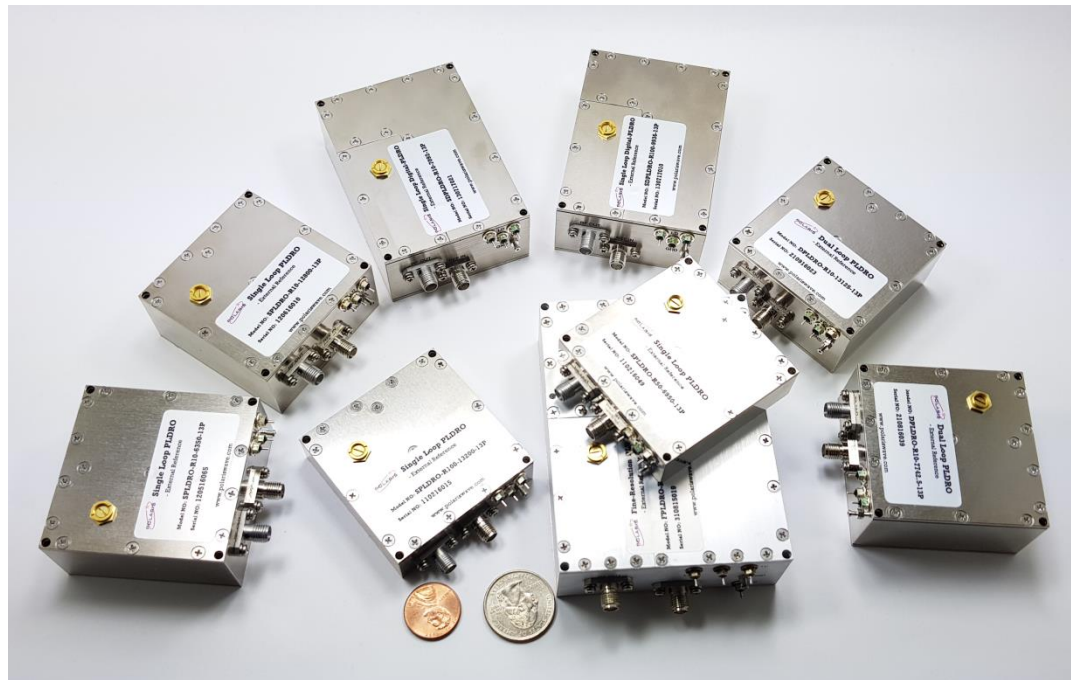


PLDRO Catalog

(Phase Locked Dielectric Resonator Oscillator)



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Description

The PLDRO (Phase Locked Dielectric Resonator Oscillator) provides the ultra-low phase noise and 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 requiring ultra-low phase noise, low spurious, and high frequency stability. Our PLDRO series are available in three types: Single Loop PLDRO, Single Loop Digital-PLDRO and Dual Loop PLDRO.



Single Loop PLDO



Single Loop Digital-PLDRO



Dual Loop PLDO

Package types		Applied Model
Single Bed Package	SB: Single Bed Package	Single Loop PLDROs without Frequency Multiplier (5 GHz to 13 GHz)
	HS: Hermetically Sealed Package	
Double Bed Package	DB: Double Bed Package	Single Loop PLDROs with Frequency Multiplier (14 GHz to 28 GHz), Dual Loop PLDROs (5 GHz to 13 GHz)

Applications

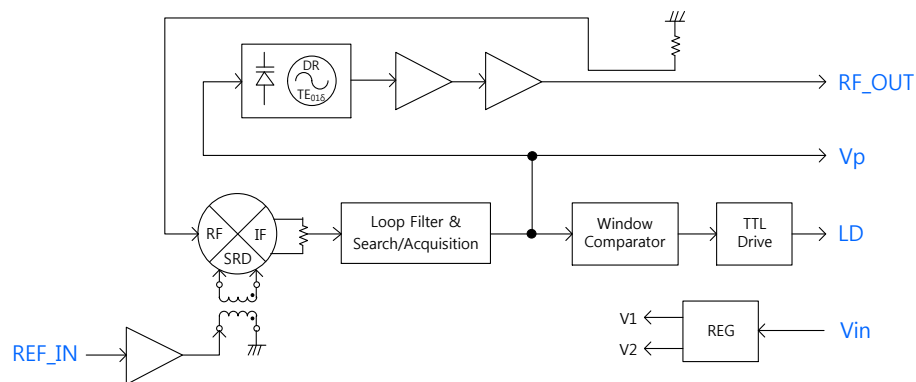
- Radar Systems
- VSAT/Satellite Communication Systems
- Test Equipment
- Microwave Transmitters & Receivers
- Cable TV Links (CATV)
- Up/Down Converters
- LMDS
- Missile Guidance
- Local Area Networks (LAN)

