

● R3267 Specifications

Frequency

Frequency range: 100 Hz to 8 GHz

Frequency	Frequency band	Harmonic order N
100 Hz to 3.5 GHz	0	1
1.6 to 3.5 GHz	1	1
3.5 to 7 GHz	2	1
6.9 to 8 GHz	3	1

Built-in YIG tuning pre-selector at 1.6 to 8 GHz

Frequency span

Range	20 Hz to 8 GHz, Zero span
Accuracy	±1%

Signal purity (dBc/Hz)

Frequency	Offset			
	1 kHz	10 kHz	100 kHz	1 MHz
100 Hz to 1 GHz	-100	-113	-118	-135
1 to 2.6 GHz	-100	-110	-118	-135
2.6 to 8 GHz	-98	-108	-112	-135

Input attenuator range

0 to 75 dB (5 dB steps)

Dynamic range

Average noise level

(Resolution bandwidth 100 Hz, input ATT 0 dB, video bandwidth 1 Hz)

Frequency	Frequency band	Average noise level
1 kHz	0	-90 dBm
10 kHz	0	-100 dBm
100 kHz	0	-101 dBm
1 MHz	0	-125 dBm
1 MHz to 3.5 GHz	0	-(130 - f (GHz)) dBm
1.6 to 3.5 GHz	1	-125 dBm
3.5 to 7 GHz	2	-125 dBm
6.9 to 8 GHz	3	-125 dBm

Average noise level

(Resolution bandwidth 1 Hz (digital), input ATT 0 dB)

Frequency	Frequency band	Average noise level
10 kHz	0	-120 dBm
100 kHz	0	-121 dBm
1 MHz	0	-141 dBm
10 MHz to 3.5 GHz	0	-(150 - f (GHz)) dBm
1.6 to 3.5 GHz	1	-145 dBm
3.5 to 7 GHz	2	-145 dBm
6.9 to 8 GHz	3	-145 dBm

1 dB gain compression

10 to 100 MHz	-3 dBm
100 MHz to 8 GHz	0 dBm

Spurious response

2nd-order harmonics distortion

	Frequency	Frequency band	Mixer level
<-70 dBc	10 MHz to 3.5 GHz	0	-30 dBm
<-90 dBc	> 1.6 GHz	1, 2, 3	-10 dBm

2-tone 3rd-order intermodulation distortion

(When using the digital filter, distortion measurement should be performed on condition that $Df > 5$ kHz)

	Frequency	Frequency band	Mixer level
<-70 dBc	10 to 100 MHz	0	-30 dBm
<-80 dBc	100 MHz to 1 GHz	0	-30 dBm
<-85 dBc	1 to 3.5 GHz	0	-30 dBm
<-90 dBc	1.6 to 8 GHz	1, 2, 3	-30 dBm

Image/multiple/out-band response

<-70 dBc (10 MHz to 8 GHz)

Residual response (No input, input ATT 0 dB, 50 Ω termination)

<-100 dBm	1 MHz to 3.5 GHz
<-90 dBm	300 kHz to 8 GHz

Amplitude accuracy

Frequency response

(Input ATT 10 dB, after tuning pre-selector for bands 1 to 3)

Frequency	Frequency band	In-band flatness (relative value)
100 MHz to 3.5 GHz	0	±1.5 dB
50 MHz to 2.6 GHz	0	±1.0 dB
1.6 to 3.5 GHz	1	±1.5 dB
3.5 to 7.0 GHz	2	±1.5 dB
6.9 to 8.0 GHz	3	±1.5 dB

Additional error by band switching	±0.5 dB
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Flatness with 30 MHz calibration signal as reference	±3.0 dB (100 Hz to 8.0 GHz)
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Input ATT switching error

(Reference 10 dB at 15 to 75 dB)

