

## Taiwan Opto-package

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### Introduction

20 of the new style Taiwan opto-packages have been produced with Truelight VCSELs and Centronic epitaxial Si PIN diodes. This note contains results from the integration of one of these packages onto an SCT opto-flex cable. The opto-package contains 2 VCSELs and one pin-diode and is pig-tailed to 50/125 fibre. More details of the package are available from the SCT links pages. The opto-flex also has an opto-hybrid with DORIC4 and VDC chips.

### VCSELs

The LI curves for the two VCSELs are given in below.

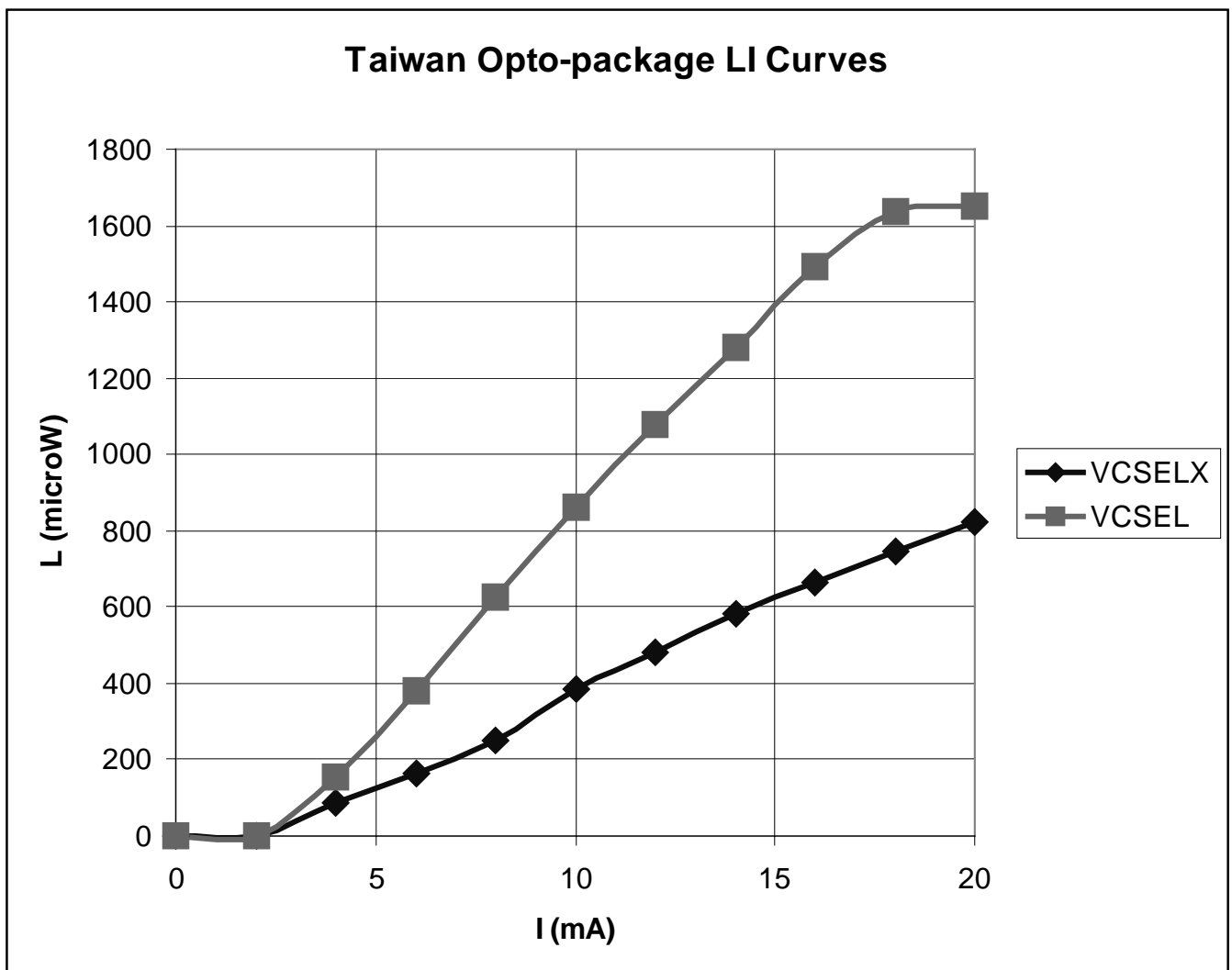


Figure 1 LI curves for the VCSELs.



