

FEATURES

- 500 MHz to 50 GHz
- Compensation for Temperature Drift
- Input Regulators for Improved Stability
 - Versus Power Supply Variations
- 12 Bit Tuning Resolution
- -40° C to +85° C Temperature Range



DESCRIPTION

MICRO LAMBDA YIG Filters, model types MLFP Series, MLFR-Series and MLFRD-Series are available with integrated digital 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.

YIG drivers act as Digital Word-to-Current converter, Converting standard DC input voltages into mA of current to tune a magnetic tuning coil.

POSITIVE INPUT DRIVERS MD Series

MICRO LAMBDA positive digital drivers are available for military environments. Standard products provide for 12 bit TTL tuning input and operate over -40° to +85°C temperature range. Units incorporate a Mil-grade 25 pin control connector and filter feedthroughs in the driver housing to minimize EMI leakage.

The MD series of digital drivers provide the main

coil current from the +15 volt input line. Current increases linearly from 0 mA = 0 GHz at a rate of approximately 50 mA per 1 GHz. A 2-8 GHz filter will require 100 mA @ 2 GHz and 400 mA @ 8 GHz.

Negative input drives which provide the main coil current on the -15 volt input line, are available as an option.

Frequency drift-performance can be minimized with inclusion temperature compensation circuits within the driver. This yields filter/driver combinations set at the factory with excellent frequency accuracy performance.

In special cases, speed-up circuits like those used to improve tuning speed of YIG-oscillators can be included to provide both fast-tuned and with good accuracy. Filter parameters can be maximized during factory alignment to meet customer specific requirements.

AVAILABLE OPTIONS FOR MD SERIES MILITARY DIGITAL DRIVERS

- Customer Defined "Truth" Table
- Latched TTL
- Negative Input Drivers

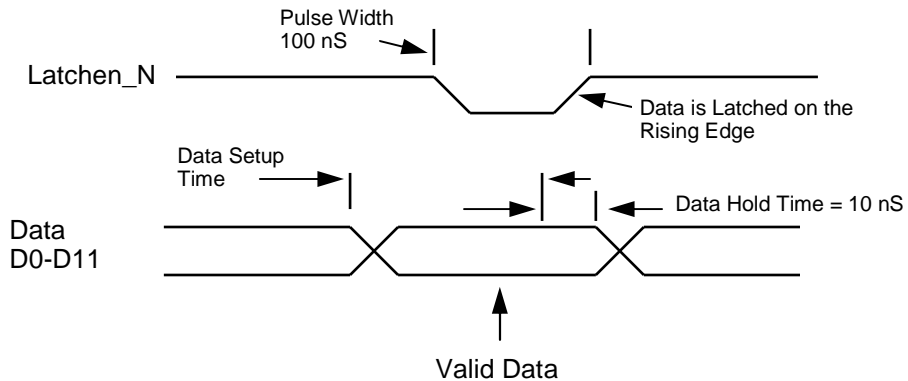


STANDARD POSITIVE INPUT DIGITAL DRIVER SELECTION GUIDE: MD SERIES

**YIG TUNED FILTERS WITH
MILITARY DIGITAL DRIVERS**

| DRIVER INPUT & RESPONSE | SPECIFICATION (-40 to + 85 deg. C) |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tuning Command | Start Word (all 0's) = Lowest Frequency Stop Word (all 1's) = Highest Frequency |
| Tuning Resolution | 12 BIT Positive Logic (Fmax-Fmin)/4095 Bit Resolution All Data Bits have Internal 10k ohm Pull-up Resistor to +5V |
| Frequency Accuracy (Note 1) (excluding hysteresis) | See Table |
| Tuning Speed | 2 mS for 1 GHz step to within +/-10 MHz. |
| Main Driver Inputs | |
| Supply Voltage & Current | +15 V +/- .5 V @ Filter Tuning Current + 50 mA, Max. -15 V +/- .5 V @ 50 mA, Max. |
| Supply Voltage Pushing | +/- .5 Vdc , 0.1 MHz Max. |
| 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 - 750 mA surge for 2 seconds, 100 - 150 mA steady state, depending on filter type. Polarity independent : ±12 Vdc or ±15 Vdc acceptable |
| Latch Enable | LATCHEN_N is a TTL, 5V CMOS control line. It has an internal 10k-ohm pull-up resistor to +5 V. It is used to transfer the data on the bus to the digital driver circuit. TTL high = data ignored. Connect to Ground if enable is not required. If the unit is to be used on a computer data bus, the below timing Diagram applies. (All times = Minimum) 10 nS rise/fall latch transitions. |

Note 1: Accuracy Includes Temp. Drift & Linearity



TIMING DIAGRAM

Bandpass Filters with Positive Input Digital Drivers (-40° C to +85° C)

| Model | # | Frequency | 3 dB | Accuracy | Current | Current | Outline |
|---------------|--------|--------------|--------------------|----------|--------------|--------------|---------|
| Number | Stages | GHz | Bandwidth (MHz) | (MHz) * | +15V (mA) | -15V (mA) | Drawing |
| MLFP-20520MD | 2 | 0.5 to 2.0 | 20 | +/- 20 | 350 | 50 | 21-052 |
| MLFP-22018MD | 2 | 2.0 to 18.0 | 25 | +/- 32 | 1050 | 50 | 21-052 |
| MLFP-22026MD | 2 | 2.0 to 26.5 | 20 | +/- 50 | 1200 | 50 | 21-061 |
| MLFP-40520MD | 4 | 0.5 to 2.0 | 20 | +/- 20 | 350 | 50 | 21-052 |
| MLFP-42008MD | 4 | 2.0 to 8.0 | 20 | +/- 28 | 550 | 50 | 21-052 |
| MLFP-42018MD | 4 | 2.0 to 18.0 | 40 | +/- 32 | 1050 | 50 | 21-052 |
| MLFP-42026MD | 4 | 2.0 to 26.5 | 25 | +/- 50 | 1200 | 50 | 21-052 |
| MLFP-43040MD | 4 | 3.0 to 40.0 | 30 | +/- 65 | 1450 | 50 | 21-090 |
| MLFP-43044MD | 4 | 3.0 to 44.0 | 30 | +/- 75 | 1550 | 50 | 21-090 |
| MLFP-43050MD | 4 | 3.0 to 50.0 | 30 | +/- 105 | 2100 | 50 | 21-139 |
| MLFP-46018MD | 4 | 6.0 to 18.0 | 100 | +/- 30 | 1050 | 50 | 21-052 |
| MLFP-47040MD | 4 | 7.0 to 40.0 | 35 | +/- 65 | 1450 | 50 | 21-090 |
| MLFP-48018MD | 4 | 8.0 to 18.0 | 400 | +/- 50 | 1050 | 50 | 21-052 |
| MLFP-41840MD | 4 | 18.0 to 40.0 | 50 | +/- 65 | 1450 | 50 | 21-090 |
| MLFP-62018MD | 6 | 2.0 to 18.0 | 40 | +/- 32 | 1050 | 50 | 21-045 |
| MLFP-62026MD | 6 | 2.0 to 26.5 | 30 | +/- 50 | 1350 | 50 | 21-048 |
| MLFP-66018MD | 6 | 6.0 to 18.0 | 100 | +/- 30 | 1050 | 50 | 21-045 |
| MLFP-68018MD | 6 | 8.0 to 18.0 | 500 | +/- 50 | 1050 | 50 | 21-045 |
| MLFP-70520MD | 7 | 0.5 to 2.0 | 20 | +/- 20 | 350 | 50 | 21-045 |
| MLFP-72018MD | 7 | 2.0 to 18.0 | 40 | +/- 50 | 1050 | 50 | 21-045 |
| MLFP-72026MD | 7 | 2.0 to 26.5 | 30 | +/- 65 | 1350 | 50 | 21-048 |
| MLFP-76018MD | 7 | 6.0 to 18.0 | 500 | +/- 60 | 1050 | 50 | 21-045 |
| MLFP-76018LMD | 7-L | 6.0 to 18.0 | 500 | +/- 60 | 1050 | 50 | 21-045 |
| MLFP-78018LMD | 7-L | 8.0 to 18.0 | 500 | +/- 60 | 1050 | 50 | 21-045 |
| MLFP-78020MD | 7 | 8.0 to 20.0 | 500 | +/- 60 | 1150 | 50 | 21-045 |
| MLFP-78020LMD | 7-L | 8.0 to 20.0 | 500 | +/- 60 | 1150 | 50 | 21-045 |

