Sierra Monolithics, Inc., a wholly owned subsidiary of Semtech Corporation

SMIVT5GTX

C-band Video/Telemetry Transmitter July 8, 2010 (Revision C)

Description:

The SMIVT5GTX and SMIVT5GRX set consists of one each transmitter and receiver. The SMIVT5GTX transmits either broadcast quality video (6 MHz Bandwidth) or telemetry. In video mode the transmitter can also simultaneously send FM telemetry data on two subcarriers at a data rate of up to 30 kbits per second each. This field proven product is used today on unmanned aerial vehicles (UAVs).

Applications:

- Unmanned Aerial Vehicle (UAV) video links
- Airborne command and telemetry links
- FLIR links
- Fixed site surveillance
- Video and data relay

Features:

- Tested for full broadcast quality video per EIA 250C (NTSC & PAL)
- Proven flight history
- Wide dynamic range
- Wide tuning range (600 MHz)
- Signal strength indicator
- >10 mile range
- Easily customized to work in L-band or Ku-band
  For customized products contact factor

RF Characteristics

Parameter	*Min*	*Nom.*	*Max*	*Units*	*Comments*
RF Output Frequency	*5250*		*5850*	*MHz*	
Output Freq Step Size		*1 MHz*			*Commanded with 10 bit TTL word.*
Output Frequency Accuracy	*-20*		*20*	*ppm*	
Output Power High Power setting	*40*			*dBm*	*Measured into 50 ohms Output On/Off = "0"*
Output Power Low Power setting		*0*		*dBm*	*Measured into 50 ohms Output On/Off = "1" Achieved by shutting off output stages*
Output Power Switching Time			*1*	*msec*	*Turn on or turn off time when Output On/Off is toggled*
Output Spurious			*60*	*dBc*	*Up to 20 GHz, High Power Mode*
Harmonics			*60*	*dBc*	*Up to 20 GHz High Power Mode*

2.0 Modulation Characteristics

2.1 Modulation Selection;

Video / Telemetry Mode Select	*Source of Modulation*
0	*Video Input and Subcarrier Inputs*
1	*Wideband Telemetry Input*

2.2 Telemetry Modulation

Input: <5V peak to peak
FM Deviation: 60 kHz/V +/-12%
Input impedance: 10 kohms
Polarity: Positive (increasing voltage increases frequency)
3 dB modulation BW: 50Hz to 300 kHz
Non-linearity: < 4%

2.3 Video Modulation

Deviation:

- *2.53 MHz/V +/- 10% (NTSC transmitter) with 1 Volt peak-to-peak, 10 KHz square wave*
- *2.25 MHz/V +/- 10% (PAL transmitter) with 1 Volt peak-to-peak, 10 KHz square wave*
- *NTSC or PAL pre-emphasis specified on order*

Input Impedance: 75 ohms +/- 5%
Polarity: Positive (increasing voltage increases frequency)
3 dB modulation BW: 8 Hz to 5 MHz
Non-linearity: < 3%
Common Mode Suppression: > 40 dB

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2.4 Subcarrier Modulation

Subcarrier Frequencies: 6.8 MHz and 7.5 MHz
Subcarrier frequency variation with temperature: +/- 30 kHz
FM Deviation: 200 kHz/V +/-10% with 5 V peak to peak input
Input Impedance: 10 kohm minimum
Polarity: Positive (increasing voltage increases frequency)
3 dB modulation BW: 50 Hz to 100 kHz

2.5 Deviation due to the Subcarriers

The subcarriers deviate the video modulator such that the first sideband level of the output frequency is -22 dBc +/-2 dB.

3.0 DC Power

Voltage	*Nominal Current*	*Maximum Current*
28 Volts		*500 mA*
12 Volts		*8 Amps*

3.1 +28 Volt Characteristics

Range: +21 Volts to +32 Volts
Ripple: <1 Volt rms ripple.
Spikes: No damage when 50 Volt spikes lasting 1 mS are applied
Powers Transmitter except last two stages

3.2 +12 Volt Characteristics

Range: +12 Volts +/-5%
Ripple: <50 mVolt rms ripple.
Switching: Can be externally switched to disable output transmitter amplifiers

4.0 Telemetry Outputs

4.1 Phase lock Indication Output

Locked: TTL Low
Unlocked: TTL high
Output Impedance: < 100 ohms
Pin 17 of D Connector

4.2 Detected Power Output

Output Type: Analog
Pin 18 of D Shell Connector
Output Impedance: 600 ohms +/- 10 %.
Maximum Output: 12 Volts
Output Settings: 4 Volts is approximately 10 Watts
0 Volts is both output stages off

4.3 Temperature Indication Output

Output Type: Buffered Analog
Pin 12 of D Connector
Location in Transmitter: Close to RF output stages
Output Voltage = Temperature in Kelvin /100
Output Impedance: 10 ohms

5.0 Commanding

The transmitter frequency is set with a 10 bit digital word commanded on pins 1-10 of the D Connector. These are TTL levels, the step size is set at 1 MHz.

