

9.1 R3265 Specifications

(1) Frequency

<p>● Frequency range</p>	<p>100Hz to 8GHz</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Frequency band</th> <th style="text-align: left;">Higher harmonics degree</th> </tr> </thead> <tbody> <tr> <td>100Hz to 3.6GHz</td> <td>1</td> </tr> <tr> <td>3.5GHz to 7.5GHz</td> <td>1</td> </tr> <tr> <td>7.4GHz to 8GHz</td> <td>1</td> </tr> </tbody> </table>	Frequency band	Higher harmonics degree	100Hz to 3.6GHz	1	3.5GHz to 7.5GHz	1	7.4GHz to 8GHz	1							
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100Hz to 3.6GHz	1															
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7.4GHz to 8GHz	1															
<p>● Frequency read accuracy (Start, Stop, Center frequency, Marker frequency)</p>	<p>\pm (Frequency reading \times Frequency reference accuracy + Span \times Span accuracy + 0.15 \times Resolution bandwidth + 10Hz)</p> <p>Span accuracy (Span > 2MHz) \pm 3% (Span \leq 2MHz) \pm 5%</p>															
<p>● Marker frequency counter Resolution Accuracy (S/N \geq 25dB)</p> <p>Delta counter accuracy</p>	<p>1Hz to 1kHz</p> <p>\pm (Marker frequency \times Frequency reference accuracy + 5Hz + 1LSD)</p> <p>\pm (Δfrequency \times Frequency reference accuracy + 10Hz + 2LSD)</p>															
<p>● Frequency reference accuracy</p>	<p>$\pm 2 \times 10^{-8}$ /Day $\pm 1 \times 10^{-8}$ /Year</p>															
<p>● Frequency stability Residual FM (Zero span) Drift (After 1 hour warm-up)</p>	<p>$< 3\text{Hz}_{p.p.} / 0.1\text{sec}$</p> <p>50kHz < Span \leq 2MHz, $< 2.5\text{kHz} \times \text{Sweep speed (min.)} \times N$ Span \leq 50kHz, $< 60\text{Hz} \times \text{Sweep speed (min.)} \times N$</p>															
<p>● Signal purity noise side band</p>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="text-align: left;">Offset</th> <th style="text-align: left;">f \leq 2.6GHz</th> <th style="text-align: left;">f > 2.6GHz</th> </tr> </thead> <tbody> <tr> <td>1kHz</td> <td>$< -100\text{dBc/Hz}$</td> <td>$< -95\text{dBc/Hz}$</td> </tr> <tr> <td>10kHz</td> <td>$< -110\text{dBc/Hz}$</td> <td>$< -108\text{dBc/Hz}$</td> </tr> <tr> <td>20kHz</td> <td>$< -110\text{dBc/Hz}$</td> <td>$< -108\text{dBc/Hz}$</td> </tr> <tr> <td>100kHz</td> <td>$< -114\text{dBc/Hz}$</td> <td>$< -110\text{dBc/Hz}$</td> </tr> </tbody> </table>	Offset	f \leq 2.6GHz	f > 2.6GHz	1kHz	$< -100\text{dBc/Hz}$	$< -95\text{dBc/Hz}$	10kHz	$< -110\text{dBc/Hz}$	$< -108\text{dBc/Hz}$	20kHz	$< -110\text{dBc/Hz}$	$< -108\text{dBc/Hz}$	100kHz	$< -114\text{dBc/Hz}$	$< -110\text{dBc/Hz}$
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● Frequency span	Linear span	Range Accuracy	200Hz to 8GHz, Zero span ± 3% (Span > 2MHz), ± 5% (Span ≤ 2MHz)
	Logarithmic span	Range Accuracy	1KHz to 1GHz (1, 2, 3 decade can be selected) ± (10% + Stop frequency × 0.1%)
● Resolution bandwidth (- 3dB)	Range Accuracy		10Hz to 3MHz, 1, 3, 10 sequence ± 50% (Resolution bandwidth 10 to 100Hz, Digital IF) ± 15% (Resolution bandwidth 100Hz to 1MHz) ± 25% (Resolution bandwidth 3MHz, 30Hz) 30Hz at 25°C ± 10°C
		Selectivity Bandwidth (6dB)	< 15:1 (100Hz to 3MHz) < 20:1 (30Hz) 5:1 (10 to 100Hz, Digital IF) Nominal 200Hz, 9kHz, 120kHz (based on the CISPR specification)
● Video bandwidth	Range		1Hz to 3MHz, 1, 3, 10 sequence

