

13. SPECIFICATIONS

13.1 U4941/4941PHS Specifications

(1) Frequency

• Frequency range	9 kHz to 2.2 GHz
• Frequency readout accuracy (Start, Stop, CF, Marker frequency)	$\pm (\text{span} \times \text{span accuracy} + 0.15 \times \text{RBW} + 50 \text{ kHz})$
• Count frequency marker Resolution Count accuracy	1 Hz to 1 kHz $\pm (\text{marker frequency} \times \text{frequency reference accuracy} + 1\text{LSD} + 5 \text{ Hz})$ (S/N ≥ 25 dB, 50 kHz \leq SPAN ≤ 10 MHz, RBW ≥ 100 kHz)
• Frequency reference accuracy	$\pm 2 \times 10^{-6}/\text{Year}$ $\pm 1 \times 10^{-5}$ (0°C to 50°C)
• Frequency span Range Accuracy	50 kHz to 2.4 GHz, ZERO $\leq \pm 5\%$ (SPAN ≥ 100 kHz)
• Frequency stability Residual FM Drift	≤ 3 kHz p-p/100 ms ≤ 10 kHz (Frequency is fixed. 30 minutes after power ON. Sweep time: 50 ms to 5 s, temperature is fixed.)
• Sideband noise	≤ -100 dBc/Hz (20 kHz offset)
• Resolution bandwidth (3 dB) Range Bandwidth range accuracy Selectivity Bandwidth (6 dB)	1 kHz to 3 MHz, 1-3 sequence $\leq \pm 20\%$ (1 kHz to 1 MHz) $\leq \pm 25\%$ (3 MHz) $\leq 15 : 1$ (60 dB : 3 dB) 9 kHz, 120 kHz
• Video bandwidth	10 Hz to 3 MHz

(2) Amplitude range

• Measurement range	+ 20 dBm to Average indicated noise level
• Maximum input level Preamplifier OFF	+ 27 dBm (Input ATT \geq 10 dB) \pm 50V DC max
Preamplifier ON	+ 13 dBm \pm 50V DC max
• Display range Log	10 \times 10div 10, 5, 2, 1 dB/div
Linear	10% /div of reference level
QP Log	40 dB (5 dB/div)
• Reference level range Preamplifier OFF Log	- 64 dBm to + 40 dBm (0.1 dB step)
Linear	141.1 μ V to 22.36 V
Preamplifier ON Log	- 84 dBm to + 5 dBm (0.1 dB step)
Linear	14.11 μ V to 707.1 mV
• Input attenuator range	0 to 50 dB (10 dB step)

(3) Dynamic range

<ul style="list-style-type: none"> • Display average noise level <li style="padding-left: 20px;">Preamplifier OFF <li style="padding-left: 20px;">Preamplifier ON 	<p>– 117 dBm + 2.7f (GHz)dB (RBW 1 kHz, VBW 10 Hz, INPUT ATT 0 dB, frequency 1 MHz or more)</p> <p>– 132 dBm + 3.3f (GHz)dB (RBW 1 kHz, VBW 10 Hz, INPUT ATT 0 dB, frequency 1 MHz or more)</p>
<ul style="list-style-type: none"> • 1 dB gain compression <li style="padding-left: 20px;">Preamplifier OFF <li style="padding-left: 20px;">Preamplifier ON 	<p>– 10 dBm (mixer input level) Frequency 10 MHz or more</p> <p>– 40 dBm (RF input level) Frequency 10 MHz or more</p>
<ul style="list-style-type: none"> • Spurious response <li style="padding-left: 20px;">Preamplifier OFF <li style="padding-left: 40px;">2nd harmonic distortion <li style="padding-left: 40px;">3rd-order inter modulation distortion 	<p>≤ -70 dB – 30 dBm input (INPUT ATT 0 dB, frequency > 10 MHz)</p> <p>≤ -70 dB – 30 dBm input (INPUT ATT 0 dB, frequency > 10 MHz)</p>
<ul style="list-style-type: none"> • Residual response <li style="padding-left: 20px;">Preamplifier OFF <li style="padding-left: 20px;">Preamplifier ON 	<p>≤ -100 dBm (INPUT ATT 0 dB, INPUT 50Ω terminated, frequency > 1 MHz)</p> <p>≤ -115 dBm (INPUT ATT 0 dB, INPUT 50Ω terminated, frequency > 1 MHz)</p>

