

FEATURES

- 500 MHz to 50 GHz
- Low-Profile Package
- Input Regulators for Improved Stability
- Versus Power Supply Variations
- 16 Bit Tuning Resolution



DESCRIPTION

MICRO LAMBDA YIG Bandpass Filters, model types MLFP 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.

COMMERCIAL SERIAL DRIVERS

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 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 (P1-6) (P1-5)	+15 V \pm .5 V @ Filter Tuning Current +50 mA, Max. -15 V \pm .5 V @ 50 mA
Supply Voltage Pushing Supply Voltage Ripple Ground (P1-4, 12)	\pm 100 kHz, Max. @ \pm .5 Vdc 10 mV Ripple Pk-Pk from 2 kHz to 3 MHz Chassis Ground
YIG Heater Voltage & Current (P1-7, 8)	+24 Vdc \pm 4 Vdc @ 300 - 750 mA surge for 2 seconds, 100 - 150 mA steady state depending on filter type. Polarity independent : ± 12 Vdc or ± 15 Vdc acceptable
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 (SELECTn) frames the serial data loading at the data input pin (DATA). Immediately following SELECTn'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 SELECTn's low-to-high transition (Figure 2). Note that if SELECTn 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.

SM-SERIES — CONT.

YIG Tuned Bandpass Filters with Commercial 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.

