Doppler Ranging Sensor Heads

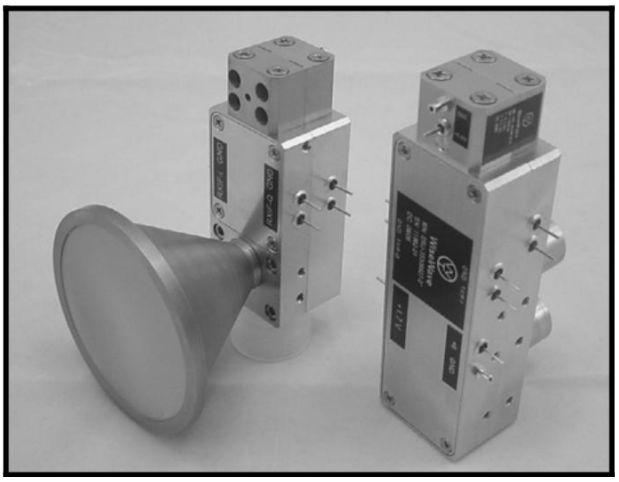
Bulletin No. SRU

FEATURES

- High sensitivity
- Low 1/f noise
- Circular polarized waveform
- Low harmonic and spurious emission
- Temperature and vibration qualified
- Compact size
- Low cost and volume production

APPLICATIONS

- Automotive Radar
- Doppler Ranging Radar



SRU Series

DESCRIPTION

SSRU series ranging sensor heads are designed for **long range** distance detection where the sensitivity is essential. The **SRU series** ranging sensors are used for **moving target** (where Doppler shift is presented) distance detection. The technology key is to utilize a single side band up-converter (modulator) to generate a second frequency in addition to its master frequency. By comparing the returned signals from the target caused by these two frequencies, the ranging (distance) information of the target can be extracted.

Four configurations are offered for special applications. The single channel versions are used for **speed** and **distance** sensing only while dual channel versions are offered for **speed**, **distance** and **direction** sensing. In addition, dual antenna versions are offered for high power version to eliminate the limited TX/RX isolation problems due to the diplexer. The single antenna versions are constructed with a high performance horn antenna or lens corrected antenna, a linear to circular polarizer and T/R diplexer, a single side band up-converter or modulator, a balanced mixer or an I-Q mixer and an amplifier and a high performance Gunn oscillator. The deviation of the dual antenna versions is that an additional antenna is used and no diplexer is required. The low 1/f noise mixer diodes and high performance oscillator enhance the detection sensitivity at low IF frequency and circular polarization waveform improves reception ability for various Radar targets.

Standard products are offered at 35.0 GHz, while other frequency bands are available upon request.

Specify Model Number: SRU – CF BW IF PP - XY

- CF: Center Frequency in GHz
- BW: Antenna 3 dB Beamwidth; Use "NA" for NO Antenna
- IF: TX IF Frequency in MHz
- PP: TX Output Power in dBm
- XY: "1" for Single Antenna, "D" for Dual Antenna; "0" for Single Channel, "D" for Dual Channel

Example: A dual channel, dual antenna sensor with center frequency 35 GHz, antenna beamwidth 12 degrees, TX input frequency 2 MHz and output power 30 dBm, the model number is SRU-35120230-DD.

