



Agilent U1210 Series Handheld Clamp Meters

Data Sheet

Handle big currents – more safely

Features

- Large clamp opening of 52 mm or 2"
- High measurement capability of up to 1000 A for AC, DC or AC+DC
- CAT III 1000 V/CAT IV 600 V safety rating
- Includes full-featured DMM with resistance, capacitance, frequency and temperature functions
- High resolution measurements – measure current as low as 0.01 A
- Peak hold
- Dual ranging mode – manual and auto
- Large dual display
- Min/max recording capability



Measurements of electrical distribution cables can be challenging and risky. For cables up to two inches in diameter, the Agilent U1210 Series handheld clamp meters enable high-current measurements without breaking the circuit. Unlike most clamp meters, they also include DMM capabilities—resistance, capacitance, frequency and temperature—to simplify troubleshooting during installation and maintenance. Best of all, they provide an extra layer of protection with CAT IV 600V and CAT III 1000 V safety ratings.



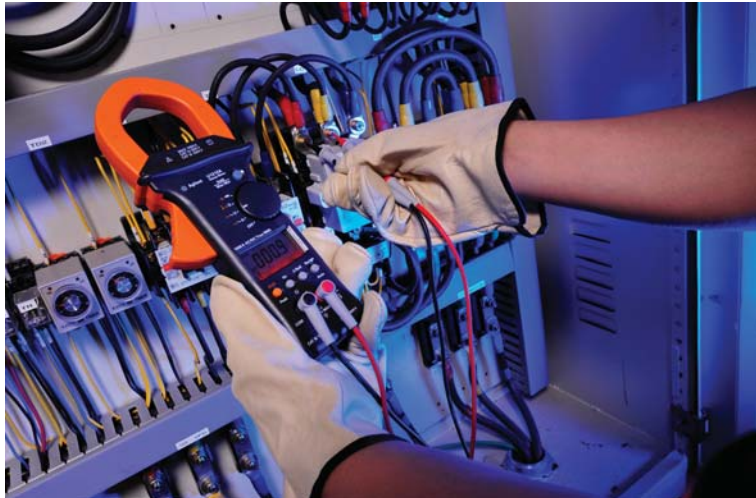
Agilent Technologies

Key Measurements



Measure current easily and accurately

Agilent U1210 Series handheld clamp meters come with clamp opening of 52 mm / 2" and high current measurement capability of up to 1000 A (AC, DC, AC+ DC). With the large jaw size, these handhelds simplify current measurements for thick cables. Clamp on with the U1210 Series and get convenience, versatility and the ability to handle big currents—safely.



Full-featured digital multimeter functions

The U1210 Series handheld clamp meters provide basic functions of a multimeter with wide measurement ranges to cater for a broad range of applications (ACA, DCV, ACV, OHM, audible continuity, diode and frequency tests. These meters also provide auto-ranging capability, built-in peak hold for in-rush current measurement, temperature and capacitance measurement capability, large backlight display and one-hand operation.



General Specifications

Title	Specification
Dimension	U1211A 106 mm (W) X 273 mm (L) X 43 mm (H)
	U1212A & U1213A 106 mm (W) X 260 mm (L) X 43 mm (H)
Net Weight	U1211A 625 grams with batteries included
	U1212A & U1213A 525 grams with batteries included
Display	4 digits with maximum reading 4,100 counts. The 12 Segments analog bar graph and full annunciator. Automatic polarity indication.
Battery	Standard 9 V Battery - Alkaline
Low batt indicator	Battery voltage drops below 6.0 V
Power Consumption	U1211A 186 mVA maximum
	U1212A & U1213A 220 mVA maximum
Battery life	60 hours (typical)
Maximum jaw opening	~2 inches
Temperature coefficient	0.12 x (specified accuracy) / °C (from 0 °C to 18 °C or 28 °C to 50 °C)
NMRR (Normal Mode Rejection Ratio)	This series has a NMRR specification of > 60 dB at 50 Hz and 60 Hz, which means a good ability to reject the effect of AC noise in DC measurement
CMRR (Common Mode Rejection Ratio)	U1211A and U1212A have CMRR specifications of >60 dB at DC to 60 Hz in the ACV function; and > 80 dB at DC, 50 Hz and 60 Hz in the DCV function.
	U1213A has a CMRR specifications of >60 dB at DC to 60 Hz in the ACV function; and > 120 dB at DC, 50 Hz and 60 Hz in the DCV function.
Operating temperature	-10 °C to 50 °C, 0 - 80 % R.H.
Storage temperature	-20 °C to 60 °C, 0 - 80 % R.H.
Relative Humidity (R.H.)	Maximum 80 % R.H. for temperature up to 31 °C decreasing linearly to 50 % R.H. at 50 °C
Temperature coefficient	0.1 x (specified accuracy) / °C (from 0 °C to 18 °C or 28 °C to 50 °C)
Safety compliance	EN/IEC 61010-1:2001, ANSI/UL 61010-1:2004, and CAN/CSA-C22.2 No.61010-1-04
Measurement category	CAT III 1000 V/ CAT IV 600 V
EMC compliance	<ul style="list-style-type: none"> • Certified to IEC61326-1:2005/ EN61326-1:2006 • CISPR 11:2003/ EN 55011:2007 Group 1 class A • Canada: ICES-001:2004 • Australia/New Zealand: AS/NZS CISPR11:2004

