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FTS250
Eval Board Quick Start Guide

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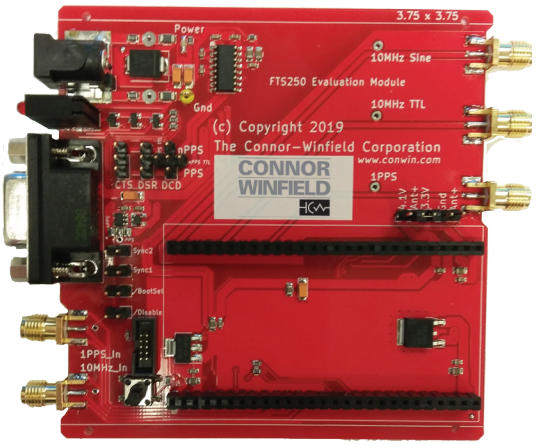
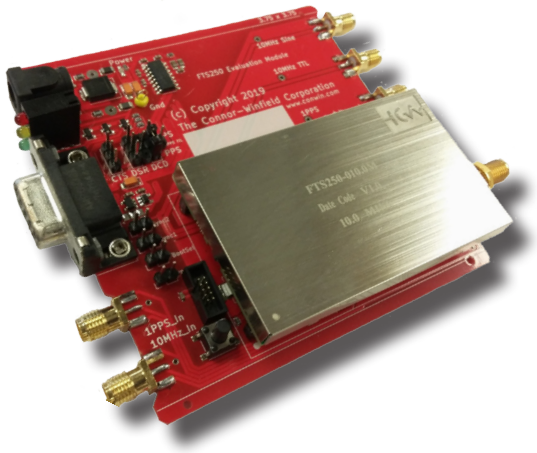
QUICK START GUIDE

General Description

The FTS250 Evaluation Board has been designed to support the test and evaluation of Connor-Winfield's various FTS250 Series GPS models. This test board provides the user with the basic connections and interfaces required to operate an FTS250 GPS module including connections for the power supply cable, a serial DB-9 port, five SMA connectors to support an external 10MHz reference, an external 1PPS signal, two frequency output signals, one Sinewave and one LVCMOS, as well as a 1PPS 3.3V output signal. A GPS antenna connection is provided on the FTS250 module itself which is sold separately. The Evaluation Board can be supplied as a stand alone test board or is available as a kit that includes a passive antenna, 5V power supply module and DB9 Serial to USB cable.





General Instructions

1) Insert the FTS250 unit into the FTS250 Evaluation Module receptacles
   - The orientation should match the photo shown above.
   - Press the unit down firmly – there should be no metal pins exposed.

Switch Label	Function
Sync1	Controls DUT pin 20 “SYNC1 Control” *Refer to Mode Control Table*
Sync2	Controls DUT pin 19 “SYNC2 Control” *Refer to Mode Control Table*
Disable	Controls DUT pin 4 (/Disable)
Boot Select	Controls DUT pin 12 (/Bootsel)- Only used for Wi125 software updates/revisions
Reset	Controls DUT pin 3 (/Reset)

Mode Control Table

SYNC 1	SYNC 2	Operating Mode
0	0	Force Holdover
0	1	Lock to External 10 MHz reference
1	0	Lock to External 1 PPS reference
1	1	(Default) Lock to GPS Signal

General Instructions continued on page 2…

General Instructions continued

2) Connect the SMAs (center positive)

a. Do not apply voltages higher than indicated or the DUT and/or test board could be damaged. The power supply maximum for this module is +6V. At 1A current draw, the dissipation of the on-board regulators will be 2.7 Watts: (6v – 3.3v) x 1A. The recommended operating maximum voltage is 5.5V. At 1A current draw, the dissipation of the on-board regulators will be 2.2 Watts: (5.5v – 3.3v) x 1A At 5V with 1A current draw, the dissipation of the on-board regulators will be 1.7 Watts: (5v – 3.3v) x 1A.

b. Connect 5.0V to J1 to power the test board using regulated 5V DC supply (500mA), 2.1 mm center pin positive barrel jack, 5.5 mm OD.