Description

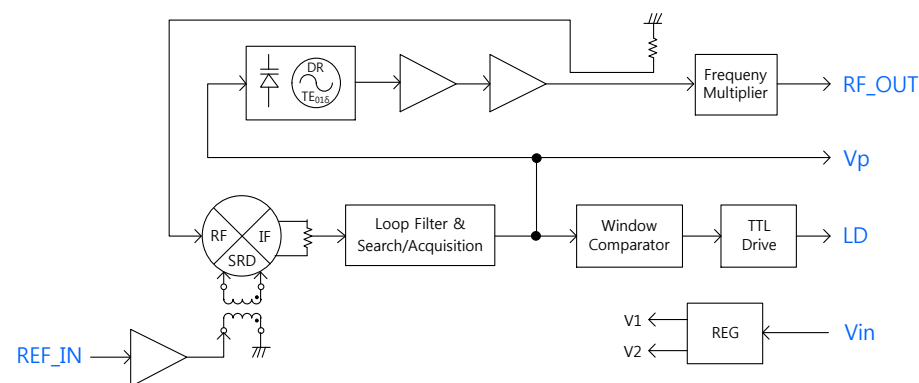


The Single Loop PLDROs provide an output frequencies whose phase is locked to an integer multiple of the external reference. This series provide output frequency up to 28 GHz. In addition, two package options are available. The first option corresponds to single bed package without Frequency Multiplier. This option provides output frequency from 5 GHz to 13 GHz and is the slimmest package in our PLDRO products. The second option corresponds to double bed package with Frequency Multiplier. This option provides an output frequency from 14 GHz to 28 GHz and has a double bed housing construction.

Single Loop PLDRO without Frequency Multiplier



Single Loop PLDRO with Frequency Multiplier



Features

- Ultra-low Phase Noise
- Low Spurious
- Phase-Locked Alarm
- Internal Voltage Regulators
- Low Power Consumption
- Compact Package
- Rugged Construction
- Affordable Price

Applications

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

Options

- High Stability Internal Reference
- 17 dBm (typ.) Output Power
- 10 VDC Supply Voltage
- Extended Operating Temperature: -40 °C to +85 °C
- Field Replaceable SMA-Jack, 2-Hole Connectors
- Customized Outlines
- Laser Marking

Specifications

Parameters			Specifications				Remarks
Output Frequency			5 GHz to 28 GHz				
Output Power			15 dBm (min.)				
Phase Noise (dBc/Hz) Note 1	Frequency		6 GHz	10 GHz	13 GHz	26 GHz	
	Offset						
	100 Hz		-92	-87	-84	-78	
	1 KHz		-112	-108	-105	-99	
	10 KHz		-122	-117	-110	-104	
	100 KHz		-123	-120	-116	-110	
External Reference	1 MHz		-139	-135	-131	-125	
	Frequency		10 MHz to 500 MHz				
Input Power			0±2 dBm				
Harmonics			-30 dBc (typ.), -20 dBc (max.)				
Frequency Stability			Same as the Reference				
Spurious			-80 dBc (typ.), -70 dBc (max.)				
Load VSWR			1.3 : 1 (typ.), 1.5 : 1 (max.)				
Output Impedance			50 Ω				
Supply Voltage			12 VDC or 15 VDC				
Current Consumption			250 mA to 450 mA depending on model				
Connectors	SB & DB Package	RF Output (RF OUT)	SMA-Jack Flange Mount, 2-Hole				SB: Single Bed Package DB: Double Bed Package
		External Reference Input (REF IN)	SMA-Jack Flange Mount, 2-Hole				
		Supply Voltage (Vin)	EMI Feed-thru				
		Phase Voltage (Vp) Note 2	EMI Feed-thru				
		Lock-Detect (LD) Note 3	EMI Feed-thru				
		GND	Turret Thread Mount Terminal				

Specifications

Parameters			Specifications	Remarks
Connectors	HS Package	RF Output (RF OUT)	Field Replaceable SMA-Jack, 2-Hole	HS: Hermetically Sealed Package
		External Reference Input (REF IN)	Field Replaceable SMA-Jack, 2-Hole	
		Supply Voltage (Vin)	Glass to Metal Hermetic Feed-thru	
		Phase Voltage (Vp) Note 2	Glass to Metal Hermetic Feed-thru	
		Lock-Detect (LD) Note 3	Glass to Metal Hermetic Feed-thru	
		GND	Turret Thread Mount Terminal	
Size (W x L x H)		SB & HS Package	2.25"[57.15] x 2.25"[57.15] x .63"[16]	Dimensions shown in brackets [] are in millimeters.
		DB Package	2.25"[57.15] x 2.25"[57.15] x 1.06"[27]	
Environmental Conditions		Operating Temperature	-20 °C to +70 °C	
		Storage Temperature	-45 °C to +85 °C	

Note 1 Phase Noise specifications assume use of 100 MHz crystal oscillator with phase noise of -130 dBc/Hz @100 Hz offset, -150 dBc/Hz @1 kHz offset, -165 dBc/Hz @10 kHz offset, and -165 dBc/Hz @100 kHz offset under room temperature and static condition.

