

TECH+PLUS

MICROWAVE Inc.



About TechPlus Microwave

FOUNDED IN 2012 BY EXPERTS IN FILTER DESIGN AND MANUFACTURING, TECHPLUS MICROWAVE, INC. IS A STATE-OF-THE-ART, INNOVATIVE, MICROWAVE RF FILTER PROVIDER SPECIALIZING IN COST-EFFECTIVE, HIGH QUALITY FILTERS AND ASSEMBLIES.

WE PROUDLY SPECIALIZE IN UNIQUE AND CHALLENGING DESIGNS TO MEET OUR CUSTOMERS NEEDS. OUR CAPABILITIES INCLUDE SMALL AND LARGE PRODUCTION RUNS UTILIZING STATE-OF-THE-ART TEST EQUIPMENT.

TECHPLUS MICROWAVE MANUFACTURES FOR A WIDE RANGE OF WIRELESS PROTOCOLS, AS WELL AS SPREAD SPECTRUM FILTERS AND DUPLEXERS FOR POINT TO POINT, POINT TO MULTIPOINT AND LMDS TO 40 GHZ.

FAST DESIGN TIMES TO MEET YOUR QUICK-RESPONSE NEEDS.

TECHPLUS MICROWAVE IS PREPARED TO PROVIDE A TIMELY RESPONSE TO REQUESTS AND SPECIFICATIONS.

STATE-OF-THE-ART CAD/CAM SOFTWARE CAPABILITIES.

OUR WIDE RANGE OF PRODUCTS INCLUDE BOTH CUSTOM AND CATALOG DESIGNS.

OUR EXPERIENCED ENGINEERING TEAM WILL ENSURE YOUR CUSTOM DESIGNED PRODUCT WILL MEET YOUR SPECIFIC PROGRAM REQUIREMENTS.

TECHPLUS MICROWAVE HAS PROVEN MANUFACTURING TECHNIQUES AND STRONG COMMITMENT TO CUSTOMER SATISFACTION,

YOUR NEEDS ARE ALWAYS OUR #1 PRIORITY. WE WELCOME THE OPPORTUNITY TO ADDRESS YOUR SPECIFIC REQUIREMENT.

Quality Assurance

◇ "In terms of importance, quality must be rated above schedule and price."

TechPlus Microwave has implemented a Quality Management system in line with ISO 9001:2015. It is our policy to supply products that conform to all established requirements and expectations of our customers. We are committed to continuous quality improvement. Everyone shares the responsibility for ensuring the quality of TechPlus Microwave's products, and to help assure the success of this policy, the following functions are assigned;

◇ **Warranty**

Each product is warranted to be free from defects for a period of 3 years

◇ **Quality Assurance - Quality Standards.**

The Quality organization's first responsibility is to protect against the consequences of shipping product that fails to meet the customers' requirements. Quality department assists all departments and individuals in the accomplishment of this policy by providing, as required, Quality education, Quality performance measurements and Quality improvement directions.

TechPlus Microwave's Quality organization sets the standards for good relations and communication, both with other functional groups within the company and with our customers and suppliers.

SUSPENDED SUBSTRATE FILTERS

Suspended Substrate Microwave Integrated Circuit (SSMIC) is a mechanical fabrication technique used to realize microwave transmission lines. TechPlus Microwave is developing its microwave components and integrated assemblies using SSMIC printed circuit techniques because of the following:

- ★ Electrical performance approaches that of coaxial air line.
- ★ Temperature stability.
- ★ Cost effective production.
- ★ Mechanical integrity.
- ★ Reliability.
- ★ Integrate-ability.

The SSMIC microwave component realization technique used by TechPlus Microwave has evolved over several decades. SSMIC was first used to fabricate broadband multiplexers and filter networks. SSMIC has proven to be a high performance temperature stable, exceptionally reliable, reproducible, microwave transmission medium.

The microwave transmission line circuit is photo etched on both sides of a thin reinforced Teflon (RT/Duroid) dielectric board and clamped between machined metal housings. Front-to-back circuit board interconnections are accomplished with plated through holes. Excellent tolerances are maintained on the circuit board and housings through the use of modern photo-etching and numerically controlled milling techniques.

SSMIC suspended stripline approaches the optimum loss configuration for a dielectric support strip transmission line. It behaves essentially as an airline; most geometries having an effective dielectric constant of 1:25 or less, and offers performance approaching machined coaxial components with reproducibility and cost effectiveness of etched stripline and microstrip. The clamped circuit board mechanical construction technique results in a gasket tight EMI and moisture seal and eliminates the tolerance and fabrication problems associated with edge clamping of “nested” circuit boards. Grounding, shielding and higher order mode suppression and isolation are effectively accomplished with plated through holes. Isolation of greater than 80 dB is realized with proper design using the EMI shielding achieved by the plated through holes. The clamped circuit board eliminates the majority of the leakage paths found in many “modular” microwave integrated assemblies. Plated through holes also result in accurately located short circuit reference planes which improve the reproducibility of short circuited transmission line elements. The use of plated through holes and the “clamped board” construction have enabled excellent large scale production reproducibility with high yields.

SSMIC allows the realization of most any transmission line network on a single circuit board. Very high impedance (>200 ohms) and very low impedances (<10 ohms) lines can be easily fabricated together in very small (high frequency) TEM geometries. The SSMIC fabrication technique also lends itself to the integration of many different transmission line media in a single package. Microstrip, Fin-line, coplanar waveguide, etc., can be realized as well as suspended stripline using the same construction techniques. Using a bit of imagination, it is possible to conceive of an RF assembly that combines waveguide, suspended stripline, microstrip, fin-line, slot-line, coplanar waveguide and lumped constant techniques on a single SSMIC circuit board clamped within one set of housings.

A large number of microwave components have been adapted to SSMIC fabrication. These include filters, multiplexers, PIN control devices (switches, attenuators, limiters, etc.).

