TEST REPORT

FCC ID: **PBWB200R36**
PBWB200R36H
(Above respectively for Base and Handset of Models SCD589, SCD588, SCD587, SCD 386 and SCD384)

IC: **3842A-B200R36**
(For Models SCD589, SCD588, SCD587, SCD 386 & SCD384)

Equipment Under Test: (EUT)

SCD589
S/N MS000552010012 (Conducted measurement)
S/N MS000552010009 (Radiated measurement)
S/N MS000552010008 (Spare for Radiated measurement)
S/N MS000552010013 (Threshold test)
S/N MS000552010010 (Handset SAR)
S/N MS000552010011 (Spare for SAR)
SCD588
S/N MS000552020008 (Radiated measurement)
S/N MS000552020010 (Handset SAR)
SCD587
S/N MS000552030008 (Radiated measurement)
S/N MS000552030010 (Handset SAR)
SCD386
S/N MS000552050008 (Radiated measurement)
S/N MS000552050011 (Handset Conducted measurement)
S/N MS000552050010 (Handset SAR)
SCD384
S/N MS000552060008 (Radiated measurement)
S/N MS000552060010 (Handset SAR)

In Accordance With:

FCC Part 15, Subparts B, C & D
IC RSS-213, RSS-Gen, & ICES-003
UPCS / LE-PCS Isochronous Device
Base & Handset: **1921.536 – 1928.448 MHz**

ANSI C63.17 – 1998 (or 2005 Draft where applicable)

Tested By: **Frank / Jeffrey**

Reviewed By: **Kevin Yau**

Date: **February 10, 2006**

NOTE: Test data that follow are for Model SCD589 as representative unless stated otherwise.

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1 CHANNEL FREQUENCIES

Clause: **15.303 (d) & (g) / 1**

Requirement: Within 1920 – 1930 MHz band for isochronous devices

U-/LE-PCS CHANNEL	FREQUENCY (MHz)
Band Edge	1930.000
1 (High)	1928.448
2	1926.720
3 (Mid)	1924.992
4	1923.264
5 (Low)	1921.536
Band Edge	1920.000

Test Condition: Refer to RF Communication Protocol or Test Mode Procedure for the selection of channel in normal and test modes of operation.

2 ANTENNA REQUIREMENT

Clause: **15.317 (15.203) / 4.1 (e), RSS-Gen 7.1.4**

Requirement: No antenna other than that furnished by the responsible party shall be used with the device

Observation: Base and Handset have each a pre-formed wire antenna permanently attached on the PCB; it is not user replaceable. Base has an additional internal antenna for diversity configuration. There is no external antenna or connector provided on the base or handset for the user to use antenna other than that furnished originally.

Spec of Antenna: As follows
Antenna transmit gain = 1.6 - 2.0 dBi (1.446 - 1.585 numeric) across the band

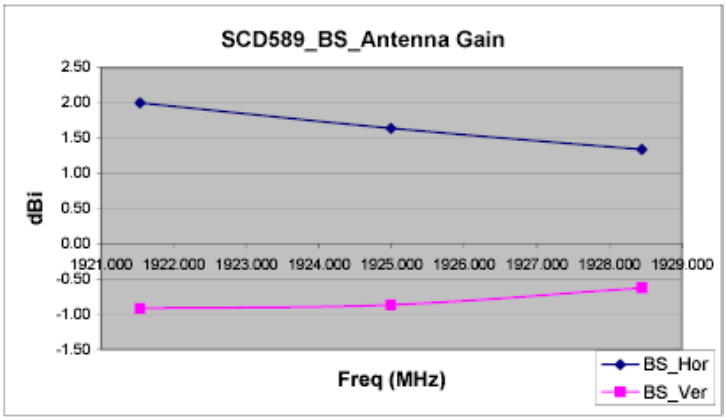
Result: As antenna gain < 3 dBi, no correction factor necessary to be applied to subsequent radiation measurement readings.

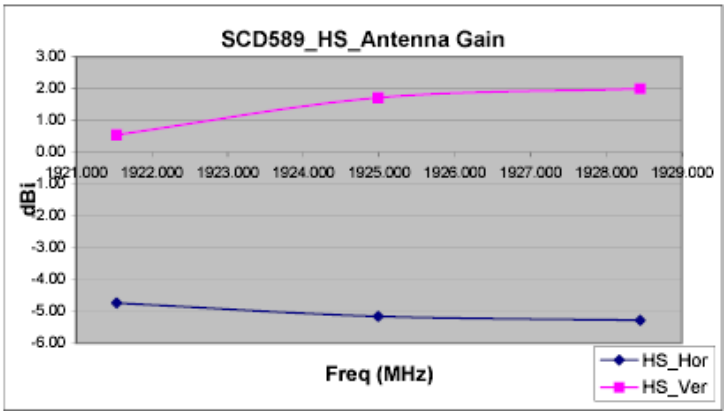
For Model SCD589

GAIN

SCD589 Antenna Gain Across Band

	Channel	Ch 0	Ch 2	Ch 4
	Freq (MHz)	1928.448	1924.992	1921.536
BS	Hor	1.34	1.64	2.00
	Ver	-0.63	-0.87	-0.92
HS	Hor	-5.28	-5.16	-4.74
	Ver	2.00	1.72	0.55



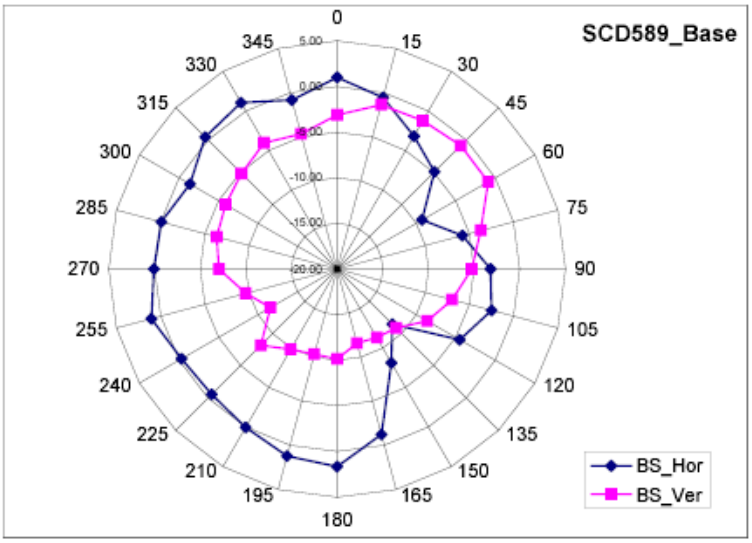


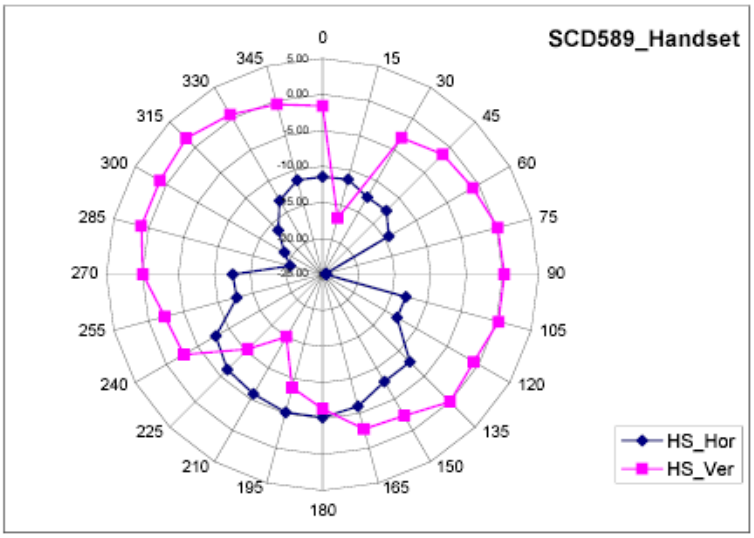
POLARIZATION PATTERN

SCD589 Antenna Polarization Pattern

Degree	BS_Hor (dBi)	BS_Ver (dBi)	HS_Hor (dBi)	HS_Ver (dBi)
0	0.98	-3.13	-11.45	-1.61
15	-0.57	-1.37	-11.34	-16.91
30	-3.20	-1.26	-12.62	-3.10
45	-4.92	-0.87	-12.46	-1.46
60	-9.28	-0.91	-14.38	-0.95
75	-5.81	-3.73	-24.47	0.17
90	-3.20	-5.26	-24.46	0.21
105	-2.49	-6.96	-13.03	0.27
120	-4.50	-8.60	-13.06	-0.79
135	-11.46	-10.85	-7.86	-0.02
150	-8.14	-11.32	-7.82	-2.34
165	-1.26	-11.59	-6.05	-2.78
180	1.64	-10.15	-5.16	-6.35
195	1.20	-10.33	-5.19	-8.73
210	0.03	-9.83	-5.86	-15.00
225	-0.56	-8.17	-6.35	-10.34
240	-0.32	-11.57	-7.92	-2.79
255	1.05	-9.67	-12.66	-2.36
270	0.06	-7.04	-12.55	-0.07
285	-0.07	-6.33	-20.36	1.03
300	-1.38	-5.89	-18.90	1.07
315	0.44	-5.19	-16.30	1.72
330	1.05	-4.05	-13.15	0.61
345	-0.84	-4.67	-11.45	-0.54
360	0.72	-3.60	-12.26	-1.45

Max (dBi)	1.64	-0.87	-5.16	1.72
Min (dBi)	-11.46	-11.59	-24.47	-16.91
Diff (dB)	13.10	10.72	19.31	18.63





For Model SCD386

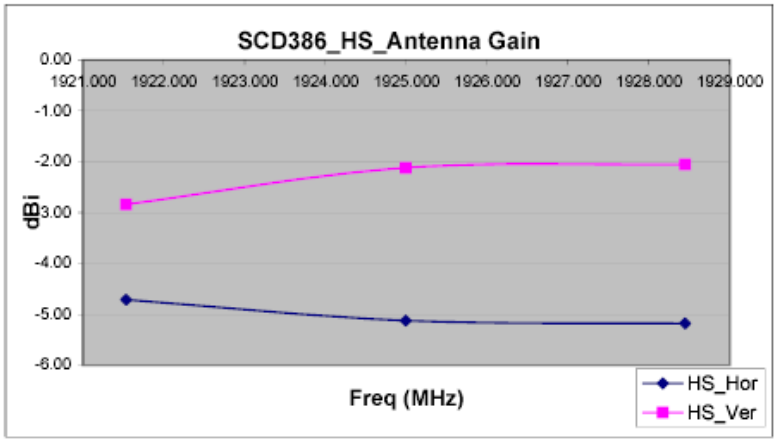
Base: See SCD589 characteristics

Handset as follows:

GAIN

SCD386 Handset Antenna Gain Across Band

Channel	Ch 0	Ch 2	Ch 4
Freq (MHz)	1928.448	1924.992	1921.536
Hor	-5.18	-5.12	-4.71
Ver	-2.05	-2.12	-2.84

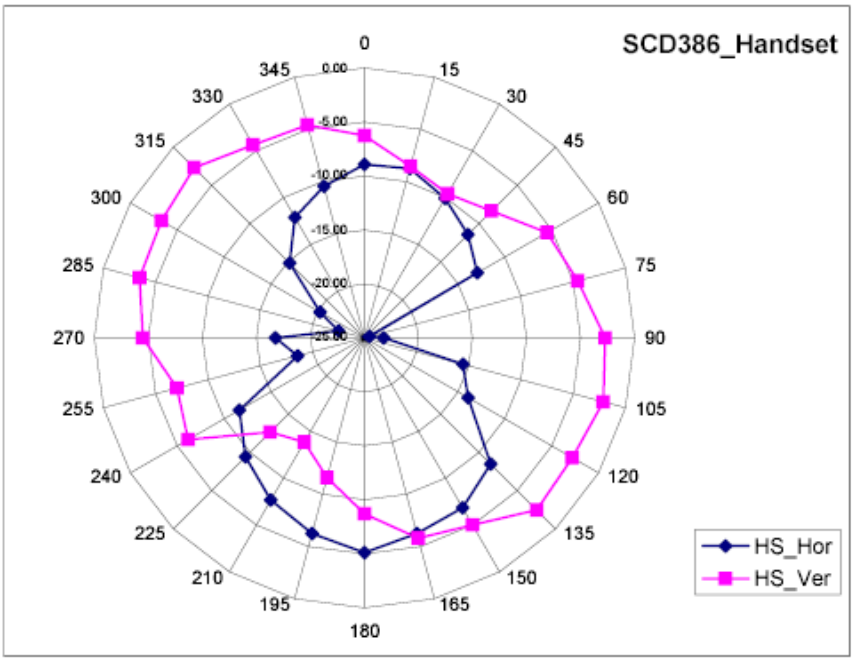


POLARIZATION PATTERN

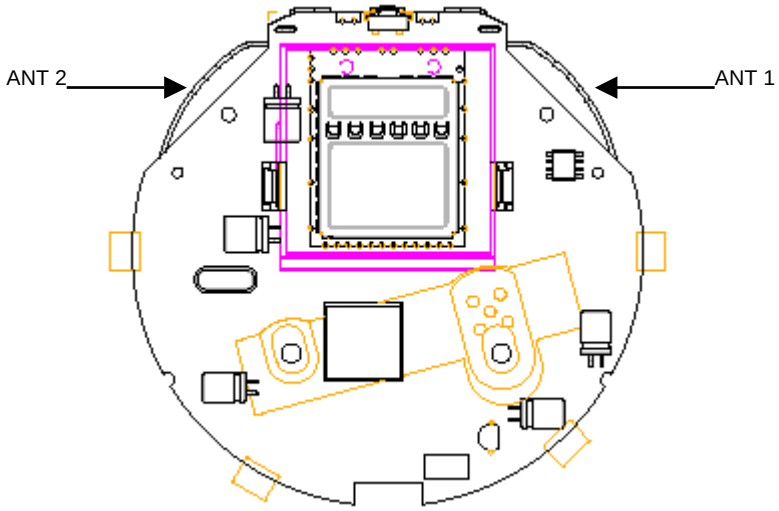
SCD386 Antenna Polarization Pattern

Degree	HS_Hor (dBi)	HS_Ver (dBi)
0	-8.92	-6.26
15	-8.75	-8.55
30	-10.08	-9.61
45	-11.48	-8.36
60	-12.93	-5.50
75	-24.51	-4.56
90	-23.23	-2.72
105	-15.55	-2.12
120	-13.92	-2.79
135	-8.48	-2.46
150	-6.84	-4.99
165	-6.25	-5.81
180	-5.12	-8.69
195	-6.23	-11.60
210	-7.66	-13.86
225	-9.42	-12.66
240	-11.63	-6.17
255	-18.58	-7.03
270	-16.77	-4.48
285	-22.54	-3.43
300	-20.26	-3.30
315	-15.20	-2.69
330	-12.11	-4.36
345	-10.48	-4.60
360	-9.91	-6.26

