level -83dBm and the offset frequency of the EUT 50 kHz; the BER shall be less than 0.001

Traffic Carrier	Center frequency offset (kHz)	Measurement BER	Limit	Result
0	0	0.00006	0.001	Pass
	+50	0.00002	0.001	Pass
	-50	0.00004	0.001	Pass
5	0	0.00007	0.001	Pass
	+50	0.00003	0.001	Pass
	-50	0.00005	0.001	Pass
9	0	0.00007	0.001	Pass
	+50	0.00003	0.001	Pass
	-50	0.00005	0.001	Pass

Note: Measurement uncertainty: 0.0000001

Test Results: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.7.2 – RADIO RECEIVER REFERENCE BER AND FER

Applicable Standard

The requirements are given in EN 300 175-2 [4], clause 6.3& EN 301406 §5.3.7.2.

The radio receiver reference BER and FER is the maximum allowed BER and FER for a power level at the receiver input of -73 dBm or greater (i.e. 70 dB µ V/m). The requirements are given in clause 6.3 of EN 300 175-2 [4]. The reference bit error rate is 0, 00001 in the D-field. The reference frame error ratio is 0, 0005.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Method of Measurement

a) The EUT shall be oriented in the reference position as determined in clause 5.1.12.3 if no antenna connector is available.
b) The LT shall be programmed to set its RF transmission to a power level of 70 dB µ V/m (-73 dBm) at the input of the EUT receiver.
c) The LT shall place the EUT in a mode whereby the EUT is positioned in a LT specified slot and RF channel c = 5 with handover disabled (see clause 5.1.10.3 for the appropriate test message reference).
d) The EUT shall be placed in a test mode whereby it performs the loopback function as referenced in clause 5.1.10.3.
e) A test modulation signal D - M2 (see clause 5.1.9.4.4) is generated by the LT.
f) The LT shall calculate the BER and FER of the EUT as determined in clause 5.1.12.4 and annexes E and F.
g) Steps b) to f) shall be repeated for RF channels c = 0 and 9.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Ding on 2012-11-16.

Test mode: TBR6

Test data please refer to the following data

Error Ratio	Traffeic Carrier	Measurement value	Limit	Result
BER	0	0.000001	0.00001	Pass
	5	0.000000	0.00001	Pass
	9	0.000001	0.00001	Pass
FER	0	0.000001	0.0005	Pass
	5	0.000000	0.0005	Pass
	9	0.000001	0.0005	Pass

Note: The measurement uncertainty is ± 0.0000001.

Test Results: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.7.3 – RADIO RECEIVER INTERFERENCE PERFORMANCE

Applicable Standard

The requirements are given in EN 300 175-2 [4], clause 6.4& EN 301406 §5.3.7.3.

The ability of DECT equipment to continue receiving in the presence of an interfering signal on the same or different DECT RF channel. The requirements are given in EN 300 175-2 [4], clause 6.4. With received signal strength of -73 dBm (i.e. 70 dBµV/m) on RF channel M, the BER in the D-field shall be maintained better than 0,001 when a modulated, reference DECT interferer of the indicated strength is introduced on the DECT RF channels shown in table 4.

Table 4: Receiver interference performance

Interferer on RF channel "Y"	Interferer signal strength	
	(dBµV/m)	(dBm)
Y = M	59	-84
Y = M ± 1	83	-60
Y = M ± 2	104	-39
Y = any other DECT channel	110	-33
NOTE: The RF carriers "Y" shall include the three nominal DECT RF carrier positions immediately outside each edge of the DECT band.		

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Method of Measurement

a) The EUT shall be oriented in the reference position as determined in clause 5.1.12.3 if no antenna connector is available.
b) The LT shall be programmed to set its RF transmission to a power level of 70 dB µ V/m (-73 dBm) at the input of the EUT receiver.
c) The LT shall place the EUT in a mode whereby the EUT is positioned in a LT specified slot and RF channel c = 5. If so equipped, the handover function in the EUT shall be disabled (see clause 5.1.10.3 for the appropriate test message reference).
d) The EUT shall be placed in a test mode whereby it performs the loopback function as referenced in clause 5.1.10.3.
e) A test modulation signal D - M2 (see clause 5.1.9.4.4) is generated by the LT.
f) The LT shall transmit in addition to the D - M2 data test pattern, a modulated DECT - like carrier (see clause 5.1.9.5) on channel "Y" whose level is determined by table 14.

