

EMC (The answers are integrated in the text behind the questions)

1) For conducted tests please provide:

Test setup diagrams and procedures. Please address how the burst nature of this device was accounted for in testing.

The Analyzer was triggered by the burst and measured the peak value in max hold position over several sweeps until the value didn't change anymore. The test setup please see document "CONFIGURATION BLOCK DIAGRAM". The offset for the conducted measurements includes Attenuator (10dB), cable and power splitter.

A results table providing numerical results .

See table "NUMERICAL SPURIOUS EMISSIONS"

New data to replace the plots for 30-1000 MHz such as on page 35 of the test report. BW of 1 MHz is required, per CFR section 24.238 (b).

See Document "spurious and band edge results" which shows the pages to be replaced of the original report

Description of how the equipment was controlled during testing to assure maximum power transmission and proper modulation.

The device was controlled by the base station simulator (CMD 55). The power level was set to the highest level.

Please discuss the difference between peak and average power reported on page 7 of the test report. The variation between 28 and 18 dBm is unexpected.

The Average power was re-measured using a power meter and a thermocouple probe see document "power measurements".

2) For radiated tests please provide:

Test setup diagrams and procedures. Please address how the burst nature of this device was accounted for in testing.

The Analyzer was triggered by the burst and measured the peak value in max hold position over several sweeps until the value didn't change anymore.

A table providing numerical results .

See table "NUMERICAL SPURIOUS EMISSIONS"

Please note that the substitution method must be used for any values within 20 dB of the limit.

We use the substitution method for **all** the measurements see description in the test report **page 8** of the test report. We extended this method for the whole range of spurious emissions (26.5 GHz) we are operating at the moment recently. During the procedure to measure the "reference path loss" it was verified that we are within ± 2 dB due to

interpolation errors. Measurement results within ± 3 dB are substituted at the single frequency

Additional details how the plots on pages 14-27 of the test report were made. Include a discussion of what steps were taken to measure peak emissions. Include details of scan time.

The plots on page 14, 17, 20 and 24 are replaced by the document "30_lgrad". All the measurements were done using the R&S measurement system with the relevant software. The sweeps are implemented using basic setting from the spurious measurement software according PTCRB requirements. This method is used to make sure that the sweep times are set to catch in minimum one Burst during the sweep time in transmit and idle mode

Clarification if all frequencies were investigated or only harmonics. The procedure on page 12 states "... measurements of the harmonics of the transmit frequency through the 10th harmonic were measured....". This suggests nonharmonic frequencies were not investigated. Please clarify.

This sentence specify only the frequency range spurious are measured. In this range all frequencies are investigated.

Description of how the equipment was controlled during testing to assure maximum power transmission and proper modulation.

The device was controlled by the base station simulator (CMD 55). The power level was set to the highest level.

3) Details of the emissions designator and justification for necessary bandwidth. This information was not located.

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4) Regarding your answer to question 4 of correspondence 21816. The frequency range stated appears to be the block frequency range as opposed to the tuning range of the equipment. Please clarify. Related to this please state the tuned frequencies for the band edge plots on test report pages 41 and 41 of 52.

Frequency range using mid frequency of the lowest and highest channel is: 1850.2 - 1909.8MHz

The band edge measurement were repeated with the relevant 5 kHz bandwidth and for the low and high channel of the lowest and the highest block and additionally on one mid frequency block see document "spurious and band edge results"

SAR answers provided by the SAR test lab ITS (the questions are attached in the next page)

1. Correction was made in the report.
2. Changes in the Manual as recommended (see attached modified manual section)
3. The device was tested in GPRS mode. In this mode it uses four time slots to transmit data (instead of one time slot in the GSM (voice) mode). In this data transmission mode voice is not active but the average power has the highest value. For this reason this mode was used.
4. The device was set to transmit the maximum power with the highest Duty Cycle. See answer 3.
5. The device was set to transmit four time slots. This is why instead of Crest Factor of 8 (usually used for GSM) the Crest Factor of 2 was setup. It is mentioned on page 18 of the test report.
6. The test was performed with the Probe Conversion Factor provided by the manufacturer (SPIAG). The manufacturer provided the Conversion Factor defined in the head tissue liquid. As per additional info from the SPIAG, the difference between the Conversion Factors for Head and Body might be in the range of 3% - 11%, and the Conversion Factor for Body is higher. With higher Conversion Factor, the SAR is less. So, the SAR numbers in the report is a worst case.
The Supplement C to OET 65 requires the Tissue Dielectric Parameters for Body for 1800-2000 MHz as:
epsilon = 53.3, sigma = 1.52.
The test were performed with the liquid with the following parameters:
epsilon = 54.9, sigma = 1.40 for f=1850 MHz
epsilon = 54.8, sigma = 1.44 for f=1880 MHz
epsilon = 54.8, sigma = 1.48 for f=1910 MHz
In the middle of the range (1910 MHz) the parameters only 3% differ from the required; sigma decreases slightly (to 8%) at 1850 MHz. As the highest SAR value was measured at 1880 MHz, where the parameters are in the 5% tolerance, we can consider that the test results are accurate.
7. The plot #10 was mistakenly insert into report. It is for 900 MHz range. The report was corrected. Please see the new plot #10 as well as the plot #11 provided by SPEAG (as a target). Please note that the system verification was made for Head tissue, as SPEAG did not provide the calibration for Body tissue.
8. The setup photographs was made a little bit brighter.
On all photos the distance between the antenna and the phantom is 2.5 cm. The antenna can be setup closer, but we kept the distance of 2.5 cm. At closer distance, the SAR will be higher and might exceed the limit. So, the safety distance is 2.5 cm.
9. In our opinion, the effect of paper supporting the laptop on the SAR is minor, as the permittivity of the dry paper is in the same range (around 5) as the permittivity of the positioner. As the SAR measured has a big margin compare to the limit, this effect does not change the test result.

SAR Questions

- 1) Conducted power measured during SAR testing.
- 2) New user manual statement. It should be clearly stated that this unit can only be used in what is considered a "typical" laptop computer.
- 3) SAR data associated with the mentioned "VOICE" mode with an appropriate headset. Sample testing at the highest SAR point is considered sufficient.
- 4) Description of how the equipment was controlled during testing to assure maximum power transmission and proper modulation.
- 5) Justification of the use of 2 as the CREST FACTOR as noted on various SAR plots. Provide new data if appropriate.
- 6) Statement justifying use of the probe calibration in a different material type than used for testing and for tissue parameters that vary from the target values by more than 5%. Please include an analysis of the expected variation on the SAR value. Alternatively please provide data using correct probe calibration factors and liquid dielectric parameters.
- 7) Manufacturers system verification data including SAR distribution plots. Please also provide SAR plots associated with your verification.
- 8) New test setup photographs. The photos provided are not of the needed clarity to evaluate the test setup. Please include a statement with the critical spacing measurements for each setup. Please discuss the antenna position associated with the photograph on page 9. This photographs suggests that the antenna could be moved to be closer than 2.5 cm to the body as illustrated in the diagrams on pages 4 and 5. Please clarify.
- 9) Please discuss and justify the means to hold up the laptop to the body phantom. It appears that reams of paper were used. If so we are concerned that the paper may have RF-absorbing effect and/or perturb device radiation pattern. Please sample re-test keyboard face-down configuration and LID-OPEN with foamed-polystyrene or equivalent low-density support.