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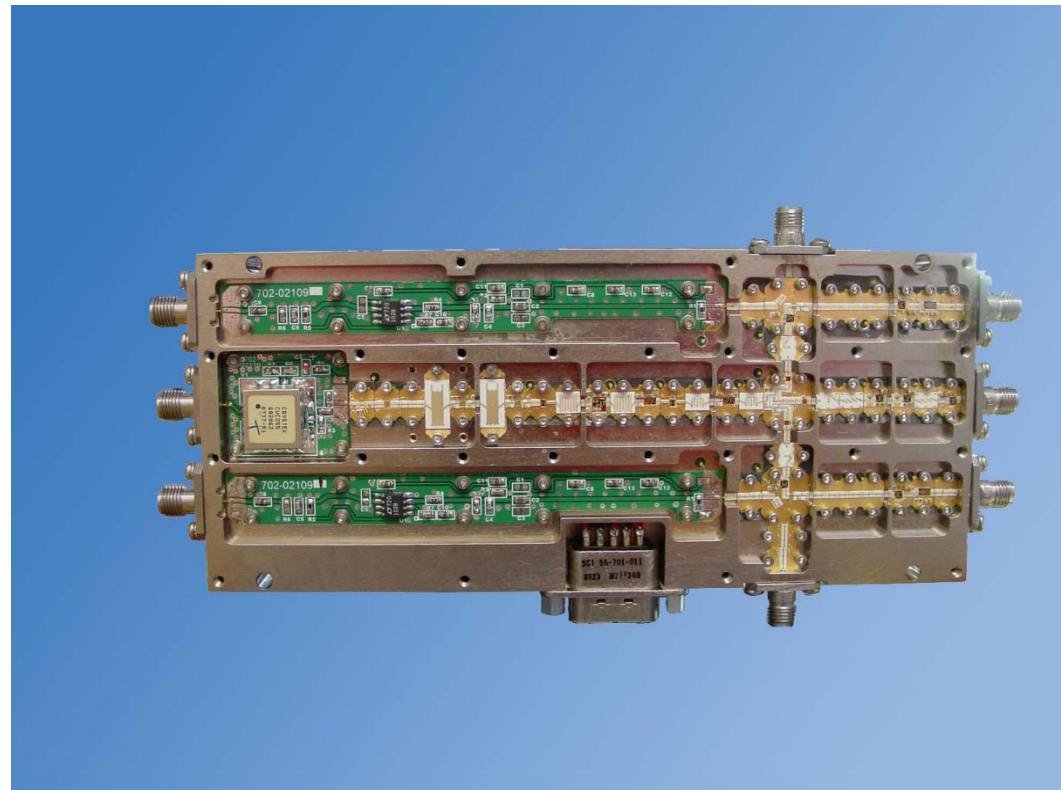
MILLIMETER

KA BAND RADAR TRANSCEIVER

5441 Merchant Circle  
Suite C  
Placerville, CA 95667  
Phone 530-642-9123  
Fax 530-642-9420

## Ka-Band Radar Transceiver with Integrated LO Source

- Homodyne System with Integrated TX & LO
- Multiplied VCO with Phase noise  $< -116\text{dBc}$  @ 1 MHz Offset
- RF LNA  $< 2.5\text{dB}$  NF
- Filtered & Amplified IF section





