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August 08, 2006

Stan Lyles
Federal Communications Commission,
Equipment Authorization Division
Application Processing Branch
7435 Oakland Mills Road
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Subject: Response to the FCC Correspondence Reference # 31233 for additional information on RIM BlackBerry Handheld FCC ID: L6ARAV20CW, 731 Confirmation # EA459850.

Dear Stan,

The following addresses the comment on your **Correspondence Reference** # 31233, dated July 26, 2006.

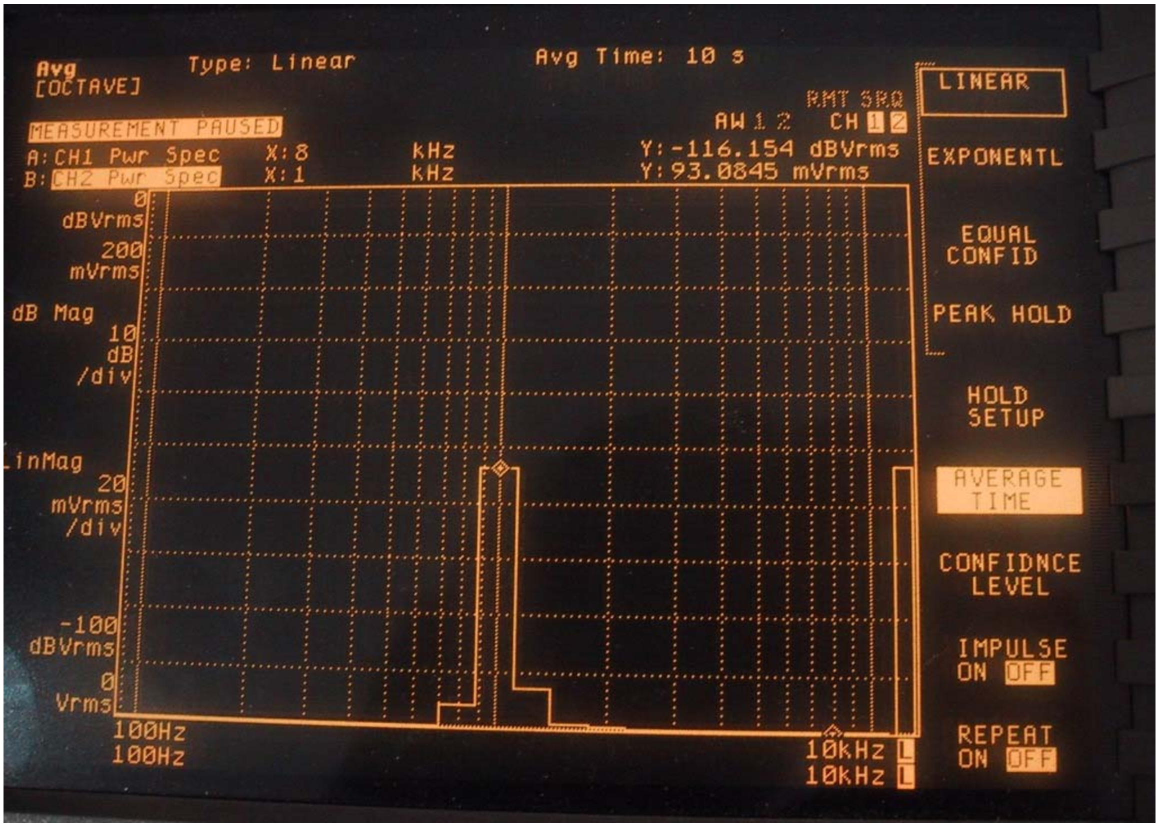
A) Regarding your answer to question 1 Please update the report to list file lengths, averaging times and any other measurement specific related information such as BWC for all measurements. Please include measurement of the input reference level. Please also specify averaging times for ABM2. Related textual explanations should be comprehensive and clear. FYI Please note that integration times for the measurement should typically be equal to that used for the reference level measurement.