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

Band Reject Filters with Positive Input Digital Drivers (-40° C to +85° C)

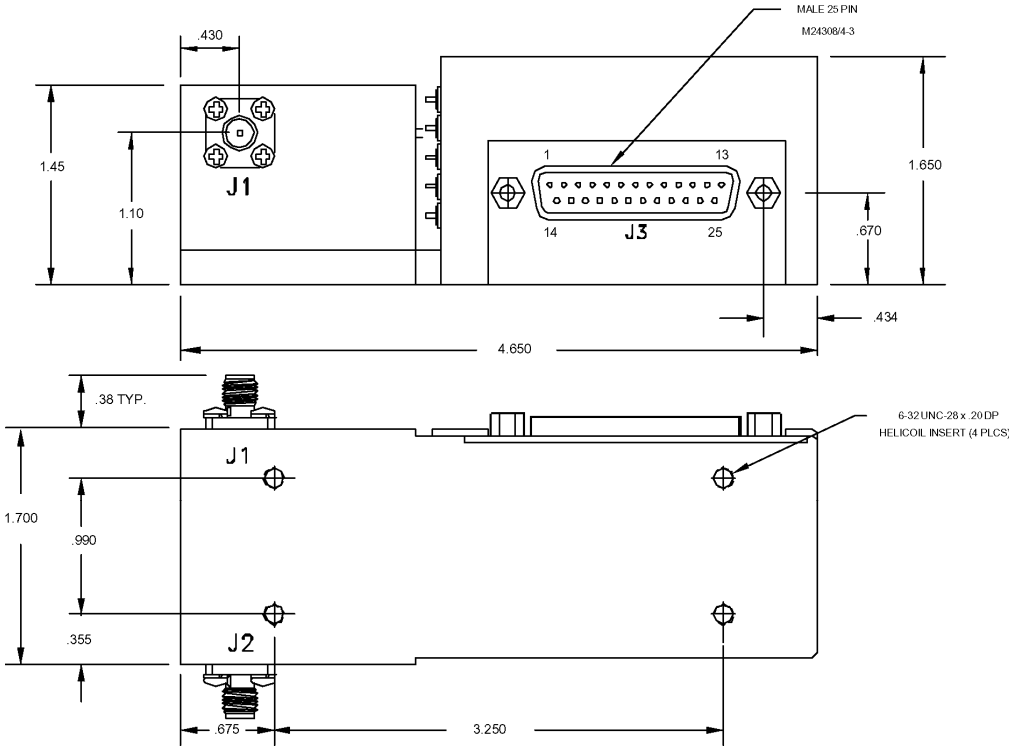
| Model Number | Frequency GHz | 3 dB Bandwidth (MHz) | 40 dB Bandwidth | Accuracy (MHz) * | Current +15 V (mA) | Current -15 V (mA) | Outline Drawing |
|-----------------|------------------|----------------------------|--------------------|-----------------------|--------------------------|--------------------------|--------------------|
| MLFR-0102MD | 1.0 to 2.0 | 100 | 10 | +/- 7 | 250 | 50 | 21-036 |
| MLFR-0204MD | 2.0 to 4.0 | 125 | 15 | +/- 12 | 350 | 50 | 21-036 |
| MLFR-0408MD | 4.0 to 8.0 | 150 | 20 | +/- 15 | 550 | 50 | 21-036 |
| MLFR-0812MD | 8.0 to 12.4 | 150 | 25 | +/- 17 | 750 | 50 | 21-036 |
| MLFR-1218MD | 12.4 to 18.0 | 150 | 25 | +/- 23 | 1050 | 50 | 21-036 |
| MLFR-0502MD | 0.5 to 2.0 | 150 | 5 | +/- 8 | 250 | 50 | 21-036 |
| MLFR-0206MD | 2.0 to 6.0 | 150 | 20 | +/- 16 | 450 | 50 | 21-036 |
| MLFR-0208MD | 2.0 to 8.0 | 150 | 15 | +/- 18 | 550 | 50 | 21-036 |
| MLFR-0212MD | 2.0 to 12.0 | 150 | 10 | +/- 20 | 750 | 50 | 21-036 |
| MLFR-0218MD | 2.0 to 18.0 | 150 | 10 | +/- 30 | 1050 | 50 | 21-036 |
| MLFR-0220MD | 2.0 to 20.0 | 150 | 5 | +/- 30 | 1050 | 50 | 21-036 |
| MLFR-0418MD | 4.0 to 18.0 | 150 | 10 | +/- 27 | 1050 | 50 | 21-036 |
| MLFR-160418MD | 4.0 to 18.0 | 150 | 25 | +/- 27 | 1050 | 50 | 21-036 |
| MLFR-0618MD | 6.0 to 18.0 | 150 | 25 | +/- 27 | 1050 | 50 | 21-036 |
| MLFR-160618MD | 6.0 to 18.0 | 150 | 25 | +/- 27 | 1050 | 50 | 21-036 |
| MLFR-0818MD | 8.0 to 18.0 | 150 | 35 | +/- 27 | 1050 | 50 | 21-036 |
| MLFR-160808MD | 8.0 to 18.0 | 150 | 35 | +/- 27 | 1050 | 50 | 21-036 |

Dual Channel Band Reject Filters with Positive Input Digital Drivers (-40° C to +85° C)

| Model Number | Frequency GHz | 3 dB Bandwidth (MHz) | 40 dB Bandwidth | Accuracy (MHz) * | Current +15 V (mA) | Current -15 V (mA) | Outline Drawing |
|-----------------|------------------|----------------------------|--------------------|-----------------------|--------------------------|--------------------------|--------------------|
| MLFRD-0206MD | 2.0 to 6.0 | 120 | 5 | +/- 16 | 450 | 50 | 21-086 |
| MLFRD-0208MD | 2.0 to 8.0 | 120 | 5 | +/- 18 | 550 | 50 | 21-086 |
| MLFRD-0618MD | 6.0 to 18.0 | 100 | 15 | +/- 27 | 1050 | 50 | 21-086 |
| MLFRD-0818MD | 8.0 to 18.0 | 100 | 5 | +/- 27 | 1050 | 50 | 21-086 |

