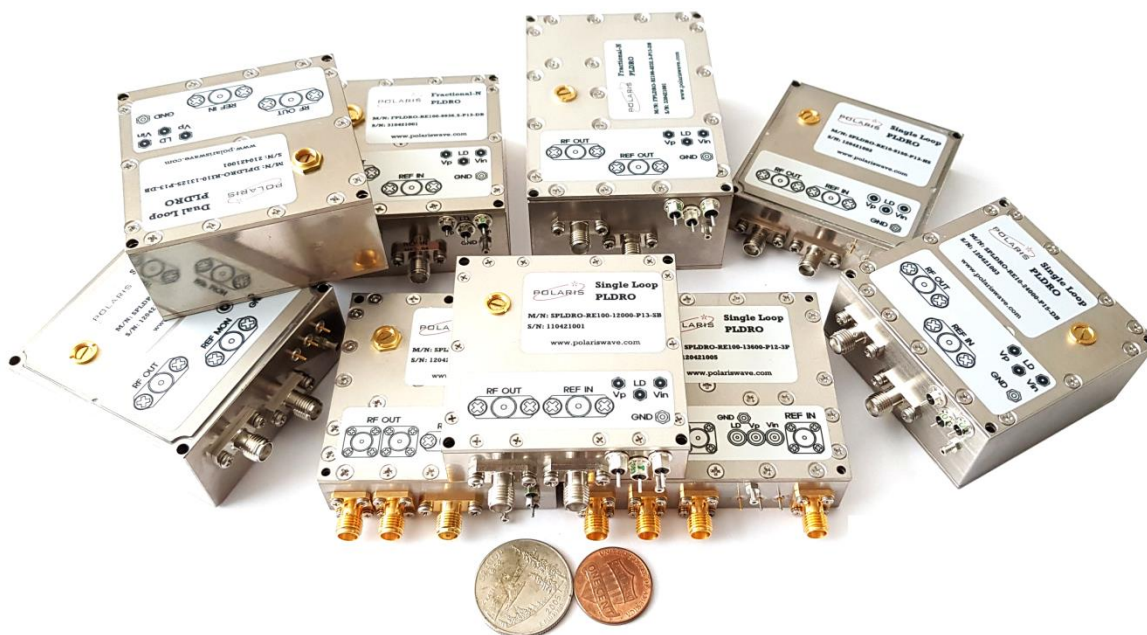


# PLDRO Catalog

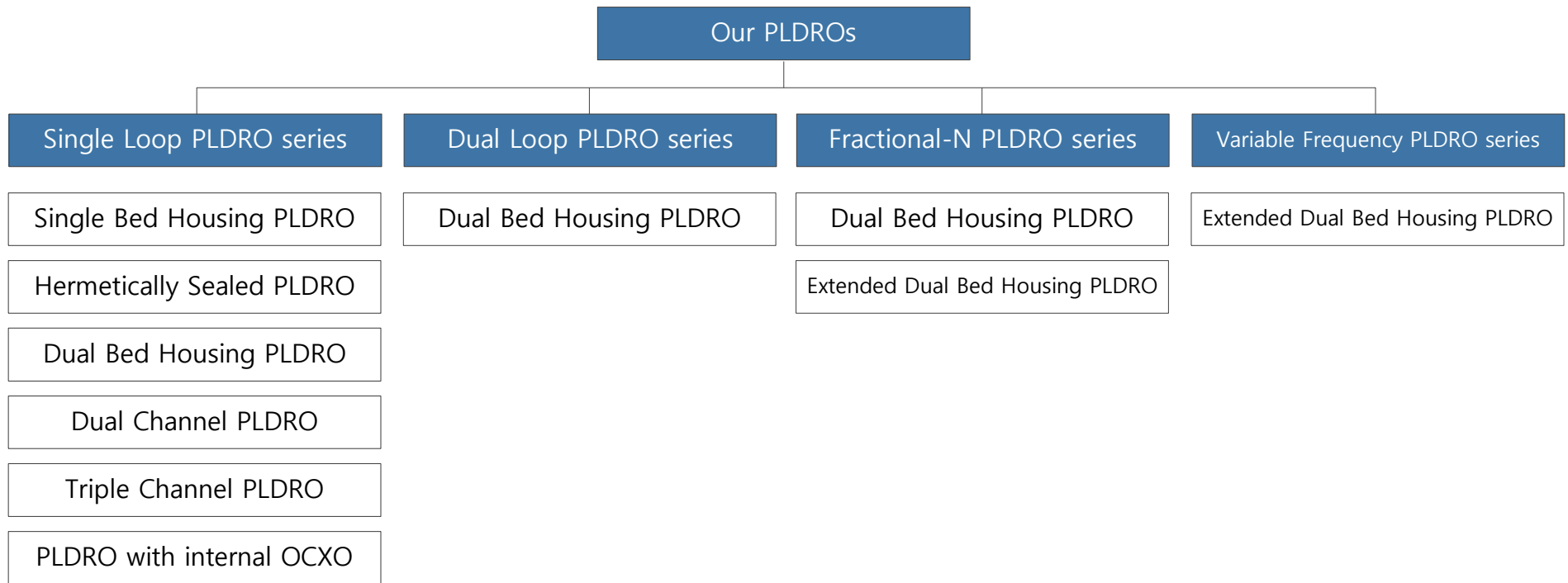
(Phase Locked Dielectric Resonator Oscillator)



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## Description

The PLDRO (Phase Locked Dielectric Resonator Oscillator) provides the ultra-low phase noise and an excellent frequency stability when it is phase-locked to a clean and stable crystal reference signal. The PLDRO provides ideal signal for commercial and military systems that require ultra-low phase noise, low spurious, and high frequency stability. Our PLDROs are available in four series products: Single Loop PLDRO, Dual Loop PLDRO, Fractional-N PLDRO, and Variable Frequency PLDRO.