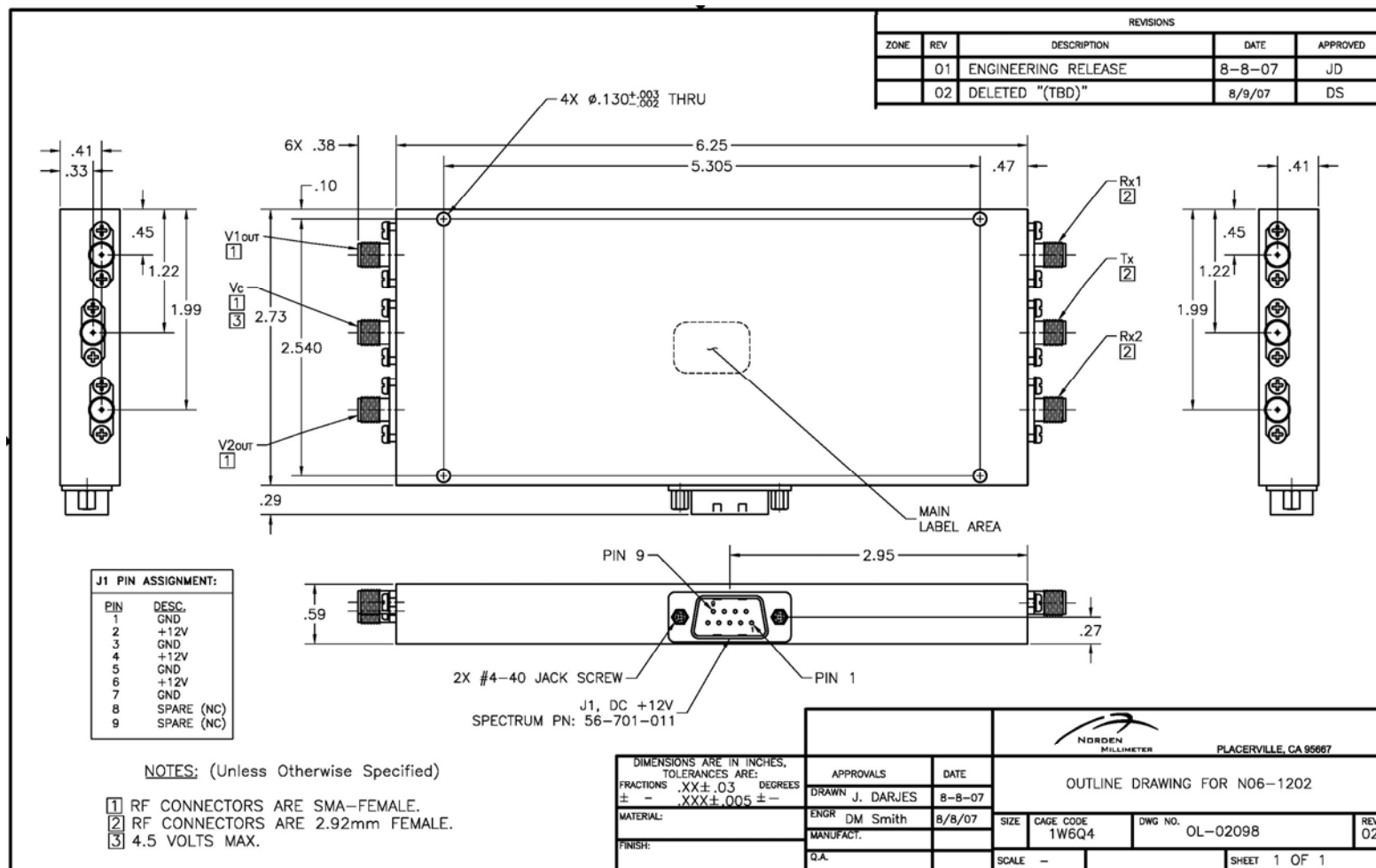
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## Production version Outline Drawing





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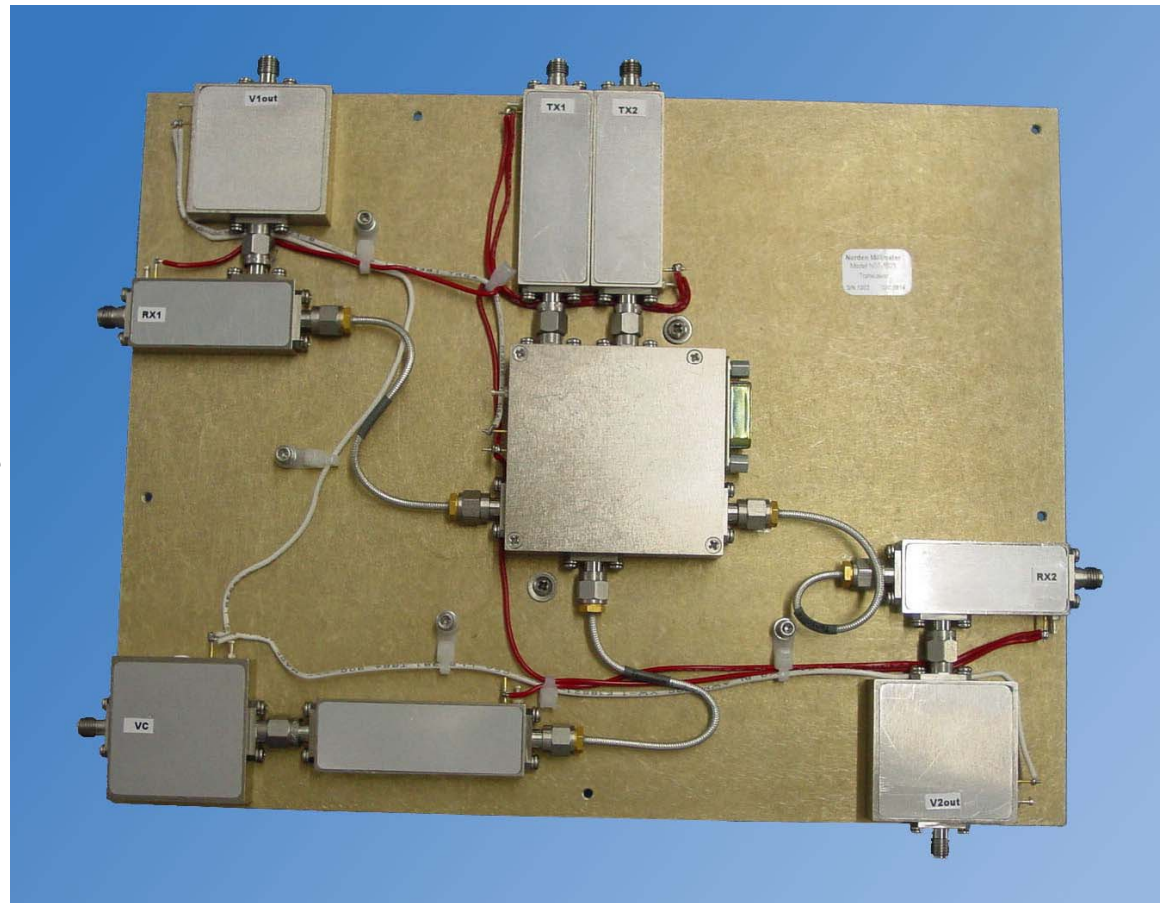
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## Ka-Band Wideband Radar Transceiver with Integrated LO