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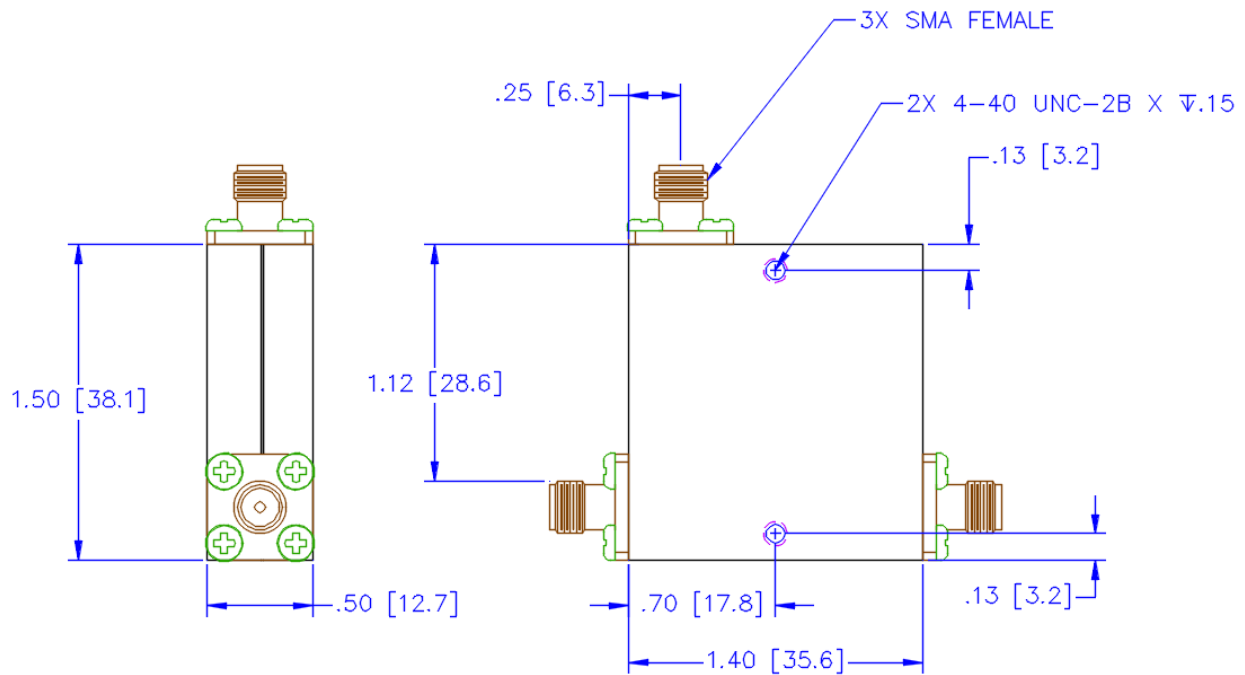
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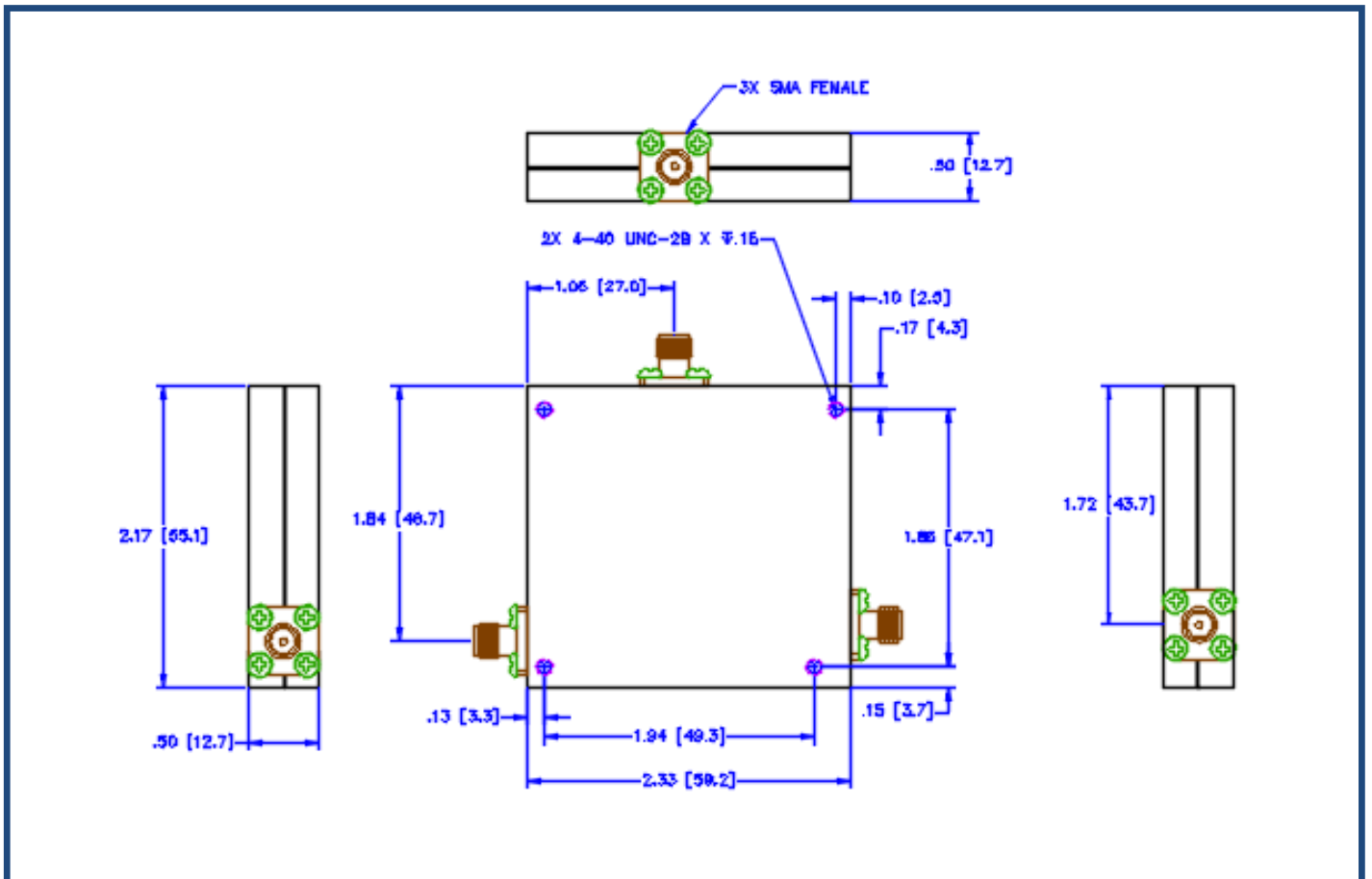
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DIPLEXER - TM2001