Frequency range	Error
100 Hz to 8 GHz	±1.1 dB/5 dB steps, max. 2.0 dB

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● R3273 Specifications

Frequency

Frequency range: 100 Hz to 26.5 GHz
26.5 to 60 GHz (with external mixer; tuning possible up to 325 GHz)

Frequency	Frequency band	Harmonic order N
100 Hz to 3.5 GHz	0	1
3.5 to 7.5 GHz	1	1
7.4 to 15.4 GHz	2	2
15.2 to 26.5 GHz	3	4

Built-in YIG tuning pre-selector at 3.5 to 26.5 GHz

Frequency span

Range	20 Hz to 26.5 GHz, Zero span
Accuracy	±1%

Signal purity (dBc/Hz)

Frequency	Offset			
	1 kHz	10 kHz	100 kHz	1 MHz
100 Hz to 1 GHz	-100	-113	-118	-135
1 to 2.6 GHz	-100	-110	-118	-135
2.6 to 7.5 GHz	-98	-108	-112	-135
7.4 to 15.4 GHz	-89	-102	-106	-129
15.2 to 26.5 GHz	-83	-96	-100	-123

Input ATT range

0 to 70 dB (10 dB steps)

Dynamic range

Average noise level

(Resolution bandwidth 100 Hz, input ATT 0 dB, video bandwidth 1 Hz)

Frequency	Frequency band	Average noise level
1 kHz	0	-90 dBm
10 kHz	0	-100 dBm
100 kHz	0	-101 dBm
1 MHz	0	-125 dBm
10 MHz to 3.5 GHz	0	- (130 - f (GHz)) dBm
3.5 to 7.5 GHz	1	-125 dBm
7.4 to 15.4 GHz	2	-122 dBm
15.2 to 22.0 GHz	3	-120 dBm
22.0 to 26.5 GHz	3	-117 dBm

Average noise level

(Resolution bandwidth 1 Hz (digital), input ATT 0 dB)

Frequency	Frequency band	Average noise level
10 kHz	0	-120 dBm
100 kHz	0	-121 dBm
1 MHz	0	-141 dBm
10 MHz to 3.5 GHz	0	- (150 - f (GHz)) dBm
3.5 to 7.5 GHz	1	-145 dBm
7.4 to 15.4 GHz	2	-142 dBm
15.2 to 22.0 GHz	3	-140 dBm
22.0 to 26.5 GHz	3	-137 dBm

1 dB gain compression

10 to 100 MHz	-3 dBm
100 MHz to 3.5 GHz	0 dBm
3.5 to 7.5 GHz	-10 dBm
7.5 to 26.5 GHz	-3 dBm

Spurious response

2nd-order harmonics distortion

	Frequency range	Frequency band	Mixer level
<-70 dBc	10 MHz to 3.5 GHz	0	-30 dBm
<-100 dBc	>3.5 GHz	1, 2, 3	-10 dBm

2-tone 3rd-order intermodulation distortion

(When using the digital filter, distortion measurement should be performed on condition that $Df > 5$ kHz)

	Frequency range	Frequency band	Mixer level
<-70 dBc	10 to 100 MHz	0	-30 dBm
<-80 dBc	100 MHz to 1 GHz	0	-30 dBm
<-85 dBc	1 to 3.5 GHz	0	-30 dBm
<-70 dBc	3.5 to 7.5 GHz	1	-30 dBm
<-75 dBc	7.5 to 26.5 GHz	2, 3	-30 dBm

Image/multiple/out-band response

<-70 dBc (10 MHz to 18 GHz)
 <-60 dBc (10 MHz to 23 GHz)
 <-50 dBc (10 MHz to 26.5 GHz)

Residual response (No input, input ATT 0 dB, 50 Ω termination)

<-100 dBm	1 MHz to 3.5 GHz
<-90 dBm	300 kHz to 26.5 GHz

Amplitude accuracy

Frequency response (Input ATT 10 dB, after tuning pre-selector, for bands 1 to 3)

