The Quality Control Test of Two ASICs
For The ATLAS Liquid Argon Calorimeter Phase-I Upgrade

Le Xiao, a,b James Thomas, a Chonghui Liu,b Emily Baker, a Mary Lena Bieele,b Chufeng Chen, b Elijah Cruda, b Nanchen Feng, b Daiao Gong, b Isaac Kay, b Tiankuan Liu, b Taiti Lozano-Brown, b Ledly Murphy, a Paylon Price, b Chelby Rhoades, b John Harrison Ray, a Aashmita Radhakrishnan Santhi, b Daniel Sela, a Quan Sun, a, b Jian Wang, a, b Zheng Guang Wang, b Zhiyue Wang, b Wei Zhou, b Jingbo Ye, b

a Department of Physics, Central China Normal University, Wuhan, Hubei 430079, P.R. China
b Department of Physics, Southern Methodist University, Dallas, TX 75275, USA

Abstract

Two ASICs, LOCx2 and LOCld, have been produced. LOCx2 (a dual-channel transmitter ASIC) and LOCld (a dual-channel VCSEL driver ASIC) have been designed for the ATLAS Liquid Argon Calorimeter (LAr) Phase-I trigger upgrade.

Introduction

The overall yield is 73.9% of the chips passed the test. About 5300 chips passed the test, and the overall yield is 73.9%.

LOCld QC Test

- The test is completed.
- About 5300 chips passed the test.
- The overall yield is 73.9%.

LOCx2 QC Test

- All dies are packaged in 100-pin QFN packaged.
- All chips will be tested for eye diagrams and Bit Error Rate (BER).

- It takes 3 minutes per chip to measure the eye diagrams for two output channels in three frequencies (40 MHz, ±1%, and ±1%).
- It takes 50 minutes to measure the BER of 6 chips in one setup (we have two) at three power voltages (nominal, ±10%, -10%).
- About 74% chips passed the eye diagram test.
- Among the chips that passed eye diagram tests, 80% passed the BER test.
- The overall yield is about 59%.
- The test is still ongoing.
- We need 2981 good chips.