Note 2 Phase Voltage (Vp)

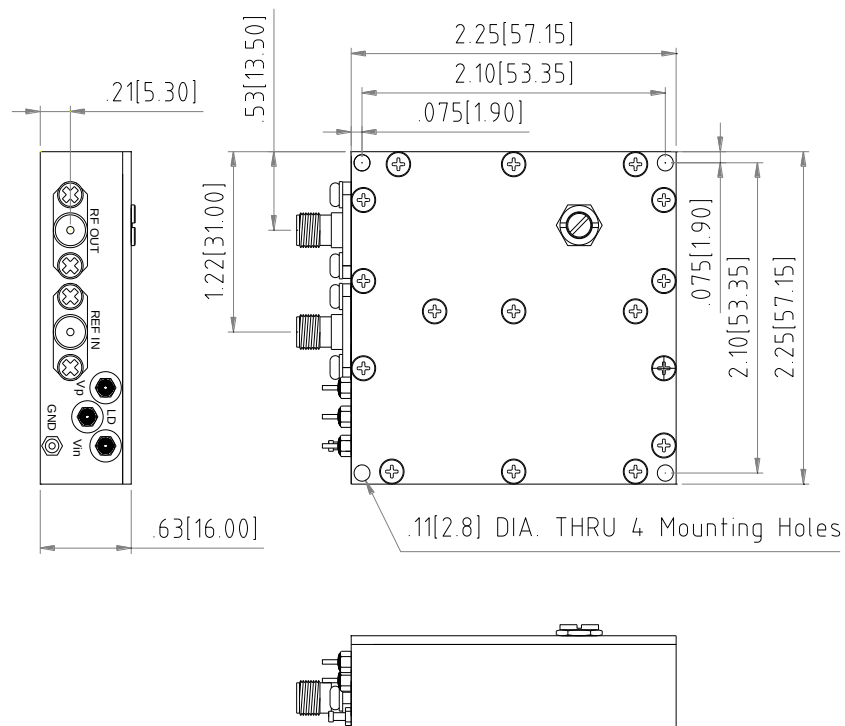
- Constant voltage output when phase locked
- Triangular waveform voltage output when phase unlocked

Note 3 Phase Lock-Detect (LD)

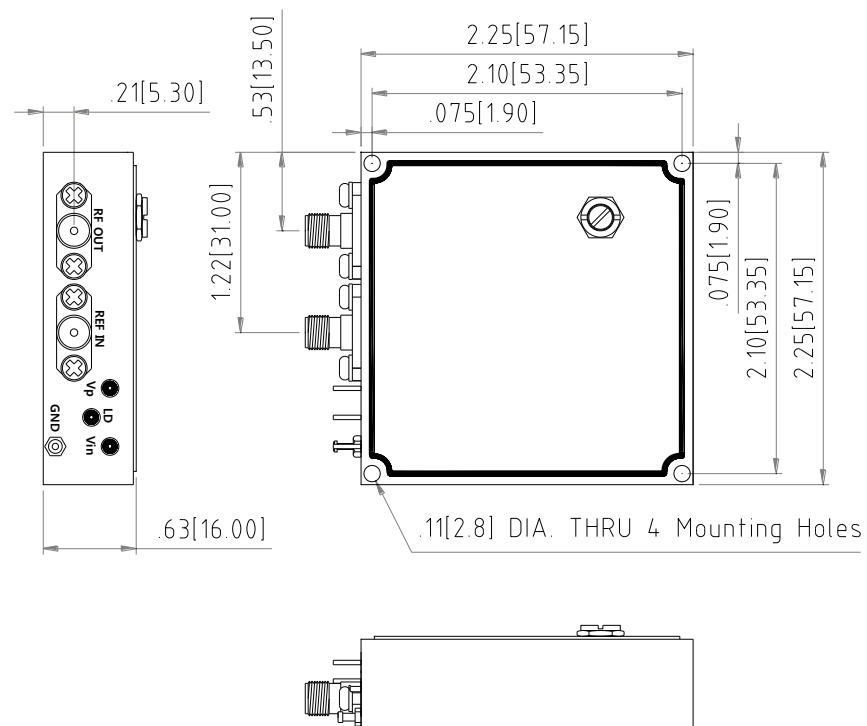
- TTL "High" output when phase locked
- TTL "Low" output when phase unlocked

Outline Drawings

Dimensions shown in brackets [] are in millimeters.



