

For low-cost high-reliability Ka-Band broadband terminal applications.



The ViaSat transceiver is specifically designed for low-cost high-reliability Ka-Band VSAT and broadband data terminal applications. Our understanding of the systems in which our components operate allow us to create a design with the optimal trade-offs in mechanical, electrical, and packaging elements. The result is a transceiver that can be produced at high yields, low cost, and is easy-to-manufacture.

Utilizing our mini block upconverter (BUC), the transceiver comprises a 3.0 Watt nominal output power and 29.5-30.0 GHz transmit chain. The 19.7 - 20.2 GHz receive chain comprises a 1.4 dB nominal noise figure low noise amplifier (LNA) front end.

L-Band IF converters for the transmit and receive chains use a free-running single DRO oscillator.

The IF frequency bands of 1800-2300 MHz for transmit, and 1000-1500 MHz for receive were specifically selected for superior spurious signal performance. They allow the use of a single DRO with excellent phase noise performance. The transceiver interfaces directly to the antenna feed orthomode coupler via a WR-28 waveguide for the transmit port, and WR-42 waveguide on the receive port.

## FEATURES

- » Highly integrated full-duplex sensor-to-antenna system
- » High P1dB: 35 dBm Typical
- » WR28 transmit output, WR42 receive input
- » Standard "F" Type connector IF ports
- » Max power dissipation 44 Watts
- » High Reliability MTBF 100,000 hours
- » Integral internal free running DRO
- » Operating Temperature ranges from -40 to +55 °C

# 3 Watt Ka-Band Transceiver Specifications

<b>MODEL NUMBER</b>	USM-TXVR-KA01-3T-F-01-110
<b>TX RF (GHz)</b>	29.5-30.0
<b>RX RF (GHz)</b>	19.7-20.2
<b>TX IF (GHz)</b>	1.8-2.3
<b>RX IF (GHz)</b>	1.0-1.5

## TRANSMITTER

Specification	Typical Performance
Output Power @ 1dB GCP	35.0 dBm typ @+ 25C; 34.0 dBm min @ + 55C;
ACPR at Po=34 dBm and 1.0 Rs	-23 dBc typ / -19 dBc max
Linear gain	51 dB < G < 63 dB max
Gain variation with frequency temperature	< 2.5 dB / 20 MHz at fixed temperature < 3.5 dB / 500 MHz at fixed temperature
Gain variation with temperature	< 4.0 dB typ at fixed frequency
Input Power (no damage)	< +6 dBm
Phase Noise @ 1/10/100/1000 kHz	< -60/-77/ -92/ -112 dBc/Hz
Spurious emissions 25.202	Complies with FCC CFR 47 Part 25.202
In-band spurious emissions @ P1dB	< -15 dBm/100 kHz from 29.50 to 30.00 GHz < -35 dBc / 100 kHz within 2 MHz from carrier
Noise figure	< 25 dB typ / < 30 dB max
RF port	WR-28, with O-ring & groove
RF Gain in mute state	< 0 dB maximum
Transmit Frequency Conversion	Inverted about 31.8 GHz LO
Local Oscillator	Internal DRO, Free Running

## RECEIVER

Specification	Typical Performance
Receive Gain (Total)	52 dB < G < 62 dB
Gain Variation with Frequency	< 0.4 dB / 20 MHz average < 0.7 dB/ 20 MHz maximum < 4 dB / 500 MHz typical
Gain Variation with Temperature	< 5 dB at any fixed frequency over temperature
Input Power (no damage)	< -42 dBm maximum
Aggregate Input Power (Operating)	< -70 dBm maximum
Noise Figure	< 1.4 dB typical at 25°C
RF port	WR-42, with O-ring & groove
IF output 1 dB compression point	> 0 dBm
In-band Spurious @ input -70 dBm	< -25 dBc
Output IP3	> 7 dBm typical
Phase noise @ 1/10/100/1000 KHz	< -63 / -80/ -95/ -115 dBc/Hz
Receive Frequency Conversion	Inverted about 21.2 GHz LO

## TX CONTROL

Specification	Typical Performance
Transmit Mute Control Signal	10.00-10.35MHz control signal on/off used for transmit mute/un-mute function
Power Level	-10 dBm < Pref < +10 dBm
Transmit Mute	Transmit mute mode active when mute control level < -40 dBm; the receiver continues to operate as a free running LNB during transmit mute mode.
Mute On/Off Time	< 100 μs
Transmit Fault / Watchdog timer	Following > 1 second of continuous transmit power-on the transceiver shall enter transmit mute mode

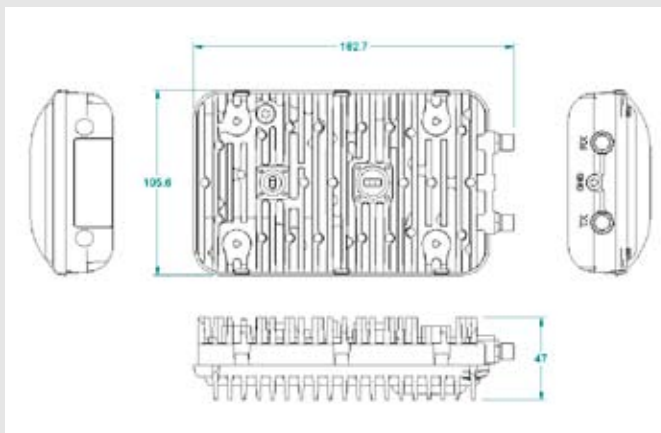
## ELECTRICAL INTERFACE

Tx IF Cable Signals	Transmit IF; DC Power; Tx Mute control
Rx IF Cable Signals	Receive IF
IF Connectors / Impedance	Type "F" Female, 75 ohms
DC Voltage	24 VDC < V < 32 VDC; Center conductor +ve
Power Consumption	< 44 W

## MECHANICAL

Weight	0.735 kg maximum
Size (Height x Width x Length)	50 mm x 107 mm x 183 mm
MTBF	100,000 Hr
Operating Temperature	-40°C < Ambient Temp. < +55°C

## DIMENSIONS



## CONTACT

1388 NORTH TECH BLVD  
GILBERT, AZ 85233

WEB WWW.VIASAT.COM/CUSTOM-MMICS-AND-RF-ASSEMBLIES  
TEL 480.503.5500  
FAX 480.503.5501  
EMAIL COMMERCIALMICROWAVEPRODUCTS@VIASAT.COM

Copyright © 2009 ViaSat, Inc. All rights reserved. Printed in the USA. ViaSat and the ViaSat logo are registered trademarks of ViaSat, Inc. All other trademarks mentioned are the sole property of their respective companies. Specifications and product availability are subject to change without notice.