PARAMETER	SPECIFICATION
CROSSOVER	1.0 GHz
LOW PASSBAND	DC - 0.95 GHz
HIGH PASSBAND	1.05 GHz - 4.0 GHz
INSERTION LOSS, INBAND	0.7 dB max.
INSERTION LOSS, @ CROSSOVER	4.5 dB min.
VSWR	1.5:1 max.
SELECTIVITY	55 dB min.
REJECTION, LOW BAND	1.15 - 4.0 GHz
REJECTION, HIGH BAND	DC - 0.85 GHz
TEMPERATURE DRIFT \pm 15% @	-55° to +125°F

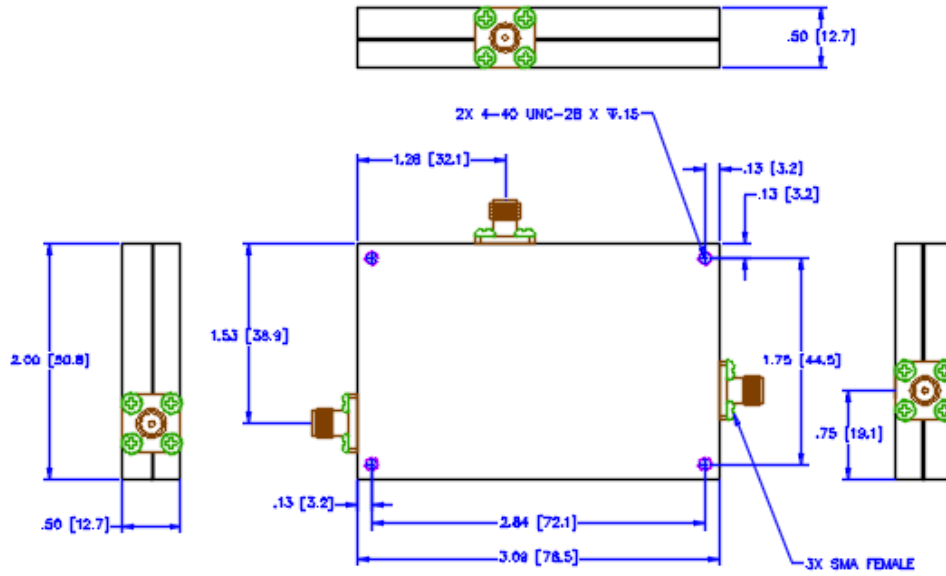
DIPLEXER - TM2002



PARAMETER	SPECIFICATION
CROSSOVER	2.0 GHz
LOW PASSBAND	DC - 1.9 GHz
HIGH PASSBAND	2.1 GHz - 4.0 GHz
INSERTION LOSS, INBAND	0.7 dB max.
INSERTION LOSS, @ CROSSOVER	4.5 dB min.
VSWR	1.5:1 max.
SELECTIVITY	55 dB min.
REJECTION, LOW BAND	2.3 - 4.0 GHz
REJECTION, HIGH BAND	DC - 1.7 GHz
TEMPERATURE DRIFT $\pm 15\%$ @	-55° to +125°F

DIPLEXER - TM2003

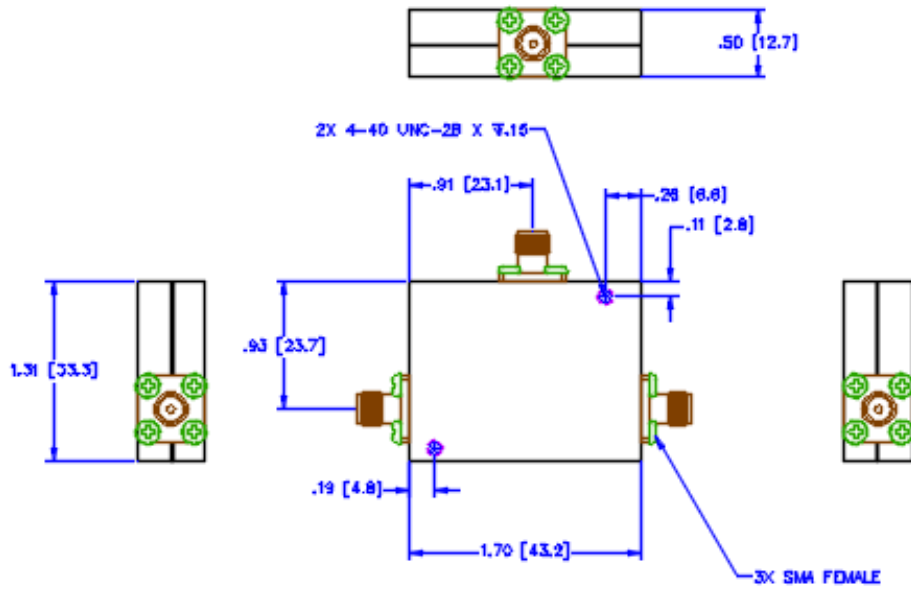
OUTLINE



PARAMETER	SPECIFICATION
CROSSOVER	2.0 GHz
LOW PASSBAND	DC - 1.9 GHz
HIGH PASSBAND	2.1 GHz - 8.0 GHz
INSERTION LOSS, INBAND	0.7 dB max.
INSERTION LOSS, @ CROSSOVER	4.5 dB min.
VSWR	1.5:1 max.
SELECTIVITY	55 dB min.
REJECTION, LOW BAND	2.3 - 8.0 GHz
REJECTION, HIGH BAND	DC - 1.7 GHz
TEMPERATURE DRIFT $\pm 15\%$ @	-55° to +125°F