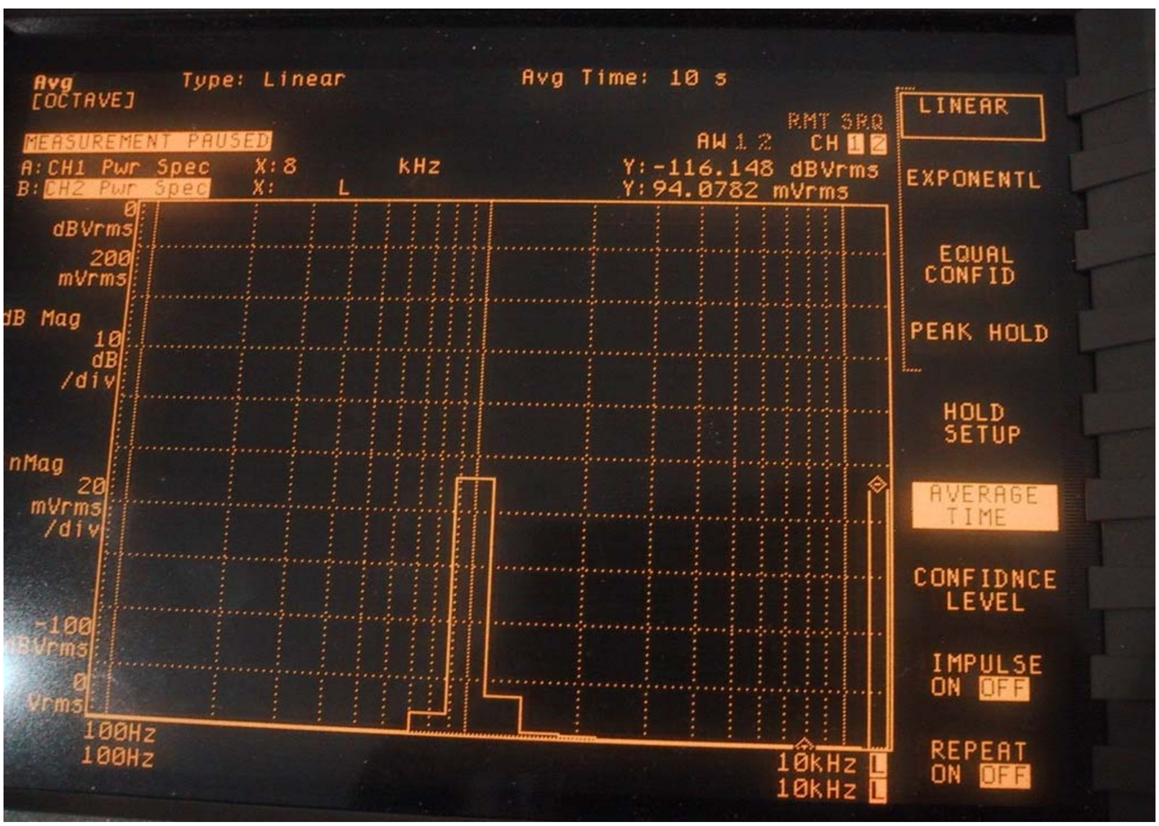
Time averaging was used with an artificial speech based signal when setting the input reference level. The averaging period was adequate to cover the signal period and the averaging method was the same for setting the reference level and performing the measurement.

A Dynamic Signal Analyzer was used to measure the time averaging of the speech-simulated signal. The analyzer was set to measure the audio signal at 1/3 octave with 10 seconds time averaging. The speech simulated signal duration is 2 seconds and the sinusoidal signal duration is 10 seconds. The DASY4 program was set to repeat the audio file while performing time averaging.

Signal type	***1.025 kHz sinewave***	***48k_voice_300-3000***
Signal length (s)	10	2
Time per location for ABM1, ABM2 and input level (s)	10	10
Averaging over signal repetitions	1	5

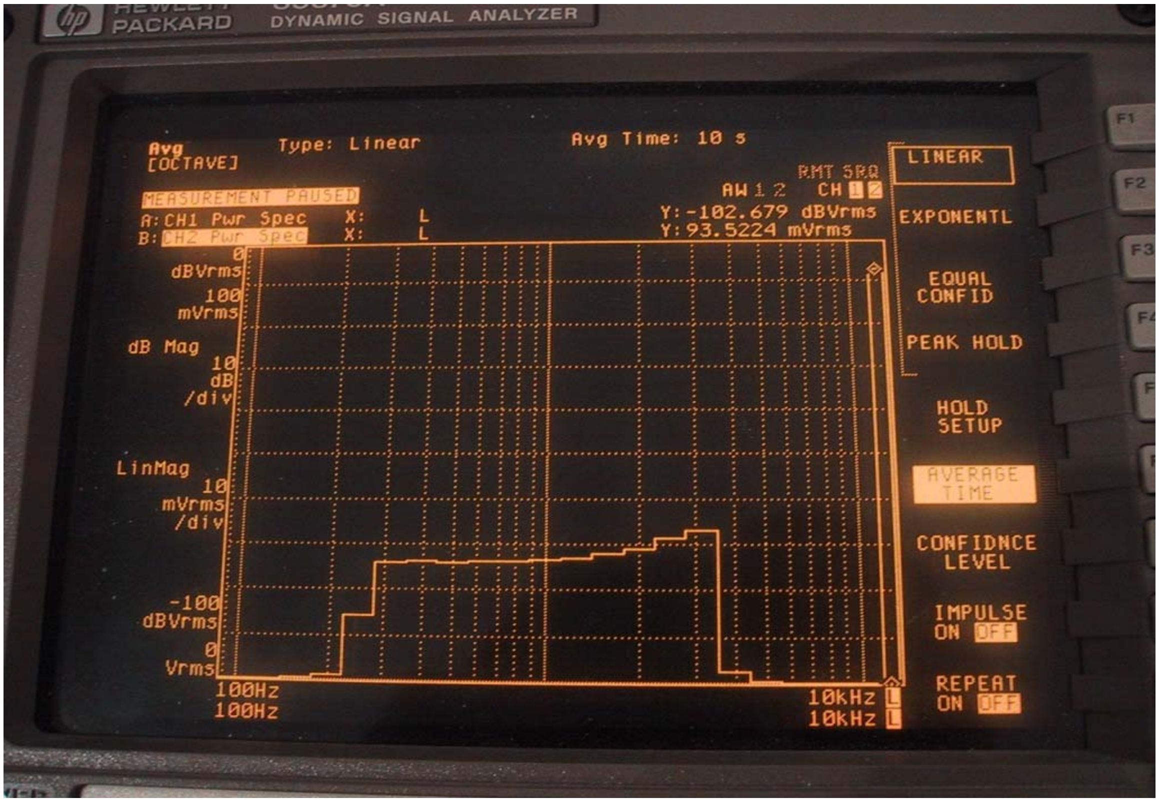
Please see new plots for the input signal measured with external analyzer DASY4 software:

