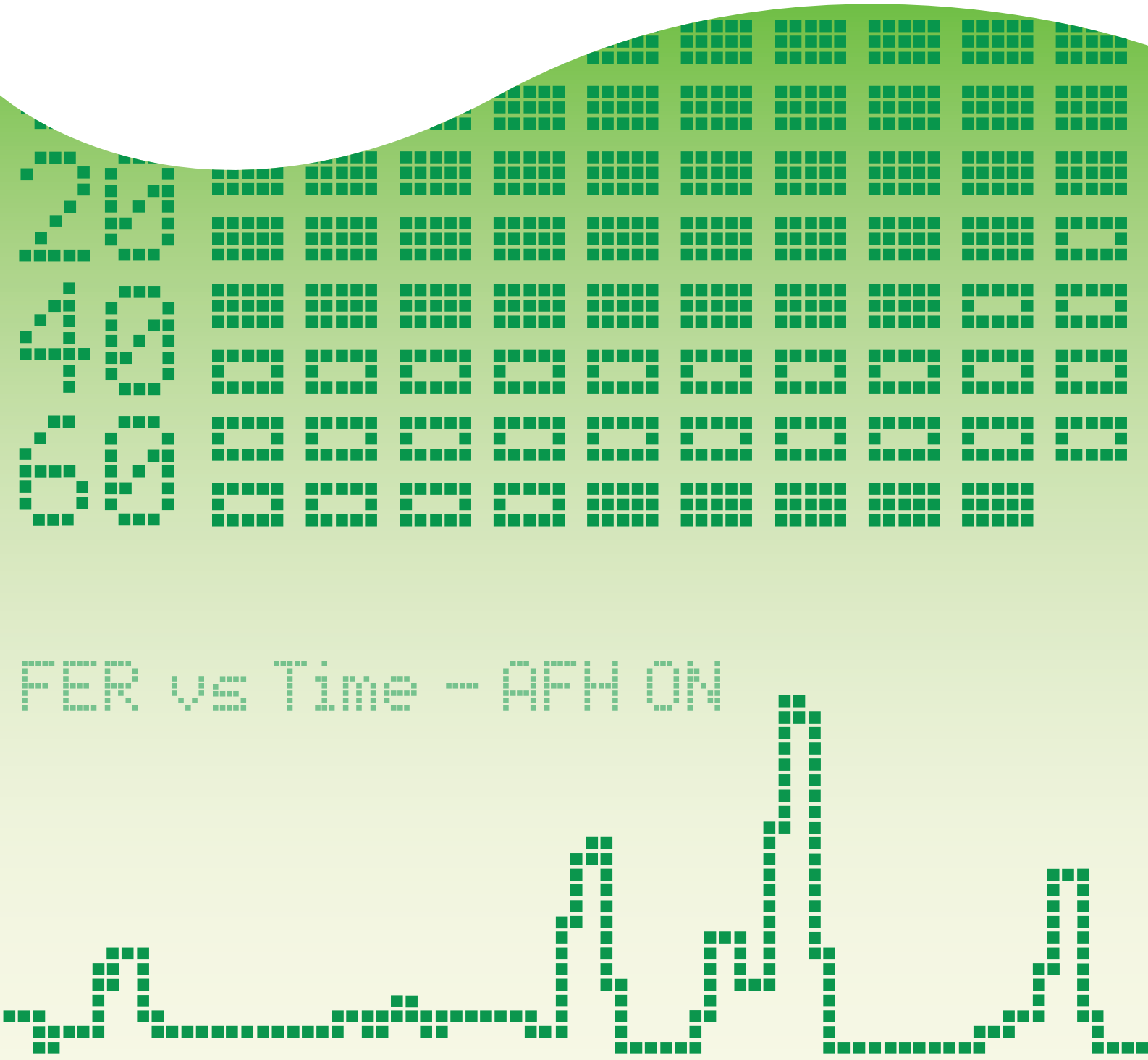
Product Information Sheet

Anritsu

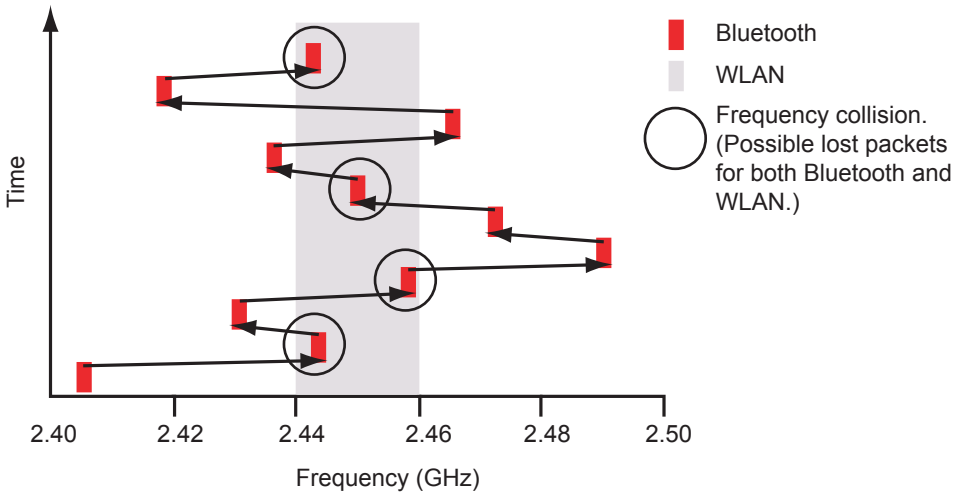
MT8852A-15

Adaptive Frequency Hopping option for the MT8852B

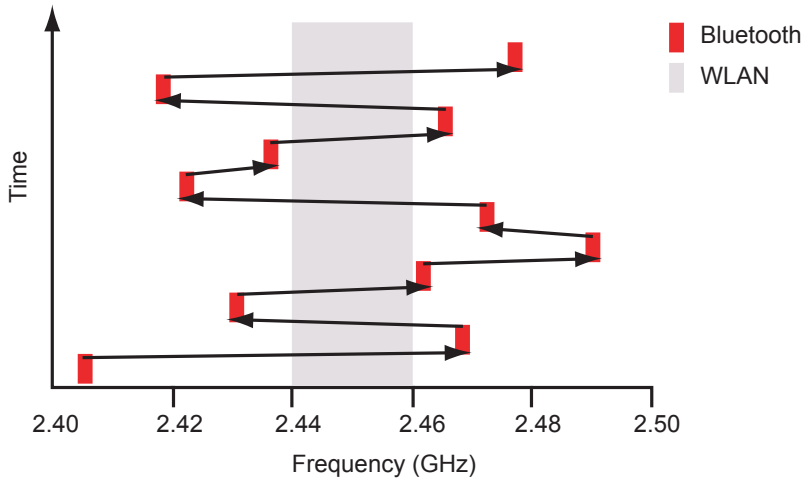


What is Adaptive Frequency Hopping?

When two Bluetooth devices connect under normal circumstances, they establish a basic frequency hopping scheme across 79 frequency channels in the 2.4 GHz ISM band, hopping at a rate of 1600 times per second. However, as is becoming increasingly common, interference may be encountered in environments where other wireless technologies, such as 802.11 WLAN or DECT are also active. Blocked channels, caused by interference, result in a deterioration in the performance of the connection, and this in turn