

# ROCのDATAファイバー Syncエラー問題

RIKEN/RBRC

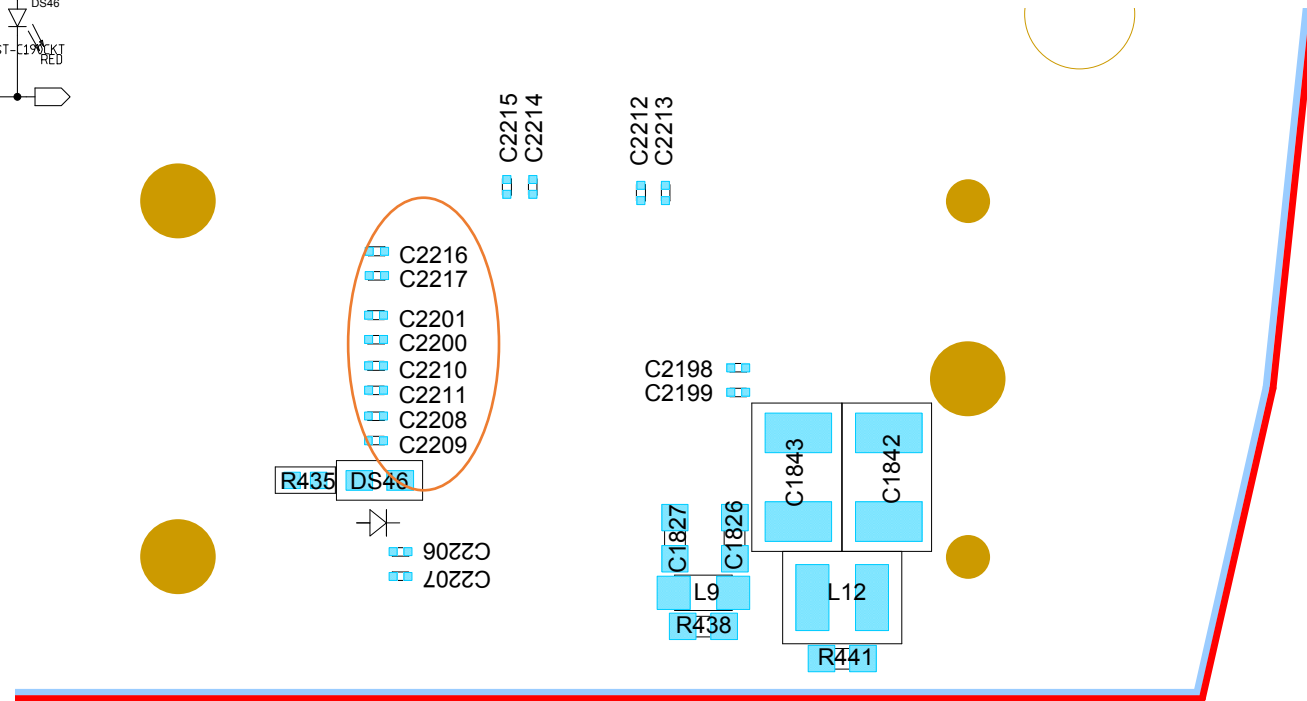