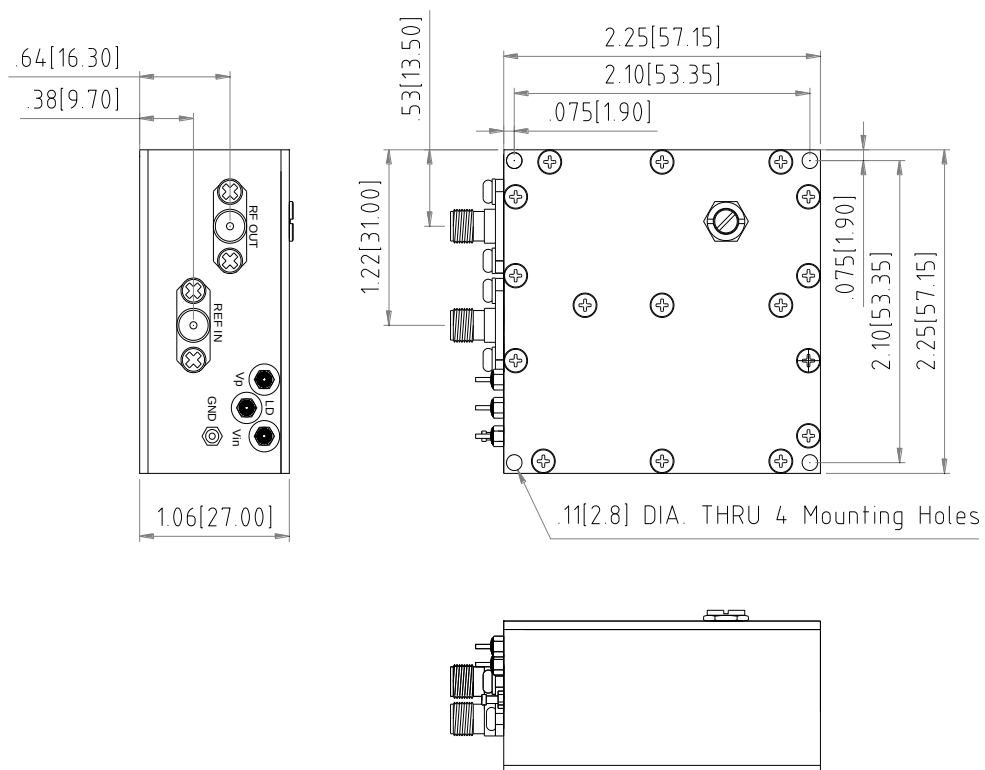
Single Bed Package



Hermetically Sealed Package

Outline Drawings

Dimensions shown in brackets [] are in millimeters.



Double Bed Package

Ordering Information

wwPLDRO-Rxxxx-y...y-Pzz-aa

- **ww**: Product Category
 - . S (Single Loop PLDRO)
 - . SD (Single Loop Digital-PLDRO)
 - . D (Dual Loop PLDRO)
 - . F (Fine-Resolution PLDRO)
- **xxxx**: Reference Frequency (MHz)
 - . Ixxx: Internal, xxxMHz
 - . Exxx: External, xxxMHz
- **y...y**: Output Frequency (MHz)
- **zz**: Output Power (dBm)
- **aa**: Package type
 - . SB (Single Bed Package)
 - . DB (Double Bed Package)
 - . HS (Hermetically Sealed Package)

Examples

SPLDRO-RE100-12300-P15-SB

- . Product Category: Single Loop PLDRO
- . Reference Frequency: External, 100 MHz
- . Output Frequency: 12,300 MHz
- . Output power: 15 dBm
- . Single Bed Package