ELECTRICAL SPECIFICATIONS FOR U1211A

Accuracy is given as \pm % of reading + no. of least significant digits at 23 °C \pm 5 °C, with relative humidity Less than 80 % R.H.

ACV/ ACA specifications are ac coupled, true R.M.S. and are valid from 5 % of range to 100 % of range. The crest factor may be up to 3.0 at full-scale except the 1000 V and 1000 A ranges where these are 1.5 at full scale. For non-sinusoidal waveforms, add (2 % reading + 2 % full scale) typical, for crest factors up to 3.

DC Voltage

Range	Resolution	Accuracy	Overload Protection
400 V	0.1 V	0.5 % \pm 5	1000 V R.M.S
1000 V	1 V	0.5 % \pm 3	

- Input Impedance: 10 M Ω (nominal).

AC Voltage

Range	Resolution	Accuracy	Overload Protection
		45~400 Hz	
400 V	0.1 V	1 % \pm 5	1000 V R.M.S
1000 V	1 V	1 % \pm 5	

- Input Impedance: 10 M Ω (nominal) in parallel with <100 pF

Voltage (1ms PEAK HOLD)

Range	Resolution	Accuracy	Overload Protection
400 V	0.1 V	1 % \pm 43	1000 V R.M.S
1000 V	1 V	1 % \pm 43	

- Specified accuracy for changes >1 ms in duration

DIODE CHECK/ AUDIBLE CONTINUITY TEST

Range	Resolution	Accuracy	Test Current	Open Voltage
Diode	0.001 V	0.5 % \pm 2	Approx. 0.8 mA	<+3.1 V

- Overload protection: 1000 V R.M.S. for circuits <0.3 A of short circuit current.
- Built-in buzzer sounds when reading is below 50 mV approx. and single tone for normal forward-biased diode or semiconductor junction as 0.3 V \leq Reading \leq 0.8 V.

RESISTANCE

Range	Resolution	Accuracy	Test Current
400 Ω	0.1 Ω	0.5 % \pm 3	0.8 mA
4 k Ω	0.001 k Ω	0.5 % \pm 3	80 μ A

Notes:

1. Overload protection: 1000 V R.M.S. for circuits <0.3 A of short circuit current.
2. Maximum open voltage: <+3.1 V
3. Instant Continuity: Built-in buzzer sounds when resistance is less than 10.0 Ω
4. The accuracy of 400 Ω and 4 k Ω is specified after Relative function, which is used to substrate the test lead resistance and the thermal effect.

ELECTRICAL SPECIFICATIONS FOR U1211A (continued)

CAPACITANCE

Range	Resolution	Accuracy	Overload Protection
400 μ F	0.1 μ F	2 %+4	1000 V R.M.S. for circuits <0.3 A of short circuit current.
4000 μ F	1 μ F	3 %+4	

- The accuracy is based on film capacitor or better and use Relative mode to zero residual value.

AC CURRENT

Range	Resolution	Accuracy *N1		
		45~65 Hz	65~400 Hz	400 Hz~1 kHz
40 A	0.01 A	1.0 %+10	1.0 %+10	3.0 %+10
400 A	0.1 A	1.0 %+5	1.0 %+5	3.0 %+5
400~700 A	1 A	1.0 %+5	1.0 %+5	3.0 %+5
700~1000 A	1 A	1.0 %+5	NONE	NONE

- Maximum overload: 1000 A RMS. The accuracy is specified on the symmetrical waveforms.
- N1: The maximum verification of current and frequency product is less than 400,000 A x Hz.

