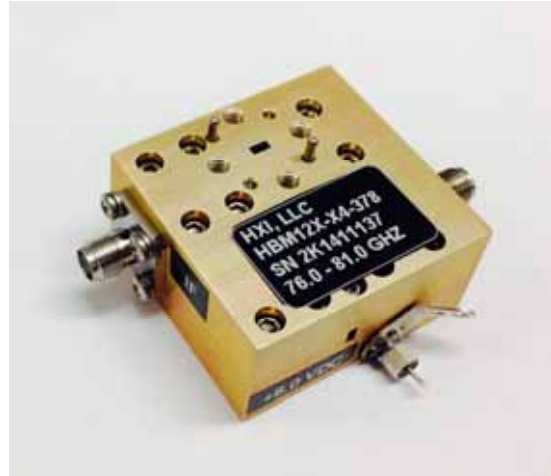


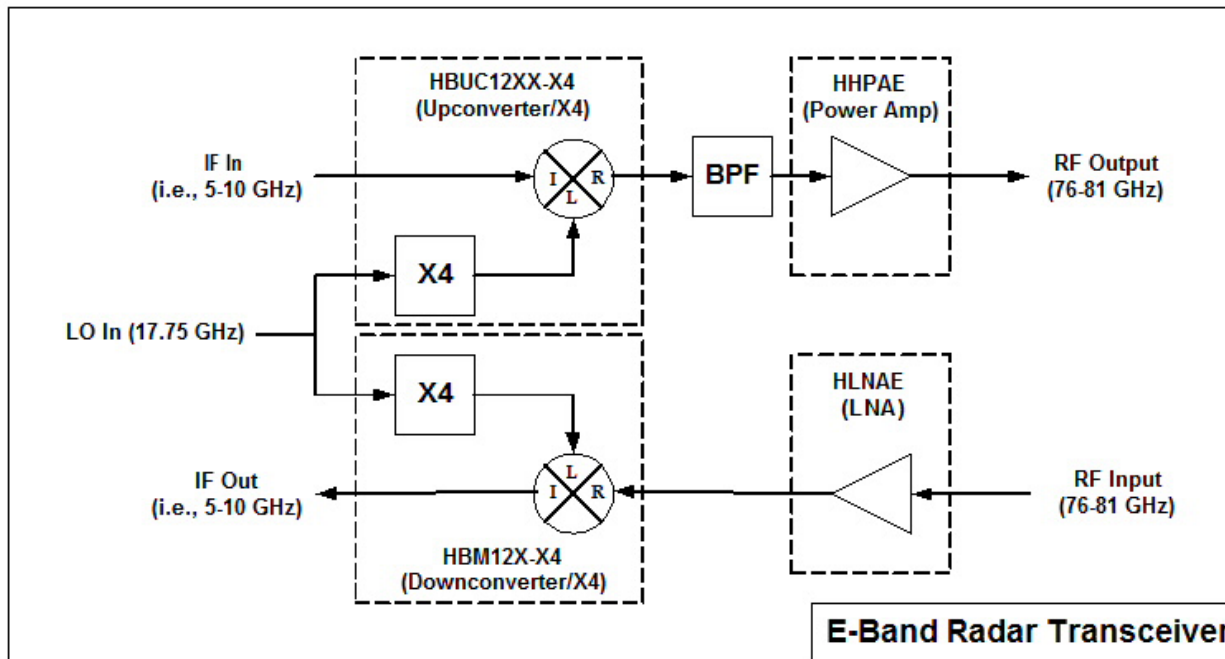
DESCRIPTION

HXI has provided a number of customers with components in the 76 to 81 GHz range in support of the development and testing of automotive IC's and modules. Among these components are integrated mixer/multipliers, LNA's, power amplifiers and isolators. Both WR12 and WR-10 waveguide sizes are supported.

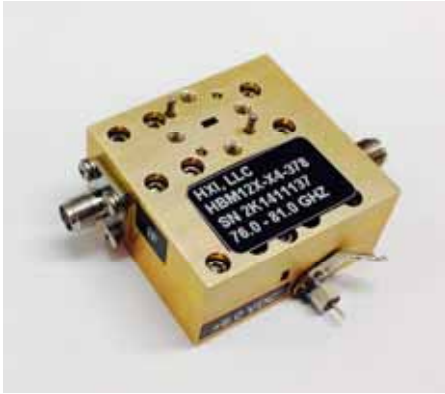
The integrated mixer/multiplier modules exhibit the same low conversion loss as our standalone HBM12 mixers and incorporate the same multiplier circuits as our standalone active frequency multipliers. The result is the same great conversion loss and flatness with the added benefits of smaller size and a lower price than buying two separate components.