results in poor voice quality or reduced data transfer rates. To limit the impact of this interference, an adaptation of frequency hopping, known as Adaptive Frequency Hopping (AFH) was introduced by the Bluetooth Special Interest Group in the 1.2 Bluetooth specification. AFH aims to restore the performance of a Bluetooth connection by identifying channels with high error rates and excluding the use of these channels thereafter. The figure below shows an example of Bluetooth packets being blocked by WLAN transmission within the same radio band.

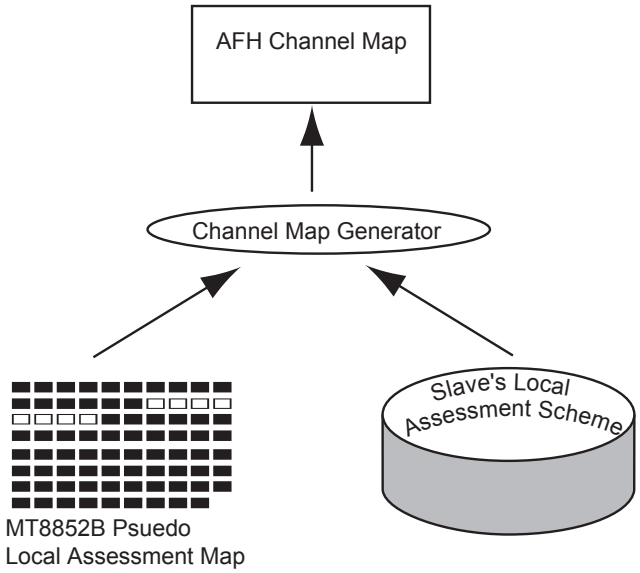


When AFH is enabled, the channels in use by WLAN are excluded and the Bluetooth packets are restricted to other channels where there is less chance of interference.