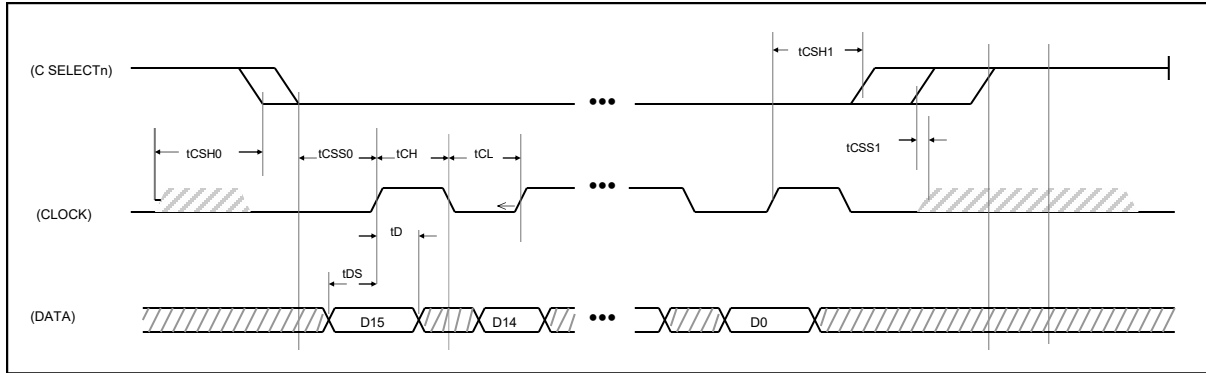


Figure 1. Timing Diagram

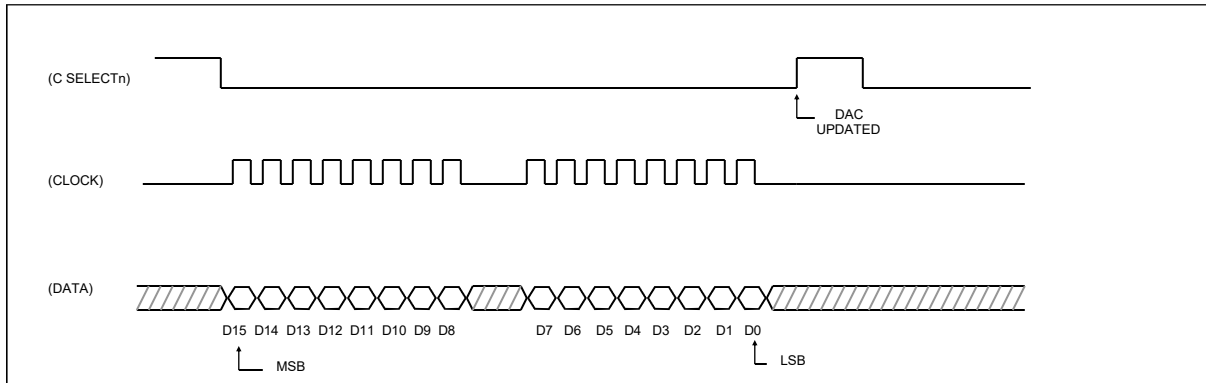


Figure 2. 3-Wire Interface Timing Diagram

TIMING CHARACTERISTICS

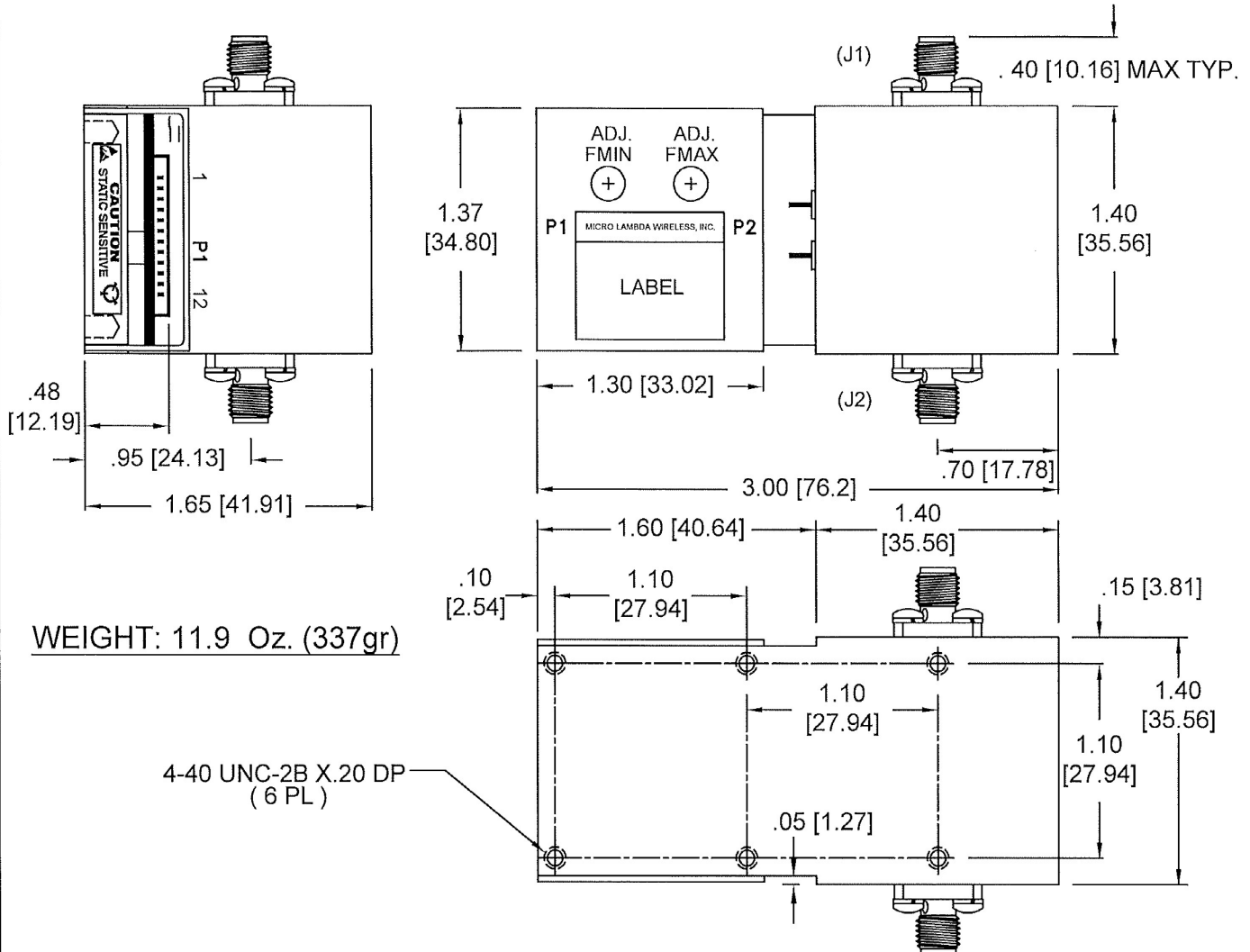
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
CLOCK Frequency	fCLK				10	MHz
CLOCK Pulse Width High	tCH		45			ns
CLOCK Pulse Width Low	tCL		45			ns
CSn Low to CLOCK High Setup	tCSS0		45			ns
CSn High to CLOCK High Setup	tCSS1		45			ns
CLOCK High to CSn Low Hold	tCSH0		30			ns
CLOCK High to CSn High Hold	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



Bandpass Filters with Positive Input Serial Drivers (0° C to +65° C)