WARNING:

The measuring duty cycle should not exceed the following limits.

0 ~ 600 A RMS	Continuous
600 ~ 700 A RMS	10 minutes ON, 10 minutes OFF
700 ~ 1000 A RMS	5 minutes ON, 20 minutes OFF.

CURRENT (1 ms PEAK HOLD)

Range	Resolution	Accuracy	Maximum Overload
40 A	0.01 A	2.0 %+70	1000 A R.M.S.
400 A	0.1 A	2.0 %+43	
1000 A	1 A	2.0 %+43	

- Specified accuracy for changes >1 ms in duration

ELECTRICAL SPECIFICATIONS FOR U1211A (continued)

FREQUENCY (AC coupling)

Range	Resolution	Accuracy	Minimum frequency
99.99 Hz	0.01 Hz	0.2 %+3	10 Hz
999.9 Hz	0.1 Hz		
9.999 kHz	0.001 kHz		
99.99 kHz	0.01 kHz		
999.9 kHz	0.1 kHz		

- Overload protection: 1000 V; <20,000,000 V x Hz

Sensitivity

FREQUENCY SENSITIVITY		
Range	MINIMUM SENSITIVITY (RMS)	
Maximum input for specified accuracy of AC	40 Hz~2 kHz	10~40 Hz or 2~100 kHz
400 V	6 V	6 V
1000 V	20 V	30 V (<10 kHz)
40 A	3 A (<1 kHz)	3 A (<1 kHz)
400 A	20 A (<1 kHz)	20 A (<1 kHz)
1000 A	50 A (1 kHz)	50 A (<1 kHz)

ELECTRICAL SPECIFICATIONS FOR U1212A

Accuracy is given as \pm % of reading + no. of least significant digits at 23 °C \pm 5 °C, with relative humidity Less than 80 % R.H.

ACV/ ACA specifications are ac coupled, true R.M.S. and are valid from 5 % of range to 100 % of range. The crest factor may be up to 3.0 at full-scale except the 1000 V and 1000 A ranges where these are 1.5 at full scale. For non-sinusoidal waveforms, add (2 % reading + 2 % full scale) typical, for crest factors up to 3.

DC Voltage

Range	Resolution	Accuracy	Overload Protection
400 V	0.1 V	0.5 %+3	1000 V R.M.S
1000 V	1 V	0.5 %+3	

- Input Impedance: 10 M Ω (nominal).

AC Voltage

Range	Resolution	Accuracy	Overload Protection
		45~400 Hz	
400 V	0.1 V	1 %+5	1000 V R.M.S
1000 V	1 V	1 %+5	

- Input Impedance: 10 M Ω (nominal) in parallel with <100 pF

Voltage (1 ms PEAK HOLD)

Range	Resolution	Accuracy	Overload Protection
400 V	0.1 V	1 %+43	1000 V R.M.S
1000 V	1 V	1 %+43	

- Specified accuracy for changes >1 ms in duration

DIODE CHECK/ AUDIBLE CONTINUITY TEST

Range	Resolution	Accuracy	Test Current	Open Voltage
Diode	0.001 V	0.5 %+2	Approx. 0.8 mA	<+3.1 V

- Overload protection: 1000 V R.M.S. for circuits <0.3 A of short circuit current.
- Built-in buzzer sounds when reading is below 50 mV approx. and single tone for normal forward-biased diode or semiconductor junction as 0.3 V \leq Reading \leq 0.8 V.

RESISTANCE

Range	Resolution	Accuracy	Test Current
400 Ω	0.1 Ω	0.5 %+3	0.8 mA
4 k Ω	0.001 k Ω	0.5 %+3	80 μ A

Notes:

1. Overload protection: 1000 V R.M.S. for circuits <0.3 A of short circuit current.
2. Maximum open voltage: <+3.1 V
3. Instant Continuity: Built-in buzzer sounds when resistance is less than 10.0 Ω
4. The accuracy of 400 Ω and 4 k Ω is specified after Relative function, which is used to substrate the test lead resistance and the thermal effect.

