



LPT-3000RX4 Specifications



Frequency

Frequency			
	Range	9 kHz to 3.0 GHz	
	Resolution	1 Hz	
Frequency Reference			
	Accuracy	± (period since last adjustment X aging rate) + stability over temperature + supply voltage stability	
	Aging Rate	± 1 ppm max.	1 year after last adjustment
	Frequency Stability over Temp.	± 0.025 ppm	0 to 50 °C
	Supply Voltage Stability	± 0.02 ppm	
Frequency Readout Accuracy			
	Start, Stop, Center, Marker	± (marker frequency indication * frequency reference accuracy + 10% * RBW + frequency resolution ¹)	
	Trace points	Max 601, min 6	
Marker Frequency Counter			
	Resolution	1 Hz, 10 Hz, 100 Hz, 1 kHz	
	Accuracy	± (marker frequency indication * frequency reference accuracy + counter resolution)	RBW/Span >= .02; Marker level to DNL > 30 dB
Frequency Span			
	Range	0 Hz (zero span), 100 Hz to 3.0 GHz	
	Resolution	1 Hz	

	Accuracy	\pm frequency resolution ¹ RBW: Auto	
Phase Noise	Offset from Carrier		Fc = 1 GHz; RBW = 1 kHz; VBW = 10 Hz, Average \geq 40
	10 KHz	<-88 dBc/Hz	<i>Typical</i> ²
	100 KHz	<-95 dBc/Hz	<i>Typical</i>
	1 MHz	<-113 dBc/Hz	<i>Typical</i>
Resolution Bandwidth (RBW) Filter			
	Filter Bandwidth	1 Hz to 1 MHz in 1-3-10 sequence	-3dB bandwidth
		200 Hz, 9 kHz, 120 kHz, 1 MHz	-6dB bandwidth
	Accuracy	\pm 8%, RBW = 1 MHz	Nominal ³
		\pm 5%, RBW < 1 MHz	Nominal
	Shape Factor	< 4.5:1	Normal Bandwidth ratio: -60 dB: -3 dB
Video Bandwidth (VBW) Filter			
	Filter Bandwidth	1 Hz to 1 MHz in 1-3-10 sequence	-3 dB bandwidth

Amplitude

Amplitude Range			
	Measurement Range	100 kHz to 1 MHz	Display Average Noise Level (DANL) to 18 dB,
		1 MHz to 10 MHz	DANL to 21 dBm
		10 MHz to 3 GHz	DANL to 25 dBm

Attenuator

Input Attenuator Range	0 to 50 dB, in 1 dB step	Auto or manual setup step
Maximum Safe Input Level		
Average Total Power	≤+27 dB,	Input attenuator ≥ 10 dB
DC Voltage	± 50 V	
1 dB Gain Compression		
Total Power at 1 st Mixer	>0 dBm	<i>Typical, Fc ≥50 MHz, preamp off</i>
Total Power at the Preamp	>-22 dBm	<i>Typical, Fc ≥50 MHz, preamp on</i>
Mixer power level (dBm)= input power (dBm)- attenuation (dB)		
Displayed Average Noise Level (DANL)⁴		
Preamp off	0 dB attenuation, RF Input is terminated with a 50 Ω load. RBW 10 Hz, VBW 10 Hz, span 500 Hz, reference level= -60 dBm, trace average ≥ 40	
9 KHz to 100 KHz	< -88 dBm	Nominal
100 KHz to 1 MHz	<-85 dBm - 3*(f/100kHz) dBm	Nominal
1 MHz to 10 MHz	< -117 dBm	Nominal
10 MHz to 2 GHz	<-117 dBm	Nominal
2 GHz to 3 GHz	<-117 dBm	Nominal, base model
2 GHz to 3 GHz	<-111 dBm	Nominal, CID option
Preamp on	0 dB attenuation, RF Input is terminated with a 50 Ω load. RBW 10 Hz, VBW 10 Hz, span 500 Hz, reference level= -60 dBm, trace average ≥ 40	
100 kHz to 1 MHz	< -103 dBm – 3*(f/100 kHz) dBm	Nominal

1 MHz to 10 MHz	< -137 dBm	Nominal, base model
1 MHz to 10 MHz	<-135 dBm	Nominal, CID option
10 MHz to 3 GHz	<-137 dBm + 3 *(f/1 GHz) dB	Nominal

Absolute Amplitude Accuracy

Absolute Point	Center = 160 MHz, RBW 10 kHz, VBW 1 kHz, span 100 kHz, log scale, 1 dB/div, peak detector, 23 ± 1°C, Signal at Reference Level	
Preamp off	± 0.3 dB	Ref level 0 dBm, 10 dB RF attenuation
Preamp on	± 0.4 dB	Ref level -30 dBm, 0 dB RF attenuation