DIPLEXER - TM2004

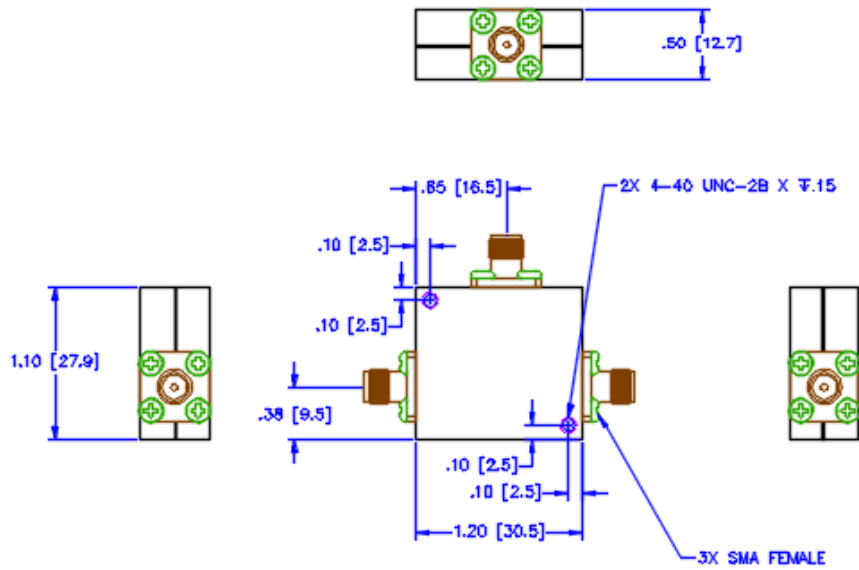
OUTLINE



PARAMETER	SPECIFICATION
CROSSOVER	4.0 GHz
LOW PASSBAND	DC - 3.80 GHz
HIGH PASSBAND	4.2 GHz - 8.0 GHz
INSERTION LOSS, INBAND	0.7 dB max.
INSERTION LOSS, @ CROSSOVER	4.5 dB min.
VSWR	1.5:1 max.
SELECTIVITY	55 dB min.
REJECTION, LOW BAND	4.6 - 8.0 GHz
REJECTION, HIGH BAND	DC - 3.4 GHz
TEMPERATURE DRIFT $\pm 15\%$ @	-55° to +125°F

DIPLEXER - TM2005

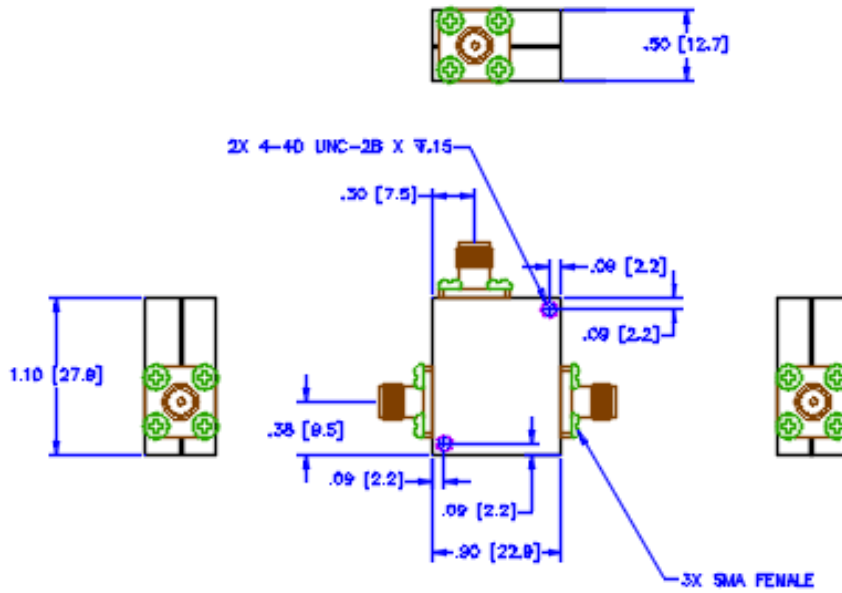
OUTLINE



PARAMETER	SPECIFICATION
CROSSOVER	8.0 GHz
LOW PASSBAND	DC - 7.60 GHz
HIGH PASSBAND	8.4 GHz - 18.0 GHz
INSERTION LOSS, INBAND	0.7 dB max.
INSERTION LOSS, @ CROSSOVER	4.5 dB min.
VSWR	1.9:1 max.
SELECTIVITY	55 dB min.
REJECTION, LOW BAND	9.2 - 18.0 GHz
REJECTION, HIGH BAND	DC - 6.8 GHz
TEMPERATURE DRIFT \pm 15% @	-55° to +125°F