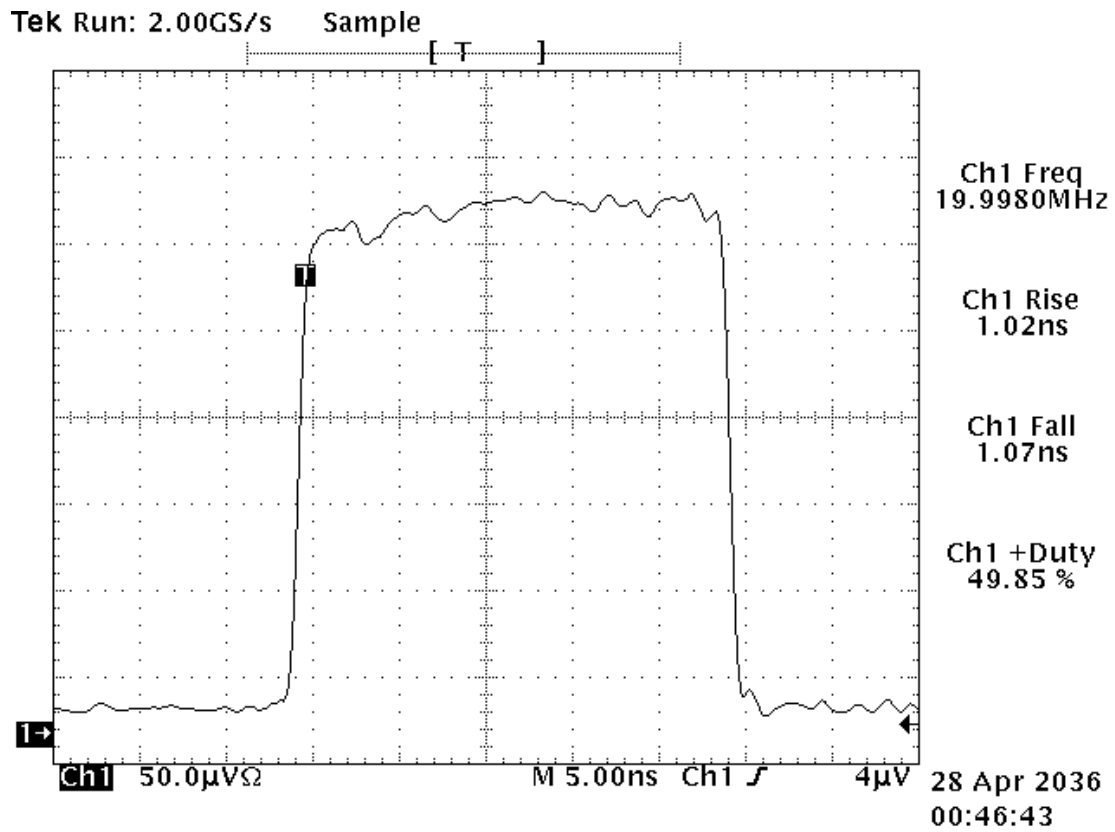


Figure 3 Optical waveform of VCSELX measured with the optical probe.

The waveforms from the two VCSELs in infinite persistence mode (integrated for 60s) are shown in below

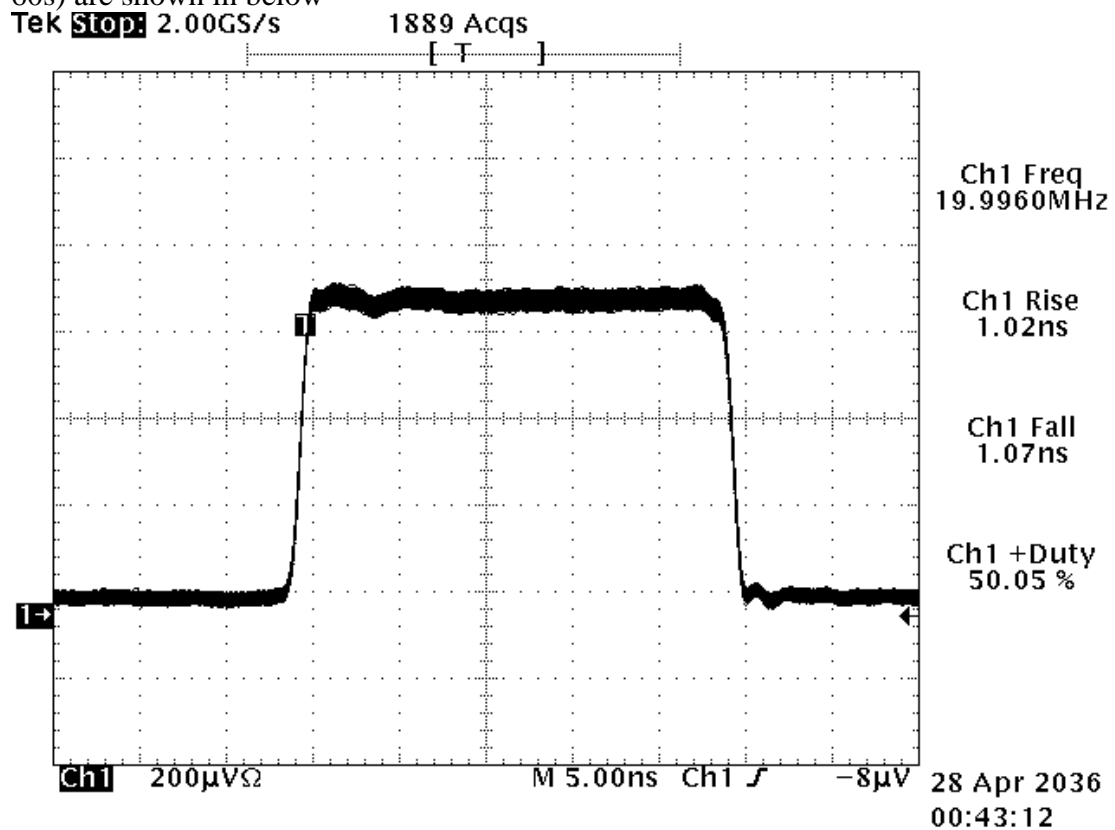


Figure 4 Optical waveform of VCSEL measured in infinite persistence mode.