Table 14: Interferer levels

Interferer on RF Channel "Y"	Interferer signal strength	
	(dBµV/m)	(dBm)
Y = M	59	-84
Y = M ± 1	83	-60
Y = M ± 2	104	-39
Y = any other DECT channel	110	-33

The RF carriers "Y" shall include the three nominal DECT RF carrier positions immediately outside each edge of the DECT band.
g) The LT shall calculate the BER of the EUT as determined in clause 5.1.12.4 and annexes E and F.
h) Steps b) to g) shall be repeated so that the single interfering DECT - like carrier has been placed on all the remaining DECT channels. Table 14 indicates the amplitude of the interferer.
i) Steps b) to h) shall be repeated for RF channels c = 0 and 9.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Ding on 2012-11-16.

Test mode: TBR6

Test data please refer to the following data

Test channel 0:

Interference carrier number	Interference level (dBm)	Measurement BER	BER Limit	Result
0	-84.0	0.00006	0.001	Pass
1	-60.0	0.00003	0.001	Pass
2	-39.0	0.00005	0.001	Pass
3	-33.0	0.00006	0.001	Pass
4	-33.0	0.00003	0.001	Pass
5	-33.0	0.00002	0.001	Pass
6	-33.0	0.00002	0.001	Pass
7	-33.0	0.00004	0.001	Pass
8	-33.0	0.00004	0.001	Pass
9	-33.0	0.00004	0.001	Pass

Test channel 5:

Interference carrier number	Interference level (dBm)	Measurement BER	BER Limit	Result
0	-33.0	0.00006	0.001	Pass
1	-33.0	0.00001	0.001	Pass
2	-33.0	0.00005	0.001	Pass
3	-39.0	0.00005	0.001	Pass
4	-60.0	0.00002	0.001	Pass
5	-84.0	0.00003	0.001	Pass
6	-60.0	0.00002	0.001	Pass
7	-39.0	0.00003	0.001	Pass
8	-33.0	0.00004	0.001	Pass
9	-33.0	0.00006	0.001	Pass

Test channel 9:

Interference carrier number	Interference level (dBm)	Measurement BER	BER Limit	Result
0	-33.0	0.00005	0.001	Pass
1	-33.0	0.00002	0.001	Pass
2	-33.0	0.00002	0.001	Pass
3	-33.0	0.00004	0.001	Pass
4	-33.0	0.00007	0.001	Pass
5	-33.0	0.00003	0.001	Pass
6	-33.0	0.00002	0.001	Pass
7	-39.0	0.00003	0.001	Pass
8	-60.0	0.00003	0.001	Pass
9	-84.0	0.00005	0.001	Pass

Note: The Measurement uncertainty: 0.0000001

Test Results: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.7.4 – RADIO RECEIVER BLOCKING CASE 1

Applicable Standard

The requirements are given in EN 300 175-2 [4], clause 6.5.1& EN 301406 §5.3.7.4.

The receiver should work in the presence of strong signals on other frequencies. These interferers may be modulated carriers or single continuous - wave carriers. The requirements are given in EN 300 175-2 [4], clause 6.5.1. With the desired signal set at -80 dBm, the BER shall be maintained below 0,001 in the D-field in the presence of any one of the signals shown in table 5.
The receiver shall operate on a frequency band allocation with the low band edge FL MHz and the high band edge FU MHz.

Table 5: Receiver blocking

Frequency (f)	Continuous wave interferer level	
	For radiated measurements dB µV/m	For conducted measurements dBm
25 MHz ≤ f < F_L - 100 MHz	120	-23
F_L - 100 MHz ≤ f < F_L - 5 MHz	110	-33
|f - F_C| > 6 MHz	100	-43
F_U + 5 MHz < f ≤ F_U + 100 MHz	110	-33
F_U + 100 MHz < f ≤ 12,75 GHz	120	-23

