



## **VTech Engineering Canada Ltd.**

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### **Responses to FCC questions**

**Re: FCC ID EW780-5348-00**

**Correspondence Reference Number : 25368**

**731 Confirmation Number : EA509979**

**July 10, 2003**

**Dear Diane,**

**Here are the responses to your questions. The replies from items (1) to (7) are from our SAR testing Lab. (Aprel). The plots for item (8) are from VTech Engineering Canada Ltd.**

**Thanks,**

**Joseph Poon**

**Regulatory Compliance Manager**

**VTech Engineering Canada Ltd.**

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From: Stuart Nicol  
> Sent: Wednesday, July 09, 2003 2:07 PM  
> To: Jay Sarkar  
> Subject: Response to FCC V-Tech  
>  
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>  
>  
> 1) Justification for tissue liquid. Dielectric constant is not within  
> target window. Please retest as appropriate.  
>  
> Due to the nature of the way in which the ingredients used in the tissues  
> respond at higher frequencies it has been proven to be difficult to have  
> an exact match for both sigma and epsilon at the higher frequencies. The  
> agreed to deviation was +/- 10% at frequencies above 3GHz and APREL worked  
> closely with the FCC back in August 2001 (Kwok Chan) in respect to meeting  
> the deviation requirements. The outcome of the discussions was that as  
> long as either epsilon or sigma were within the deviation, and that the  
> uncertainty associated with the measurement did not exceed 30% then it  
> would be acceptable. The values presented for the targets are those which  
> were derived during the development of the tissue recipes. As the overall  
> uncertainty of the measurements is below 21% for 1g APREL do not see the  
> need to retest, as the data provided in the report is more conservative  
> than what would have been presented had the target values been achieved.  
>  
>  
> 2) Tissue liquid recipe.  
>  
> The recipes developed by APREL took considerable time and effort at great  
> expense, and as such have enabled testing to be conducted at these higher  
> frequencies. APREL Laboratories have presented the FCC with the complete  
> tissue manufacturing procedures for reference. The current point of  
> contact would be Martin Perrine who should be able to provide the details.  
>  
>

> 3) Justification for phantom size. Supplement C recommends that a phantom  
> of twice the devices dimensions be used. Please retest as appropriate.  
>  
> The phantom used by APREL Laboratories is twice the size of the external  
> form factor of the device tested in the appropriate axis.  
>  
> It is also the understanding of APREL Laboratories that the FCC have  
> acknowledged that the stated value of 2x the size of a given device may  
> not be achievable in certain circumstances, due to the thickness allowable  
> for the phantom and the tolerance for sagging. It is understood that an  
> amendment will possibly be made to change the requirement to 20% for the  
> physical form factor for the device under test. Would it be possible for  
> the FCC to confirm this approach?  
>  
>  
> 4) SAR scans covering entire device. Page 30 of 68 shows hot spots that  
> are cut off.  
>  
> All scans executed covered the whole device as tested, and where a  
> secondary peak has been detected within 60% of the initial peak value, a  
> secondary test is executed. The graph referenced above and which is  
> presented in the report reflects the conservative value measured, and  
> shows the location of the conservative SAR with no hotspot cut off.  
>  
>  
> 5) Keyboard down 1 gm SAR data.  
>  
> It is the understanding of APREL Laboratories that the device would never  
> be worn on a body configuration, and as such 1g data is not relevant to  
> the SAR report. The device when operating will be located on a flat  
> surface i.e. a table and as such this configuration would not reflect the  
> normal user conditions. Direct SAR data was included within the report for  
> this configuration as it is feasible that the user could move the base  
> unit with their hands while it is transmitting. Where it would be possible  
> that a part of the body could come into contact with the device while  
> transmitting APREL Laboratories have provided test data.  
>  
>  
> 6) Justification for verification target value. The value stated does not  
> seem to fit the expected trend from P1528 frequency versus target value  
> from below 5 GHz.  
>  
> APREL Laboratories have developed tissues which are easy to manufacture,  
> which do not use harmful chemicals, are repeatable, and have a long shelf  
> life. To allow this the target values have deviated from the trend which  
> was created using the data as presented in Supplement C. The IEEE 1528  
> standard does not yet have methodologies for body testing. APREL  
> Laboratories have created a number of FDTD models using both sets of data  
> and have shown that the deviation from the extrapolated target values do  
> not effect the final peak SAR, when comparing the conservative value  
> against the conservative SAR using the extrapolated target values. The  
> numbers used have been included in the uncertainty budget as presented in  
> the report, and the final uncertainty associated with the measurement does  
> not exceed 30% and so should be acceptable. APREL Laboratories are working  
> with other IEC/IEEE committee members to harmonize the expected target  
> values, and when this has been achieved will use the associated parameters  
> for assessment and submit these for future applications.  
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- >
- > 7) Explanation for the unusual behavior seen in some Z axis plots above
- > 20mm.
- >
- > At the higher frequencies the e-filed probe used by APREL Laboratories can
- > occasionally detect spikes which may occur due to the software in which
- > the device uses to lock down the channels, ambient conditions, or static.
- > When this has been detected APREL Laboratories will review the scan
- > parameters along with the Z axis exponential curves, and retest where
- > appropriate. As the numbers documented in the SAR report, would not be
- > affected by the slight rise in the exponential slope above the 20mm range,
- > and the 1 and 10 gram averaging would not reduce the conservative value
- > recorded the graph submitted has been termed as valid. It should also be
- > noted that the rise in the exponential slope is less than 10% of the peak
- > value and so has been accounted for in the uncertainty calculation. These
- > issues among others are currently being investigated by IEC along with
- > IEEE and will be resolved through standards, practices and protocols at a
- > latter date.
- >
- >
- >