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

Outline Drawing: 21-045

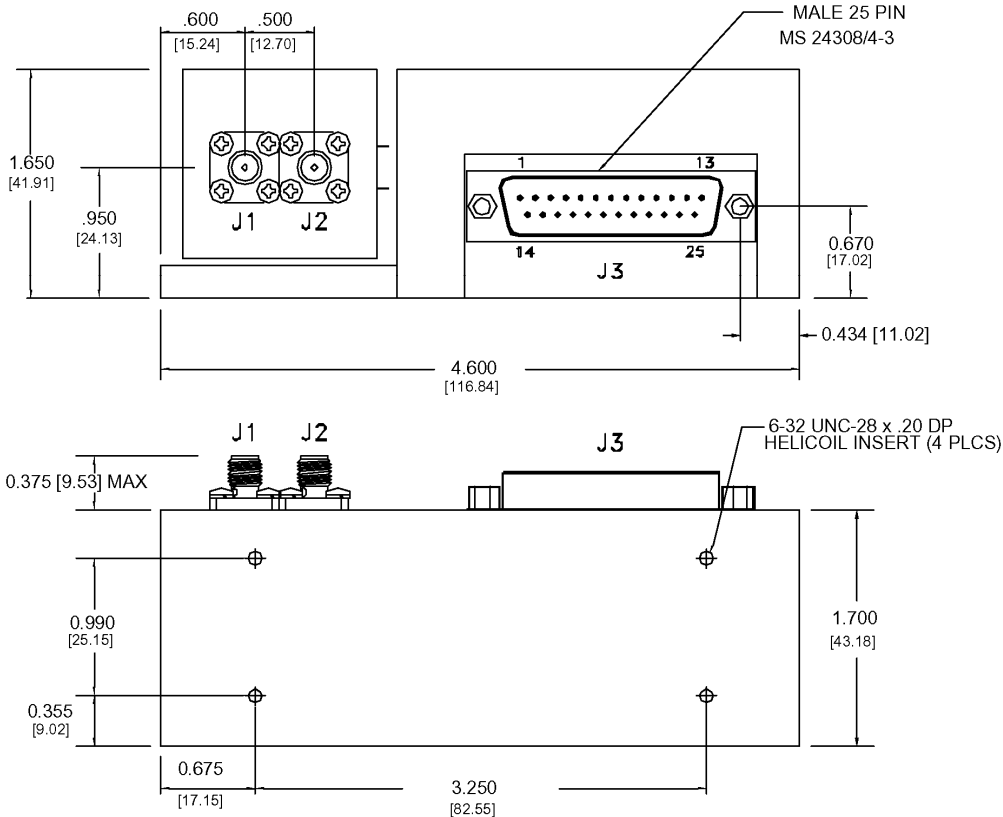


Weight: 23 oz.

| CONNECTIONS | | | |
|-------------|------------|-------|-------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J1 | SMA FEMALE | THD | RF IN |
| J2 | SMA FEMALE | THD | RF OUT |
| J3 | DB25 MALE | 1 | DATA BIT 0 (LSB) |
| J3 | DB25 MALE | 2 | DATA BIT 1 |
| J3 | DB25 MALE | 3 | DATA BIT 2 |
| J3 | DB25 MALE | 4 | DATA BIT 3 |
| J3 | DB25 MALE | 5 | DATA BIT 4 |
| J3 | DB25 MALE | 6 | DATA BIT 5 |
| J3 | DB25 MALE | 7 | DATA BIT 6 |
| J3 | DB25 MALE | 8 | DATA BIT 7 |
| J3 | DB25 MALE | 9 | DATA BIT 8 |
| J3 | DB25 MALE | 10 | DATA BIT 9 |
| J3 | DB25 MALE | 11 | DATA BIT 10 |
| J3 | DB25 MALE | 12 | DATA BIT 11 (MSB) |
| J3 | DB25 MALL | 13 | N/C |
| J3 | DB25 MAI F | 14 | N/C |
| J3 | DB25 MAI F | 15 | N/C |
| J3 | DB25 MALL | 16 | N/C |
| J3 | DB25 MALL | 17 | LATCH/STROBL |
| J3 | DB25 MAI F | 18 | GROUND |
| J3 | DB25 MAI F | 19 | +SUPPLY VOLTAGE |
| J3 | DB25 MAI F | 20 | -SUPPLY VOLTAGE |
| J3 | DB25 MALL | 21 | FILATER VOLTAGE |
| J3 | DB25 MALL | 22 | FILATER RETURN |
| J3 | DB25 MALL | 23 | FM COIL + ** |
| J3 | DB25 MALL | 24 | FM COIL ** |
| J3 | DB25 MAI F | 25 | TTL BAND SELECT * |

