



TRANSCEIVER MODULE

Description and Specifications

Model TR76.5CIRC



Manufactured by:
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MODEL TR76.5CIRC TRANSCEIVER MODULE

Description and Operation

1. Scope

Model TR76.5CIRC is a transceiver front-end module.

It transmits an FM/CW signal at 76.5 GHz to an external antenna and it processes the returned signal from that antenna in a balanced mixer and a video amplifier.

The signal control, modulation and processing is done in an external system.

The Model TR76.5 CIRC module is to be mounted in a vehicle and powered from the external power supply.

2. Description

Model TR76.5CIRC block diagram is shown in Fig.1. It has a Gunn VCO to generate the 76.5 GHz signal to be transmitted via the circulator and external antenna. The power divider takes some generated power to pump the receiving mixer. The signal returned from the antenna is directed via the circulator to the mixer which operates as a multiplier. The product of the transmitted and received signals is a video signal which is amplified in the video ("IF") amplifier before being sent to an external signal processor. In this external unit, also VCO modulating signal and DC power is generated.

The TR76.5CIRC module is integrated into a rigid enclosure and can be mounted in a vehicle in a suitable location to be connected to an external antenna.

3. Specifications:

Center transmit/receive frequency: 76.5 GHz

System bandwidth: VCO +/- 150 MHz, Video bandwidth <10 MHz *

Transmitted Power: +11 dBm +/- 1 dB

Receiver Conversion Gain: 10 +/- 1 dB

Transmitter/Receiver Isolation : >30 dB (circulator)**

VCO tuning voltage: 0 ... 10 V ***

VCO modulation bandwidth: >10 MHz

RF Antenna connector: WR-10

IF Output, VCO tune connectors: SMA/F

Receiver noise figure: <13 dB

DC Power: +12 V DC (10.5 to 14 V)

Environmental: Shock 60G, 0.6 ms, Vibration: 6G, 20 Hz ~ 2 kHz

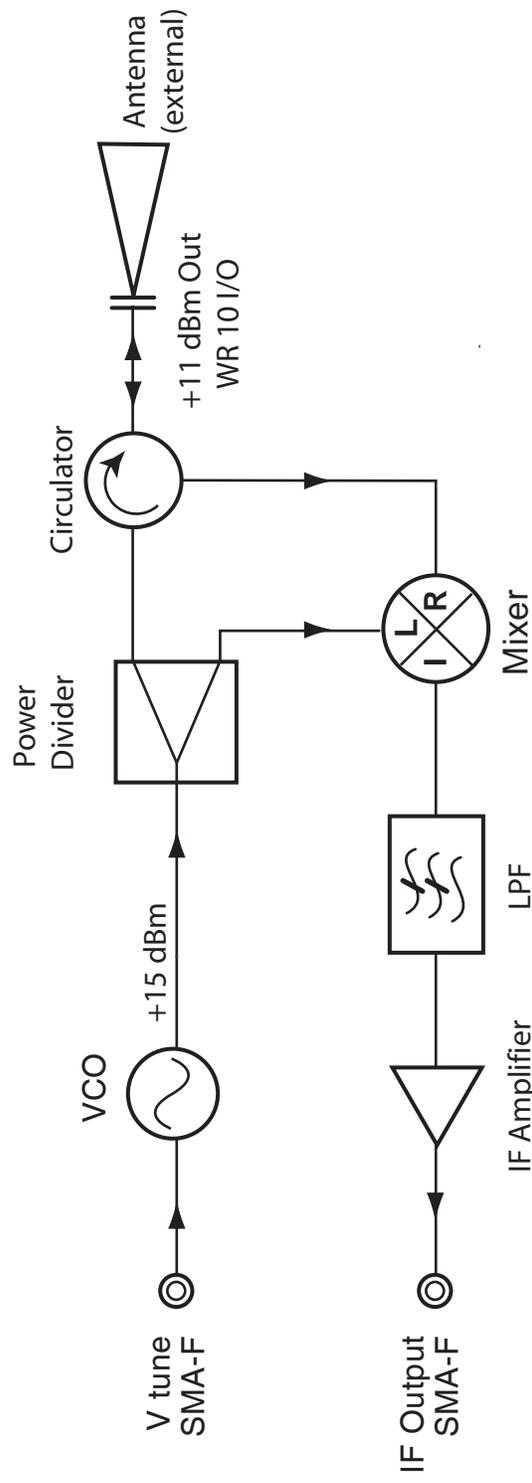


Figure 1: Transceiver Module Block Diagram Model No. TR76.5CIRC

Notes:

- *) Video bandwidth agreed with the customer to extend from 100Hz to 5 MHz/3 dB
- **) To meet this specification, a triple-junction circulator is used, but antenna mismatch can cause a degradation of isolation
- ***) VCO is an InP Gunn oscillator requiring power from a 9.0V. 160 mA at 76.5 GHz; voltage variation from 8.0 to 10.0 V sweeps the transmitted frequency from 76.0 to 76.7 GHz. A specific driver should be used to power and modulate the VCO