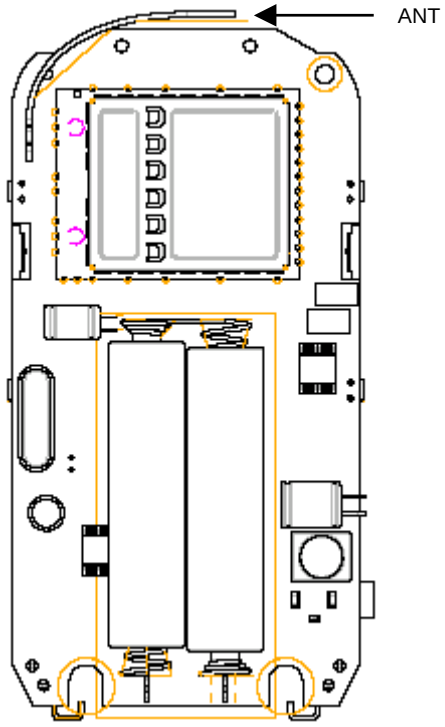
Max (dBi)	-5.12	-2.12
Min (dBi)	-24.51	-13.86
Diff (dB)	19.39	11.74



BASE ANTENNA ASSEMBLY



HANDSET ANTENNA ASSEMBLY

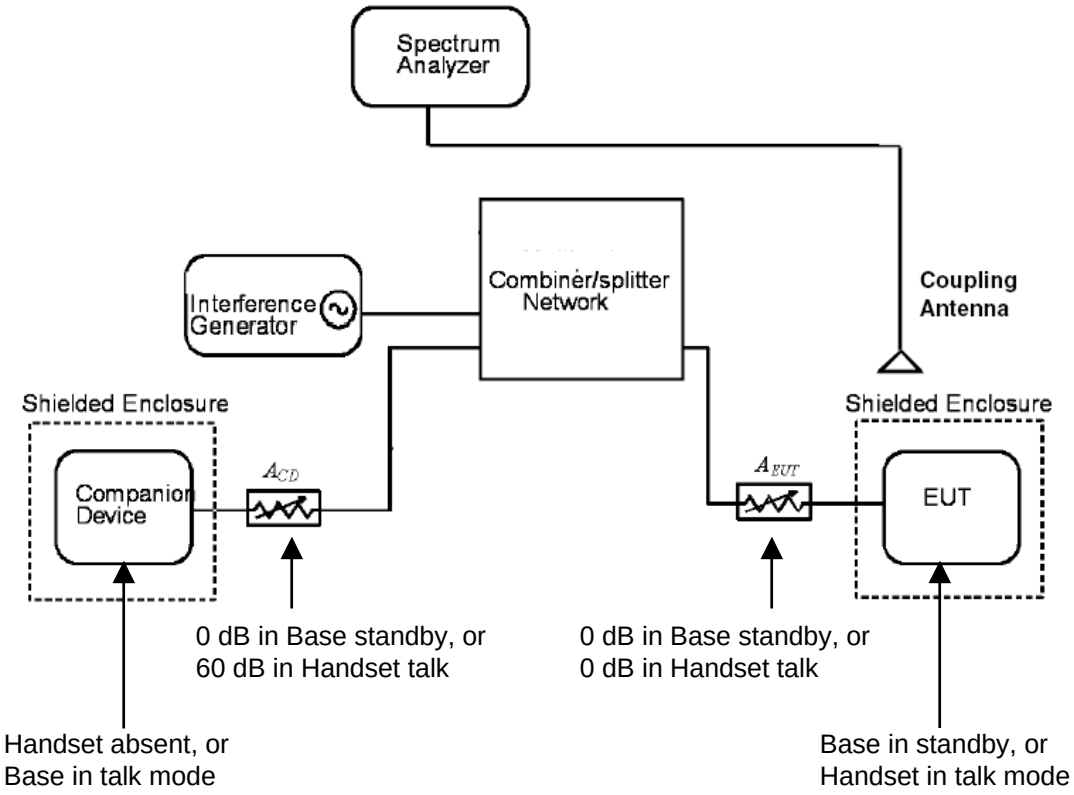


3 MONITORING THRESHOLD

Clause: **15.323 (c)(5) / 4.3.4 (b)**

Requirement: ≤ –61 dBm for 1.5 MHz BW and 20.5 dBm Tx power derived from formula as follows:
Upper limit = 15 logB – 184 + 50 – P as per ANSI 63.17 Sec. 7.2.1

Test Setup: As shown below per Fig. 8 of 7.1.1 in ANSI C63.17 – 1998



EUT (Base and Handset) modified in
- Tx power purposely reduced by about 10 dB to reduce requirement on external attenuators A_{EUT} and A_{CD}
- Limited 2-channel operation by EEPROM setting

Base alone in standby or complete set in talk mode as in normal functional operation.

Mode	EUT	A_{EUT} (dB)	Companion Device	A_{CD} (dB)
Standby	Base	0	Handset absent	0
Talk	Handset	0	Base	60

Test Result: Threshold < –61 dBm
Resolution within 2 dB

3.1 Standby

Note:
- Base is left alone power-up without handset nearby or any power whatsoever supplied to it.
- Main deciding factor in protocol is signal strength RSSI.

Combiner / Coupler insertion loss = 4 dB
Cable loss 1 = 0.8 dB
Cable loss 2 = 1.6 dB
Total insertion loss = 6.4 dB

Measured threshold = Sig Gen reading – Insertion loss
= –65.0 – 6.4 (Sig Gen reading: –66 ~ –65 dBm)
= –71.4 dBm (Resolution within 2 dB)

3.2 Talk

Note:
- Handset is the initiator; base the responding device.
- Main deciding factors in protocol are CRC (or BER), sync pulse and clock jitter besides signal strength RSSI.
- Base conveys information on channel conditions to add to that detected by handset before handset decides on initiating channel change.

Measured threshold = –61.0 – 6.4 (Sig Gen reading: –62 ~ –61 dBm)
= –67.4 dBm (Resolution within 2 dB)

4 FREQUENCY STABILITY AND JITTER

Clause: **15.323 (e), 15.323 (f) / 4.3.4 (c), 6.2**

Requirement:

- Frame frequency stability ≤ 50 ppm
- TDMA frame frequency stability ≤ 10 ppm over 1 hour or interval between channel access monitoring, whichever is shorter
  (That translates to frequency drift of19.2 kHz for 1920 MHz carrier)
- Frame jitter ≤ 25 μs
- Carrier frequency stability over –20 to +50 ^{0}C at normal supply voltage, and over 85% to 115% of rated supply voltage (voltage variation not required for battery operated device)

Equipment: ROHDE & SCHWARZ Digital Radio Tester MODEL CTS60
THERMOTRON Environmental Chamber MODEL SM-4S-SL

Eq. Setting: Offset –18 (for UPCS frequency band)
Data Pattern = Fig 31 (specific for frequency drift and jitter tests), or
0000111100001111 for other stability tests
Attenuation 1 dB (to compensate for cable loss to antenna connector)

Test Result: Complies with requirements

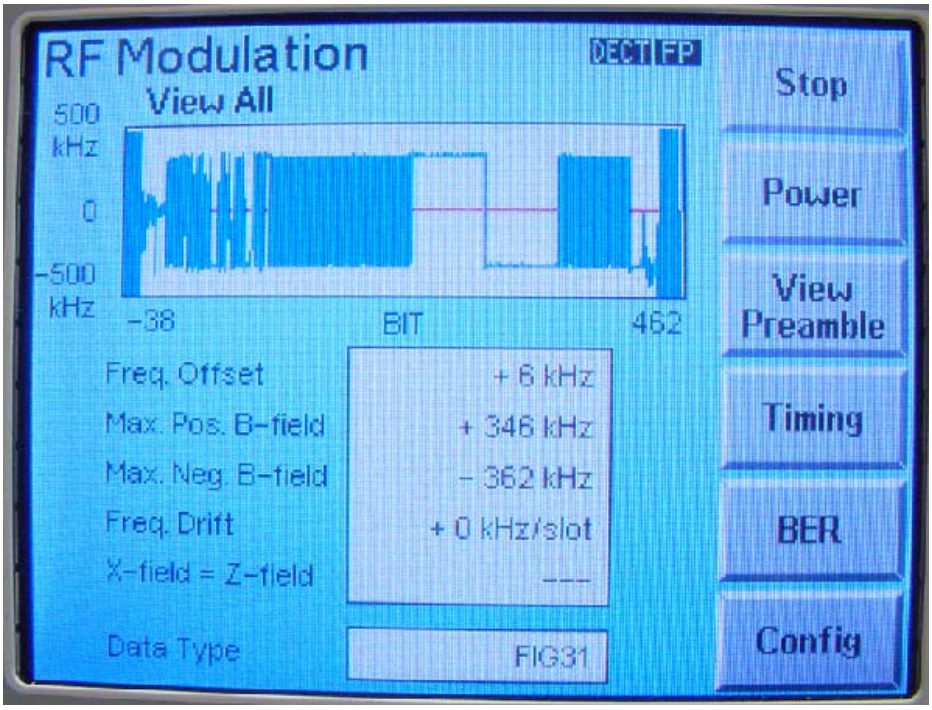
4.1 Base

4.1.1 Frame Frequency Drift and Jitter

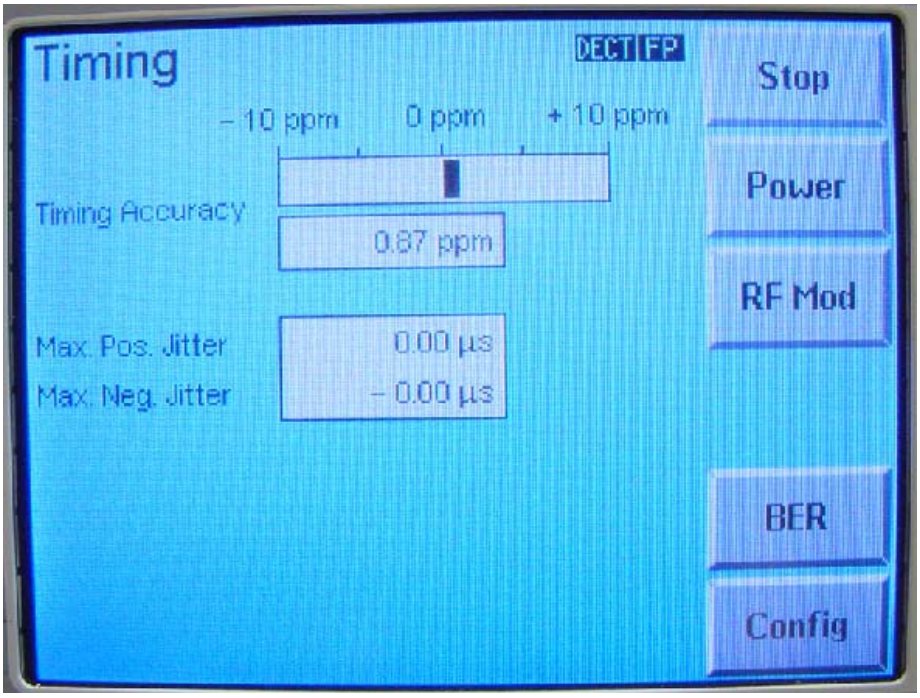
Test Mode	Channel No.	Frequency (kHz / slot)		Jitter (μs)	
		Drift	Limit	Meas.	Limit
TBR6	5	0.00	19.2	0.00	25
TBR6	3	**0.00**	19.2	**0.00**	25
TBR6	1	0 .00	19.2	0.00	25

Note: Test Mode TBR6 is built-in per ETSI standard and resides in firmware apart from the FCC test mode in Test Mode Menu.

Photos of worst-case display follow:



Base Frequency Drift at Mid Channel



Base TDMA Frame Jitter at Mid Channel

4.1.2 Carrier Frequency Stability with Supply voltage

Test Mode	Channel No.	Frequency (kHz / slot)			Limit (kHz / slot)
		4.25 V (85%)	5 V (Norm.)	5.75 V (115%)	
TBR6	5	-10	-11	-11	19.2
TBR6	3	-12	-11	-12	19.2
TBR6	1	-9	-8	-8	19.2

Note: Test Mode TBR6 is built-in per ETSI standard and resides in firmware apart from the FCC test mode in Test Mode Menu.