* REQUIRED FOR DUAL OSC. ONLY
** NOT USED FOR FILTER

Outline Drawing: 21-036

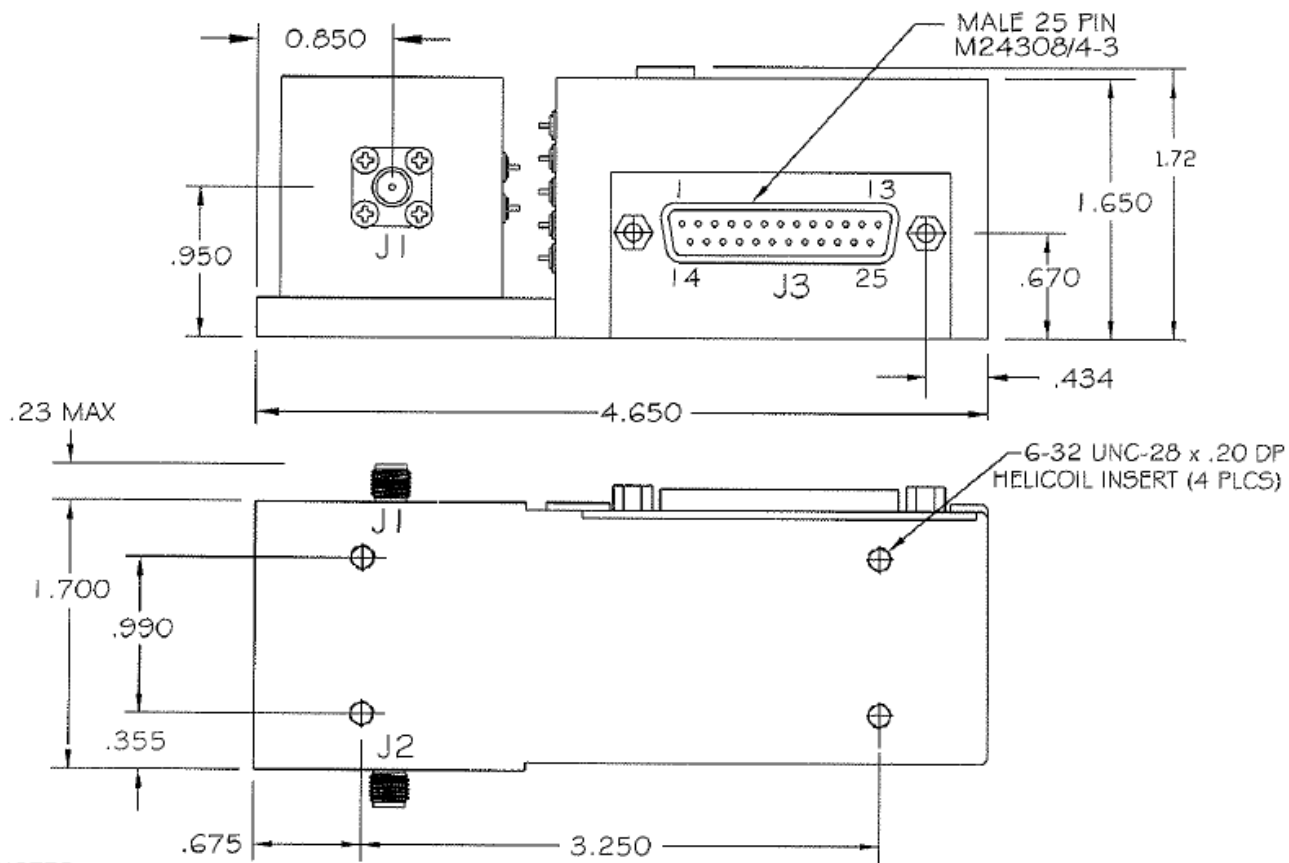


NOTES :

- DIMENSIONS ARE IN INCHES
- SUPPLY & GROUND WIRES = 20-22 GAUGE
ALL OTHER WIRES = 24-26 GAUGE
- THERMAL COMPOUND REQUIRED BETWEEN
BASE PLATE AND MOUNTING SURFACE
- DIMENSIONS IN () ARE IN MM
- LATCH/STROBE TTL 0 = DATA ACTIVE
TTL 1 = DATA LATCHED

(*) : TTL BAND SEL. 0=8-Fmax ; 1=2-8 GHz
* 000=2GHz ; 5FF=8GHz ; FFF=Fmax

Weight: 17 oz.



NOTES :

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

- DIMENSIONS IN () ARE IN MM
- LATCH/STROBE TTL 0 = DATA ACTIVE
TTL 1 = DATA LATCHED

(*) : TTL BAND SEL. 0=8-Fmax ; 1=2-8 GHz
* 000=2GHz ; 5FF=8GHz ; FFF=Fmax

| CONNECTIONS | | | |
|-------------|------------|-------|-------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J1 | SMA FEMALE | THD | RF IN |
| J2 | SMA FEMALE | THD | RF OUT |
| J3 | DB25 MALE | 1 | DATA BIT 0 (LSB) |
| J3 | DB25 MALE | 2 | DATA BIT 1 |
| J3 | DB25 MALE | 3 | DATA BIT 2 |
| J3 | DB25 MALE | 4 | DATA BIT 3 |
| J3 | DB25 MALE | 5 | DATA BIT 4 |
| J3 | DB25 MALE | 6 | DATA BIT 5 |
| J3 | DB25 MALE | 7 | DATA BIT 6 |
| J3 | DB25 MALE | 8 | DATA BIT 7 |
| J3 | DB25 MALE | 9 | DATA BIT 8 |
| J3 | DB25 MALE | 10 | DATA BIT 9 |
| J3 | DB25 MALE | 11 | DATA BIT 10 |
| J3 | DB25 MALE | 12 | DATA BIT 11 (MSB) |

| CONNECTIONS | | | |
|-------------|-----------|-------|-------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J3 | DB25 MALE | 13 | N/C |
| J3 | DB25 MALE | 14 | N/C |
| J3 | DB25 MALE | 15 | N/C |
| J3 | DB25 MALE | 16 | N/C |
| J3 | DB25 MALE | 17 | LATCH/STROBE |
| J3 | DB25 MALE | 18 | GROUND |
| J3 | DB25 MALE | 19 | +SUPPLY VOLTAGE |
| J3 | DB25 MALE | 20 | -SUPPLY VOLTAGE |
| J3 | DB25 MALE | 21 | HEATER VOLTAGE |
| J3 | DB25 MALE | 22 | HEATER RETURN |
| J3 | DB25 MALE | 23 | FM COIL + ** |
| J3 | DB25 MALE | 24 | FM COIL - ** |
| J3 | DB25 MALE | 25 | TTL BAND SELECT * |

* REQUIRED FOR DUAL OSC. ONLY
** NOT USED FOR FILTER

UNLESS OTHERWISE SPECIFIED DIMENSIONS
ARE IN INCHES
TOLERANCE ARE:
FRACTIONS DECIMALS ANGLES
± .010 ± .005 ± .010

CONTRACT NO.

APPROVALS DATE

DRAWN: N. NGUYEN 6/11/09

CHKD: *[Signature]* 6/11/09

MAILED: *[Signature]*

C.A.

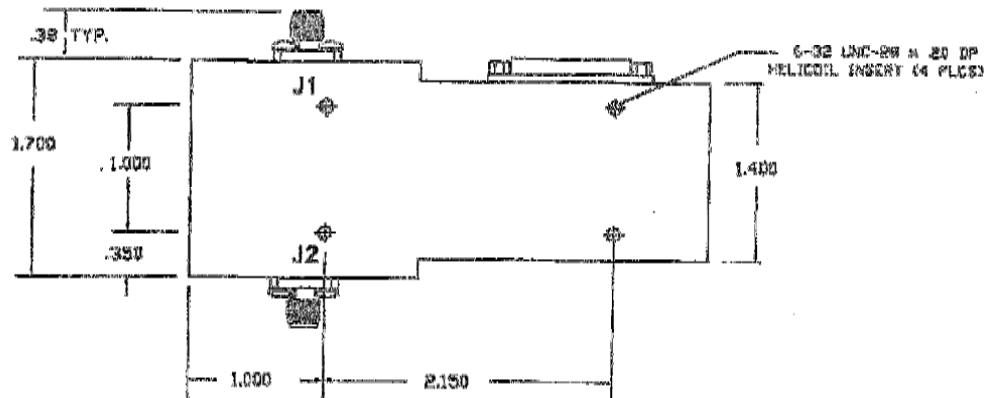
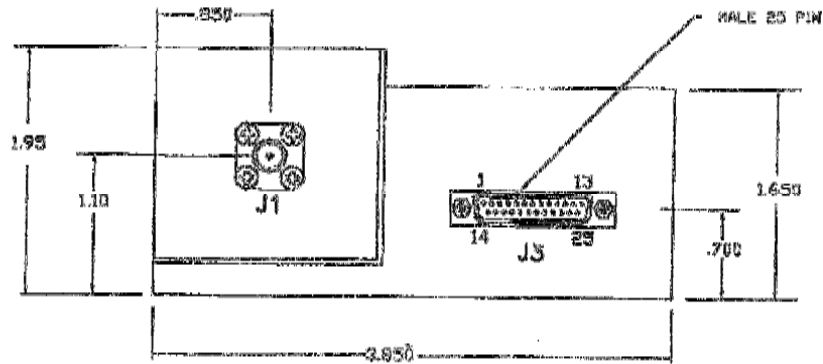


MICRO LAMBDA WIRELESS, INC.

