



MAXWELLON MX2281

9kHz ~ 1.2/2/3GHz

Digital RF Millivoltmeter/Frequency Counter

2023

MX2281 is a new intelligent digital RF millivoltmeter/frequency counter. The instrument operates on the principle of envelope detection and can measure sinusoidal voltages in the range of 10kHz to 3000MHz (measurement frequency range determined by the coaxial detector). It features a voltage measurement range of 1mVrms to 10Vrms with a resolution of 1 μ V. For power level measurements, the range is -47dBm to +33dBm with a resolution of 0.01dB. The coaxial detector uses an N-type bidirectional connector with a 50 Ω RF load.

The instrument employs a high-brightness TFT LCD display, offering clear readings, high brightness, and a long lifespan. It boasts excellent frequency response, low standing wave ratio, high sensitivity, low power consumption, compact size, and light weight. The instrument has an auto-zeroing function, and for voltage measurements, you can choose between automatic or manual measurement ranges. It comes with an RS232 interface and optional GPIB interface for remote measurement control.

The MX2281 is an essential tool for metrology and testing of ultrahigh-frequency voltages in production workshops and laboratories. It is suitable for tasks such as measuring the voltage-frequency response of ultrahigh-frequency standard signal sources. The instrument provides excellent measurement stability, high resolution, and good repeatability. It can be used for calibrating the voltage error and stability of signal sources, as well as for the transfer of standards in the 10kHz to 3000MHz ultrahigh-frequency voltage measurement field. It can also be used in automatic test systems for testing high-frequency voltages, amplifier gain, attenuator attenuation, and more.

The instrument can be optionally equipped with a 10kHz to 3000MHz frequency counter module, providing dual functionality in a single unit.

Key Feature

- Adopting a new microprocessor chip, the instrument features outstanding advantages such as high resolution, high accuracy, high reliability, and excellent cost-effectiveness.
- Specialized QVGA color LCD display with capacitive touch key functionality for clear readings and easy operation.
- Surface Mount Technology (SMT) production with a new metal chassis.
- High reliability, with a service life exceeding 20,000 hours.
- Comes standard with an RS232 interface, and optional GPIB and USB interfaces are available.

Specifications

Millivoltmeter					
Frequency Range for Voltage Measurement	With 1.2GHz coaxial detector: 10kHz to 1200MHz				
	With 2GHz coaxial detector: 10kHz to 2000MHz				
	With 3GHz coaxial detector: 10kHz to 3000MHz				
Voltage Range	1mVrms to 10Vrms (with 50 Ω load) (4mVrms/40mVrms/400mVrms/4Vrms/10Vrms)				
Power Level Range	-47 dBm to +33dBm (with 50 Ω load, where 0dBm = 0.223 Vrms) (-40/-20/0/+20/+40dBm)				
Frequency response error of coaxial detector measuring voltage (with 100kHz as reference, 50 Ω coaxial terminal precision load)	Frequency Range	2GHz Coaxial Detector		3GHz Coaxial Detector	
	Range	2.25V~10mVrms (+20dBm~-27dBm)	10mV~2mVrms (-27dBm~-41dBm)	2.25V~10mVrms (+20dBm~-27dBm)	10mV~2mVrms (-27dBm~-41dBm)
	100kHz~100MHz	±2%	±3%	±2%	±3%
	10kHz~200MHz	±3%	±4%	±3%	±4%
	200MHz~600MHz	±5%	±7%	±5%	±7%
	600MHz~1000MHz	±8%	±9%	±7%	±9%
	1000MHz~1500MHz	±12%	±13%	±12%	±13%
	1500MHz~2000MHz	±15%	±16%	±16%	±17%
	2000MHz~2500MHz	/	/	±15%	±16%
2500MHz~3000MHz	/	/	±17%	±18%	

Millivoltmeter		
SWR at the coaxial detector end face for 10V (with 50Ω load)	Frequency Range	SWR
	10kHz~200MHz	≤1.03
	200MHz~500MHz	≤1.04
	500MHz~1000MHz	≤1.15
	1000MHz~1600MHz	≤1.25
	1600MHz~2000MHz	≤1.35
2000MHz~3000MHz	≤1.40	
Frequency Counter (optional)		
Frequency Measurement Range	10kHz~3GHz (Measurement frequency range determined by the frequency channel)	
Min. Input Voltage	50mVrms	
Max. Allowable Input Voltage	5Vrms	
Coupling Method	AC coupling	
Waveform Adaptability	Sine wave	
Low Pass Filter	Cutoff frequency approximately 100kHz	
	In-band attenuation: ≤3dB	
	Out-of-band attenuation: ≥30dB	
Gate Time	100mS, 1S selectable	
Display Digits	5 digits (Gate=100mS), 6 digits (Gate=1S)	
Measurement Error	Timebase error ± Trigger error (Trigger error less than 3‰ when signal-to-noise ratio is better than 40dB)	
Timebase	Better than 5×10^{-6} (22°C ±5°C)	
Gate Time	100mS, 1S selectable	
Gate Time	100mS, 1S selectable	
Reference Output		
Output Frequency	≈100kHz	
Output Amplitude	When connected to a 50Ω load, output is 1 Vrms; when not connected to a 50Ω load, output is 2 Vrms, with an accuracy of ±0.5%.	
Output Impedance	50Ω	
Reference Output		
Interface	RS232 and IEEE-488 (GPIB)	
Power supply voltage	220V±10% or 110V±10%; frequency is 50Hz±5%; power consumption is approximately 35W.	
MTBF	20000 hours	
Dimensions	255×370×100 (mm)	
Weight	3.5kg	

■ Ordering Information

Standard

No.	Name	Qty.
1	RF probe (9kHz~1200MHz) (1.2GHz standard)	1 pc
2	Coaxial three-way splitter (1.2GHz standard)	1 pc
3	10V coaxial detector (10kHz~2000MHz) (2GHz standard)	1 pc
4	10V coaxial detector (10kHz~3000MHz) (3GHz standard)	1 pc
5	N/BNC-50KK	1 pc
6	50Ω coaxial test cable	1 pc
7	Power cord	1 pc
8	Fuse tube 0.5A/220V (already installed in the socket)	2 pc
9	Product user manual	1 pc
10	Product qualification certificate	1 pc
11	RS232 connection cable	1 pc
12	RS232 test software CD	1 pc

Option

No.	Name	Qty.
1	Frequency counter	1 pc
2	GPIB Interface	1 pc
3	USB	1 pc



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