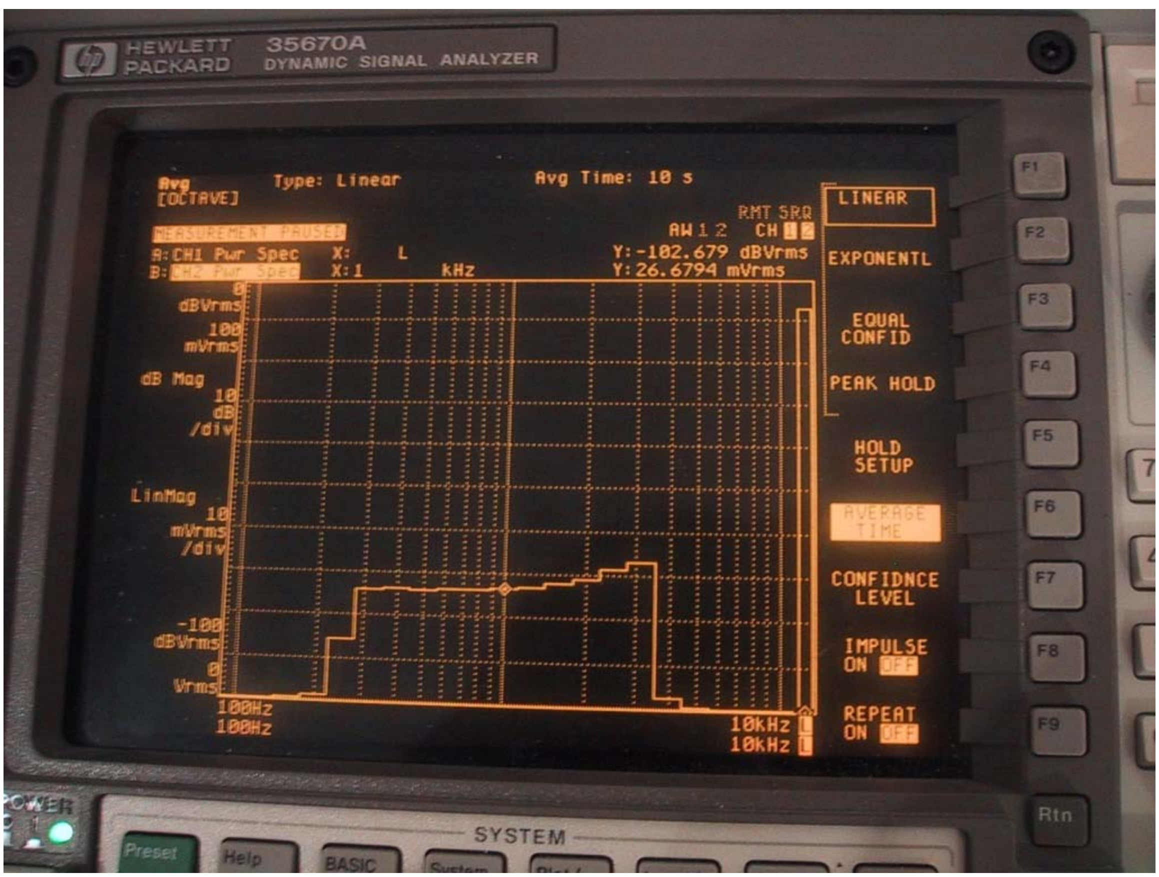




Input level measurement analyzer plots for the sinusoidal 1.025 kHz signal

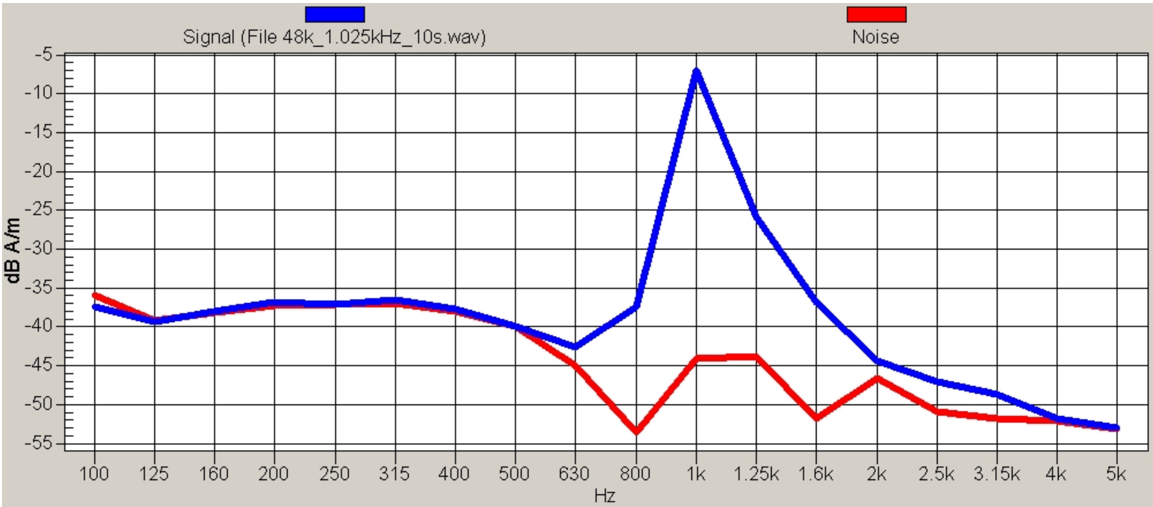
“L” shows power sum

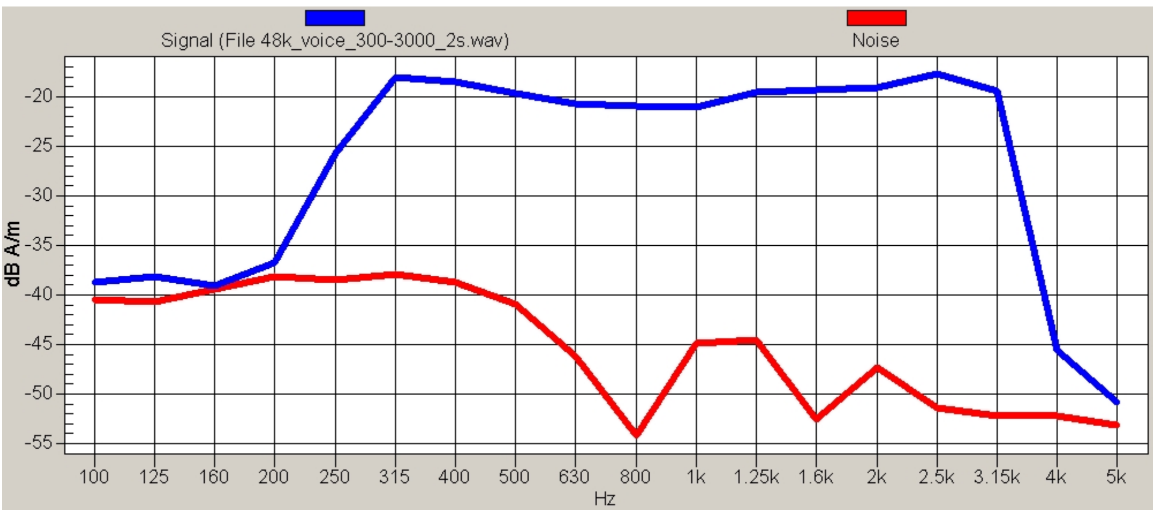




Input level measurement analyzer plots for the voice signal

“L” shows power sum





Sinusoidal and voice reference signal DASY4 plots

B) Regarding your answer to question 2 and 7 The FCC would like to see additional clarification of the use of the BWC. A .2 dB BWC is not expected for a CW signal. Also, how BWC is handled for each 1/3 octave in the frequency response measurement is unclear.

Our measurements always result in ~ 0.2 dB BWC for the 1.025 kHz sinusoidal signal. We investigated and repeated BWC measurements, but could not obtain a 0 dB BWC for a sinusoidal signal. Since 0.2 dB deviation is very small, we believe it should not be a concern given the measurement uncertainty for the ABM. In addition, FCC allows a 0.2 dB power drift for SAR and HAC RF measurements.

We also addressed this phenomenon to the manufacturer of the test equipmnet and got the response below.

The following is clarification for the use of the BWC as per SPEAG the manufacturer of the DASY4 measurement system.

ABM1 values and deduced quantities (SNR and frequency response scaling) are based on the measured field in the 1 kHz third-octave filter. Bandwidth compensated values are available under the following conditions:

● A reference measurement with the same signal type is available (T-Coil job marked with “use as reference”) before the job to be compensated.
● The reference measurement is taken in the AMCC (z orientation), evaluating the coil signal.