(4) Amplitude accuracy

<ul style="list-style-type: none"> ● Frequency response <li style="padding-left: 20px;">Preamplifier OFF <li style="padding-left: 20px;">$\leq \pm 1.0$ dB (100 kHz to 2 GHz) <li style="padding-left: 20px;">$\leq \pm 2.0$ dB (9 kHz to 2.2 GHz) <li style="padding-left: 20px;">(INPUT ATT 10 dB, 20°C to 30°C, referenced to 30 MHz after self calibration) <li style="padding-left: 20px;">Preamplifier ON <li style="padding-left: 20px;">$\leq \pm 1.0$ dB (100 kHz to 2 GHz) <li style="padding-left: 20px;">$\leq \pm 2.0$ dB (9 kHz to 2.2 GHz) <li style="padding-left: 20px;">(INPUT ATT 0 dB, 20°C to 30°C, referenced to 30 MHz after self calibration) 	
<ul style="list-style-type: none"> ● Calibration signal accuracy 	- 20 dBm \pm 0.3 dB
<ul style="list-style-type: none"> ● IF gain error (after self calibration) 	< \pm 0.5 dB
<ul style="list-style-type: none"> ● Scale fidelity accuracy (after self calibration) <li style="padding-left: 20px;">LOG <li style="padding-left: 20px;">$\leq \pm 1.5$ dB/90 dB <li style="padding-left: 20px;">$\leq \pm 1.0$ dB/10 dB <li style="padding-left: 20px;">$\leq \pm 0.2$ dB/1 dB <li style="padding-left: 20px;">LIN <li style="padding-left: 20px;">$\leq \pm 5\%$ of reference level 	
<ul style="list-style-type: none"> ● Input attenuator (20 to 50 dB settings referenced to 10 dB) 	$\leq \pm 1.0$ dB (100 kHz to 2 GHz) $\leq \pm 1.5$ dB (9 kHz to 2.2 GHz)
<ul style="list-style-type: none"> ● Resolution bandwidth switching error (after self calibration) 	$\leq \pm 1.0$ dB (at reference bandwidth: 3 MHz)

(5) Sweep

<ul style="list-style-type: none"> ● Sweep time <li style="padding-left: 20px;">Accuracy 	50 ms to 1000 s and manual sweep $\leq \pm 5\%$
<ul style="list-style-type: none"> ● Trigger mode 	FREE RUN, SINGLE, VIDEO, EXT, TV

(6) Demodulation

<ul style="list-style-type: none"> ● Spectrum demodulation <li style="padding-left: 20px;">Modulation type <li style="padding-left: 20px;">Audio output 	AM, FM Speaker and phone jack with volume control adjustable
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(7) Input/Output

<ul style="list-style-type: none"> • RF input <ul style="list-style-type: none"> Connector Impedance Preamplifier OFF Preamplifier ON 	N-type female 50 Ω (nominal) VSWR \leq 1.5 (100 kHz to 2 GHz) VSWR \leq 2.0 (9 kHz to 2.2 GHz) INPUT ATT \geq 10 dB VSWR \leq 2.1 (10 MHz to 2 GHz) INPUT ATT \geq 0 dB
<ul style="list-style-type: none"> • 10 MHz reference input <ul style="list-style-type: none"> Connector Impedance Input range 	BNC female, rear panel 50 Ω (nominal) + 8 dBm to + 16 dBm
<ul style="list-style-type: none"> • Video output <ul style="list-style-type: none"> Connector Impedance Amplitude (75Ω termination) 	BNC female, rear panel 75 Ω (nominal), AC coupled Approx. 1Vp-p, 75 Ω termination (composite video signal)
<ul style="list-style-type: none"> • External trigger input <ul style="list-style-type: none"> Connector Impedance Trigger level 	BNC female, rear panel 10 k Ω (nominal), DC coupled TTL level
<ul style="list-style-type: none"> • Gate input <ul style="list-style-type: none"> Connector Impedance Sweep stop Sweep continue 	BNC female, rear panel 10 k Ω (nominal) during TTL level low level during TTL level high level
<ul style="list-style-type: none"> • Phone output <ul style="list-style-type: none"> Connector Power output 	Subminiature monophonic 3.6 ϕ mm jack, front panel 0.2 watt max. 8 Ω (nominal)
<ul style="list-style-type: none"> • GPIB <ul style="list-style-type: none"> Plotter Printer 	IEEE-488, bus connector Supports R9833, HP7470A, HP7475A, HP7440A, HP7550A, 682-XA HP2225AJ
<ul style="list-style-type: none"> • RS-232 <ul style="list-style-type: none"> Printer 	D-SUB 9 pin, rear panel BJ-10, VP-600, MJ400, HP505J

**RF FIELD ANALYZER
OPERATION MANUAL**

13.1 U4941/4941PHS Specifications

(cont'd)

<ul style="list-style-type: none"> ● Power input Battery mounter adapted 	Advantest AC/DC adapter Model: A08364 Automatically selections between 100 VAC and 200 VAC Antonbauer Inc: PROPAC14 battery (nominal 60WH)
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(8) General specifications

<ul style="list-style-type: none"> ● Environment temperature Operating temperature Non-operating temperature Relative humidity 	0°C to +50°C -20°C to +60°C RH 85% or less
<ul style="list-style-type: none"> ● Power supply External DC input Power consumption during DC operation During AC adapter is used During 100 VAC operation During 220 VAC operation 	Connector: XLR 4 pin Input range: +10 V to +16 V 50W max. Automatically selections between 100 VAC and 220 VAC Voltage: 100 V to 120 V Power consumption: 110 VA max Frequency: 50/60 Hz Voltage: 220 V to 240 V Power consumption: 110 VA max. Frequency: 50/60 Hz
<ul style="list-style-type: none"> ● Mass 	Approx. 6.8 kg (Without carrying belt, accessory, battery and option)
<ul style="list-style-type: none"> ● Dimensions 	Approx. 148 (height) × 291 (wide) × 330 (depth) mm Excluding the projecting (legs, connector, etc.).
<ul style="list-style-type: none"> ● External memory Memory card 	2 slot, upper panel Connector: JEIDA-Ver4.1, PCMCIA Rel 2.0