



MICRO LAMBDA WIRELESS, INC.

REMOTE SERIAL DRIVER RSM "MINI" SERIES FOR ELECTROMAGNETIC DEVICES .5-50 GHz



FEATURES

- All Electromagnetic Oscillators and Filters
- Voltage Regulators for Improved Stability
- 16 Bit Tuning Resolution
- Remote Device/Driver Location

DESCRIPTION

All Micro Lambda Electromagnetic YIG Devices are available with remotely located serial driver circuits. These drivers eliminate the need for customers to design or develop their own circuits and sophisticated test and alignment procedures. These remote drivers can be aligned at Micro Lambda's factory to ensure peak performance. Alignment and compensation with the particular YIG Device can be maximized down to the component level.

All drivers in this series provide input voltage regulators, reverse voltage/dataline protection and compensation circuits to improve frequency drift. All voltages required by the YIG Device, except the heater inputs are supplied by the voltage regulators.

COMMERCIAL SERIAL DRIVERS

.5-50 GHz YIG DEVICE, SERIAL SERIES

DRIVER INPUT & RESPONSE	SPECIFICATION (0 to + 65 deg. C)
Tuning Command	Start Word (all 0's) = Lowest Frequency Stop Word (all 1's) = Highest Frequency
Tuning Resolution	16 BIT Positive Logic (Fmax-Fmin)/65,535 Resolution
Frequency Accuracy (Note 1) (excluding hysteresis)	YIG Device Accuracy +2 MHz
Tuning Speed	5 mSec for 1 GHz step to within +/-10 MHz.
Main Driver Inputs	
Supply Voltage & Current (Note 2)	YIG Device Tuning Current + 100 mA, Max. 100 mA, (Plus Oscillator -5 Vdc Current if any) Max.
+15 V +/- .5 V (P1-6)	
-15 V +/- .5 V (P1-5)	
Supply Voltage Pushing	+/- .2%MHz Max. @ .5Vdc (2-3000 kHz)
Supply Voltage Ripple	10 mV Ripple Pk-Pk from 2 kHz to 3 MHz
Ground (P1-4 & 12)	Chassis Ground
YIG Heater Voltage & Current (Note 3)	750 mA surge for 2 seconds, 150 mA steady state
+24 Vdc ±4 Vdc (P1-7&8)	Polarity independent : ±12 Vdc or ±15 Vdc acceptable
Fast / Slow (P1-11)	Logic Input 3.3V / 5.0V Compatible, High = Normal Switching Speed Low = Low Noise / Slow Switching Speed (Used for Oscillators)
Digital Interface (P1-1, 2, 3, 4)	The MLWI digital driver interface is a standard 3-wire connection compatible with SPI/QSPI/MICROWIRE interfaces. The 3-wire serial interface will operate in a 5V or 3.3V logic system. The chip-select input (CSELECTn) frames the serial data loading at the data input pin (DATA). Immediately following CSELECTn's high-to-low transition, the data is shifted synchronously and latched into the input register on the rising edge of the serial-clock input (CLOCK). After 16 data bits have been loaded into the serial input register, it transfers its contents to the DAC latch on CSELECTn's low-to-high transition (Figure 2). Note that if CSELECTn does not remain low during the entire 16 CLOCK cycles, data will be corrupted. In this case, reload the DAC latch with a new 16-bit word.
Power-On Reset	The MLWI digital driver has a power-on reset circuit to set the DAC's output to OV(F-min) in unipolar mode when VDD is first applied. This ensures that unwanted DAC output voltages will not occur immediately following a system power-up, such as after power loss.

Note 1: Accuracy Includes Temperature Drift & Linearity.
 2. Some YIG Devices require higher voltages - Check with factory.
 3. See particular YIG Device specification for heater current requirements.

SERIAL REMOTE SERIES (RSM “MINI”-SERIES) — CONT.