BPF (1.4" X 1.4") WITH MILITARY 12 BIT DIGITAL DRIVER

SIZE: ORNG3 CAGE NO: DWG. NO: 21-052 REV: A

DO NOT SCALE DRAWING



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

- * - LATCH/STROBE TTL 0 = DATA ACTIVE
 TTL 1 = DATA LATCHED
 (*) : TTL BAND SEL. 0=8-Fmax ; 1=2-8 GHz
 * 000=2GHz ; 5FF=3GHz ; FFF=Fmax

| CONNECTIONS | | | |
|-------------|------------|-------|-------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J1 | SMA FEMALE | THD | RF IN |
| J2 | SMA FEMALE | THD | RF OUT |
| J3 | DB25 MALE | 1 | DATA BIT 0 (LSB) |
| J3 | DB25 MALE | 2 | DATA BIT 1 |
| J3 | DB25 MALE | 3 | DATA BIT 2 |
| J3 | DB25 MALE | 4 | DATA BIT 3 |
| J3 | DB25 MALE | 5 | DATA BIT 4 |
| J3 | DB25 MALE | 6 | DATA BIT 5 |
| J3 | DB25 MALE | 7 | DATA BIT 6 |
| J3 | DB25 MALE | 8 | DATA BIT 7 |
| J3 | DB25 MALE | 9 | DATA BIT 8 |
| J3 | DB25 MALE | 10 | DATA BIT 9 |
| J3 | DB25 MALE | 11 | DATA BIT 10 |
| J3 | DB25 MALE | 12 | DATA BIT 11 (MSB) |

| CONNECTIONS | | | |
|-------------|-----------|-------|-------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J3 | DB25 MALE | 13 | N/C |
| J3 | DB25 MALE | 14 | N/C |
| J3 | DB25 MALE | 15 | N/C |
| J3 | DB25 MALE | 16 | N/C |
| J3 | DB25 MALE | 17 | LATCH/STROBE |
| J3 | DB25 MALE | 18 | GROUND |
| J3 | DB25 MALE | 19 | +SUPPLY VOLTAGE |
| J3 | DB25 MALE | 20 | -SUPPLY VOLTAGE |
| J3 | DB25 MALE | 21 | HEATER VOLTAGE |
| J3 | DB25 MALE | 22 | HEATER RETURN |
| J3 | DB25 MALE | 23 | FM COIL + ** |
| J3 | DB25 MALE | 24 | FM COIL - ** |
| J3 | DB25 MALE | 25 | TTL BAND SELECT * |

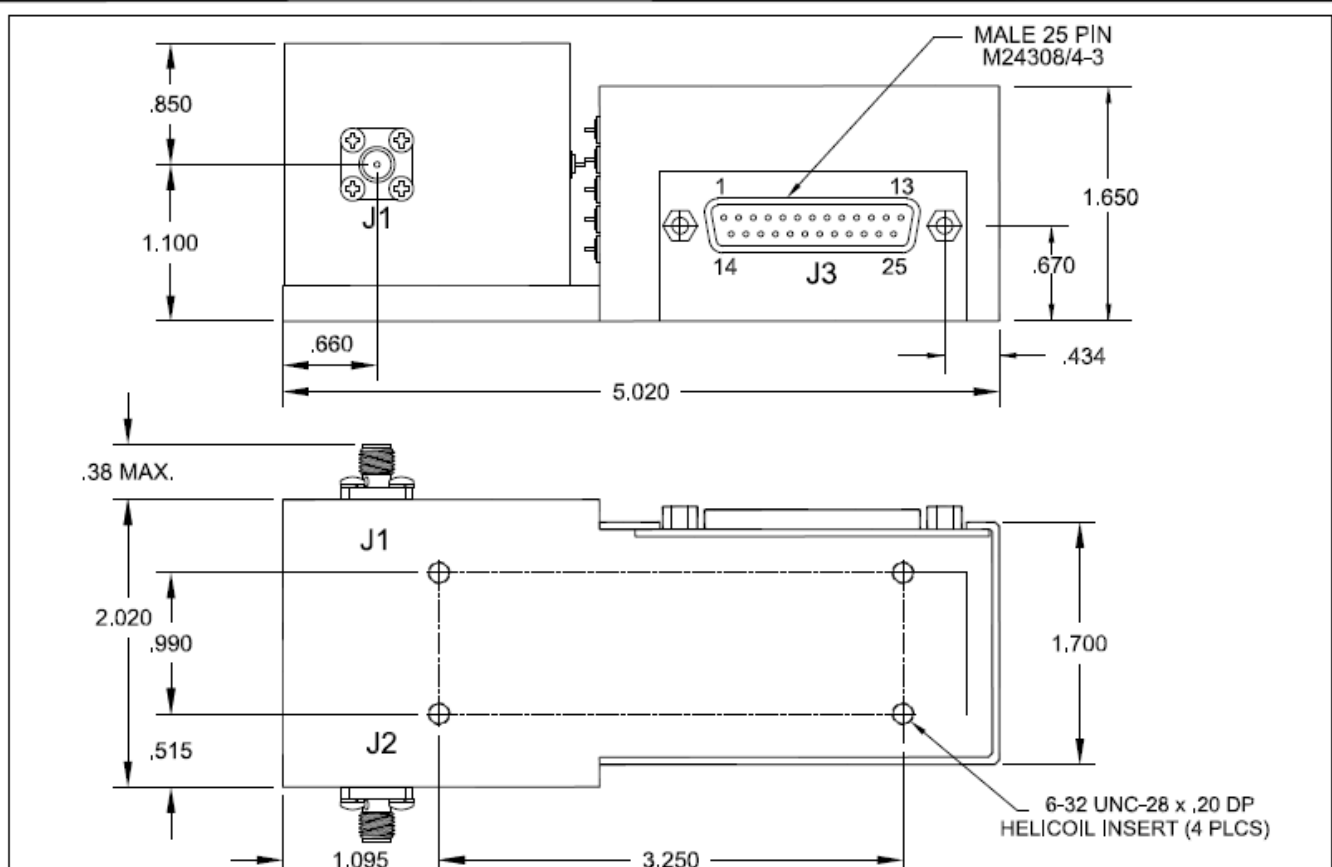
* REQUIRED FOR DUAL OSC. ONLY
** NOT USED FOR FILTER

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| MANUFACTURED BY: MICRO LAMBDA, INC. DATE OF DESIGN: 5/31/01 DRAWN BY: D.J. CHECKED BY: D.J. APPROVED BY: D.J. DATE: 5/31/01 | WEIGHT: 19 oz. HEIGHT: |
|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|



MICRO LAMBDA, INC.

| | | | |
|------------------------------------------------------------|---------|----------|-----|
| BANDPASS FILTER (1.7" : 4 STG.) WITH DIGITAL DRIVER | | | |
| SIZE | FORM NO | CHK. NO. | 30K |
| | 08N63 | 21 - 061 | |