● The reference measurement precedes the job within the same procedure.
● Before displaying the desired value based on the measured ABM1 value, a pop-up window appears, proposing a default value based on the reference measurement.

The proposed value is calculated as the ratio of (power sum of third-octave filters from 100 Hz to 5 kHz) / (ABM1 in 1 kHz third-octave filter). This factor leads to the “ABM1 bandwidth compensated” which is an estimation of the signal level of a narrowband ABM1 signal with the same input amplitude. The estimated value may however differ from a measurement with a narrowband signal due to nonlinearity effects or contribution of noise and interference available during the reference measurement.

If an input signal completely within the 1 kHz third-octave band is used (narrow band signal), no compensation is required. If the test signal contains spectral components in other third-octave bands, the power in the 1 kHz subband is lower for the same overall power, and the reading from the 1 kHz band is consequently reduced. This reduction shall be compensated to give the equivalent reading as when using a narrowband signal. The reduction - when using a wideband signal with the same overall RMS power - is the ratio between the overall RMS power and the RMS power in the 1 kHz band. For signal with limited bandwidth (e.g. from 300 Hz to 3 kHz), the power is determined by summing up their contribution in all third-octave subbands. The correction is the ratio "sum power / 1 kHz power" (linear) or the equivalent value in dB (20 * log (Vrms total / Vrms 1k)).