ELECTRICAL SPECIFICATIONS FOR U1212A (continued)

CAPACITANCE

Range	Resolution	Accuracy	Overload Protection
400 μ F	0.1 μ F	2 % +4	1000 V R.M.S. for circuits <0.3 A of short circuit current.
4000 μ F	1 μ F	3 % +4	

- The accuracy is based on film capacitor or better and use Relative mode to zero residual value.

DC CURRENT

Range	Resolution	Accuracy	Maximum Overload
40 A	0.01 A	1.5 % +15	1000 A R.M.S.
400 A	0.1 A	1.5 % +3	
1000 A	1 A	2.0 % +5	

- Use Relative mode to zero residual offset.

AC CURRENT

Range	Resolution	Accuracy *N1		Maximum Overload
		45~65 Hz	65 Hz~1 KHz	
40 A	0.01 A	2.0 % +10	3.0 % +10	1000 A R.M.S.
400 A	0.1 A	2.0 % +5	3.0 % +5	
1000 A	1 A	2.0 % +5	3.0 % +5	

- N1: The maximum verification of current and frequency product is less than 400,000 A x Hz.

CURRENT (1 ms PEAK HOLD)

Range	Resolution	Accuracy	Maximum Overload
40 A	0.01 A	2.0 % +70	1000 A R.M.S.
400 A	0.1 A	2.0 % +43	
1000 A	1 A	2.0 % +43	

- Specified accuracy for changes >1 ms in duration

TEMPERATURE TEST

Thermal Type	RANGE	Resolution	Accuracy
K	-200~-40 °C	0.1 °C	1 % +3 °C
	-40~1372 °C	0.1 °C	1 % +1 °C
	-328~-40 °F	0.1 °F	1 % +6 °F
	-40~2502 °F	0.1 °F	1 % +2 °F

Notes:

1. The accuracy does not include the tolerance of thermocouple probe, and the meter should be putting on the place will be operating for 1 hour at least.
2. Do not allow the temperature sensor to contact a surface that is energized above 33 V RMS or 70 V DC. Such voltages will pose a shock hazard.
3. The temperature calculation is according to the standard of EN/IEC-60548-1 and NIST175.

ELECTRICAL SPECIFICATIONS FOR U1212A (continued)

FREQUENCY (AC coupling)

Range	Resolution	Accuracy	Minimum frequency
99.99 Hz	0.01 Hz	0.2 %±3	10 Hz
999.9 Hz	0.1 Hz		
9.999 kHz	0.001 kHz		
99.99 kHz	0.01 kHz		
999.9 kHz	0.1 kHz		

- Overload protection: 1000 V

Sensitivity

FREQUENCY SENSITIVITY		
Range	MINIMUM SENSITIVITY (RMS)	
Maximum input for specified accuracy of AC	40 Hz~2 kHz	10~40 Hz or 2~100 kHz
400 V	6 V	6 V
1000 V	20 V	30 V (<10 kHz)
40 A	3 A (<1 kHz)	3 A (<1 kHz)
400 A	20 A (<1 kHz)	20 A (<1 kHz)
1000 A	50 A (1 kHz)	50 A (<1 kHz)

ELECTRICAL SPECIFICATIONS FOR U1213A

Accuracy is given as \pm % of reading + no. of least significant digits at 23 °C \pm 5 °C, with relative humidity Less than 80% R.H.

AC voltage, AC current, AC+DC voltage, AC+DC current specifications are ac coupled, true R.M.S. and are valid from 5 % of range to 100 % of range. The crest factor may be up to 3.0 at full-scale except the 1000 V and 1000 A ranges where these are 1.5 at full scale. For non-sinusoidal waveforms, add (2 % reading + 2 % full scale) typical, for crest factors up to 3.

DC Voltage

Range	Resolution	Accuracy	Overload Protection
4 V	0.001 V	0.2 % +5	1000 A R.M.S.
40 V	0.01 V		
400 V	0.1 V		
1000 V	1 V	0.5 % +3	

- Input Impedance: 10 M Ω (nominal).

