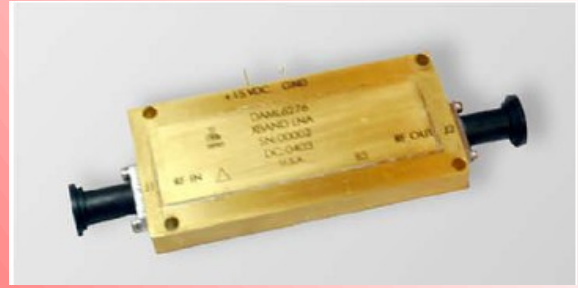
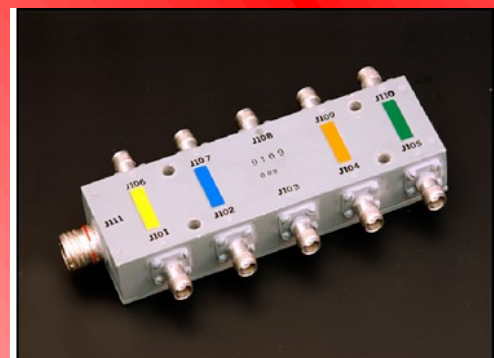
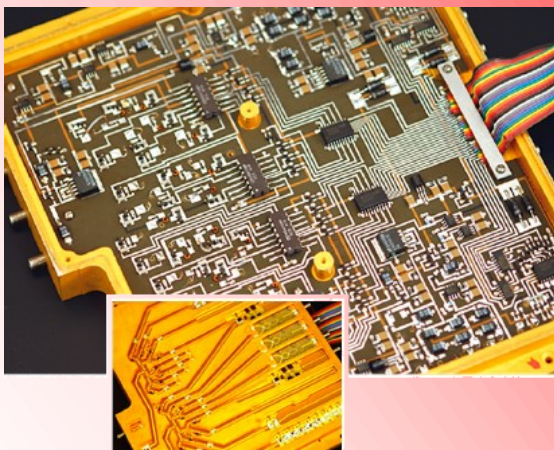


# Broadband Technology 2000



## Directory of Sample Products

- Control Products
- MFAs Subassembly Integration
- Amplifiers



# CONTROL PRODUCTS

## CSW29209

Transmit/ Receive Switch

RUGGED MILITARY RADAR Application

- L-Band Operating Frequency
- 4 KW RF Power Handling
- Power Detection and Automatic Limiting Circuitry
- Guaranteed Group Delay
- Excellent Isolation Performance
- Operating Temperature: Full Military Range

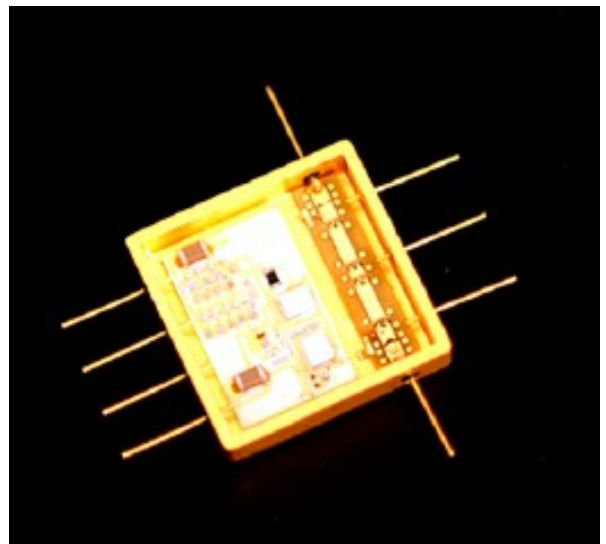


## CATV08068

High-Frequency VCA

SPACE PAYLOAD Application

- Operating Frequency: 12 GHz Center
- 15 dB Attenuation Range
- Linearized Attenuation Curve
- SMT or SMA-Connectorized Package