E-Band Mixer/X4 Frequency Multiplier



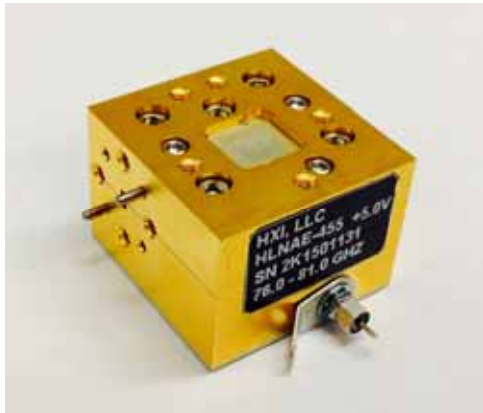
Generic Auto Radar Block Diagram



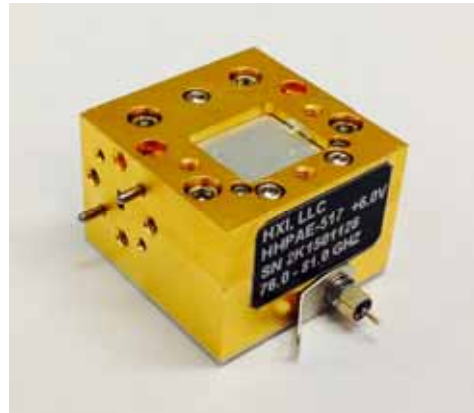
E-Band Mixer/X4 Multiplier

Integrated Mixer/Multiplier Specifications	
Parameter	HBM12X-X4-XXX / HBUC12X-X4-XXX
RF Frequency Range	76-81 GHz
LO Input Frequency*	17.75 GHz
IF Output Frequency*	5-10 GHz
Conversion Loss	6.5 dB typical (downconverter)
	7.5 dB typical (upnconverter)
Loss Flatness	+/-0.5 dB typical
LO Input Level	+12 dBm nominal
DC Bias	+6 VDC @ 400 mA typical
* Contact factory for different LO and IF frequency configurations.	

Low Noise Amplifier Specifications				
Model Number	Frequency Range	Noise Figure (typ/max)	Gain (min/typ)	DC Bias (typ)
HLNAE-455	76.0 to 81.0 GHz	5.2 dB / 6.5 dB	20 dB / 24 dB	+5 VDC @ 150 mA
HLNAW-512	76.0 to 81.0 GHz	5.2 dB / 6.5 dB	20 dB / 24 dB	+5 VDC @ 150 mA



E-Band Low Noise Amplifier



E-Band Power Amplifier

Power Amplifier Specifications				
Model Number	Frequency Range	P1dB (min/typ)	Gain (min/typ)	DC Bias (typ)
HHPAE-517	76.0 to 81.0 GHz	+20 dBm / +22 dBm	30 dB / 32 dB	+6 VDC @ 1A
HHPAW-499	76.0 to 81.0 GHz	+19 dBm / +21 dBm	28 dB / 30 dB	+6 VDC @ 850 mA

The HMI series of isolators have been modified for extended bandwidth to cover the 76 to 81 GHz automotive band. With a minor compromise of insertion loss and isolation, the full 5 GHz of bandwidth is covered without the high loss and long insertion length of a Faraday-type isolator.



E-Band Isolator

Wideband Isolators					
Part Number	Frequency Range	Waveguide	Insertion Loss (typ/max)	Isolation (min/typ)	CW Power Handling
HMI12-387-78.5-5.0	76.0 to 81.0 GHz	WR-12	0.7 dB/ 0.9 dB	16 dB / 20 dB	0.75 watts
HMI10-387-78.5-5.0	76.0 to 81.0 GHz	WR-10	0.7 dB/ 0.9 dB	16 dB / 20 dB	0.75 watts

Additional Products

Also available for the 76-81 GHz band are the following products:

- Balanced Mixers
- X4 Frequency Multipliers
- X6 Frequency Multipliers
- Harmonic Mixers
- Detectors
- SPST & SPDT PIN Switches
- 4-Way Power Divider

In addition, combinations of components can be provided as integrated assemblies or integrated multi-function modules.