

COMMUNICATION



SATCOM/DATA LINK CAPABILITIES

Microwave solutions for **your demanding requirements**



TELEDYNE MICROWAVE SOLUTIONS
Everywhereyoulook™

Introduction

Teledyne Microwave Solutions (TMS) brings the strength of seven leading microwave companies to a suite of vertically integrated product lines for military and commercial communications.

From microwave components to integrated assemblies, TMS has more than 50 years of experience as a worldwide leader in the design, development, and manufacture of advanced microwave technologies. Our product lines include:

Amplifiers • Filters • Synthesizers • YIG Filters and Oscillators
Transceivers and Converters • Integrated Microwave Assemblies (IMAs)
BAW Delay Lines • TWTs

K-Band Switchable LNB
(19.2–20.2GHz and
20.2–21.2GHz
in one unit)



Low Noise Amplifiers

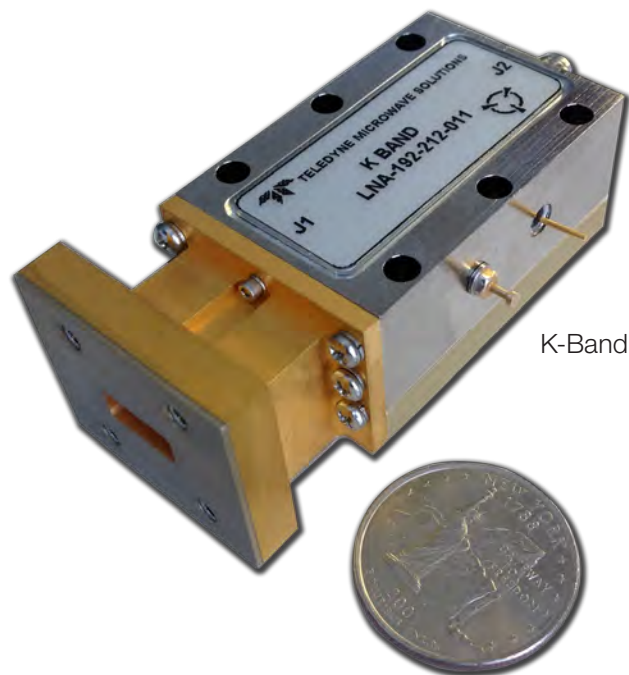
Low Noise Amplifiers Engineered around Proprietary Teledyne Technology

Teledyne Microwave Solutions has introduced a new range of Low Noise Amplifier (LNA) products designed specifically for the satcom communications market. By incorporating internally-packaged MMICs, we are now able to offer LNAs with some of the lowest noise figures available in the industry.

For example, our new K-Band LNA operates over a 19.2–21.2 GHz in 1 GHz Band Width with 1.3 dB Noise Figure at 25°C. Our K-Band LNAs are configured with a WR42 Waveguide input and 2.92 output connector. The housing is hermetically sealed, EMI shielded, and includes reverse voltage protection.

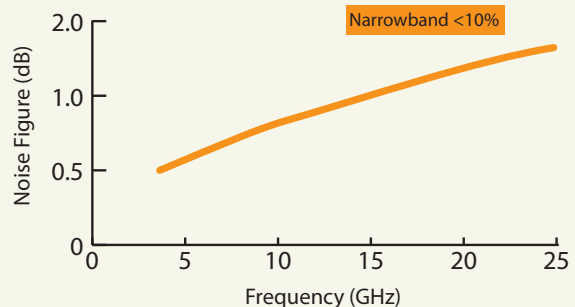
Typical specifications:

- Noise figure of 1.3 dB at 25°C
- Output 1dB comp is 0 dBm minimum
- Small-signal gain is 40 dB and gain flatness is ± 1.5 dB maximum
- Current draw is nominally 150 mA from a single +15V supply
- Size: 1.0 x 1.5 x 0.5"
- Operating temperature of -54 to +85°C case
- Input/output return loss 15 dB minimum



