

TWTMC-FSDO Sine to square converter fanout/switched output

The board converts the sine wave output of 2 oscillators or frequency doublers into square wave. It provides 2 outputs for each input (fanout) or 2 switched output between the 2 inputs. It can be controlled via a single fixed on-off signal or via two independent fixed/pulse signals.

It accepts sine wave or square wave inputs, the outputs are 3V3 CMOS.

Features:

Oscillator type: any

Input: sine wave (max +16 dBm) or square wave (CMOS 3V3 or 5V)

Frequencies: 5.6448 MHz to 98.304 MHz

Output: square wave (CMOS 3V3 +15 dBm)

Controls: 3V3 (5V tolerant) with optical isolation

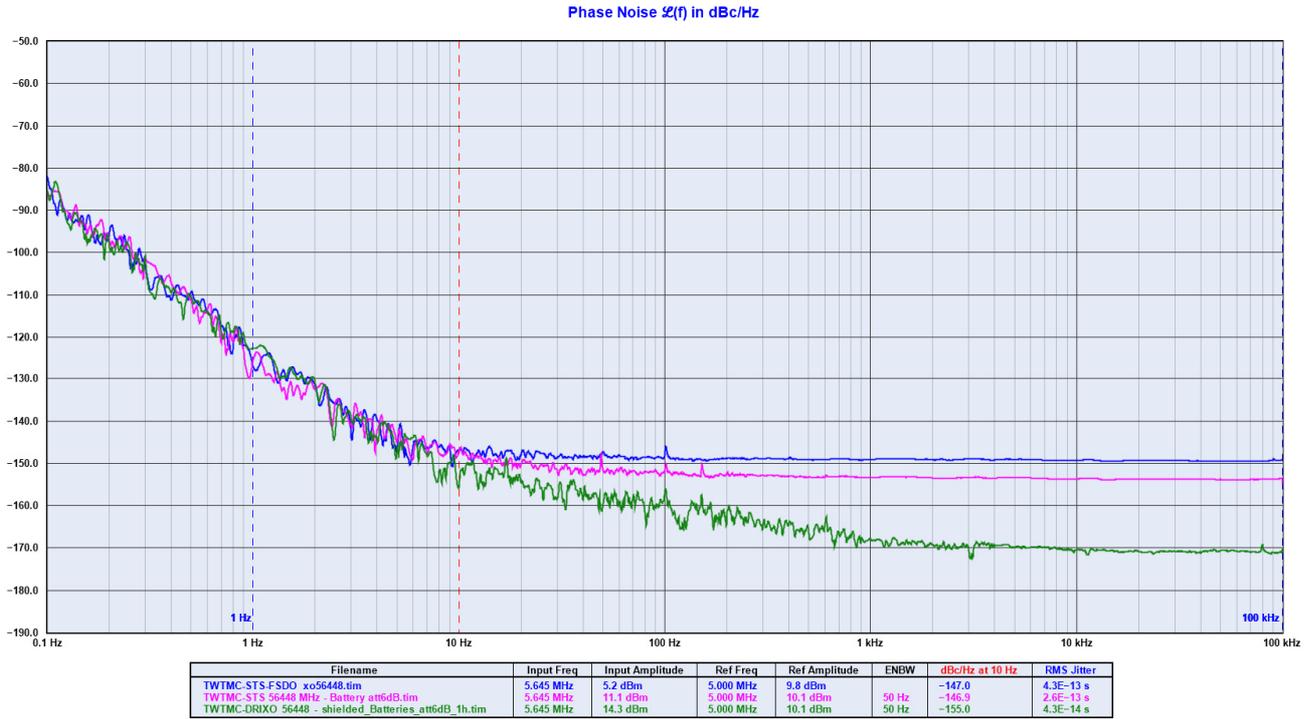
Board size: 100mm x 90mm

Power supply: 3.3 Vdc 50 mA (150 mA peak when relays switch)