MODEL NUMBER	# Stages	Frequency GHz	3 dB Bandwidth (MHz)	Accuracy (MHz) *	Current +15V (mA)	Current -15V (mA)	Outline Drawing
MLFP-20520SM	2	.50 to 2.0	20	+/- 10	350	50	99-0021-171
MLFP-22018SM	2	2.0 to 18.0	25	+/- 20	1050	50	99-0021-171
MLFP-22026SM	2	2.0 to 26.5	20	+/- 35	1200	50	99-0021-172
MLFP-40520SM	4	.50 to 2.0	20	+/- 10	350	50	99-0021-171
MLFP-42008SM	4	2.0 to 8.0	20	+/- 20	550	50	99-0021-171
MLFP-42018SM	4	2.0 to 18.0	40	+/- 20	1050	50	99-0021-171
MLFP-42026SM	4	2.0 to 26.5	25	+/- 35	1200	50	99-0021-172
MLFP-46018SM	4	6.0 to 18.0	100	+/- 20	1050	50	99-0021-171
MLFP-48018SM	4	8.0 to 18.0	400	+/- 25	1050	50	99-0021-171
MLFP-43040SM	4	3.0 to 40.0	30	+/- 50	1450	50	99-0021-180
MLFP-43044SM	4	3.0 to 44.0	30	+/- 60	1550	50	99-0021-180
MLFP-43050SM	4	3.0 to 50.0	30	+/- 90	2100	50	99-0021-173
MLFP-47040SM	4	7.0 to 40.0	35	+/- 50	1450	50	99-0021-180
MLFP-41840SM	4	18.0 to 40.0	50	+/- 50	1450	50	99-0021-180
MLFP-60520SM	6	0.5 to 2.0	20	+/-20	350	50	99-0021-179
MLFP-62008SM	6	2.0 to 8.0	50	+/-20	550	50	99-0021-179
MLFP-62018SM	6	2.0 to 18.0	50	+/- 20	1050	50	99-0021-179
MLFP-62026SM	6	2.0 to 26.5	30	+/- 35	1350	50	99-0021-181
MLFP-66018SM	6	6.0 to 18.0	100	+/- 20	1050	50	99-0021-179
MLFP-68018SM	6	8.0 to 18.0	500	+/- 25	1050	50	99-0021-179
MLFP-70520SM	7	0.5 to 2.0	20	+/-10	350	50	99-0021-179
MLFP-72008SM	7	2.0 to 8.0	50	+/-20	550	50	99-0021-179
MLFP-72018SM	7	2.0 to 18.0	40	+/- 35	1050	50	99-0021-179
MLFP-76018SM	7	6.0 to 18.0	500	+/- 45	1050	50	99-0021-179
MLFP-78020SM	7	8.0 to 20.0	500	+/- 45	1150	50	99-0021-179
MLFP-72026SM	7	2.0 to 26.5	30	+/- 35	1350	50	99-0021-181
MLFP-76018LSM	7-L	6.0 to 18.0	500	+/- 45	1050	50	99-0021-179
MLFP-78018LSM	7-L	8.0 to 18.0	500	+/- 45	1050	50	99-0021-179
MLFP-78020LSM	7-L	8.0 to 20.0	500	+/- 45	1150	50	99-0021-179

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



WEIGHT: 11.9 Oz. (337gr)

4-40 UNC-2B X.20 DP
(6 PL)

INPUT

PIN	FUNCTION	FUNCTION
1	CONTROL-V 0-10V	CLOCK (SCLK)
2	CONTROL RETURN	DATA (MOSI)
3	N/C	SELECTn (CS)
4	GROUND	GROUND
5	-V SUPPLY	-V SUPPLY
6	+V SUPPLY	+V SUPPLY
7	HEATER 1	HEATER 1
8	HEATER 2	HEATER 2
9	N/C	N/C
10	N/C	N/C
11	N/C	N/C
12	GROUND	GROUND

FILTER RF CONNECTIONS

CONN.	TYPE	FUNCTION
J1	SMA	RF INPUT
J2	SMA	RF OUTPUT

NOTES:

- RECOMMENDED WIRE SIZE = 24 GAUGE
- P1 CONNECTION:
 - MOLEX PART # : 5040501291(1.5MM)
 - MATING WITH # : 5040511201
 - CRIMP CONTACT : 5040520098
- DIMENSIONS ARE IN INCHES
- () DIMENSIONS ARE IN MM.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ARE:
 FRACTIONS DECIMALS ANGLES

CONTRACT NO.

