

S87234X Series USB Peak and Average Power Sensor Datasheet



Saluki Technology Inc.

The document applies to the USB peak and average power sensor of the following models:

- S87234D USB peak and average power sensor (50MHz - 18GHz)
- S87234E USB peak and average power sensor (50MHz - 26.5GHz)
- S87234F USB peak and average power sensor (50MHz - 40GHz)
- S87234L USB peak and average power sensor (500MHz - 67GHz)

The document applies to the USB peak and average power sensor of the following models:

- S87234X USB power sensor × 1
- USB cable × 1
- Trigger cable × 2
- PC software × 1

Preface

Thanks for choosing S87234 series USB power sensor produced by Saluki Technology Inc.

We devote ourselves to meeting your demands, providing you high-quality measuring instrument and the best after-sales service. We persist with “superior quality and considerate service”, and are committed to offering satisfactory products and service for our clients.

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Document Authorization

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Product Quality Assurance

The warranty period of the product is 36 months from the date of delivery. The instrument manufacturer will repair or replace damaged parts according to the actual situation within the warranty period.

Product Quality Certificate

The product meets the indicator requirements of the document at the time of delivery. Calibration and measurement are completed by the measuring organization with qualifications specified by the state, and relevant data are provided for reference.

Quality/Settings Management

Research, development, manufacturing and testing of the product comply with the requirements of the quality and environmental management system.

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1. Overview

The S87234D/E/F/L USB peak and average power sensor is a diode-detection broadband power measurement instrument based on the USB 2.0 interface, which can realize accurate average power measurement, pulse power measurement with large dynamic range and CCDF statistical measurement analysis. The frequency range covers 50MHz to 67GHz, the highest power accuracy can reach 0.2dB, the video bandwidth is $\geq 30\text{MHz}$, and the rise/fall time is $\leq 13\text{ns}$. This product is small in size, light in weight, and uses USB interface for power supply and communication. It can be connected to a computer for use. S87234 series can flexibly expand the power measurement function of electronic measuring instruments and test systems, and is mainly used for field testing, production line testing and system integration.

2. Key Features

- High frequency up to 67GHz
- Excellent dynamic range and accuracy
- CCDF statistical measurement analysis
- Internal zero calibration function
- Built-in trigger input function
- Automatic measurement function, including 16 pulse power and time parameters
- Excellent measurement speed, up to 50,000 readings per second
- Built-in radar and wireless presets
- External trigger buffer measurement
- Small size and easy to carry

3. Technical Specifications

Frequency Range	S87234D	50MHz - 18GHz
	S87234E	50MHz - 26.5GHz
	S87234F	50MHz - 40GHz
	S87234L	500MHz - 67GHz
Power Range	Normal	-30dBm to +20dBm (50MHz - 500MHz) -35dBm to +20dBm ($\geq 500\text{MHz}$)
	Average ⁽¹⁾	-45dBm to +20dBm
Damage Level	+23dBm (average power)	
	+30dBm (peak power, duration <1us)	
Rise/Fall Time	$\leq 13\text{ns}$ ⁽²⁾	
Sampling Rate	80M Samples/sec, continuous	

Video Bandwidth	≥ 30MHz	
Single Capture Bandwidth	≥ 30MHz	
Minimum Pulse Width	50ns	
Average Power Measurement Accuracy⁽³⁾	S87234D	≤ ±0.20dB (±4.5%)
	S87234E	≤ ±0.25dB (±6.0%)
	S87234F	≤ ±0.30dB (±6.7%)
	S87234L	≤ ±0.33dB (±7.9%)
Maximum Capture Length	1s (down frequency)	
	1.2ms (maximum sample rate)	
Maximum Pulse Repetition Frequency	10MHz	
Maximum SWR	S87234D	1.20 (50MHz - 2GHz)
		1.26 (2GHz - 18GHz)
	S87234E	1.20 (50MHz - 2GHz)
		1.26 (2GHz - 18GHz) 1.35 (18GHz - 26.5GHz)
S87234F	1.20 (50MHz - 2GHz)	
	1.26 (2GHz - 18GHz) 1.35 (18GHz - 26.5GHz) 1.50 (26.5GHz - 40GHz)	
S87234L	1.20 (500MHz - 2GHz)	
	1.26 (2GHz - 18GHz) 1.35 (18GHz - 26.5GHz) 1.50 (26.5GHz - 40GHz) 1.70 (40GHz - 67GHz)	
Calibration Uncertainty	S87234D	4% (50MHz - 10GHz)
		4.5% (10GHz - 18GHz)
	S87234E	4.2% (50MHz - 1GHz)
		4.5% (1GHz - 18GHz) 5.3% (18GHz - 26.5GHz)
S87234F	4.2% (50MHz - 1GHz)	
	4.5% (1GHz - 18GHz) 5.3% (18GHz - 26.5GHz) 5.8% (26.5GHz - 40GHz)	
S87234L	4.5% (500MHz - 18GHz)	
	5.3% (18GHz - 26.5GHz) 5.8% (26.5GHz - 40GHz)	