Frequency	Frequency band	In-band flatness (correlation value)
100 Hz to 3.5 GHz	0	±1.5 dB
50 MHz to 2.6 GHz	0	±1.0 dB
3.5 to 7.5 GHz	1	±1.5 dB
7.4 to 15.4 GHz	2	±3.5 dB
15.4 to 26.5 GHz	3	±4.0 dB

Additional error by band switching ±0.5 dB

Flatness with 30 MHz calibration signal as reference ±5.0 dB (100 Hz to 26.5 GHz)

Input ATT switching error (Reference 10 dB, at 20 to 70 dB range)

Frequency range	Error
100 Hz to 12.4 GHz	±1.1/10 dB steps, max. 2.0 dB
12.4 to 18 GHz	±1.3/10 dB steps, max. 2.5 dB
18 to 26.5 GHz	±1.8/10 dB steps, max. 3.5 dB

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● R3267/3273 Common Specifications

Frequency read accuracy

\pm (Reading of Frequency x Frequency reference accuracy + Span x Span accuracy + 0.15 x Resolution bandwidth + 10 Hz)

Marker frequency counter (SPAN <1 GHz)

Resolution Accuracy (S/N >25 dB)	1 Hz to 1 kHz \pm (Marker frequency x Frequency reference accuracy + 5 Hz x N + 1LSD)
Delta counter	\pm (Δ Frequency x Frequency reference accuracy + 10 Hz x N + 2LSD)

Frequency reference source

Stability	Aging/day: $\pm 3 \times 10^{-8}$, Aging/year: $\pm 1 \times 10^{-7}$ Warm up (nominal) 3 minutes, $\pm 5 \times 10^{-8}$ (Reference: after 60 minutes)
Temperature stability	$\pm 1 \times 10^{-7}$ (0 to 40°C) (with reference to the frequency when temperature is 25°C $\pm 2^\circ$ C)
OPT.21 Stability	Aging/day: $\pm 5 \times 10^{-9}$, Aging/year: $\pm 8 \times 10^{-8}$ Warm up (nominal) 3 minutes, $\pm 5 \times 10^{-8}$ (Reference: after 60 minutes)
Temperature stability	$\pm 5 \times 10^{-8}$ (0 to 40°C) (with reference to the frequency when temperature is 25°C $\pm 2^\circ$ C)
OPT.22*1 Stability	Aging/day: $\pm 3 \times 10^{-10}$, Aging/year: $\pm 2 \times 10^{-8}$ $\pm 1 \times 10^{-8}$ /30 minutes, $\pm 5 \times 10^{-9}$ /60 minutes warm up (nominal) (Reference: after 24 hours)
Temperature stability	$\pm 5 \times 10^{-9}$ (0 to 50°C) (with reference to the frequency when temperature is +25°C)
OPT.23*1 Stability	(Rubidium frequency reference source) Frequency accuracy: $\pm 5 \times 10^{-9}$, Aging/month: $\pm 1 \times 10^{-10}$
Temperature stability	$\pm 1 \times 10^{-9}$ (0 to 40°C, with reference to the frequency when temperature is +25°C)
Warm-up	$\pm 1 \times 10^{-9}$ /15 minutes

*1 Probe power cannot be used when installing OPT.22 and OPT.23.

Frequency stability

Residual FM (zero span) Drift	<3 Hz x Np-p/0.1 sec. N: Harmonics order Same as reference value
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(After 60 minute warm-up)

Resolution bandwidth (3 dB)

Range	1 Hz to 10 MHz (1, 3, 10 sequences), 5 MHz
Accuracy	$\pm 25\%$: RBW = 3 MHz, 5 MHz $\pm 15\%$: RBW = 100 Hz to 1 MHz $\pm 25\%$ (25 °C ± 10 °C): RBW = 30 Hz $\pm 10\%$: RBW = 1 to 100 Hz (digital filter)
Selectivity	<15:1 (RBW = 100 Hz to 5 MHz) <20:1 (RBW = 30 Hz) <5:1 (RBW = 1 to 100 Hz, digital filter)