MT8852B Implementation of AFH

When Bluetooth devices that implement the 1.2 specification are connected, each device can create its own Local Assessment Scheme. This is a channel map that defines which channels the device assesses to be clear and which are experiencing interference. The MT8852B is designed to respond to the EUT assessment of the channels experiencing interference. The MT8852B, being the Master device, creates an Active Channel Map that is the combination of the EUT's local assessment scheme and any channels that the user has manually masked from the user interface. This is shown in the figure below.



The Active Channel Map defines the permitted channels that the MT8852B and EUT use whilst frequency hopping.

The MT8852A-15 option allows you to:-

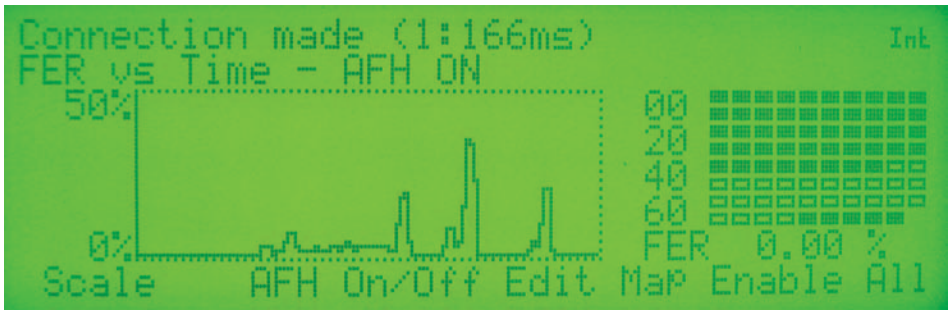
- Connect to an EUT using the Faster Connection feature within the Bluetooth 1.2 specification and display the connection time in milliseconds.
- Display the EUT Bluetooth 1.2 Supported Features map, including AFH capabilities.
- Create an AFH connection to the EUT.
- Read the EUT Local Assessment Scheme in the presence of an external interfering signal (e.g. WLAN).
- Manually define additional channels to mask in the MT8852B Psuedo Local Assessment Map.
- Display a graph of channel utilization against time to measure the speed with which an EUT masks channels when an interfering source is activated.
- Display a graph of Frame Error Rate (FER) against time to validate that an EUT identifies all "Bad" channels and maintains a zero or low FER.
- Establish an audio SCO link so that the audio quality can be monitored in the presence of interfering signals, and ensure that the AFH functionality maintains a high quality audio path.

Channel Utliization Against Time

This screen presents a graph with one second resolution of the number of channels masked by the EUT. It can be used to measure the time that it takes an EUT to respond to the introduction of an interfering signal source. When the interfering source is removed, the same display shows the time that it takes an EUT to re-introduce the, now clear, channels into the hopping scheme.

Frame Error Rate Against Time

This screen presents a graph with one second resolution of the FER of the Bluetooth link with AFH enabled. When an interfering source such as a 802.11 WLAN access point is activated, the FER can be seen to increase immediately. As the EUT's local assessment scheme identifies the "bad" channels and reports its assessment to the MT8852B, the FER decreases as channels are removed from the hopping plan.



Audio Measurements with AFH

The MT8852B also supports SCO connections with AFH active. This facilitates analysis of the impact of an interfering source on the quality of an audio signal.

MT8852A-15 Option Summary

Order code	MT8852A-15
Faster connection	Displays connection time in milli-seconds
AFH graphical screens	Channel utilization against time (120 seconds active display with one second resolution). FER against time (120 seconds active display with one second resolution)
AFH active channel map	Live display of currently active channel map
AFH settings	AFH On/Off EUT reporting rate (1 to 30 seconds) EUT reporting On/Off
MT8852B Pseudo local assessment	Manual setting of masked chan-nels
Minimum number of active channels	Can be set to 1 (Bluetooth specifi-cation requires a minimum of 20 active channels in AFH mode)
Audio capability	AFH enabled with SCO connection established.

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Ordering information:

Part number	Item
MT8852A-15	Adaptive Frequency Hopping

Data subject to change without notice. For the most recent specification visit: www.eu.anritsu.com

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