

# Application Note

**AEROFLEX**  
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**FASTBIT FB100A**

**MEASURING "IN-CIRCUIT" BER ON LIVE DATA**



Flexible hardware connection and programmable framing enhances R&D engineers' test capability.

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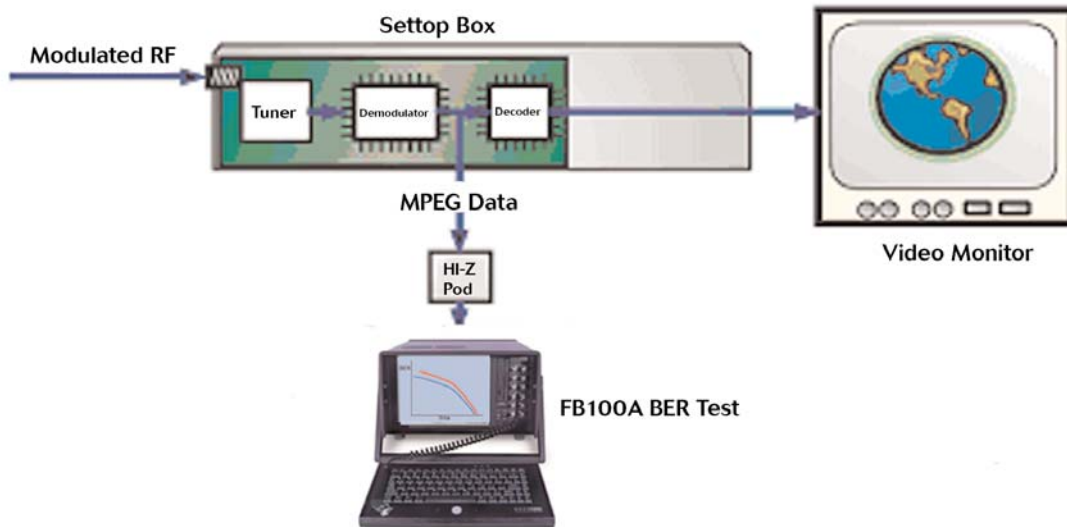


Figure 1. Interfacing FB100A to DUT with High-Z Pod, in-circuit BER testing

### TECHNICAL HIGHLIGHTS

- BERT can be connected with Hi-Z pod directly to IC output
- Programmable frame filter in FB100A filters data to be analyzed by FB100A BERT
- Quality of decoded audio, video can be correlated with BER of physical layer
- Dropped frames associated with analyzer sync loss

### RELATED APPLICATION NOTES

- BER ANALYSIS USING FRAMED DATA
- CABLE MODEM PHY PERFORMANCE EVALUATION
- MEASURING BER OF DEVICES WITH UNIQUE SERIAL AND PARALLEL INTERFACES

### TEST DATA EMBEDDED IN MPEG TRANSPORT STREAM

In transmission systems using an MPEG-2 transport stream, "null" packets are inserted by the multiplexer when the multiplexer does not have data to transmit. These null packets can be used to transport test data, such as a PRBS pattern, which can be used by the FB100A BER test system for evaluating the BER.

By using the FB100A along with an appropriate interface pod, a high impedance electrical connection can be made to the demodulator IC, using micro-grabbers or a test header. The FB100A's Packet ID (PID) filter can be enabled to analyze the BER of packets with a predefined packet ID, such as the null PID. Because the FB100A taps into the transport stream unobtrusively, stream continuity is maintained and the decoder continues to perform its function.

The test engineer can verify the robustness and BER of the physical layer while correlating decoder problems. The BER at the "Threshold of Visibility", when video is lost, for example, can be ascertained by examining the payload BER of the null packets while observing video degradation on a monitor.