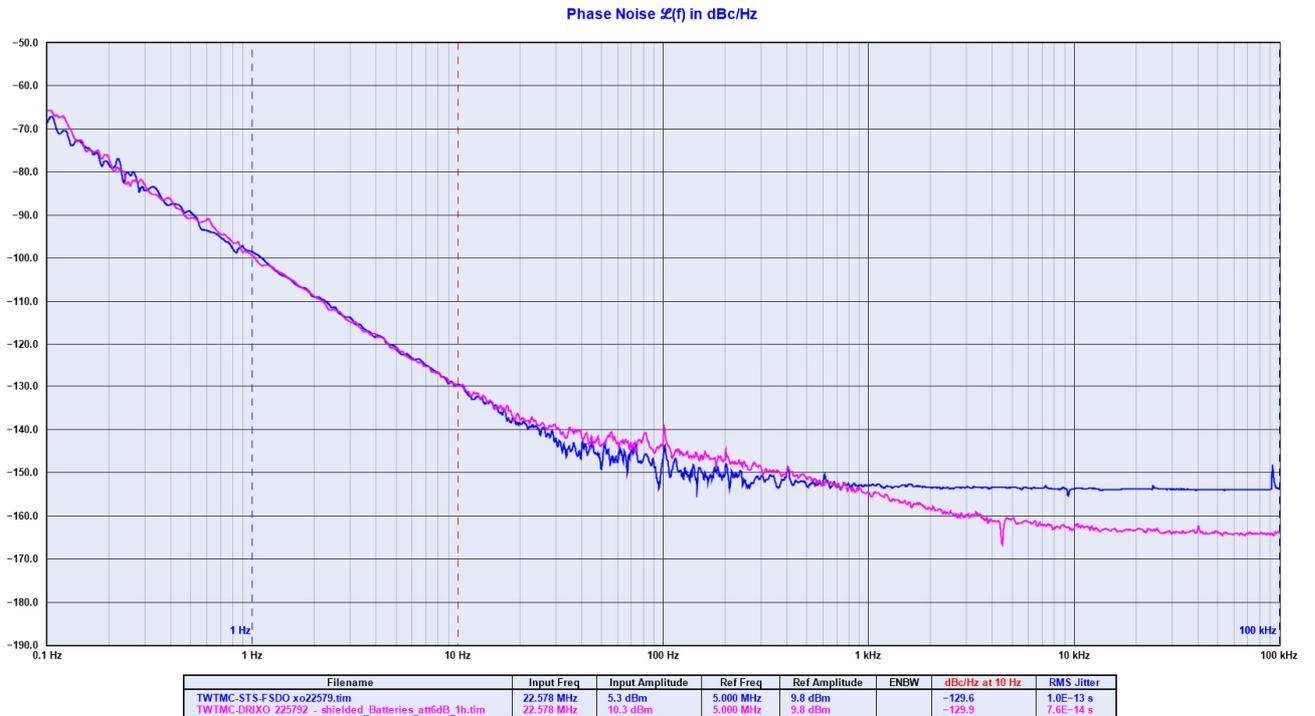
Board options: finished only

Note: 2 versions available, TWTMC-STS-FSDO-F (fanout option) and TWTMC-STS-FSDO-S (switched out option)

Measured phase noise of the TWTMC-ST5-FSDO with different oscillators (5.6448 MHz and 22.5792 MHz)