Frequency Response

Preamp off	Attenuation: 10 dB, Ref: 160 MHz, 20 to 30°C	
100 kHz to 2.0 GHz	± 0.5 dB	Nominal, base model
2.0 GHz to 3.0 GHz	± 0.8 dB	Nominal, base model
100 kHz to 2.0 GHz	± 2.0 dB	Nominal, CID option
2.0 GHz to 3.0 GHz	± 3.0 dB	Nominal, CID option
Preamp on	Attenuation: 0 dB, Ref: 160 MHz, 20 to 30°C	
1 MHz to 2 GHz	± 0.6 dB	Nominal, base model
2 GHz to 3 GHz	± 0.8 dB	Nominal, base model
1 MHz to 2 GHz	± 2.0 dB	Nominal, CID option
2 GHz to 3 GHz	± 3.0 dB	Nominal, CID option

Attenuation Switching Uncertainty

Attenuator Setting	0 to 50 dB in 1 dB step	
Uncertainty	± 0.25 dB	Reference: 160 MHz, 10 dB attenuation

RBW Filter Switching Uncertainty			
	1 Hz to 1 MHz	± 0.25 dB	Reference: 10 kHz RBW
Level Measurement Uncertainty			
	Overall Amplitude Accuracy	± 1.5 dB	20 to 30° C, frequency > 1 MHz, signal input 0 to -50 dBm, input attenuation 10 dB, RBW 1 kHz, VBW 1 kHz, after cal, preamp off
		± 0.5 dB	<i>Typical</i>
Spurious Response			
	Second Harmonic Intercept		Preamp off, signal input -30 dBm, 0 dB attenuation
		+ 35 dBm	<i>Typical</i> , 10 MHz < fc < 775 MHz
		+ 60 dBm	<i>Typical</i> , 10 MHz < fc < 1.5 MHz
	Third-order Intercept		Preamp off, signal input -30 dBm, 0 dB attenuation
		>1dBm	300 MHz to 3.0 GHz
	Input Related Spurious	<-60 dBc	Input signal level - 30dBm, Att. Mode= 0dB, 20- 30°C
	Residual Response (inherent)	<-90 dBm	Input terminated, 0 dB attenuation, Preamp off

RF Port Characteristic

Channel Performance

Channel Frequency Response	± 1 dB	All ports but port 1 Reference: port 1, zero span
Switching Time	0.5 ms	Without sweep time
Isolation	55 dB	

Sweep

Sweep Time

Range	310 μ s to 1000 s	Span > 0 Hz
	50 μ s to 1000 s	Span = 0 Hz, Min Resolution = 10 μ s
Sweep Mode	Continuous, Single	
Trigger Source	Free run, Video, External	
Trigger Slope	Positive or negative edge	

RF Preamplifier

Frequency Range	1 MHz to 3 GHz	
Gain	18 dBm	Nominal (installed as standard)

Front Panel Input / Output

Power LED

Power Mode On	Yellow
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Rear Panel Input / Output

RF Input

Connector Type	4-port N-type female	
Impedance	50 Ω	Nominal

	VSWR	< 2.1:1	300 kHz to 3.0 GHz, Input attenuator ≥ 10 dB
Reference Input			
	Connector Type	BNC female	
	Input Reference Frequency	10 MHz	
	Input Amplitude	-5 dBm to +10 dBm	
	Frequency Lock Range	Within ± 5 ppm of the input reference frequency	
RS-232 Interface			
	Connector Type	D-sub 9-pin female	Tx, Rx, RTS, CTS
LAN TCP/IP interface			
	Connector Type	RJ-45	
	Base	10Base-T, 100Base-TX, Auto-MDIX	
AC Power Input			
	Power Source	AC 100 V to 240 V, 50/60 Hz Auto range selection	

OPTIONS

	Carrier ID Extraction		
	Internal Downconverter	K band or C band to L band	
General			
	Internal Data Storage	16 MB	Nominal
	Power Consumption	< 65 W	
	Warm-up Time	>45 minutes	

Temperate Range	+5°C to +45°C	Operating
	-20°C to +70°C	Storage
Weight	8.16 kg (17.99 lbs)	Basic
Dimensions	416 x 430 x 44 (mm)	Approximately
	16.38 x 16.93 x 1.73 (in)	

- [1] Frequency Resolution = Span / (trace points – 1)
- [2] Typical specifications in this datasheet mean that the performance can be exhibited in 80% of the units with a 95% confidence level over the temperature range 20 to 30°C. They are not covered by the product warranty.
- [3] Nomical values indicate expected performance. They are not covered by the product warranty.
- [4] DANL spec excludes spurious response.