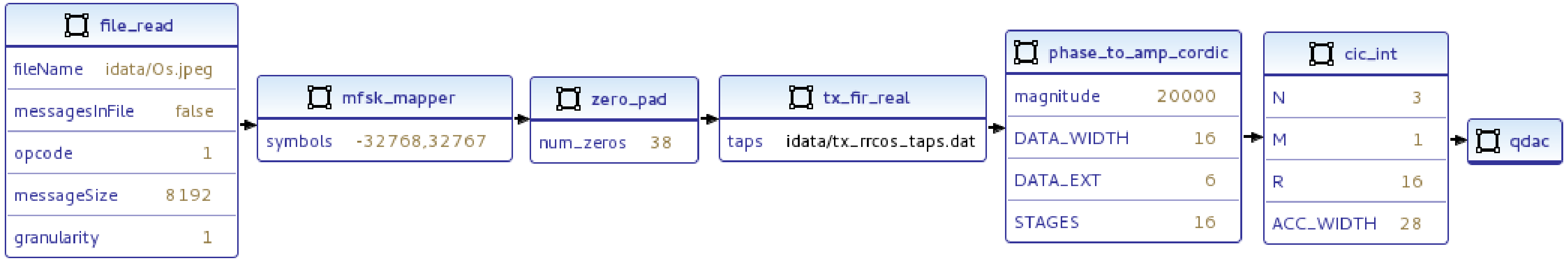
FSK Application Demo

OpenCPI Reference Applications

- Two reference RF applications are included as part of the OpenCPI 1.3 release:
  1. rx_app – a program used to stream timestamped samples to file
  2. FSK – a FSK modulator/demodulator. FPGA internal loopback and RF (tx,rx,txrx)
- Located in the ocpi.assets project
- Target the Matchstiq-Z1 platform
- Include documentation on building and testing

FSK Reference Application (IDE View)

Transmit Path



file_read
fileName idata/Os.jpeg
messagesInFile false
opcode 1
messageSize 8192
granularity 1

mfsk_mapper
symbols -32768,32767

zero_pad
num_zeros 38

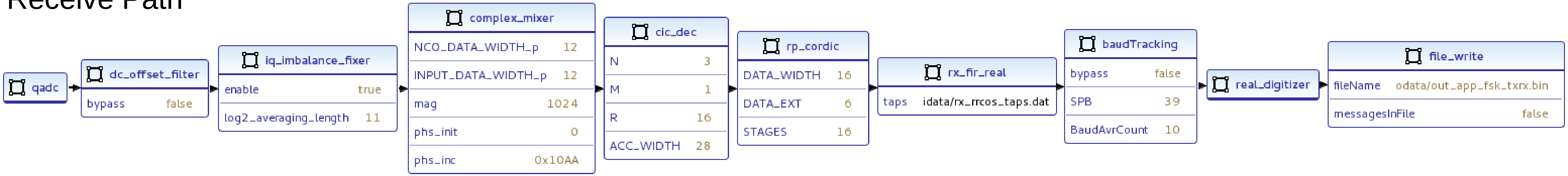
tx_fir_real
taps idata/tx_rrcos_taps.dat

phase_to_amp_cordic
magnitude 20000
DATA_WIDTH 16
DATA_EXT 6
STAGES 16

cic_int
N 3
M 1
R 16
ACC_WIDTH 28

qdac

Receive Path



qadc

dc_offset_filter
bypass false

iq_imbalance_fixer
enable true
log2_averaging_length 11

complex_mixer
NCO_DATA_WIDTH_p 12
INPUT_DATA_WIDTH_p 12
mag 1024
phs_init 0
phs_inc 0x10AA

cic_dec
N 3
M 1
R 16
ACC_WIDTH 28

rp_cordic
DATA_WIDTH 16
DATA_EXT 6
STAGES 16

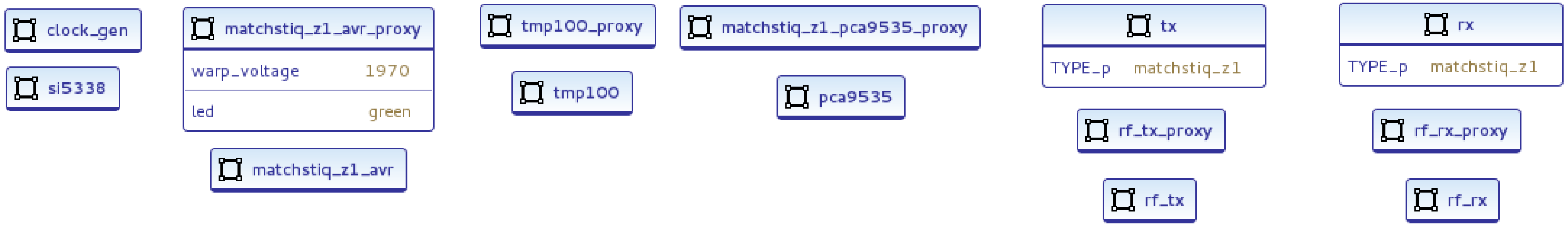
rx_fir_real
taps idata/rx_rrcos_taps.dat