FM Coil Driver (RFM Option)

Voltage (P1-9&10)	+/- 10 V
Current	+/- 100 mA
Input Impedance	1 k-Ohms
Sensitivity	+/- 2.5 MHz/V
Frequency Deviation	+/- 25 MHz
Outline Drawing	99-0051-023 **with FM Driver 99-0051-024

Serial Interface Timing Diagrams

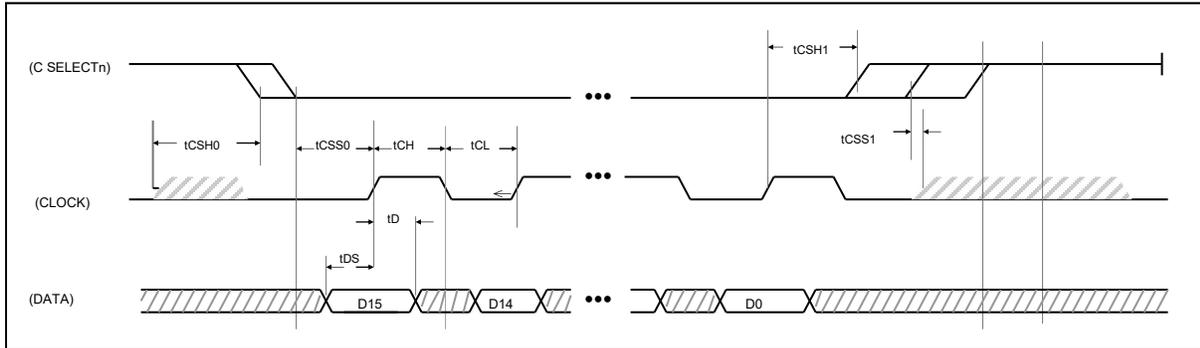


Figure 1. Timing Diagram

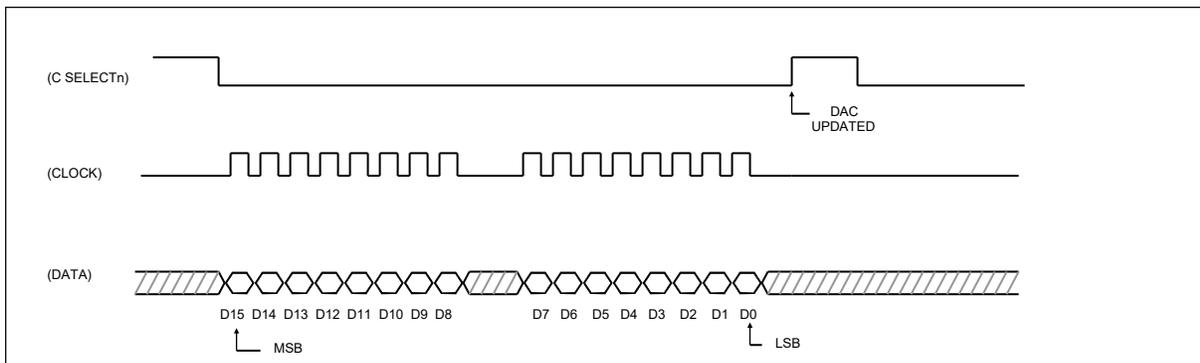
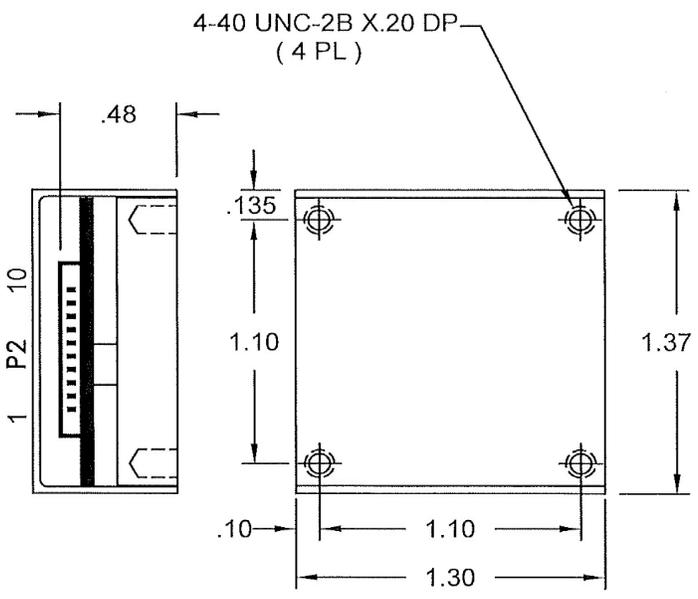
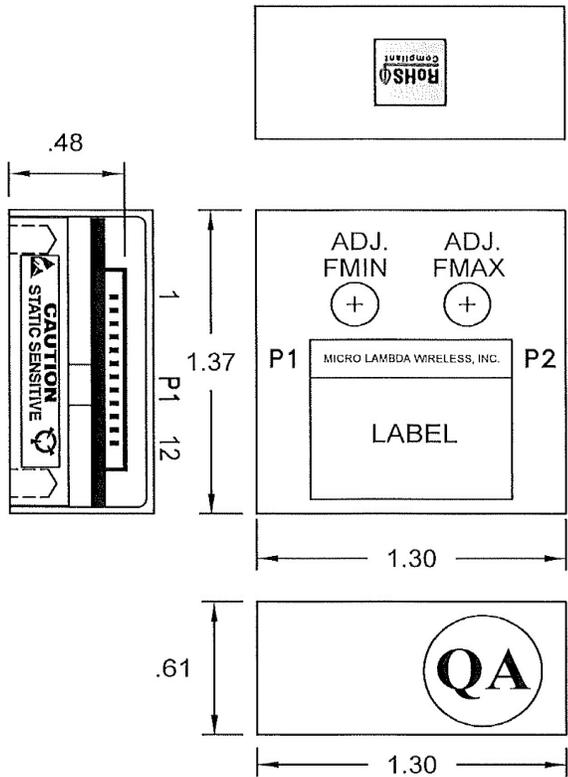