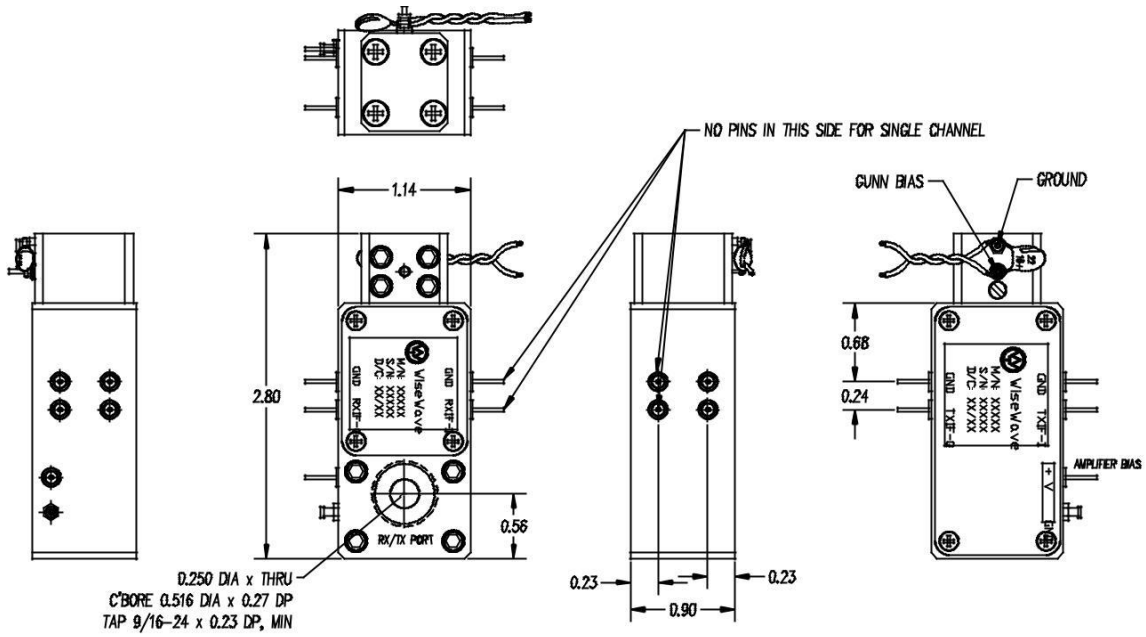
STANDARD MODELS

	Typical Specifications (Single Channel)	
Parameters	SRU-35NA9910-01	SRU-35NA9927-0D
RF Frequency	35.000 GHz	35.000 GHz
Transmitter output power	+10 dBm (typical)	0 to 100 MHz (Min)
Transmitter IF Bandwidth	0 to 100 MHz (Min)	12 dB
Receiver conversion loss	6 dB (typical)	6 dB (typical)
RX IF bandwidth	DC to 100 MHz (minimum)	DC to 100 MHz (minimum)
Antenna 3 dB beamwidth	To be specified by customer	To be specified by customer (30 Degrees or wider)
Antenna side lob level	To be specified by customer	To be specified by customer
Polarization	Right hand circular	Right hand circular
TX and RX isolation	20 dB (minimum)	80 dB (minimum)
ΔF/ΔT	-0.40 MHz/ΔC (maximum)	-0.40 MHz/ΔC (maximum)
ΔP/ΔT	-0.04 dB/ΔC (maximum)	-0.04 dB/ΔC (maximum)
Oscillator DC bias	+5.0 V / 250 mA (typical)	+5.0 V / 250 mA (typical)
Amplifier DC bias	+8.0 V / 250 mA (typical)	+8.0 V / 650 mA (typical)
Operation temperature	-40 to +85 ΔC	-40 to +85 ΔC

	Typical Specifications (Dual Channel)	
Parameters	SRU-35NA9910-D1	SRU-35NA9927-DD
RF Frequency	35.000 GHz	35.000 GHz
Transmitter output power	+10 dBm (typical)	+27 dBm (typical)
Transmitter IF Bandwidth	0 to 100 MHz (Min)	0 to 100 MHz (Min)
Receiver conversion loss	10 dB (typical)	10 dB (typical)
RX IF bandwidth	DC to 100 MHz (minimum)	DC to 100 MHz (minimum)
Antenna 3 dB beamwidth	To be specified by customer	To be specified by customer (30 Degrees or wider)
Antenna side lob level	To be specified by customer	To be specified by customer
Polarization	Right hand circular	Right hand circular
TX and RX isolation	20 dB (minimum)	80 dB (minimum)
ΔF/ΔT	-0.40 MHz/ΔC (maximum)	-0.40 MHz/ΔC (maximum)
ΔP/ΔT	-0.04 dB/ΔC (maximum)	-0.04 dB/ΔC (maximum)
Oscillator DC bias	+5.0 V / 250 mA (typical)	+5.0 V / 250 mA (typical)
Amplifier DC bias	+8.0 V / 250 mA (typical)	+8.0 V / 650 mA (typical)
Operation temperature	-40 to +85 ΔC	-40 to +85 ΔC

Note: The standard model is offered with out antenna. Specify the antenna by type, 3 dB beamwidth and gain. The output power other than shown is available. Consult factory for your detailed requirements.

Single Antenna



Dual Antenna