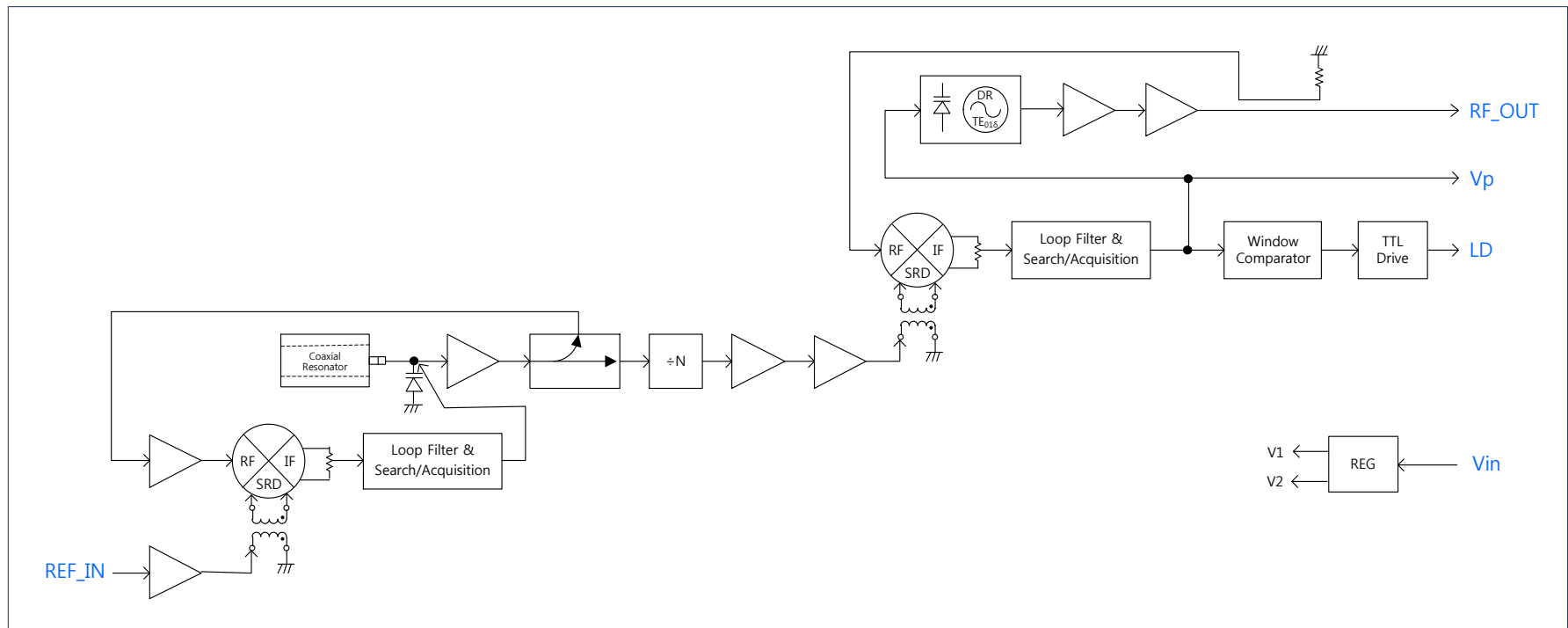
SPLDRO-RE10-6850-P17-HS

- . Product Category: Single Loop PLDRO
- . Reference Frequency: External, 10 MHz
- . Output Frequency: 6,850 MHz
- . Output power: 17 dBm
- . Hermetically Sealed Package

Description



The Dual Loop PLDROs provide an output frequencies whose phase is locked to an integer or fractional multiple of the external reference using PLCRO (Phase Locked Coaxial Resonator Oscillator) and frequency divider. This series provide output frequency from 5 GHz to 13 GHz with 500 KHz frequency resolution. For more finer frequency resolution, please refer to Single Loop Digital-PLDRO.



Features

- Fine Frequency Resolution
- Ultra-low Phase Noise
- Low Spurious
- Phase-Locked Alarm
- Internal Voltage Regulators
- Low Power Consumption
- Rugged Construction
- Affordable Price

Applications

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

Options

- 17 dBm (typ.) Output Power
- 10 VDC Supply Voltage
- Extended Operating Temperature: -40 °C to +85 °C
- High Stability Internal Reference
- Field Replaceable SMA-Jack, 2-Hole Connectors
- Customized Outlines
- Laser Marking

Specifications

Parameters		Specifications			Remarks
Output Frequency		5 GHz to 13 GHz			
Frequency Resolution		500 KHz (min.)			
Output Power		15 dBm (min.)			
Phase Noise (dBc/Hz) Note 1	Frequency	6 GHz	10 GHz	13 GHz	
	Offset				
	100 Hz	-92	-87	-84	
	1 KHz	-112	-108	-105	
	10 KHz	-122	-117	-110	
	100 KHz	-123	-120	-116	
	1 MHz	-139	-135	-131	
External Reference	Frequency	10 MHz to 100 MHz			
	Input Power	0±2 dBm			
Harmonics		-30 dBc (typ.), -20 dBc (max.)			
Frequency Stability		Same as the Reference			
Spurious		-80 dBc (typ.), -70 dBc (max.)			
Load VSWR		1.3 : 1 (typ.), 1.5 : 1 (max.)			
Output Impedance		50 Ω			
Supply Voltage		12 VDC or 15 VDC			
Current Consumption		350 mA to 550 mA depending on model			
Connectors	RF Output (RF OUT)	SMA-Jack Flange Mount, 2-Hole			
	External Reference Input (REF IN)	SMA-Jack Flange Mount, 2-Hole			
	Supply Voltage (Vin)	EMI Feed-thru			
	Phase Voltage (Vp) Note 2	EMI Feed-thru			
	Lock-Detect (LD) Note 3	EMI Feed-thru			
	GND	Turret Thread Mount Terminal			

Specifications

Parameters		Specifications	Remarks
Size (W x L x H)	DB Package	2.25"[57.15] x 2.25"[57.15] x 1.06"[27]	Dimensions shown in brackets [] are in millimeters.
Environmental Conditions	Operating Temperature	-20 °C to +70 °C	
	Storage Temperature	-45 °C to +85 °C	

Note 1 Phase Noise specifications assume use of 100 MHz crystal oscillator with phase noise of -130 dBc/Hz @100 Hz offset, -150 dBc/Hz @1 kHz offset, -165 dBc/Hz @10 kHz offset, and -165 dBc/Hz @100 kHz offset under room temperature and static condition.