## Description

The Single Loop PLDRO is a phase locked dielectric resonator oscillator whose output frequency is generated by a single phase locked loop. The Single Loop PLDRO series are classified into various types of PLDROs as shown below.



Single Bed Housing  
PLDRO

Hermetically Sealed  
PLDRO

Dual Bed Housing  
PLDRO

Dual Channel PLDRO

Triple Channel PLDRO

PLDRO with Internal  
OCO

## Features

- Ultra Low Phase Noise
- Low Spurious
- Phase-Locked Alarm
- Wide Supply Voltage
- Low Current Consumption
- Compact Housing
- Rugged Construction

## Options

- Output Power: 17 dBm (typ.)
- Supply Voltage: 6 VDC
- Operating Temperature: -20 °C to 70 °C / -40 °C to 70 °C
- Field Replaceable SMA-Jack
- Laser Marking

## Applications

- Radar Systems
- VSAT/Satellite Communication Systems
- Test Equipment
- Microwave Transmitters & Receivers
- Cable TV Links (CATV)
- LMDS
- Missile Guidance
- Local Area Networks (LAN)

## Specifications

Parameters		Specifications				Remarks
Output Frequency		5 GHz to 28 GHz				
Number of Output Channels		1 , 2, or 3				
Output Power	Single Channel PLDRO	15 dBm (typ.)				
	Dual Channel PLDRO	13 dBm (typ.)				
	Triple Channel PLDRO	12 dBm (typ.)				
Phase Noise (dBc/Hz)	Frequency	6 GHz	10 GHz	13 GHz	26 GHz	
	Offset					
	100 Hz	-92	-87	-84	-78	
	1 KHz	-113	-111	-107	-101	
	10 KHz	-120	-116	-114	-108	
	100 KHz	-123	-117	-115	-109	
External Reference	1 MHz	-139	132	128	-125	
	Frequency	10 MHz to 500 MHz				
	Input Power	0 ± 2 dBm				
Harmonics		-30 dBc (typ.), -20 dBc (max.)				
Sub-harmonics (N*Fout/2, N odd)		-25 dBc (typ.), -15 dBc (max.)				
Frequency Stability		Same as the Reference				
Spurious		-80 dBc (typ.), -70 dBc (max.)				
Pulling (3 : 1 VSWR)		Will not break lock				
Output Impedance		50 Ω				
Supply Voltage		12 ± 0.5 VDC				
Current Consumption		Consult Factory				

## Specifications

Parameters		Specifications	Remarks	
Connectors	RF Output (RF OUT)	SMA-Jack		
	Reference	(REF IN)	SMA-Jack	PLDRO with External Reference
		(REF OUT)	SMA-Jack	PLDRO with Internal Reference
	Supply Voltage (Vin)	EMI Feed-thru		
		Hermetic Feed-thru	Hermetically Sealed Housing	
	Phase Voltage (Vp)	EMI Feed-thru		
		Hermetic Feed-thru	Hermetically Sealed Housing	
Phase Lock-Detect (LD) <b>Note 1</b>	EMI Feed-thru			
	Hermetic Feed-thru	Hermetically Sealed Housing		
GND	Turret Thread Mount Terminal			
Size (W x L x H)	Single Bed Housing, Hermetically Sealed Housing, and Dual Channel Housing	2.25"[57.15] x 2.25"[57.15] x .63"[16]		
	Dual Bed Housing	2.25"[57.15] x 2.25"[57.15] x 1.06"[27]		
	Triple Channel Housing	2.25"[57.15] x 2.75"[69.85] x .63"[16]		
Operating Temperature		0 °C to 60 °C		
Storage Temperature		-20 °C to 70 °C		

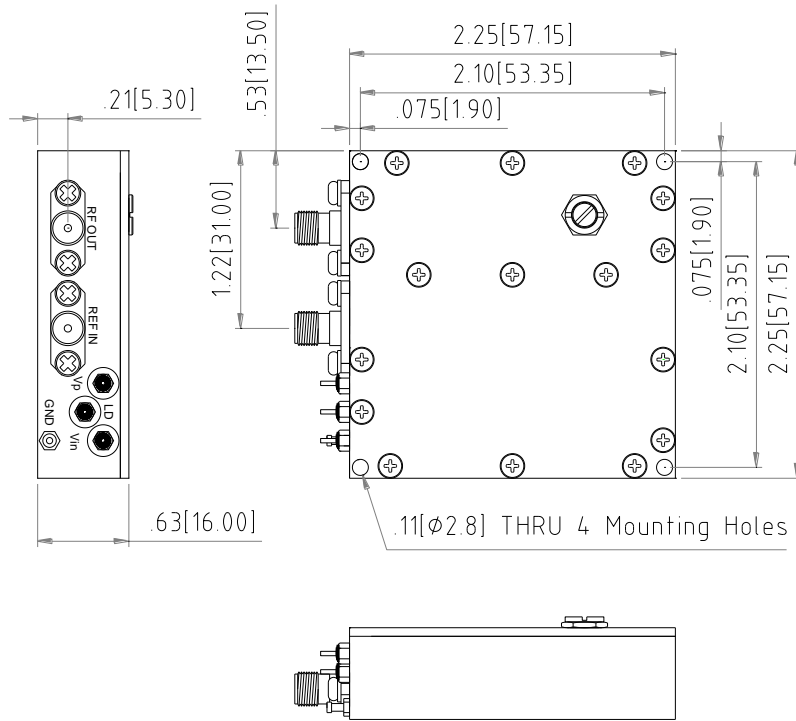
These specifications are subject to change without notice. Please contact the factory for the latest specifications.

