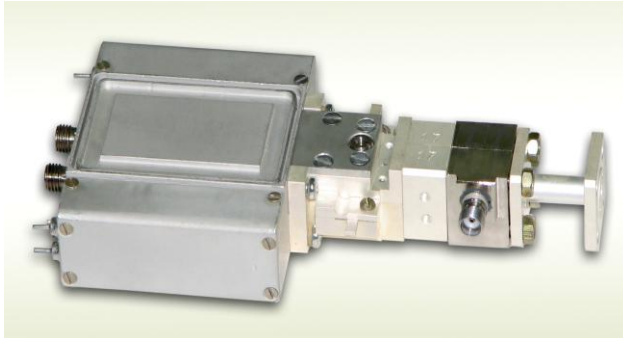




92 GHz Transceiver with FMCW output signal



APPLICATION

Solid-state transceiver, **M353004** module, with linear frequency modulation of output signal is intended for operation in radio range finders, level indicators, W-band altimeters included into aboard or stationary measuring equipment.

DESCRIPTION

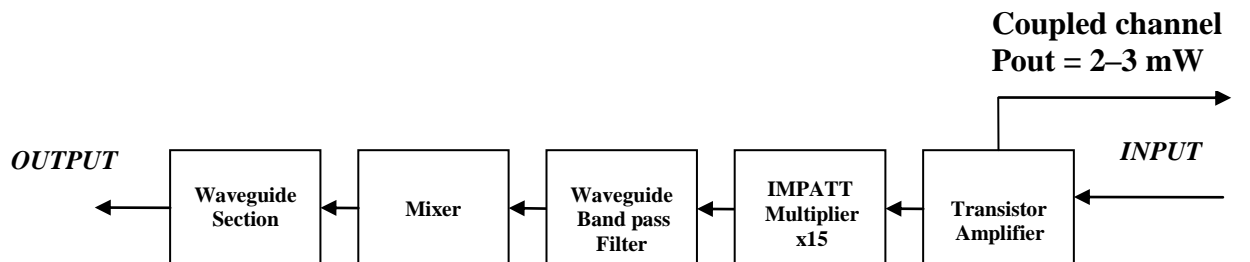
The transceiver is designed on the basis of simplified homodyne scheme and consists of IMPATT-frequency multiplier of high multiplicity ($N=15$) and two-port mixer. Deviation of output probing signal reaches 1 GHz.

Functionally the transceiver transfers input frequency modulated signal, generated at centimeter wave band, into millimeter wave band. Output signal of frequency multiplier is simultaneously a probing signal of transmitter and a signal of receiver LO. Separation of the frequency-modulated signal into probing and heterodyne ones occurs directly in a plane of mixing diodes resulting in minimal error in measurement of beats signal phase, caused by temperature instability of spreading signal time in various electric circuits.

Passive coupler of power is installed at the transceiver input. It makes possible conducting constant check and temperature correction of the input frequency-modulated signal in order to maintain a constant value of its deviation and a required level of linearity.

Since the transceiver is designed as a separate block, and information signals of control and check, and supply of feeding voltages are carried out through separate sockets, it is easily integrated into FMCW radar.

The transceiver is supplied by three DC voltage sources of minus 12, +12 and +24 V with total power consumption no more than 8 W.



$F_{out} = 92-93 \text{ GHz}$
 $P_{out} = 2-4 \text{ mW}$

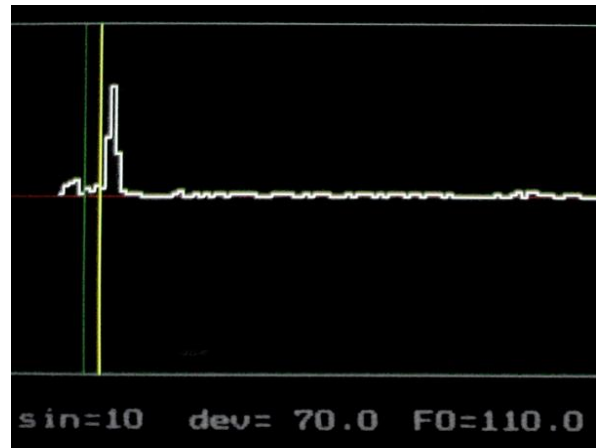
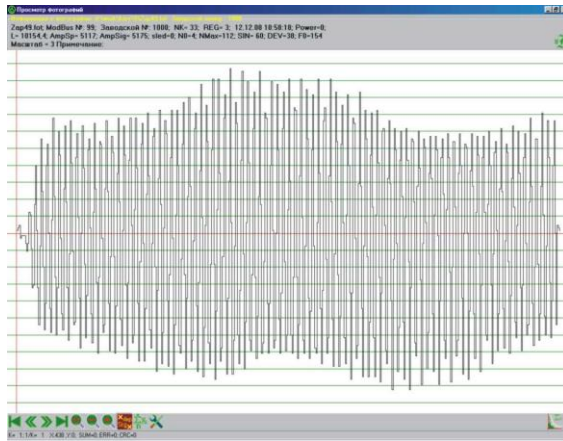
$F_{in} = 6.133-6.200 \text{ GHz}$
 $P_{in} = 50 \text{ mW}$

SPECIFICATIONS

<i>Electrical characteristics of output signal of the transmitter</i>	
Center operating frequency of output signal, F_0 , GHz	92,5
Frequency range, GHz	$F_0 \pm 0.5$
Output power in operating frequency range, mW	2-4
Range of input operating frequencies, GHz	6.133-6.200
Power of input signal, mW	50±5
Multiplication factor of input signal	15
Type of a socket for input signal	SMA
<i>Electrical characteristics of the receiver</i>	
Receiver operating frequency, GHz	92.5±0.5
Single band noise factor, dB, no more	30
Frequency band of IF channel, GHz	0-1
Gain of a signal from input to output, dB, not less	-12
Type of connecting waveguide flange according to ГОСТ 13317-89 or UG-387/U	
<i>Power supply</i>	
Supply voltage, V / Current consumption, mA, no more	+24/150 +12/400 -12/10
Temperature range of transceiver, °C	From +10 to +70



CHACTERISTICS OF THE TRASCEIVER



Typical oscillogram of beat signal (left) and typical spectrum of beat signal after fast Fourier transform (right) for transceiver included into FMCW radar

OVERALL DIMENSIONS DRAWING

