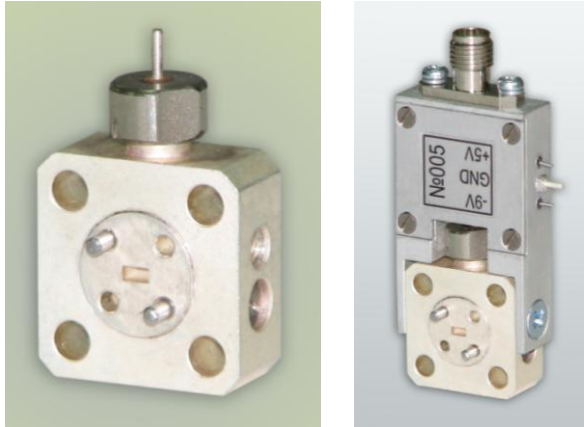




Waveguide *p-i-n*-modulator in frequency range 80–150 GHz



APPLICATION

Modulator **M343002** is intended for use both in general purpose equipment and in on-board equipment in frequency range $F_0 = 80\text{--}150$ GHz.

The modulator on an external command carries out fast amplitude modulation of microwave power in waveguide section.

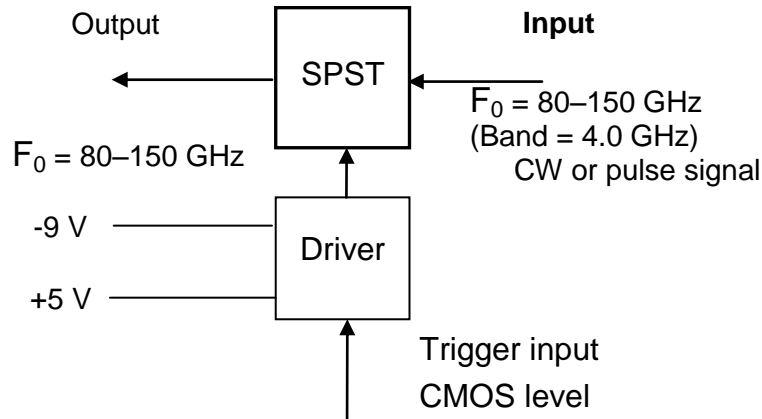
The modulator can be used as a part of complex radio systems, for example in pulse transceivers as an element of the device for receiver protection or as a part of two-channel antenna switch.

In operating frequency band ($F_0 \pm 2$ GHz) modulator direct loss is no more than 1.5 dB and level of isolation not less than 25 dB is provided. Using control device (driver) switching rate from one state to another one is achieved 5–10 nanoseconds.

DESCRIPTION

The modulator is made under resonant scheme, through mode and isolation mode are provided by changing VSWR.

Using special silicon package *p-i-n*-diodes of RI "Orion" production it is achieved high switching rate. The thickness of *i*-layer makes some micron. In through mode the direct current of 10–20 mA flows through *p-i-n*-diode, in isolation mode the diode is under reverse voltage no more than 20 V.



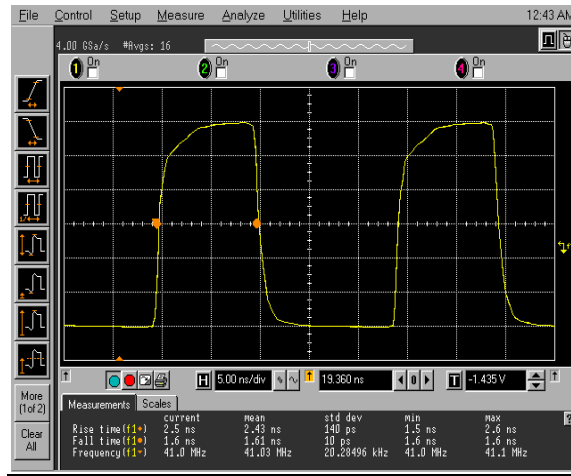
SPECIFICATIONS

Central operating frequency, F_0 ,* GHz	80–150
Band of operating frequencies, GHz	$F_0 \pm 2$
Direct loss (at control current of 10–20 mA), dB, no more	1.5
Isolation (at reverse voltage of 3–10 V), dB, not less	25
VSWR in through mode in operating frequency range, no more	2
Switching time on level 0.1-0.9 of switching microwave power, nanosecond, no more	10
Input microwave power handling, W, no more	
continuous	0.5
pulse (pulse duration of 100 nsec and pulse rate of 50 kHz)	10
Modulator weight without driver/with driver, g, no more	20/35
Input resistance at control input of driver, Ohm	50
Supply voltage of modulator driver, B	-9 / +5
<i>Electrical characteristics of a control pulse</i>	
Input levels at 50 Ohm load, V	
low level	0...1.5
high level	3.5...5.0
Type of connecting waveguide flanges according to ГOCT 13317-89	

* F_0 value is specified by a customer.



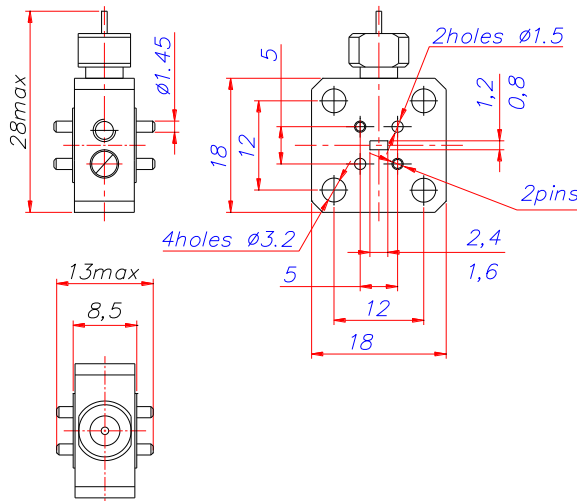
CHARACTERISTIC



Oscillogram of radio pulses envelope, formed with waveguide p-i-n-modulator.

OUTLINE DRAWING

Modulator without driver



Modulator with driver