Note 1 Phase Lock-Detect (LD)

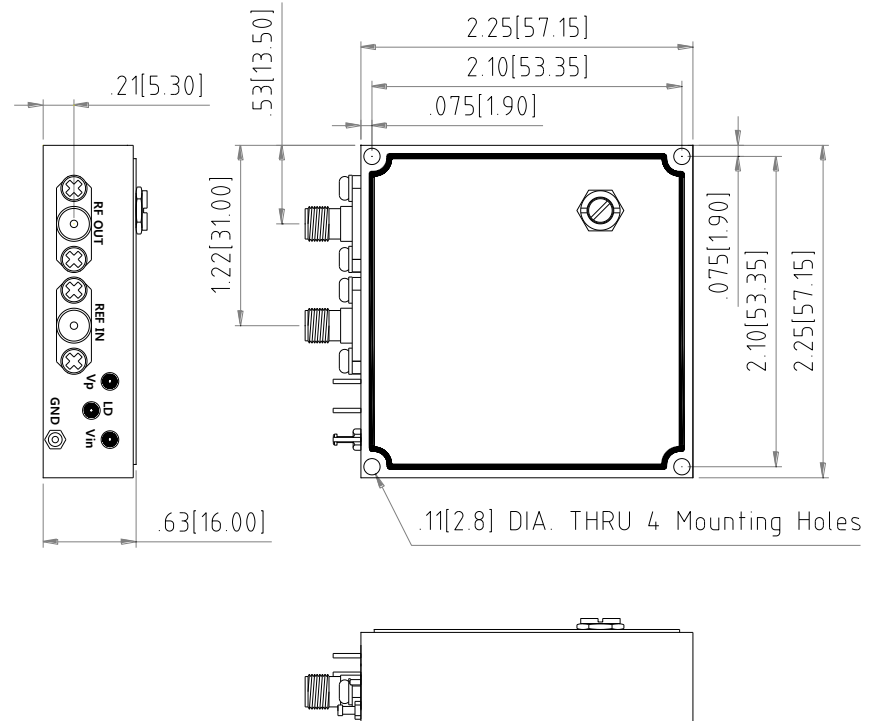
- 3.3 V when phase locked
- 0 V when phase unlocked

## Outline Drawings

Dimensions shown in brackets [ ] are in millimeters.



