

PDF Series

200-800MHz Phase Detector with Loop Filter

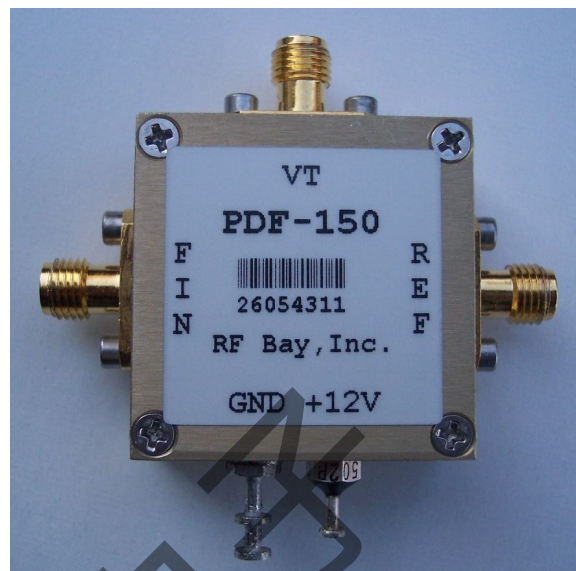
Features

- Frequency Range: 200 to 800MHz
- Input Power: -7 to +10dBm
- Integrated Loop Filter
- Directly Interface to FPS Series
- Directly Interface to VCO Series
- DC Power: 12V
- SMA Connector

Description

PDF-150 is a Phase/Frequency Detector with integrated Loop Filter. It operates with input frequency range from 200MHz to 800MHz, easy to use for Phase Locked Loop application.

Picture



Electrical Specifications @ +25 °C, 50 Ω System, DC Supply = +12V

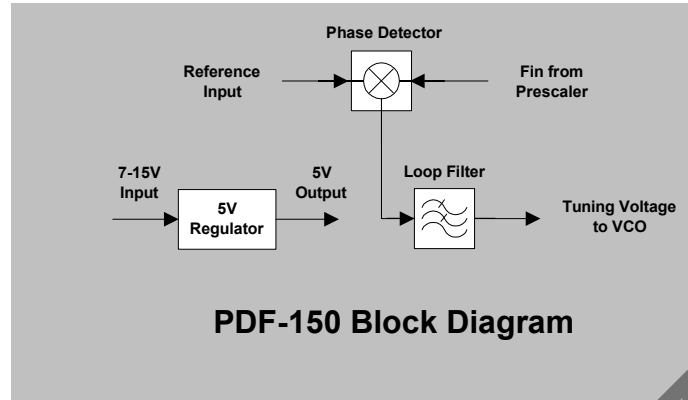
Parameter	Unit	Minimum	Typical	Maximum
Fin and Ref Input Frequency Range	MHz	200		800
Input Power Level	dBm	-7		+10
*Phase Noise @1KHz Offset With FPS-12-13 and VCO-2375 Fo=2400MHz, Ref=200MHz	dBc/Hz	-87	-92	
*Phase Noise @1KHz Offset With FPS-4-13 and VCO-3300 Fo=3200MHz, Ref=800MHz	dBc/Hz	-87	-92	
Loop Filter Bandwidth	KHz	5	10	
Tuning Voltage Output Range	V	0.1		4.9
Input VSWR			1.2:1	2.0:1
Output VSWR			1.2:1	2.0:1
DC Power Supply	V	9	12	15
Supply Current	mA		90	115

* Phase Noise depends on VCO, reference and loop.

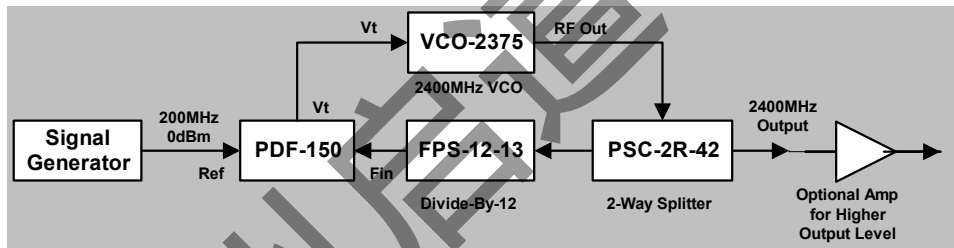
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Block Diagram



Application Example 1



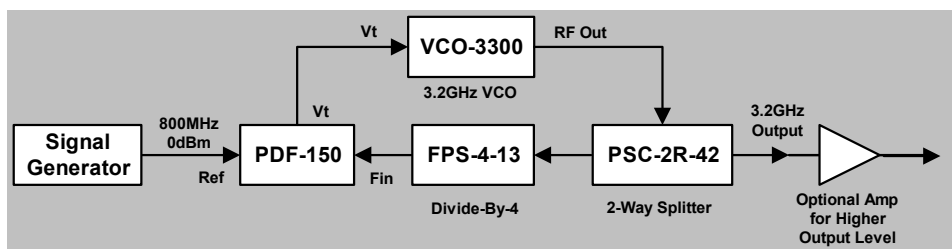
Building Block

RF Bay, Inc. Part Number	Description
PDF-150	200-800MHz Phase Detector with Loop Filter
FPS-12-13	0.1 – 13.0GHz Divide-by-12 Prescaler
VCO-2375	2300-2450MHz Voltage Controlled Oscillator
PSC-2R-42	DC-4200MHz 2-Way Power Splitter/Combiner
LPA-4-14	10-4000MHz RF Amplifier

