

# Electronically Tuned Gunn Oscillators

## 18-140 GHz

### 6 (WG) V Series

#### Features

- GaAs or InP
- Electronic Tuning to 4 GHz
- Excellent Linearity
- Output Power to 200 mW
- Small and Lightweight
- Optional Mechanical Tuning
- 15 or 28 Vdc Temperature Controller Available

#### Description

These varactor tuned Gunn oscillators are designed to generate RF power in the 18 to 140 GHz range while allowing electronic tuning by suitably coupling an abrupt or hyperabrupt GaAs varactor with a Gunn diode (GaAs or InP) in a single cavity. Standard models achieving 1% linearity, while producing 200 mW at 35 GHz and over 50 mW at 94 GHz, are used in FMCW radar transceivers, communication links, collision avoidance radars, AFC loops and phase locked systems. Broadband models used for instrumentation and laboratory testing allow electronic tuning of over 4 GHz with center frequencies up to 100 GHz.

Options with these oscillators include some mechanical tuning for course frequency adjustment, temperature controller to improve the frequency stability due to change in ambient temperature and an isolator to reduce the frequency pulling caused by changes in load VSWR.

#### Environmental

These devices are designed to meet the following conditions:

Test	MIL-STD	Method	Condition
Temperature Cycle	202	102A	-50°C to +85°C 5 cycles, ½ hour per cycle
Acceleration (Non-Operating)	202	212	11G, three mutually perpendicular axes
Vibration (High Freq.)	202	204B	10G Peak, 10-2000 Hz

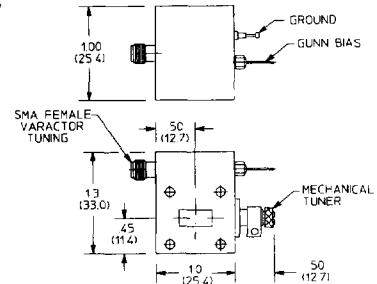
#### Maximum Ratings

Storage Temp.	-50°C to +85°C
Operating Temp. <sup>1</sup>	-30°C to +70°C

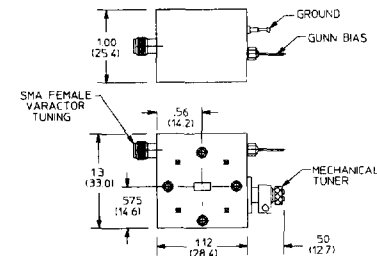
#### Notes:

<sup>1</sup> Units will operate from -30°C to +70°C although specifications listed above are guaranteed only between 0°C and +50°C. Broader temperature units are available. Test data measured at a case temperature of 30 ± 5°C is provided with each unit.

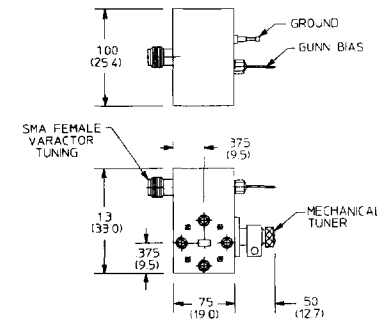
#### 6-42V & 6-28V Series



#### 6-22V & 6-19V Series



#### 6-15V, 6-12V, 6-10V, 6-08V Series



Dimensions apply to standard models only. Consult factory regarding other models.

Specifications at  $T_c$  30°C<sup>1,3</sup>

Frequency (GHz) <sup>2</sup>	Output Power (mW)		Frequency Stability <sup>10</sup> (MHz/°C Max.)	Power Stability (dB/°C Max.)	dc Power (V/A Max.)		Model No. <sup>†</sup>
	Standard	Broadband			GaAs	InP	
18-26.5	150	70	2.0	0.03	8/1.5	N/A	6-42V-XXX-XX**
26.5-40	200	70	2.5	0.03	8/1.5	13/0.3	6-28V-XXX-XX**
33-50	150	50	3.5	0.03	7/1.5	13/0.3	6-22V-XXX-XX
40-60	100	50	4.0	0.03	7/1.5	12/0.3	6-19V-XXX-XX
50-60	100	30	5.0	0.03	6/1.5	11/0.4	6-15V-XXX-XX
60-75	70	30	5.0	0.03	6/1.5	11/0.4	6-12V-XXX-XX
60-75	70	30	5.0	0.03	6/1.4	11/0.4	6-12V-XXX-XX
75-90	50	20	5.0	0.03	6/1.4	11/0.4	6-10V-XXX-XX
75-95	50	20	5.0	0.03	6/1.4	11/0.4	6-10V-XXX-XX
95-110	30	10	5.0	0.03	6/1.4	11/0.4	6-10V-XXX-XX
90-110	20	*	*	*	*	*	6-08V-XXX-XX
110-140	*	*	*	*	*	*	6-08V-XXX-XX

\*Consult factory.

\*\*Specify tapped or thru holes for flange.

Tuning Range Options

Standard	Broadband
1: ± 100 MHz	3: ± 500 MHz
2: ± 250 MHz	4: ± 750 MHz
	5: ± 1000 MHz
	6: ± 1500 MHz
	7: ± 2000 MHz

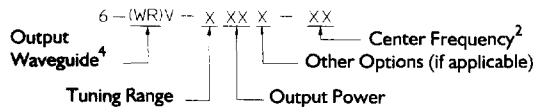
Output Power Options

01: 10mW	07: 70mW
02: 20mW	10: 100mW
03: 30mW	12: 125mW
04: 40mW	15: 150mW
05: 50mW	20: 200mW

Other Options

- F: Integrated Ferrite Isolator<sup>6</sup>
- H: Temperature Controller<sup>7</sup> (15 or 28Vdc)
- M: Mechanical Tuning

†How to Order



Mechanical Specifications

Waveguide	WR-42	WR-28	WR-22	WR-19	WR-15	WR-12	WR-10	WR-08
RF Mating Flange <sup>4</sup> MIL-F-3922/	54-001-M	68-001 68-002	67B-006	67B-007	67B-008	67B-009	67B-010	67B-010 MOD
UG Reference	595/U	599/U	383/U	383/U-M	385/U	387/U	387/U-M	387/U-M
Gunn Bias Connector	Feed Thru							
Tuning Port Connector	SMA Female							
Cooling	Conduction <sup>5</sup>							

Notes:

1. This table lists the maximum power available in the frequency ranges specified. For a specific combination of tuning range and output power, consult the factory.
2. All oscillators are supplied with a center frequency tolerance of ± 50 MHz unless otherwise stated.
3. Units will operate from -30°C and +70°C although specifications listed above are guaranteed only between 0°C to +50°C. Broader temperature units are available. Test data measured at a case temperature of 30 ± 5°C is provided with each unit.
4. Other waveguide flange patterns and custom designs are available.
5. Heat sink can be provided. Consult factory.
6. When ordered with ferrite isolator, the output power will be reduced by the isolator loss.
7. When temperature controller is ordered, the units are stabilized at 55 ± 2°C and the output power is reduced by approximately 1.0 dB.
8. For most units, the varactor tuning voltage is from 0 to +25 Vdc (max.) with respect to ground. Some designs, though, require the tuning supply to be isolated from the case ground because the varactor voltage is referenced to the Gunn bias.
9. Modulation rate is 0-80 MHz.
10. Frequency stability is improved typically by a factor of 2 with temperature compensated units.

Specifications Subject to Change Without Notice.