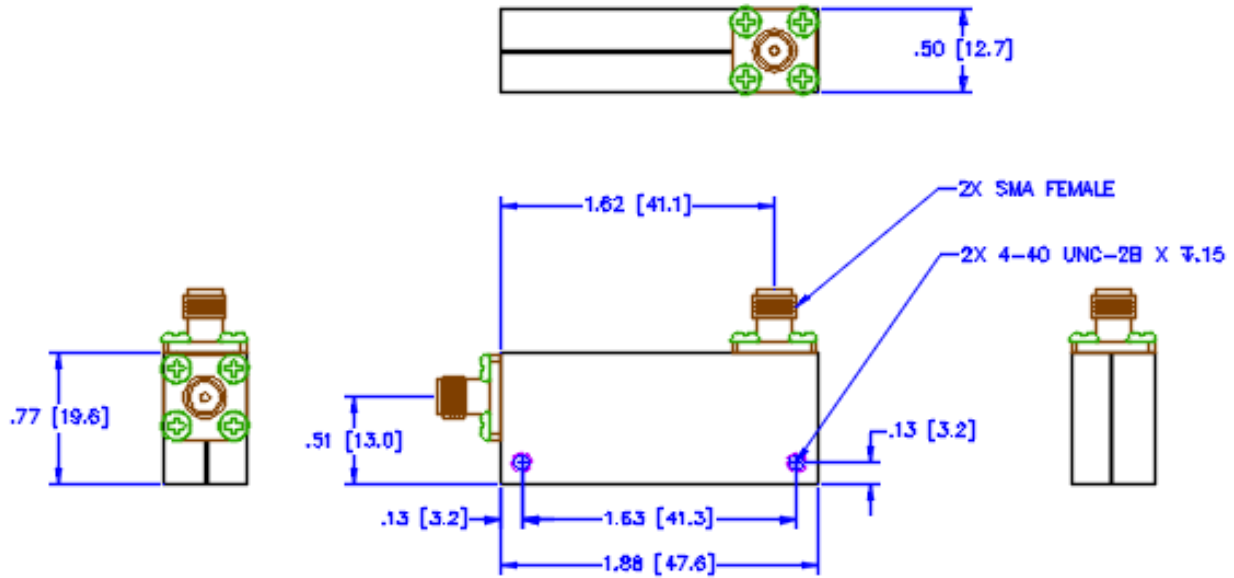
DIPLEXER - TM2006

OUTLINE



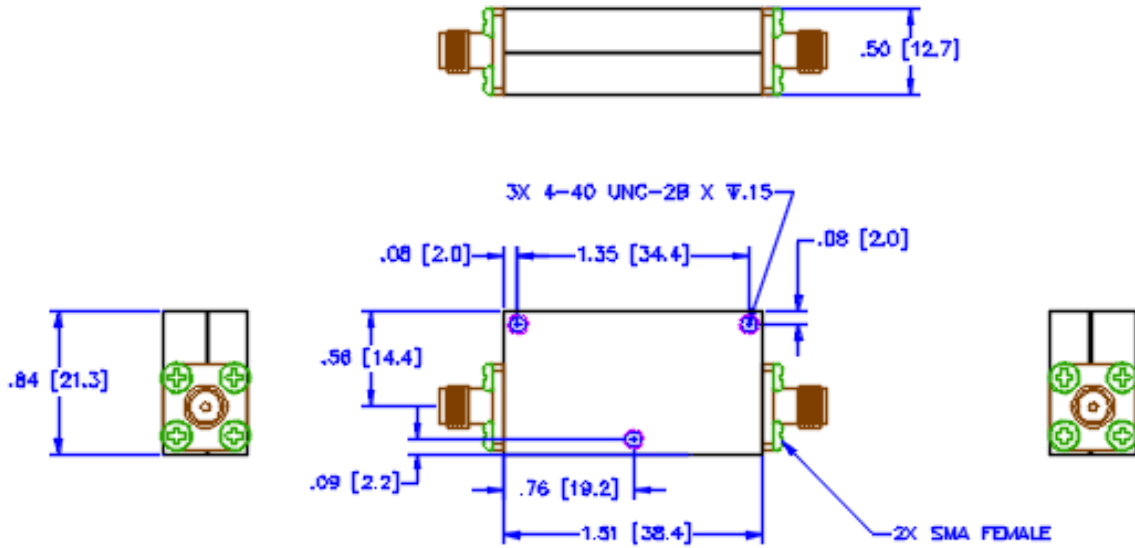
PARAMETER	SPECIFICATION
CROSSOVER	12.0 GHz
LOW PASSBAND	DC - 11.40 GHz
HIGH PASSBAND	12.6 GHz - 8.0 GHz
INSERTION LOSS, INBAND	1.0 dB max.
INSERTION LOSS, @ CROSSOVER	4.5 dB min.
VSWR	1.9:1 max.
SELECTIVITY	55 dB min.
REJECTION, LOW BAND	13.8 - 18.0 GHz
REJECTION, HIGH BAND	DC - 10.2 GHz
TEMPERATURE DRIFT $\pm 15\%$ @	-55° to +125°F

HIGHPASS - TM2007



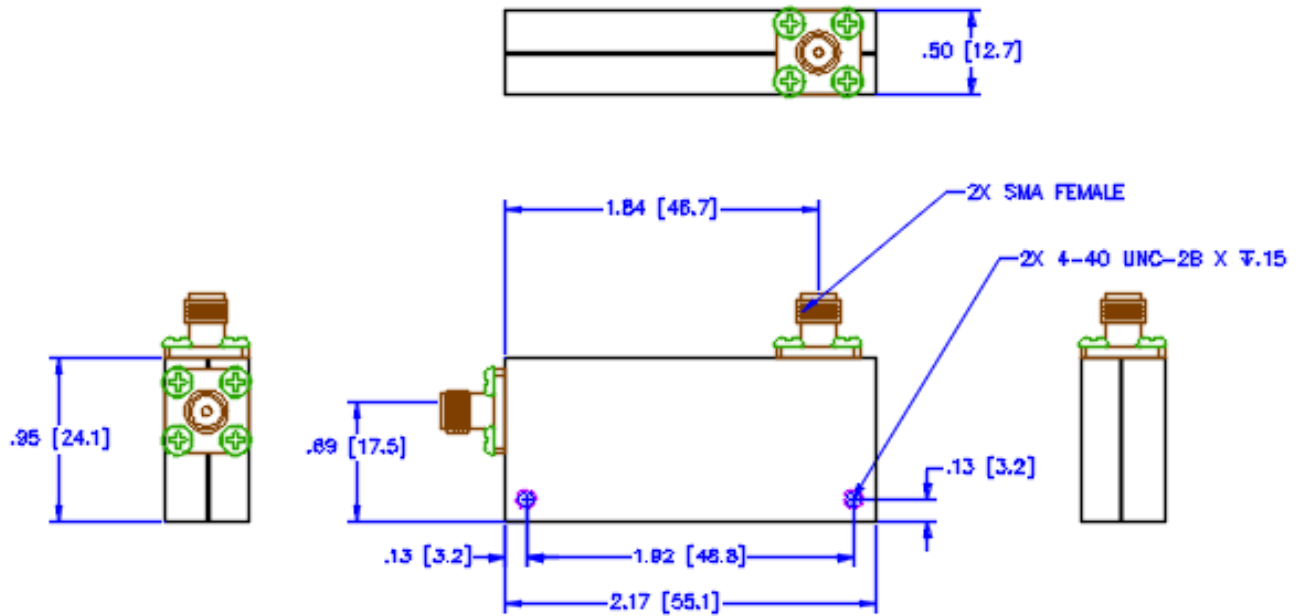
PARAMETER	SPECIFICATION
PASSBAND	1.0 GHz - 4.0 GHz
INSERTION LOSS	1.0 dB max.
VSWR	1.6:1 max.
REJECTION, HIGH BAND	DC - 0.85 GHz
OPERATING TEMPERATURE	-55° to +125°F