- Modular Design for experimentation
- Individual sections easily upgradeable
- All RF circuits used can be integrated into single unit for production units with little or no design modifications





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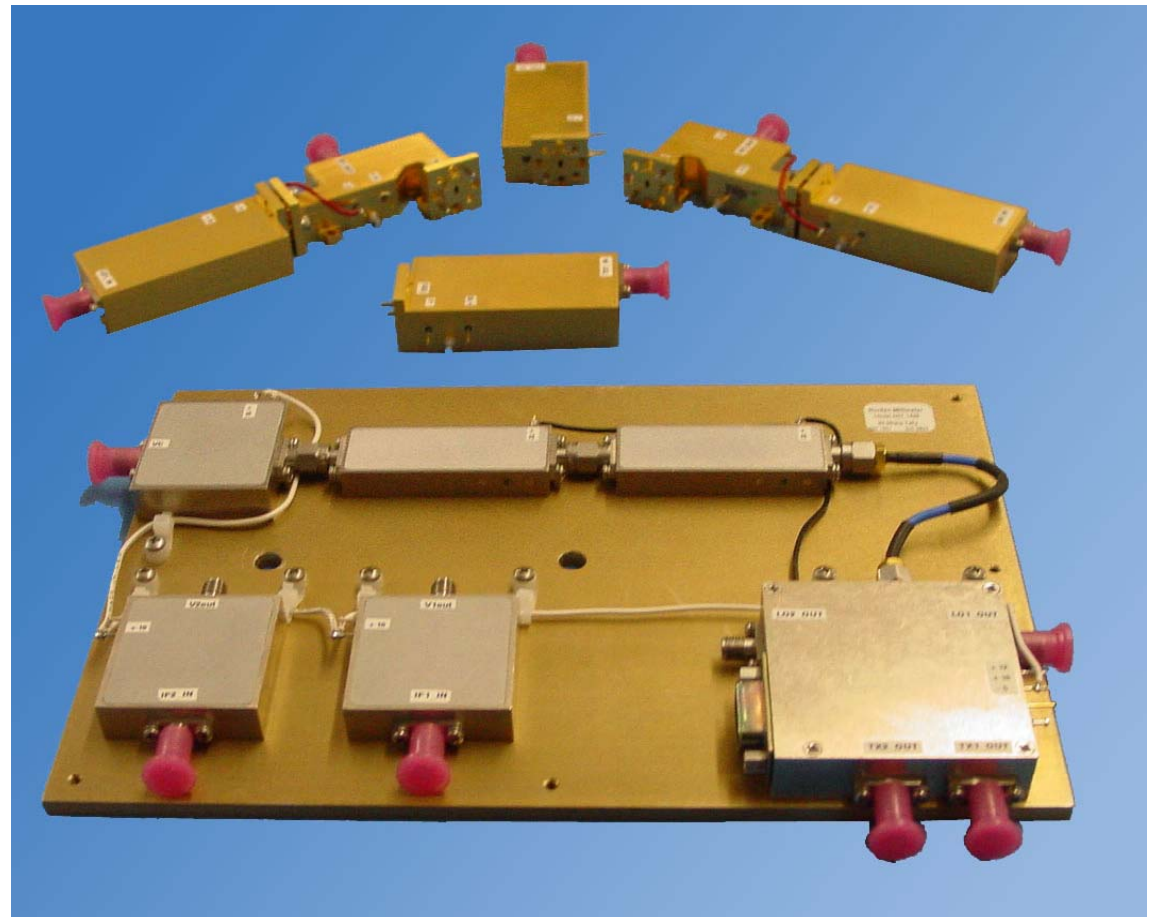
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## W-Band Radar Transceiver with Integrated LO