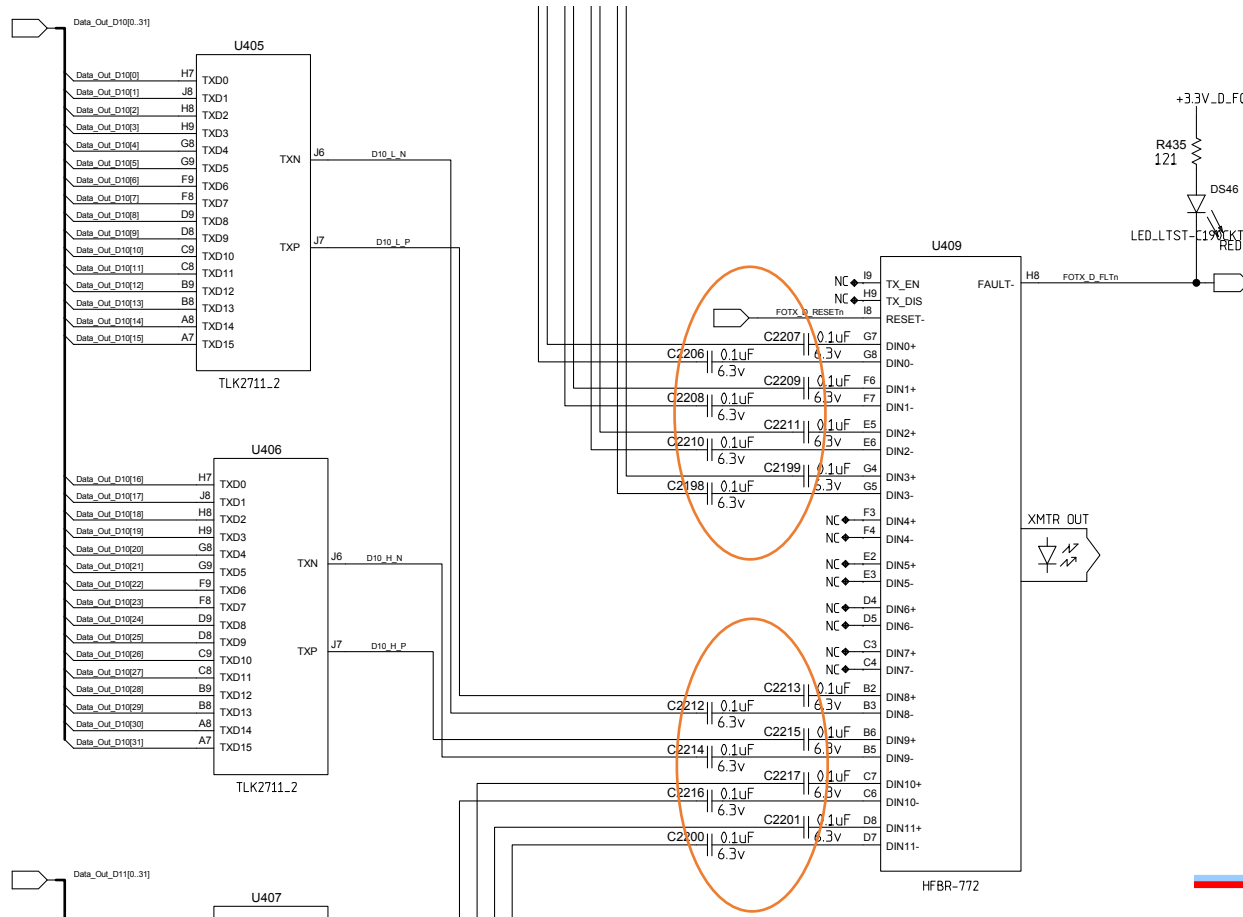
Itaru Nakagawa