AC Voltage

Range	Resolution	Accuracy		Overload Protection
		45~400 Hz	400 Hz~2 kHz	
4 V	0.001 V	1.0 % +5	2.0 % +5	1000 V R.M.S
40 V	0.01 V			
400 V	0.1 V			
1000 V	1 V			

Notes:

1. Input Impedance: 10 M Ω (nominal) in parallel with <100 pF

AC+DC Voltage

Range	Resolution	Accuracy		Overload Protection
		45~400 Hz	400 Hz~2 kHz	
4 V	0.001 V	1.5 % +9	2.5 % +9	1000 V R.M.S
40 V	0.01 V			
400 V	0.1 V			
1000 V	1 V			

- Input Impedance: 10 M Ω (nominal) in parallel with <100 pF

Voltage (1 ms PEAK HOLD)

Range	Resolution	Accuracy	Overload Protection
4 V	0.001 V	1.0 % +43	1000 V R.M.S
40 V	0.01 V		
400 V	0.1 V		
1000 V	1 V		

- Specified accuracy for changes >1 ms in duration

DIODE CHECK/ AUDIBLE CONTINUITY TEST

Range	Resolution	Accuracy	Test Current	Open Voltage
Diode	0.001 V	0.5 % +2	Approx. 0.8 mA	<+3.1 V

- Overload protection: 1000 V R.M.S. for circuits <0.3 A of short circuit current.
- Built-in buzzer sounds when reading is below 50 mV approx. and single tone for normal forward-biased diode or semiconductor junction as 0.3 V \leq Reading \leq 0.8 V.

ELECTRICAL SPECIFICATIONS FOR U1213A (continued)

RESISTANCE

Range	Resolution	Accuracy	Test Current
400 Ω	0.1 Ω	0.3 %+3	0.8 mA
4 kΩ	0.001 kΩ		80 μA
40 kΩ	0.01 kΩ		8 μA
400 kΩ	0.1 kΩ		727 nA
4 MΩ	0.001 MΩ	0.6 %+3	112 nA
40 MΩ	0.01 MΩ	2.0 %+5	112 nA

Notes:

1. Overload protection: 1000 V R.M.S. for circuits <0.3 A of short circuit current.
2. Maximum open voltage: <+3.1 V
3. Instant Continuity: Built-in buzzer sounds when resistance is less than 10.0 Ω
4. The accuracy of 400 Ω and 4 kΩ is specified after Relative function, which is used to substrate the test lead resistance and the thermal effect.

CAPACITANCE

Range	Resolution	Accuracy	Overload Protection
4 μF	0.001 μF	1 %+4	1000 V R.M.S. for circuits <0.3 A of short circuit current.
40 μF	0.01 μF		
400 μF	0.1 μF	2 %+4	
4000 μF	1 μF	3 %+4	

- The accuracy is based on film capacitor or better and use Relative mode to zero residual value.

DC CURRENT

Range	Resolution	Accuracy	Maximum Overload
40 A	0.01 A	1.5 %+15	1000 A R.M.S.
400 A	0.1 A	1.5 %+3	
1000 A	1 A	2.0 %+5	

- Use Relative mode to zero residual offset.

AC CURRENT

Range	Resolution	Accuracy *N1		Maximum Overload
		45~65 Hz	65 Hz~1 KHz	
40 A	0.01 A	2.0 %+10	3.0 %+10	1000 A R.M.S.
400 A	0.1 A	2.0 %+5	3.0 %+5	
1000 A	1 A	2.0 %+5	3.0 %+5	

- N1: The maximum verification of current and frequency product is less than 400,000 A x Hz.

ELECTRICAL SPECIFICATIONS FOR U1213A (continued)

AC+DC CURRENT

Range	Resolution	Accuracy		Maximum Overload
		45~65 Hz	65 Hz~1 kHz	
40 A	0.01 A	3.5 %+25	4.5 %+25	1000 A R.M.S
400 A	0.1 A	3.5 %+9	4.5 %+9	
1000 A	1 A	4.5 %+9	5.0 %+9	

CURRENT (1 ms PEAK HOLD)

Range	Resolution	Accuracy	Maximum Overload
40 A	0.01 A	2.0 % +70	1000 A R.M.S.
400 A	0.1 A	2.0 % +43	
1000 A	1 A	2.0 % +43	

- Specified accuracy for changes >1 ms in duration

TEMPERATURE TEST

Thermal Type	RANGE	Resolution	Accuracy
K	-200~-40 °C	0.1 °C	1 % +3 °C
	-40~1372 °C	0.1 °C	1 % +1 °C
	-328~-40 °F	0.1 °F	1 % +6 °F
	-40~2502 °F	0.1 °F	1 % +2 °F

Notes:

1. The accuracy does not include the tolerance of thermocouple probe, and the meter should be putting on the place will be operating for 1 hour at least.
2. Do not allow the temperature sensor to contact a surface that is energized above 33 V RMS or 70 V DC. Such voltages will pose a shock hazard.
3. The temperature calculation is according to the standard of EN/IEC-60548-1 and NIST175.