4.1.3 Carrier Frequency Stability with Temperature and Time

Test Mode	Channel No.	Frequency Offset (kHz)			Limit (kHz)
		–20 °C	25 °C	50 °C	
TBR6	5	**-12.0**	6.0	-9.0	± 19.2
TBR6	3	-3.0	5.0	-8.0	± 19.2
TBR6	1	-9.0	4.0	-5.0	± 19.2

Test was conducted for duration longer than 1 hour. Photo of worst-case display follows:

Base Carrier Frequency Offset with Temperature

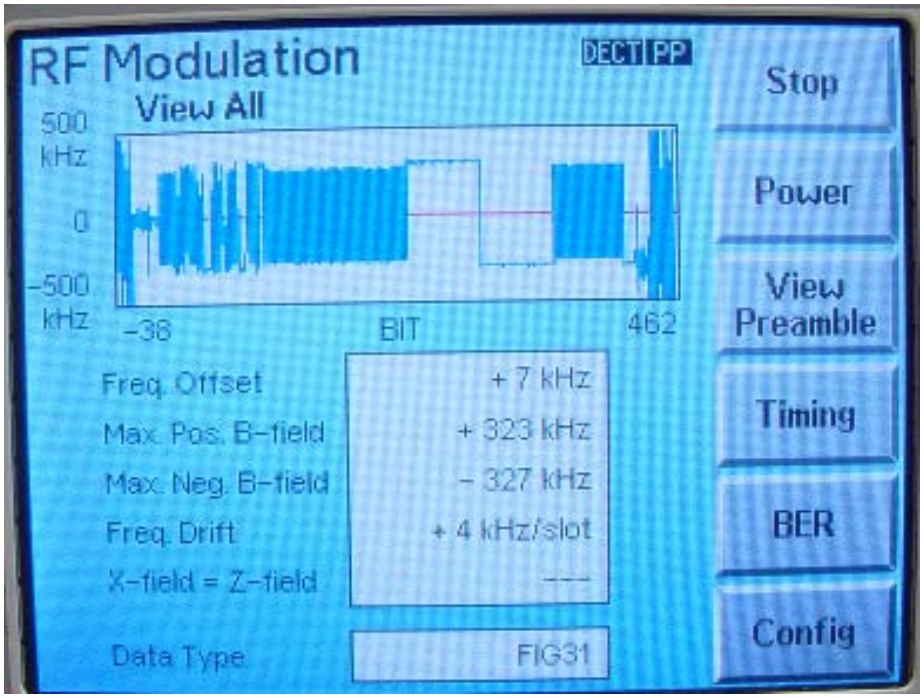
4.2 Handset

4.2.1 Frame Frequency Drift and Jitter

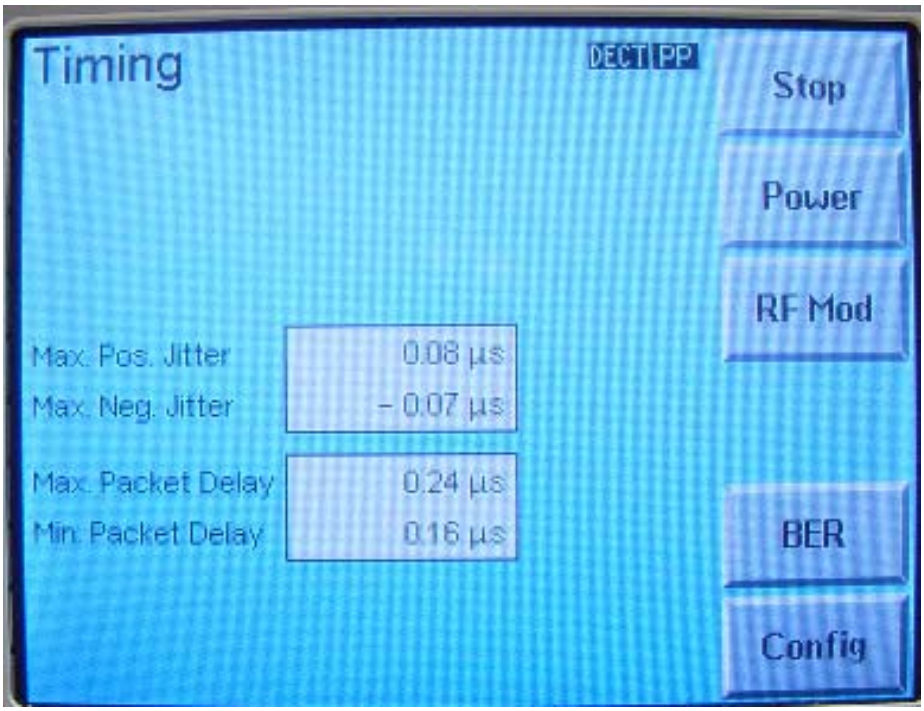
Test Mode	Channel No.	Frequency (kHz / slot)		Jitter (μs)	
		Drift	Limit	Meas.	Limit
TBR6	1	4.00	19.2	0.00	25
TBR6	3	**4.00**	19.2	**0.08**	25
TBR6	5	3.00	19.2	0.00	25

Note: Test Mode TBR6 is built-in per ETSI standard and resides in firmware apart from the FCC test mode in Test Mode Menu.

Photos of worst-case display follow:



Handset Frequency Drift at Mid Channel



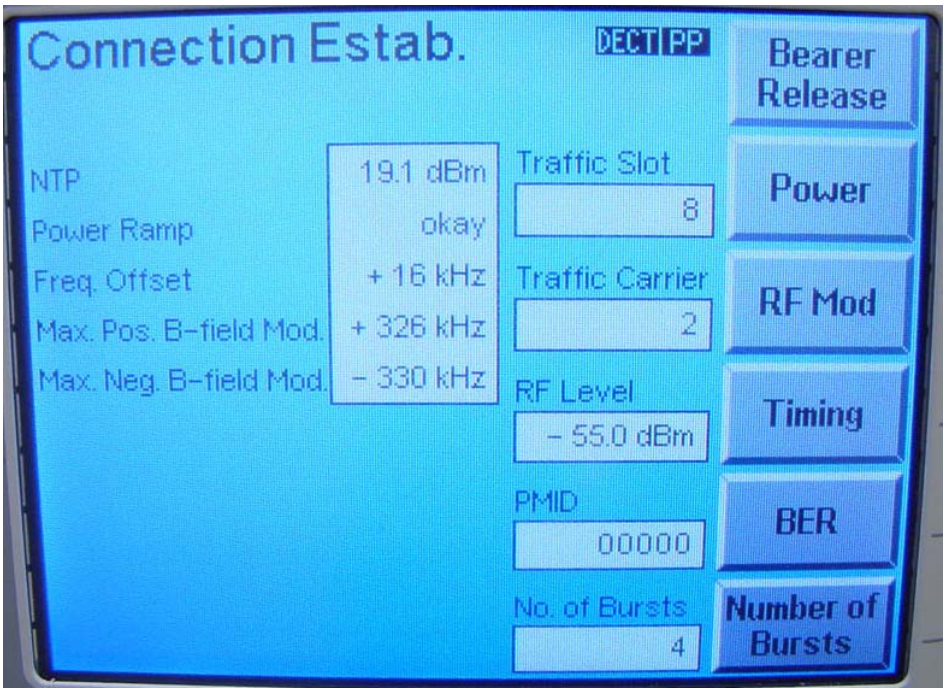
Handset TDMA Frame Jitter

4.2.2 Carrier Frequency Stability with Temperature and Time

Test Mode	Channel No.	Frequency Offset (kHz)			Limit (kHz)
		–20 °C	25 °C	50 °C	
TBR6	5	10.0	3.0	0.0	± 19.2
TBR6	3	**16.0**	7.0	0.0	± 19.2
TBR6	1	11.0	6.0	0.0	± 19.2

Note: Test Mode TBR6 is built-in per ETSI standard and resides in firmware apart from the FCC test mode in Test Mode Menu.

Test was conducted for duration longer than 1 hour. Photo of worst-case display follows:



Handset Carrier Frequency Offset with Temperature

5 EMISSION BANDWIDTH

Clause: **15.323 (a) / 6.4**

Requirement: 50 kHz < B < 2.5 MHz

SA Setting: RBW ≃ 1 % of Emission BW (or 0.5 % < RBW < 2 % for fixed setting)

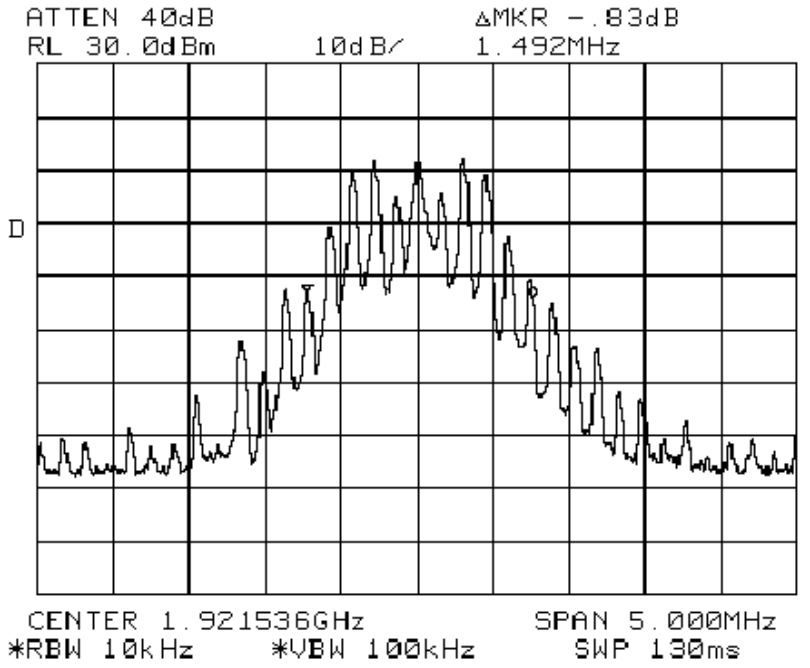
ANSI 6.1.3 VBW ≥ 3 x RBW
Span ≥ 2 x B
Sweep: Sufficient to stabilize trace
Detection: Peak hold

Test Result: Base: 1.492 MHz < Limit 2.5 MHz
Handset: 1.492 MHz < Limit 2.5 MHz

5.1 Base

Test Mode	Channel No.	Frequency (MHz)	26 dB Bandwidth (kHz)
3.4	5	1921.536	**1492**
3.5	3	1924.992	1485
3.6	1	1928.448	1476

Worst-case plot follows:

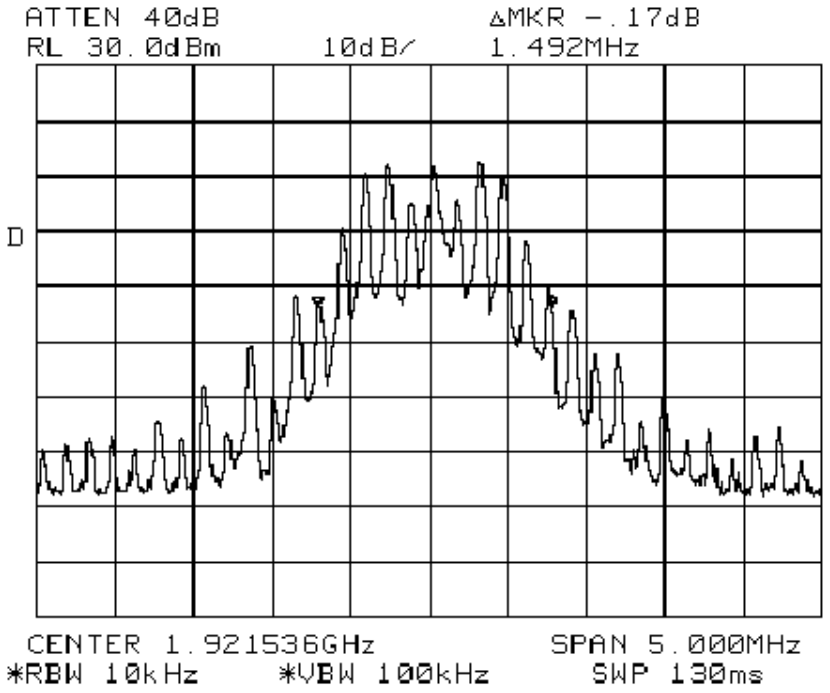


Base emission BW at Low-freq Channel

5.2 Handset

Test Mode	Channel No.	Frequency (MHz)	26 dB Bandwidth (kHz)
3.4	5	1921.536	**1492**
3.5	3	1924.992	1483
3.6	1	1928.448	1475

Worst-case plot follows:



Handset emission BW at Low-freq Channel

6 CONDUCTED PEAK TRANSMIT POWER

Clause: **15.319 (c) / 6.5**

Requirement: ≤ 100 μW x $\sqrt{B}$ = 5 logB - 10 dBm = 20.8 dBm, where B rated 1.5 MHz maximum

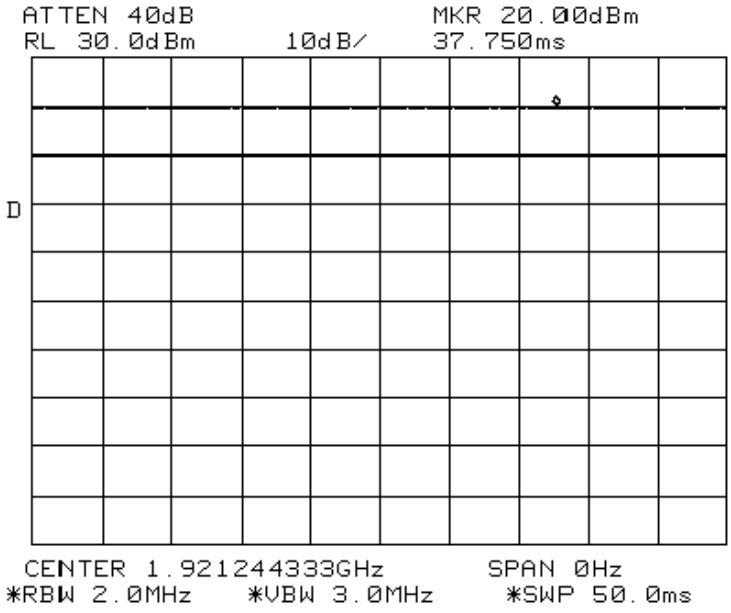
SA Setting: RBW ≥ Emission BW (or increased until no more than 0.5 dB change in power)
ANSI 6.1.2 VBW ≥ 3 x RBW
Span = zero, centered on channel center
Sweep: fast enough to resolve transmit pulse
Detection: Peak

