

From: Andy Ward [andy.ward@ubisense.net]

Sent: Monday, February 16, 2004 4:25 PM

To: John Kennedy

Cc: rhc@uiuc.edu; rvanhook@ad.uiuc.edu; jay.cadman@ubisense.net;
rupert.curwen@ubisense.net

Subject: U. Illinois STA application

Dear Mr Kennedy,

I have been asked by Professor Roy Campbell at the University of Illinois to provide clarification details regarding the issues below which arose as part of an STA application made by Professor Campbell's department.

The device which Professor Campbell's group wish to operate under the STA is a UWB transmitter. I have attached the results of some testing of the UWB transmitter done by the UK Radiocommunications Agency in case this helps to answer any future questions regarding the STA application.

With regards to the specific issues which were raised:

1) The necessary bandwidth requested in this application is 2.923 GHz, but the frequency range requested is only 5-6.5 GHz. Please clarify this discrepancy.

The necessary bandwidth figure in the application is calculated using the formulae in NTIA OSM Red Book Annex J (from <http://www.ntia.doc.gov/osmhome/redbook/J.pdf>) for non-FM pulsed radars (the closest analogue to the UWB device in question). We followed the guidance in this document stating that the appropriate formula should be used in preference to measured results – the 2.923GHz figure is the calculated -20dB bandwidth (using 500ps rise time, 750ps pulse duration at 50% level).

The *measured* -10dB bandwidth of the device is 2.7GHz (see attachment).

The 5-6.5GHz figure is the nominal -6dB bandwidth – my apologies if inclusion of this figure has caused confusion.

2) Is the device to be used an ultra-wideband device?

Yes. It is a pre-production prototype of an ultra-wideband device which will be used indoors.

3) What is the average power over the occupied bandwidth?

The measured RMS EIRP across the entire occupied bandwidth is -29dBm (see attachment).

4) What is the pulse repetition frequency?

12MHz (fixed).

5) What is the -10 dB bandwidth?

The measured -10dB bandwidth is 2.7GHz (see attachment)

Please get in touch if you require any further information relating to this matter.

Regards,
Andy Ward

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From: John Mellish [John.Mellish@ra.gsi.gov.uk]
Sent: Monday, November 03, 2003 10:54 AM
To: Siewyoon Tan
Cc: Bernard Bond; Prem Mangat; andy.ward@ubisense.net
Subject: Re. Measurements on 27/10/03

Hi All,

1: I have now checked to see if the gain of the measuring antenna was suffering any apparent loss of gain due to near-field effects during the measurements. This involved monitoring the received signal level from a radiating source (small aperture), whilst increasing the measurement distance from that used during the measurement (20cm) to two times this distance (40 cm) and noting that the expected decrease (6 dB) in signal level was observed. As this was the case, I conclude that no adjustment for near-field effects is necessary, even although the measurement distance was very short.

2: An Excel spreadsheet is attached. This contains the measurement data, and the calculated EIRP (approximately -48.5 dBm RMS). As the spectral lines were spaced at 12 MHz intervals, this EIRP remains constant for all measuring bandwidths below 12 MHz (and peak = RMS).

3: The spreadsheet also contains calculations to determine the RMS and Peak EIRP's in wider bandwidths, as well as the EIRP of the entire (total) transmission (both Peak and RMS).

4: Conclusions. The UWB transmission observed was exactly as Dr Andy Ward described. It consisted of discrete spectral lines spaced every 12 MHz. Although it was not noise-like, the RMS (and peak) EIRP in a 1 MHz BW was approximately 7 dB below the FCC indoor limit. The RMS and peak EIRP's of the entire transmission (non-band limited) was of the order of -29 and -4.5 dBm respectively.

Please e-mail or telephone to discuss.

Regards

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