

# SMIVT5G<sup>TX/RX</sup>



**Reliable, rugged, real-time video and telemetry data link (receiver/transmitter pair) for unmanned air vehicles using C-band frequency**

## Features and Benefits

- ▮ The operating frequency is programmable, covering the C-band in one MHz steps
- ▮ The system was designed and is being tested to military specifications. Its rugged design ensures it can be used over wide temperature ranges, under varying environmental conditions
- ▮ Transmitter output frequency remains stable over the operating temperature range within +/- 200 ppm
- ▮ Wide dynamic range with agile automatic gain control (AGC) prevents fading of the video signal
- ▮ The system provides a receive signal strength indicator
- ▮ With spurious and harmonic response at -60 dBc (or better), EMI is minimized
- ▮ Tested for full broadcast quality video in accordance with EIA 250C (NTSC & PAL)

The SMIVT5G<sup>TX/RX</sup> set consists of one transmitter and one receiver. The set is used to uplink command and control data to a remotely piloted vehicle and to receive broadcast quality video from the vehicle. In downlink mode, the set simultaneously transmits FM video (6 MHz bandwidth) and FM telemetry data on two sub-carriers at a data rate of up to 30 kbps each. In uplink mode, the set uses the carrier to uplink telemetry data only, at a data rate of up to 200 kbps.

## Applications

The SMIVT5G<sup>TX/RX</sup> set is designed for airborne applications. It is currently used in an unmanned aerial vehicle extensively used by the U.S. Military. The system combines high power output with very good receiver sensitivity for longer range. The SMIVT5G<sup>TX/RX</sup> incorporates a very flexible architecture. It is a versatile wideband wireless data link for a variety of applications, and can easily be customized for unique uses. Products in the same data link product family have been used in hand-launched aircraft (weight reduced to less than 2 oz), maritime traffic monitoring by the U.S. Coast Guard, and in commercial applications including monitoring highway and harbor traffic, sports event video and data relay, fixed site surveillance, etc. The products work in various frequency bands, from L-band to Ku-band.

## Innovative Design

The unique characteristic of the SMIVT5G<sup>TX/RX</sup> system, is the flexibility of its design. The transmitter and receiver pair can be set up to carry audio, telemetry data, and also broadcast quality video. It has been customized to work in frequency bands other than C-band, e.g. L-band or Ku-band.

Since fail-safe reliability is an important requirement for unmanned vehicles, the transmitter provides output from a temperature sensor located at the final amplification stage (for example) which provides for an automated shutdown should a preset value be exceeded.

## Technical Specifications

### power supply

TX +28 VDC Input	+21 V to +32 V ( <i>nominal</i> ); up to 1 V ( <i>rms</i> ) ripple, current draw less than 500 mA, no damage with 50 V spikes ( <i>up to 1 ms duration</i> )
TX +12 VDC Input	+/- 5%; up to 50 mV ( <i>rms</i> ) ripple; current draw less than 8 A, no damage with 50 V spikes ( <i>up to 1 ms duration</i> )
RX +28 VDC Input	+21 V to +32 V ( <i>nominal</i> ); up to 1 V ( <i>rms</i> ) ripple, current draw less than 1 A, no damage with 50 V spikes ( <i>up to 1 ms duration</i> )

## Performance Specifications

### TX characteristics

frequency	C-band programmable in 1 MHz steps
peak output power	10 Watts ( <i>nominal</i> )
spurious & harmonic output levels	response better than -60 dBc ( <i>measured up to 20 GHz</i> )
frequency drift	+/- 20 ppm of the programmed frequency over temperature
video modulation	20 MHz FM
subcarrier modulation	300 kHz FM at 6.8 & 7.5 MHz
telemetry modulation	200 kHz FM

### RX characteristics

frequency	C-band programmable in 1 MHz steps
spurious and image rejection	better than 60 dB
frequency drift	+/- 20 ppm of the programmed frequency over temperature
noise figure	< 2 dB ( <i>over entire frequency range</i> )
input impedance	50 Ohms ( <i>nominal</i> ); VSWR < 2:1
max. input level	+ 10 dBm ( <i>no damage sustained</i> )
telemetry sensitivity	-103 dBm
telemetry demodulation	3.3 V peak-to-peak
video sensitivity	-84 dBm
video demodulation	NTSC or PAL ( <i>standard EIA250C quality</i> )
subcarrier demodulation	1.7 V ( <i>rms</i> ), 5 V peak-to-peak
dynamic range	operates correctly up to -20 dBm

## Environmental Specifications

operating temp	-40 to 71 °C (-40 to 149 °F)
storage temp	-55 to 125 °C (-67 to 257 °F)
vibration	5 g at frequencies up to 50 Hz
shock	20 g with a duration of 11 ms, i.a.w. MIL-STD 810C
humidity, rain, dust, salt spray	sealed per MIL-STD 810C
altitude	-1,000 to +40,000 ft.

## Interfaces

TX RF output, RX RF input, RX video input	SMA female connector
TX video input	ground isolated BNC female connector
all other signals	25-pin female D-sub connector

## Physical Characteristics

weight (TX)	810 g (1 lb 12.5 oz)
weight (RX)	710 g (1 lb 8.9 oz)
size (LxWxH)	152 x 91 x 38 mm (6.00 x 3.60 x 1.50 in)

## Ordering Information

part no.	SMI-VT5GTX/RX
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