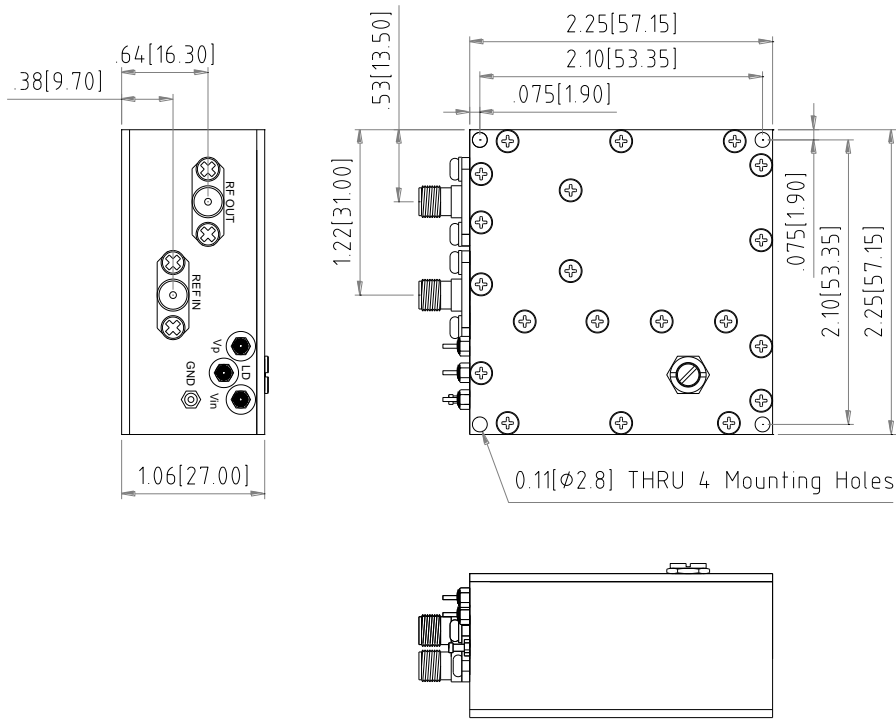
Single Bed Housing



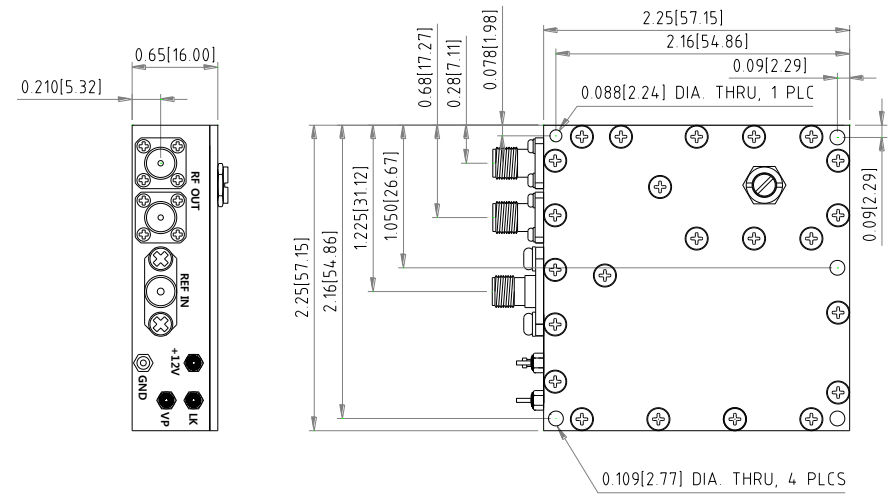
Hermetically Sealed Housing

# Outline Drawings

Dimensions shown in brackets [ ] are in millimeters.



Dual Bed Housing

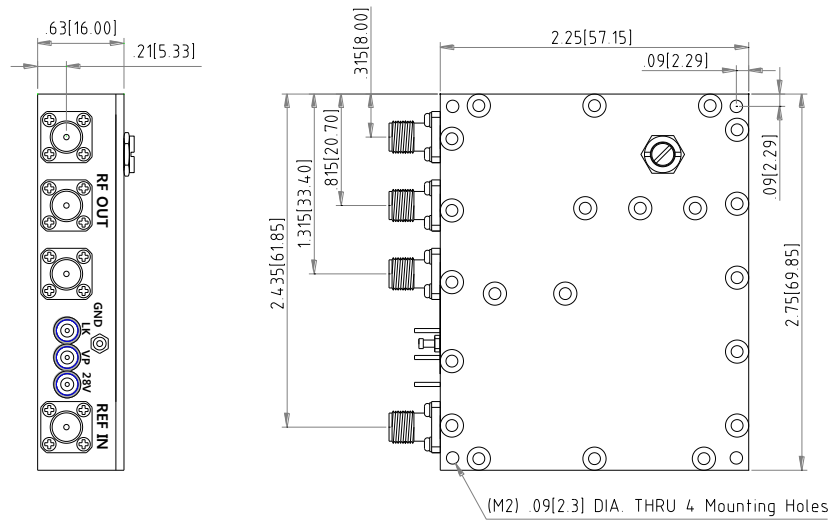


Dual Channel Housing



## Outline Drawings

Dimensions shown in brackets [ ] are in millimeters.



Triple Channel Housing

## Ordering Information

### wPLDRO-Rxxxx-y...y-Pzz-aa

- **w**: Product Categories
  - . S (Single Loop PLDRO)
  - . D (Dual Loop PLDRO)
  - . F (Fractional-N PLDRO)
- **xxxx**: Reference Frequencies (MHz)
  - . Ixxx: Internal, xxxMHz
  - . Exxx: External, xxxMHz
- **y...y**: Output Frequency (MHz)
- **zz**: Output Power (dBm)
- **aa**: Housing types
  - . SB (Single Bed Housing)
  - . DB (Dual Bed Housing)
  - . HS (Hermetically Sealed Housing)
  - . NP (Number of Ports)

### Examples

#### SPLDRO-RE10-8150-P13-SB

- . Product Category: Single Loop PLDRO
- . Reference Frequency: External, 10 MHz
- . Output Frequency: 8,150 MHz
- . Output power: 13 dBm
- . Single Bed Housing

#### SPLDRO-RE100-12300-P12-3P

- . Product Category: Single Loop PLDRO
- . Reference Frequency: External, 100 MHz
- . Output Frequency: 12,300 MHz
- . Output power: 12 dBm
- . Triple Channel Housing

## Description



The Dual Loop PLDRO is a phase locked dielectric resonator oscillator whose output frequency is generated by a dual phase locked loop. This PLDRO series provides an output frequency whose phase is locked to an integer or fractional multiple of the external reference using PLCRO (Phase Locked Coaxial Resonator Oscillator) and frequency divider.