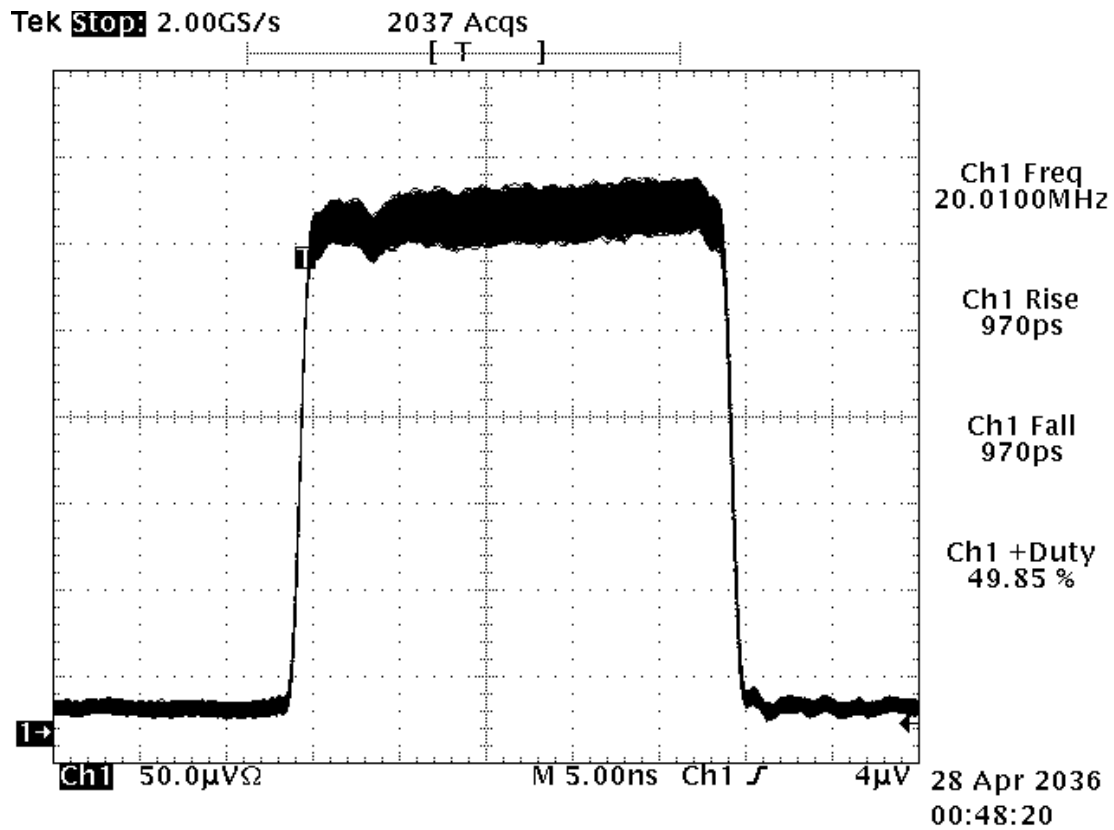


Figure 5 Optical waveform of VCSELX measured in infinite persistence mode.

### ***PIN diode***

The responsivity of the PIN diode was measured with VCSEL light at 850 nm to be 0.41 A/W which is slightly lower than expected.

### ***BER for TTC links***

The BER for the TTC link was measured as a function of the amplitude of the optical signal input to the PIN diode and the results are given in Table 2 below.

Table 2 BER measurements for the TTC link.

Optical Amplitude (μW)	Errors in 60s
149	0
123	0
105	0
77.7	0
74.0	0
63.4	DORIC mis-locks

To test for cross-talk the measurements were repeated whilst simultaneously pulsing VDCX asynchronously at 20 MHz with a current of 20 mA. There was no difference in the results. These measurements show that the TTC links works well within ATLAS specifications. A longer run at an optical amplitude of 950 μW showed no

error in 1000s, which corresponds to an upper limit on the BER of less than  $6 \cdot 10^{-11}$  which is well below the ATLAS specification of  $10^{-9}$ .

### ***Conclusions***

The Taiwan opto-package with Centronic epitaxial Si PIN diode and Truelight VCSELs appears to work well when integrated into the ATLAS optical links system. The system performance conforms to the ATLAS specifications.