(2) Amplitude range

● Measurement range		+ 30dBm to the average indication noise level
● Maximum safe input	Average continuous power (Input ATT ≥ 10dB) DC input	± 30dBm (1W) 0 [V]
● Display range	Logarithmic Linear QP logarithm	10 × 10 div. 10, 5, 2, 1, 0.5, 0.2, 0.1 dB/div. 10%/div. of the reference level 40dB (5dB/div.)
● Reference level range	Logarithmic Linear	- 140dBm to + 60dBm (0.1dB step) 2.2 μV to 223V (approx. 1% step of the full scale)
● Input attenuator range		0 to 70dB (10dB step)

(3) Dynamic range

<p>● Maximum dynamic range 1dB gain compression level Noise level</p> <p>Input frequency Distortion characteristics Higher harmonics 100MHz to 3.6GHz 10MHz to 3.6GHz 10MHz > 3.5GHz</p> <p>Tertiary intermodulation > 200MHz > 10MHz</p>	<p>100MHz to 3.6GHz : 135dB – 1.55 × f(GHz)dB 10MHz to 3.6GHz : 130dB – 1.55 × f(GHz)dB</p> <p>87d 82.5dB 112dB</p> <p>93dB 90dB</p>
<p>● Average display noise level (Resolution bandwidth 10Hz (Digital IF), Input attenuator 0dB, Average 20 times) Frequency range 1kHz 10kHz 100kHz 1MHz to 3.6GHz 3.5GHz to 8GHz</p>	<p>– 100dBm – 110dBm – 111dBm – {140 - 1.55 × f (GHz)}dBm – {145 - 1.55 × f (GHz)}dBm (Low noise mode) – 135dBm</p>
<p>● 1dB gain compression > 200MHz > 10MHz</p>	<p>– 5dBm (Mixer input level) – 10dBm (Mixer input level)</p>
<p>● Spurious response Secondary higher harmonics distortion Frequency range 100MHz to 3.6GHz 10MHz to 3.6GHz 10MHz > 3.5GHz</p> <p>Tertiary higher harmonics distortion Frequency range 200MHz to 3.6GHz 10MHz to 3.6GHz 10MHz > 3.5GHz</p> <p>Image/Multiple/Band external response 10MHz to 8GHz</p>	<p>Mixer level – 30dBm < – 70dBc – 30dBm < – 60dBc – 10dBm < – 100dBc</p> <p>Mixer level – 30dBm < – 70dBc – 30dBm < – 60dBc – 30dBm < – 75dBc</p> <p>< – 70dBc</p>

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Residual response (No input signal, Input ATT 0dB, 50Ω terminate) 1MHz to 3.6GHz 300kHz to 8GHz	< - 100dBm < - 90dBm
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(4) Amplitude accuracy

<ul style="list-style-type: none"> ● Frequency response Flatness within the band (Input ATT 10dB) <ul style="list-style-type: none"> 100Hz to 3.6GHz ± 1.5dB 50MHz to 2.6GHz ± 1.0dB 3.5GHz to 7.5GHz ± 1.5dB 7.4GHz to 8GHz ± 1.5dB Additional error due to band switching < + 0.5dB Calibration signal as the reference (Input ATT 10dB) ± 3dB (100Hz to 8GHz) 	
<ul style="list-style-type: none"> ● Calibration signal accuracy 	- 10dBm ± 0.3dBm
<ul style="list-style-type: none"> ● IF gain error (After self calibration) <ul style="list-style-type: none"> 0dBm to -50dBm ± 0.3dB 0dBm to -80dBm ± 0.7dB ● Scale indication accuracy (After self calibration) <ul style="list-style-type: none"> Logarithmic <ul style="list-style-type: none"> ± 0.2dB/1dB ± 1dB/10dB ± 1.5dB/90dB Linear <ul style="list-style-type: none"> ± 5% of reference level ± 1.0dB/30dB, ± 2dB/40dB QP mode logarithmic <ul style="list-style-type: none"> ± 1.0dB/40dB (25°C ± 10°C) 	
<ul style="list-style-type: none"> ● Error due to input attenuator switching (10dB as the reference; at 20 to 70dB) Frequency range 0 to 8GHz 	± 1.1dB/10dB step, Maximum 2.0dB
<ul style="list-style-type: none"> ● Error due to resolution bandwidth switching (Resolution bandwidth: 300kHz, reference; After self calibration) 	100Hz to 3MHz; ± 0.3dB 30Hz ± 1dB 10Hz to 100Hz (digital IF) ± 15dB