Test Result: Base: 20.80 dBm (120 mW)
Handset: 20.47 dBm (112 mW)

6.1 Base

Test Mode	Chan. No.	Freq. (MHz)	Reading (dBm)	Cable (dB)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
3.4	5	1921.536	**20.00**	0.8	20.80	20.8	**0.00**
3.5	3	1924.992	19.83	0.8	20.63	20.8	0.17
3.6	1	1928.448	19.83	0.8	20.63	20.8	0.17

Worst-case plot follows:



Base peak power at Low-freq Channel

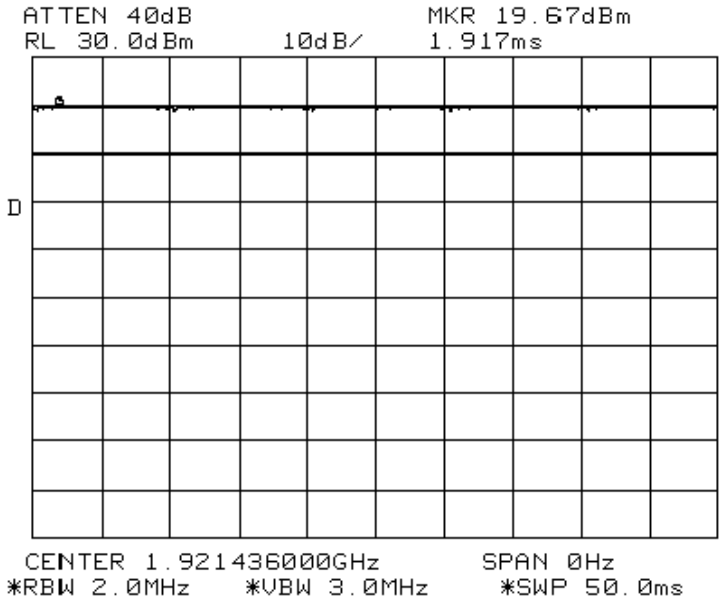
6.2 Handset

Test Mode	Chan. No.	Freq. (MHz)	Reading (dBm)	Cable (dB)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
3.4	5	1921.536	**19.67**	0.8	20.47	20.8	**0.33**
3.5	3	1924.992	19.50	0.8	20.30	20.8	0.50
3.6	1	1928.448	19.67	0.8	20.47	20.8	0.33

For Model SCD386

Test Mode	Chan. No.	Freq. (MHz)	Reading (dBm)	Cable (dB)	Peak Power (dBm)	SCD589 (dBm)	Diff (dB)
3.4	5	1921.536	19.17	0.8	**19.87**	20.47	-0.60
3.5	3	1924.992	19.00	0.8	19.80	20.30	-0.50
3.6	1	1928.448	19.00	0.8	19.80	20.47	-0.67

Worst-case plot follows:



Handset peak power at Low-freq Channel

7 RADIATED PEAK POWER

See TIMCO test report in file. Page 22 ~ 25 deleted from this report.

8 RF EXPOSURE

Clause: **15.319 / RSS-Gen 5.5**

Requirement: **1.1307(b), 2.1091 and 2.1093 / RSS-102**

MPE ≤ 1 mW/cm^2 at 20 cm

given by Power density S = EIRP / 4πR^2, where R is distance 20 cm.

For S = 1 mW/cm^2

Maximum permissible P = 4πR^2 = 4π(20)^2 = 5026 mW = 37 dBm

SAR ≤ 1.6 W/kg over any 1 g of tissue

Reference: OET Bulletin 65 for General Population / Uncontrolled Exposure

Test Result: Base: Compliant
Handset: Compliant

8.1 Base MPE

From worst case in Sec. 5.1

Chan. No.	Freq. (MHz)	Radiated Power (mW)	EIRP (dBm)	MPE Power Limit (dBm)	Margin from Limit (dBm)
1	1928.88	70.63	18.49	37	18.51

8.2 Handset SAR

Refer to separate SAR testing report by Celltech.

Measurement of radiated power for SAR EUT

Chan. No.	Frequency (MHz)	Meter Peak Reading (dBμV)	Coax Loss (dB)	Antenna Factor (Note 2) (dB)	Pre-amp Gain (dB)	Field Strength at 3m (dBμV/m)	Radiated Power (Note 3) (dBm)	EIRP (mW)
1 (HIGH)	1928.38	76.47	7.52	28.3 V	0	112.29	15.29	33.81
3 (MID)	1924.88	77.59	7.52	28.3 V	0	113.41	16.41	43.75
5 (LOW)	1921.38	78.00	7.52	28.3 V	0	113.82	**16.82**	48.08

Note 2: Horn antenna in Horizontal (H) or Vertical (V) polarization
Note 3: 97 dB taken as factor to convert Field Strength to Radiated Power in numerical value
Note 5: EUT raised up by at least 5 cm to minimize reflection of RF emissions by test table

Worst-case for other models

Model No.	Chan. No.	Meter Peak Reading (dBμV)	Coax Loss (dB)	Antenna Factor (Note 2) (dB)	Pre-amp Gain (dB)	Field Strength at 3m (dBμV/m)	Radiated Power (Note 3) (dBm)	EIRP (mW)
SCD588	5	78.65	7.52	28.3 V	0	114.47	**17.47**	55.84
SCD587	5	78.03	7.52	28.3 V	0	113.85	16.85	48.41
SCD386	5	73.81	7.52	28.3 V	0	109.63	12.63	18.32
SCD384	5	73.80	7.52	28.3 V	0	109.62	12.62	18.28

Note 2: Horn antenna in Horizontal (H) or Vertical (V) polarization
Note 3: 97 dB taken as factor to convert Field Strength to Radiated Power in numerical value
Note 5: EUT raised up by at least 5 cm to minimize reflection of RF emissions by test table

9 DUTY CYCLE CORRECTION FACTOR

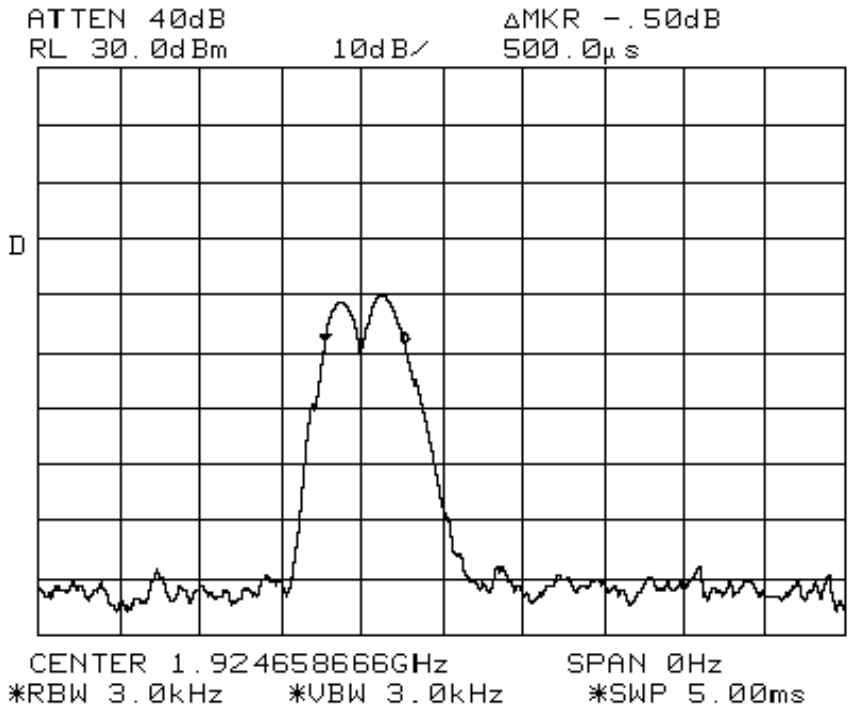
Clause: **RSS-Gen 4.3**

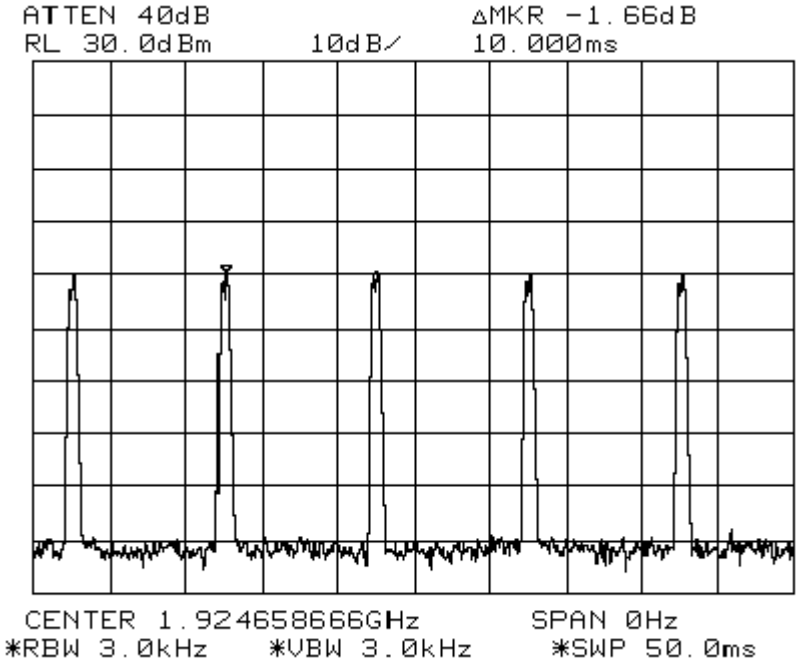
Max. Allowed: 6 dB for RSS-213 6.6

SA Setting: RBW = 3 kHz
VBW = RBW
Sweep = 100 ms (or less for better resolution)
Span = zero, centered on channel center
Detection: Peak

9.1 Base

DCF_BS = 10 log (TX-on Time/100 ms) for power in dBm
= 10 log (500 μs x 5 / 50 ms) from timing plots below
= –13.0 dB => –6 dB maximum allowed



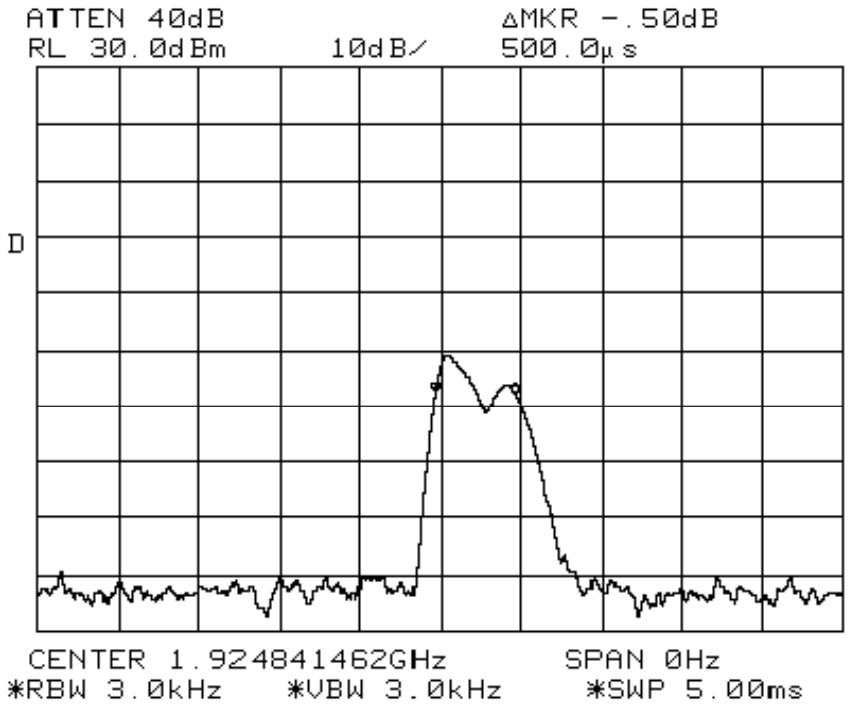


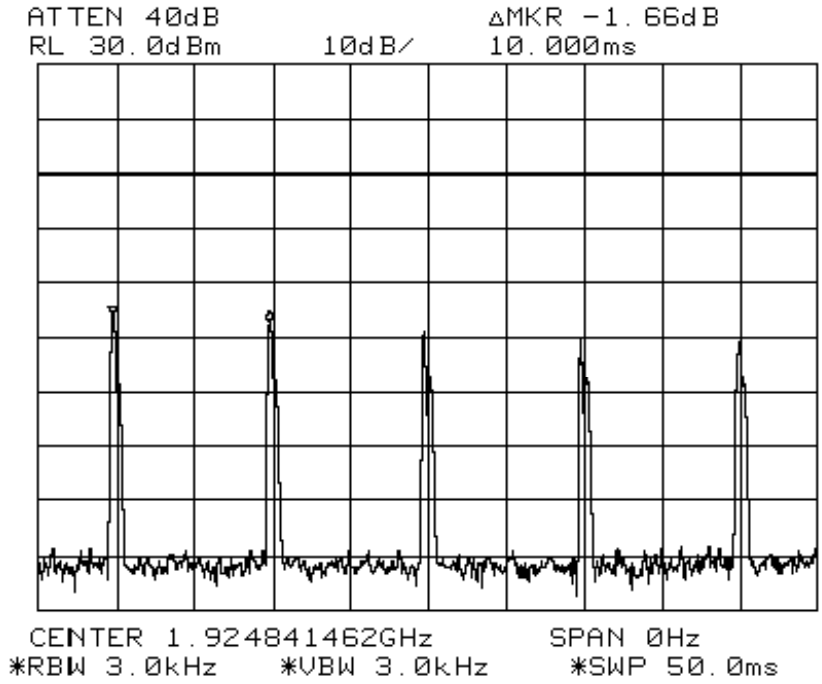
9.2 Base with multi-handset

DCF_BS = 10 log (4 x 500 μs x 5 / 50 ms) for up to 4 time slots occupied
= –7.0 dB => –6 dB maximum allowed