## Features

- Integer or Fractional Multiple of the External Reference
- Ultra Low Phase Noise
- Low Spurious
- Phase-Locked Alarm
- Low Current Consumption
- Compact Housing
- Rugged Construction

## Options

- Output Power: 17 dBm (typ.)
- Supply Voltage: 6 VDC
- Operating Temperature: -20 °C to 70 °C / -40 °C to 70 °C
- Field Replaceable SMA-Jack
- Laser Marking

## Applications

- Radar Systems
- VSAT/Satellite Communication Systems
- Test Equipment
- Microwave Transmitters & Receivers
- Cable TV Links (CATV)
- LMDS
- Missile Guidance
- Local Area Networks (LAN)

## Specifications

Parameters		Specifications				Remarks
Output Frequency		5 GHz to 28 GHz				
Output Power		15 dBm (typ.)				
Phase Noise (dBc/Hz)	Frequency	6 GHz	10 GHz	13 GHz	26 GHz	
	Offset					
	100 Hz	-92	-87	-84	-78	
	1 KHz	-112	-110	-106	-100	
	10 KHz	-117	-113	-111	-105	
	100 KHz	-120	-114	-112	-106	
External Reference	Frequency	10 MHz to 100 MHz				
	Input Power	0 ± 2 dBm				
Harmonics		-30 dBc (typ.), -20 dBc (max.)				
Sub-harmonics (N*Fout/2, N odd)		-25 dBc (typ.), -15 dBc (max.)				
Frequency Stability		Same as the Reference				
Spurious		-80 dBc (typ.), -70 dBc (max.)				
Pulling (3 : 1 VSWR)		Will not break lock				
Output Impedance		50 Ω				
Supply Voltage		12 ± 0.5 VDC				
Current Consumption		Consult Factory				
Connectors	RF Output (RF OUT)	SMA-Jack				
	External Reference Input (REF IN)	SMA-Jack				
	Supply Voltage (Vin)	EMI Feed-thru				
	Phase Voltage (Vp)	EMI Feed-thru				
	Phase Lock-Detect (LD) <b>Note 1</b>	EMI Feed-thru				
	GND	Turret Thread Mount Terminal				

## Specifications

Parameters	Specifications	
Size (W x L x H)	2.25"[57.15] x 2.25"[57.15] x 1.06"[27]	
Operating Temperature	0 °C to 60 °C	
Storage Temperature	-20 °C to 70 °C	

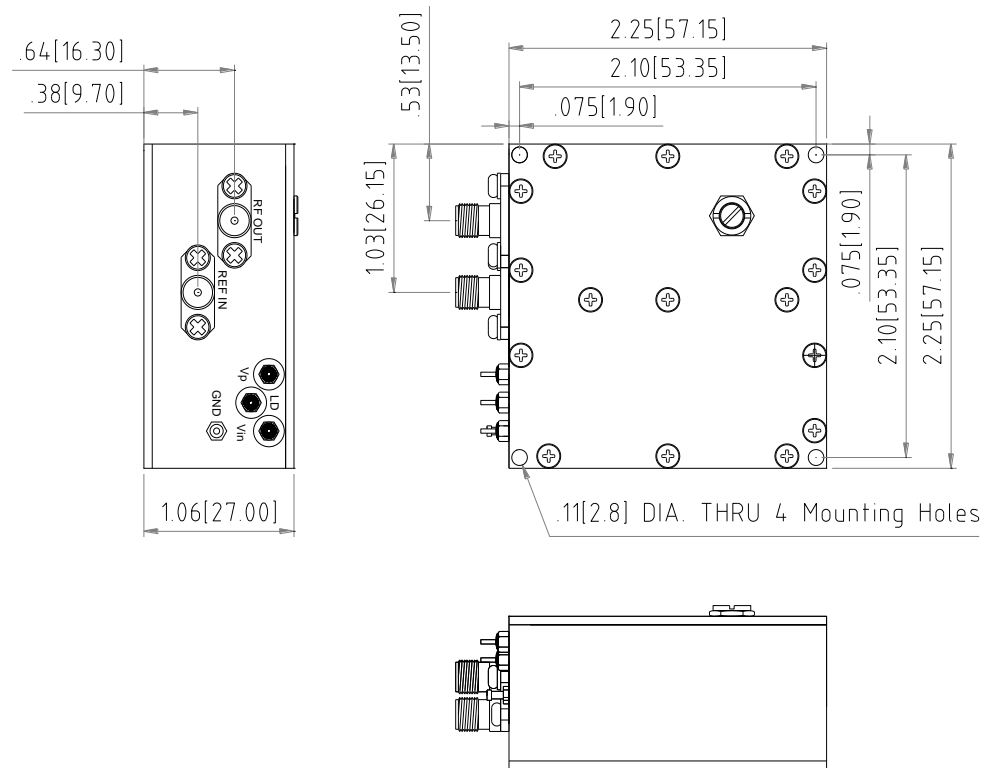
These specifications are subject to change without notice. Please contact the factory for the latest specifications.

Note 1 Phase Lock-Detect (LD)

- 3.3 V when phase locked
- 0 V when phase unlocked

## Outline Drawings

Dimensions shown in brackets [ ] are in millimeters.



Dual Bed Housing

## Ordering Information

### wPLDRO-Rxxxx-y...y-Pzz-aa

- **w**: Product Categories
  - . S (Single Loop PLDRO)
  - . D (Dual Loop PLDRO)
  - . F (Fractional-N PLDRO)
- **xxxx**: Reference Frequencies (MHz)
  - . Ixxx: Internal, xxxMHz
  - . Exxx: External, xxxMHz
- **y...y**: Output Frequency (MHz)
- **zz**: Output Power (dBm)
- **aa**: Housing types
  - . SB (Single Bed Housing)
  - . DB (Dual Bed Housing)
  - . HS (Hermetically Sealed Housing)
  - . NP (Number of Ports)

### Examples

#### DPLDRO-RE10-7742.5-P15-DB

- . Product Category: Dual Loop PLDRO
- . Reference Frequency: External, 10 MHz
- . Output Frequency: 7,742.5 MHz
- . Output power: 15 dBm
- . Dual Bed Housing

#### DPLDRO-RE10-13125-P17-DB

- . Product Category: Dual Loop PLDRO
- . Reference Frequency: External, 10 MHz
- . Output Frequency: 13,125 MHz
- . Output power: 17 dBm
- . Dual Bed Housing



## Description



Fractional-N PLDRO  
using External Reference



Fractional-N PLDRO with  
Internal OCXO

The Fractional-N PLDRO is an innovative phase locked dielectric resonator oscillator that solves the reference frequency dependence of the output frequency. This PLDRO series can generate any frequency in 1 KHz steps within 5 GHz to 28 GHz and has the same phase noise performance as Single Loop PLDRO.