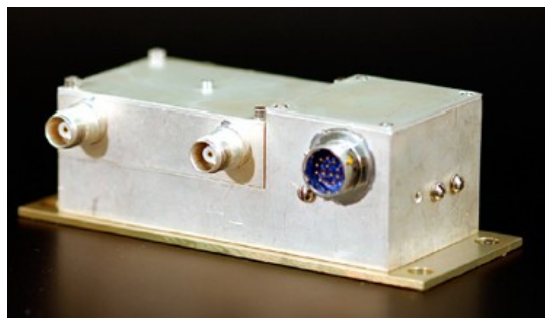
# MFA's SUBASSEMBLY INTEGRATOR

## CSWX9290

Antenna Selector

MILITARY FIGHTER AIRCRAFT Application

- Operating Frequency: 30-500 MHz
- Transfer Switch Function
- RF Power: 100 Watts AM Modulation
- Auto Mode Cycles Com 1 to Upper/ Lower & Com 2 to Upper Lower
- Memory Function with Memory Automatically Selects Antenna on Which Last Signal Was Received
- Memory Function with Memory Automatically Selects Antenna on Which Last Signal Was Received
- Failsafe Condition
- Isolation 50 dB
- Insertion Loss: 0.5 dB

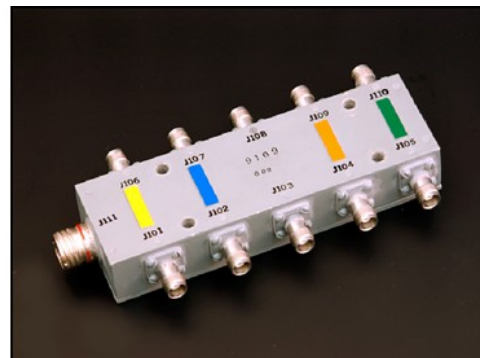


## CSA09109

C/D/Band Switch

MILITARY FIGHTER AIRCRAFT Application

- Operating Frequency: 500 MHz to 2000 MHz
- Switch Assembly—Five SPST Switches
- Control RS-422
- Amplitude/ Phase Matched ( $\pm 5$  degrees; flatness  $\pm 0.1$  dB)
- High— Isolation (70 dB)
- Blanking Function
- Reverse Polarity Protection

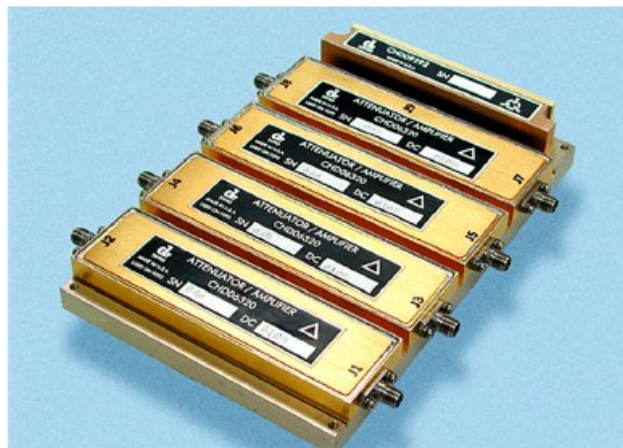


## CHD09292

Adaptive Gain Module

SHIPBOARD RADAR Application

- VHF Operating Frequency
- Gain (thru): +0.15 dB
- Attenuation Accuracy:  $\pm 0.10$  dB Typical
- Attenuation Tracking Channel to Channel:  $\pm 0.15$  dB Typical
- Phase vs Attenuation:  $\pm 0.2$  Degrees Typical
- Attenuation Settling Speed: 30 nS Typical
- Switching Transients: 15 mV peak to Peak Typical
- Noise Figure (Thru): 5.2 dB Typical
- VSWR: 1.03/1 Typical
- Channel to Channel Isolation: 86 dB Typical



Four Channel Attenuator/Amplifier with Amplitude and Phase Matching Requirements. Each Channel is in a Separate Insertable Hybrid Assembly.