9.3 Handset

DCF_HS = –6 dB maximum allowed (only one-slot operation in TDMA)





10 POWER SPECTRAL DENSITY

Clause: **15.319 (d) / 6.6**

Requirement: ≤ 3 mW (4.77 dBm) by average detection or 12 mW (10.8 dBm) by peak-hold detection

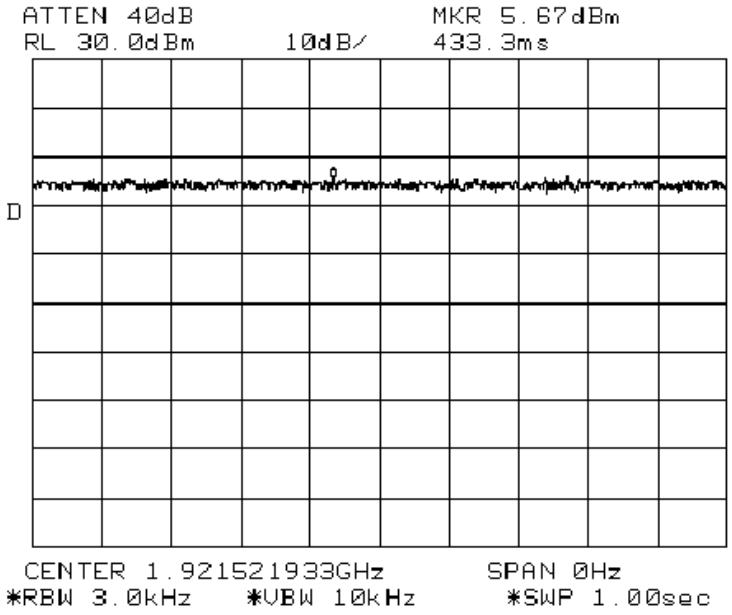
SA Setting: RBW = 3 kHz
ANSI 6.1.5 VBW = RBW
Span = B first to locate peak, then 10 kHz to read power within 3 kHz
Sweep: slow enough for at least 2 bursts to occur in each 3 kHz of span swept; e.g. 10 s sweep captures 1000 bursts of 10 ms-burst-rate signal while sweeping across 1.5 MHz, for 2 bursts per 3 kHz interval
Detection: Average or Peak (see applicable limit above)

Test Result: Base: 0.47 dBm (1.11 mW)
By peak-hold Handset: 1.63 dBm (1.46 mW)

10.1 Base

Test Mode	Chan. No.	Freq. (MHz)	Reading (dBm)	Cable (dB)	DCF (dB)	PSD (dBm)	Limit (dBm)	Margin (dB)
3.4	5	1921.536	**5.67**	0.8	–6.0	0.47	4.77	**4.30**
3.5	3	1924.992	5.50	0.8	–6.0	0.30	4.77	4.47
3.6	1	1928.448	5.50	0.8	–6.0	0.30	4.77	4.47

Worst-case plot follows:

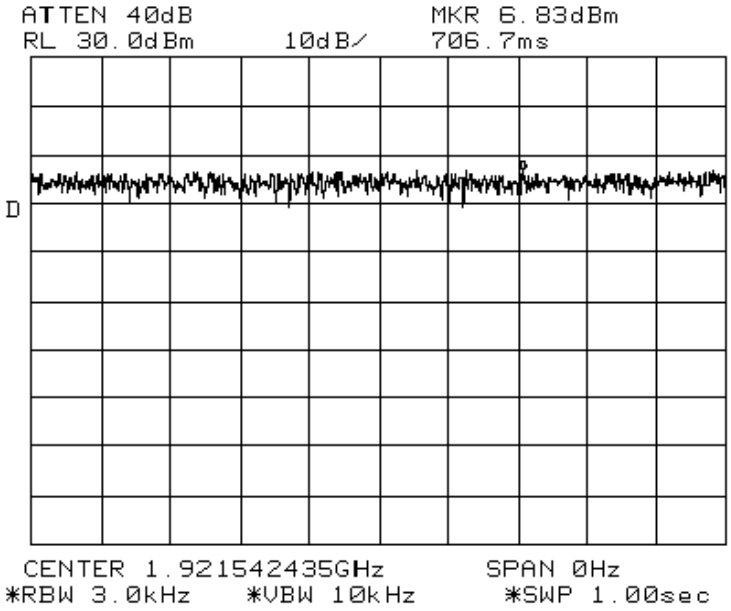


Base PSD at Low-freq Channel

10.2 Handset

Test Mode	Chan. No.	Freq. (MHz)	Reading (dBm)	Cable (dB)	DCF (dB)	PSD (dBm)	Limit (dBm)	Margin (dB)
3.4	5	1921.536	**6.83**	0.8	–6.0	1.63	4.77	**3.14**
3.5	3	1924.992	6.67	0.8	–6.0	1.47	4.77	3.30
3.6	1	1928.448	6.67	0.8	–6.0	1.47	4.77	3.30

Worst-case plot follows:



Handset PSD at Low-freq Channel

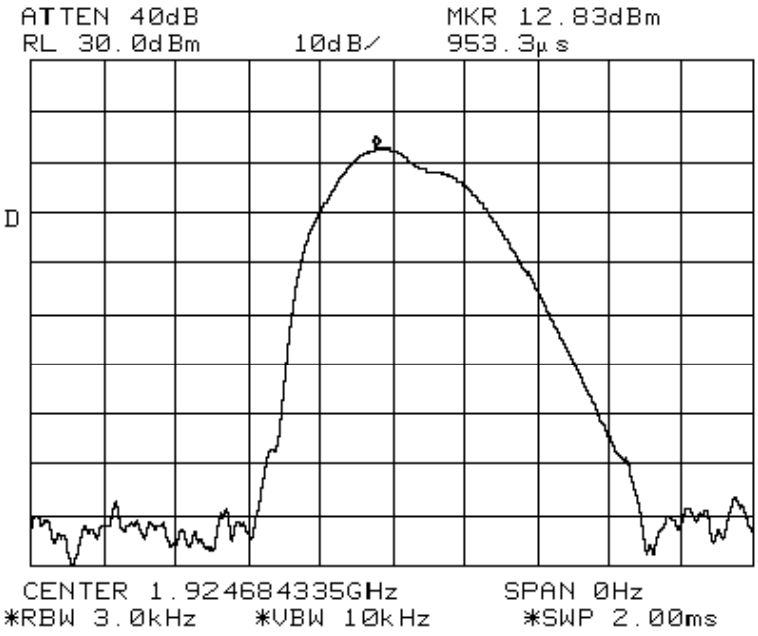
Alternative estimation of PSD by CAT method per ANSI Clause 6.1.5

Test Result: Base: –13.20 dBm (0.048 mW)
Handset: –13.20 dBm (0.048 mW)

10.3 Base (Alternative)

Test Mode	Chan. No.	Freq. (MHz)	Reading (dBm)	Cable (dB)	Av. CF (dB)	PSD (dBm)	Limit (dBm)	Margin (dB)
3.4	5	1921.536	12.33	0.8	–26.83	–13.70	4.77	–18.47
3.5	3	1924.992	**12.83**	0.8	–26.83	–13.20	4.77	**–17.97**
3.6	1	1928.448	12.33	0.8	–26.83	–13.70	4.77	–18.47

Worst-case of sample pulse follows:



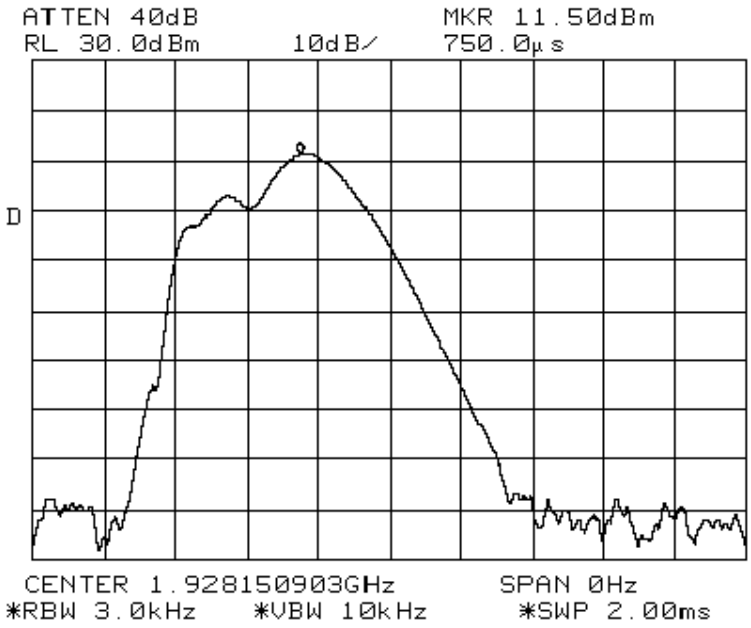
Base Pulse Sample at Mid Channel
With Ext. Trigger from TX_ON

Power summation within 20 dBc	= 1.12E+03 mW (by peak detection)
Summation sample points	= 171
Mean power summation	= 1.12E+03 / 171 = 6.55 mW
Pulse sampling frequency	= 600 / 2 ms = 300 kHz
Pulse duration within 20 dBc	= 568 µs
Averaged PSD	= 6.55 mW / 300 kHz x 568 µs
	= 0.038 mW ≃ –14 dBm
Peak power reading	= 12.83 dBm
Average conversion factor	= –14 – 12.83 = –26.83 (taken as representative)

10.4 Handset (Alternative)

Test Mode	Chan. No.	Freq. (MHz)	Reading (dBm)	Cable (dB)	Av. CF (dB)	PSD (dBm)	Limit (dBm)	Margin (dB)
3.4	5	1921.536	11.33	0.8	–25.50	–13.37	4.77	–18.14
3.5	3	1924.992	11.50	0.8	–25.50	–13.20	4.77	–17.97
3.6	1	1928.448	**11.50**	0.8	–25.50	–13.20	4.77	**–17.97**

Worst-case of sample pulse follows:



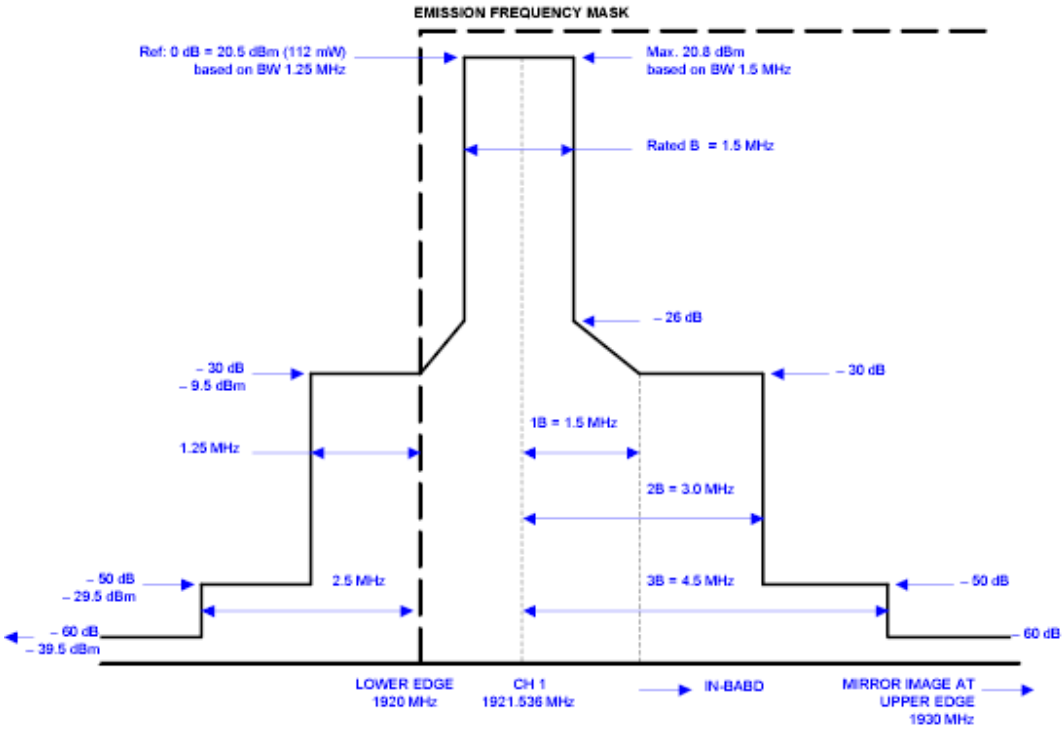
Handset Pulse Sample at High Channel
With Ext. Trigger from TX_ON