HIGHPASS - TM2008



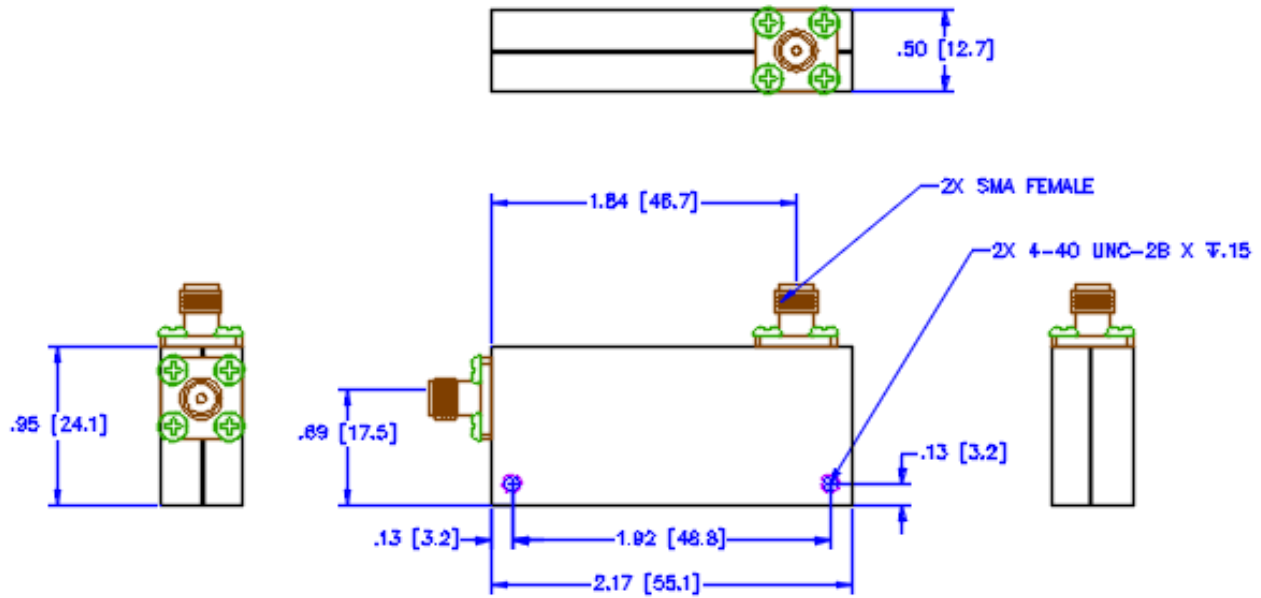
PARAMETER	SPECIFICATION
PASSBAND	2.0 GHz - 8.0 GHz
INSERTION LOSS	1.0 dB max.
VSWR	1.8:1 max.
REJECTION, HIGH BAND	DC - 1.6 GHz
OPERATING TEMPERATURE	-55° to +125°F

HIGHPASS - TM2009



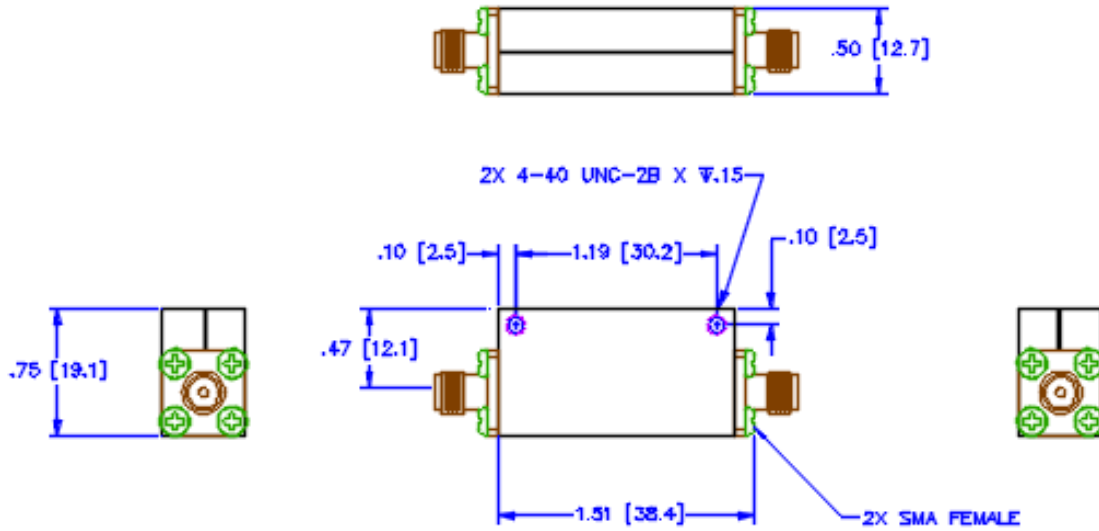
PARAMETER	SPECIFICATION
PASSBAND	0.5 GHz - 2.0 GHz
INSERTION LOSS	1.0 dB max.
VSWR	1.8:1 max.
REJECTION, HIGH BAND	DC - 0.425 GHz
OPERATING TEMPERATURE	-55° to +125°F