APPROVALS	DATE
DRAWN N.NGUYEN	5/19/2022
CHECKED DS	5/24/22
ISSUED	

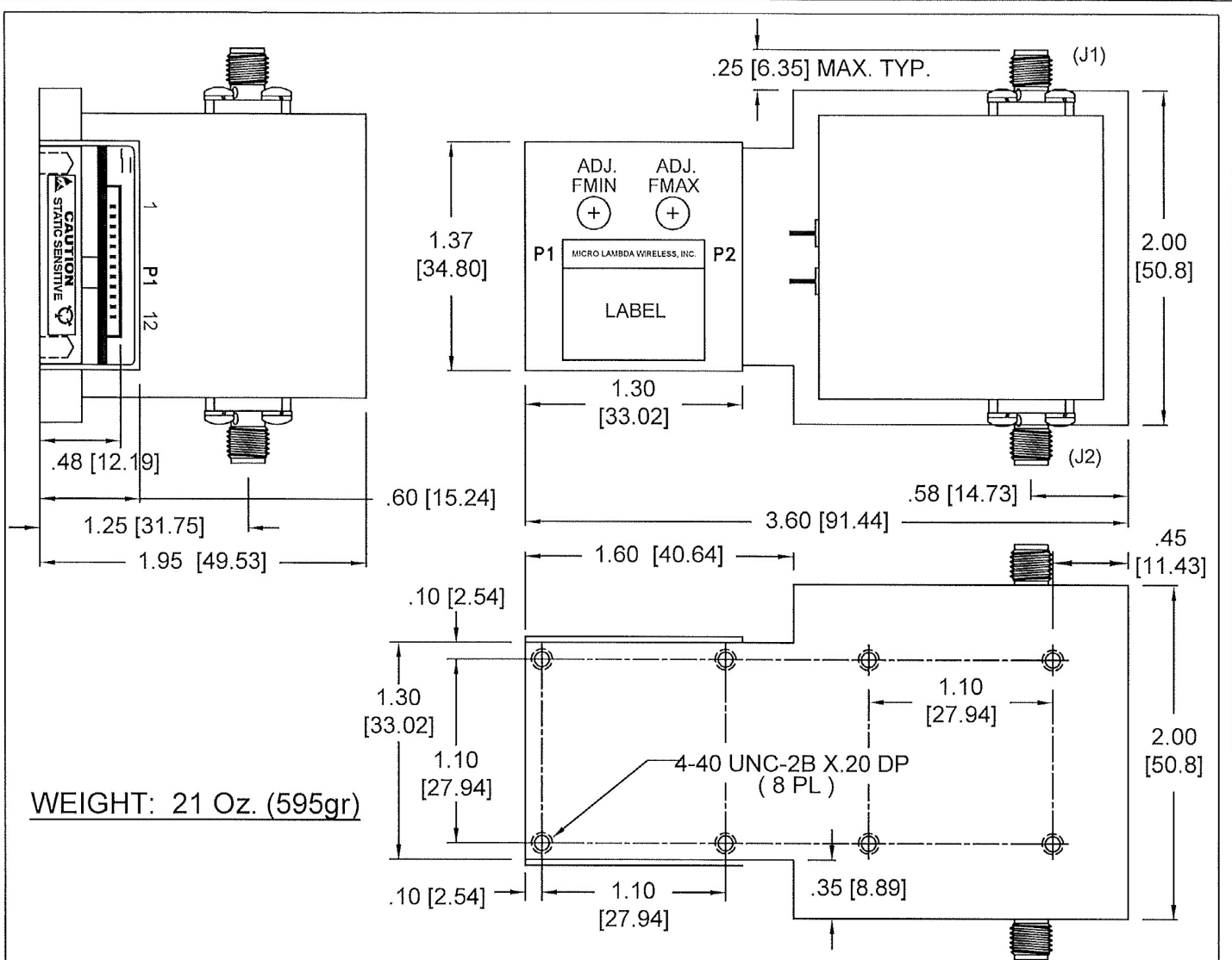


MICRO LAMBDA WIRELESS, INC.