- Modular Design for experimentation
- Individual sections easily upgradeable
- All RF circuits used can be integrated into single unit for production units with little or no design modifications

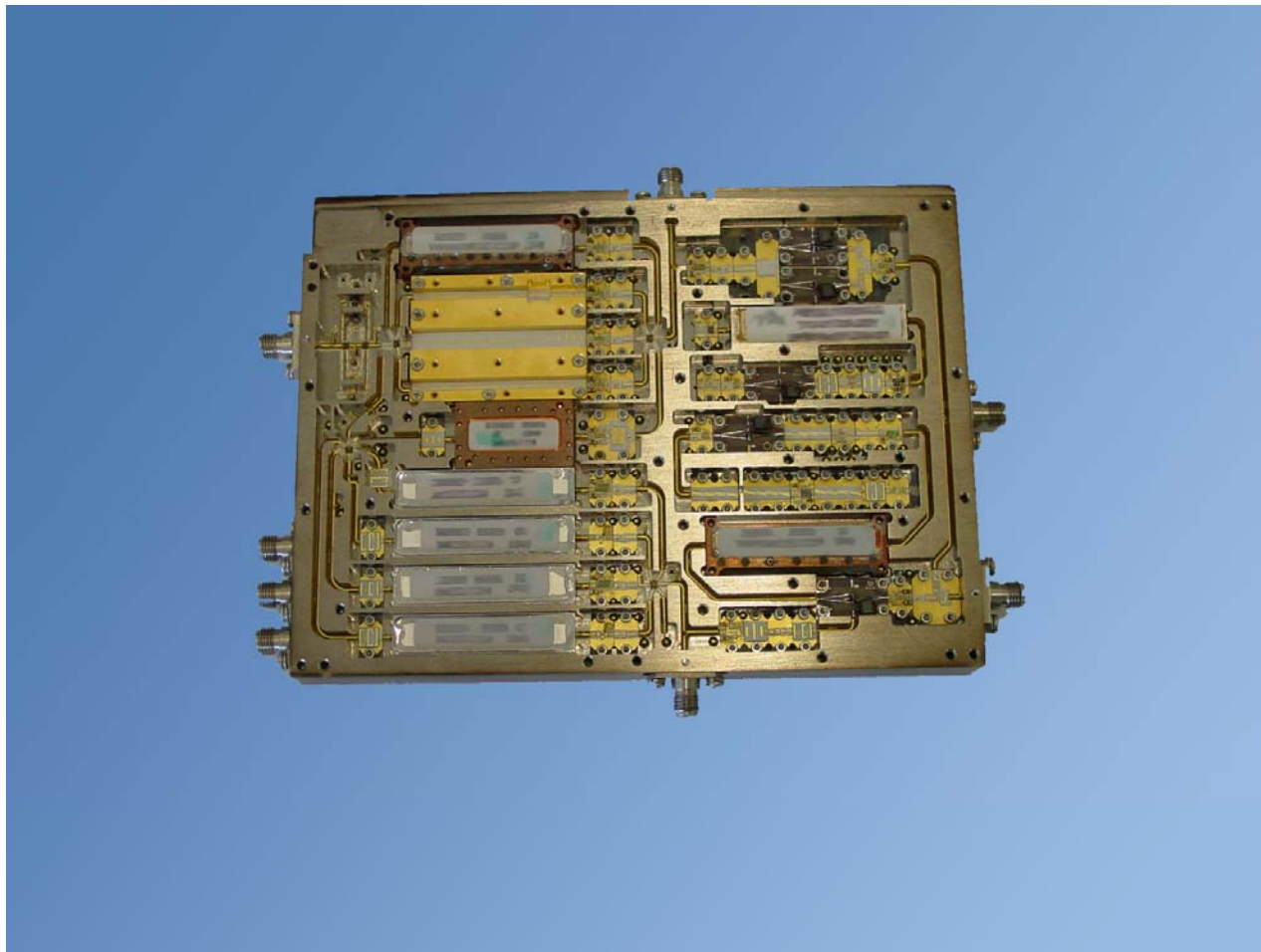




## 0.5-18 GHz RECEIVER

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### Down Converter





## BROADBAND QUADRUPLER

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### 38-70 GHz X4 Frequency Multiplier