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
 - 4. - DIMENSIONS IN () ARE IN MM
 - 4. - LATCH/STROBE TTL 0 = DATA ACTIVE
TTL 1 = DATA LATCHED
- (*) : TTL BAND SEL. 0=8-Fmax ; 1=2-8 GHz
* 000=2GHz ; 5FF=8GHz ; FFF=Fmax

| CONNECTIONS | | | |
|-------------|--------------|-------|-------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J1 | K-CONN (FEM) | THD | RF IN |
| J2 | K-CONN (FEM) | THD | RF OUT |
| J3 | DB25 MALE | 1 | DATA BIT 0 (LSB) |
| J3 | DB25 MALE | 2 | DATA BIT 1 |
| J3 | DB25 MALE | 3 | DATA BIT 2 |
| J3 | DB25 MALE | 4 | DATA BIT 3 |
| J3 | DB25 MALE | 5 | DATA BIT 4 |
| J3 | DB25 MALE | 6 | DATA BIT 5 |
| J3 | DB25 MALE | 7 | DATA BIT 6 |
| J3 | DB25 MALE | 8 | DATA BIT 7 |
| J3 | DB25 MALE | 9 | DATA BIT 8 |
| J3 | DB25 MALE | 10 | DATA BIT 9 |
| J3 | DB25 MALE | 11 | DATA BIT 10 |
| J3 | DB25 MALE | 12 | DATA BIT 11 (MSB) |

| CONNECTIONS | | | |
|-------------|-----------|-------|-------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J3 | DB25 MALE | 13 | N/C |
| J3 | DB25 MALE | 14 | N/C |
| J3 | DB25 MALE | 15 | N/C |
| J3 | DB25 MALE | 16 | N/C |
| J3 | DB25 MALE | 17 | LATCH/STROBE |
| J3 | DB25 MALE | 18 | GROUND |
| J3 | DB25 MALE | 19 | +SUPPLY VOLTAGE |
| J3 | DB25 MALE | 20 | -SUPPLY VOLTAGE |
| J3 | DB25 MALE | 21 | HEATER VOLTAGE |
| J3 | DB25 MALE | 22 | HEATER RETURN |
| J3 | DB25 MALE | 23 | FM COIL + ** |
| J3 | DB25 MALE | 24 | FM COIL - ** |
| J3 | DB25 MALE | 25 | TTL BAND SELECT * |

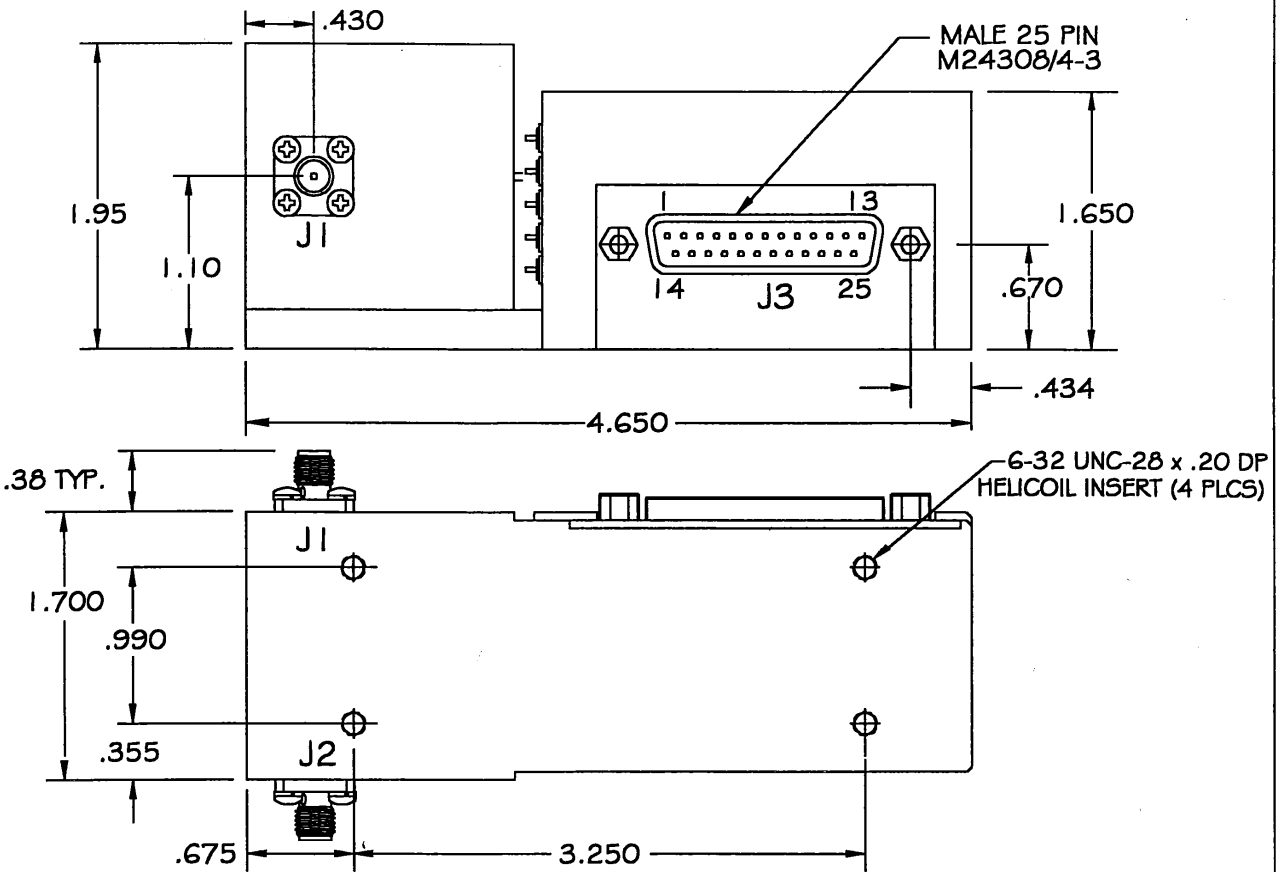
* REQUIRED FOR DUAL OSC. ONLY
** NOT USED FOR FILTER

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <small>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ARE:</small> <small>FRACTIONS .XX ▲.020</small> <small>DECIMALS .XXX ▲.005</small> <small>ANGLES</small> WEIGHT 20 oz. FINISH <small>DO NOT SCALE DRAWING</small> | CONTRACT NO. |
| | APPROVALS |
| | DATE |
| | DRAWN N.NGUYEN 4/20/10 |
| | ENGR. |
| MANUF. | |
| QA | |

MICRO LAMBDA WIRELESS, INC.

BPF (2.0" X 1.7") WITH MILITARY 12 BIT DIGITAL DRIVER

| | | | |
|------|-------------------------|-----------------------------|------------------|
| SIZE | CAGE No ORN63 | DWG. NO. 21 - 090 | REV. A |
|------|-------------------------|-----------------------------|------------------|



| CONNECTIONS | | | |
|-------------|------------|-------|-------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J1 | SMA FEMALE | THD | RF IN |
| J2 | SMA FEMALE | THD | RF OUT |
| J3 | DB25 MALE | 1 | DATA BIT 0 (LSB) |
| J3 | DB25 MALE | 2 | DATA BIT 1 |
| J3 | DB25 MALE | 3 | DATA BIT 2 |
| J3 | DB25 MALE | 4 | DATA BIT 3 |
| J3 | DB25 MALE | 5 | DATA BIT 4 |
| J3 | DB25 MALE | 6 | DATA BIT 5 |
| J3 | DB25 MALE | 7 | DATA BIT 6 |
| J3 | DB25 MALE | 8 | DATA BIT 7 |
| J3 | DB25 MALE | 9 | DATA BIT 8 |
| J3 | DB25 MALE | 10 | DATA BIT 9 |
| J3 | DB25 MALE | 11 | DATA BIT 10 |
| J3 | DB25 MALE | 12 | DATA BIT 11 (MSB) |

