

Appendix B

Data for Optoelectronic Testing of Fully Integrated OE-MCMs

B.1 Schematic and Photos of Optical Test Rig Set-up

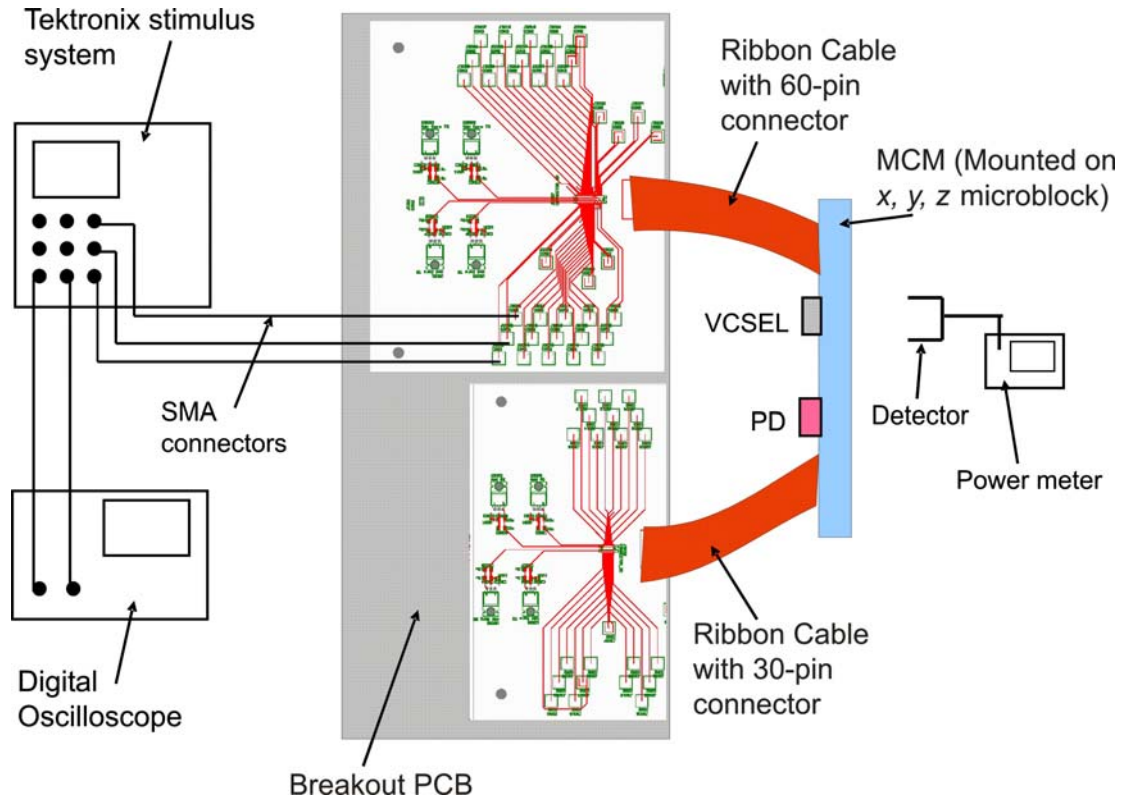


Figure B-1) Schematic showing the experiment set-up of the optical rig used to test the fully populated modules