baudTracking
bypass false
SPB 39
BaudAvrCount 10

real_digitizer

file_write
fileName odata/out_app_fsk_txrx.bin
messagesInFile false

Board Support Package Components for TX/RX configuration



clock_gen

si5338

matchstiq_z1_avr_proxy
warp_voltage 1970
led green

matchstiq_z1_avr

tmp100_proxy

tmp100

matchstiq_z1_pca9535_proxy

pca9535

tx
TYPE_p matchstiq_z1

rf_tx_proxy

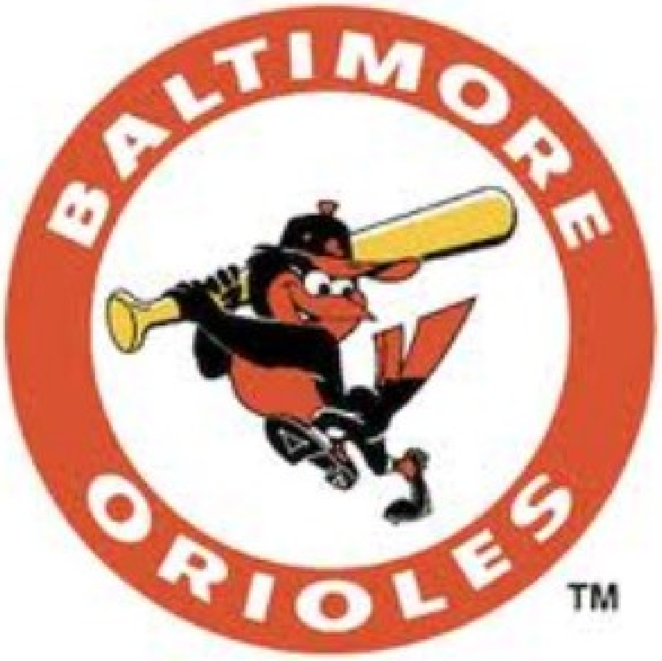
rf_tx

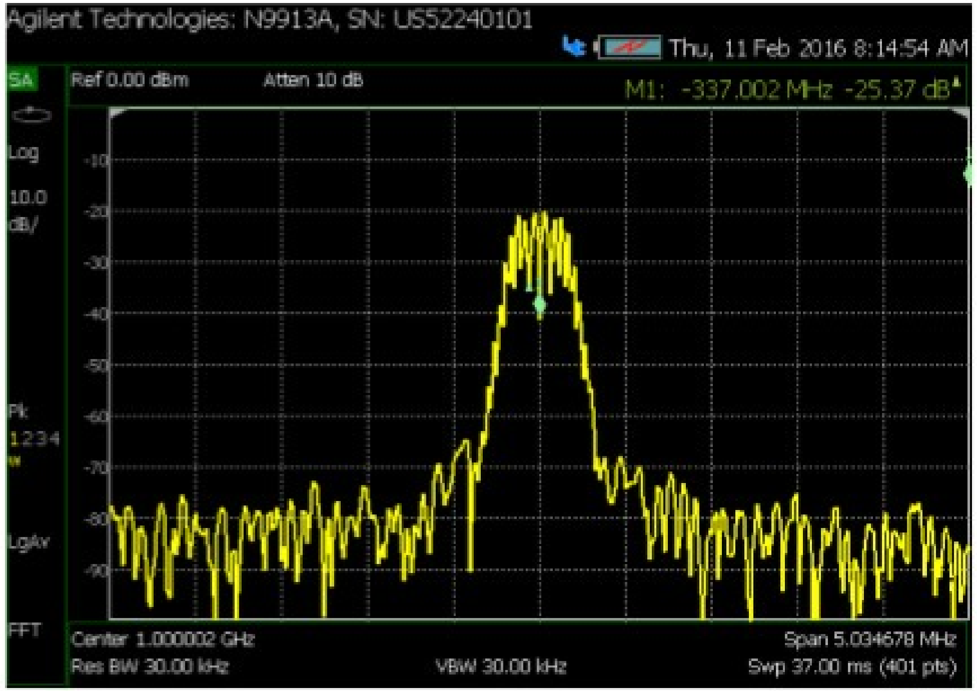
rx
TYPE_p matchstiq_z1

rf_rx_proxy

rf_rx

FSK Reference Application Expected Results




Agilent Technologies: N9913A, SN: US52240101
Thu, 11 Feb 2016 8:14:54 AM
SA
Ref 0.00 dBm
Atten 10 dB
M1: -337.002 MHz -25.37 dB
Log
10.0 dB/
Pk
1234
LgAv
FFT
Center 1.000002 GHz
Span 5.034678 MHz
Res BW 30.00 kHz
VBW 30.00 kHz
Swp 37.00 ms (401 pts)

Input Data Image	**Transmit Spectrum**
Prepended with training sequence to aid with recovery	Centered at 1 GHz ~-25 dBM, Bandwidth: ~1 MHz