ANALOG OR SERIAL DRIVER WITH 1.4" BP FILTER

SIZE	CAGE No ORN63	DWG. NO. 99 - 0021 - 171	REV. A
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DO NOT SCALE DRAWING



INPUT

PIN	FUNCTION	FUNCTION
1	CONTROL-V 0-10V	CLOCK (SCLK)
2	CONTROL RETURN	DATA (MOSI)
3	N/C	SELECTn (CS)
4	GROUND	GROUND
5	-V SUPPLY	-V SUPPLY
6	+V SUPPLY	+V SUPPLY
7	HEATER 1	HEATER 1
8	HEATER 2	HEATER 2
9	FM +/- 10V	N/C
10	FM RETURN	N/C
11	FAST/SLOWn	N/C
12	GROUND	GROUND

FILTER RF CONNECTIONS

CONN.	TYPE	FUNCTION
J1	SMA	RF INPUT
J2	SMA	RF OUTPUT

NOTES:

- RECOMMENDED WIRE SIZE = 24 GAUGE
- P1 CONNECTION:
 - MOLEX PART # : 5040501291(1.5MM)
 - MATING WITH # : 5040511201
 - CRIMP CONTACT : 5040520098
- DIMENSIONS ARE IN INCHES
- [] DIMENSIONS ARE IN MM.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCE ARE:
FRACTIONS DECIMALS ANGLES
▲ .xx ±.02
▲ .xxx ±.010

CONTRACT NO.

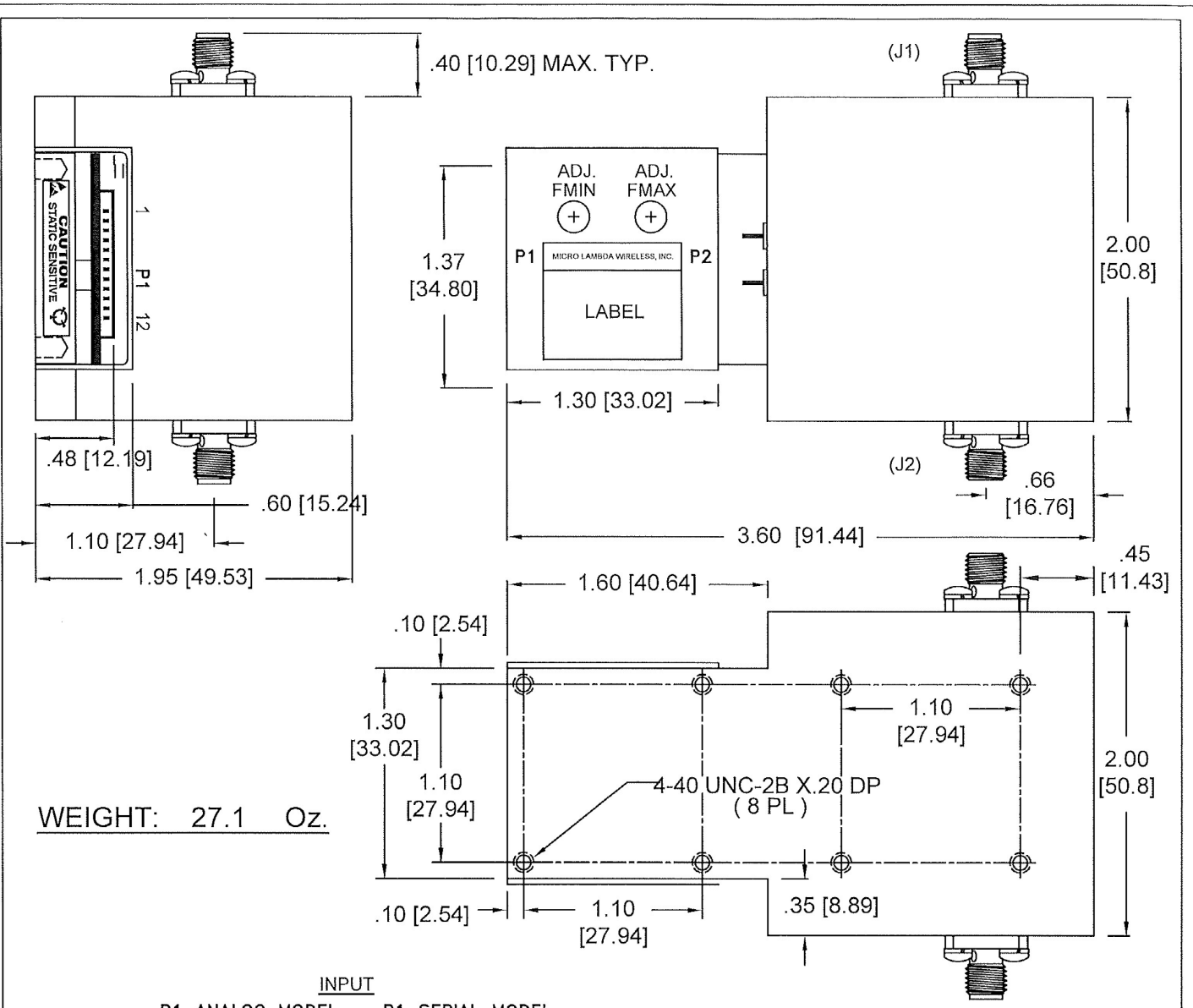
APPROVALS	DATE
DRAWN N. NGUYEN	9/19/2022
CHECKED Ds	9/19/22
ISSUED	



MICRO LAMBDA WIRELESS, INC.