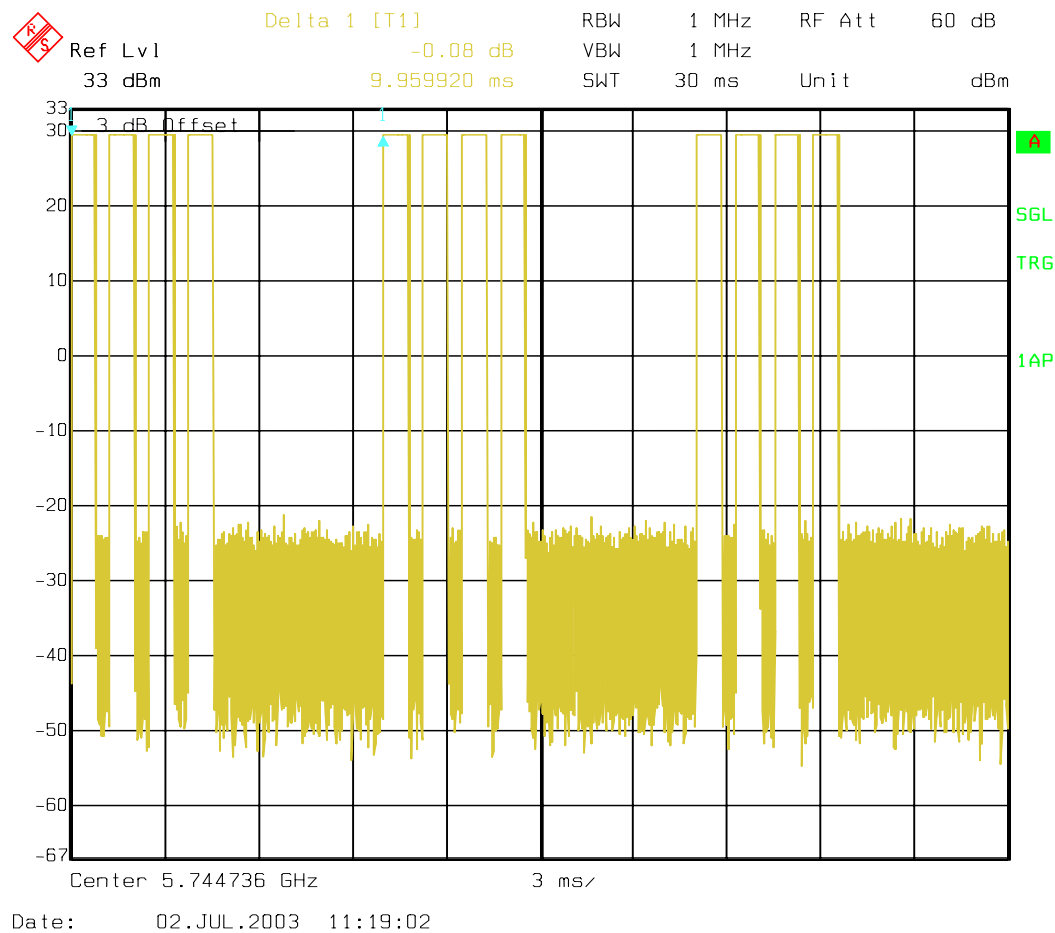
# Base Transmit Duty Cycle Calculation for SAR Measurement (Response item 8)

The following plots show how the transmitter duty cycle is calculated on the 5.8GHz Bundle Cordless Phone.

