Test Procedure of TSW30SH84 with TSW1400

TSW1400EVM

1. Connect 5 V power supply to J12, 5V_IN jack of the TSW1400 EVM.

2. Connect PC's USB port to J5 USB port of the TSW1400 EVM. The cable should be a standard A to mini-B connector cable.

TSW30SH84EVM

1. Connect J13 connector of TSW30SH84 EVM to J4 connector of TSW1400 EVM.

2. Connect 6V to the J18, Power In jack of the TSW30SH84 EVM.

3. Connect PC's USB port to J14 USB port of the TSW30SH84 EVM. The cable should be a standard A to mini-B connector cable.

4. Provide 10 dBm maximum, 300 MHz to 4 GHz LO source to connectors J19 and/or J22. The J19 or the J22 connector routes the LO source to the respective TRF3705 modulator TX path. Optionally, the EVM can be configured to share the LO source between the two TX paths through an on-board 3 Db splitter. The source should be connected to J22 in this case. See the *TX Path Optional Configuration* section for details.
5. Connect the RF output port of J7 and/or J9 to the spectrum analyzer.

TSW30SH84 GUI Setup Procedure

1. Turn on power to both boards, and press the reset button SW1 on the TSW30SH84EVM.

2. Start the TSW308x EVM GUI program. When the program starts, press the *RESET USB Port* button in

the GUI, and verify USB communication.

3. Select the appropriate EVM platform on the software menu.

🖶 TSW308x_v2p1.vi

TEXAS INSTRUMENTS Device Selection: TSW30H84/SH84 EVM Software 🔻

4. Click on LOAD REGS, browse to the installation folder, and load example files. The example files are located at C:\Program Files (x86)\Texas

 $Instruments \ TSW308x \ Configuration \ Files \ \$

TSW30SH84_single_PLL_mode_internal_clock_correct_output. To configure the LMK04808B in single PLL mode, select the file in the LMK04808 PLL Mode 10MHz reference folder. To configure the LMK04808B in clock distribution mode, select the file in the LMK04808 Clock Distribution Mode folder. For the TSW30SH84, the files contain settings for 2x interpolation with the DAC34SH84 running at 1474.56 MSPS. The data rate for each DAC is at 737.28 MSPS. The NCO is enabled at 30 MHz.

5. Click on Send All to write all of the values to the devices. If the LMK04808B is programmed properly in single PLL mode, the LMK LOCK LED (D7) near the device will be illuminated. The updated register configuration for the LMK04808B now appears.

Type Digital Output Advanced UMOV4800 Control Send All Load Regs Save Regs DAC Readback Show USB Row ResetUB Row Rest UB Row Rest Row <th>SW308x_v2p2.vi</th> <th></th> <th></th> <th></th> <th>_ D X</th>	SW308x_v2p2.vi				_ D X
FIFO SIF Control Input format Parity Version 0 FIFO enabled enabled Parity Style ever parity Style for for for	PIEXAS INSTRUM	LINK04800 Control Send All Rea	ad All Load Regs Save R	egs DAC Readback Show USB F	ort Reset USB Port Exit
FIFO Output Sync Select RAME Constant Input 0 Temperature sensor LVDS delay PLL Settings TempSensor On TempSensen TempSensor On TempSensor On TempSensen Te	FIFO FIFO enabled FIFO offset FIFO Input Sync FIFO Input Sync FIFO Input Sync FIFO FIFE A COMPARENT COMPA	SIF Control Serial Interface 3-pin I	Input Format Format Z's complement V Reverse bus normal V Input data 32-Bit Single Mode V	Parity Version 0 Parity Style even Parity Check enabled Block Parity disabled	x1F x8882 1000 1000 1000 0010
Data Routing None Bias OpAmp Off Word in A 0 Image: Charge Pump M B Image: Charge Pump Image:	FIFO Stync Select FRAME LVDS delay data (ps) 0 Clock (ps) 160	PLL Settings PLL Settings PLL disabled Prescaler 1 VCO Bias Tune 0	Constant Input 0	Temperature sensor PLL reset PLSleep Temp (C) Sync PLL dividers	
	Data Routing Word in A Word in B Word in C Word in C Word in D 3	Charge Pump M N S Freq. Tune (Coarse)	2 0 10 20 30 40 50 63	Bias OpAmp Off Fuse Sleep PLL Lock PLL LF Voltage	LMK REGISTERS
					x10 x000000

