Agilent U1730 系列手持式 LCR 表

最新 LCR 表超出您的预期

技术资料

Agilent U1730 系列手持式 LCR 表可支持您进行高达 100 kHz 频率的测量，这通常是台式 LCR 才能提供的功能。使用一键自动识别功能按键，该仪表即可显示元件类型和更详细的元件分析（例如 Z、ESR 和 DCR），从而帮助您更速快地完成测量。新款 LCR 表是现场或移动测试的理想选择，因为它可以通过持续时间达 16 小时的电池供电。借助 U1730 系列无与伦比的便利性，您可以低成本地快速完成基本 LCR 测量。

特性

主要特性

- 20,000 计数分辨率
- 0.2% 基本精度
- 宽 LCR 范围，并具有 3 至 5 个可选测试频率 (U1733C 高达 100 kHz)
- 自动识别 *(Ai)* 功能可以自动确定并显示元件类型和测量
- 通过 DCR、ESR、Z、D、Q 和 θ 功能进行详细的元件分析
- 16 小时电池供电时间／使用交流电源
- IR-USB 连通性，可以方便地在 PC 上记录数据

频率高达 100 kHz

测试频率扩展至 100 kHz，意味着更高的灵活性和更广泛的元件测试范围。扩展的测试频率范围（例如高达 100 kHz）十分适合测试开关电源电路中使用的铝电解电容器以及其它应用。

图 1. 将 1731C/U1732C/U1733C 与 PC 连接，即可以自动记录连续读数

自动识别功能

Ai 可以提供轻松的测试与测量体验：只需一键，即可避免尝试和错误时间。这个独有的特性可以自动指定 L、C 或 R 并联或串联模式，无需手动更改按键。

详细的元件分析

手持式 LCR 表可以让您测试不同类型的元件，包括第二元件的损耗因数 (D) 和质量因数 (Q) 以及阻抗 (θ) 的角指示。新款手持式仪表系列还包括其它功能，可以提供更详细的元件分析。例如，内置等效串联电阻 (ESR) 功能可以帮助您更好地理解电容器在不同选择频率上固有的电阻行为。DCR 是内置直流电阻测量，可以在不使用独立数字万用表情况下进行元件测试。

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深入观察

可视听容差模式，可轻松对元件进行分选

最大值、最小值和平均值记录

*Ai*可根据阻抗级别自动识别L、C和R元件

ESR功能支持电容串联电阻分析

自动计算相位角、损耗因数和质量因数

选择需要的Z、L、C或R功能

输入1%、5%、10%和20%容限范围

背光功能可以在较暗环境下提供清晰视图（仅限U1732C/U1733C）

第二显示屏

20,000计数分辨率

数据保持功能可以冻结并保存测量值

支持交替使用手动或自动范围调整

选择需要的测试频率：
- U1731C: 高达1 kHz
- U1732C: 高达10 kHz
- U1733C: 高达100 kHz

支持DCR测量（仅限U1733C）

进入相对模式，并将显示读数存储为参考值

图2. U1733C前视图

U1731C/U1732C/U1733C 电气指标

在23°C±5°C、相对湿度低于80%的环境中，精度为±(%读数+计数最小有效数字)。请参见用户指南，了解针对每个L/C/R范围、串联或并联模式指定的测量模式。测量在测试插座上进行，在测量之前必须完成必要的开路和短路修正。精度已经过设计和指定类型测试的验证。