### THE FB100A OFFERS FLEXIBLE FRAME FILTERING

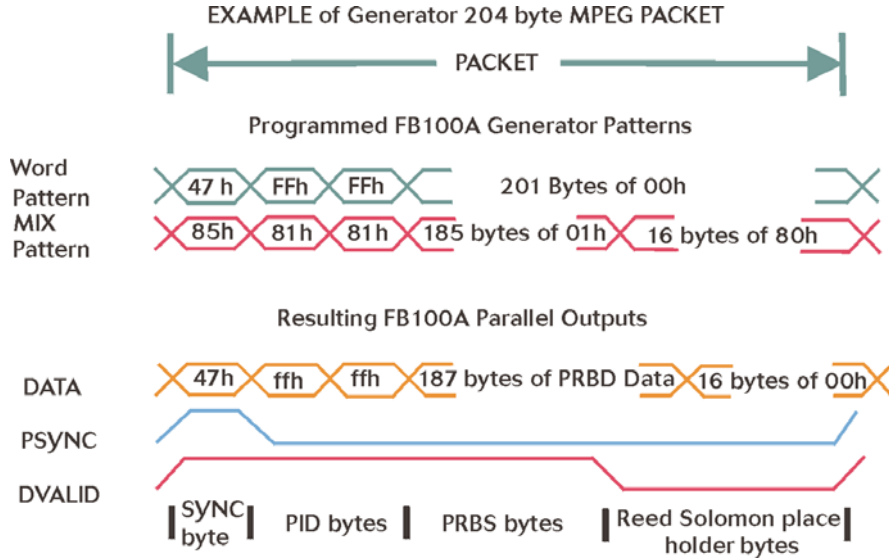
FB100A packet filtering is programmable allowing for a wide variety of user defined packet types. A packet is constructed by programming the overhead bytes, which contain the sync byte(s), two Packet ID (PID) bytes and any additional bytes needed for signaling. The payload section is then filled with the appropriate PRBS pattern. The sync byte(s) is used for packet synchronization. The PID bytes are used for filtering the incoming packets. Each of the PID bits has a corresponding enable/disable that is set in the PID Mask Register. Overhead bytes are not used in the BER measurement.

**CREATING PATTERNS AND CONTROL SIGNALS**  
**FB100A PACKET FILTER FEATURE**

**Generator**

Packets are assembled in the FB100A by using MIX mode. This mode allows you to program byte values into the sync byte and PID byte locations, and uses the pseudo-random data generator to fill

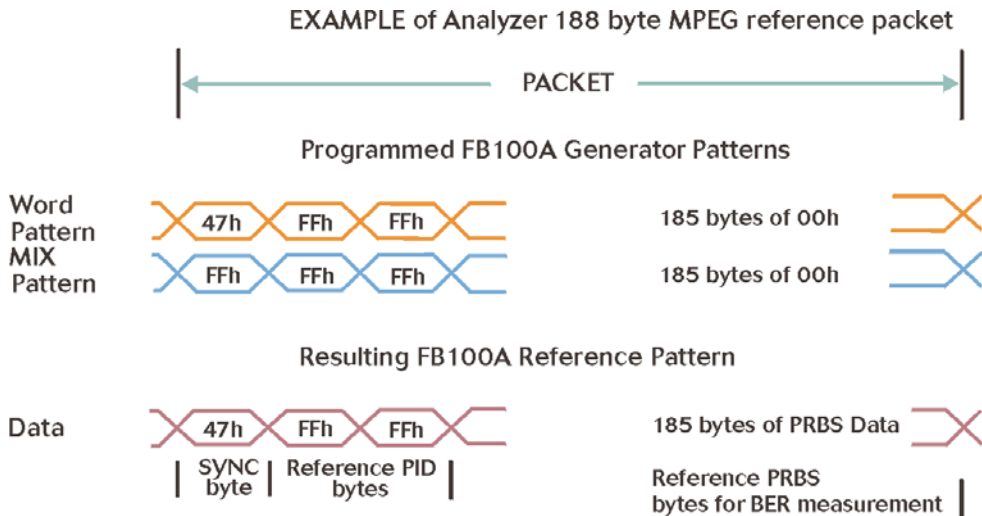
the payload section. The variable length pattern memory (up to 4MB) can be used to generate a single packet or multiple packets. Additional signals are available for providing a Sync pulse and data valid indicator if needed.



**Analyzer**

The FB100A analyzer reference pattern is programmed in a similar manner to the generator pattern using MIX mode. In this mode it will synchronize on the sync byte(s) provided at the beginning of the pattern. It will then compare the enabled PID filter bits to the corresponding incoming PID bit. Alternately

synchronization can be done using an externally provided sync pulse that is aligned with the first byte of each packet (select PSYNC Mode). The Analyzer then synchronizes to the PRBS data bytes of the filtered packets. The BER is measured over the PRBS bytes only.



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