# MFA's SUBASSEMBLY INTEGRATOR

## CHD09297

Four Channel Up-Converter  
SHIPBOARD RADAR Application

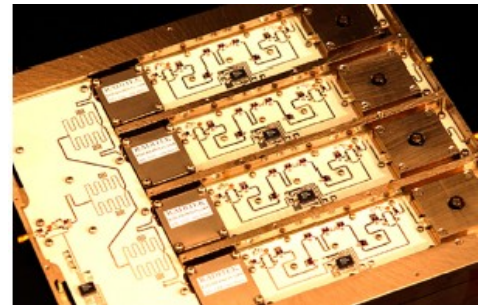
- 60-600 MHz
- Converts VHF Input Signal to Four Channels at UHF and Combines any Combination of the Four Channels
- Gain is  $-10 \pm 0.2$  dB Typical
- Channel to Channel Isolation  $> 85$  dB Typical
- $IP_3 > + 35$  dBm
- VHF Feed-through  $< -90$  dBc Typical
- Harmonic Output  $< -70$  dBc Typical
- Built in Four-Bit Digital Attenuator (45 dB Range)
- -11 dB Sample Port Output



## CHD09105

Multi-Function Assembly  
MILITARY RADAR Application

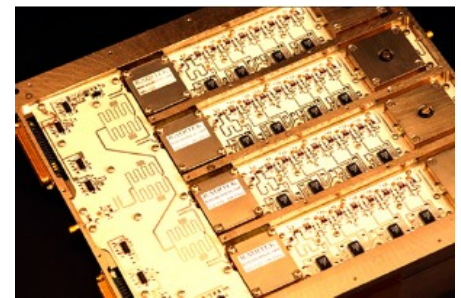
- Operating Frequency: 420 MHz to 450 MHz
- Insertion Loss: 10dB
- SPST RF Switch
- 4:1 Power Divider
- Four Circulators
- Four-1 Bit Phase Shifters (180 degrees)
- Four-6 Bit Attenuators (LSB 1 dB; MSB 32 dB)
- Four Mechanical Trimmers (phase and attenuation)
- Amplitude/ Phase Tracking ( $\pm 0.5$  dB,  $\pm 3.0$  degrees)



## CHD09106

Multi-Function Assembly  
MILITARY RADAR Application

- Operating Frequency: 420 MHz to 450 MHz
- Insertion Loss: 10dB
- SPST RF Switch
- 4:1 Power Divider
- Four Circulators
- Four-1 Bit Phase Shifters (180 degrees)
- Four-6 Bit Attenuators (LSB 1 dB; MSB 32 dB)
- Four Mechanical Trimmers (phase and attenuation)
- Amplitude/ Phase Tracking ( $\pm 0.5$  dB,  $\pm 3.0$  degrees)

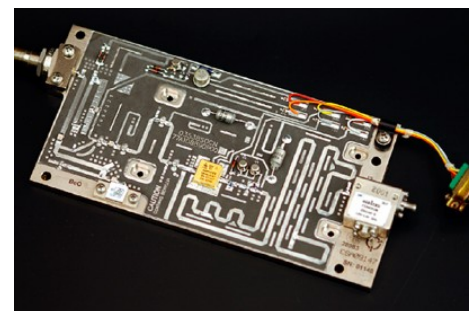


## CSA09147

Combination T/R Switch/ LNA  
RADAR Application

- Multi-Function Assembly
- Operating Temperature: Full Military Range

This Product combines the functions of both Daico  
P/Ns **CSW29209 & CAML9210**



# MFAs SUBASSEMBLY INTEGRATION

## CHD09103

Quad Two-Way Combiner  
MILITARY RADAR Application

- Multi-Function Assembly
- Operating Frequency: 420 MHz to 450 MHz
- Isolation: 97 dB
- Insertion Loss: 4.5 dB
- Amplitude and Phase Tracking  
( $\pm 0.5$  dB,  $\pm 0.5$  degrees unit-to-unit)
- 2:1 Combiner (loss is 0.2dB)
- 10 dB Coupler (Wilkinson micro-strip, low-loss 0.75 dB)
- SP4T RF Switch (PIN diode low-loss, 0.2 dB)