阻抗／电阻

范围	分辨率	精度=AZ+偏置					
		U1731C/U1732C/U1733C			U1732C/U1733C	U1733C	
		100 Hz	120 Hz	1 kHz	10 kHz	100 kHz	DCR
2 Ω[1]	0.0001 Ω	0.7% + 50	0.7% + 50	0.7% + 50	0.7% + 50	1.0% + 50	0.7% + 50
20 Ω[1]	0.001 Ω	0.7% + 8	0.7% + 8	0.7% + 8	0.7% + 8	0.7% + 8	0.7% + 8
200 Ω[1]	0.01 Ω	0.2% + 3	0.2% + 3	0.2% + 3	0.2% + 3	0.5% + 5	0.2% + 3
2000 Ω	0.1 Ω	0.2% + 3	0.2% + 3	0.2% + 3	0.2% + 3	0.5% + 5	0.2% + 3
20 kΩ	0.001 kΩ	0.2% + 3	0.2% + 3	0.2% + 3	0.2% + 3	0.5% + 5	0.2% + 3
200 kΩ	0.01 kΩ	0.5% + 5	0.5% + 5	0.5% + 5	0.5% + 5	0.7% + 8	0.5% + 5
2000 kΩ	0.1 kΩ	0.5% + 5	0.5% + 5	0.5% + 5	0.7% + 5	NA	0.5% + 5
20 MΩ	0.001 MΩ	2.0% + 8	2.0% + 8	2.0% + 8	5.0% + 8	NA	2.0% + 8
200 MΩ	0.01 MΩ	6.0% + 80	6.0% + 80	6.0% + 80	NA	NA	6.0% + 80

1. 2~200 Ω范围内的精度由Math Null操作后确定，Math Null用于去除测试中的引线电阻和接触电阻。

注：
a. 在20 MΩ和200 MΩ范围，相对湿度指标需<60%
b. 电阻指标为Q<10且D>0.1，否则精度应为(AZ+Offset) x $\sqrt{1+Q^2}$
c. 等效串联电阻(ESR)测量取决于阻抗测量和范围。最大显示高达199.99 kΩ，精度为(AZ+Offset) x $\sqrt{1+Q^2}$

电容

范围	分辨率	精度=交流+偏置				
		U1731C/U1732C/U1733C			U1732C/U1733C	U1733C
		100 Hz	120 Hz	1 kHz	10 kHz	100 kHz
20 mF	0.001 mF	0.5% + 8	0.5% + 8	NA	NA	NA
2000 µF	0.1 µF	0.5% + 5	0.5% + 5	0.5% + 8	NA	NA
200 µF	0.01 µF	0.3% + 3	0.3% + 3	0.5% + 5	0.5% + 8	NA
20 µF	0.001 µF	0.2% + 3	0.2% + 3	0.2% + 3	0.5% + 5	5.0% + 10
2000 nF	0.1 nF	0.2% + 3	0.2% + 3	0.2% + 3	0.2% + 3	0.7% + 10
200 nF	0.01 nF	0.2% + 3	0.2% + 3	0.2% + 3	0.5% + 3	0.7% + 10
20 nF	0.001 nF	0.5% + 5	0.5% + 5	0.2% + 3	0.5% + 3	0.7% + 10
2000 pF[1]	0.1 pF	0.5% + 10	0.5% + 10	0.5% + 5	0.5% + 3	2.0% + 10
200 pF[1]	0.01 pF	NA	NA	0.5% + 10	0.8% + 10	2.0% + 10
20 pF[1]	0.001 pF	NA	NA	NA	1.0% + 20	2.5% + 10

1. 20 pF~2000 pF范围内的精度由Math Null指定，后者用于代替测试引线的杂散电容。

注：
a. 对陶瓷电容测量精度的影响将取决于陶瓷电容制作材料的介电常数(K)。如欲了解相关的影响因素，*请参阅《阻抗测量手册》中“影响元件测量的因素”章节的内容*。手册可免费下载，地址为 **http://www.agilent.com.cn/find/lcrmeters**

