

Measuring GSM mobile signals with the ST124SMA Power Sensor.

GSM mobile signals are usually present for a single time-slot per frame, that is, for approximately one eighth of the time, since there are eight time slots per frame. The mobile transmitter is active for slightly less than this time because the transmitter has around three 'tail' bits to ramp up and down in power, and 8.25 guard bits where the transmitter is silent. This means that the transmitter is inactive for 11.25 bits out of 156.25.

That is for roughly $(156.25 - 11.25) / 156.25 = 0.928$ of a time slot.

The duty cycle of the transmitter is then $12.5\% * 0.928 = 11.6\%$. If 11.6% is entered into the duty cycle window and the 'enable' box is ticked, the power meter will read the GSM phone power in the active part of the time slot with reasonable accuracy, after the 'apply' button is pressed. In some cases, when the modulation is GPRS for example, multiple time slots are used. The correct duty cycle can be found by multiplying 11.6% by the number of active time-slots.

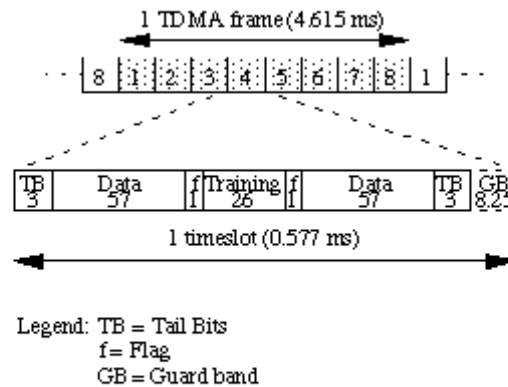


Figure 5: GSM TDMA structure and Normal Burst. Number of bits per field below the field legend.

N.B. The numbers in each section of the diagram above are bit periods. – Add the word 'bits' after the numbers.



Measurably better value

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To make this measurement do the following:

1. Start the application
2. Zero the sensor
3. Open the measurement control panel.
Select the control panel icon or select

Measurement > Control Panel.

4. Enable the duty cycle option and set the duty cycle percentage to 11.6%.
5. Select Apply - the sensor will read the GSM phone power in the active time slot with reasonable accuracy.



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