- Input Freq (GHz) 9.5-17.5
- Input Power +13 to +20 dBm,
- Output Power Min (dBm) +12,
- Harmonics Max (dBc) -20,
- Spurious Max (dBc)-60,
- Input VSWR 3.00:1,
- Output VSWR 2.50:1,
- 12VDC @ 600mA
- Pout Level Control





## BROADBAND QUADRUPLER WITH SWITCH

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### 38-70 GHz X4 Frequency Multiplier

- Input Freq (GHz) 9.5-17.5
- Input Power +15 to +22 dBm,
- Output Power Min (dBm) +20,
- Harmonics Max (dBc) -20,
- Spurious Max (dBc)-60,
- Input VSWR 3.00:1,
- Output VSWR 2.50:1,
- 12VDC @ 900mA
- Pout Level Control
- Input 2-20 GHz Switch



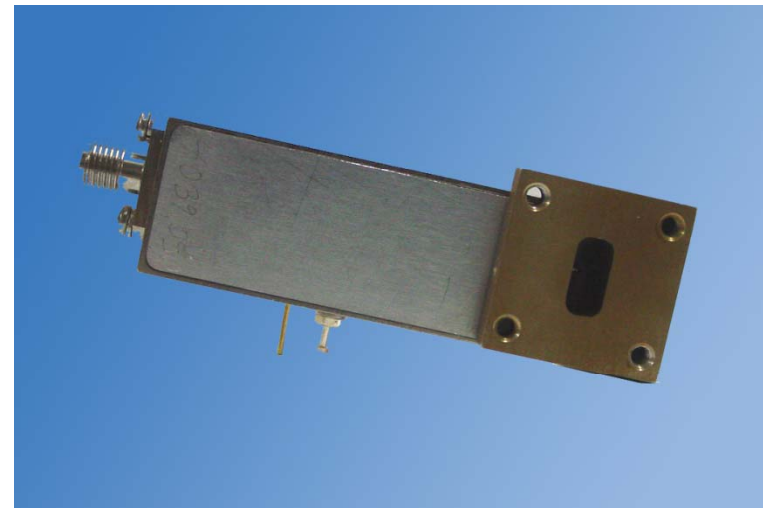
### 21.5-37.5 GHz X2 Frequency Multiplier

- Input Freq (GHz) 10.75 - 18.75
- Input Power +4 to +7 dBm
- Output Power Min/Max (dBm) +24/+26
- Harmonics Max (dBc) -15
- Spurious Max (dBc) -65
- I/O VSWR 2.00:1
- 12VDC @ 1000mA



### 18.3 - 31.4 GHz X2 Frequency Multiplier

- Input Freq (GHz) 9.15 - 15.7
- Input Power +4 to +7 dBm
- Output Power Min/Max (dBm) +24/+26
- Harmonics Max (dBc) -15
- Spurious Max (dBc) -65
- I/O VSWR 2.00:1
- 12VDC @ 1000mA





## BROADBAND AMPLIFIER

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### 1-18 GHz

- Gain 15 dB Min
- Gain Flatness +/-2.5 dB
- Saturated Output Power Min/Max (dBm) +15/+18
- I/O VSWR 2.20:1
- 12VDC @ 250mA
- HPF on Input