## CHD09104

Amplifier/ Attenuator Assembly  
MILITARY RADAR Application

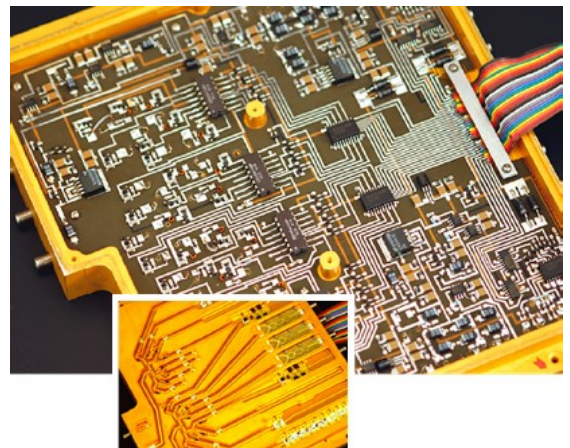
- Multi-Function Assembly
- Operating Frequency: 420 MHz to 450 MHz
- Circulator
- Amplifier (+7.5db nominal)
- Attenuator 1,4 Bit; (0 db to 48dB, 6 dB step)
- Attenuator 2,1 Bit; (60 dB)
- Attenuation Range .120 dB
- 2:1 Power Divider
- 2:1 Power Divider



## CSA09122

Output Signal Distribution Unit  
HI-REL SPACE Application

- Multi-Function Assembly
- Operating Frequency: 10 MHz to 4000 MHz
- Phase Matched
- Four-Bit Attenuator with Driver
- Low-Noise Amplifier
- Equalizer
- Passive Elements (2-Way Power/ Divider/ 6 dB Coupler)
- SP8T RF Switch with Driver
- Assembly Techniques—Modular Design



# AMPLIFIERS

## CAMH9222

L-Band—High Power Amplifier  
AIRBORNE RADAR Application

- L-Band Operating Frequency
- 2 KW Peak Power Output
- 53 dB Gain
- 55 dBc Minimum Harmonics
- 49% Efficiency
- Infinite-to-One Mismatch Withstanding
- Available in Matched Sets:
  - ±3° Phase vs Frequency
  - ±0.3 dB Gain Tracking (unit to unit)
- Zero Pulse Drop on Medium Pulse
- Pulse Width 1 Millisecond
- VSWR, I/O 1.31
- Duty Cycle 15%
- Rise Time < 100 nanoseconds
- Output Power Monitoring
- Temperature Monitoring



## CAMH9126

L-Band—High Power Amplifier  
MANPACK RADAR Application

- Operating Frequency 1.2-1.4 GHz
- 1.6 kW Peak Power Output
- 60 dB Gain
- Spurious Performance 55 dBc Minimum
- 45% Efficiency
- Infinite-to-One Mismatch Withstanding
- Short Pulse Applications
- VSSWR I/O—1.3:1
- Operating Temp. ±65°C to -46°C
- Rise time < 100 nanoseconds
- Built-in Modulator
- Fully protected for:
  - Long Pulses
  - High Duty Cycle
  - Low and High Supply Voltage
  - Over Temperature
  - Low Power Output
- Bus Communications on Fault
- Spectral Purity non-Harmonics To 10 GHz to 90 dBc



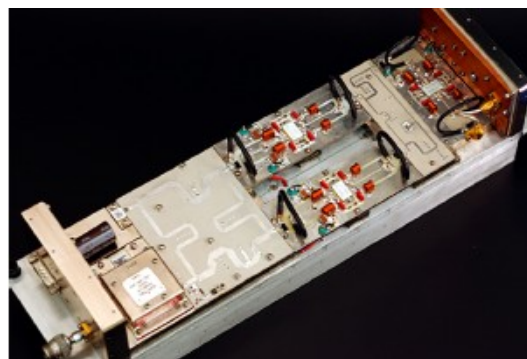
# AMPLIFIERS

## CAMH9120

High Power Amplifier

RADAR Application

- UHF Operating Frequency
- 2.5W Peak Power Output
- 19 dB Gain
- 60% Efficiency
- 65 dBc Minimum for Harmonics
- Infinite-to-one Mismatch Withstanding
- Zero Pulse Droop on Medium Pulse Widths
- Output Power Monitoring
- Modular Design Approach