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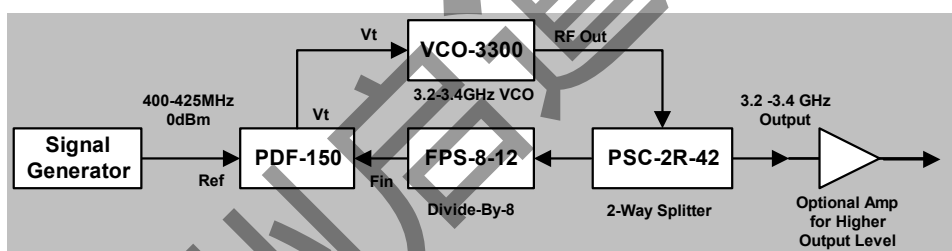
Application Example 2



Building Block

RF Bay, Inc. Part Number	Description
PDF-150	200-800MHz Phase Detector with Loop Filter
FPS-4-13	0.1 – 13.0GHz Divide-by-4 Prescaler
VCO-3300	3200-3400MHz Voltage Controlled Oscillator
PSC-2R-42	DC-4200MHz 2-Way Power Splitter/Combiner
LPA-4-14	10-4000MHz RF Amplifier

Application Example 3



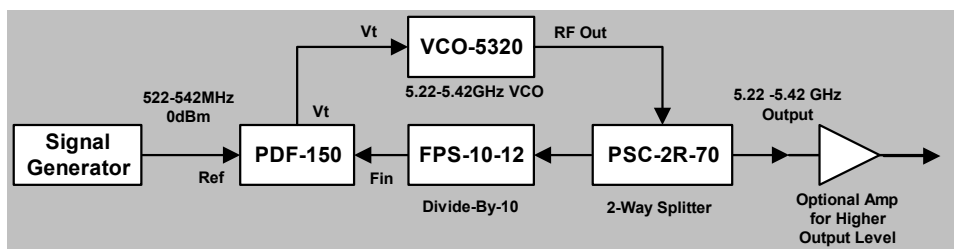
Building Block

RF Bay, Inc. Part Number	Description
PDF-150	200-800MHz Phase Detector with Loop Filter
FPS-8-12	0.1 – 12.0GHz Divide-by-8 Prescaler
VCO-3300	3200-3400MHz Voltage Controlled Oscillator
PSC-2R-42	DC-4200MHz 2-Way Power Splitter/Combiner
LPA-4-14	10-4000MHz RF Amplifier

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200-800MHz Phase Detector with Loop Filter

Application Example 4



Building Block

RF Bay, Inc. Part Number	Description
PDF-150	200-800MHz Phase Detector with Loop Filter
FPS-10-12	0.1 – 12.0GHz Divide-by-10 Prescaler
VCO-5320	5220-5420MHz Voltage Controlled Oscillator
PSC-2R-70	DC-7000MHz 2-Way Power Splitter/Combiner
LPA-6-12/LPA-6-26	100-6000MHz RF Amplifier

Application Note

PDF-150 is designed for quick bench setup to generate frequency plan for your system design. In addition to work with RF Bay, Inc. Prescaler, VCO, Power Divider and Amplifier, it also works with widely commercial available similar product. Keep in mind following will help you to improve the system performance:

- 1) With smaller Prescaler divide ratio, the better phase noise performance
- 2) Reference phase noise play critical role for entire system performance
- 3) Running lower DC supply voltage will reduce extra heat from the unit
- 4) In many cases, unit may work with frequency under 200MHz and above 800MHz
- 5) When sweep reference frequency, the switching time is around 300 μ s
- 6) Different loop filter bandwidth can be specially ordered
- 7) Connection shown in application examples are short SMA coaxial cables

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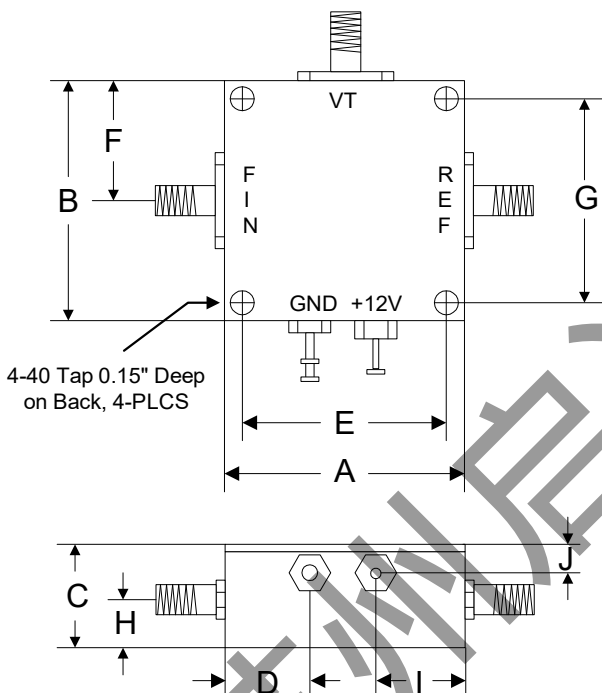
Absolute Maximum Ratings

Parameter	Absolute Maximum
RF/REF Input Power	+20dBm
Supply Voltage	+16V
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-55 °C to +125 °C

ESD Sensitive Material



Outline



Port Frequency Input (Fin) connects to RF output frequency after Prescaler output
 Port Reference Input (Ref) connects to signal generator or other frequency source
 Port Voltage Tuning (VT) connects to Voltage Controlled Oscillator tuning input

	A	B	C	D	E	F	G	H	I	J
Inch	1.250	1.250	0.563	0.450	1.000	0.625	1.000	0.250	0.500	0.187
mm	31.75	31.75	14.29	11.43	25.40	15.88	25.40	6.35	12.70	4.76