

Double Speed mode of Dual XO Clock Board

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Description

Some applications need higher MCLK frequency. For example running SARBE32 DAC at synchronize mode. Dual XO Clock Board has a reserved double speed mode which could allow XO frequency going up to 45.1584 MHz and 49.1520 MHz to meet this kind of requirements. The double speed mode is not recommended to classical DACs and S/PDIF DITs to avoid any risk of possible damage. Because I don't know what gonna be happened if feed MCLK with up to $1024 * F_s$ into those devices.

Setting up double speed mode

Double speed mode is achieved by selecting XO frequencies and setting up correspond jumpers.

1. U1 frequency and TP3,TP4 and TP5

XO frequency for socket U1 has to be either 45.1584 MHz or 22.5792 MHz; this socket couldn't be left empty.

Jumper settings

U1 frequency	Jumper settings
45.1584 MHz	TP3 – TP4 short
22.5792 MHz	TP4 – TP5 short

MCLK and F_s relationship will be as below

U1 frequency and F_s	44.1 KHz	88.2 KHz	176.4 KHz	352.8 KHz
45.1584 MHz	$MCLK=1024 * F_s$	$MCLK=512 * F_s$	$MCLK=256 * F_s$	$MCLK=128 * F_s$
22.5792 MHz	$MCLK=512 * F_s$	$MCLK=256 * F_s$	$MCLK=128 * F_s$	N/A

2. U2 frequency and TP6,TP7 and TP8

XO frequency for socket U2 has to be either 49.1520 MHz or 24.5760 MHz; this socket couldn't be left empty.

Jumper settings

U2 frequency	Jumper settings
49.1520 MHz	TP6 – TP7 short
24.5760 MHz	TP7 – TP8 short

MCLK and Fs relationship will be as below

U2 frequency and Fs	48 KHz	96 KHz	192 KHz	384 KHz
49.1520 MHz	MCLK=1024 * Fs	MCLK=512 * Fs	MCLK=256 * Fs	MCLK=128 * Fs
24.5760 MHz	MCLK=512 * Fs	MCLK=256 * Fs	MCLK=128 * Fs	N/A

LED indicators

- MCLK frequency indicators:

512Fs On: MCLK = 512*Fs

128Fs On: MCLK = 128*Fs

Both 512Fs and 128Fs On: MCLK = 256*Fs

Both 512Fs and 128Fs Off: MCLK = 1024*Fs

- Fs indicators

Because of the double speed mode, the actual Fs should be the double as what it is displayed

Actual Fs	44.1 KHz	88.2 KHz	176.4 KHz	352.8 KHz
LED indicating	44.1 and 88.2	44.1	88.2	176.4

Actual Fs	48 KHz	96 KHz	192 KHz	384 KHz
LED indicating	48 and 96	48	96	192

Application notes and tips

1. The FIFO board will work with the Dual XO Clock Board in double speed mode automatically without need any additional setting.
2. In some special cases, the LED indicators on the Dual XO Clock Board may not show the Fs and *Fs correctly if the default FIFO setting and the clock board output MCLK is matching directly after power up.

Reason: To avoid introducing any additive jitter by communicating between the FIFO and the clock board, after power up, the FIFO is working at passive mode while the MCU on the Dual XO Clock Board is working at power down (deep sleep) mode. They will launch the automatic frequency switching processing and synchronize with each other only when the Fs is changing. After that, every LED indicating will be correct.

3. Text indications on the Dual XO Clock Board PCB silkscreen may not be suitable for the double speed mode. Please follow this document for details.
4. Both frequencies and jumpers of the two XOs have to be set exactly according to this document, otherwise the FIFO KIT won't work properly.
5. Make sure your device could work with high frequency MCLK before starting any double speed configuration.

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