For the basic DECT frequency band allocation FL is 1 880 MHz and F_U is 1 900 MHz. Receivers may support additional carriers, e.g. up to F_U = 1 920 MHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Signal Generator	8341B	2624A00116	2012-05-17	2013-05-16
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Method of Measurement

a) The EUT shall be oriented in the reference position as determined in clause 5.1.12.3 if no antenna connector is available.
b) The power level of the RF transmission from the LT shall be set to -80 dBm.
c) The LT shall place the EUT in a mode whereby the EUT is positioned in a LT specified slot and frequency (Fc). The frequency chosen shall be RF channel c = 5 of the DECT RF channels. If so equipped, the handover function in the EUT shall be disabled (see clause 5.1.10.3 for the appropriate test message reference).

d) The EUT shall be placed in a test mode whereby it performs the loopback function as referenced in clause 5.1.10.3.

e) A test modulation signal D - M2 (see clause 5.1.9.4.4) is generated by the LT.
f) The LT shall transmit in addition to the D -M2 signal a single continuous - wave interferer with an equivalent frequency change rate not exceeding the following:

Equipment type	Frequency change rate
A-field only	1 MHz/s
half-slot	2,5 MHz/s
full-slot	10 MHz/s
Variable length slot with j = 640	20 MHz/s
double-slot	20 MHz/s

The frequency (f) and levels are determined by table 15. If discrete frequency steps are used, the step shall not exceed 1 MHz.
The EUT shall operate on the declared frequency allocation with the low band edge F_L in MHz and the high band edge F_U in MHz.

Table 15: Interferer levels

Frequency (f)	Continuous wave interferer level	
	For radiated measurements dB µV/m	For conducted measurements dBm
25 MHz ≤ f < F_L - 100 MHz	120	-23
F_L - 100 MHz ≤ f < F_L - 5 MHz	110	-33
| f- F_C | > 6 MHz	100	-43
F_U + 5 MHz < f ≤ F_U + 100 MHz	110	-33
F_U + 100 MHz < f ≤ 12,75 GHz	120	-23

For the basic DECT frequency band allocation F_L is 1 880 MHz and F_U is 1 900 MHz. EUTs may support additional carriers, e.g. up to F_U = 1 920 MHz.

g) The LT shall for frequencies and conditions defined under part f) monitor bit errors with time intervals not exceeding 1s.
h) At frequencies where 1 or more errors are found, the LT shall calculate the BER of the EUT as determined inclause 5.1.12.4 and annexes E and F. If the measured BER exceeds 0,001 the frequency shall be recorded.
i) For all frequencies recorded under h) the measurement and recording procedure shall be repeated, but with the interferer level decreased to 100 dB µ V/m for radiated measurements or -43 dBm for conducted measurements.
j) For all frequencies recorded under i), the measurement and recording procedure shall be repeated, but with the interferer level decreased to 80 dB µ V/m for radiated measurements or -63 dBm for conducted measurements.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Ding on 2012-11-16.

Test mode: TBR6

Test data please refer to the following data

Interferer frequency level:

Frequency (f)	Continuous wave interferer level	
	For radiated measurements dB µV/m	For conducted measurements dBm
25 MHz ≤ f < F_L - 100 MHz	120	-23
F_L - 100 MHz ≤ f < F_L - 5 MHz	110	-33
| f- F_C | > 6 MHz	100	-43
F_U + 5 MHz < f ≤F_U + 100 MHz	110	-33
F_U + 100 MHz < f ≤ 12,75 GHz	120	-23

Traffic Carrier:		**5**	
Transmitter level:	-80.00 dBm	Step Frequency:	1.00 MHz
Start Frequency	25.00 MHz	Stop Frequency	12750.00 MHz

Limit: The BER shall be ≤ 0.001

RF channel 5 is chosen for test, and the BER is 0.000001 during the test.

Note: The Measurement uncertainty: 0.000000

Test Results: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.7.5 – RADIO RECEIVER BLOCKING CASE 2

Applicable Standard

The requirements are given in EN 300 175-2 [4], clause 6.5.2& EN 301406 §5.3.7.5

When a high level interferer is present in a physical channel other than the one the receiver is on, the receiver is able to continue receiving the desired signal. The requirements are given in EN 300 175-2 [4], clause 6.5.2. With a signal of strength -14 dBm (i.e. 129 dB/µVm) incident on the receiver in slot "N" on RF carrier "M", the receiver shall be able to receive at -83 dBm, and with the BER in the D-field maintained better than 0,001, on slot(N + 2) modulo 24 on any DECT RF carrier.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Method of Measurement