## Features

- Can generate any frequency in 1 KHz steps within 5 GHz to 28 GHz
- Ultra Low Phase Noise
- Low Spurious
- Phase-Locked Alarm
- Compact Housing
- Rugged Construction

## Options

- Output Power: 17 dBm (typ.)
- Operating Temperature: -20 °C to +70 °C
- 0.1 KHz Frequency Resolution
- Field Replaceable SMA-Jack
- Laser Marking

## Applications

- Radar Systems
- VSAT/Satellite Communication Systems
- Test Equipment
- Microwave Transmitters & Receivers
- Cable TV Links (CATV)
- LMDS
- Missile Guidance
- Local Area Networks (LAN)

## Specifications

Parameters		Specifications				Remarks
Output Frequency		5 GHz to 28 GHz				
Frequency Step		1 KHz				
Output Power		15 dBm (typ.)				
Phase Noise (dBc/Hz)	Frequency	6 GHz	10 GHz	13 GHz	26 GHz	
	Offset					
	100 Hz	-92	-87	-84	-78	
	1 KHz	-113	-111	-107	-101	
	10 KHz	-120	-116	-114	-108	
	100 KHz	-123	-117	-115	-109	
External Reference	Frequency	50 MHz or 100 MHz				
	Input Power	0 ± 2 dBm				
Internal Reference	Frequency	50 MHz or 100 MHz				
Harmonics		-30 dBc (typ.), -20 dBc (max.)				
Sub-harmonics (N*Fout/2, N odd)		-25 dBc (typ.), -15 dBc (max.)				
Frequency Stability		Same as the Reference				
Spurious		-80 dBc (typ.), -70 dBc (max.)				
Pulling (3 : 1 VSWR)		Will not break lock				
Output Impedance		50 Ω				
Supply Voltage		12 ± 0.5 VDC				
Current Consumption		Consult Factory				

## Specifications

Parameters		Specifications	Remarks	
Connectors	RF Output (RF OUT)	SMA-Jack		
	Reference	(REF IN)	SMA-Jack	PLDRO with External Reference
		(REF OUT)	SMA-Jack	PLDRO with Internal Reference
	Supply Voltage (Vin)	EMI Feed-thru		
	Phase Voltage (Vp)	EMI Feed-thru		
	Lock-Detect (LD) <b>Note 1</b>	EMI Feed-thru		
	GND	Turret Thread Mount Terminal		
Size (W x L x H)	Dual Bed Housing	2.25"[57.15] x 2.25"[57.15] x 1.06"[27]		
	Extended Dual Bed Housing	2.25"[57.15] x 3.15"[80] x 1.30"[33]		
Operating Temperature		0 to 60 °C		
Storage Temperature		-20 to 70 °C		

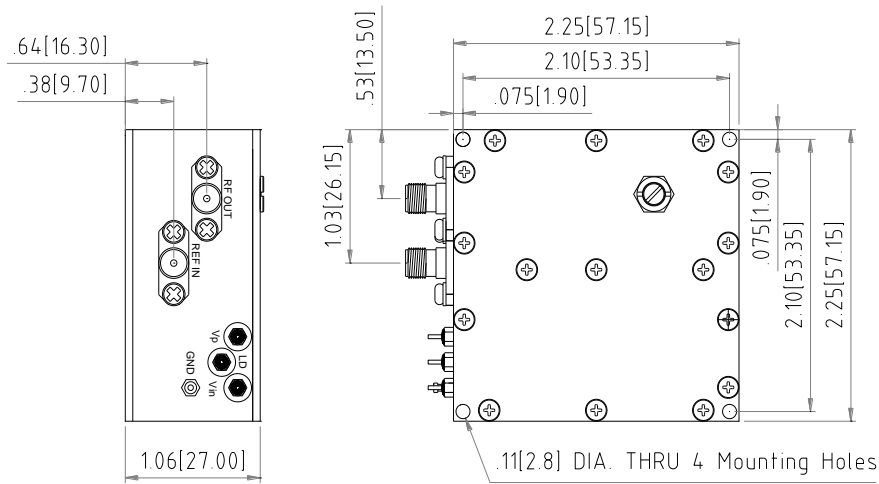
These specifications are subject to change without notice. Please contact the factory for the latest specifications.

