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## D-Band I/Q Converter with X12 LO Multiplier, 140-170 GHz

### Features:

- Integrated module including active multiplier and D-band mixer
- 20dB (typ.) Conversion Loss
- Operation from 140-170 GHz
- Single Supply Operation
- Internal Bias Sequencing and Regulation
- LO Input: 11-15 GHz
- Anti-cocking flange



### Applications

These D-band mixer modules provide up or down conversion from D-band using convenient coaxial interfaces for the LO and IF ports. Applications include next-generation fixed services like point-to-point multi-gigabit radios for applications such as 5G backhaul. The mixer modules include both in-phase and quadrature IF ports for convenient baseband modulation or de-modulation. They can also be used as a single-ended image reject mixers by adding external 90-degree IF hybrids.

An active multiplier chain with a multiplication factor of six is used to drive the LO port of a harmonic mixer ( $N=2$ ). This results in a net LO multiplication factor of twelve. The benefit to the user is a simple LO source requirement operating between 11GHz and 15 GHz. Only a single +8V to +12V supply is needed to power the module. An EMI suppressing feed thru and ground turret terminals are used to connect DC. Negative bias is generated internally through an inverter on the power conditioning board that includes voltage regulation and bias sequence electronics. A reverse polarity series diode protects the module against misconnection of DC. The result is a simplified and easy-to-use DC interface. Four mounting holes for either #4 or M3 fasteners can be used for attaching the device to a bracket or baseplate.

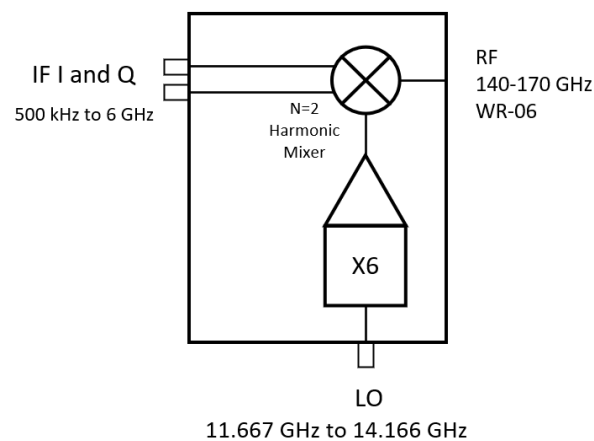
Three SMA compatible connectors are used for the LO, I and Q connections. Four-hole field-replaceable connectors provide long serviceable life and are more resistant to flange rotation than 2-hole connectors. The waveguide flange uses our Enhanced-Alignment Flange™ that incorporates a slotted feature to aid initial pin engagement, precise flatness, and precise dowel perpendicularity, along with the widely adopted NRAO recommendations for precise location tolerances and the integration of an anti-cocking rim. The Enhanced-Alignment Flange™ is backward compatible with legacy Mil-F-3922/67B (UG-387) 0.75" diameter flanges.

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## Specifications

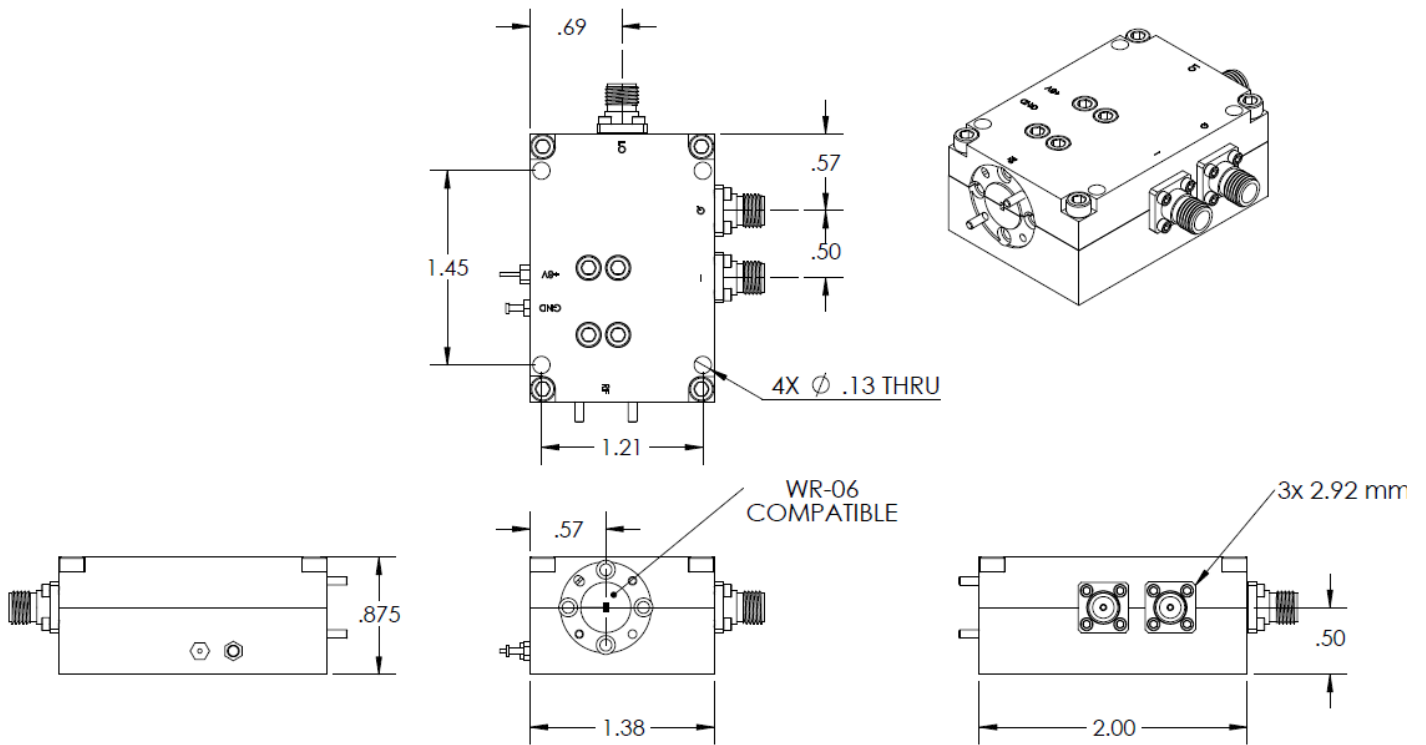
Parameter	Specification @25C	Notes
RF Frequency Range	140-170 GHz	
IF Frequency	500kHz to 6 GHz	
LO Frequency Range	11.667 GHz to 14.166 GHz	
LO input power	+5 dBm typ.	Optimal LO, LO <sub>opt</sub> , determined at test and provided with test data. Maximum LO drive is current limited and typically +3dB above LO <sub>opt</sub> .
Conversion Loss	Conversion Loss: 20 dB typ.	
P1dB	-5dBm typ.	
Voltage	+8VDC to +12 VDC	Internally Regulated and Bias sequenced.
RF Connectors, I/Q/LO	SMA compatible	
RF Connector RF	WR-06 Enhanced-Alignment Flange™ waveguide	
DC Connector	Solder terminals	
Temperature	-20 to +50C	
Material (housing)	Gold-Plated Aluminum 6061	

## Block Diagram



**Measured Data (TBD)**

**Outline Drawing (inches)**



**Ordering Information**

Part Number: 200516-01	D-Band I/Q Mixer with X12 LO Multiplier, 140-170 GHz
ECCN:	3A001.b.4.e.3

Specifications subject to Change without notice.