Measuring Receiver Sensitivity of a *Bluetooth* device at less than -90 dBm

Introduction

The MT8852B has a transmit power level range of 0 dBm to -90 dBm. The latest generation of *Bluetooth* devices often have sensitivity better than -90 dBm. This application note explains how to use the MT8852B to measure the receiver sensitivity of devices below -90 dBm.

Procedure

Receiver sensitivity can be measured at a power less than -90 dBm by putting a fixed attenuator on the output port of the MT8852B and entering the attenuation value as an offset.

The new path offset mode (PAD) can be selected only by sending the GPIB "PATHOFF" command and using the "FIXEDOFF" command to specify the pad value.

When the Pad offset mode is enabled, an additional item ("PAD") is added to the settings available at the "Path offset" field on page 3 of the "Script setup" screen.
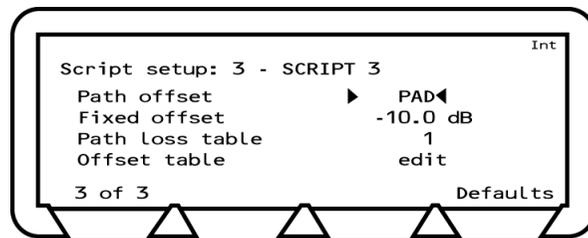

Figure 1. Script Setup Page 3 of 3

Note: The specified Pad offset is applied on a script by script basis and does not affect the operation of path offsets that have already been specified.

MT8852B Transmitter Range

If "Path offset" is set to "Off", "Fixed", or "Table", the settable range is 0 to -90 dBm even if an attenuator offset value has been entered. If "Path offset" is set to "PAD", the specified offset is added to the minimum transmitter power level. A -10 dB path loss, for example, changes the settable transmitter power range from [0 to -90 dBm] to [-10 to -100 dBm].

When Pad offset mode is deselected, all values lower than the minimum power (-90 dBm) are reset to that level. If a PAD offset value is changed (when Pad is selected), all values outside of the new range are set to the minimum or maximum power level as appropriate.

GPIB Commands

Use of a Pad offset is specified using the "PATHOFF" command.

Set command format	`PATHOFF<ws><script number><,><mode>`
	\<script number\> 1 to 10
	\<mode\>
	OFF No user offsets applied.
	FIXED Apply the fixed offset value for all channels.
	TABLE Apply the offset table.
	PAD Apply the PAD offset.
Example	To set the PAD offset value the command would be:
	`PATHOFF 4,PAD`
Query command format	`PATHOFF?<ws><script number>`
	\<script number\> 1 to 10
Response	The response is returned in the form of the command to set that state.
Example	`PATHOFF? 7`
Response	If script 7 test path offset was set to use the PAD offset, the response would be:
	`PATHOFF 7,PAD`

The Pad offset value is specified using the "FIXEDOFF" command.

Set command format	`FIXEDOFF<ws><script number><,><value>`
	\<script number\> 1 to 10
	\<value\> number of dB
	Range in Fixed Mode: 0 to -40.0 dB.
	Range in PAD Mode: 0 to -35.0 dB
Example	To set the fixed offset to -10 dBm in script 4, the command would be:
	`FIXEDOFF 4,-10.0`
Query command format	`FIXEDOFF?<ws><script number>`
	\<script number\> 1 to 10
Response	The response is returned in the form of the command to set that state.
Example	`FIXEDOFF? 7`
Response	If script 7 fixed offset was set to -2.3 dBm, the response would be:
	`FIXEDOFF 7,-2.3`