ANALOG OR SERIAL DRIVER WITH 1.7" BP / FILTER

DO NOT SCALE DRAWING	SIZE	CAGE No 0RN63	DWG. NO. 99 - 0021 - 181	REV. A
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WEIGHT: 27.1 Oz.

INPUT

PIN	FUNCTION	FUNCTION
1	CONTROL-V 0-10V	CLOCK (SCLK)
2	CONTROL RETURN	DATA (MOSI)
3	N/C	SELECTn (CS)
4	GROUND	GROUND
5	-V SUPPLY	-V SUPPLY
6	+V SUPPLY	+V SUPPLY
7	HEATER 1	HEATER 1
8	HEATER 2	HEATER 2
9	FM +/- 10V	N/C
10	FM RETURN	N/C
11	FAST/SLOWn	N/C
12	GROUND	GROUND

FILTER RF CONNECTIONS

CONN.	TYPE	FUNCTION
J1	K-CONN; FEM.	RF INPUT
J2	K-CONN; FEM.	RF OUTPUT

NOTES:

- 1- RECOMMENDED WIRE SIZE = 24 GAUGE
- 2- P1 CONNECTION:
 - MOLEX PART # : 5040501291(1.5MM)
 - MATING WITH # : 5040511201
 - CRIMP CONTACT : 5040520098
- 3- DIMENSIONS ARE IN INCHES
- 4- () DIMENSIONS ARE IN MM.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCE ARE:
FRACTIONS DECIMALS ANGLES
▲ .xx ±.02
▲ .xxx ±.010

MATERIAL

FINISH

DO NOT SCALE DRAWING

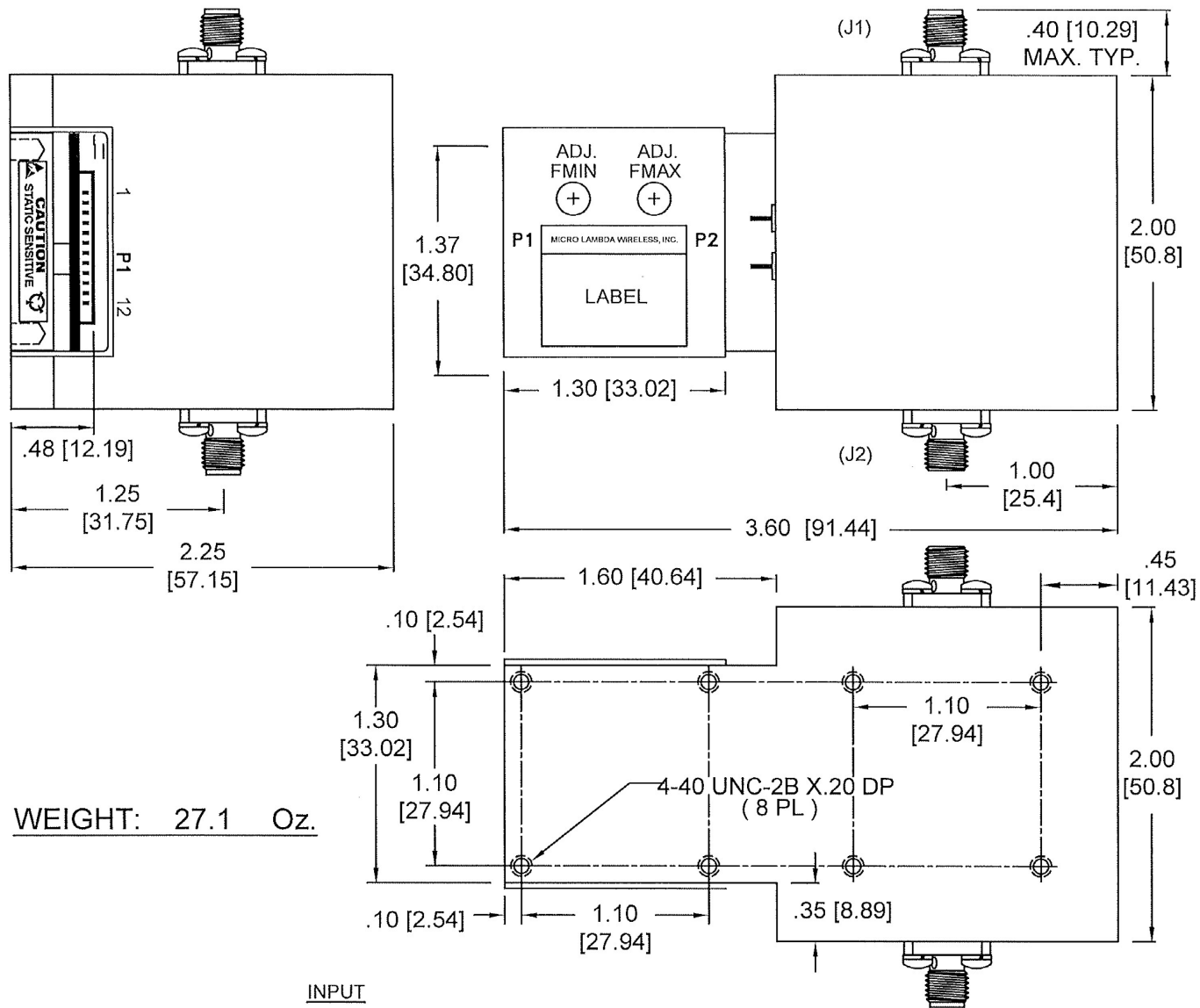
CONTRACT NO.	
APPROVALS	DATE
DRAWN N. NGUYEN	7/26/2022
CHECKED DS	7/27/22
ISSUED	



