MICRO LAMBDA WIRELESS, INC.

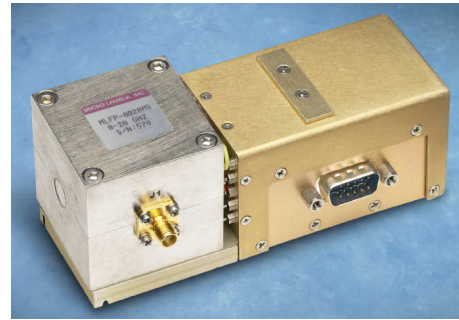**YIG TUNED MULTIPLIERS WITH MILITARY SERIAL DRIVERS MS SERIES**

FEATURES
- 1 GHz to 18 GHz
- Compensation for Temperature Drift
- Input Regulators for Improved Stability
  - Versus Power Supply Variations
- 16 Bit Tuning Resolution
- -40 ℃ to +85 ℃ Temperature Range

DESCRIPTION
MICRO LAMBDA YIG Multipliers, model types MLHG Series are available with integrated serial driver circuits.

MICRO LAMBDA drivers eliminate the need for customers to design or develop their own driver circuits and sophisticated test and alignment procedures. Integrating a driver at MICRO LAMBDA's factory ensures that peak performance will be achieved at the time of manufacture. Alignment and compensation with the particular YIG filter can be maximized down to the component level.

All drivers in this series provide input voltage regulators, and compensation circuits to improve frequency drift.

STANDARD POSITIVE INPUT SERIAL DRIVER SELECTION GUIDE: MS SERIES

MILITARY SERIAL DRIVERS	1-18 GHz YTMs, MS SERIES
DRIVER INPUT & RESPONSE	SPECIFICATION (-40 to +85 deg. ℃)
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 Bit Resolution
Tuning Accuracy (excluding hysteresis)	See Table
Tuning Speed	5 mS for 1 GHz step to within ±10 MHz.
Main Driver Inputs	
Supply Voltage & Current	+15 V ± .5 V @ Multiplier Tuning Current +50 mA, Max. -15 V ± .5 V @ 50 mA
Supply Voltage Pushing	± 100 kHz, Max. @ ± .5 Vdc
Supply Voltage Ripple	10 mV Ripple Pk-Pk from 2 kHz to 3 MHz
Ground	Chassis Ground
YIG Heater Voltage & Current	+24 Vdc ±4 Vdc @ 300 mA surge for 2 seconds, 25 mA steady state Polarity independent : ±12 Vdc or ±15 Vdc acceptable
Digital Interface	The MLWI digital driver interface is a standard 3-wire connection compatable 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.