## CAMD9121

High Power Amplifier

RADAR Application

- UHF Operating Frequency
- 600 Watts Peak Power Output
- 55 dB Gain
- 40% Efficiency
- 65 dBc Minimum for Harmonics
- Includes Linear Stages Operating at Low Power Levels
- Infinite-to-One Mismatch Withstanding
- Output Power Monitoring
- Modular Design Approach



## CAMH9115

S-Band—High Power Amplifier

MOBILE & FIXED RADAR Application

- S-Band Operating Frequency
- 850 Watts Peak Power Output
- 22 dB Gain
- 55 dBc Minimum Harmonics
- 35% Efficiency
- Infinite-to-One Mismatch Withstanding
- Available in Matched Sets:
  - ±4° Phase vs Frequency
  - ±0.3 dB Gain Tracking (unit to unit)
- 0.1 Pulse Drop on Medium Pulse
- VSWR, 1/0 1.3:1
- Duty Cycle 12%
- Modular Design Approach



### DAMD9227

S-Band—High Power Amplifier  
MOBILE AND FIXED RADAR Application

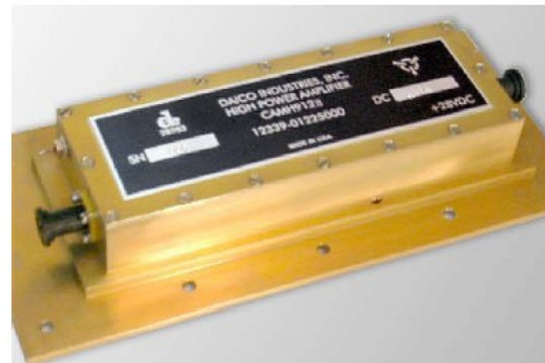
- S-Band Operating Frequency
- 30 Watts Peak Power Output
- Input Power +3 dBm to +18dBm
- 40 dB Gain
- Infinite-to-One Mismatch Withstanding
- VSWR I/O—1.3:1
- Duty Cycle 12%
- Modular Design Approach



### CAMH9127

L-Band—High Power Amplifier  
AIRBORNE TRAINER Application

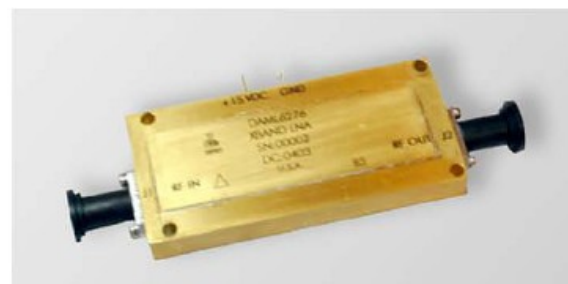
- Operating Frequency High L-Band
- Operating Mode, Pulse or CW
- Power Output, 25W @ All Conditions
- Power Gain, 27 dB Min
- I/O VSWR Protection, Infinite to 1
- Spurious, 70 dBc Min
- Harmonics 45 dBc Min
- DC Input, 23-32 VDC w/28VDC Nom
- High Efficiency, 30% Min
- Enable/Disable Switch, 20 $\mu$ S Max
- Operating Temperature, -54° to 71°C Max
- Environmentally Sealed



### CAML6276

X-Band Medium-Power Amplifier  
RADAR Application

- X-Band Operating Frequency
- 31 dB Gain
- P1 dB Compression 30 dBm
- 2.5 dB Noise Figure Maximum
- Ultra Low Noise Performance
- Input/Output Return Loss >18dB
- Single Voltage Supply
- Spectral Purity non-Harmonics To 10 GHz to 90 dBc

