EMSCAN real-time results

SERDES Case Study
EMxpert™

EMI Near-Field Emissions Profiles: Reducing Time-to-Market

Background: A major semiconductor manufacturer had already developed a point-to-point solution (half duplex) between Serializer/Deserializer (SerDes) devices. In the next generation, the SerDes interface was upgraded by embedding a bidirectional control channel together onto the high-speed serial link for a two-way transmission (full duplex).

Research Objective: Quantify the EMI emissions profile by comparing the half duplex deserializer to the next generation full duplex design. Determine whether the full duplex design impacts the EMI profile and, if so, quantify the difference.

Test Method: The design team utilized the on-site EMxpert near-field EMI scanner. They placed the original half duplex board on the scanner to generate a baseline measurement. After connecting power to the device under test (DUT), they activated the scan on a PC. (Fig. 1)

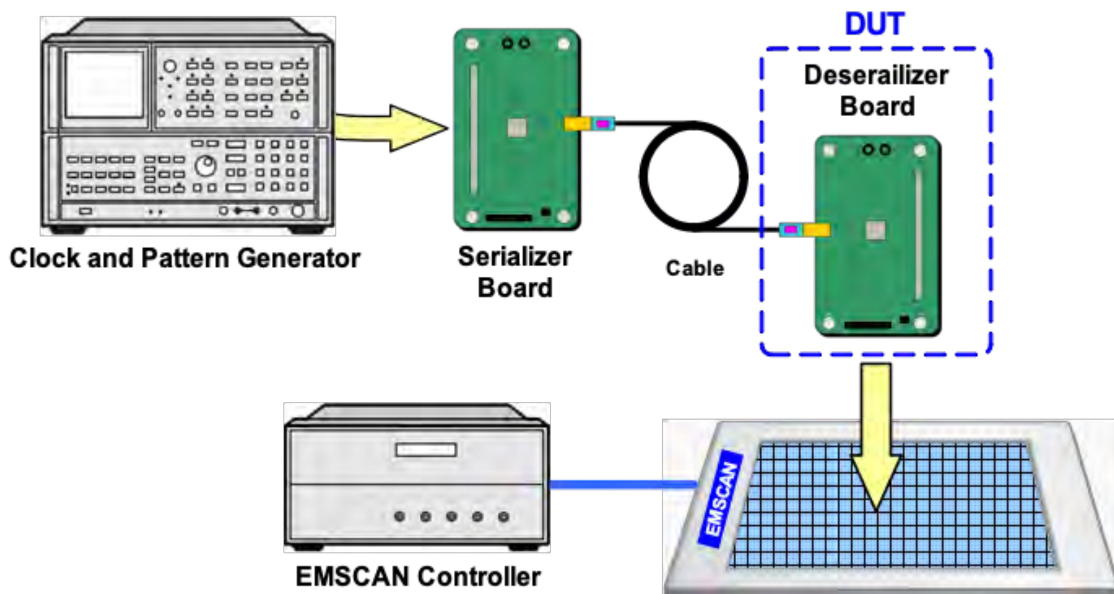

Fig. 1 Test Setup for EMI Scan

Using the identical test setup, the team replaced the baseline board with the new generation full duplex board. They also maintained identical scales for each profile.

Test Results: The EMxpert system generates and displays emissions profiles that include both spatial and spectral results. The profile of the baseline system appears in Fig. 2.

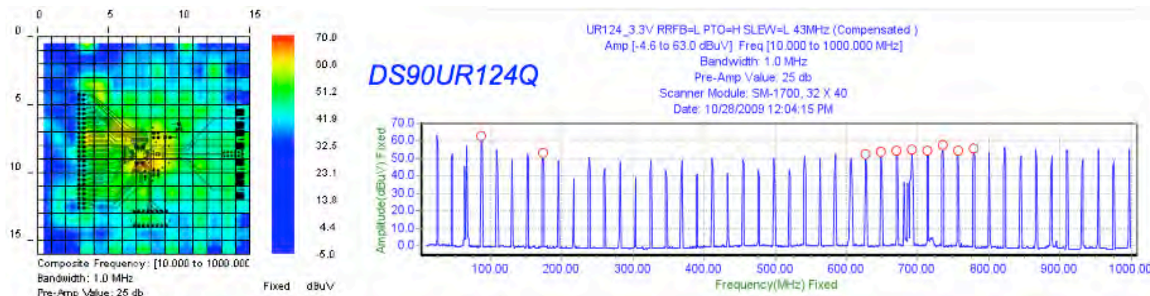

Fig. 2 Baseline results - SERDES in 1/2 Duplex Mode

By comparison, note the emissions scan for the full duplex scan in Fig. 3.

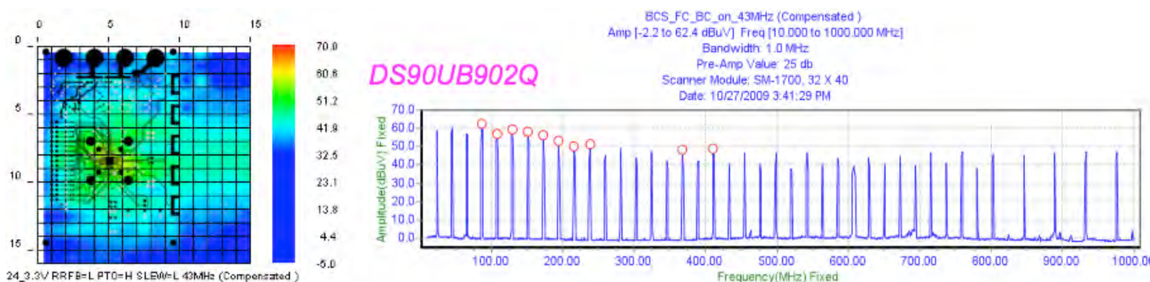

Fig.3 Emissions Profile – SERDES in Full Duplex Mode

Conclusions: The team carefully compared the spatial and spectral scan results. They observed no spikes, very similar peak emissions, and a slightly better EMI profile (more blue in the spatial scan) in full duplex mode than the baseline. By quantifying that no appreciable change occurred in full duplex mode, (Fig. 3) the team implemented the full duplex feature with no additional mitigation measures.

Performance Impact on Design Time: The design team conducted the scans on the EMxpert system in their offices. In a matter of minutes, they obtained the results shown above. Because the emissions profile clearly demonstrated a superior emissions profile, the design required no additional mitigation. To test the new design in a chamber would have required that an engineer travel to an off-site test facility for the better part of a day. Results would have taken another two weeks.

To learn more: info@EMSCAN.com

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