HIGHPASS - TM2010



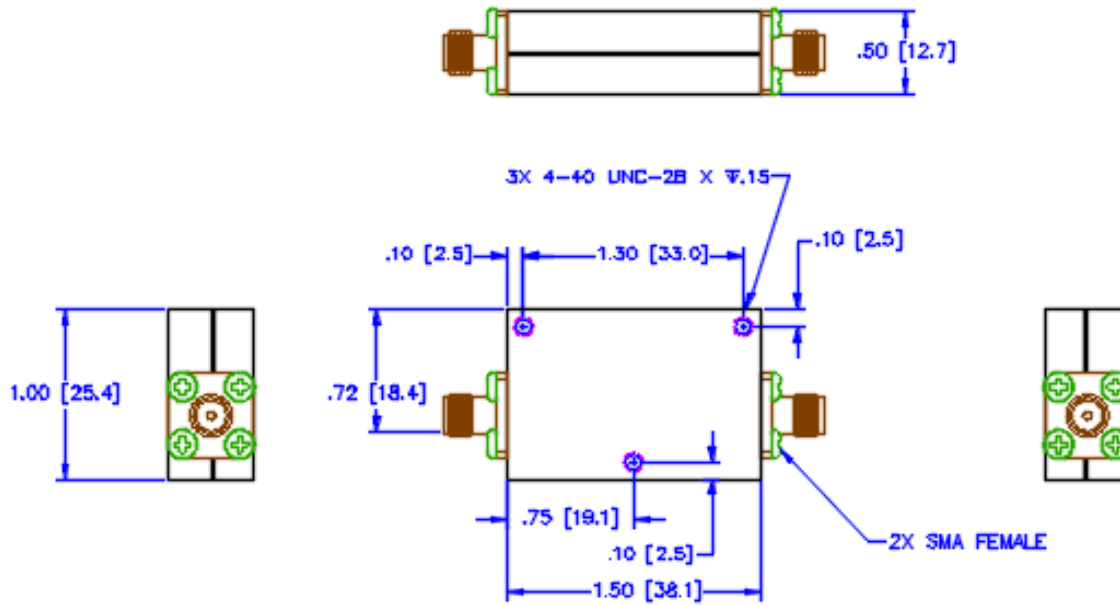
PARAMETER	SPECIFICATION
PASSBAND	0.5 GHz - 4.0 GHz
INSERTION LOSS	1.0 dB max.
VSWR	1.8:1 max.
REJECTION, HIGH BAND	DC - 0.425 GHz
OPERATING TEMPERATURE	-55° to +125°F

HIGHPASS - TM2011



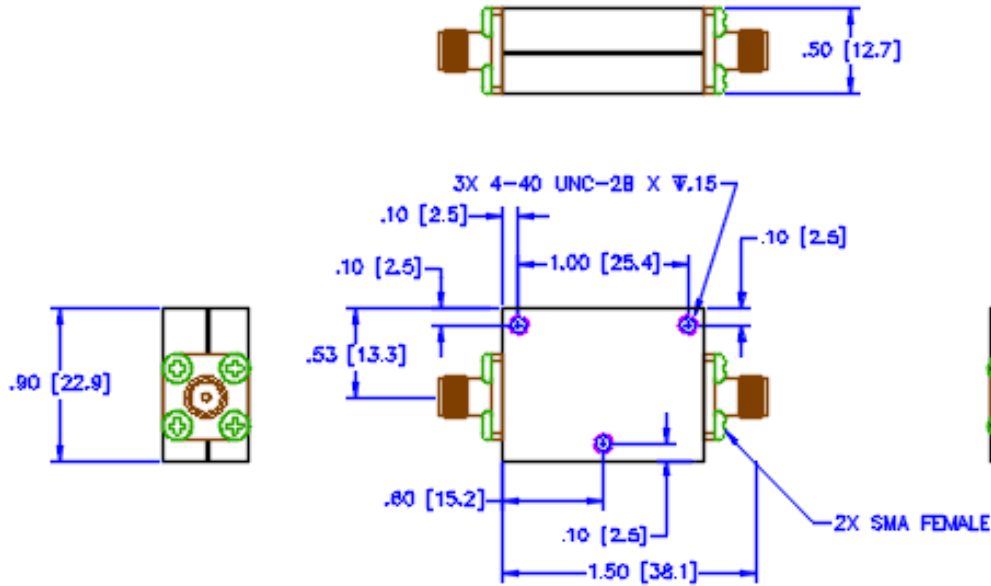
PARAMETER	SPECIFICATION
PASSBAND	8.0 GHz - 18.0 GHz
INSERTION LOSS	1.0 dB max.
VSWR	1.8:1 max.
REJECTION, HIGH BAND	DC - 7.60 GHz
OPERATING TEMPERATURE	-55° to +125°F

LOWPASS - TM2012



PARAMETER	SPECIFICATION
PASSBAND	DC - 4.0 GHz
INSERTION LOSS	1.0 dB max.
VSWR	1.8:1 max.
REJECTION, HIGH BAND	4.2 GHz - 11.0 GHz
OPERATING TEMPERATURE	-55° to +125°F

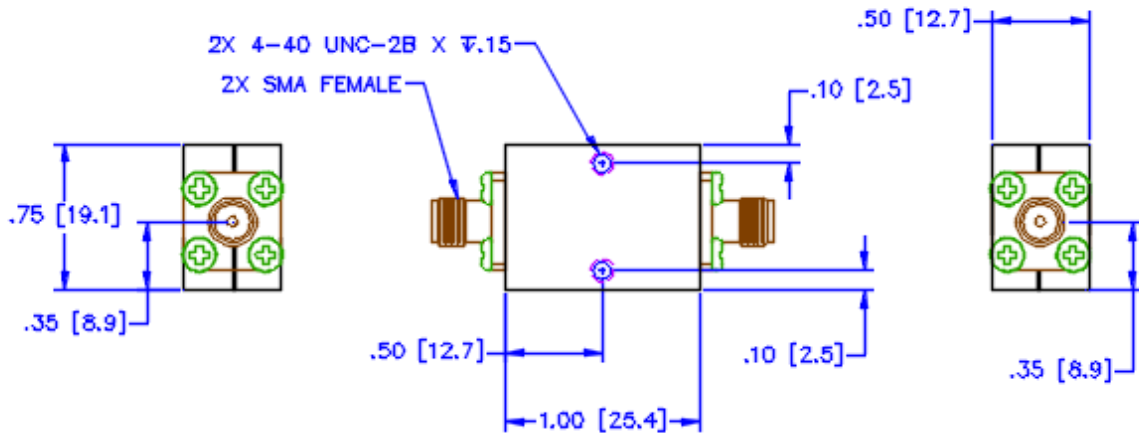
LOWPASS - TM2013



PARAMETER	SPECIFICATION
PASSBAND	DC - 6.0 GHz
INSERTION LOSS	1.0 dB max.
VSWR	1.8:1 max.
REJECTION, HIGH BAND	6.2 GHz - 17.0 GHz
OPERATING TEMPERATURE	-55° to +125°F