| CONNECTIONS | | | |
|-------------|-----------|-------|-------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J3 | DB25 MALE | 13 | N/C |
| J3 | DB25 MALE | 14 | N/C |
| J3 | DB25 MALE | 15 | N/C |
| J3 | DB25 MALE | 16 | N/C |
| J3 | DB25 MALE | 17 | LATCH/STROBE |
| J3 | DB25 MALE | 18 | GROUND |
| J3 | DB25 MALE | 19 | +SUPPLY VOLTAGE |
| J3 | DB25 MALE | 20 | -SUPPLY VOLTAGE |
| J3 | DB25 MALE | 21 | HEATER VOLTAGE |
| J3 | DB25 MALE | 22 | HEATER RETURN |
| J3 | DB25 MALE | 23 | FM COIL + ** |
| J3 | DB25 MALE | 24 | FM COIL - ** |
| J3 | DB25 MALE | 25 | TTL BAND SELECT * |

* REQUIRED FOR DUAL OSC. ONLY
** NOT USED FOR FILTER

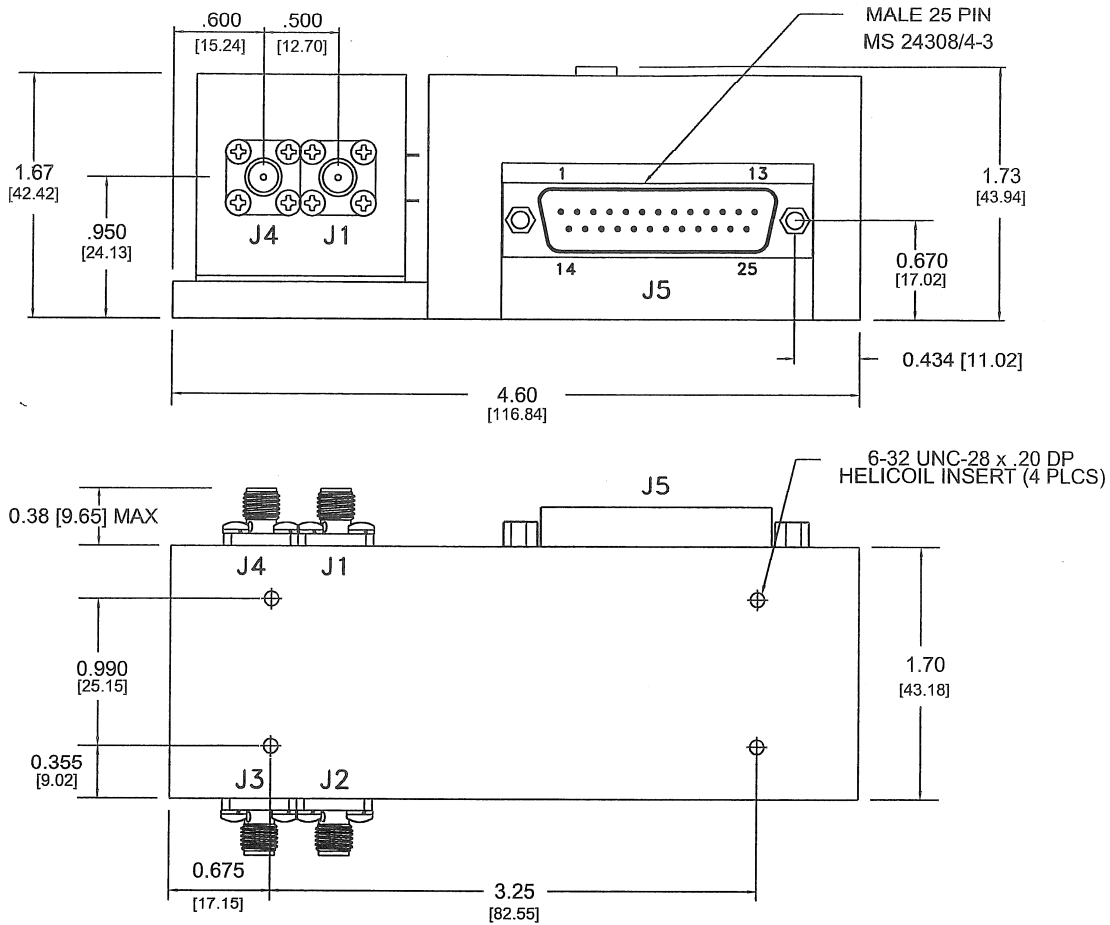
| | | |
|-------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ARE : FRACTIONS .005 DECIMALS .0005 ANGLES .0005 | CONTRACT NO. | |
| | APPROVALS | DATE |
| WEIGHT 25 oz. | DRAWN | N.NGLUYEN 10/19/98 |
| | ENGR | <i>[Signature]</i> 10/19/98 |
| FINISH | MANUF. | |
| | Q.A. | |
| DO NOT SCALE DRAWING | | |



MICRO LAMBDA, INC.

BPF (1.7" X 1.7") WITH MILITARY 12 BIT DIGITAL DRIVER

| | | | |
|------|------------------|----------------------|------|
| SIZE | CAGE No ORN63 | DWG. NO. 21 - 048 | REV. |
|------|------------------|----------------------|------|



* POWER SUPPLY & GROUND WIRES=20-22 AWG * OTHERS=24-26 AWG
 DATA 000= F-MIN LATCH-EN 0 = DATA ACTIVE * DIMENSIONS ARE IN INCHES
 FFF= F-MAX 1 = DATA LATCHED * DIMENSIONS IN [] ARE IN MM.

| CONNECTIONS | | | |
|-------------|------------|-------|------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J1 | SMA FEMALE | THD | RF IN |
| J2 | SMA FEMALE | THD | RF OUT |
| J3 | SMA FEMALE | THD | RF IN |
| J4 | SMA FEMALE | THD | RF OUT |
| J5 | DB25 MALE | 1 | DATA BIT 0 (LSB) |
| J5 | DB25 MALE | 2 | DATA BIT 1 |
| J5 | DB25 MALE | 3 | DATA BIT 2 |
| J5 | DB25 MALE | 4 | DATA BIT 3 |
| J5 | DB25 MALE | 5 | DATA BIT 4 |
| J5 | DB25 MALE | 6 | DATA BIT 5 |
| J5 | DB25 MALE | 7 | DATA BIT 6 |
| J5 | DB25 MALE | 8 | DATA BIT 7 |
| J5 | DB25 MALE | 9 | DATA BIT 8 |
| J5 | DB25 MALE | 10 | DATA BIT 9 |
| J5 | DB25 MALE | 11 | DATA BIT 10 |

| CONNECTIONS | | | |
|-------------|-----------|-------|------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J5 | DB25 MALE | 12 | DATABIT 11 (MSB) |
| J5 | DB25 MALE | 13 | N/C |
| J5 | DB25 MALE | 14 | N/C |
| J5 | DB25 MALE | 15 | N/C |
| J5 | DB25 MALE | 16 | N/C |
| J5 | DB25 MALE | 17 | LATCH/STROBE |
| J5 | DB25 MALE | 18 | GROUND |
| J5 | DB25 MALE | 19 | +SUPPLY VOLTAGE |
| J5 | DB25 MALE | 20 | -SUPPLY VOLTAGE |
| J5 | DB25 MALE | 21 | HEATER VOLTAGE |
| J5 | DB25 MALE | 22 | HEATER RETURN |
| J5 | DB25 MALE | 23 | N/C |
| J5 | DB25 MALE | 24 | N/C |
| J5 | DB25 MALE | 25 | N/C |

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

CONTRACT NO.