K-Band LNA

Typical Noise Figure Performance @ 25°C



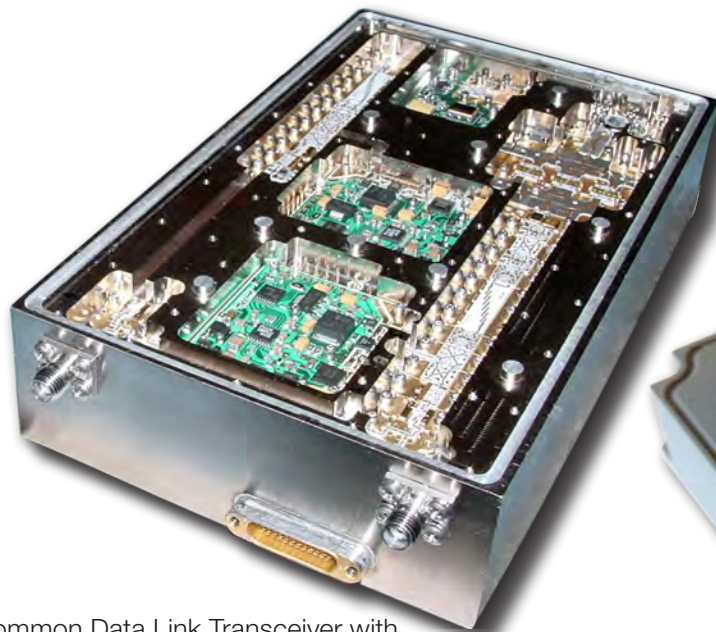
Converters

Agile and Block RF Converters designed for airborne, ground, and space-based applications

Teledyne Microwave Solutions offers a wide range of frequency converters, from UHF to over 40 GHz with a varied list of packaging options. With a knowledge base of over 1,500 microwave circuit designs, new applications can be addressed with minimal risk and time to completion. Our converter products range from compact modules that meet extremely low size, weight and power (SWaP) requirements to standard rack-mount products typically used in satellite earth stations. Available architectures include everything from fixed block up and down converters to agile products that contain ultra-high speed tuning synthesizers.

Providing both COTS and custom products

Though many of the converter products produced by TMS are based upon elements of existing designs, our family of over 1,000 employees and eight manufacturing locations ensure that we have the ability to address most any application – whether it be for commercial-off-the-shelf (COTS) products or a custom solution that requires the latest cutting-edge tools and expertise.



Common Data Link Transceiver with integrated SSPA & LNA

X-Band 25W P1 BUC



TMS is well positioned to facilitate the growing migration towards the Ka-Band with a large portfolio of existing products and a seasoned team of high-frequency RF design engineers employing the latest techniques and devices to ensure that we evolve with the markets, both commercial and military.

Frequency converters from TMS are available as free-standing units or module-based products that can be integrated with other system components. Our converters are often packaged with solid state power amplifiers (SSPAs) when additional gain is required and are available in most frequencies up through Ka – from 2 watts to several thousand watts.

Common functionality requirements that we see and support include (note: this is not a complete list):

- Current Monitoring
- Linearizer circuits enabling compliance with spectral regrowth requirements with less back off
- Digital Frequency Control
- Automatic Gain Control
- Temperature Compensation
- Battle Short
- Temperature Monitoring
- RF Log and Linear Power Monitors
- Output VSWR monitoring and automatic shut down
- Return Power Detect with shut down capability
- Front End Limiter



Switchable Ka-Band BUC
(29-30GHz and 30-31GHz in one unit)



Solid State Power Amplifiers

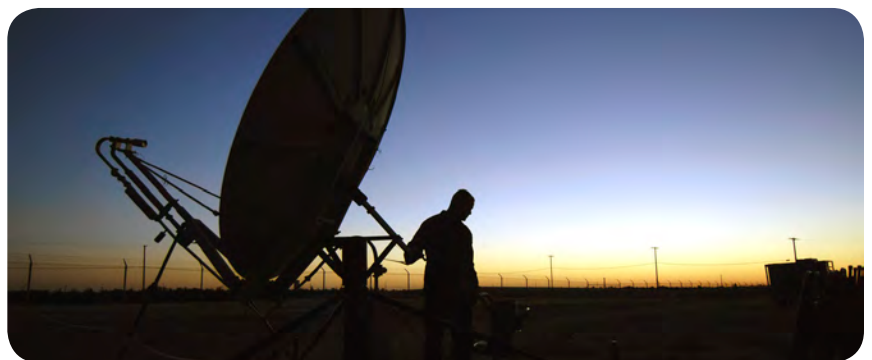
SSPAs from TMS are the benchmark for robust, mission-critical applications