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<ul style="list-style-type: none"> ● Pulse quantization error (In pulse measurement mode, PRF > 700/Sweep time) Peak to peak <li style="padding-left: 20px;">Logarithmic <li style="padding-left: 20px;">Linear 	<ul style="list-style-type: none"> 1.2dB (Resolution bandwidth ≤ 1MHz) 3dB (Resolution bandwidth = 3MHz) 4% of the reference level (Resolution bandwidth ≤ 1MHz) 12% of the reference level (Resolution bandwidth = 3MHz)
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(5) Sweep

<ul style="list-style-type: none"> ● Sweep time <li style="padding-left: 20px;">Zero span <li style="padding-left: 20px;">Span ≥ 200Hz <li style="padding-left: 20px;">Accuracy 	<ul style="list-style-type: none"> 50μs to 1000s, Manual sweep 20ms to 1000s, Manual sweep ± 3%
<ul style="list-style-type: none"> ● Trigger 	<ul style="list-style-type: none"> Free run, Line, Single, Video, TV-H, TV-V, External

(6) Demodulation

<ul style="list-style-type: none"> ● Spectrum demodulation <li style="padding-left: 20px;">Modulation type <li style="padding-left: 20px;">Audio output <li style="padding-left: 20px;">Demodulation duration 	<ul style="list-style-type: none"> AM, FM Internal speaker, Earphone jack. Sound volume adjustable 100ms to 1000s
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(7) Input/Output

<ul style="list-style-type: none"> ● RF input <li style="padding-left: 20px;">Connector <li style="padding-left: 20px;">Impedance <li style="padding-left: 20px;">VSWR <li style="padding-left: 20px;">(Frequency setting input ATT ≥ 10dB) <li style="padding-left: 20px;">LO radiation (Average) <li style="padding-left: 20px;">Frequency setting 0 to 8GHz 	<ul style="list-style-type: none"> N-type female 50Ω(Nominal) < 1.5 : 1 (≤ 3.6GHz) (Nominal) < 2.0 : 1 (> 3.6GHz) (Nominal) < - 80dBm Typ, Input ATT 10dB
<ul style="list-style-type: none"> ● First LO output <li style="padding-left: 20px;">Connector <li style="padding-left: 20px;">Impedance <li style="padding-left: 20px;">Frequency range <li style="padding-left: 20px;">Amplitude 	<ul style="list-style-type: none"> SMA female, Front panel 50Ω(Nominal) 3.921 to 7.921GHz ± 5dBm or above