Note 2 Phase Voltage (Vp)

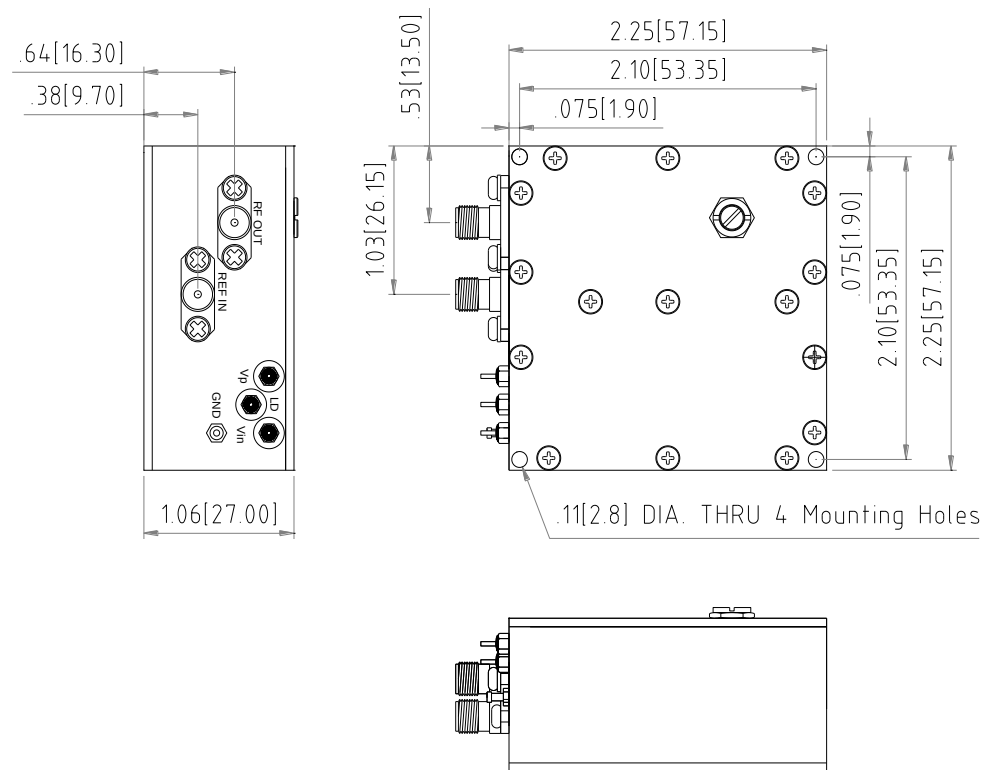
- Constant voltage output when phase locked
- Triangular waveform voltage output when phase unlocked

Note 3 Phase Lock-Detect (LD)

- TTL "High" output when phase locked
- TTL "Low" output when phase unlocked

Outline Drawings

Dimensions shown in brackets [] are in millimeters.



Double Bed Package

Ordering Information

wwPLDRO-Rxxxx-y...y-Pzz-aa

- **ww**: Product Category
 - . S (Single Loop PLDRO)
 - . SD (Single Loop Digital-PLDRO)
 - . D (Dual Loop PLDRO)
 - . F (Fine-Resolution PLDRO)
- **xxxx**: Reference Frequency (MHz)
 - . Ixxx: Internal, xxxMHz
 - . Exxx: External, xxxMHz
- **y...y**: Output Frequency (MHz)
- **zz**: Output Power (dBm)
- **aa**: Package type
 - . SB (Single Bed Package)
 - . DB (Double Bed Package)
 - . HS (Hermetically Sealed Package)