Power summation within 20 dBc	= 1.16E+03 mW (by peak detection)
Summation sample points	= 175
Mean power summation	= 1.16E+03 / 175 = 6.63 mW
Pulse sampling frequency	= 600 / 2 ms = 300 kHz
Pulse duration within 20 dBc	= 560 µs
Averaged PSD	= 6.63 mW / 300 kHz x 560 µs
	= 0.039 mW ≃ –14 dBm
Peak power reading	= 11.50 dBm
Average conversion factor	= –14 – 11.50 = –25.50 (taken as representative)

11 EMISSIONS AT BAND EDGE AND BEYOND

Clause: **15.323 (d) / 6.7**

Requirement: As shown in diagram of Emission Mask



SA Setting: RBW ≅ 1 % of Emission BW (or 0.5 % < RBW < 2 % for fixed setting)

ANSI 6.1.6.2 VBW = 3 x RBW
Span ≥ 3.5 x B
Sweep: Sufficient to stabilize trace (≥ pulse repetitive interval x no. of trace elements)
Detection: Peak hold

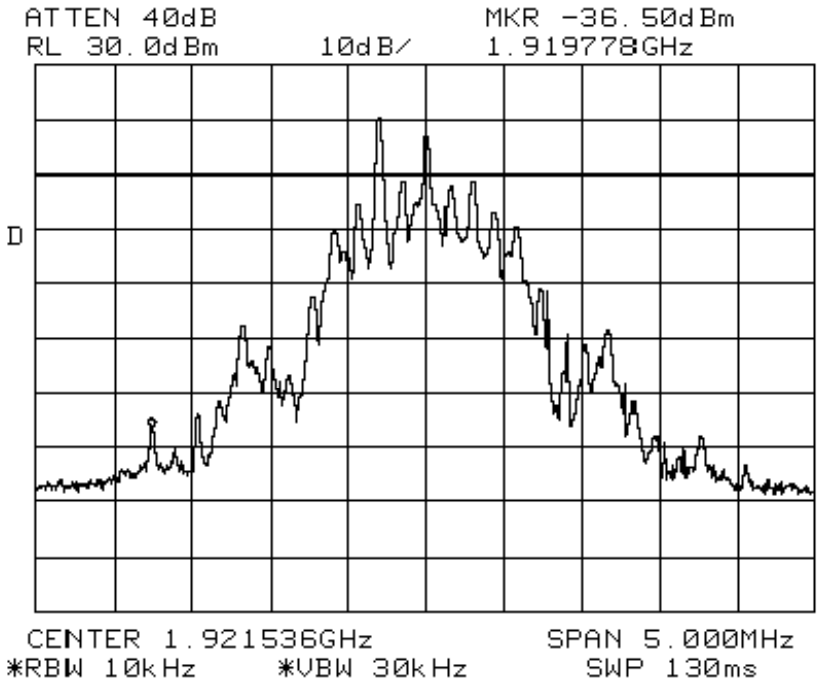
Test Result: Base: –75.00 dBc at upper band edge
Handset: –71.83 dBc at upper band edge

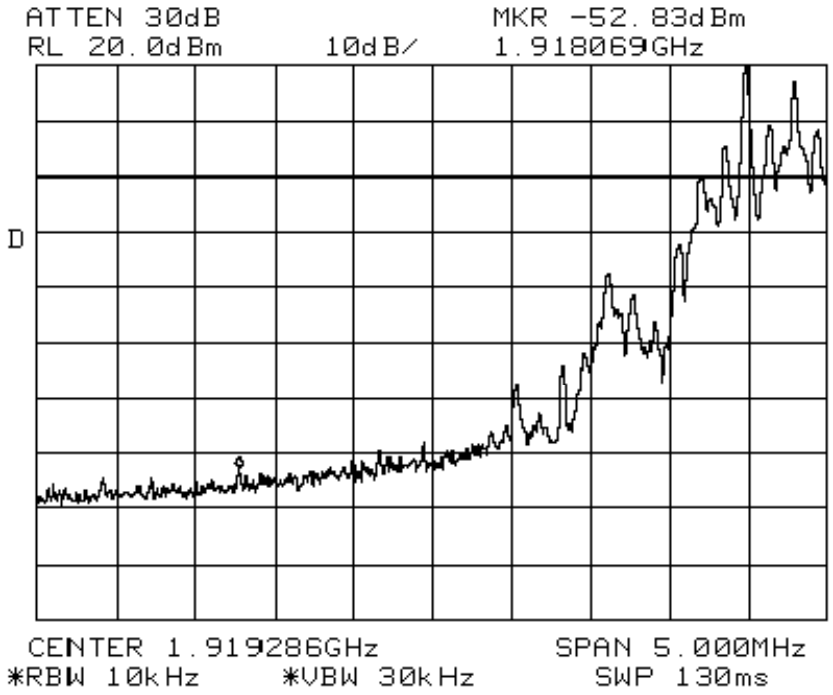
For in-band out-of-channel emissions, since emission bandwidth B is greater than out-band step bandwidth 1.25 MHz and occupied bandwidth is symmetrical about channel center, compliance in out-band emissions will automatically lead to compliance in in-band out-of-channel.

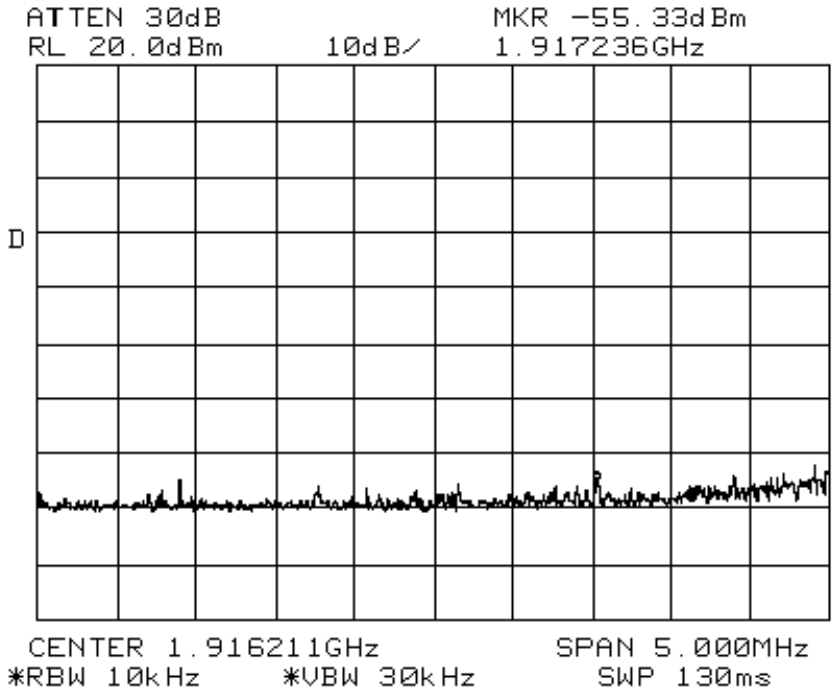
11.1 Base Near Band Edge

Test Mode	Chan. No.	Freq. (MHz)	Freq. Range (MHz)	Reading (dBm)	Rel. Att. (dBc)	Limit (dBc)	Margin (dB)
3.4	5	1921.536	Lower Edge	20.50	0. 00	---	---
		1919.944	1918.75 ~1920	–36.50	–57.00	–30	27.00
		1918.661	1917.5 ~1918.75	–52.83	–73.33	–50	23.33
		1917.294	Down ~1917.5	–55.33	–75.83	–60	15.83
3.6	1	1928.448	Upper edge	20.50	0. 00	--	---
		1930.073	1930 ~1931.25	–38.67	–59.17	–30	29.17
		1931.365	1931.25 ~1932.5	–49.50	–70.00	–50	20.00
		1932.840	1932.5 ~ up	–**54.50**	–75.00	–60	**15.00**

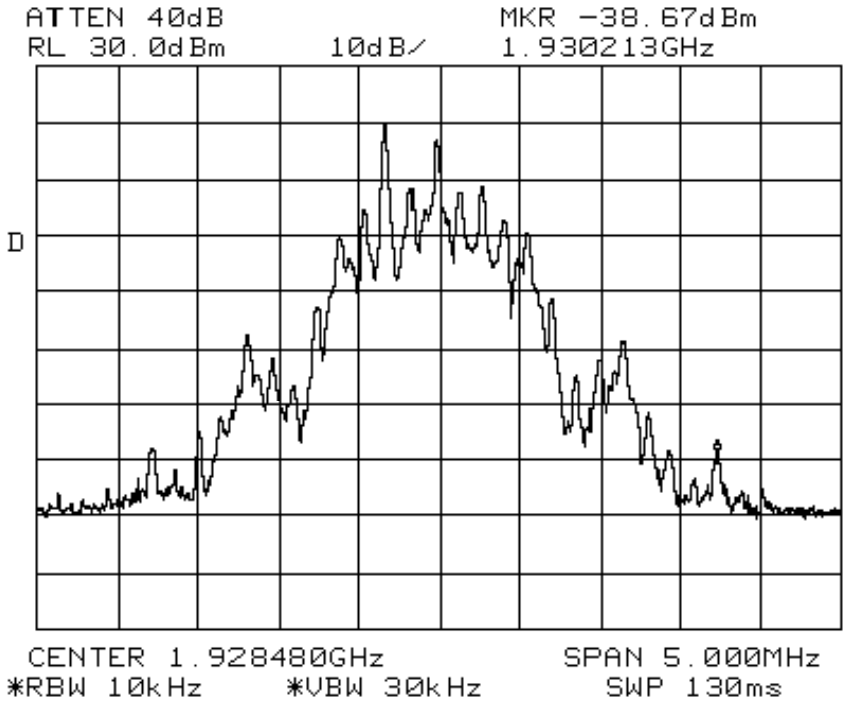
Lower out-band plots follow:

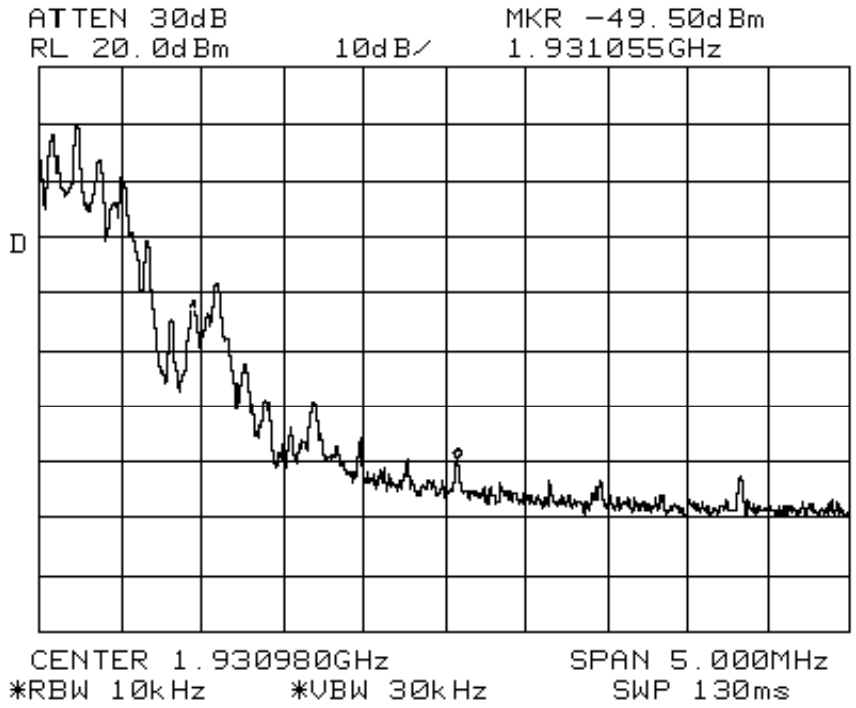


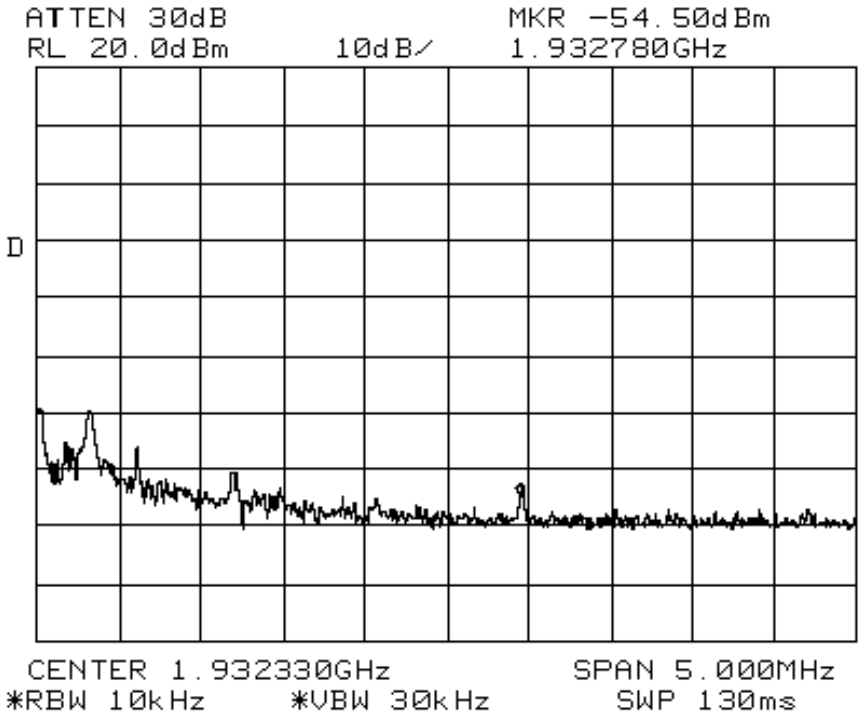

ATTEN 30dB
RL 20.0dBm
10dB/
MKR -52.83dBm
1.918069GHz
D
CENTER 1.919286GHz
SPAN 5.000MHz
*RBW 10kHz
*VBW 30kHz
SWP 130ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -55.33dBm
1.917236GHz
D
CENTER 1.916211GHz
SPAN 5.000MHz
*RBW 10kHz
*VBW 30kHz
SWP 130ms