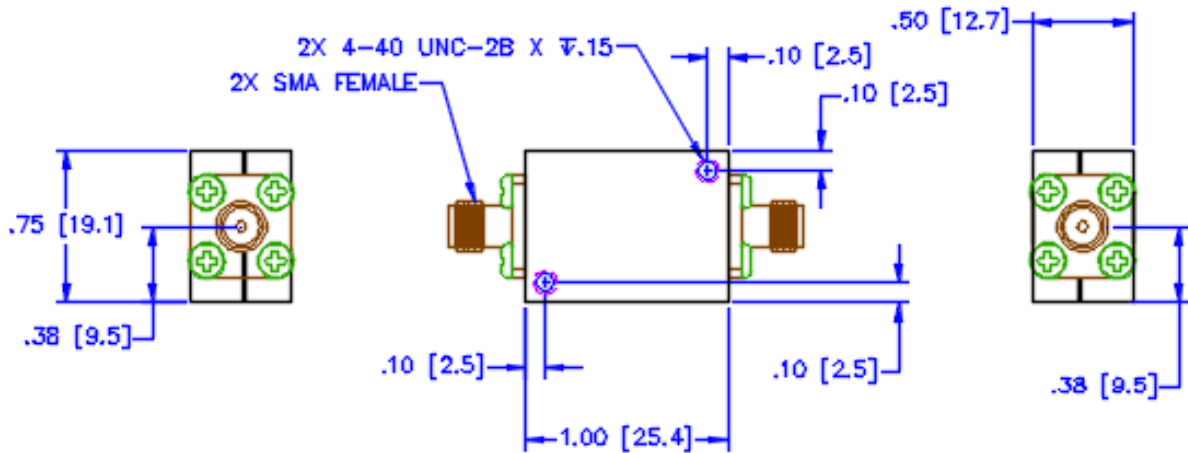
LOWPASS - TM2014

OUTLINE



PARAMETER	SPECIFICATION
PASSBAND	DC - 8.0 GHz
INSERTION LOSS	1.0 dB max.
VSWR	1.8:1 max.
REJECTION, HIGH BAND	8.4 GHz - 20.0 GHz
OPERATING TEMPERATURE	-55° to +125°F

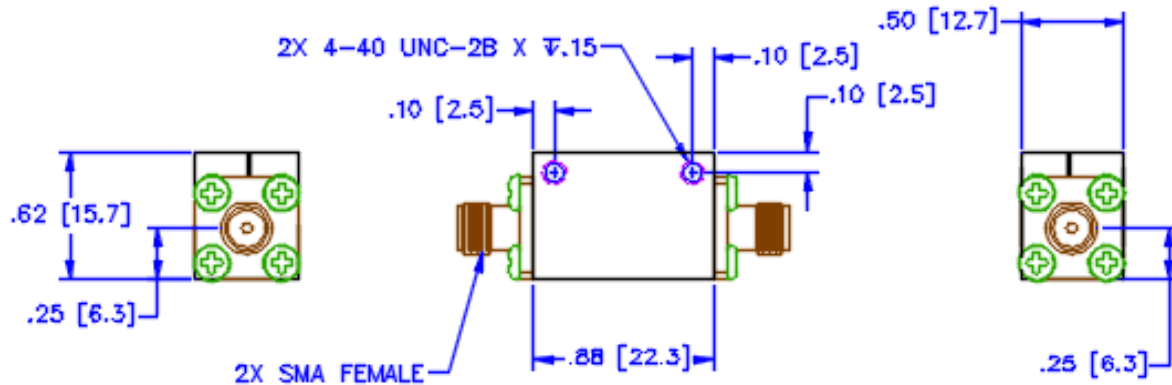
LOWPASS - TM2015



PARAMETER	SPECIFICATION
CROSSOVER	4.0 GHz
LOW PASSBAND	DC - 3.80 GHz
HIGH PASSBAND	4.2 GHz - 8.0 GHz
INSERTION LOSS, INBAND	0.7 dB max.
INSERTION LOSS, @ CROSSOVER	4.5 dB min.
RETURN LOSS	18 dB min.
SELECTIVITY	55 dB min.
REJECTION, LOW BAND	4.6 - 8.0 GHz
REJECTION, HIGH BAND	DC - 3.4 GHz
TEMPERATURE DRIFT $\pm 15\%$ @	-55° to +125°F

LOWPASS - TM2016

OUTLINE



PARAMETER	SPECIFICATION
CROSSOVER	4.0 GHz
LOW PASSBAND	DC - 3.80 GHz
HIGH PASSBAND	4.2 GHz - 8.0 GHz
INSERTION LOSS, INBAND	0.7 dB max.
INSERTION LOSS, @ CROSSOVER	4.5 dB min.
RETURN LOSS	18 dB min.
SELECTIVITY	55 dB min.
REJECTION, LOW BAND	4.6 - 8.0 GHz
REJECTION, HIGH BAND	DC - 3.4 GHz
TEMPERATURE DRIFT $\pm 15\%$ @	-55° to +125°F

- ★ Products can be designed with any Connector configuration
- ★ Product can be designed for Hermetic sealing (Laser Weld)
- ★ Products can be designed for Outdoor Configuration — IP67



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