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
- . Double Bed Package

DPLDRO-RE10-13125-P17-DB

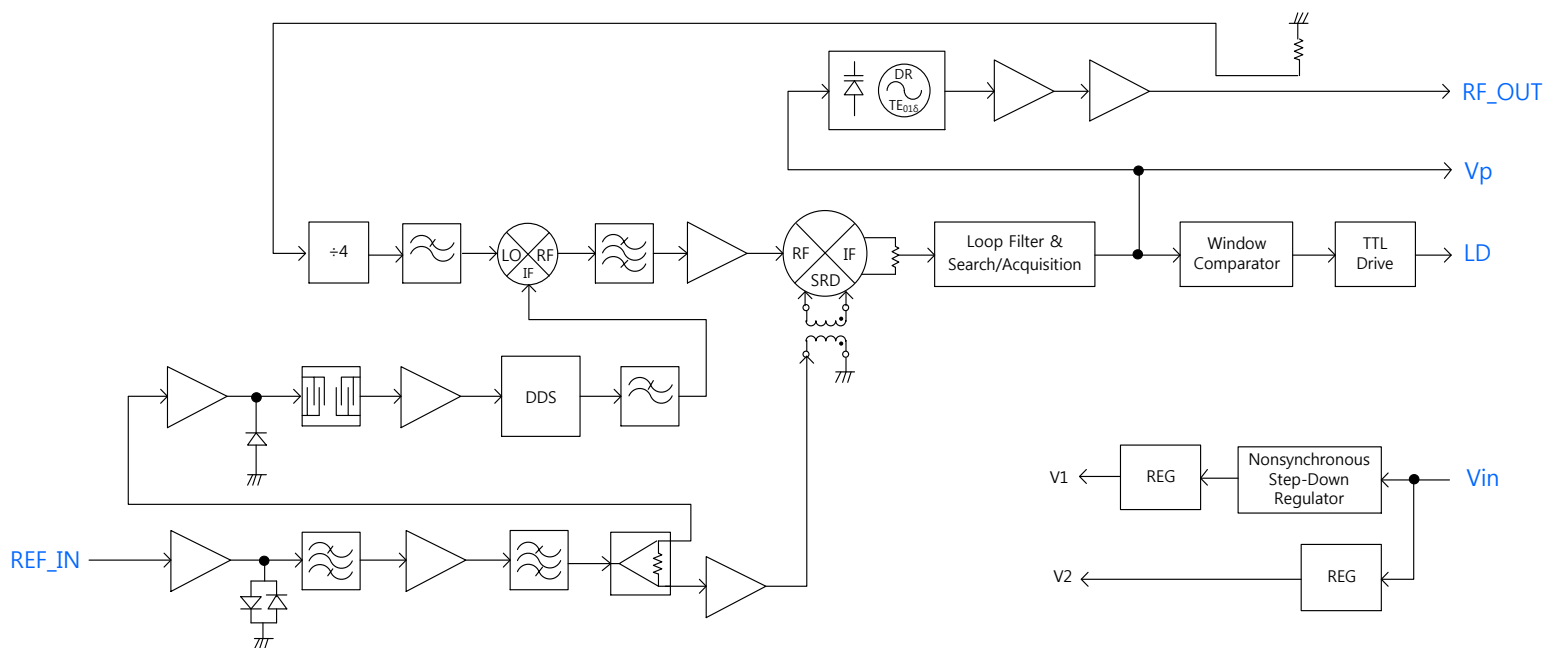
- . Product Category: Dual Loop PLDRO
- . Reference Frequency: External, 10 MHz
- . Output Frequency: 13,125 MHz
- . Output power: 17 dBm
- . Double Bed Package

Description



The Single Loop Digital-PLDRO can provide any output frequency in 5 GHz to 13 GHz. This series generates output frequency by shifting the phase of the output frequency using a Frequency Divider, DDS and Mixer so that the output frequency is an integer multiple of the reference frequency. This series also offers very fine frequency resolution of 10 KHz.

Single Loop Digital-PLDRO using external 10MHz reference



Features

- Any Output Frequency Available
- Very Fine Frequency Resolution
- Phase Locked using DDS & Mixer
- Ultra-low Phase Noise
- Low Spurious
- Phase-Locked Alarm
- Internal Voltage Regulators
- Rugged Construction
- Affordable Price

Applications

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

Options

- 17 dBm (typ.) Output Power
- 10 VDC Supply Voltage
- 1KHz Frequency Resolution
- High Stability Internal Reference
- Customized Outlines
- Laser Marking

Specifications

Parameters		Specifications			Remarks
Output Frequency		5 GHz to 13 GHz			
Frequency Resolution		10 KHz (min.)			
Output Power		15dBm (min.)			
Phase Noise (dBc/Hz) Note 1	Frequency	6 GHz	10 GHz	13 GHz	
	Offset				
	100 Hz	-92	-87	-84	
	1 KHz	-112	-107	-104	
	10 KHz	-122	-113	-109	
	100 KHz	-122	-117	-113	
	1 MHz	-136	-132	-128	
External Reference	Frequency	10 MHz to 100 MHz			
	Input Power	0±2 dBm			
Harmonics		-30 dBc (typ.), -20 dBc (max.)			
Frequency Stability		Same as the Reference			
Spurious		-75 dBc (typ.), -65 dBc (max.)			
Load VSWR		1.3 : 1 (typ.), 1.5 : 1 (max.)			
Output Impedance		50 Ω			
Supply Voltage		12 VDC or 15 VDC			
Current Consumption		350 mA to 550 mA depending on model			
Connectors	RF Output (RF OUT)	SMA-Jack Flange Mount, 2-Hole			
	External Reference Input (REF IN)	SMA-Jack Flange Mount, 2-Hole			
	Supply Voltage (Vin)	EMI Feed-thru			
	Phase Voltage (Vp) Note 2	EMI Feed-thru			
	Lock-Detect (LD) Note 3	EMI Feed-thru			
	GND	Turret Thread Mount Terminal			

Specifications

Parameters		Specifications	Remarks
Size (W x L x H)		2.25"[57.15] x 3.15"[80] x 1.06"[27]	Dimensions shown in brackets [] are in millimeters.
Environmental Conditions	Operating Temperature	-20 to +70 °C	
	Storage Temperature	-45 to +85 °C	

Note 1 Phase Noise specifications assume use of 100MHz crystal oscillator with phase noise of -130 dBc/Hz @100 Hz offset, -150 dBc/Hz @1 kHz offset, -165 dBc/Hz @10 kHz offset, and -165 dBc/Hz @100 kHz offset under room temperature and static condition.