For 1025 Hz, the proposed factor is very close to 0 dB (linear 1), because the signal is completely within the 1 kHz subband. Small deviations may occur due to noise during the reference measurement, or due to other spectral components. Differences between the narrowband and the voice signal test: ABM1 (without BWC) for the same RMS reading is smaller for the wideband (voice) signal compared to the narrowband signal by the BWC. For the “***48k_voice_300-3000 (duration 2 s)”*** predefined signals, the difference is provided by SPEAG to be 10.8 dB.

During the reference measurement, the spectral distribution of the input signal is determined. A spectral distribution results which is equivalent to the input distribution plus the response of the WD. To determine the response of the WD, the spectrum from the WD is deducted. The response is then compared to the limits, which are level dependent (based on the ABM1 signal level). For the display, the spectrum is displayed with the BWC applied.

C) Regarding your answer to question 3. Please readdress. The procedure mentioned pertains to SAR testing not HAC. Please justify the subset tested in accordance with the FCC 3G procedure for HAC. Also, you mentioned that the device has both 8K enhanced and 8K enhanced low. Please address both or justify subset testing.

FCC 3G certification policy for the Hearing Aid Compatibility

Voice modes for at the ear usage modes should be addressed.

For T-coil compliance, modes that produce higher levels of base band magnetic noise are of interest for the ABM2 measurements, such as RF modes with high peak-to-average power ratio, noisy display settings, or operational modes requiring high digital computations/processing. Additionally, ABM1 measurements might be influenced by audio processing such as vocoder or audio auto levelling options and should be investigated.

If all operational modes are not tested justification must be made for the modes tested. The justification should be sufficient to assure to a reasonable extent that the device will comply in all untested modes.

The following Speech Services are supported:

Service Option: 3
Radio Configuration 1 and 3
Vocoder type: 8k Enhanced (Low) / 8k Enhanced

These were evaluated and the worst case ABM2 was determined to be RC1, SO3 and 8k Enhanced (Low), mid channel.
In addition, the RF environment (M rating) for T-Coil rating was determined by evaluating 1/8 th rate RC1, SO2 option. This option does not have a vocoder to perform ABM measurements.

The following are ABM2 measurement data and plots for supported speech service options, vocoder type and RF channel to show justification:

Test Laboratory: RTS

TCoil_cCharm_CDMA800_FCC_corres_08_01_06

DUT: BlackBerry Wireless Handheld; Type: Sample ; Serial: Not Specified

Communication System: CDMA 800; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used: $\sigma = 0$ mho/m, $\varepsilon_r = 1$; $\rho = 1$ kg/m^3
Phantom section: AMB with Coil Section

DASY4 Configuration:

- Probe: AM1DV2 - 1016; ; Calibrated: 18/04/2006
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn473; Calibrated: 09/03/2006
- Phantom: HAC Test Arch with Coil; Type: SD HAC P01 BA; Serial: 100x
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Point scan/z (axial) scan at point with noise RC1 SO3 8 k Enhanced (Low) Mid Chan/ABM Noise(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Cursor:
ABM2 = -31.1467 dB A/m
Location: -4, 0, 363.7 mm

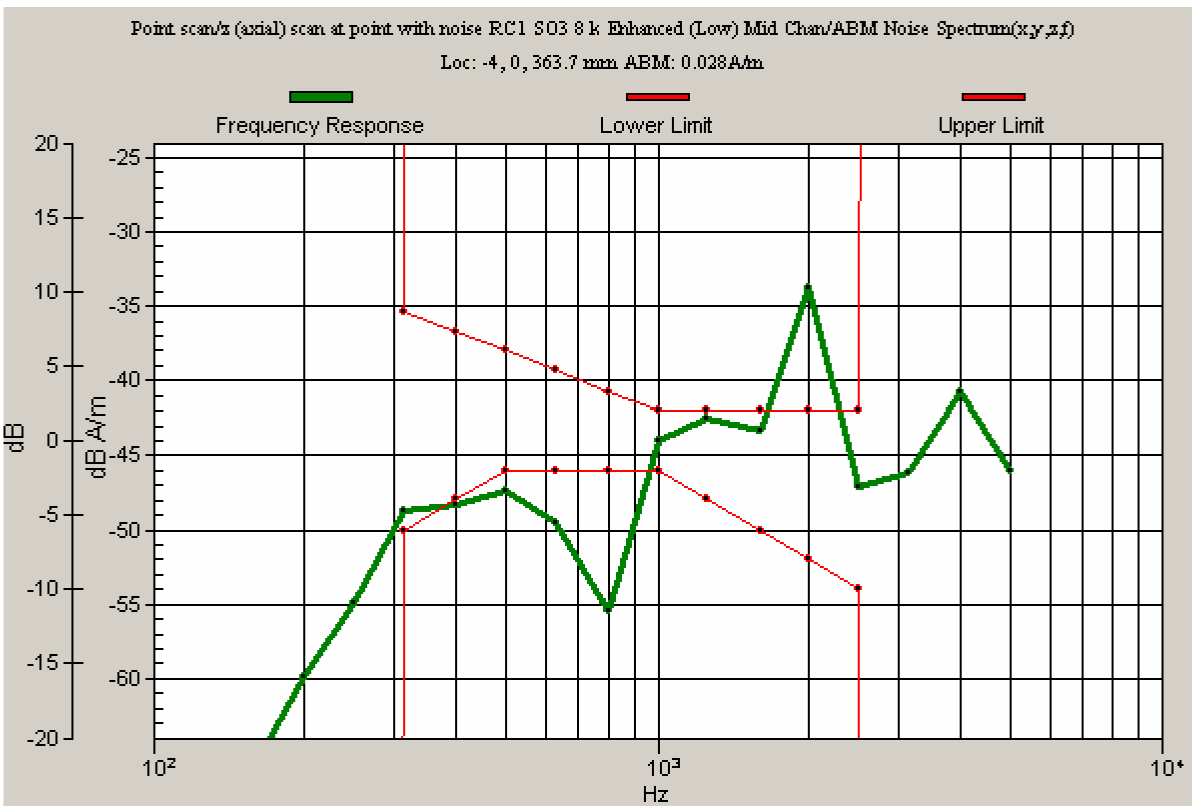
Point scan/z (axial) scan at point with noise 2 RC1 SO3 8 k Enhanced (Low) Low chan/ABM Noise(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Cursor:
ABM2 = -31.2454 dB A/m
Location: -4, 0, 363.7 mm