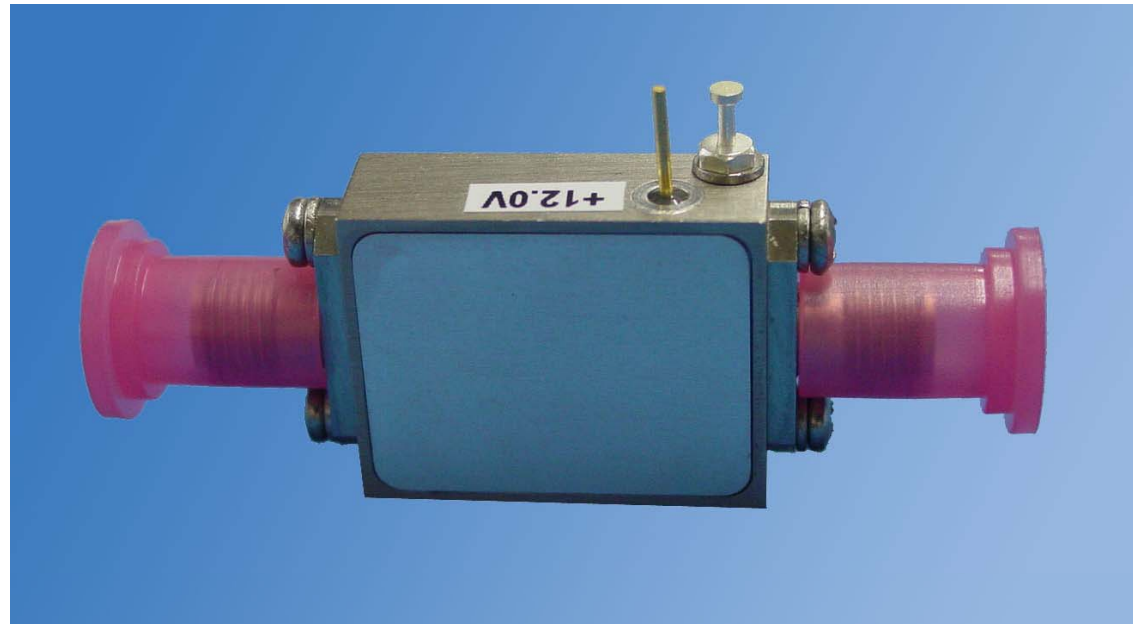


## SATURATED AMPLIFIER

5441 Merchant Circle  
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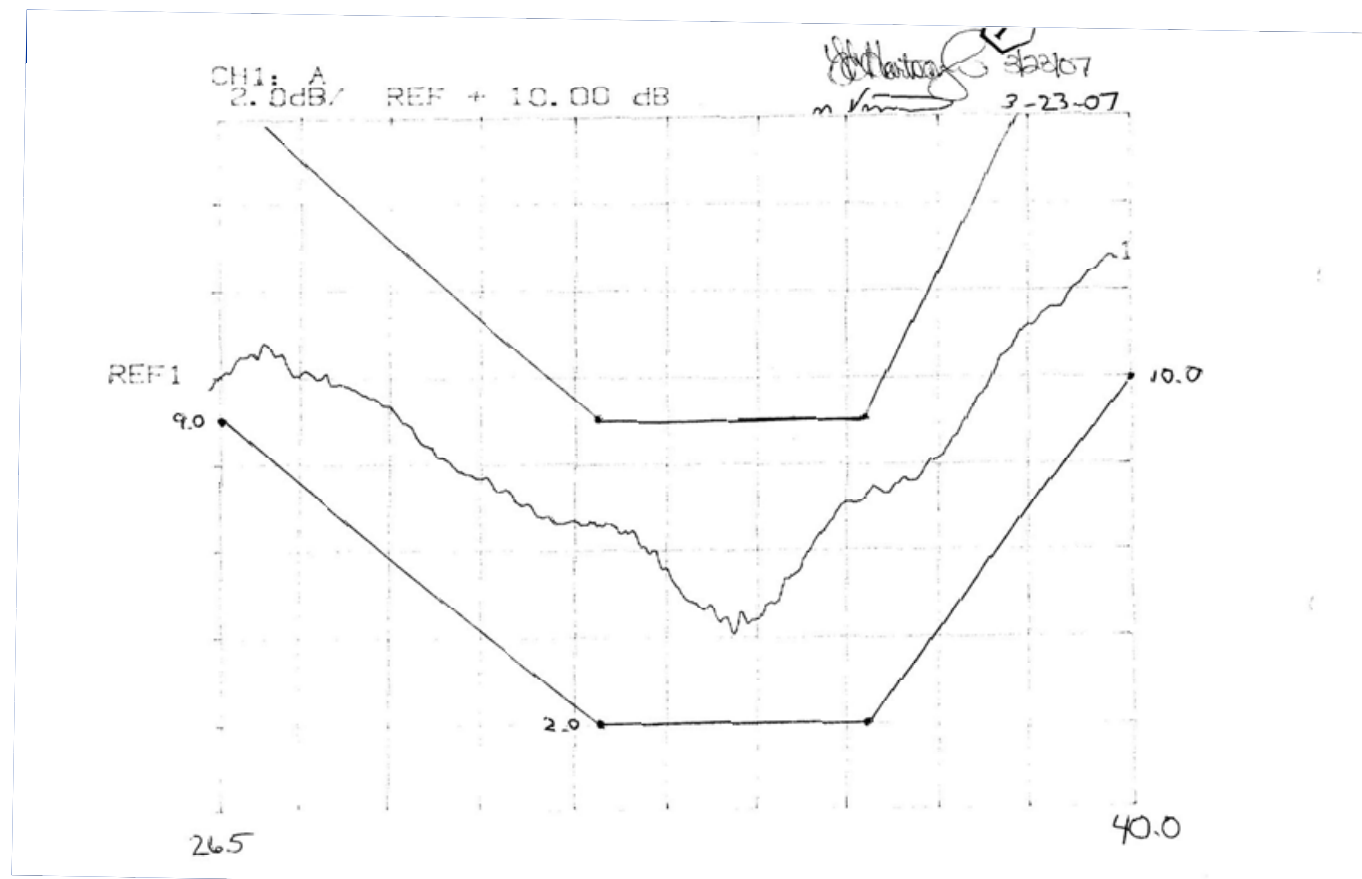
### 11-18.5 GHz Amplifier