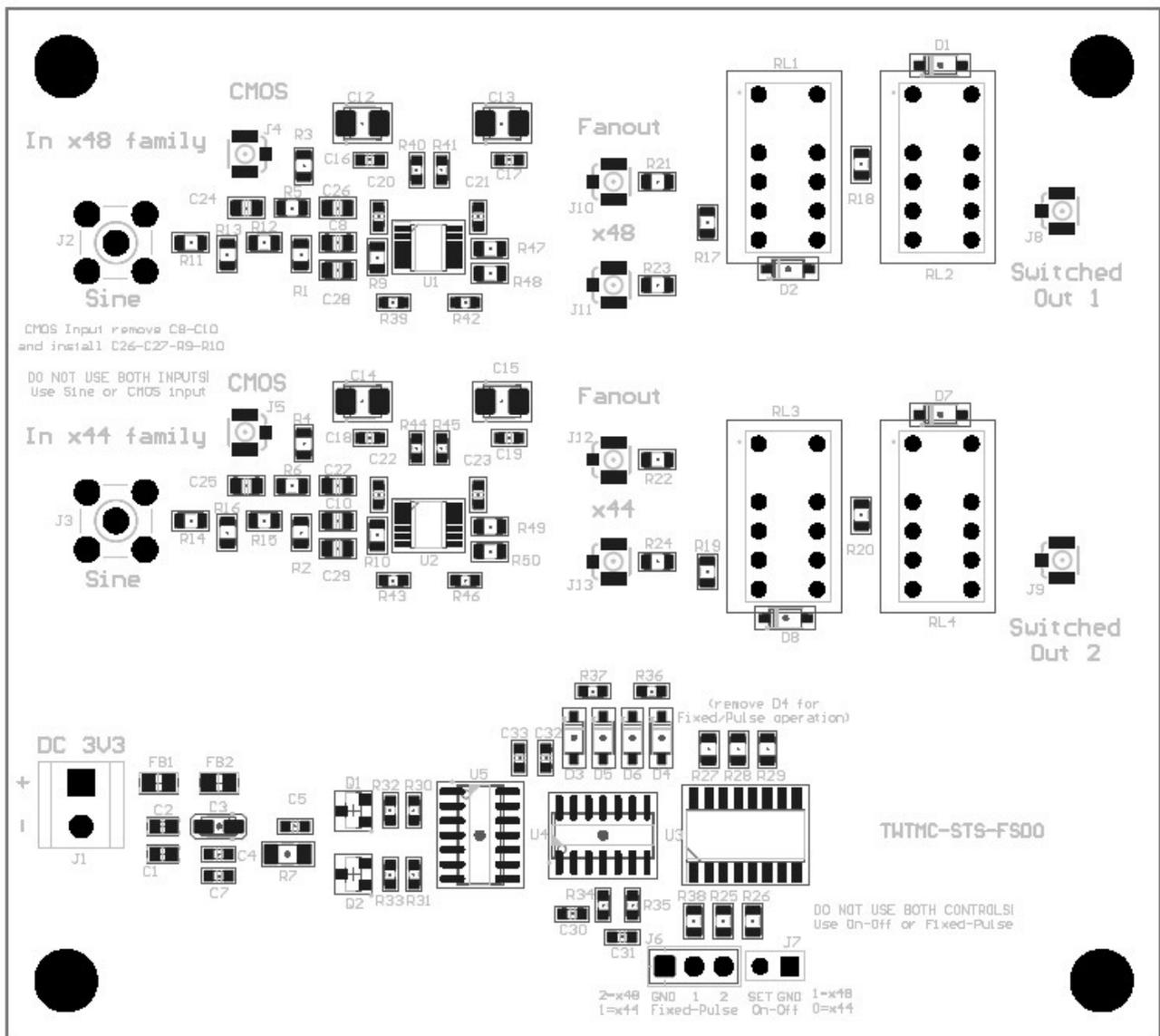


TWTMC-ST5-FSDO 5.6448 MHz phase noise



TWTMC-ST5-FSDO 22.5792 MHz phase noise

PCB layout



Connectors

J1: DC power supply (3.3 Vdc). The circuit is not protected against power supply polarity inversion.

J2: Sine wave RF input, x48 family. SMA plug connector and RG400 semi-rigid cable should be used to connect oscillators to this board.

J3: Sine wave RF input, x44 family. SMA plug connector and RG400 semi-rigid cable should be used to connect oscillators to this board.

J4: Square wave RF input, U.fl plug connector x48 family. To use this input connector a few updates are needed: remove C8, install C26 (use the removed C8) and R9 (51 ohm Susumu RR1220Q-510-D Mouser part 754-RR1220Q-510D)

J5: Square wave RF input, U.fl plug connector x44 family. To use this input connector a few updates are needed: remove C10, install C27 (use the removed C10) and R10 (51 ohm Susumu RR1220Q-510-D Mouser part 754-RR1220Q-510D)

J10, J11: RF output. TWTMC-ST5-FSDO-F fanout option U.fl plug connector, x48 family.

J12, J13: RF output. TWTMC-ST5-FSDO-F fanout option U.fl plug connector, x44 family.

J8: RF output. TWTMC-ST5-FSDO-S switched option U.fl plug connector, x48 family.

J9: RF output. TWTMC-ST5-FSDO-S switched option U.fl plug connector, x44 family.