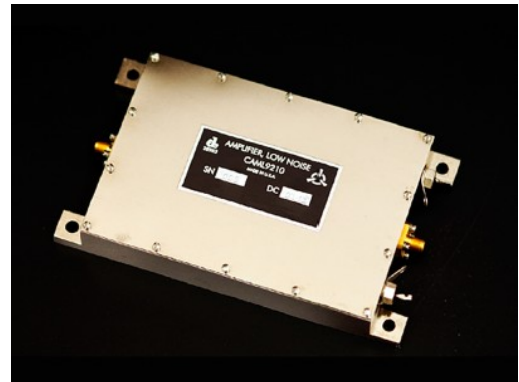




### **CAML9210**

Low Noise Amplifier  
RADAR Application

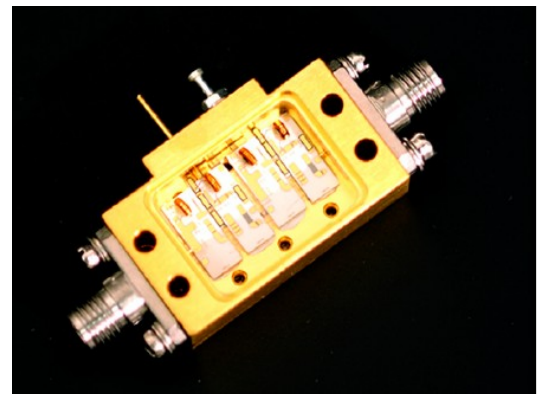
- Operating Frequency: 1.2GHz to 1.4 GHz
- 29 dB Minimum Gain
- RF Output Power: +10 dBm
- $\pm 0.3$  dB Gain Flatness vs Frequency and Temperature
- 1.5 dB Maximum Noise Figure
- Phase and Group Delay Guaranteed Performance
- Operating Temperature: Full Military Range



### **DAML6284**

Broadband LNA  
MISSILE Application

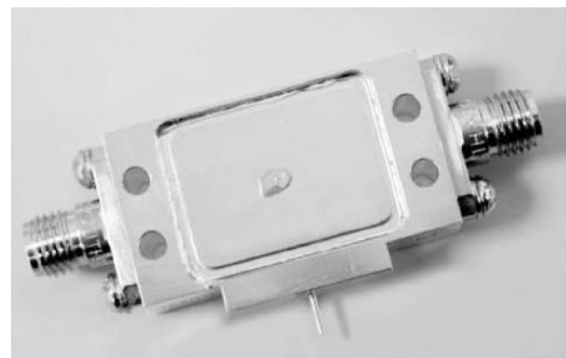
- Operating Frequency: 0.01 to 2.2 GHz
- 27 dB Gain
- 1.3 dB Maximum NF
- Available in Matched Sets
- $\pm 1$  Degree Phase vs Frequency (unit to unit)
- $\pm 1$  dB Gain Tracking (unit to unit)
- $\pm 9$  dBm Power Out
- Single +5V Supply
- SMA-Connectorized Package
- Input/ Output Return Loss:  $>16$ dB



### **DAML6278**

C-X Wide Band—Low Noise Amplifier  
MILITARY RADAR Application

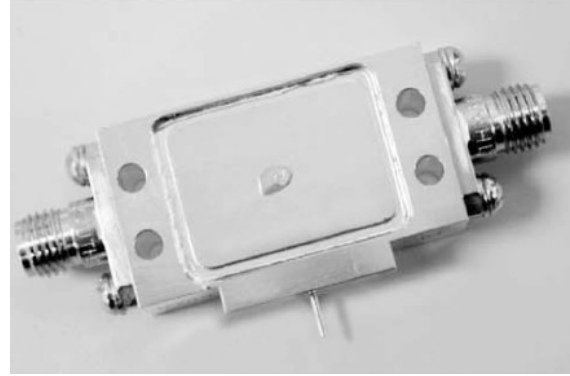
- Operating Frequency: 0.01 to 2.2 GHz
- 27 dB Gain
- 1.3 dB Maximum NF
- Available in Matched Sets
- $\pm 1$  Degree Phase vs Frequency (unit to unit)
- $\pm 1$  dB Gain Tracking (unit to unit)
- $\pm 9$  dBm Power Out
- Single +5V Supply
- SMA-Connectorized Package
- Input/ Output Return Loss:  $>16$ dB