This test is done on a BS transmitter, set into Test Mode with all (4) tx slots active. Note that this is the heaviest the BS transmitter will be used during standard phone operation.

## 1.1 Frame Length

This plot shows the frame length as indicated by the markers: 9.96ms.





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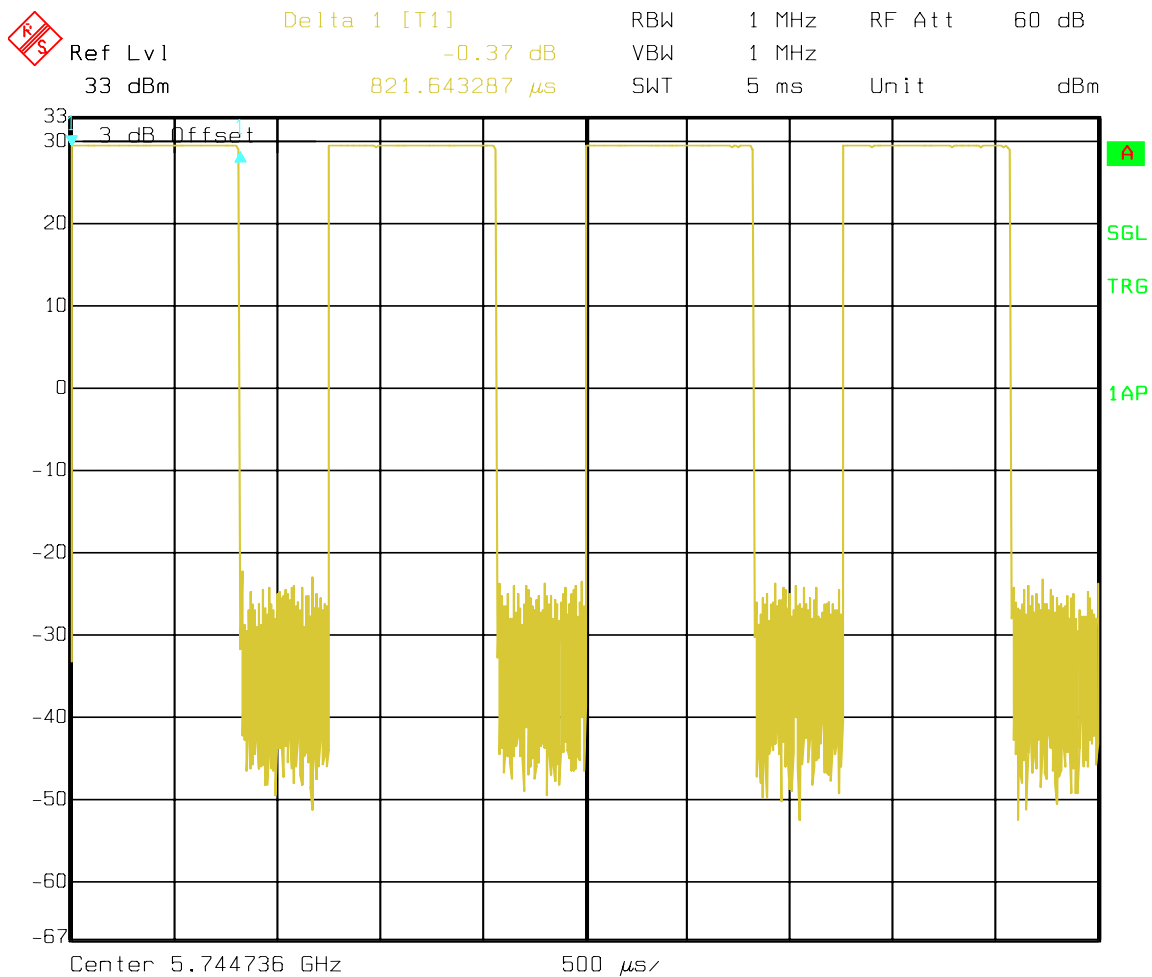
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### 1.2 Slot Timing

This plot shows the transmitter “on-time” of 0.821ms.



Date: 02.JUL.2003 11:19:39

### 1.3 Duty Cycle Calculation

$$\begin{aligned}\text{Duty Cycle (\%)} &= ((\text{Tx On-time} * 4) / \text{Frame Length}) * 100 \\ &= ((0.821\text{ms} * 4) / 9.96\text{ms}) * 100 \\ &= 32.97 \% \\ &= \mathbf{33 \%}\end{aligned}$$