a) The EUT shall be orientated in the reference position as determined in clause 5.1.12.3 if no antenna connector is available.
b) The LT shall be programmed to set its RF transmission to a power level of 70 dB µ V/m (-73 dBm) at the input of the EUT receiver.
c) The LT shall place the EUT in a mode whereby the EUT is positioned in RF channel c = 5 and slot-pair N (i.e. slot N and slot N + 12 with N ⩾ 2). If so equipped, the handover function in the EUT shall be disabled (see clause 5.1.10.3 for the appropriate test message reference).
d) The EUT shall be placed in a test mode whereby it performs the loopback function as referenced in clause 5.1.10.3.
e) A test modulation signal D-M2 (see clause 5.1.9.4.4) is generated by the LT.
f) The LT shall transmit at the same time a DECT-like physical packet interferer at a level of -14 dBm (129 dB µ V/m) in slot N - 2 for measuring a PT and slot (N + 12) - 2 for measuring an FT (see clause 5.1.9.5 for a description of this interferer). The power level of any emissions by the LT shall be less than -93 (50 dB µ V/m) dBm on slot N - 1 for measuring a PT and on slot (N + 12) - 1 for measuring an FT.
g) The LT shall be programmed to set its RF transmission to a power level of 60 dB µ V/m (-83 dBm) at the input of the EUT receiver in slot N for measuring a PT and in slot N + 12 for measuring an FT.
h) The LT shall calculate the BER of the EUT as determined in clause 5.1.12.4 and annexes E and F.
i) Steps b) to h) shall be repeated with the EUTs receiver placed on RF channels c = 0 and 9.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Ding on 2012-11-16.

Test mode: TBR6

Test data please refer to the following data

Traffic Carrier	Measurement BER	BER Limit	Result
0	0.000002	0.001	Pass
5	0.000001	0.001	Pass
9	0.000002	0.001	Pass

Note: Measurement uncertainty: 0.0000001

Test Results: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.7.6 –RECEIVER INTERMODULATION PERFORMANCE

Applicable Standard

The requirements are given in EN 300 175-2 [4], clause 6.6& EN 301406 §5.3.7.6

With a call set-up on a particular physical channel, two interferers are introduced so that they can produce an intermodulation product on the physical channel already in use. The requirements are given in EN 300 175-2 [4], clause 6.6. If RF carrier number "d" is in use, a reference DECT interferer and a continuous wave interferer are introduced on DECT carriers "e" and "f" to produce an intermodulation product on carrier "d". Neither "e" nor "f" shall be adjacent to "d". The received level of carriers "e" and "f" shall be -48 dBm and the received level of carrier "d" shall be -80 dBm. With "e" and "f" being received 32 dB greater than "d", and "d" being received at -80 dBm, the receiver shall still operate with a BER of less than 0,001 in the D-field.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Signal Generator	8341B	2624A00116	2012-05-17	2013-05-16
R & S	Digital Radio-Communication Tester	CMD60	829902/026	2012-03-16	2013-03-15
R&S	Digital Radio Communication Test	CMD60	837605/031	2012-10-28	2013-10-27

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to National Institute of Metrology (NIM).

Method of Measurement

a) The EUT shall be oriented in the reference position as determined in clause 5.1.12.3 if no antenna connector is available.
b) The LT shall be programmed to set its RF transmission level to a power level of 63 dB µ V/m (-80 dBm) at the input of the EUT receiver.
c) The EUT's RF channel is recorded as channel "M".
d) The LT shall place the EUT in a mode whereby the EUT is positioned in a LT specified slot and frequency. If so equipped, the handover function in the EUT shall be disabled (see clause 5.1.10.3 for the appropriate test message reference).
e) The EUT shall be placed in a test mode whereby it performs the loopback function as referenced in clause 5.1.10.3.
f) A test modulation signal D - M2 (see clause 5.1.9.4.4) is generated by the LT.

g) The LT shall then transmit in addition to the D - M2 test signal, a modulated DECT-like carrier "B" and a continuous-wave carrier "A" whose intermodulation product is present within the DECT channel "M" of the EUT. The level of these carriers shall be set to -48 dBm (95 dB µ V/m) at the receiver input of the EUT. The LT shall calculate the BER of the EUT as determined in clause 5.1.12.4 and annexes E and F. The measurement shall be performed 4 times with the interfering carriers and the EUT receive channel positioned on the DECT RF channels as given in table 16.

