



## 76–77 GHz transceiver with linear frequency modulation



### APPLICATION

Transceiver, **M353003** module, operates in special allocated frequency range 76–77 GHz intended for use in various radio systems which provide safety of vehicular traffic.

### DESCRIPTION

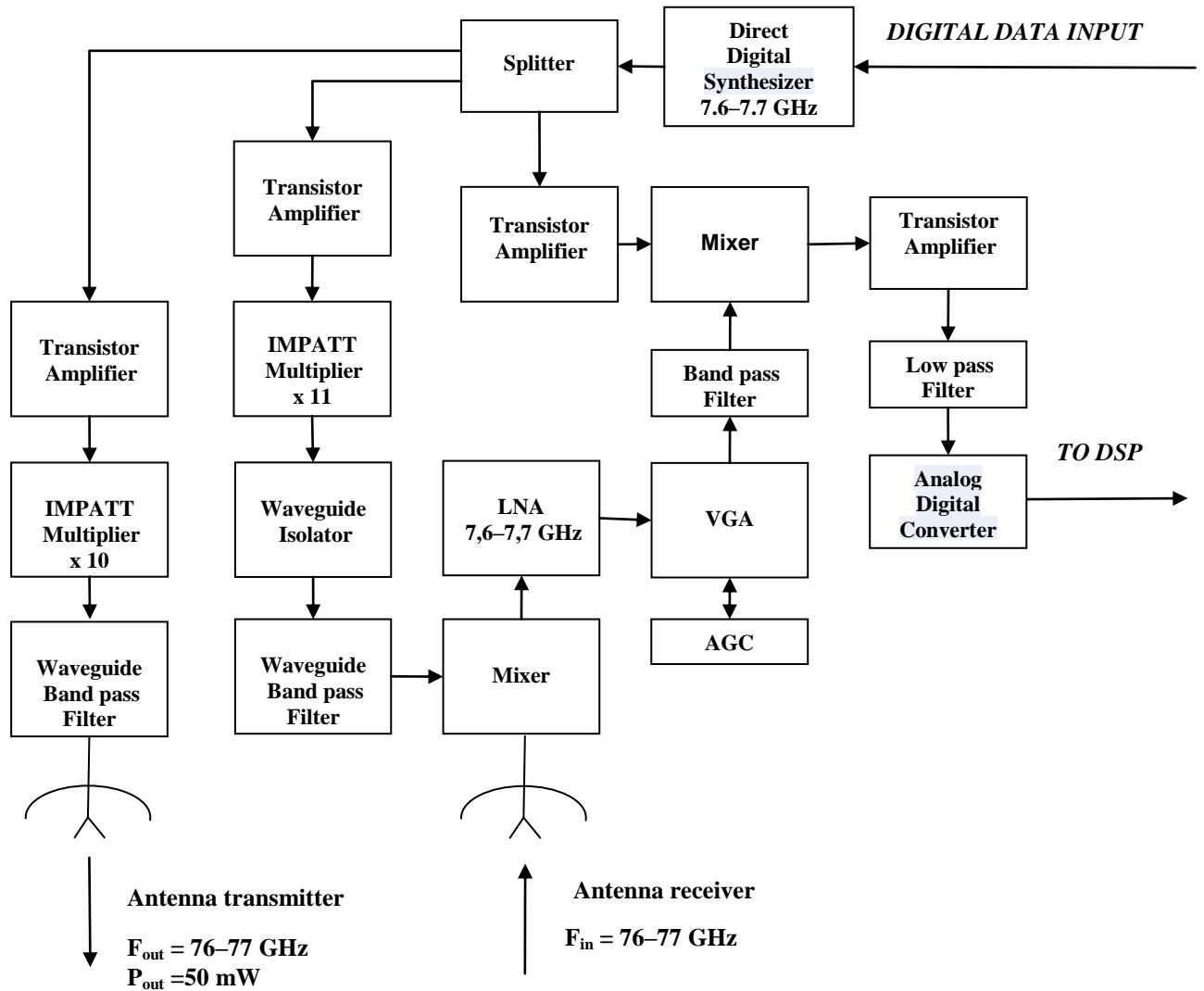
Transceiver is made on the basis of such sources as: frequency synthesizer, power amplifiers, frequency multipliers, passive microwave elements which produced at RI "Orion". The design of this kind transceiver allows fulfilling individual adjustment of the sources and checking parameters, that provides high quality and technical characteristics of the transceiver as a whole.

Structurally the transceiver has two channels – receiving and transmitting, each of which operates to its antenna. It provides a high level of isolation between receiving and transmitting channels that leads to extension of receiver dynamic range.

Use of an active IMPATT frequency multiplier as the final stage of the transmitter makes it possible to form the continuous output sounding signal over frequency range of 76–77 GHz with power not less than 30 mW and linear frequency modulation.

The receiver is made on super heterodyne circuit with double frequency conversion and provides noise factor no more than 10 dB. Active IMPATT-multiplier of high multiplicity is used as the first heterodyne of the receiver.

Use of high speed schemes of synthesis and processing of linearly frequency modulated signal, permits a wide range of measured velocities and distances to be achievable, that does the transceiver unique as to its technical characteristics.

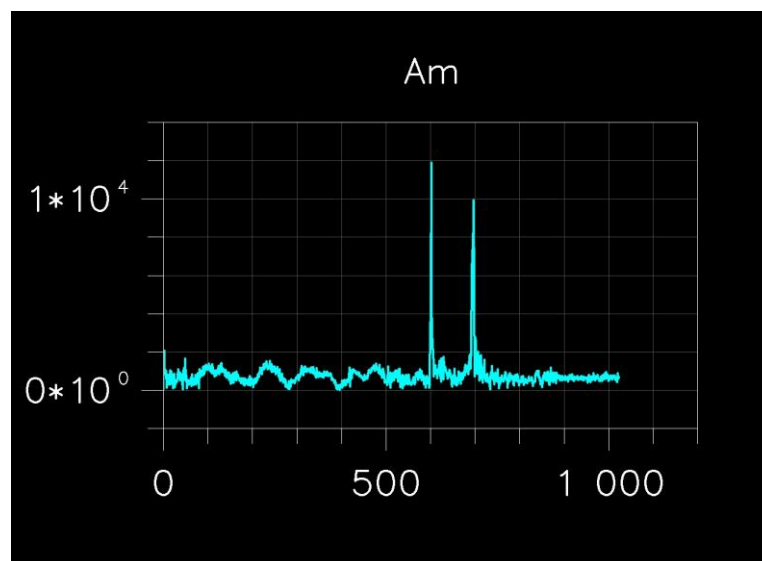




#### SPECIFICATIONS

Parameter, unit of measure	Typical values
Center operating frequency of transceiver, $F_0$ , GHz	76.5
Continuous emitting power, mW	30
Type of continuous signal modulation	Symmetrical linear FM
Frequency deviation, GHz	1.0
Tuning slope, GHz/msec	1.0
Nonlinearity of linear-frequency modulation, %, no more	0.1
Receiver noise factor, dB	10
Range of detection (passive mirrors), m, no more	100
Range resolution, %, not less	0.1
Isolation between receiving and transmitting antennas, dB, not less	80
Overall dimensions (without antenna system), mm, no more	300x150x80

#### CHARACTERISTICS



*Typical spectrum of reflected received signal as a result of fast Fourier transformation.  
The target is defined as two distant objects that are 90 m and 104 m away of the radar.*