- Input Power +5 to +10 dBm
- Output Power +24 Min dBm
- Power Flatness +/-1.0 dB
- Harmonics Max (dBc) -30
- Spurious Max (dBc)-65
- I/O VSWR 2.00:1
- 12VDC @ 450mA



## Ka-band Amplifier

- 26.5-40 GHz TWT Driver
- 6 dB Gain increase at Low End
- 8.5 dB Gain increase at High End





## WR-15 MULTIPLIER

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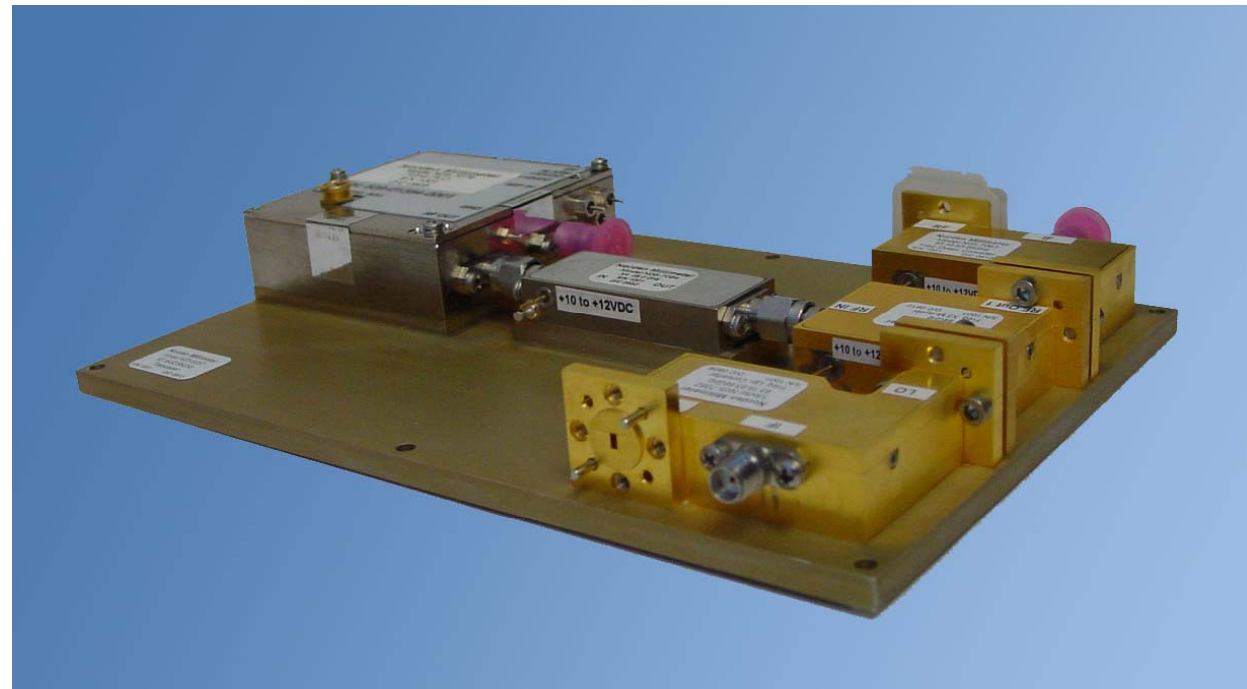
### 50.8-73.4 GHz X8 Frequency Multiplier

- Input Freq (GHz) 6.35-9.175
- Input Power +0 to +3 dBm,
- Output Power Min (dBm) +10,
- Harmonics Max (dBc) -20,
- Spurious Max (dBc) -60,
- Input VSWR 2.00:1,
- Output VSWR 2.50:1,
- 12VDC @ 450mA



## 94 GHz Transceiver

- 7 GHz LO
- 28 GHz X4 Multiplier
- 84 GHz X3 Multiplier & Splitter
- 94 GHz Frequency Up-Converter
- 94 GHz Frequency Down-Converter
- 10 GHz IF
- Image Reject Filters
- +20dBm Pout @ 93-95 GHz
- 8dB NF
- +5 dBm Pin No damage on RCV