Upper out-band plots follow:






ATTEN 30dB
MKR -54.50dBm
RL 20.0dBm
10dB/
1.932780GHz
D
CENTER 1.932330GHz
SPAN 5.000MHz
*RBW 10kHz
*VBW 30kHz
SWP 130ms

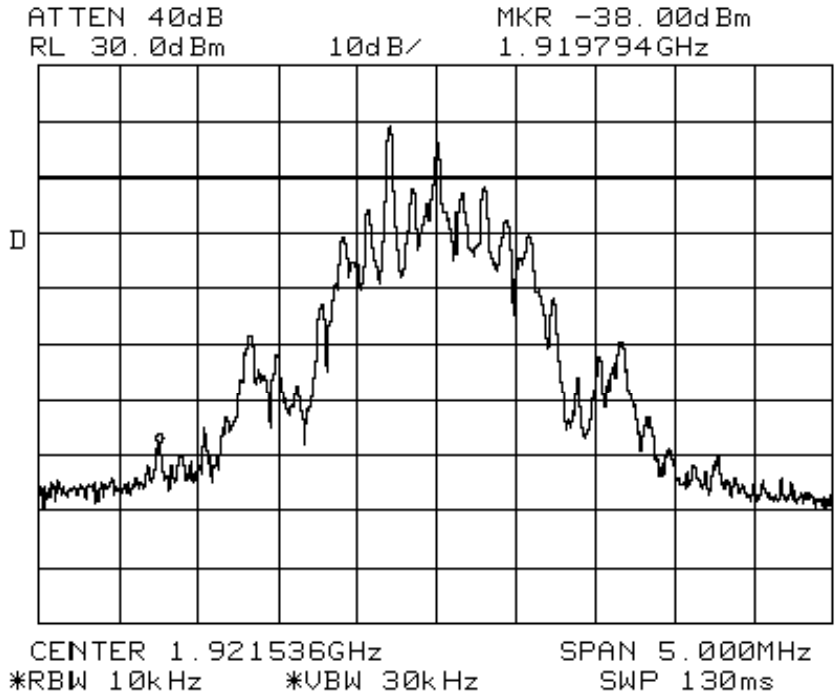
11.2 Base Tx Harmonics

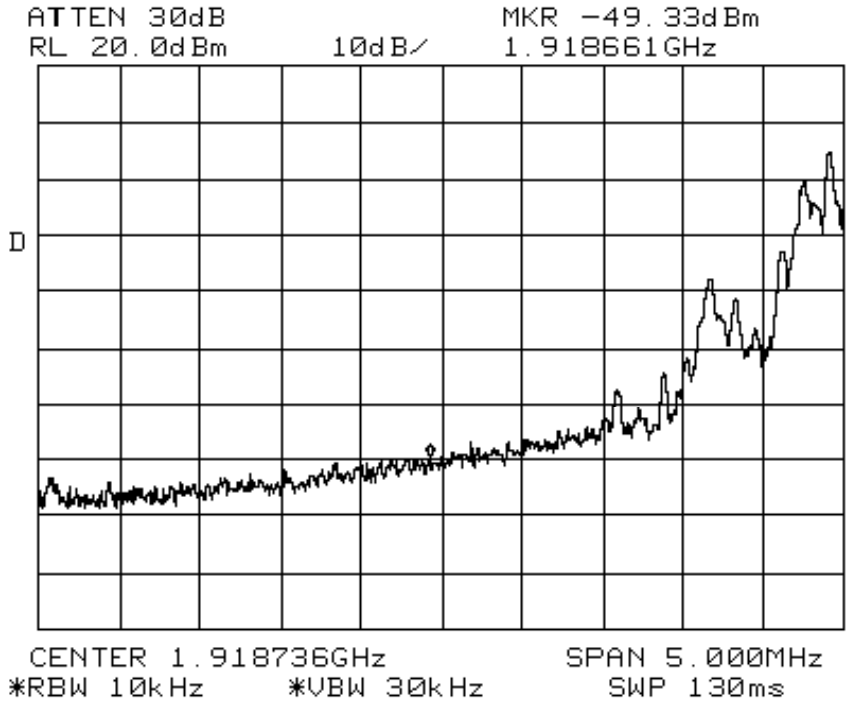
See TIMCO test report in file. Page 41 ~ 42 deleted from this report.

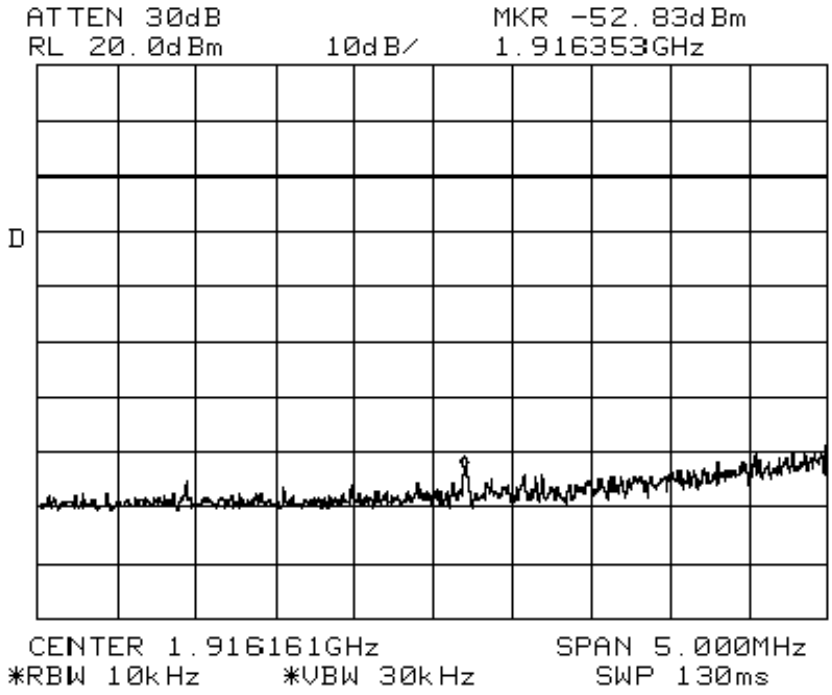
11.3 Handset Near Band Edge

Test Mode	Chan. No.	Freq. (MHz)	Freq. Range (MHz)	Reading (dBm)	Rel. Att. (dBc)	Limit (dBc)	Margin (dB)
3.4	5	1921.536	Lower Edge	20.50	0. 00	--	---
		1919.794	1918.75 ~1920	–38.00	–58.50	–30	28.50
		1918.669	1917.5 ~1918.75	–49.33	–69.83	–50	19.83
		1917.378	Down ~1917.5	–52.83	-73.33	–60	13.33
3.6	1	1928.448	Upper edge	20.50	0. 00	---	---
		1930.231	1930 ~1931.25	–38.83	–59.33	–30	29.33
		1931.381	1931.25 ~1932.5	–51.33	–71.83	–50	21.83
		1932.740	1932.5 ~ up	**–51.33**	–71.83	–60	**11.83**

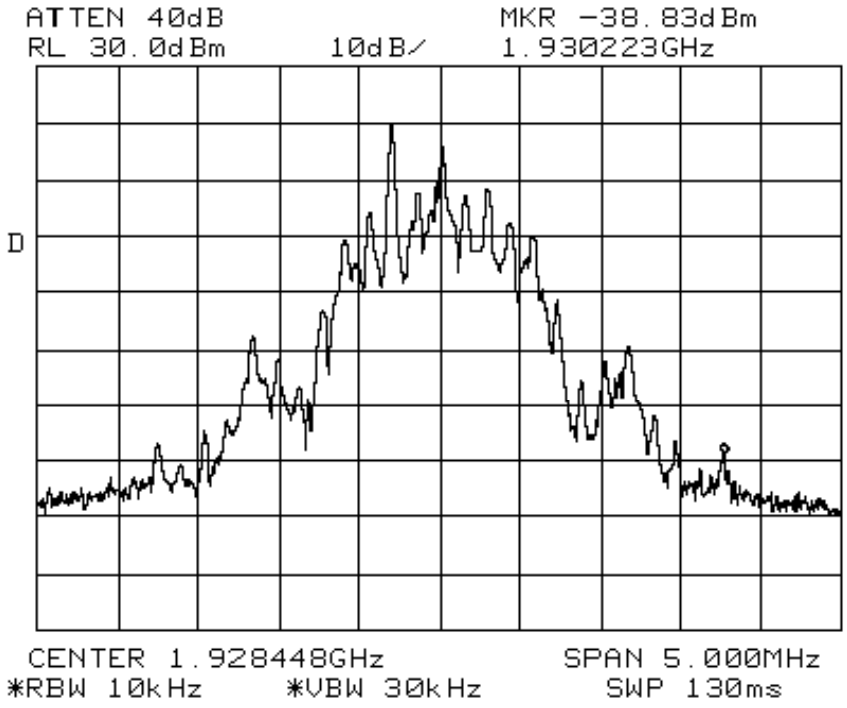
Lower out-band plots follow:

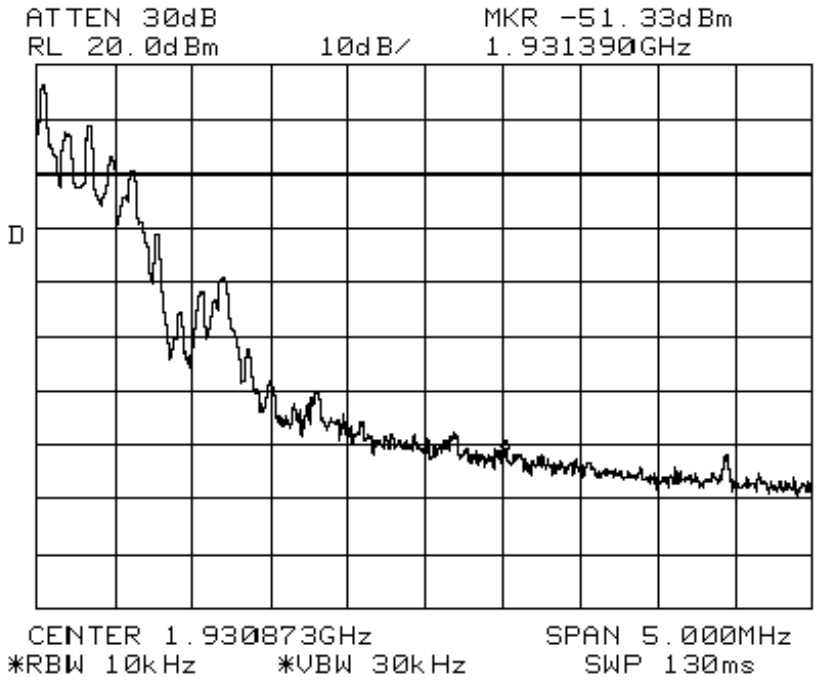


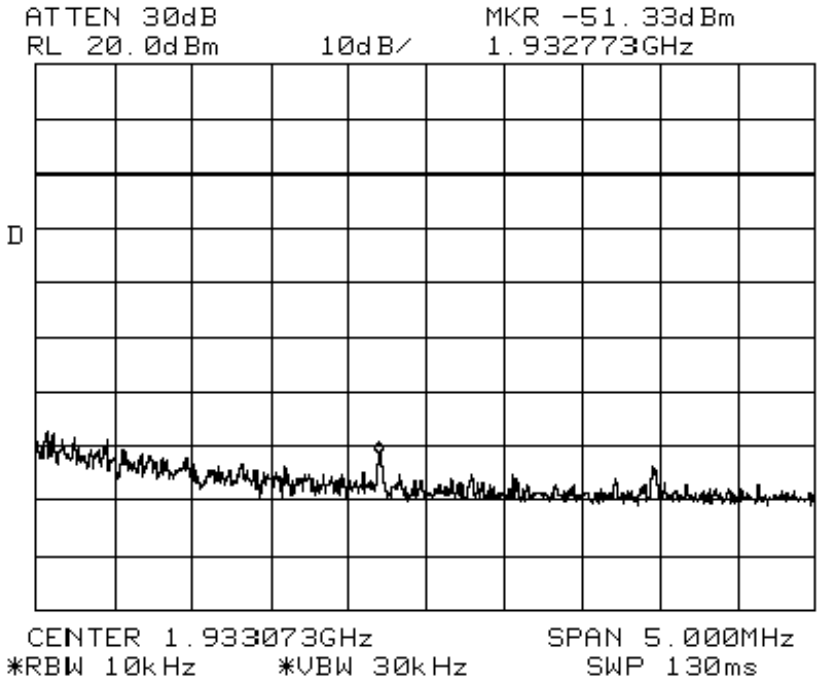



ATTEN 30dB
RL 20.0dBm
10dB/
MKR -52.83dBm
1.916353GHz
D
CENTER 1.916161GHz
SPAN 5.000MHz
*RBW 10kHz
*VBW 30kHz
SWP 130ms

Upper out-band plots follow:






ATTEN 30dB
MKR -51.33dBm
RL 20.0dBm
10dB/
1.932773GHz
D
CENTER 1.933073GHz
SPAN 5.000MHz
*RBW 10kHz
*VBW 30kHz
SWP 130ms

11.4 Handset Tx Harmonics

See TIMCO test report in file. Page 49 ~ 50 deleted from this report.

12 RADIATED SPURIOUS EMISSIONS

13 POWER LINE CONDUCTED EMISSIONS

See TIMCO test report in file. Page 52 ~ 59 deleted from this report.