### DAML6266

VHF-Band— Low Noise Amplifier  
MISSILE Application

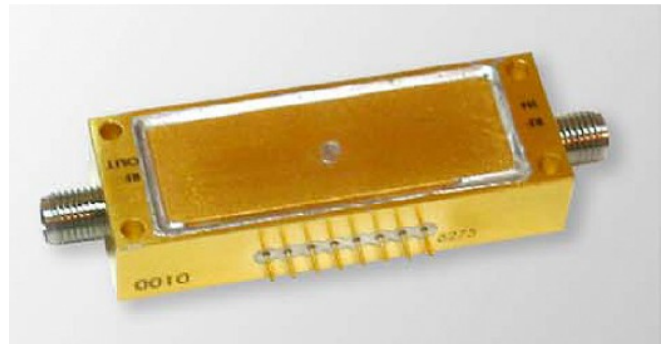
- Frequency Range 20-100 Mhz
- Small Signal Gain 25 dB
- Isolation >35 dB
- 1.8 dB Maximum Noise Figure
- VSWR In/Out 1.4:1
- 1 dB Compression +17 dBm
- IP3 +46 dBm
- Available in Matched Sets:  
±10 degrees Phase Tracking  
±1 dB Gain Tracking
- Single ±5V Supply



### DAML6273

UHF Variable Gain Amplifier (w/5-Bit Attenuator)  
MISSILE Application

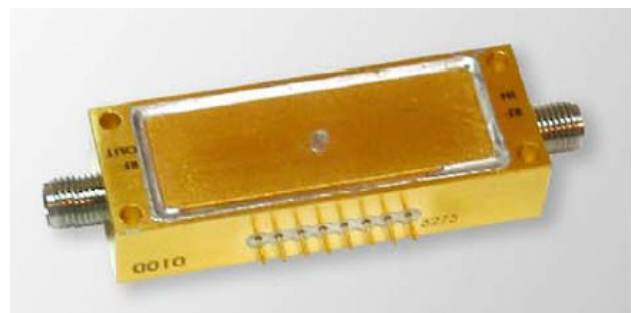
- Operating Frequency 60-100 Mhz
- Small Signal Gain—30dB
- 1.6 dB Maximum NF
- IP3 +31 dBm
- P1dB—Compression +18dBm
- VSWR IN/Out 1.3:1
- Limiting Threshold +12 dBm Logic'1'
- Input Limiter Protection 6 Watts CW 20 Watts Peak
- Attenuation Range 30 dB
- Available in Matched Sets:  
±10 degrees Phase Unit-to-Unit  
±1 dB Amplitude Unit-to-Unit
- Single ±5V Supply



### DAML6274

Broadband Variable Gain LNA (w/5-Bit Attenuator)  
MISSILE Application

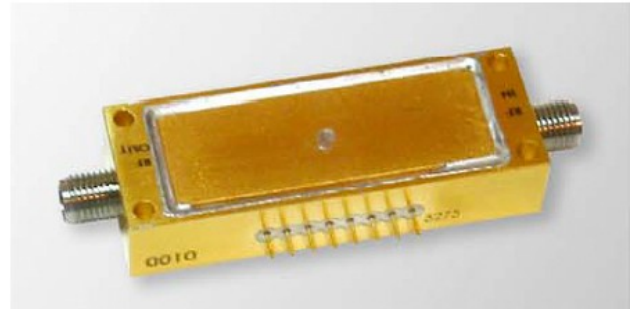
- Operating Frequency 0.7-2.1 GHz
- Small Signal Gain—31dB
- 1.7 dB Maximum NF @ No Attenuation
- Available in Matched Sets:  
±10 degrees Phase vs Frequency Unit-to-Unit  
±0.8 dB Gain Tracking Unit-to-Unit
- Attenuation Range 30 dB 5 Bit
- P1 dB Compression Under Full Attenuation—+7 dBm
- Single ±5V Supply
- Input/ Output Return Loss > 14 dB