Figure 2. 3-Wire Interface Timing Diagram

TIMING CHARACTERISTICS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
CLOCK Frequency	f _{CLK}			10		MHz
CLOCK Pulse Width High	t _{CH}		45			ns
CLOCK Pulse Width Low	t _{CL}		45			ns
CSn Low to CLOCK High Setup	t _{CSS0}		45			ns
CSn High to CLOCK High Setup	t _{CSS1}		45			ns
CLOCK High to CSn Low Hold	t _{CSH0}		30			ns
CLOCK High to CSn High Hold	t _{CSH1}		45			ns
DATA to CLOCK High Setup	t _{DS}		40			ns
DATA to CLOCK High Hold	t _{DH}		0			ns
VDD High to CSn Low (power-up delay)				20		μs



WEIGHT: 2.0 Oz / 56.7g

P1 CONNECTION (INPUT)

MOLEX PART # : 5040501291 (1.5MM)
 MATING WITH # : 5040511201
 CRIMP CONTACT : 5040520098

PIN	FUNCTIONS
1	CLOCK (SCLK)
2	DATA (MOSI)
3	SELECT _n (CS)
4	GROUND
5	-V SUPPLY
6	+V SUPPLY
7	HEATER 1
8	HEATER 2
9	FM +/- 10V
10	FM RETURN
11	FAST/SLOW _n
12	GROUND

P2 CONNECTION (TO YIG)

MOLEX PART # : 5040501091 (1.5MM)
 MATING WITH # : 5040511001
 CRIMP CONTACT : 5040520098

PIN	FUNCTIONS
1	+ TUNE COIL
2	- TUNE COIL
3	+FM COIL
4	-FM COIL
5	OSC. VCC (+V)
6	OSC. - 5V (OPTIONAL)
7	HEATER 1
8	HEATER 2
9	GROUND
10	N/C

NOTES:

- 1- RECOMMENDED WIRE SIZE = 24 GAUGE
- 2- PROPER HEAT-SINK REQUIRED FOR REMOTE DRIVER & FILTER TO DISSIPATE UP TO 37.5 WATTS, DEPENDING ON THE CONNECTED YIG DEVICES CURRENT CONSUMPTION.

<small>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ARE :</small> <small>FRACTIONS DECIMALS ANGLES</small> <small>▲ .xx ±.02</small> <small>▲ .xxx ±.010</small>	CONTRACT NO.		 MICRO LAMBDA WIRELESS, INC.
	APPROVALS	DATE	
MATERIAL	DRAWN	N.NGUYEN	8/12/2022
FINISH	CHECKED	DS	8/12/22
ISSUED			
DO NOT SCALE DRAWING		SIZE	CAGE No 0RN63
		DWG. NO.	99 - 0051 - 024
		REV.	B

1.3" 16 BIT SERIAL MINI REMOTE W/FM DRIVER