# Consulted with John Kuczewski

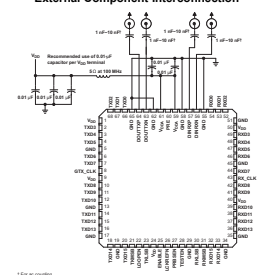
- May 13, 2022
- He suggested following debugging approaches
  1. Monitor current draw of power supply if there is any change in the current draws when synchronization is failed.
  2. Check regulator outputs to see if there is any voltage drop.
  3. Execute PRBS Test for the health check of TLK2711-SP chip.
  4. John will setup a 4GHz Fast Oscilloscope and optical divider casset at the silicon lab **at BNL** to help us diagnose the problem.
  5. The existence of HFBR-772 shouldn't affect on the comma word issuance in upstream ICs. However, there is a better way to probe by scope as proposed in the next page.

# Probe Point of Oscilloscope

To be probed AC coupling capacitors which are dedicated to each channels. This way, there is no need to remove the driver for monitoring signals.



Backside of HFBR-772 area



# Pseudo-Random Bit Stream (PRBS)

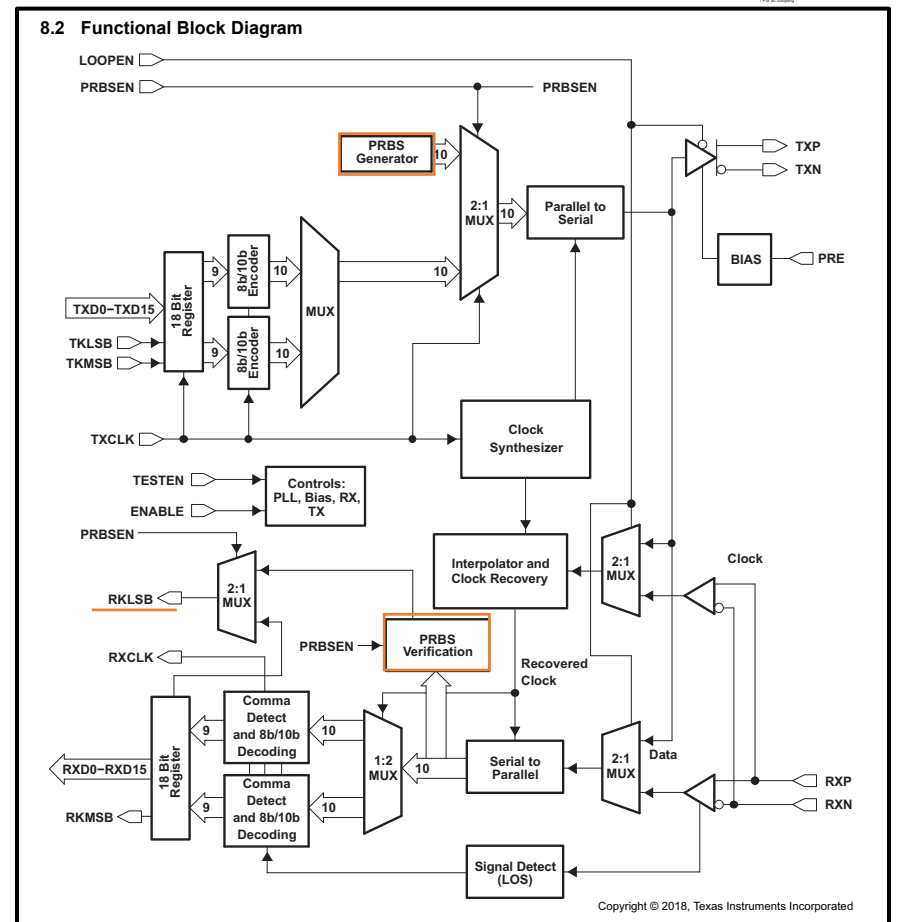
## 8.3.5 Pseudo-Random Bit Stream (PRBS) Generator

The TLK2711-SP has a built-in  $2^7 - 1$  PRBS function. When the PRBSEN pin is forced high, the PRBS test is enabled. A PRBS is generated and fed into the 10-bit parallel-to-serial converter input register. Data from the normal input source is ignored during the PRBS mode. The PRBS pattern is then fed through the transmit circuitry as if it were normal data and sent out to the transmitter. The output can be sent to a bit error rate tester (BERT), the receiver of another TLK2711-SP, or looped back to the receive input. Because the PRBS is not really random, but a predetermined sequence of 1s and 0s, the data can be captured and checked for errors by a BERT.



## 8.3.14 PRBS Verification

The TLK2711-SP also has a built-in BERT function in the receiver side that is enabled by the PRBSEN. It can check for errors and report the errors by forcing the RKLSB pin low.



# 方針

- Data Fiberエラーが未解決のROCはBNLに送って、BNLでJohnの協力を得ながらデバッグを続ける。