SAR EVALUATION USING UPPER BOUND TRANSMISSION DUTY FACTOR (UBTDF)

FOR

SOLUSMOBILE BLOOD GLUCOSE METER

(HANDHELD BLOOD GLUCOSE METER)

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Cellular Module Function

Overview

The cellular module in the Solus Mobile meter is typically enabled once a day for 255 seconds. The power supply to the module is shut off for the remainder of the day (23 hours, 55 minutes and 45 seconds).

The user can initiate a manual synchronization at any time.

The radio module is a MC2261 CDMA module (800 MHz band) that works on the Verizon Wireless network. The ID is FCC ID is OJD-MC2261. The device will only operate at 800 MHz.

The plots in the following sections show the cellular communications modules current consumption versus time. The following table shows the modules function versus current draw.

| Current	Mode
Less than 50 mA	Sleep mode
Greater than 50 mA and less than 130 mA	Receive only mode
Greater than 130 mA	Transmit and Receive mode

Automatic Synchronization

The Solus Mobile meter will initiate an automatic synchronization each night between 1:00 AM and 4:00 AM. The exact time is determined from the cellular communications modules MEID.
The module is turned on for 4 minutes before data is transmitted. This allows the module to register on the network and receive messages.
The module transmits for 0.2 seconds to register on the network and then cycles between sleep mode and receive mode every 5 seconds. The receive mode last for approximately 30 msec.
After the 4 minute idle period, the module transmits 2 to 3 text messages. This typically takes 10 seconds. The meter is transmitting data for approximately 0.8 seconds total.