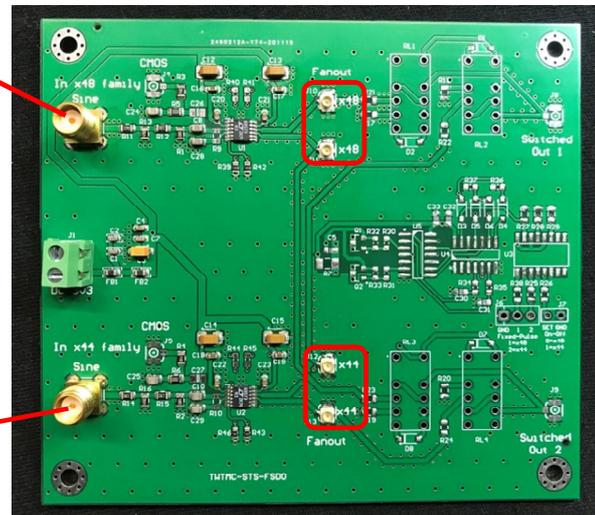
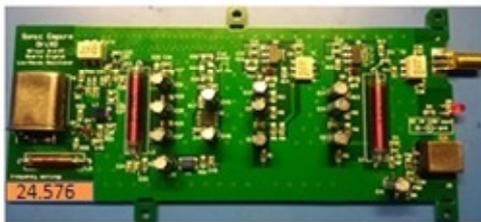
J6: Fixed/pulse control. Connect the ground of the control to the GND pin of J6, connect the x44 family control to the pin 1 of J6, connect the x48 family control to the pin 2 of J6. Fixed or pulse 3.3/5V signals (pulse duration 30 ms min) can be applied to pins 1 and 2 to switch between the two sample rate family inputs. In order to use this option D4 has to be removed.

J7: On-Off control. Connect the ground of the control signal to the GND pin of J7, connect the control signal (0V = x44 family, +3.3/5V x48 family) to the Set pin of J7. This is the default option supplied.

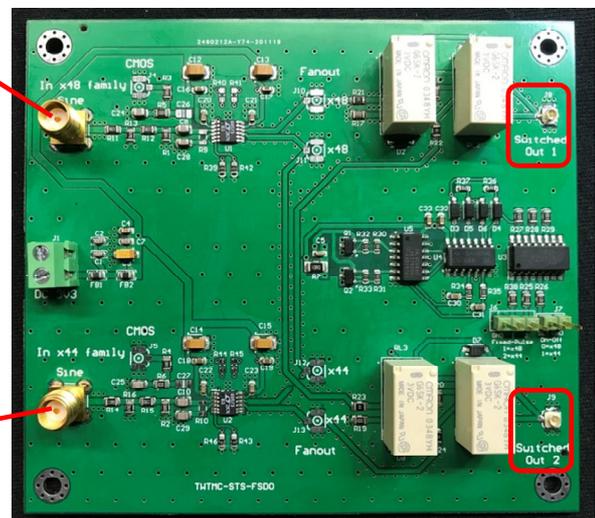
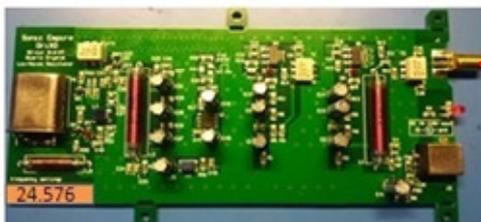
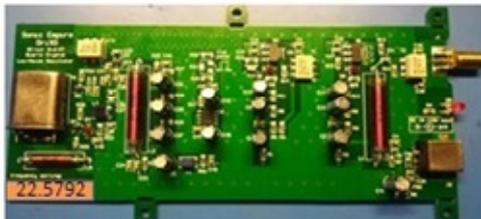
The screenshot shows the Superbat website interface for custom cable assemblies. It includes a search bar, navigation tabs, and a configuration area with dropdown menus for cable type (RG400), connector 1 (SMA Straight Plug), and connector 2 (SMA Straight Plug). Below the configuration are images of the selected components and a diagram illustrating the cable length measurement between two connectors (A and B) with heat shrink tubes.

There are two different options for this board:

- TWTMC-ST5-FSDO-F (fanout option)
- TWTMC-ST5-FSDO-S (switched out option)



Option 1: fanout both sample rate families



Option 2: fanout switched sample rate families