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<ul style="list-style-type: none"> ● Calibration signal output <ul style="list-style-type: none"> Connector Frequency Impedance Amplitude 	<p>BNC female, Front panel 25MHz × (1 ± Frequency reference accuracy) 50Ω (Nominal) – 10dBm ± 0.3dB</p>									
<ul style="list-style-type: none"> ● 10MHz frequency reference input/output <ul style="list-style-type: none"> Connector Impedance Frequency range Amplitude Input range 	<p>BNC female, Rear panel 50Ω(Nominal) 10MHz × Frequency reference accuracy 0dBm ± 3dB – 5dBm to + 5dBm</p>									
<ul style="list-style-type: none"> ● 21.4MHz IF output <ul style="list-style-type: none"> Connector mpedance Amplitude 3dB bandwidth 	<p>BNC female, Rear panel 50Ω (Nominal) 0dBm (Typ) in full scale = Resolution bandwidth</p>									
<ul style="list-style-type: none"> ● 421MHz IF output <ul style="list-style-type: none"> Connector Impedance Gain, Noise factor, 3dB bandwidth Frequency range 1MHz to 3.6GHz 3.5GHz to 8GHz 	<p>BNC female, Rear panel 50Ω (Nominal)</p> <table border="1" data-bbox="750 1079 1365 1249" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>3dB bandwidth (Nominal)</th> <th>Noise factor (Nominal)</th> <th>Gain (Nominal)</th> </tr> </thead> <tbody> <tr> <td>> 15MHz</td> <td>17dB</td> <td>+ 6dB</td> </tr> <tr> <td>> 30MHz</td> <td>24dB</td> <td>– 9dB</td> </tr> </tbody> </table>	3dB bandwidth (Nominal)	Noise factor (Nominal)	Gain (Nominal)	> 15MHz	17dB	+ 6dB	> 30MHz	24dB	– 9dB
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> 15MHz	17dB	+ 6dB								
> 30MHz	24dB	– 9dB								
<ul style="list-style-type: none"> ● Video output <ul style="list-style-type: none"> Connector Impedance (AC connection) Amplitude (75Ωterminate) 	<p>BNC female, Rear panel 75Ω(Nominal) Approx. 1V_{P-P} (Composite video signal)</p>									
<ul style="list-style-type: none"> ● X axis, 2V/nGHz output <ul style="list-style-type: none"> Connector Impedance X axis output 2V/nGHz ● Y axis output <ul style="list-style-type: none"> Connector Impedance Amplitude 	<p>BNC female, Rear panel 1kΩ (Nominal), DC connection approx. – 5V to + 5V approx. 2V per 1GHz</p> <p>BNC female, Rear panel 220Ω (Nominal) approx. 2V in full scale</p>									

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<ul style="list-style-type: none"> ● Z axis output <ul style="list-style-type: none"> Connector Amplitude During sweep Retrace interval 	<ul style="list-style-type: none"> BNC female, Rear panel TTL level High level Low level
<ul style="list-style-type: none"> ● External trigger input <ul style="list-style-type: none"> Connector Impedance Trigger level 	<ul style="list-style-type: none"> BNC female, Rear panel 10kΩ (Nominal), DC connection TTL level
<ul style="list-style-type: none"> ● Gate input <ul style="list-style-type: none"> Connector Impedance Sweep stop Sweep 	<ul style="list-style-type: none"> BNC female, Rear panel 10kΩ (Nominal) During low mode at TTL level During high mode at TTL level
<ul style="list-style-type: none"> ● Probe power <ul style="list-style-type: none"> Voltage Current 	<ul style="list-style-type: none"> 4-pin connector, Front panel + 15V, - 15V 150mA each
<ul style="list-style-type: none"> ● Voice output (Modulation audio) <ul style="list-style-type: none"> Connector Power output 	<ul style="list-style-type: none"> Small-size monophonic jack, Front panel Maximum 0.2W, 8Ω (Nominal)
<ul style="list-style-type: none"> ● GPIB Plotter 	<ul style="list-style-type: none"> IEEE-488 bus connector R9833, HP7470A, HP7475A, HP7440A, HP7550A

(8) General specifications

<ul style="list-style-type: none"> ● Temperature and humidity <ul style="list-style-type: none"> During operation When stored Humidity 	<ul style="list-style-type: none"> 0°C to 50°C - 20°C to 60°C RH 85% or below
<ul style="list-style-type: none"> ● Power source <ul style="list-style-type: none"> During 100VAC operation Voltage Power consumption Frequency During 220VAC operation Voltage Power consumption Frequency 	<ul style="list-style-type: none"> 90V to 132V 400VA at maximum 48Hz to 440Hz 198V to 250V 400VA at maximum 48Hz to 66Hz
<ul style="list-style-type: none"> ● Weight 	<ul style="list-style-type: none"> 22kg (Nominal) (Excluding optional blocks, front cover, and accessories)
<ul style="list-style-type: none"> ● Dimensions 	<ul style="list-style-type: none"> Approx. 177mm (Height) × 353mm (Width) × 450mm (Depth) (Excluding the handle, legs and front cover)