APPROVALS DATE

DRAWN N.NGUYEN 6/01/09

CHECKED [Signature] 6/1/09

ISSUED

WEIGHT
 17 oz. (482gr.)

FINISH

DO NOT SCALE DRAWING



MICRO LAMBDA WIRELESS, INC.

DUAL FILTER WITH MIL. DIG. DRIVER

SIZE

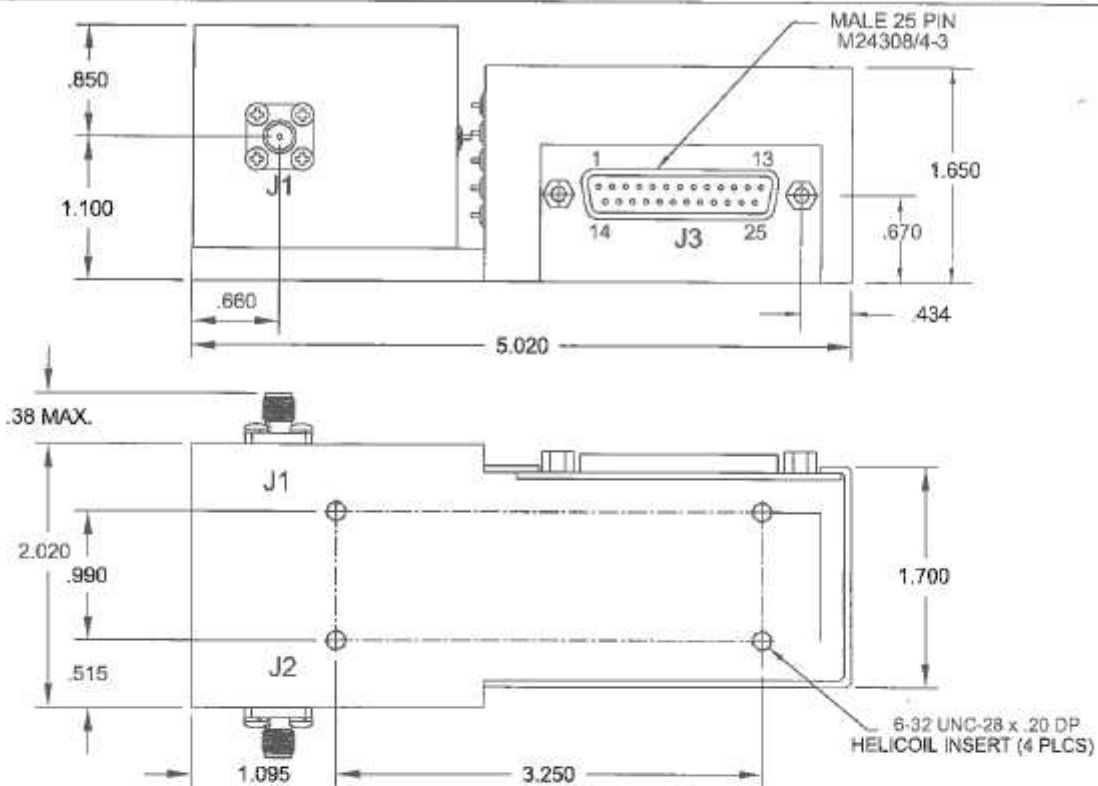
CAGE No
 ORN63

DWG. NO.

21 - 086

REV.

A



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
- 4. - DIMENSIONS IN () ARE IN MM
- 4. - LATCH/STROBE TTL 0 = DATA ACTIVE
TTL 1 = DATA LATCHED

(*) : TTL BAND SEL. 0=6-Fmax ; 1=2-8 GHz
* 000=2GHz ; 5FF=8GHz ; PFF=Fmax

| CONNECTIONS | | | |
|-------------|--------------|-------|-------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J1 | V-CONN (FEM) | THD | RF IN |
| J2 | V-CONN (FEM) | THD | RF OUT |
| J3 | DB25 MALE | 1 | DATA BIT 0 (LSB) |
| J3 | DB25 MALE | 2 | DATA BIT 1 |
| J3 | DB25 MALE | 3 | DATA BIT 2 |
| J3 | DB25 MALE | 4 | DATA BIT 3 |
| J3 | DB25 MALE | 5 | DATA BIT 4 |
| J3 | DB25 MALE | 6 | DATA BIT 5 |
| J3 | DB25 MALE | 7 | DATA BIT 6 |
| J3 | DB25 MALE | 8 | DATA BIT 7 |
| J3 | DB25 MALE | 9 | DATA BIT 8 |
| J3 | DB25 MALE | 10 | DATA BIT 9 |
| J3 | DB25 MALE | 11 | DATA BIT 10 |
| J3 | DB25 MALE | 12 | DATA BIT 11 (MSB) |

| CONNECTIONS | | | |
|-------------|-----------|-------|-------------------|
| CONN. | TYPE | PIN # | FUNCTION |
| J3 | DB25 MALE | 13 | N/C |
| J3 | DB25 MALE | 14 | N/C |
| J3 | DB25 MALE | 15 | N/C |
| J3 | DB25 MALE | 16 | N/C |
| J3 | DB25 MALE | 17 | LATCH/STROBE |
| J3 | DB25 MALE | 18 | GROUND |
| J3 | DB25 MALE | 19 | +SUPPLY VOLTAGE |
| J3 | DB25 MALE | 20 | -SUPPLY VOLTAGE |
| J3 | DB25 MALE | 21 | HEATER VOLTAGE |
| J3 | DB25 MALE | 22 | HEATER RETURN |
| J3 | DB25 MALE | 23 | FM COIL + ** |
| J3 | DB25 MALE | 24 | FM COIL - ** |
| J3 | DB25 MALE | 25 | TTL BAND SELECT * |

* REQUIRED FOR DUAL OSC. ONLY
** NOT USED FOR FILTER

| | | |
|--------------------------------------------------------------------------------------|--------------------------|----------------|
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES FRACTIONS TO DECIMALS 1/16 | DECIMALS TO 1/32 1/32 | ANGLES 1/16 |
| FINISH 20 gZ | | |
| TOLERANCE | | |
| SEE REF. SIDE P. DRAWING | | |

| | |
|-----------------------|---------|
| CONTRACT NO. | |
| APPROVALS | DATE |
| DESIGNER N. NGUYEN | 10/5/15 |
| CHECKER DS | |
| DATE | |



MICRO LAMBDA WIRELESS, INC.

BPF (2.0" X 1.7") WITH 12 BIT DIGITAL DRIVER & V CONN.

| | | | |
|-----|-------|----|-----------------|
| REV | DATE | BY | REV |
| | 08N63 | | 99 - 0021 - 139 |