YIG Tuned Multipliers with Military Serial Drivers

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.
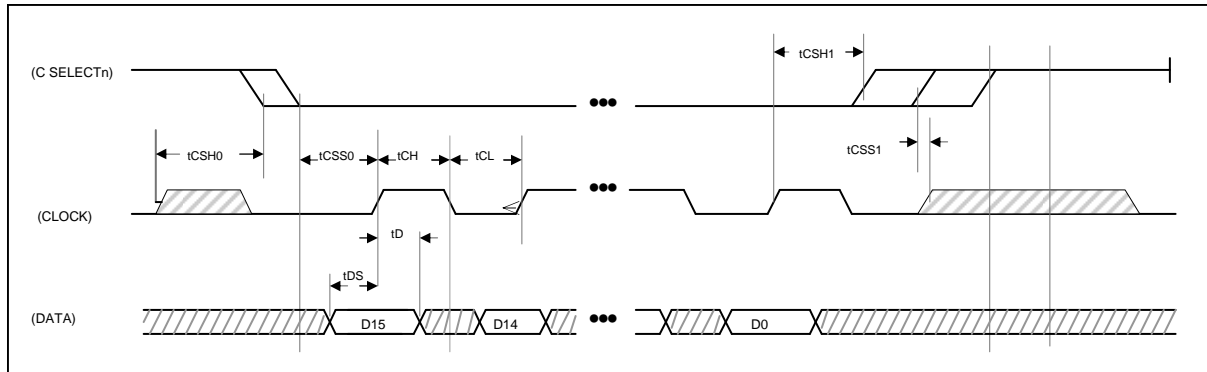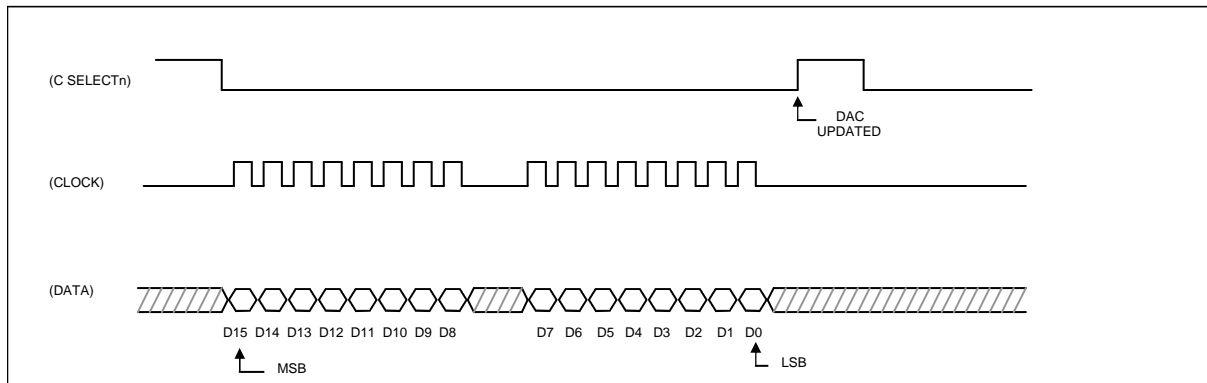
Figure 1. Timing Diagram
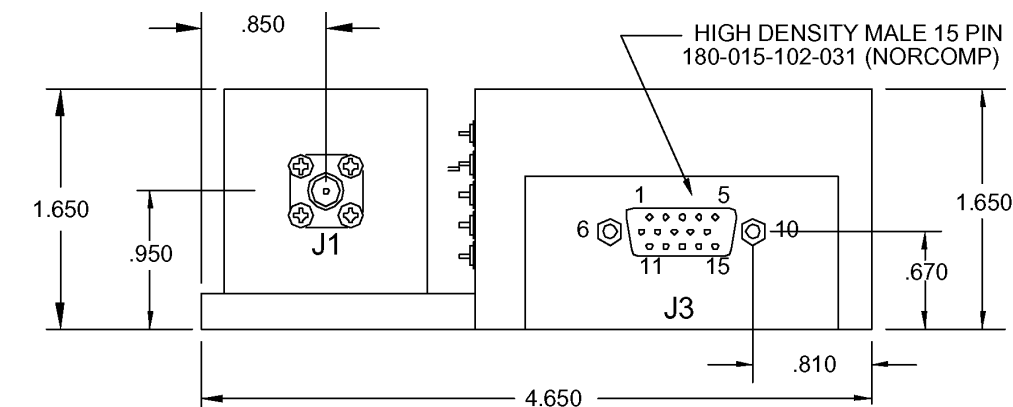
Figure 2. 3-Wire Interface Timing Diagram

TIMING CHARACTERISTICS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
CLOCK Frequency	fCLK				10	MHz
CLOCK Pulse Width High	tCH		45			ns
CLOCK Pulse Width Low	tCL		45			ns
CSn Low to CLOCK High Setup	tCSS0		45			ns
CSn High to CLOCK High Setup	tCSS1		45			ns
CLOCK High to CSn Low Hold	tCSH0		30			ns
CLOCK High to CSn High Hold	tCSH1		45			ns
DATA to CLOCK High Setup	tDS		40			ns
DATA to CLOCK High Hold	tDH		0			ns
VDD High to CSn Low (power-up delay)				20		µs