Teledyne Microwave Solutions is committed to a strong Solid State Power Amplifier (SSPA) portfolio. Over recent years we've had the opportunity to work with most of the large OEM system manufacturers to develop custom SSPAs for both pulsed and CW needs. In addition, TMS offers a broad line of COTS SSPAs for satcom applications. These amplifier developments have a frequency of operation as low as L-Band (10+ KW) and as high as Ka-Band (75W) with plans to move into Q-Band. Our units have worked in a number of applications including:

- Satcom Subsystems
- Common Data Link (CDL)
- Space qualified CDL
- Airborne



1.3lb Ka-Band 29-31 GHz
16 W (10 Watt Linear) SSPA



KEY FEATURES

- ▶ Proven Rugged Design
- ▶ Low Profile Hermetic Package
- ▶ Power Efficient Design
- ▶ Lightweight
- ▶ Detect and Disable available
- ▶ Linearizer available on some models
- ▶ Integrated VGA and Power Detect Loop available
- ▶ Low Power Mode
- ▶ VSWR Detect
- ▶ Bus Control (RS422 and others)



20W P1 Ku-Band 13.75 to 15.4GHz
SSPA with connectors on one face to help with RFE integration

Frequency Range (GHz)	4.4 - 5.0	7.0 - 8.0	13.75 - 15.4	13.75 - 15.4	13.75 - 15.4	13.75 - 15.4	13.75 - 15.4	13.75 - 15.4	29.0 - 31.0
Power (P1dB)	25W	25W	5W	10W	15W	15W	20W	25W	16W (8W linear)
Small Signal Gain	45dB	45dB	35 dB	47 dB	47 dB	43 dB	43 dB	43 dB	42 dB
Spurious	-60dBc	-60dBc	-60 dBc	-60 dBc	-60 dBc	-60 dBc	-60 dBc	-60 dBc	-60 dBc
Low Power Mode incl	N	N	N	Y	Y	Y	Optional	Optional	N
Temperature Monitor Incl	N	N	N	Y	Y	Y	Y	Y	Y
Detect and Disable Incl	Y	Y	Y	Y	Y	Y	Y	Y	N
Blanking	30mS	30mS	1.5µS	30mS	30mS	30mS	30mS	30mS	30mS
DC Power @P1dB	100W	100W	31W	75W	150W	100W	175W	200W	135W
Linearizer Available	N	N	N	Y	Y	Y	Y	Y	Y
Weight	0.8 lbs	0.8 lbs	0.3 lbs	0.5 lbs	0.5 lbs	0.5 lbs	0.8 lbs	0.8 lbs	1.3 lbs
Operating Temperature Range	-45°C to +85°C	-45°C to +85°C	-45°C to +85°C	-45°C to +85°C	-45°C to +85°C	-45°C to +85°C	-45°C to +85°C	-45°C to +85°C	-55°C to +70°C
Hermetic	Y	Y	Y	Y	Y	Y	Y	Y	Y





TELEDYNE MICROWAVE SOLUTIONS
Everywhere you look™



Teledyne Microwave Solutions designs and manufactures the most extensive line of hybrid amplifiers and signal processing components on the market today.

- Strong heritage of pushing the envelope of performance
- Flexibility to tune for application/customer specific requirements
- Unparalleled experience in the Hi-Rel arena

The Power of Consolidation  Cougar • Defence • Labtech • MEC • Microwave • Paradise Datacom

800.832.6869

Microwave@Teledyne.com

TeledyneMicrowave.com

Information subject to change without notice.