Video bandwidth

Range	1 Hz to 10 MHz (1, 3, 10 sequences), 5 MHz
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Frequency sweep

Sweep time	Zero span: 1 μ s to 1000 s Span >0 Hz: 20 ms to 1000 s
Accuracy	$\pm 3\%$ (When using the digital filter, dynamic range measurement is not available)
Trigger	Free run, line, video, external, IF

Gated sweep

Gate position/resolution	100 ns to 1 s/100 ns
Gate value/resolution	1 μ s to 1 s/100 ns
Trigger	IF (Mixer input -40 dBm or more), external trigger, external gate

Delayed sweep

Delay time/resolution	100 ns to 1 s/100 ns
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Amplitude range

Measurement range

+30 dBm, to average noise level

Maximum safety input

Average continuous power (input ATT >10 dB) DC input	+30 dBm (1 W) 0 V
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Display range: 10 x 10 div.

Log mode	10, 5, 2, 1, 0.5 dB/div
Linear mode	10% of the reference level/div.

Reference level range

Log	-140 to +60 dBm (0.1 dB steps)
Linear	22.4 nV to 223 V (steps of about 1% of the full scale)

Calibration signal accuracy (30 MHz)

-10 dBm ± 0.3 dB

IF gain error

(After auto calibration)

0 to -50 dBm	± 0.5 dB
0 to -80 dBm	± 0.7 dB

Scale display accuracy

(After automatic calibration)

Log	0 to -90 dB Max. ± 0.85 dB ± 0.2 /1 dB
Linear	$\pm 5\%$ of reference level

Resolution bandwidth switching error

(Reference: RBW 300 kHz, after automatic calibration)

< ± 0.3 dB (RBW = 100 Hz to 5 MHz)
< ± 1.0 dB (RBW = 30 Hz)
< ± 0.5 dB (RBW = 1 to 100 Hz, digital filter)

Total level accuracy

Accuracy (typ.)	± 1.0 dB Frequency range: 50 MHz to 2.6 GHz (frequency band 0) Resolution bandwidth: 3 kHz to 1 MHz Frequency span: <Resolution bandwidth x 20 Input ATT: 10 dB Log scale display: 0 to -50 dB Reference level: 0 to -50 dBm Detection mode: Sample Ambient temperature: 20 to 30 °C S/N: 20 dB or more
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Input/Output

RF input

Connector	N-type female (R3273 only: SMA convertible)
Impedance	50 Ω (nominal)
VSWR (Input ATT >10 dB, with set frequency)	<1.5:1 (<3.5 GHz) (nominal) <2.1:1 (>3.5 GHz) (nominal)

Calibration signal output

Connector	BNC female, front panel
Frequency	30 MHz x (1 \pm Frequency reference determined)
Impedance	50 Ω (nominal)
Amplitude	-10 dBm \pm 0.3 dB

10 MHz frequency reference output

Connector	BNC female, rear panel
Output impedance	50 Ω (nominal)
Output frequency accuracy	10 MHz x Frequency reference accuracy
Output amplitude range	0 dBm \pm 5 dB

10 MHz frequency reference input

Connector	BNC female, rear panel
Input impedance	50 Ω (nominal)
Input amplitude range	-5 to +5 dBm

Probe power supply

\pm 12.6 V (100 mA) (nominal)

21.4 MHz IF output

Connector	BNC female, rear panel
Impedance	50 Ω (nominal)

421.4 MHz IF output

Connector	BNC female, rear panel
Impedance	50 Ω (nominal)

1st LO output (R3273 only)

Connector	SMA female, front panel
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Video output

Connector	VGA (15-pin, female), rear panel, Equivalent to 640 x 480 dot VGA
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X-axis output

Connector	BNC female, rear panel
Impedance	1 k Ω (nominal), DC-coupled
Amplitude	Approx. -5 to +5 V

Y-axis output

Connector	BNC female, rear panel
Impedance	220 Ω (nominal)
Amplitude	Approx. 2 V for full scale (with 10 dB/div.)