The meter is not intended to be held by the user while it is communicating on the cellular network. It will typically be on a table or dresser during synchronization.
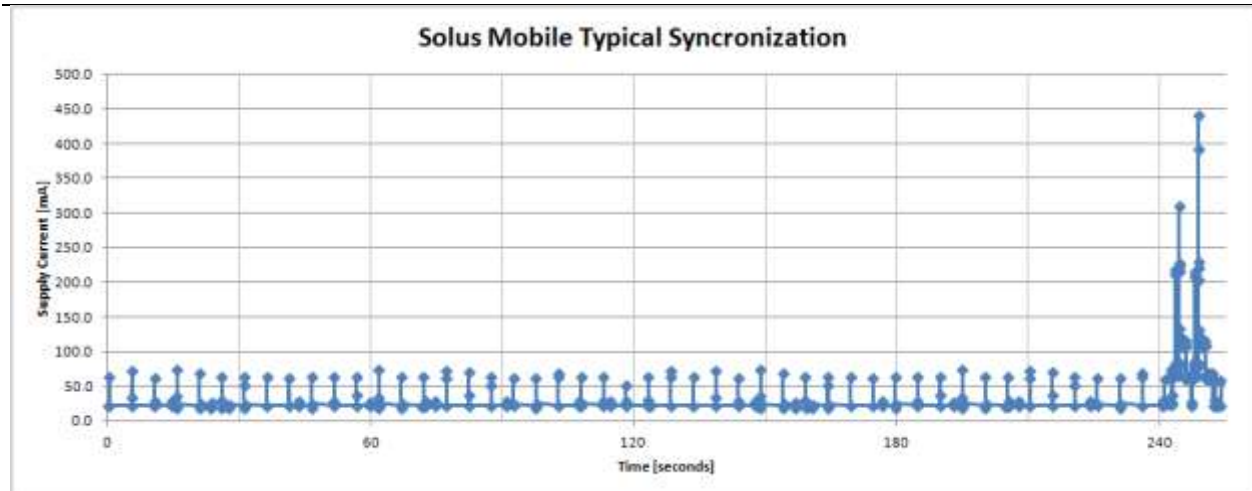
Figure 1 - Typical Solus Mobile Automatic Synchronization
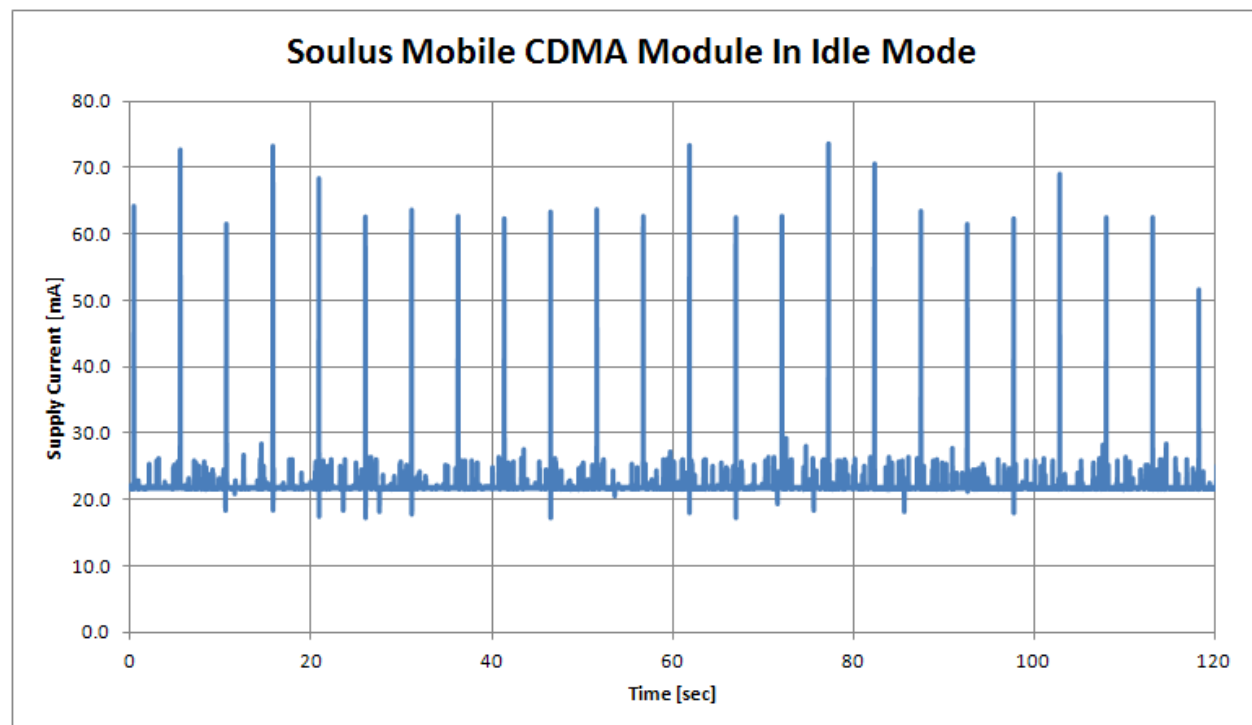
Figure 2 - Close Up Of Solus Mobile CDMA Module During 4 Minute Idle Period
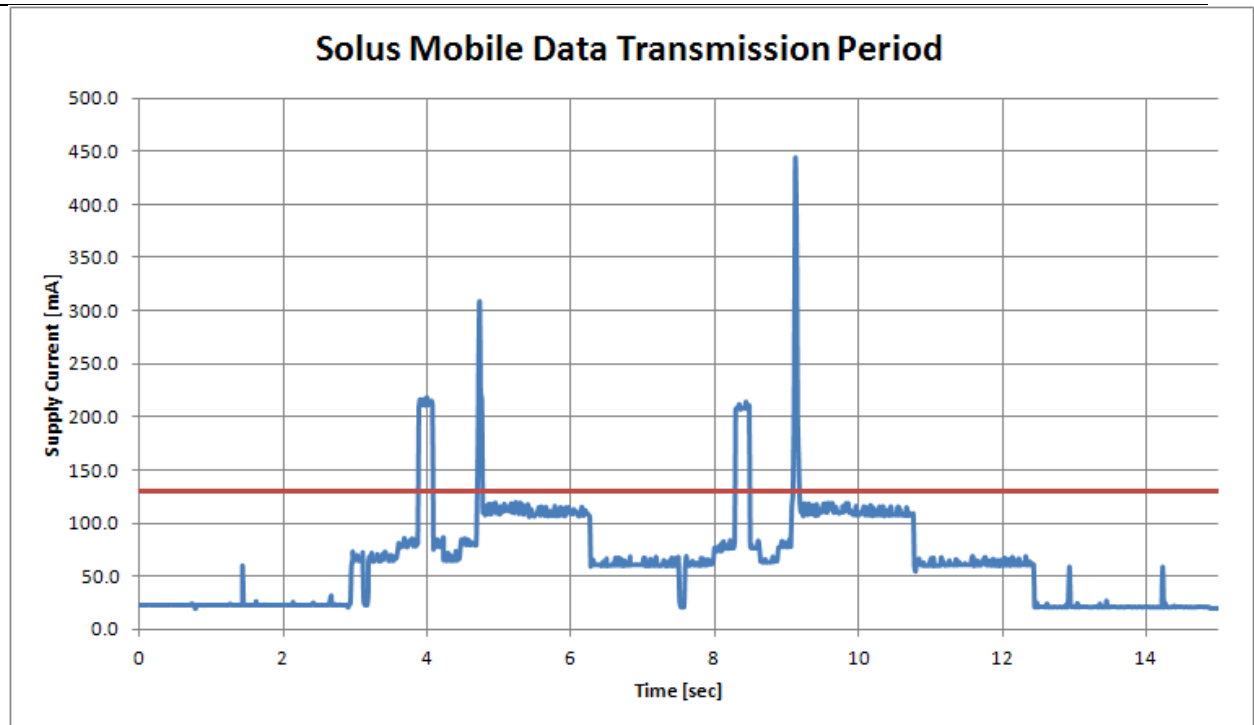
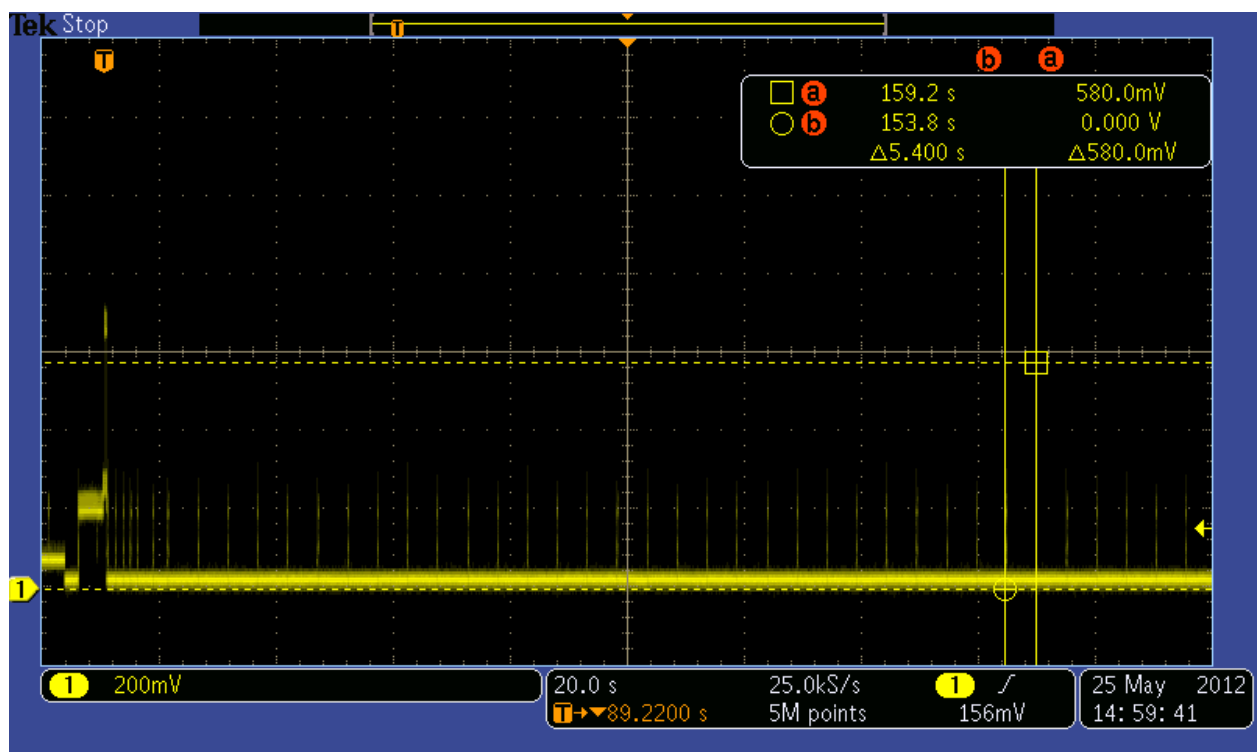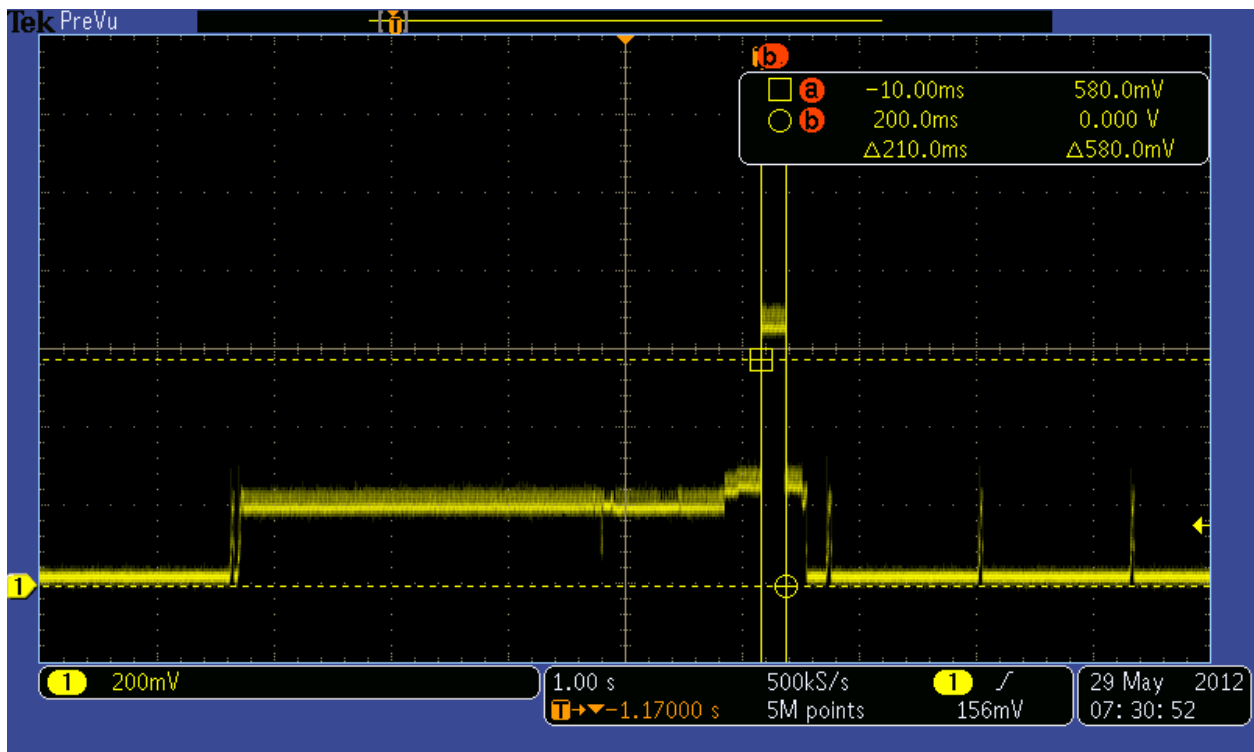**Figure 3 - Close Up Of Solus Mobile CDMA Module During Data Transmission Period**