Table 16: RF carrier combinations

M	A	B
5	7	9
5	3	1
0	2	4
9	7	5

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

The testing was performed by Henry Ding on 2012-11-16.

Test mode: TBR6

Test data please refer to the following data

RF Carrier Combinations			Interfere level (dBm)	Measurement BER	Limit	Result
Carrier Channel Number	Interferer Signal Channel					
M	A	B				
0	2	4	-48	0.000002	0.001	Passed
5	3	1	-48	0.000001	0.001	Passed
5	7	9	-48	0.000001	0.001	Passed
9	7	5	-48	0.000002	0.001	Passed

Note:
M: DECT carrier channel
A: Continuous-wave carrier
B: Modulated DECT-like carrier
Note: The Measurement uncertainty: 0.0000001

Test Results: Pass

ETSI EN 301 406 V2.1.1 (2009-07) §4.5.7.7 - SPURIOUS EMISSIONS WHEN THE PP HAS NO ALLOCATED TRANSMIT CHANNEL

Not apply for FP

Note: The power level of any spurious emission when the PP has not been allocated a transmit channel. The FP is always allocated a transmit channel as soon as it is power on.

EXHIBIT A - PRODUCT LABELING

Label Format

CE1313

Specifications: Text is black in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing and shall be affixed at a conspicuous location on the EUT.
1313: 4 digit notified body number.

Proposed Label Location on EUT

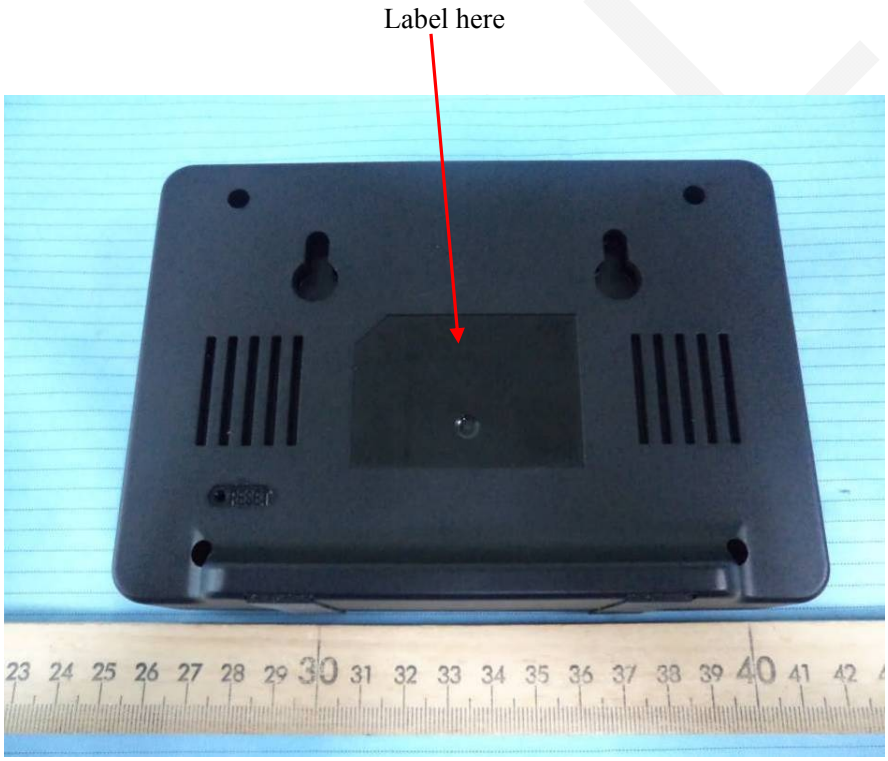
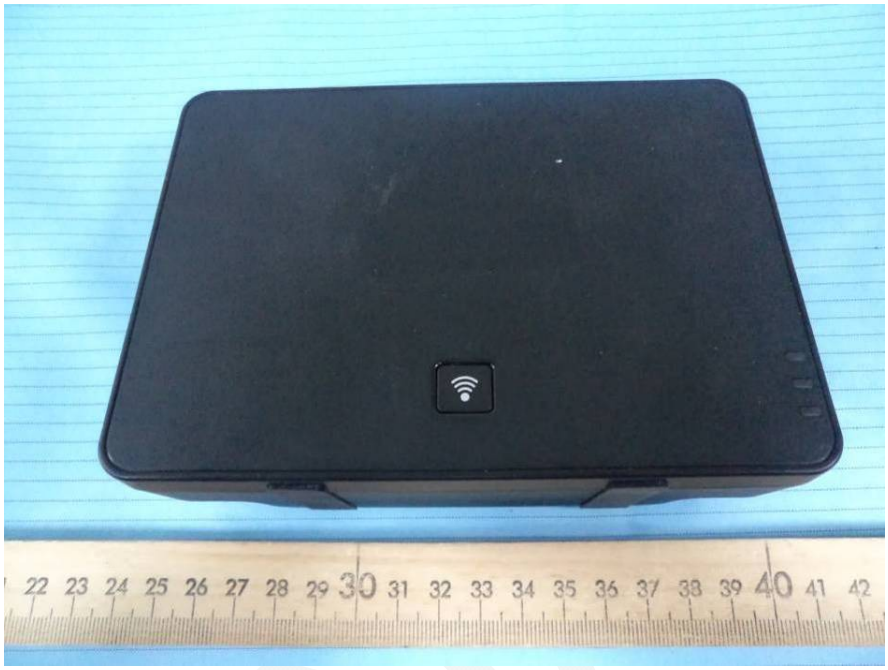