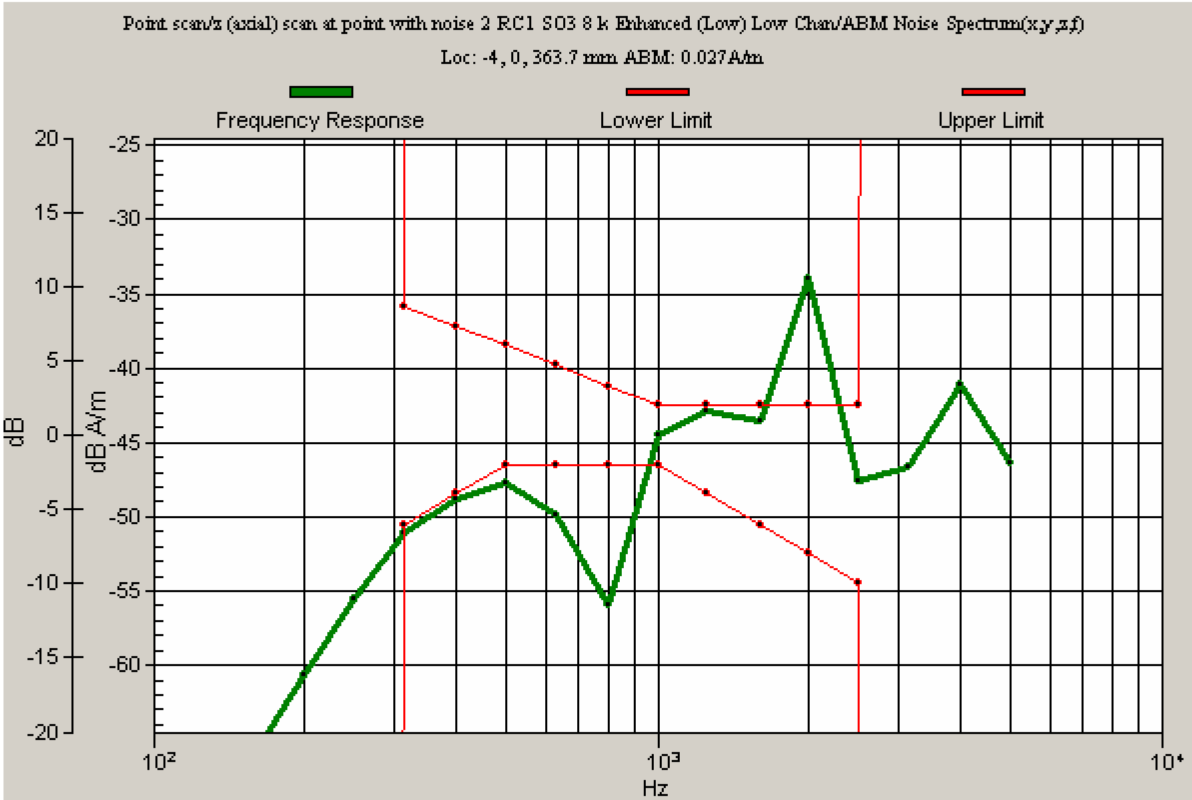
Point scan/z (axial) scan at point with noise 3 RC1 SO3 8 k Enhanced (Low) High Chan/ABM Noise(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm

Cursor:
ABM2 = -31.2139 dB A/m
Location: -4, 0, 363.7 mm

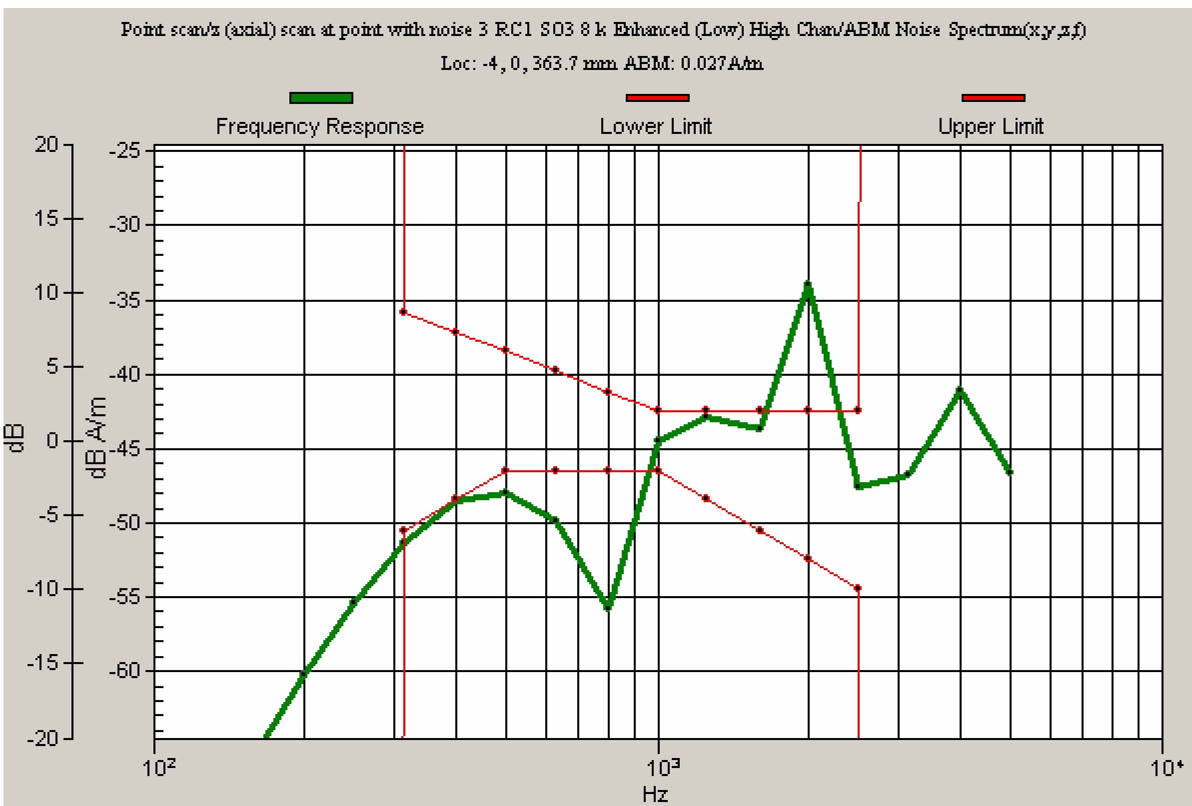
Point scan/z (axial) scan at point with noise 4 RC1 SO3 8 k Enhanced Mid Chan/ABM Noise(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Cursor:
ABM2 = -35.676 dB A/m
Location: -4, 0, 363.7 mm

Point scan/z (axial) scan at point with noise 4 2 RC3 SO3 8 k Enhanced (Low) Mid Chan/ABM Noise(x,y,z) (1x1x1):
Measurement grid: dx=10mm, dy=10mm
Cursor:
ABM2 = -49.6989 dB A/m
Location: -4, 0, 363.7 mm