Input Setting

Digital Settings

TSW308x_v2p2.vi						
TEXAS INSTRU	MENTS Device	Selection: TSW3	0H84/SH84	EVM Software	back Show USB Pr	ort Reset USB Port Exit
Digital Filters	Offset Adjustment	QMC		NCO		DAC REGISTERS x1F x8882 1000 1000 1000 0010
Interpolation 2x 💌	OffsetAB adjust disable	d QMC Correct AB	enabled 💌	Enable NCO Upd	late freg 🗩	:
Digital Mixer	Offset A 0	QMC GainA	1446 🚖	F sample [MHz]	1474.5600	
Enable Mixer	Offset B 0	QMC GainB	1446 🚔	NCO Freq _AB [MHz]	30.0000 🚔	
Mixer Bypass 💌	OffsetAB Sync REGWR	QMC PhaseAB	0	NCO Freq _CD [MHz]	30.0000 🚖	
Inverse sinx/x filter		CorrectAB Sync	REGWR 💌	Gain	0 dB 💌	
Compensate AB	OffsetCD adjust disable	d 💌	Sync AB	NCO Acc SYnc	SIF SYNC 💌	
Clark Passiver Sleep	Offset C 0	QMC Correct CD	enabled 💌	NCO DDS AB	87381333 🚔	-
Clock Divider Sync	Offset D 0	QMC GainC	1446 🌲	Phase Offset AB	0	
Clock Div Sync source FRAME	OffsetCD Sync REGWR	QMC GainD	1446 🚔	MixAB Sync	SIF SYNC 💌	
Group Delay A 0		QMC PhaseCD	0	NCO DDS CD	87381333	
Group Delay B 0		CorrectCD Sync	REGWR 💌	Phase Offset CD		
Group Delay C 0			Sync CD	MIXED Syric	SIF STINC •	LMK REGISTERS
Group Delay D 0						×1D ×0000000
DAC Gain 10						
SIE Svoc						
ou oyne 🐨						

Output Settings

ISW308x_v2p2.vi	election: TSW30H84/SH84 EVM Software	
Input Digital Output Advanced LMKD4800 Control Send All	Read All Load Regs Save Regs DAC Readback	Show USB Port Reset USB Port Exit TIENUATOR AB ATTENUATOR CD 0 0 0 0 DAC REGISTERS x1F x8882 1000 1000 1000 10
Complement A Reference Internal Complement A Output AB Delay Output CD Delay 0 0 0 Data Routing Word out A 0 1 Word Out B 2 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0	DACA Sleep DAC Gain 10 (*) DACB Sleep DAC QDAC DACC Sleep DAC QDAC DACD Sleep DAC FIFO Collision Rev Interface DACA Decoder Thermometer	enabled enabled enabled disabled
		LMK REGISTERS UMK REGISTERS x1D x0000000

Advanced Settings

TSW308x_v2p2.vi	RUMENTS Device Sele	ection: TSW30H84/SH84 EVM Software Save Regs DAC Readback Show USB	Port Reset USB Port Exit
Sleep Control Enable DACA DACA DACC DACC Clock Receiver LVDS Data LVDS Control Temp Sensor @ Fuses @ Bias OpAmp @	Alarm Alarm Reset 64count Alarm FIFO 2 away enabled Alarm FIFO 1 away Alarm FIFO 1 away Erro Check TFIFO Collison Mask Status Zero Check TFIFO Collison FIFO 1 away DACCLK gone DCCLK gone DCCK gone D	IO Test IO Test disabled Pattern 0 7478 Pattern 1 6666 Pattern 2 EAEA Pattern 3 4545 Pattern 4 1A1A Pattern 5 1616 Pattern 6 AAAA Pattern 7 C6C6 IO Test Results IO Test Results IO Test Results @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @ @	X1F x8882 1000 1000 1000 0010
Auto Resync on Collision Insert Ramp in FIFO Input Test SIF VOH Test SIF VOL OSTR to DIG	Alarm Alarm polarity	DAC Spares NS Image: State of the state	x1D x000000

LMK04800 Control Settings



LMK04800 advance Settings



TSW1400 GUI Setup Procedure

1. Start the High Speed Converter Pro GUI program. When the program starts, select the DAC tab and then select DAC34SH84 device in the "Select DAC" menu



Select DAC34SH84 in the High Speed Converter Pro GUI Program-

2. When prompted Load DAC Firmware?, select YES.



Load DAC Firmware Prompt

3. Click on the button labeled "Load External Pattern File", located near the top left of the GUI



Load File to Transfer into TSW1400

4. Select the file "WCDMA_TM1_complexIF30MHz_Fdata737.28MHz_1000.tsw" under C:\Program

Files\Texas Instruments\High Speed Data Converter Pro\Testfiles

5. Enter 737.28M for the "Data Rate" and 2's complement for the "DAC Option".

6. Select Hanning for "Window".

7. In the "DAC Selection" panel on the left side of the GUI, click on "Send" to load the data into memory.

8. Toggle the SIF SYNC button of the TSW308x EVM GUI to synchronize the appropriate digital blocks, if the example file with NCO setting is used.

9. Verify the spectrum using the spectrum analyzer at the two RF outputs, J7 and J9, of the TSW30SH84.

10. With 1780 MHz of LO, the expect results are shown as