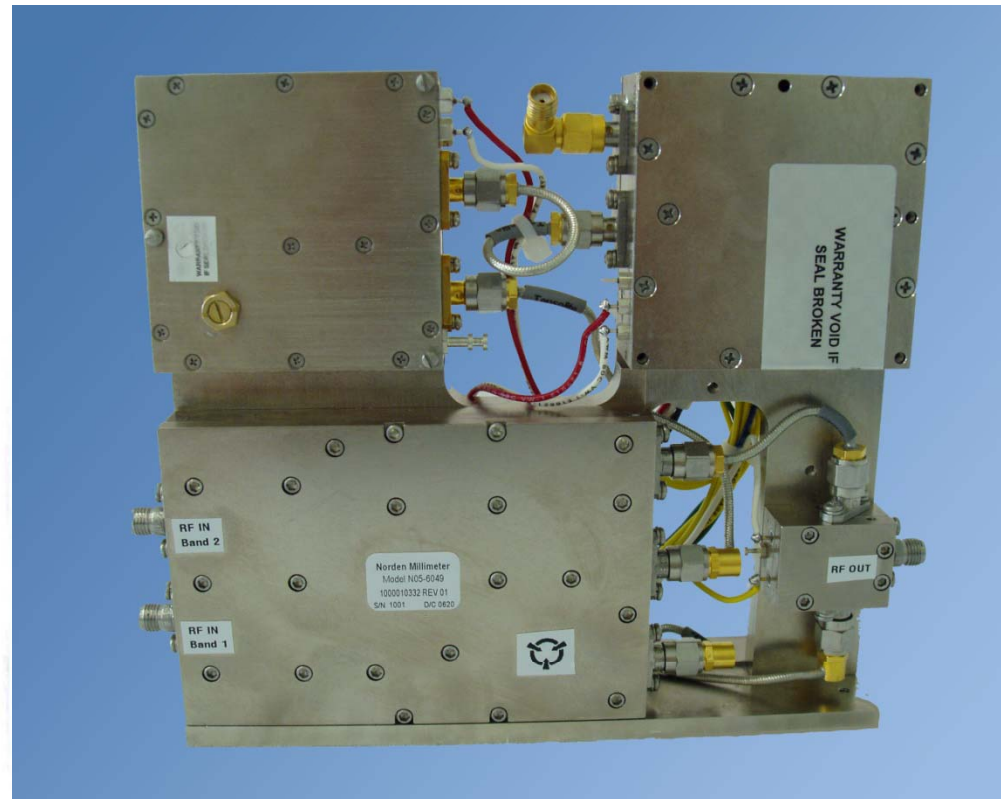
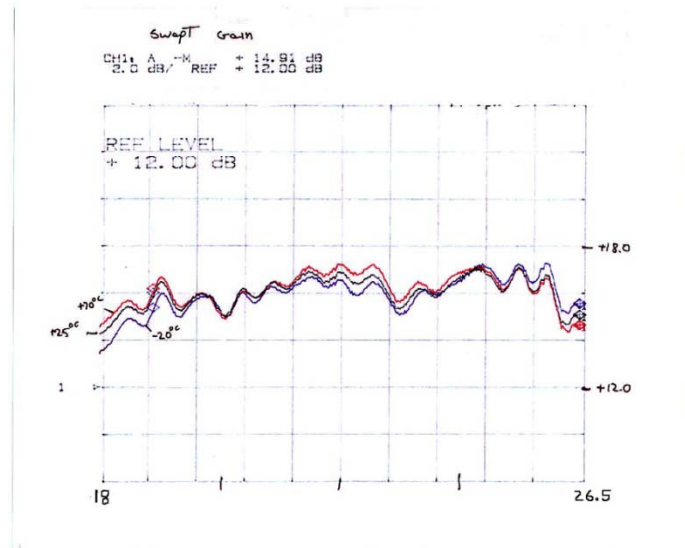
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## MILLIMETER 18-40 GHz DOWN CONVERTER

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### 18-40 GHz Dual Down Converter

- 100 MHz Phase Locked OCXO Reference
- Phase Locked DRO 0.7° rms Integrated Phase Noise
- Gain Temperature Compensated
- 12-18 dB Conversion Gain
- 13 dB NF
- -90 dBm LO Leakage
- -65 dB Image Rejection
- -20° to +70° C Operation





## 10- POLE SWITCH ASSEMBLY

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### 10PST Switch Unit

- Positive Gain Slope from 4 to 12 GHz.
- >80dB isolation Ch to Ch.
- Corrected flatness of  $\pm 1$  dB.
- Adjustable



## 8-26 GHz Switched Filter Assembly

- 5 Sub-Bands covering the X, Ku, & K bands
- 60 dB Isolation
- Low Group Delay Variation
- 100 nS Switching Speed
- Matched Channel Loss