MICRO LAMBDA WIRELESS, INC.

ANALOG OR SERIAL DRIVER WITH 2.0" BP FILTER; K-CONN.

SIZE	CAGE No	DWG. NO.	REV.
0RN63	99 - 0021 - 180		A



INPUT

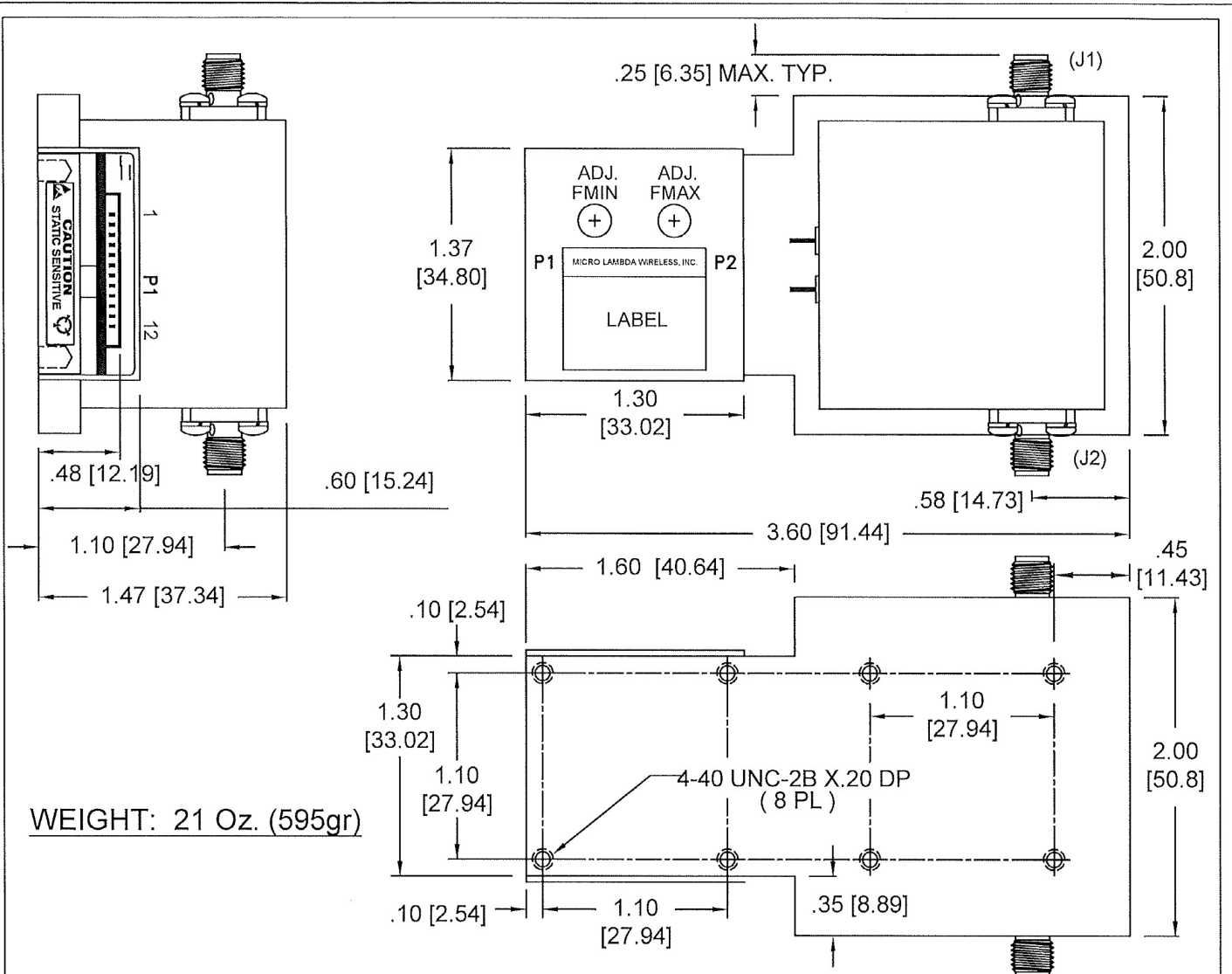
PIN	FUNCTION	FUNCTION
1	CONTROL-V 0-10V	CLOCK (SCLK)
2	CONTROL RETURN	DATA (MOSI)
3	N/C	SELECTn (CS)
4	GROUND	GROUND
5	-V SUPPLY	-V SUPPLY
6	+V SUPPLY	+V SUPPLY
7	HEATER 1	HEATER 1
8	HEATER 2	HEATER 2
9	FM +/- 10V	N/C
10	FM RETURN	N/C
11	FAST/SLOWn	N/C
12	GROUND	GROUND