Connector Designator/Label	Input/ Output	Voltage / Logic Type	Function
J1: “5.0V”	Input	3.3V +/- 5%	Eval board power
J6: “10MHz Ext”	Input	LVCMOS/LVTTL	External 10MHz reference signal for DUT Pin 7
J2: “1PPS Ext”	Input	LVCMOS/LVTTL	External 1PPS reference signal for DUT Pin 5
FTS250_010	Input	Between 3-12V	SMA GPS Antenna Connection DUT Pin 15
J7: “1PPS Out”	Output	LVCMOS	1PPS signal from DUT Pin 24
J3: “Frequency CMOS Out”		LVCMOS	Frequency CMOS signal from DUT Pin 26
J4: “Frequency SINE Out”		SINE	SINE Frequency SINE signal from DUT Pin 28 50 ohm 9db 2.2% Total Harmonic Distortion

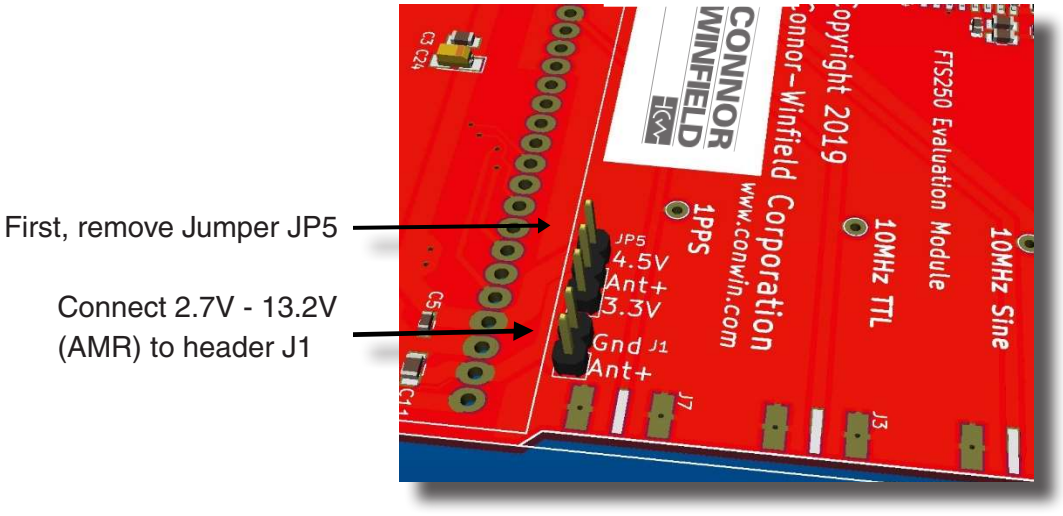
DB-9 Connections

DB9 Female	Pin	Jumper	Options
CTS	8	JP8	PPS_RS232 or nPPS_RS232
DSR	6	JP7	PPS_RS232 or nPPS_RS232 or nPPS_TTL
DCD	1	JP6	PPS_RS232 or nPPS_RS232 or nPPS_TTL or PPS_TTL
Tx	2	RS232	
Rx	3	RS232	

Note: An external voltage can be applied to the antenna. Remove Jumper JP5 first. Connect 3-12V (AMR) to header J1 to power the active antenna through the FTS250's SMA Bulkhead antenna connector. If a different antenna is used other than that supplied with the FTS250 Eval Board, consult that antenna's documentation for the required voltage.

Antenna Power Supply

An external voltage can be applied to the Antenna



General Instructions continued

3) Connect the female DB9 connector “P3” to a computer USB or serial port (optional).
   Used to monitor NMEA 0183 data stream.
   NS3KView software is recommended for use and can be provided per request.
   Baud rate: 115200 baud 8N1 also available at 38400
   Refer to FTS250 User Manual for more information on NMEA and the proprietary messages and commands.