External trigger input

Connector	BNC female, rear panel
Impedance	10 k Ω (nominal), DC-coupled
Trigger level	TTL level

External gate input

Connector	BNC female, rear panel
Impedance	10 k Ω (nominal), DC-coupled
Sweep stop	During LOW on TTL level
Sweep	During HIGH on TTL level

Trigger output

Connector	BNC female, rear panel
Amplitude	TTL level

I/O

GPIB RS232 Printer Extended I/O port FDD	IEEE-488 bus connector, rear panel D-SUB 9-pin, rear panel D-SUB 25-pin, rear panel D-SUB 25-pin, rear panel 3.5-inch floppy disk drive
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Direct print

Output by ESC/P, PCL, or ESC/P raster commands

General Specifications

Temperature

Operating temperature	0 to 50°C
Storage temperature	-20 to +60°C
Humidity	85% RH or less (no condensation)

Power supply: Automatically selects between 100 VAC and 220 VAC

	100 VAC	220 VAC
Voltage	100 V - 120 V	220 V - 240 V
Power consumption	300 VA or less	300 VA or less
Frequency	50/60 Hz	50/60 Hz

Mass

18 kg or less (excluding options, front cover, and accessories)

Dimensions

Approx. 177 (H) x 350 (W) x 420 (D) mm
(without handle, feet, and front cover)

Accessories

Product name	Model name
Power cable	A01412
Input cable	A01036-0150
Converter adapter	JUG-201A/U
Power fuse	T6.3A/250V
Front cover	

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Options

OPT.02 Memory card drive

Memory card drive:	(Exchangeable with floppy disk drive) 2-slot, front panel Connector; JEIDA-Ver. 4.2/PCMCIA2.1
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OPT.08 Rx control

When connected to the R3560

Signal source parameter settings:	Output frequency, output level, output On-Off, modulation parameters
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BER measurement & parameter settings

BER measurement:	Average frequency, bit length, clock polarity, data polarity, measurement interval, TCH frame timing signal
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Receiver sensitivity measurement & parameter settings

Receiver sensitivity measurement:	Search upper and lower limits, search step, search point
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When connected to the R3561

Signal source parameter settings:	Output frequency, output level, output On-Off, modulation On-Off, modulation parameters, I/O clock
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CAL/ADJ function:	AWGN CAL execution, modulator CAL execution, 10 MHz Ref Adjust value setting
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Self Test:	Self Test execution
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When connected to the R3562

Signal source parameter settings:	Output frequency, output level, output On-Off, modulation On-Off, modulation parameters, I/O clock
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BER measurement & parameter settings:	BER settings, data, bit length, clock polarity, data polarity
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CAL/ADJ function:	Modulator CAL execution, 10 MHz Ref Adjust value setting
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Self Test:	Self Test execution
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OPT.09 CDMA test source control (for R3267)

R3561L parameter setting

Output frequency setting:	Range; 10 to 2300 MHz, Resolution; 1 Hz
Output level setting:	Output; ON/OFF, Range; -125 to +6 dBm Resolution; 0.1 dB, unit; dBm, dBμ
Modulation:	ON/OFF Reverse/Forward Link switching, Data rate switching; 9600/4800/2400/ 1200/14400/7200/3600/1800 bps Data source switching; ZEROS/RANDOM/RANDERR/USER (*Written by user via GPIB) PN offset; 0 to 511 (x 64 chips) Burst; ON/OFF Even Second In; ENABLE/DISABLE Equalizing Filter; ON/OFF
Reference standard:	Synthe reference input switching; 19.6608/15/10/9.8304/5/4.9152/ 2.4576/2/1.2288/1 MHz CDMA Time Base input switching; 19.6608/15/10/9.8304/5/4.9152/ 2.4576/2/1.2288/1 MHz/INTERNAL
Save/recall function:	Max. 10 setting
External interface:	GPIB
1st local output:	4241.4 to 6531.4 MHz, 0 dBm or more SMA connector