Figure 4 - MC2261 Registration 1

Figure 5 - MC2261 Registration 2

Manual Synchronization

A manual synchronization can be initiated by the user at any time. The manual synchronization differs from the automatic synchronization in that there is no 4 minute idle period. Only the data is transmitted. The process lasts for 20 to 30 seconds. The process is illustrated in figure 3. The increased time is due to the communications module powering up and registering on the network.

The meter can store 500 readings in memory. This is 3-4 months of data for a typical user. If a user lived in an area with no cell phone coverage, they would need to perform a manual synchronization 4 times a year from a location with cell phone coverage) to prevent data loss.

It takes 190 seconds to transmit 500 readings. During this time the cellular communications module is in transmit mode for 12.705 seconds. See figure 6.
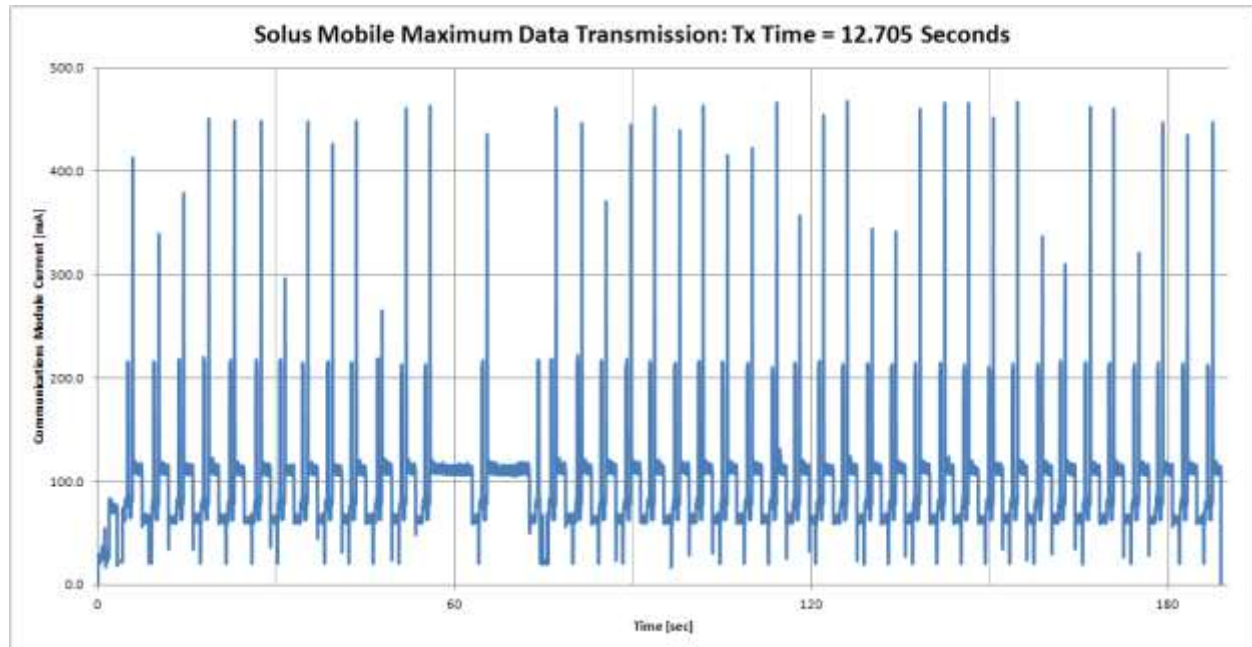
Figure 6- Maximum Solus Mobile Data Transmission

Upper Bound Transmission Duty Factor (UBTDF) Calculations:

Automatic synchronization

	Event	Event Duration (sec)	Transmitter on-time (sec)
1	Power-up and register on network	240	0.2
2	Transmit data via text messaging (3 messages max)	10	0.8
	Total	250	1.0
	UBTDF		0.4 %

The maximum reported conducted RF power under this FCC id is 0.379 W (i.e. 25.8 dBm)

UBTDF power adjustment = 10log (0.004) = -23.9 dB

Therefore, adjusted maximum RF Average power = 25.8 – 23.9 dBm = **1.9 dBm = 1.5 mW**

RF low power threshold requirements (60/f) for SAR exclusion = 60/0.84831= **70.7 mW**

Therefore, adjusted RF Average Power from device < RF low power SAR exclusion threshold. Therefore the device qualifies for SAR test exclusion.

Manual synchronization

	Event	Event Duration (sec)	Transmitter on-time (sec)
1	Transmit 500 readings in memory (including 0.2 ms registration time)	190	12.905
	Total	190	12.905
	UBTDF		6.8 %

UBTDF power adjustment = 10log (0.068) = -11.7 dB

Therefore, adjusted maximum RF Average power = 25.8 – 11.7 dBm = 14.1 dBm = **25.7 mW**

RF low power threshold requirements (60/f) for SAR exclusion = 60/0.84831 = **70.7 mW**

Therefore, adjusted RF Average Power from device < RF low power SAR exclusion threshold. Therefore the device qualifies for SAR test exclusion.

Summary

Under both operating modes (i.e. automatic and manual synchronization) the UBTDF adjusted maximum conducted power is less than the low power threshold requirements for SAR exclusion. Therefore, the SolusMobile Blood Glucose Meter is exempt from SAR testing.