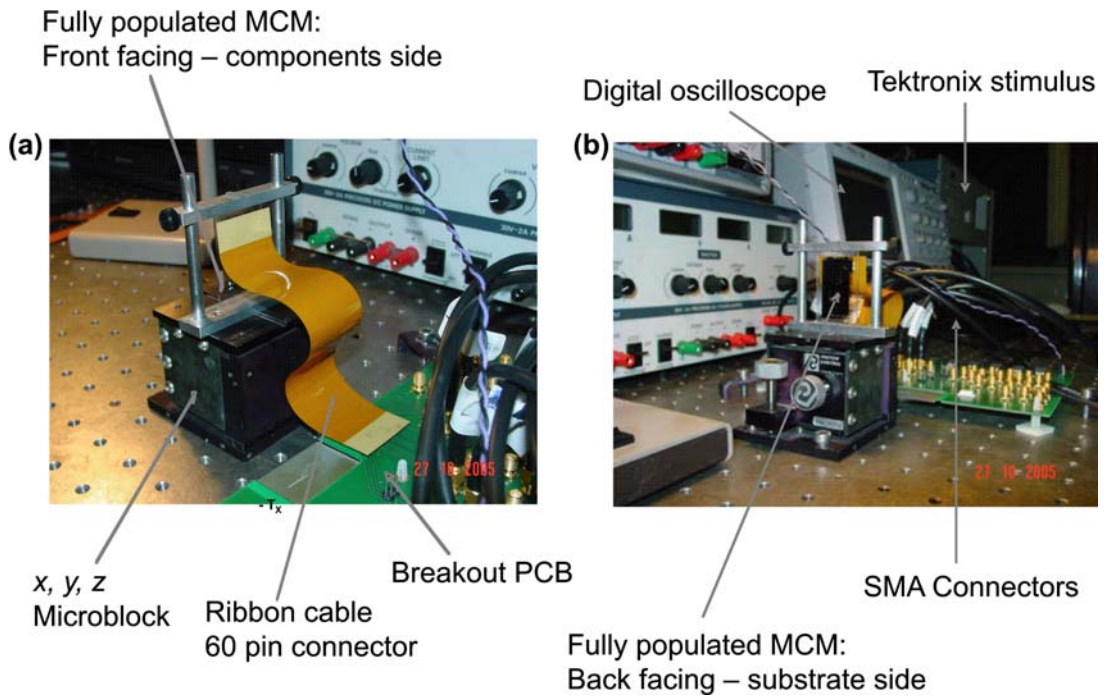


Figure B-2) Photos of Optical test rig. Ribbon cable with 60-pin connectors connect the MCM and PCB: (a) MCM front facing – components side: flip chip bonded, (b) MCM back facing – substrate side, where VCSEL optical output was measured.