* 21.4 MHz IF output terminal is erased

OPT.10 Level tuning (for PDC-B5)

Calibration frequency range:	810 to 959.45 MHz 1420 to 1518 MHz
Level measurement range:	+15 to -30 dBm
Level measurement accuracy	
Calibration error:	±0.2 dB or less
Measurement error:	±0.3 dB or less (at 1 dB, 2 dB/DIV, 25°C, Input ATT 30 dB, RBW 30 kHz, 100 kHz, ZERO SPAN mode, TOTAL GAIN after automatic calibration)
During average power measurement mode:	±0.5 dB or less (5 dB, 10 dB/DIV, 25°C)
Temperature-induced TOTAL GAIN calibration error:	0.015 dB/°C
Calibration cycle:	6 months

OPT.11 3GPP level calibration (Power meter function)

Calibration frequency range:	1848.3 to 2171.7 MHz
Level measurement range:	+25 to -60 dBm
Level measurement accuracy	
Measurement error:	±0.4 dB or less (+25 to -50 dBm) ±0.6 dB or less (-50 to -60 dBm) (at 25°C, after GAIN CAL, ATT = AUTO, Min ATT = ON)
Measurement linearity:	±0.2 dB or less (0 to -30 dB)
Temperature-induced GAIN CAL error:	0.015 dB/°C
Calibration cycle:	1 year

OPT.16/17 External mixer

OPT3273+16

1 dB gain compression:	26.5 to 40 GHz; 0 dBm (typ.)
Max. input level:	26.5 to 40 GHz; +15 dBm (typ.)
Frequency response:	26.5 to 40 GHz; ±3 dB (typ.) (after reading frequency response compensated data)
Average display noise level:	26.5 to 40 GHz; -90 dBm (typ.) (RBW 1 kHz, VIDEO BW 10 Hz)

OPT3273+17

1 dB gain compression:	40 to 60 GHz; 0 dBm (typ.)
Max. input level:	40 to 60 GHz; +15 dBm (typ.)
Frequency response:	40 to 60 GHz; ±5 dB (typ.) (after reading frequency response compensated data)
Average display noise level:	40 to 60 GHz; -90 dBm (typ.) (RBW 1 kHz, VIDEO BW 10 Hz)

OPT.25 Reference Converter

10MHz frequency reference input

Frequency:	10 MHz, 15 MHz, 19.6608 MHz
Input amplitude range:	-5 to +5 dBm

OPT.74 Tracking generator

Output frequency:	100 kHz to 3.6 GHz (START FREQ <3.5 GHz)
Output level	
Setting range:	0 to -50 dBm
Setting resolution:	0.1 dB
Output level flatness:	<±3 dB (100 kHz to 3.6 GHz, relative value)
Output level accuracy:	<±1 dB (30 MHz, -10 dBm, 25 ±10°C)
Vernier accuracy:	<0.5 dB/1 dB
Level sweep width setting range:	(0 to -10 dBm) - ATT (ATT = 0 to 40 dB/10 dB Step)

Spurious output	
Harmonic:	<-15 dBc (at 0 dBm output)
Non-harmonic:	<-25 dBc (at 0 dBm output)

TG Leakage	
100 kHz to 3.0 GHz:	<-110 dBm
3.0 to 3.6 GHz:	<-100 dBm

TG Output	
Impedance:	50 Ω (nominal)
VSWR	
(at -10 dBm output, nominal):	<1.5 (100 kHz to 3.6 GHz)

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