APPENDIX TEST SETUP

Equipment List

ITEM	EQUIPMENT	MAKE	MODEL	S/N	LAST CAL.
1.	Spectrum Analyzer	AGILENT	8560E	A1429	07 April 2003
2.	Spectrum Analyzer	AGILENT	8596E	4105A01873	09 April 2004
3.	Pre-amplifier	AGILENT	8449B	A8135	N/A
4.	Pre-amplifier	AGILENT	87405A	3207A01735	30 May 2004
5.	High-pass Filter	In-house built	2.4 GHz cut-off	N/A	N/A
6.	Biconical Antenna	A.H. SYSTEMS	SAS-200/540	457	27 April 1994
7.	Log Periodic Antenna	A.H. SYSTEMS	SAS-200/512	319	27 April 1994
8.	Horn Antenna	EMC TEST SYS.	3115	6328	09 June 2001
9.	Digital Radio Tester	ROHDE & SCHWARZ	CTS60	100407	20 July 2004
10.	Selectable Attenuator	KAY ELEMETRICS	839	20902-34	N/A
11.	Attenuator	In-house built	Fixed 33 dB	N/A	N/A
12.	Attenuator	In-house built	Fixed 22 dB	N/A	N/A
13.	Line Impedance Stabilization Network (LISN)	WAYNE KERR	LSN0930A	322A288	30 Sep 1998
14.	3 m Semi-Anechoic Chamber	RAYPROOF (ETS-LINDGREN)	Series 81	A1393	27 Nov 2003
15.	Environmental Chamber	THERMOTRON	SM-4S-SL	23060	N/A

Radiation Test Set-up & Procedure

Reference	• ANSI Standard C63.4- 2000: Section 8.1, 8.2.3 and 8.3
Set-up	• Take the Base or Handset as separate EUT. • For AC operated device (e.g. base unit), the EUT is operated from a 120 Vac mains supply via an AC adapter unless power source stated otherwise in owner's manual. • For battery operated device (e.g. handset), the EUT is powered by the battery type stated in the owner's manual. • Terminal equipment, if applicable, is terminated with loop simulator (or telephone analyzer) such as TELTONE TLS-5. • Arrange the EUT and its peripherals to minimize crossing of connecting wires.
Procedures	• Setup and connect the EUT as shown in Figures 1 and 2. • Put EUT into Test Mode. • Monitor the frequency spectrum for different modes of operation with variations in antenna height (1 m through 4 m), antenna polarization (horizontal and vertical), EUT azimuth and cable or wire placement.

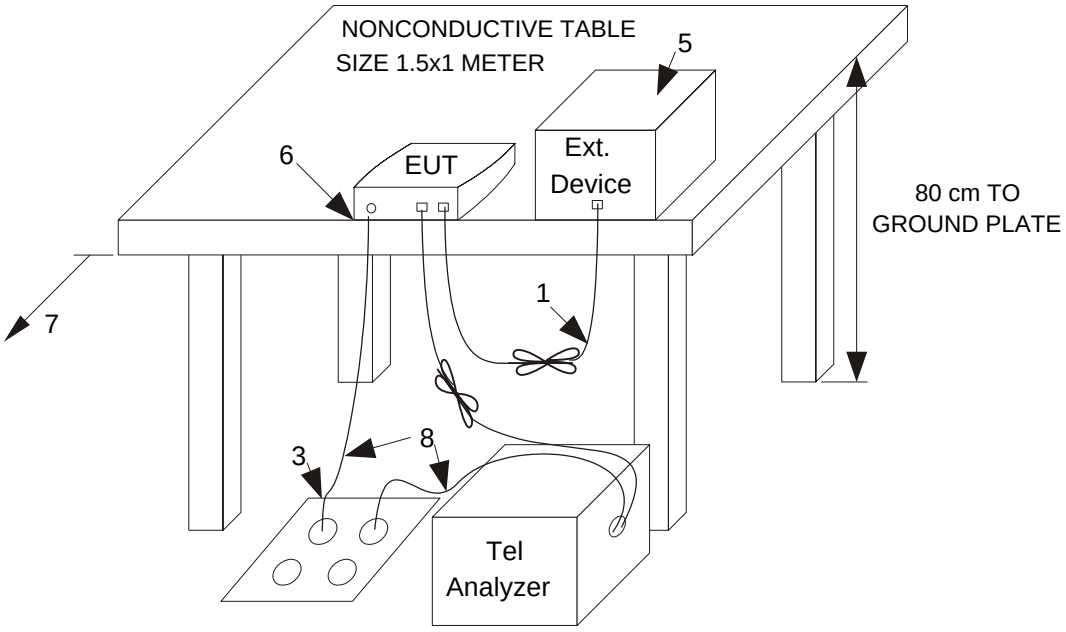


Figure 1. Test Configuration – Radiated Emissions Test

LEGEND:

1. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between ground plane and table.
2. I/O cables that are connected to a peripheral shall be bundle in center. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.
3. If Line Impedance Stabilization Networks (LISN) are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground plane with the receptacle flush with the ground plane.
4. Cables of hand-operated devices, such as keyboards, mouses, etc., have to be placed as close as possible to the host.
5. Non-EUT components being tested.
6. Rear of EUT, including peripherals, shall be all aligned and flush with rear of tabletop.
7. No vertical conducting wall is used.
8. Power cords drape to the floor and are routed over to receptacle.

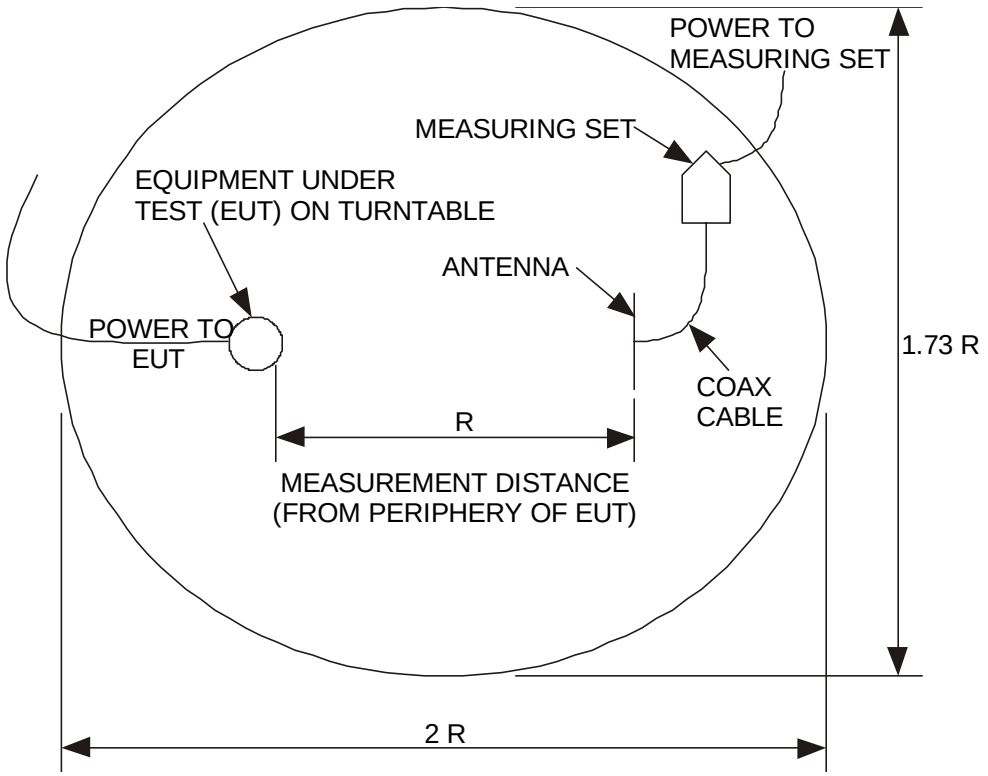


Figure 2. Radiated Emissions Measurement – Free Area for Site with a Turntable

Area dimensions with R = 3m is 6m x 5.2m, with R = 10m is 20m x 17.3m

Power-line Conducted Emission Set-up & Procedure

Reference	• ANSI Standard C63.4–2000: Section 7.1 & 7.2
Criteria	For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 450 kHz to 30 MHz shall not exceed 250 microvolts (48dBμV).
Set-up	• The EUT is operated from a 120 Vac mains supply via an AC adapter unless power source stated otherwise in owner's manua. • Terminal equipment, if applicable, is terminated with loop simulator (or telephone analyzer) such as TELTONE TLS-5. • Arrange the EUT and its peripherals to minimize crossing of connecting wires.
Procedures	• Setup and connect the EUT as shown in Figures 1 and 2. • Put EUT into Test Mode. • Using the Spectrum Analyzer to measure the conducted RF voltage from each of the power leads (Live and Neutral).

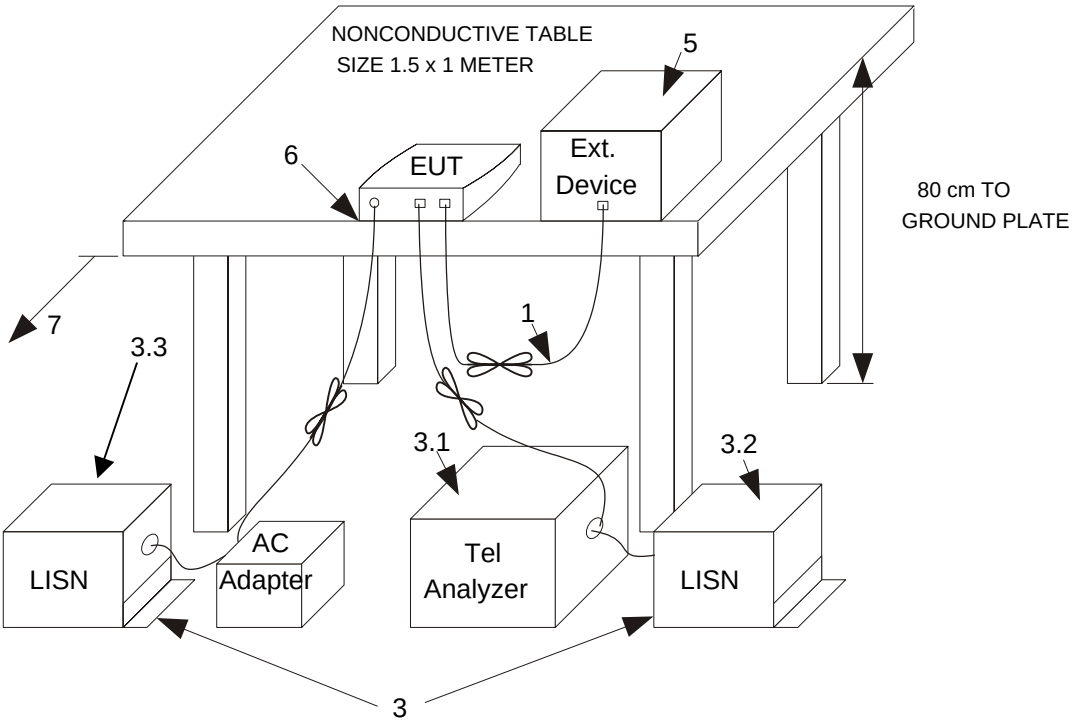


Figure 1. Test Configuration - Tabletop Equipment Conducted Emissions

LEGEND:

1 Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between ground plane and table.

2 I/O cables that are connected to a peripheral shall be bundle in center. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.

3 EUT connected to one Line Impedance Stabilization Network (LISN). Unused LISN output connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, ground plane.

3.1 All other equipment power from second LISN.

3.2 Multiple outlet strips can be used to power up more than one non-EUT equipment.

3.3 LISN at least 80 cm from nearest part of EUT chassis.

4 Cables of hand-operated devices, such as keyboard, mouse, etc., have to be placed as close as possible to the host.

5 Non-EUT components being tested.

6 Rear of EUT, including peripherals, shall be all aligned and flush with rear of tabletop.

7 Rear of tabletop shall be 40 cm away from a vertical conducting plane that is bonded to the floor ground plane.

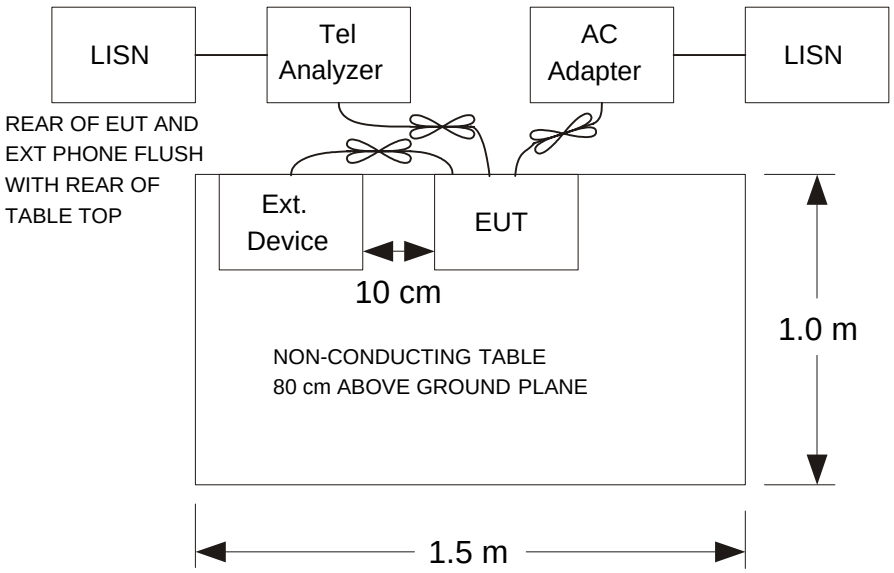


Figure 2. Layout Configuration for Tabletop Equipment (Top View)