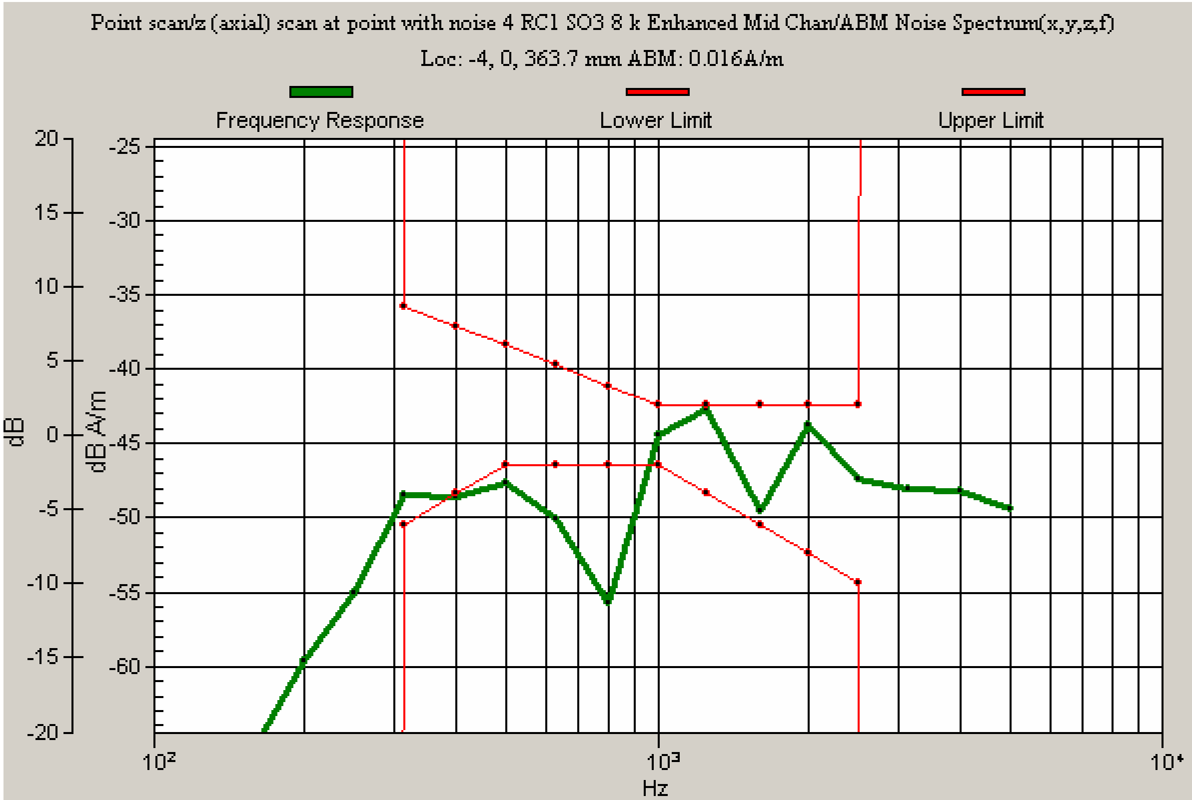


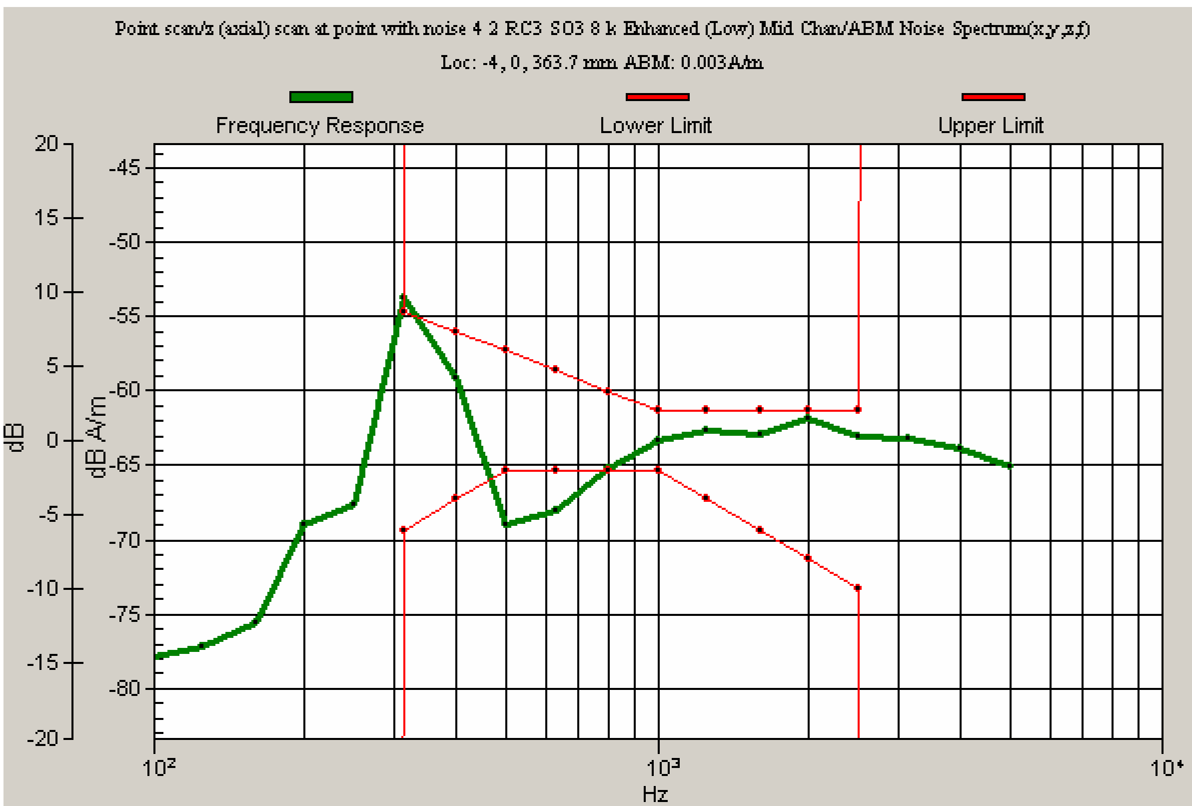


Point scan/z (axial) scan at point with noise 2 RC1 S03 8 k Enhanced (Low) Low Chan/ABM Noise Spectrum(x,y,z,f)
Loc: -4, 0, 363.7 mm ABM: 0.027A/m
Frequency Response
Lower Limit
Upper Limit
dB
dB A/m
Hz



Point scan/z (axial) scan at point with noise 3 RC1 S03 8 k Enhanced (Low) High Chan/ABM Noise Spectrum(x,y,z,f)
Loc: -4, 0, 363.7 mm ABM: 0.027A/m
Frequency Response
Lower Limit
Upper Limit
dB
dB A/m
Hz


Point scan/z (axial) scan at point with noise 4 RC1 SO3 8 k Enhanced Mid Chan/ABM Noise Spectrum(x,y,z,f)
Loc: -4, 0, 363.7 mm ABM: 0.016A/m
Frequency Response
Lower Limit
Upper Limit
dB
dB A/m
Hz


Point scan/z (axial) scan at point with noise 4 2 RC3 SO3 8 k Enhanced (Low) Mid Chan/ABM Noise Spectrum(x,y,z,f)
Loc: -4, 0, 363.7 mm ABM: 0.003A/m
Frequency Response
Lower Limit
Upper Limit
dB
dB A/m
Hz

D) Regarding your answer to question 13. The blue outline in the graphic provide does not seem to match the test device. Please update.

Please refer to the revised report number RTS-0445-0606-06 rev 02 for updated device dimensions.

Please do not hesitate to contact the undersigned should you have any questions.

Yours truly,

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