

DORIC4A TEST NOTE

29/06/2000

9 DORIC4A die were mounted on a ceramic tile and probe tested. All worked correctly to nominal specification (see below).

These 9 die irradiated with 2.5×10^{14} n/cm² at Ljubljana.

Die taken to Birmingham where they were removed from the ceramic substrate and attached to powered test substrate. With power applied they were gamma irradiated to 500kGy.

Die removed from powered substrate and bonded into 40-pin DIL packages for final test. All 9 packaged devices were fully functional with no apparent degradation in performance.

Nominal specification:

Power supply current must be within acceptable limits. With minimum input signal amplitude the decoder must work and produce clock and data from a biphasemark encoded signal stream. The minimum input signal is applied as a single-ended input into either of the two inputs in turn and both must work. All output signals must be of correct level and duty cycle (clock) or pulse width (data). Output enable/inhibit function tested with signal levels less than the minimum expected. The present test only runs at 40MHz because no programmable signal generator is available. When a suitable generator has been purchased the tests will be performed at frequencies above and below 40MHz to ensure the control loop has a sufficient wide operating range to cover any component variation over lifetime.

This test equipment and procedure is being developed as the die acceptance test for DORIC4A die on the production wafers. Such tests need to be comprehensive but reasonably quick to perform. The tests are driven by a LabView system and the pass/fail criteria are set by values in a table. There is a clear indication of pass or fail. The measured values from each die test may be stored as a text file for analysis. The equipment may be easily connected to the probe station and used to produce wafer maps of good/bad devices. Any advice or suggestions for improving the procedure will be considered.