Note 1 Phase Lock-Detect (LD)

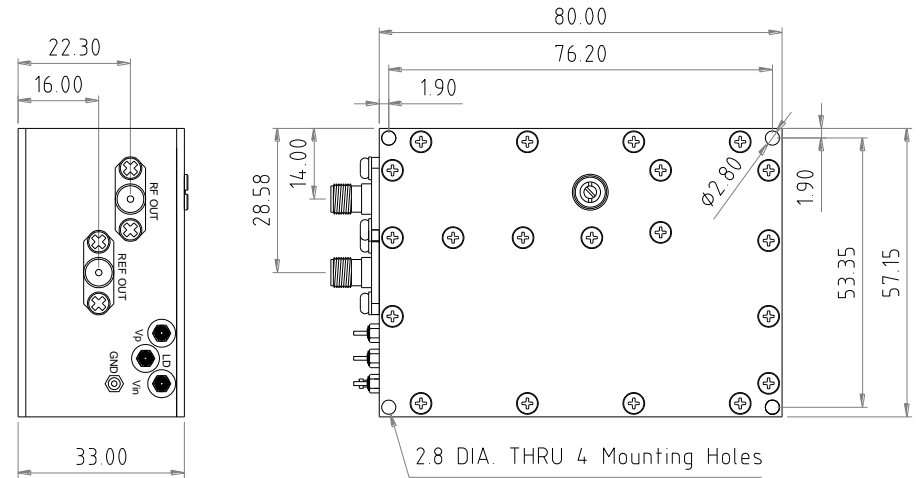
- 3.3 V when phase locked
- 0 V when phase unlocked

# Outline Drawings

Dimensions shown in brackets [ ] are in millimeters.



Dual Bed Housing



Extended Dual Bed Housing

## Ordering Information

### wPLDRO-Rxxxx-y...y-Pzz-aa

- **w**: Product Categories
  - . S (Single Loop PLDRO)
  - . D (Dual Loop PLDRO)
  - . F (Fractional-N PLDRO)
- **xxxx**: Reference Frequencies (MHz)
  - . Ixxx: Internal, xxxMHz
  - . Exxx: External, xxxMHz
- **y...y**: Output Frequency (MHz)
- **zz**: Output Power (dBm)
- **aa**: Housing types
  - . SB (Single Bed Housing)
  - . DB (Dual Bed Housing)
  - . HS (Hermetically Sealed Housing)
  - . NP (Number of Ports)

### Examples

#### FPLDRO-RI50-9936.951-P13-DB

- . Product Category: Fractional-N PLDRO
- . Reference Frequency: Internal, 50 MHz
- . Output Frequency: 9,936.951 MHz
- . Output power: 13 dBm
- . Extended Dual Bed Housing

#### FPLDRO-RE100-7092.35-P15-DB

- . Product Category: Fractional-N PLDRO
- . Reference Frequency: External, 50 MHz
- . Output Frequency: 7,092.35 MHz
- . Output power: 15 dBm
- . Dual Bed Housing

## Description



The variable frequency PLDRO series is a signal generator capable of providing both the ultra low phase noise performance of the PLDRO and the excellent frequency resolution of a direct digital synthesizer. This PLDRO series covers 5 GHz to 29 GHz and output frequency can be varied in steps of 10 KHz or less within a specified bandwidth.

## Features

- Available from 5 GHz to 29 GHz
- Frequency changeable in steps of 10 KHz or less within the specified bandwidth
- Ultra Low Phase Noise
- Low Spurious
- Phase-Locked Alarm
- Compact Housing
- Rugged Construction

## Options

- Output Power: 17 dBm (typ.)
- Operating Temperature: -20 °C to +70 °C
- 100 Hz Frequency Steps
- Field Replaceable SMA-Jack
- Laser Marking

## Applications

- Radar Systems
- VSAT/Satellite Communication Systems
- Test Equipment
- Microwave Transmitters & Receivers
- Cable TV Links (CATV)
- LMDS
- Missile Guidance
- Local Area Networks (LAN)



## Specifications

Parameters		Specifications				Remarks	
Output Frequency	Available Range	5 GHz to 29 GHz					
	Operating Bandwidth	Consult Factory					
	Resolution	1 KHz (min.), 10 KHz (typ.)					
Output Power		15 dBm (typ.)					
Phase Noise (dBc/Hz)	Offset	Frequency	6 GHz	10 GHz	13 GHz	27 GHz	
	100 Hz		-92	-87	-84	-78	
	1 KHz		-112	-110	-106	-100	
	10 KHz		-120	-114	-112	-106	
	100 KHz		-123	-115	-113	-107	
	1 MHz		-139	-130	-126	-125	
External Reference	Frequency	100 MHz					
	Input Power	$0 \pm 2$ dBm					
Harmonics		-30 dBc (typ.), -20 dBc (max.)					
Sub-harmonics (N*Fout/2, N odd)		-25 dBc (typ.), -15 dBc (max.)					
Frequency Stability		Same as the Reference					
Spurious	External Reference	-80 dBc (typ.), -70 dBc (max.)					
	Mixer Intermodulation	-70 dBc (typ.), -60 dBc (max.)					
Pulling (3 : 1 VSWR)		Will not break lock					
Output Impedance		50 $\Omega$					
Supply Voltage		$12 \pm 0.5$ VDC					
Current Consumption		Consult Factory					