Command Decoder:
5250 MHz = 0 (binary)
5850 MHz = 601 (binary)

Pin 1 is LSB
Pin 10 is MSB

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If a frequency is selected which is out of band, the transmitter will automatically select an output frequency of 5300 MHz.

6.0 Interfaces

RF Output: 50 ohms SMA Female
Video Input: 75 ohm BNC (ground isolated)
Other Signals 25 Pin D-shell as noted below:

Pin	*Description*
1	*PLL Command Word bit 0 (LSB)*
2	*PLL Command Word bit 1*
3	*PLL Command Word bit 2*
4	*PLL Command Word bit 3*
5	*PLL Command Word bit 4*
6	*PLL Command Word bit 5*
7	*PLL Command Word bit 6*
8	*PLL Command Word bit 7*
9	*PLL Command Word bit 8*
10	*PLL Command Word bit 9 (MSB)*
11	*Output On/Off Control (Digital Input)*
12	*Temperature Indication (Analog Output)*
13	*Wideband Telemetry Input (Analog Input)*
14	*6.8 MHz Subcarrier Input (Input)*
15	*7.5 MHz Subcarrier Input (Input)*
16	*Video / Telemetry Mode Select (Input)*
17	*Phase Lock Indication (Digital Output)*
18	*Detected Power Output (Analog Output)*
19	*+28 Volts*
20	*+12 Volts*
21	*+12 Volts*
22	*+12 Volts*
23	*Ground*
24	*Ground*
25	*Ground*

7.0 Environmental

7.1 Temperature

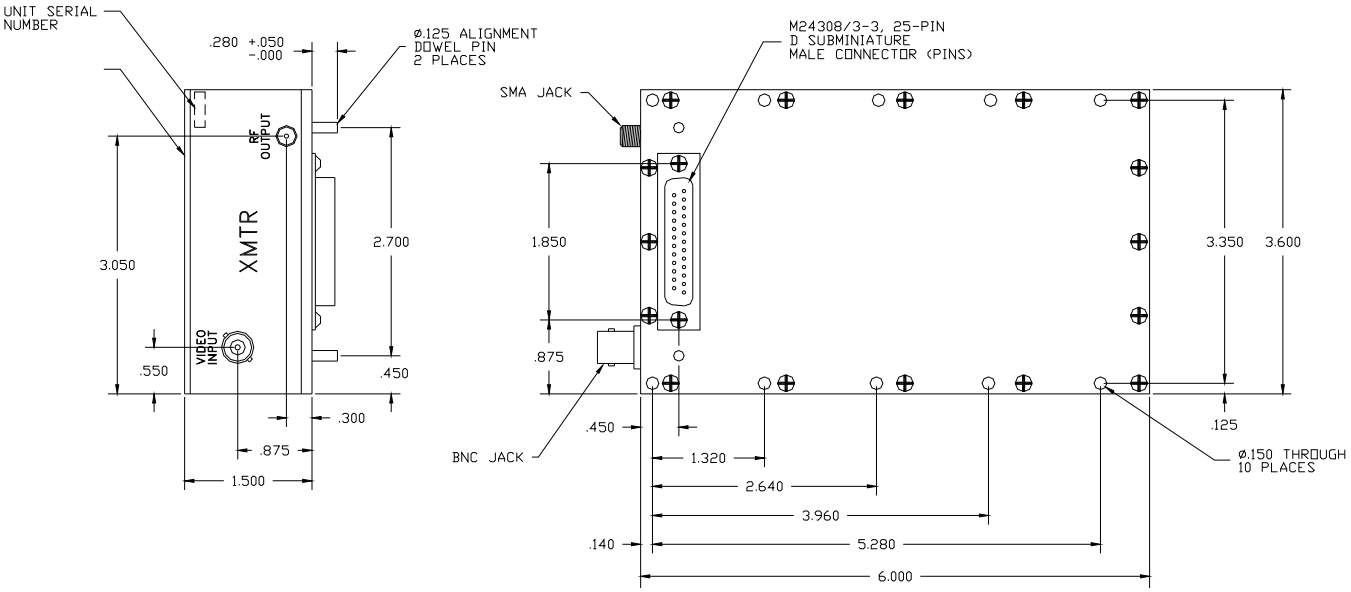
Operational: -40 to +70 degrees C, Case Temperature.
Storage: -55 to +125 degrees C

7.2 ***Vibration:*** *Meets all operational specifications while being vibrated at 5 G's at frequencies from 20 to 200 Hertz.*

7.3 ***Shock:*** *No damage with a shock of 20G's with a duration of 11 mS tested per MIL-STD-810C.*

7.4 ***Humidity, Dust and Rain****: Sealed against humidity, dust, rain and salt spray as per MIL-STD-810C.*

8.0 Mechanical:



9.0 Ordering Information

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