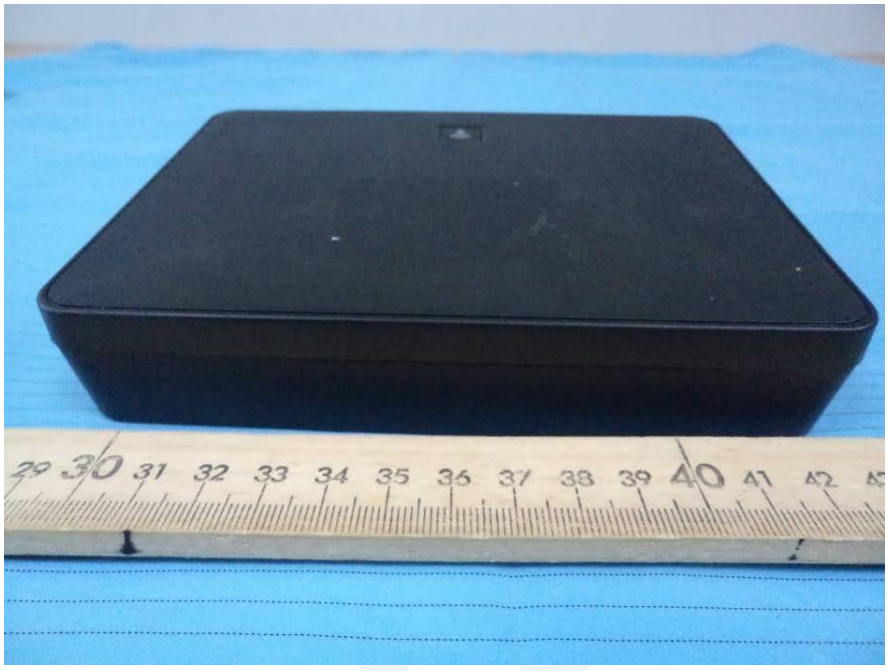
EXHIBIT B - EUT PHOTOGRAPHS

EUT (Base) – Front View



EUT (Base) – Rear View

EUT (Base) – Top View



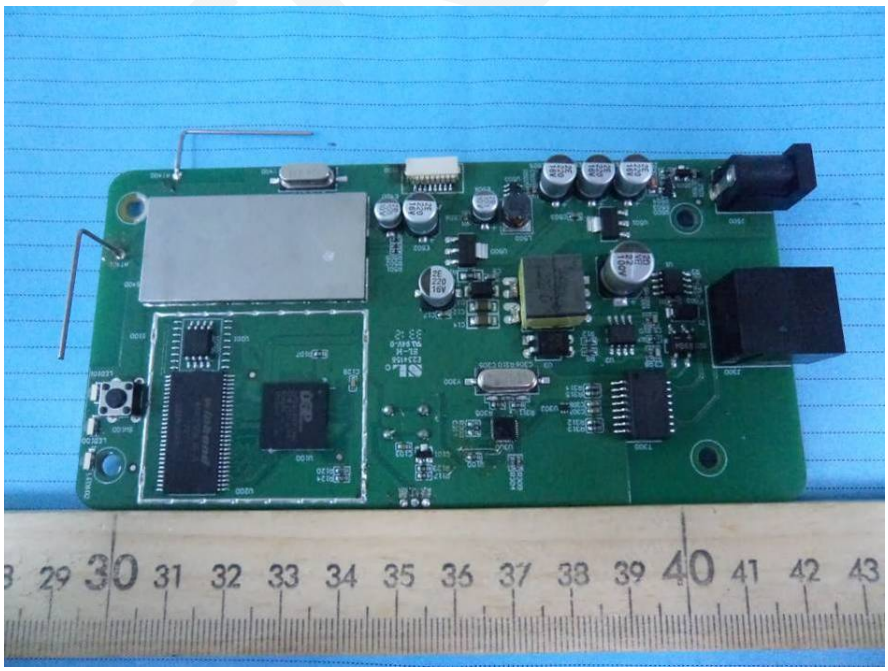
EUT (Base) – Bottom View

EUT (Base) – Left Side View

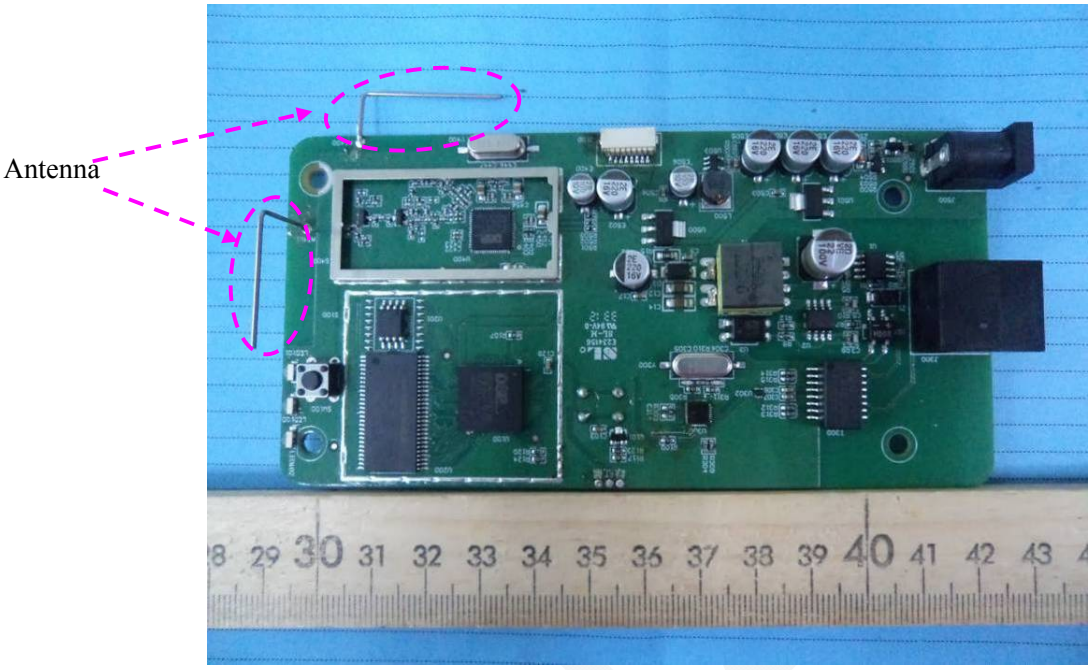
EUT (Base) – Right Sdie View

EUT (Base) – Cover off View

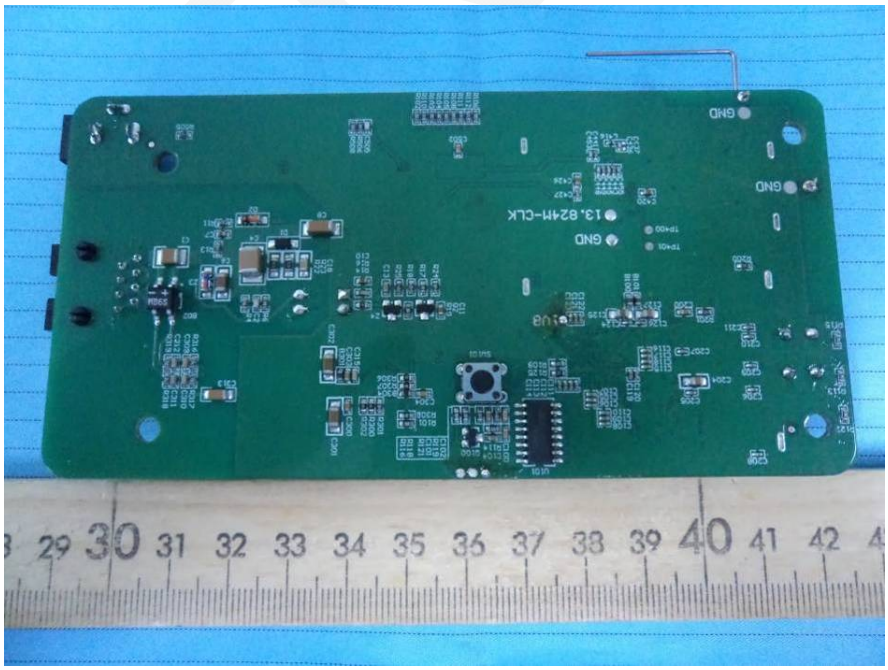
EUT (Base) – Main Board Top View



EUT (Base) – Main Board Top Shielding off View



EUT (Base) –Main Board Bottom View



EUT (Base) – Adapter View

EUT (Base) – Adapter Label View

EXHIBIT C - TEST SETUP PHOTOGRAPHS

Radiated Spurious Emissions View (Below 1 GHz)

Radiated Spurious Emissions View (Above 1 GHz)

Extreme Condition View

DECLARATION LETTER

YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD.
Add: 4th-5th Floor,South Building,No.63 Wanghai Road,2nd Software Park,Xiamen,China(361008).
Tel: 86-592-570-200
Fax:86-592-570-2455

Declaration of Identification

To:

Bay Area Compliance Laboratories Corp.
1274 Anvilwood Avenue
Sunnyvale, CA 94089
Dear Sir/Madam

Re: Declaration of Identification among model: W52P, W52H, W52Duo

We, YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD. hereby declare the below:

For PP:

We declare that

① it is not possible for the user to alter the IPEI using any normally accessible procedure

②the first PT transmission on the newly selected channel shall be made in accordance with the scan sequence of the addressed RFP;

③to continue transmitting on the newly selected physical channel the PT shall receive an indication that the FT is receiving the PT transmissions within 2 frames of the first PT transmission. For the "no-emission" mode wakeup requests, longer unconfirmed transmission intervals of more than N211 frames (see EN 300 175-3 [5], clause A.2) are allowed. See also EN 300 175-3 [5], clause 9.4.4.

For FP:

①DECT FPs which do not transmit the TA escape message transmits the NT message as defined in EN 300 175-3 [5] at least once every 10 seconds on all active physical channels;

②these NT identity messages are transmitted with the appropriate A-field header code as defined in EN 300 175-3 [5] and the NT message contains an ETSI distributed code as defined in EN 300 175-6 [8].

③ the RFP shall not transmit on more than 2 physical channels for which complementary physical channels do not exist;

④ temporarily more than 2 dummy bearers may exist when an RFP has double dummies and dummy bearer hopping is enabled as defined in EN 300 175-3 [5]

On behalf of YEALINK (XIAMEN) NETWORK TECHNOLOGY CO., LTD., I fully understand the legality of the above declaration and I'm ready to responsible for the consequence if any faulty and violation to the above declaration

Sincerely,
Signature:
Stone Lu
Vice General Manager
2012-12-4

Yealink (Xiamen) Network Technology Co., LTD.
4th-5th Floor, South Building, No.63 Wanghai Road,2nd Software Park, Xiamen, China.
Tel: 86-592-5702000-2801 Fax: 86-592-5702455

2012-11-20

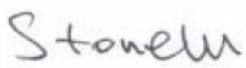
Product Similarity Declaration Letter

To Whom It May Concern,

We, Yealink （Xiamen）Network Technology Co.,Ltd. hereby declare that our product IP DECT Phone, the model W52P, W52H, W52Duo, the difference is W52P has one base and one handset, W52H has only one handset, and W52Duo has one base and two handsets. Model W52P was tested by BACL.

Please contact me if you have any question.

Signature:



Stone Lu：
Vice General Manager

******END OF REPORT******