**DAML6275**

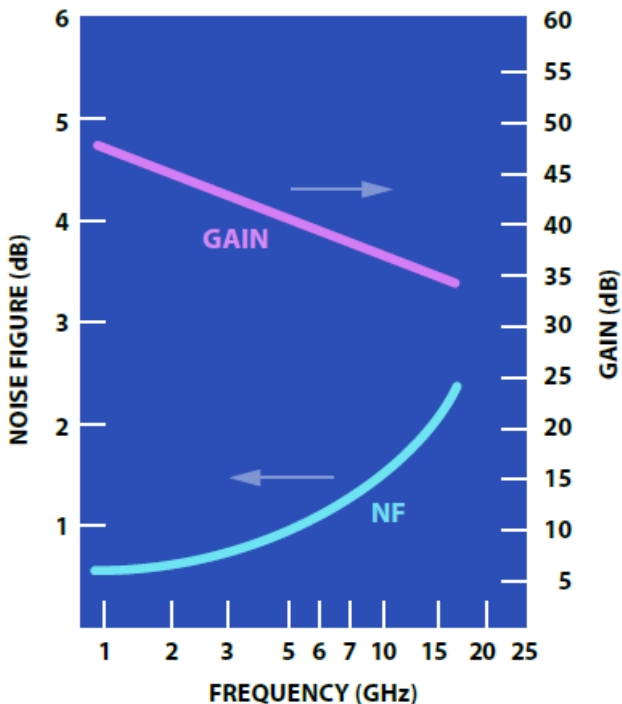
L- Band Variable Gain LNA (w/5-Bit Attenuator)  
MISSILE Application

- Operating Frequency 1.9-2.0 GHz
- Small Signal Gain—31dB
- 1.5 dB Maximum NF @ Zero Attenuation
- Available in Matched Sets:  
±10 degrees Phase vs Frequency  
±0.8 dB Gain Tracking
- Attenuation Range 30 dB 5 Bit
- P1 dB Compression @ Full Attenuation—+7 dBm
- Single ±5V Supply
- Input/ Output Return Loss > 14 dB

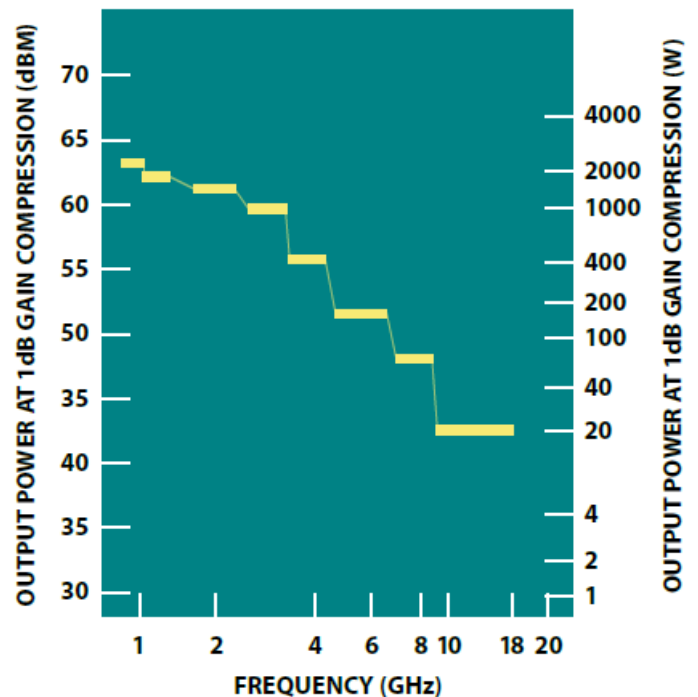


**CAPABILITIES: Low Noise Amplifiers & Power Amplifiers**

**LOW NOISE AMPLIFIER**



**POWER AMPLIFIER**



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Rev 10.04.2017



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