4) Connect a full sky view GPS antenna to the DUT’s female SMA Bulkhead connector.

5) Power the unit on.

6) LED Function
   - Antenna Fault Status **Red** LED (D7) turns on if a fault condition is indicated on DUT Pin 23. An antenna fault condition is defined as an ovecurrent on Pin 15 of the DUT (Antenna Supply Voltage). This fault status is self-clearing once the fault condition goes away.
   - Holdover Status **Amber** LED (D6) turns on if the unit is in automatic or forced holdover as indicated by DUT Pin 22 “Holdover Status”.
   - Lock Status **Green** LED (D5) turns on if the unit is tightly locked to the selected input as indicated by DUT Pin 21 “Lock Status”.

Absolute Maximum Ratings *(@T_A = +25°C, unless otherwise specified)*

Symbol	Paramater	Ratings	Unit	Note
ESD HBM	Human Body Model ESD Protection	2000	V	1
ESD MM	Machine Model ESD Protection	200	V	1
V_{IN}	Input Voltage	-0.3 to 6.0	V	1
V_{OUT}	Out Voltage	-0.3 to VIN 0.3	V	1
I_{OUT}	Continuous Load Current	Internal Limited	-	1
T_{ST}	Storage Temperature Range	-65 to 150	°C	1
T_J	Maximum Junction Temperature	150	°C	1

Recommended Operating Conditions *(@T_A = +25°C, unless otherwise specified)*

Symbol	Paramater	Min	Max	Unit	Note
V_{IN}	Input Voltage	2.2	5.5	V	
I_{OUT}	Output Current	0	1.5	A	
T_A	Operating Ambient Temperature	-40	85	°C	
T_J	Operating Junction Temperature	-40	125	°C	2

Notes:

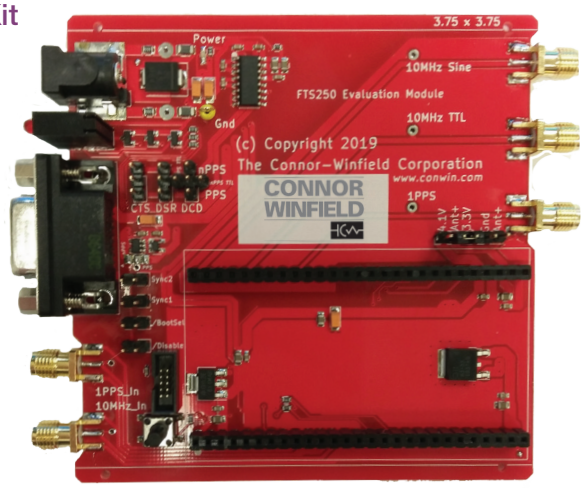
1) Stresses beyond those listedw under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only and functional operation of the device at those or any other conditions beyond those indicated are not implied. Exposure to absolute-maximum rated conditions for extended periods may affect device reliability.

2) Operating junction temperature must be evaluated and derated as needed, based on ambient temperature (T_A), power dissipation (P_D), maximum allowable operating junction temperature (T_{J_MAX}), and package thermal resistance (Ω_{JA}).

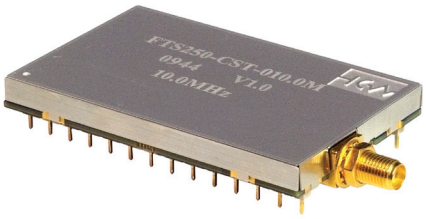
FTS250 Evaluation Board Kit

FTS250 Kit Includes:

One FTS250 Test Board
One Power Supply Unit
One GPS Patch Antenna
One DB9 Serial to USB Cable



FTS250 Module sold separately



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Schematic Image