Note 2 Phase Voltage (Vp)

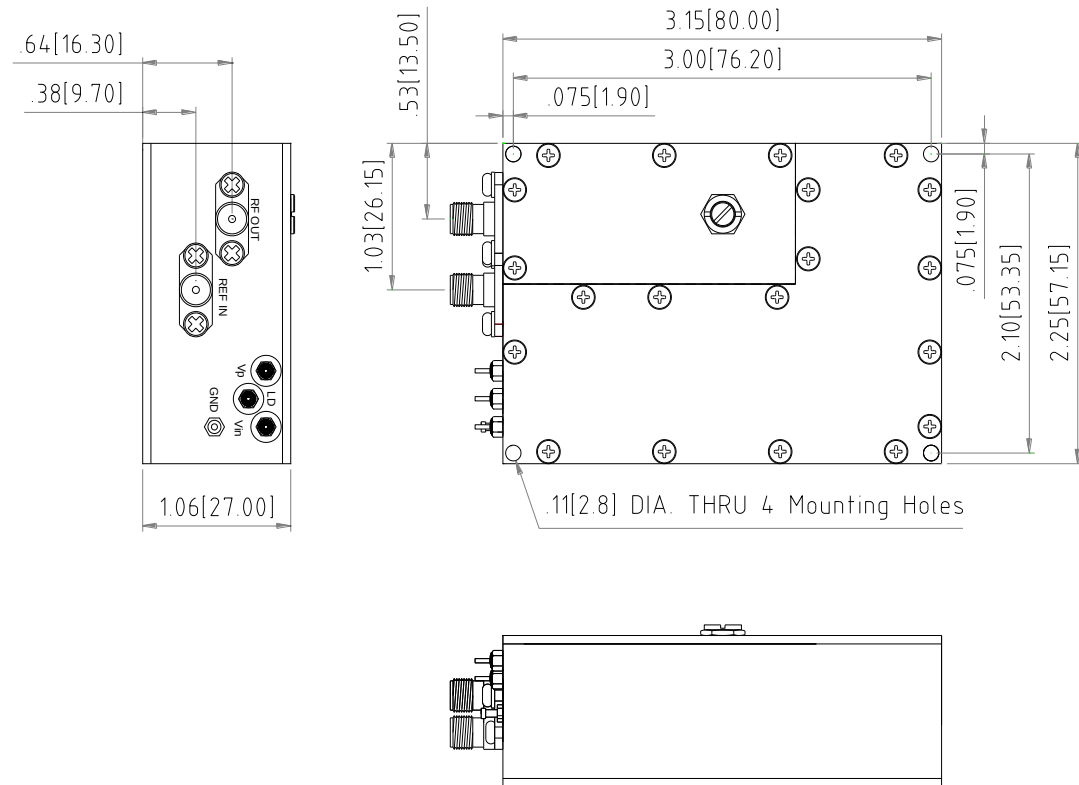
- Constant voltage output when phase locked
- Triangular waveform voltage output when phase unlocked

Note 3 Phase Lock-Detect (LD)

- TTL "High" output when phase locked
- TTL "Low" output when phase unlocked

Outline Drawings

Dimensions shown in brackets [] are in millimeters.



Ordering Information

wwPLDRO-Rxxxx-y...y-Pzz-aa

- **ww**: Product Category
 - . S (Single Loop PLDRO)
 - . SD (Single Loop Digital-PLDRO)
 - . D (Dual Loop PLDRO)
 - . F (Fine-Resolution PLDRO)
- **xxxx**: Reference Frequency (MHz)
 - . Ixxx: Internal, xxxMHz
 - . Exxx: External, xxxMHz
- **y...y**: Output Frequency (MHz)
- **zz**: Output Power (dBm)
- **aa**: Package type
 - . SB (Single Bed Package)
 - . DB (Double Bed Package)
 - . HS (Hermetically Sealed Package)

Examples

SDPLDRO-RE10-7092.35-P15

- . Product Category: Single Loop Digital-PLDRO
- . Reference Frequency: External, 10 MHz
- . Output Frequency: 7,092.35 MHz
- . Output power: 15 dBm

SDPLDRO-RE100-9936.95-P17

- . Product Category: Single Loop Digital-PLDRO
- . Reference Frequency: External, 100 MHz
- . Output Frequency: 9,936.95 MHz
- . Output power: 17 dBm