		7.0% (40GHz - 67GHz)
Connector	S87234D	N-Type(m)
	S87234E	3.5mm(m)
	S87234F	2.4mm(m)
	S87234L	1.85mm(m)

Note:

(1) It is recommended to perform zero calibration when the machine is turned on, the temperature has changed significantly or a long time has passed since the last zero calibration. An external zero calibration should be performed in averaging mode and ensure that the power meter and RF source are isolated.

(2) It is valid when the frequency is $\geq 500\text{MHz}$ and the video bandwidth is closed.

(3) It is valid when the power range is -15dBm to $+20\text{dBm}$, the frequency is $\geq 500\text{MHz}$, and the SWR is less than 1.20. In the free running mode, the average value is set to 32.

4. Time Base / Trigger

Time Base	Range	2ns/div to 100ms/div
	Accuracy	$\pm 25\text{ppm}$
Internal Trigger (typ.)	Range	-20dBm to $+20\text{dBm}$
	Resolution	0.1dB
	Level Accuracy	$\pm 0.5\text{dB}$
External TTL Trigger Input	High Level	$> 2.4\text{V}$
	Low Level	$< 0.7\text{V}$
	Trigger Pulse Width	10ns (min.)
	Trigger Repetition Period	50ns (min.)
	Trigger Input Voltage	5V (max.)
	Impedance	50 Ω
External TTL Trigger Output	High Level	$> 2.4\text{V}$
	Low Level	$< 0.7\text{V}$
	Impedance	50 Ω
Trigger Delay	Range	$\pm 1.0\text{s}$ (max.)
	Resolution	1%, min. 12.5ns
Trigger Holdoff	Range	1 μs - 400ms
	Resolution	1%, min. 12.5ns

5. Input & Output

RF Input	S87234D	N-Type(m)
	S87234E	3.5mm(m)
	S87234F	2.4mm(m)
	S87234L	1.85mm(m)
Trigger Input	Compatible with TTL level, MMCX connector	
Trigger Output	Compatible with TTL level, MMCX connector	
Video Output	0-1V, 50 ohm impedance, MMCX connector	
Programmable Interface	USB 2.0, compatible with USB-TMC	
Maximum Measurement Speed	50,000 per second	

6. General Information

Dimension (W×H×D)	S87234D	141.1mm × 52.0mm × 34.0mm
	S87234E	133.9mm × 52.0mm × 34.0mm
	S87234F	124.7mm × 52.0mm × 34.0mm
	S87234L	124.7mm × 52.0mm × 34.0mm
Weight	< 0.3kg	
Power Supply	+5V, 500mA	
Operation Temperature	0°C to 50°C	
Storage Temperature	-40°C to +70°C	
Altitude	0 - 4600m	
Vibration	Random vibration: Frequency 5 - 100Hz, power spectral density 0.015g ² /Hz; Frequency 100 - 137Hz, slope -6dB; Frequency 137 - 350Hz, power spectral density 0.0075g ² /Hz; Frequency 350 - 500Hz, slope -6dB; Frequency 500Hz, power spectral density 0.0039g ² /Hz.	
Reliability Requirement	MTBF (θ_0) ≥ 5000h	
Master PC	Operating System	Windows 10 32-bit & 64-bit, Windows 7 32-bit & 64-bit, Windows XP, Linux (support visa library)
	Hardware	Processor: 1GHz or higher (2GHz or higher recommended) RAM: 2GB or more (4GB or more recommended)

	Hard Disk Space: 1.0GB or more Display: 1280 × 1024 or higher
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7. Ordering Information

Part Number	Frequency Range
S87234D	50MHz - 18GHz
S87234E	50MHz - 26.5GHz
S87234F	50MHz - 40GHz
S87234L	500MHz - 67GHz

8. Standard Package

Number	Description	Qty.
1	Power sensor	1
2	Power cable, 2 meter	1
3	Trigger cable, 2 meter	2
4	CD (PC software)	1

9. Options

Option Number	Description	Note
S87234-H01	Power cable	4.5 meter
S87234-H02	Trigger cable	4.5 meter
S87234-H03	Certificate of calibration	/
S87234-H05A	Hard carrying case	(can carry one set of products)
S87234-H05B	Hard carrying case	(can carry two sets of products)

- End of Document -