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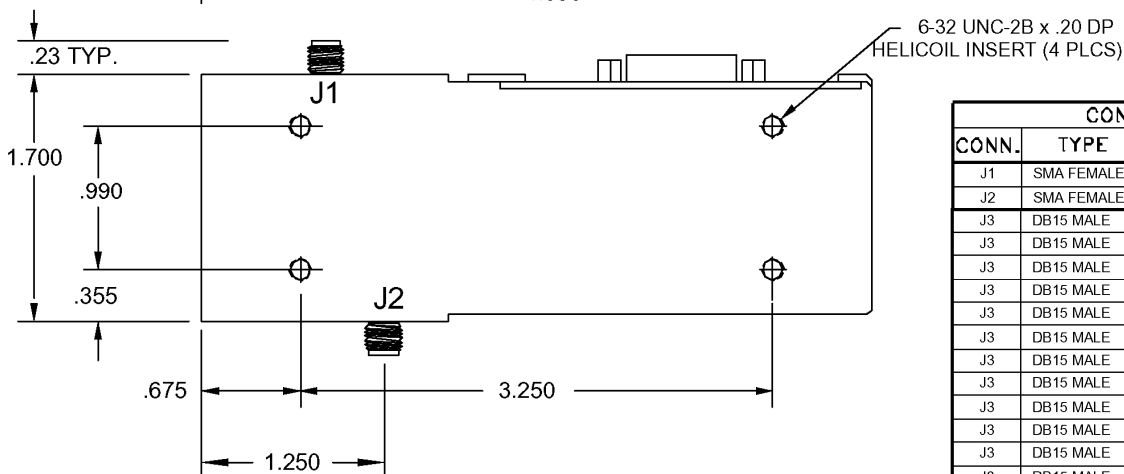| MODEL NUMBER	Output Freq. (GHz)	Input Freq. (MHz)	Output Power (dBm)	Accuracy (MHz) *	Current +15V (mA)	Current -15V (mA)	Outline Drawing
Multi-Octave Bands							
MLHG-1212MS	1.0-12.4	100	-30	±15	720	100	31-015
MLHG-2212MS	1.0-12.4	200	-25	±15	720	100	31-015
MLHG-5212MS	1.0-12.4	500	-13	±15	720	100	31-015
MLHG-1312MS	1.0-12.4	1000	-15	±15	720	100	31-015
Wideband							
MLHG-1218MS	1-18	100	-40	±20	1000	100	31-015
MLHG-2218MS	1-18	200	-35	±20	1000	100	31-015
MLHG-5218MS	1-18	500	-28	±20	1000	100	31-015
MLHG-1018MS	2-18	100	-37	±20	1000	100	31-015
MLHG-2018MS	2-18	200	-30	±20	1000	100	31-015

* Accuracy includes frequency drift and linearity errors over the temperature range.

OUTLINE DRAWING: 31-015

.850

HIGH DENSITY MALE 15 PIN
180-015-102-031 (NORCOMP)

1.650

.950

J1

1 5
6 10
11 15

J3

1.650

.670

.810

4.650

NOTES :
1. - DIMENSIONS ARE IN INCHES
2. - SUPPLY & GROUND WIRES = 20-22 GAUGE
   ALL OTHER WIRES = 24-26 GAUGE
3. - THERMAL COMPOUND REQUIRED BETWEEN
   BASE PLATE AND MOUNTING SURFACE

.23 TYP.

J1

1.700

.990

.355

J2

.675

3.250

1.250

6-32 UNC-2B x .20 DP
HELICOIL INSERT (4 PLCS)

Weight: 20 oz.

CONNECTIONS			
CONN.	TYPE	PIN #	FUNCTION
J1	SMA FEMALE	THD	RF IN
J2	SMA FEMALE	THD	RF OUT
J3	DB15 MALE	1	CLOCK
J3	DB15 MALE	2	DATA
J3	DB15 MALE	3	C SELECT N
J3	DB15 MALE	4	GROUND
J3	DB15 MALE	5	- V SUPPLY
J3	DB15 MALE	6	+ V SUPPLY
J3	DB15 MALE	7	HEATER 1
J3	DB15 MALE	8	HEATER 2
J3	DB15 MALE	9	N/C
J3	DB15 MALE	10	N/C
J3	DB15 MALE	11	N/C
J3	DB15 MALE	12	N/C
J3	DB15 MALE	13	N/C
J3	DB15 MALE	14	N/C
J3	DB15 MALE	15	N/C