FREQUENCY (AC coupling)

Range	Resolution	Accuracy	Minimum frequency
99.99 Hz	0.01 Hz	0.2 %+3	10 Hz
999.9 Hz	0.1 Hz		
9.999 kHz	0.001 kHz		
99.99 kHz	0.01 kHz		
999.9 kHz	0.1 kHz		

- Overload protection: 1000 V; <20,000,000 VxHz

ELECTRICAL SPECIFICATIONS FOR U1213A (continued)

Sensitivity

FREQUENCY SENSITIVITY		
Range	MINIMUM SENSITIVITY (RMS)	
Maximum input for specified accuracy of AC	45 Hz~2 kHz	10 Hz ~200 kHz
4 V	0.3 V	0.6 V
40 V	2 V	3 V
400 V	20 V	30 V (<100 kHz)
1000 V	50 V	50 V (<10 kHz)
40 A	3 A (<1 kHz)	3 A (<1 kHz)
400 A	20 A (<1 kHz)	20 A (<1 kHz)
1000 A	50 A (<1 kHz)	50 A (<1 kHz)

DUTY CYCLE

MODE	RANGE	Accuracy of Full Scale
AC coupling	0.1 %~99.9 %	0.3 % per kHz+0.3 %

Notes:

1. The accuracy for duty cycle is based a 4 V square wave input to the DC 4 V range and maximum frequency up to 2 kHz. The duty cycle range can be measured within 5 %~95 % as the signal frequency >20 Hz.

Standard shipped items:

- Test leads
- 19-mm probes
- 4-mm probes
- Soft carrying case
- Quick Start Guide
- Certificate of Calibration (CoC)

Optional Accessories:

- U1168A Standard Test Lead Kit
- U1162A Alligator clips
- U1175A Soft carrying case
- U1186A K-type thermocouple and adapter



Did you know?

Ensure that the clamp meter measures only one conductor at a time. Measuring multiple conductors may cause inaccuracy in measurement reading due to vector sum of the currents flowing in the conductors.



Agilent Email Updates

www.agilent.com/find/emailupdates

Get the latest information on the products and applications you select.



www.lxistandard.org

LXI is the LAN-based successor to GPIB, providing faster, more efficient connectivity. Agilent is a founding member of the LXI consortium.

Agilent Channel Partners

www.agilent.com/find/channelpartners

Get the best of both worlds: Agilent's measurement expertise and product breadth, combined with channel partner convenience.

Remove all doubt

Our repair and calibration services will get your equipment back to you, performing like new, when promised. You will get full value out of your Agilent equipment throughout its lifetime. Your equipment will be serviced by Agilent-trained technicians using the latest factory calibration procedures, automated repair diagnostics and genuine parts. You will always have the utmost confidence in your measurements. For information regarding self maintenance of this product, please contact your Agilent office.

Agilent offers a wide range of additional expert test and measurement services for your equipment, including initial start-up assistance, onsite education and training, as well as design, system integration, and project management.

For more information on repair and calibration services, go to:

www.agilent.com/find/removealldoubt

www.agilent.com

www.agilent.com/find/clampmeter

For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office. The complete list is available at:

www.agilent.com/find/contactus

Americas

Canada	(877) 894 4414
Latin America	305 269 7500
United States	(800) 829 4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Thailand	1 800 226 008

Europe & Middle East

Austria	43 (0) 1 360 277 1571
Belgium	32 (0) 2 404 93 40
Denmark	45 70 13 15 15
Finland	358 (0) 10 855 2100
France	0825 010 700*
	*0.125€/minute
Germany	49 (0) 7031 464 6333
Ireland	1890 924 204
Israel	972-3-9288-504/544
Italy	39 02 92 60 8484
Netherlands	31 (0) 20 547 2111
Spain	34 (91) 631 3300
Sweden	0200-88 22 55
Switzerland	0800 80 53 53
United Kingdom	44 (0) 118 9276201

Other European Countries:
www.agilent.com/find/contactus

Revised: October 1, 2009

Product specifications and descriptions in this document subject to change without notice.

© Agilent Technologies, Inc. 2010
Printed in USA, May 20, 2010
5990-5083EN



Agilent Technologies