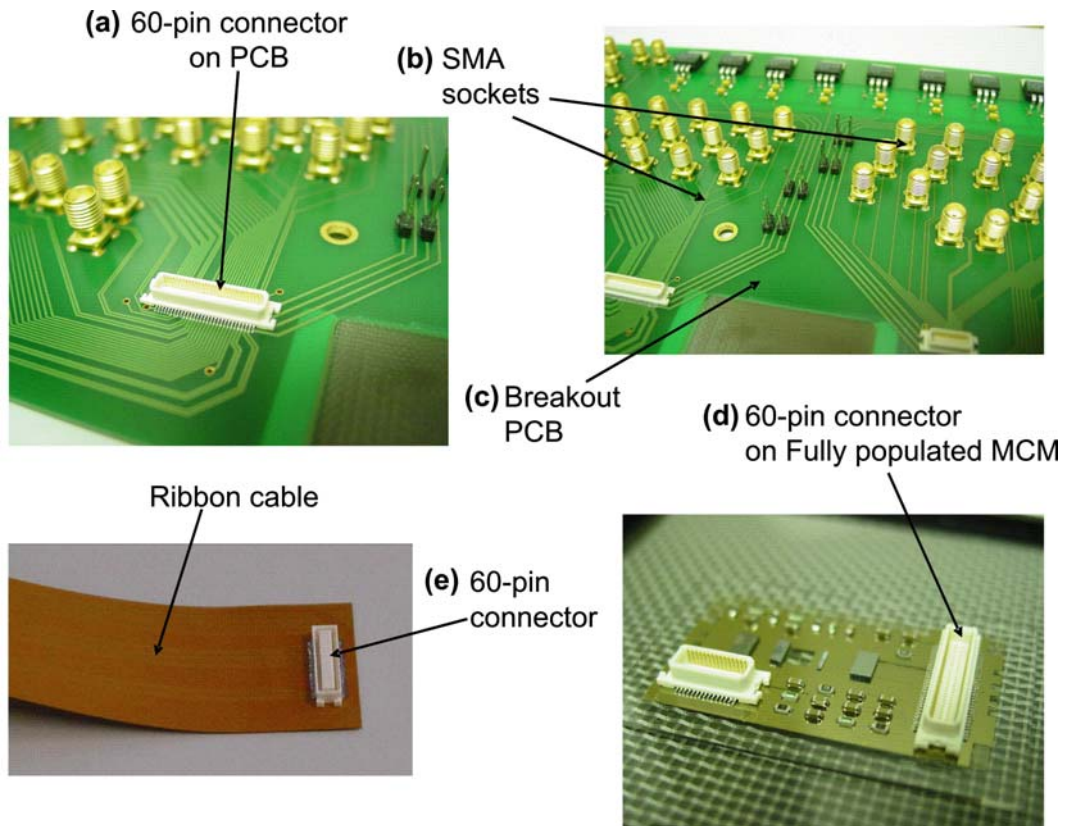


Figure B-3) Photos showing: (a) 60-pin connector on breakout PCB, (b) SMA sockets on PCB, (c) Breakout PCB, (d) 60-pin connector on populated MCM, (e) Ribbon cable and associated 60-pin connector.

B.2 Programmed Digital Sequence Signals

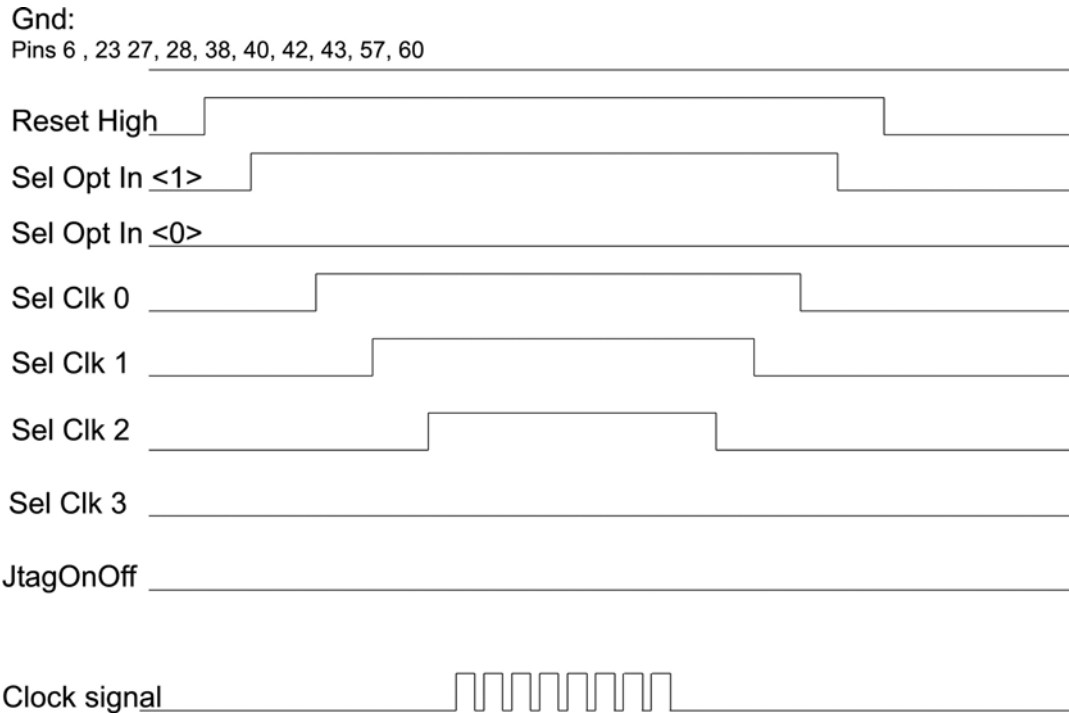


Figure B-4) Picture showing pre-programmed sequence of digital signals on the Tektronix stimulus for Optical testing of fully populated test modules.

| Digital Signal Name | Functionality |
|----------------------------|--|
| Gnd | Ground supply |
| Reset High | Asynchronous Reset of all digital functionalities |
| Sel Opt In<1> | Selects the Optical canal <1> to use |
| Sel Opt In<0> | Selects the Optical canal <0> to use |
| Sel Clk 0 | Selects the Clock input pin 0 = LVDS external clock |
| Sel Clk 1 | Selects the Clock input pin 1 = Unipolar external clock |
| Sel Clk 2 | Selects the Clock input pin 2 = Fast clock/8 |
| Sel Clk 3 | Selects the Clock input pin 3 = Fast clock/8 |
| JtagOnOff | 1 = Configuration using Jtag 0 = Configuration using I/O pins |
| Clock Signal | Transmission Clock signal |

Table B-1) Functionality details of pre-programmed digital signals