## Specifications

	Parameters	Specifications	Remarks
Connectors	RF Output (RF OUT)	SMA-Jack	
	Reference Input (REF_IN)	SMA-Jack	
	Supply Voltage (Vin)	EMI Feed-thru	
	Phase Voltage (Vp)	EMI Feed-thru	
	Phase Lock-Detect (LD) <b>Note 1</b>	EMI Feed-thru	
	3.3 V UART TX Data (TXD)	EMI Feed-thru	
	3.3 V UART RX Data (RXD)	EMI Feed-thru	
	GND	Turret Thread Mount Terminal	
Housing Size (W x L x H)		2.25"[57.15] x 3.15"[80] x 1.157"[29.4]	
Environmental Conditions	Operating Temperature	0 to 60 °C	
	Storage Temperature	-20 to 70 °C	

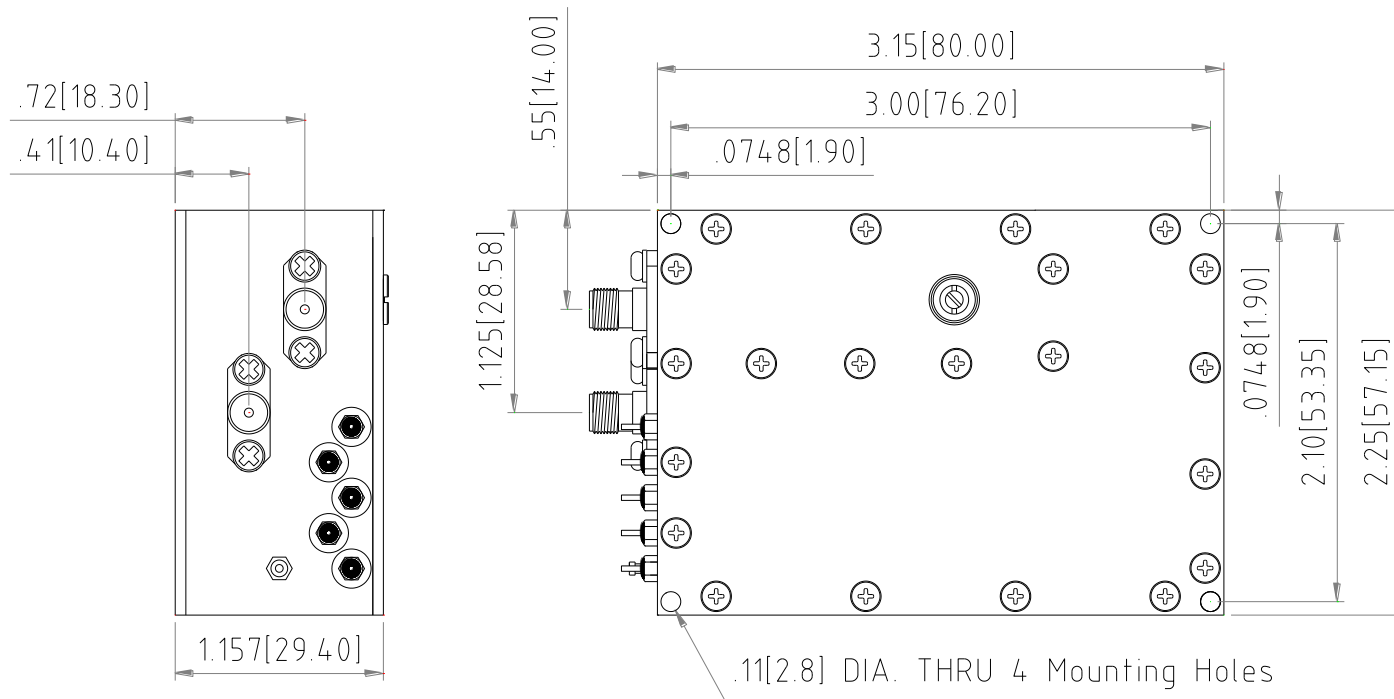
These specifications are subject to change without notice. Please contact the factory for the latest specifications.

Note 1 Phase Lock-Detect (LD)

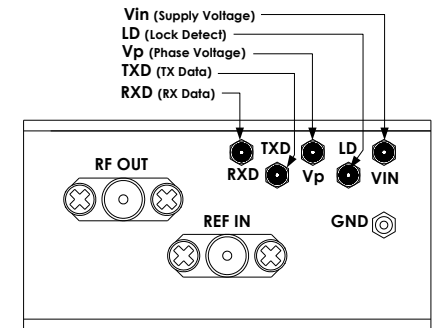
- 3.3 V when phase locked
- 0 V when phase unlocked

## Outline Drawings

Dimensions shown in brackets [ ] are in millimeters.



Extended Dual Bed Housing



Pin Descriptions

## Ordering Information

### VPLDRO-RE100-*w...w*-*Bxx*-*Ryy*-*Pzz*

- *w*: Center Frequency (MHz)
- *xx*: Bandwidth (MHz)
- *yy*: Resolution (KHz)
- *zz*: Output Power (dBm)

### Examples

#### VPLDRO-RE100-8337-B5-R1-P13

- . Product Category: Variable Frequency PLDRO
- . External Reference: 100 MHz
- . Center Frequency: 8337 MHz
- . Bandwidth: 5 MHz
- . Resolution: 1 KHz
- . Output Power: 13 dBm

#### VPLDRO-RE100-27213-B10-R10-P13

- . Product Category: Variable Frequency PLDRO
- . External Reference: 100 MHz
- . Center Frequency: 27213 MHz
- . Bandwidth: 10 MHz
- . Resolution: 10 KHz
- . Output Power: 13 dBm