FILTER RF CONNECTIONS

CONN.	TYPE	FUNCTION
J1	V-CONN; FEM.	RF INPUT
J2	V-CONN; FEM.	RF OUTPUT

- NOTES:
- RECOMMENDED WIRE SIZE = 24 GAUGE
 - P1 CONNECTION:
 - MOLEX PART # : 5040501291(1.5MM)
 - MATING WITH # : 5040511201
 - CRIMP CONTACT : 5040520098
 - DIMENSIONS ARE IN INCHES
 - () DIMENSIONS ARE IN MM.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ARE: FRACTIONS DECIMALS ANGLES * .xx ±.02 * .xxx ±.010		CONTRACT NO.		MICRO LAMBDA WIRELESS, INC.
MATERIAL		APPROVALS	DATE	
FINISH		DRAWN N.NGUYEN	5/20/2022	
DO NOT SCALE DRAWING		CHECKED DS	5/26/22	
		ISSUED		ANALOG OR SERIAL DRIVER WITH 2.0" BP FILTER
SIZE	CAGE No	DWG. NO.	REV.	
	0RN63	99 - 0021 - 173	A	



WEIGHT: 21 Oz. (595gr)

INPUT

PIN	FUNCTION	FUNCTION
1	CONTROL-V 0-10V	CLOCK (SCLK)
2	CONTROL RETURN	DATA (MOSI)
3	N/C	SELECTn (CS)
4	GROUND	GROUND
5	-V SUPPLY	-V SUPPLY
6	+V SUPPLY	+V SUPPLY
7	HEATER 1	HEATER 1
8	HEATER 2	HEATER 2
9	FM +/- 10V	N/C
10	FM RETURN	N/C
11	FAST/SLOWn	N/C
12	GROUND	GROUND

FILTER RF CONNECTIONS

CONN.	TYPE	FUNCTION
J1	SMA FEMALE	RF INPUT
J2	SMA FEMALE	RF OUTPUT

NOTES:

- RECOMMENDED WIRE SIZE = 24 GAUGE
- P1 CONNECTION:
 - MOLEX PART # : 5040501291(1.5MM)
 - MATING WITH # : 5040511201
 - CRIMP CONTACT : 5040520098
- DIMENSIONS ARE IN INCHES
- [] DIMENSIONS ARE IN MM.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCE ARE:
FRACTIONS DECIMALS ANGLES
XX .02
XXX .010

CONTRACT NO.

APPROVALS DATE

DRAWN N. NGUYEN 7/26/2022

CHECKED DS 7/27/22

ISSUED



MICRO LAMBDA WIRELESS, INC.

ANALOG OR SERIAL DRIVER WITH 1.7" X 1.2" BP FILTER

SIZE CAGE No ORN63 DWG. No 99 - 0021 - 179 REV. A

DO NOT SCALE DRAWING