U1731C/U1732C/U1733C 电气指标

电感

范围	分辨率	精度=AL+偏置				
		U1731C/U1732C/U1733C			U1732C/U1733C	U1733C
		100 Hz	120 Hz	1 kHz	10 kHz	100 kHz
20 µH	0.001 µH	NA	NA	NA	1.0% + 5	2.5% + 20
200 µH	0.01 µH	NA	NA	1.0% + 5	0.7% + 3	2.5% + 20
2000 µH	0.1 µH	0.7% + 10	0.7% + 10	0.5% + 3	0.5% + 3	0.8% + 20
20 mH	0.001 mH	0.5% + 3	0.5% + 3	0.2% + 3	0.3% + 3	0.8% + 10
200 mH	0.01 mH	0.5% + 3	0.5% + 3	0.2% + 3	0.2% + 3	1.0% + 10
2000 mH	0.1 mH	0.2% + 3	0.2% + 3	0.2% + 3	0.5% + 5	1.0% + 10
20 H	0.001 H	0.2% + 3	0.2% + 3	0.5% + 5	1.0% + 5	2.0% + 10
200 H	0.01 H	0.7% + 5	0.7% + 5	1.0% + 5	2.0% + 8	NA
2000 H	0.1 H	1.0% + 5	1.0% + 5	2.0% + 8	NA	NA

阻抗相位角

范围	分辨率	精度 (θe)	条件
-180°~180°	0.1°/1°	(AZ + Offset/Zx) x180/π	D<1 或 Q>1

阻抗	Zx	AZ	偏置	θe
1999.9 Ω	19999	0.2%	3	±0.12 °
199.9 Ω	1999	0.2%	3	±0.20 °
19.9 Ω	199	0.2%	3	±0.98 °
1.9 Ω	19	0.2%	3	±9.16 °

注：
a. 除非特别指明，指标适用于所有型号 (U1731C、U1732C 和 U1733C)
b. “AZ” 和偏置是用于指明阻抗精度
c. “π” 约为 3.14159

损耗 / 质量因数

功能	范围	精度 (De)	条件
Z	0.001~999	AZ + Offset/Zx x 100% + 3	D < 1 或 Q > 1
L	0.001~999	AL + Offset/Lx x 100% + 3	D < 1 或 Q > 1
C	0.001~999	AC + Offset/Cx x 100% + 3	D < 1 或 Q > 1

电容	Cx	AC	偏置	De
88.88 µF	8888	0.2%	3	0.203% + 3

注：
1. 除非特别说明，指标适用于所有型号 (U1731C、U1732C 和 U1733C)
2. “AZ、AL、AC” 和偏置分别用于指明阻抗、电感和电容的精度
3. Zx、Lx 和 Cx 是读数的显示计数。例如，200 µF 范围时如果电容为 88.88 µF，Cx 为 8888。
4. 质量因数是损耗因数的倒数。

U1731C/U1732C/U1733C 电气指标

测试信号

型号	选择频率	测试信号电平		测试频率	
		电平	精度	频率	精度
U1731C/U1732C/U1733C	100 Hz	0.74 Vrms	0.05 Vrms	100 Hz	0.01%
	120 Hz	0.74 Vrms	0.05 Vrms	120.481 Hz	0.01%
	1 kHz	0.74 Vrms	0.05 Vrms	1 kHz	0.01%
U1732C/1733C	10 kHz	0.70 Vrms	0.05 Vrms	10 kHz	0.01%
U1733C	100 kHz	0.70 Vrms	0.05 Vrms	100 kHz	0.01%
	DCR	+1.235 V	0.05 V	NA	NA

阻抗 / 电阻测量的源阻抗

范围	典型源阻抗					
	U1731C/U1732C/U1733C			U1732C/U1733C	U1733C	
	100 Hz	120 Hz	1 kHz	10 kHz	100 kHz	DCR
2 Ω	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω
20 Ω	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω
200 Ω	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω
2000 Ω	1 kΩ	1 kΩ	1 kΩ	1 kΩ	1 kΩ	1 kΩ
20 kΩ	10 kΩ	10 kΩ	10 kΩ	10 kΩ	1 kΩ	10 kΩ
200 kΩ	100 kΩ	100 kΩ	100 kΩ	10 kΩ	1 kΩ	100 kΩ
2000 kΩ	100 kΩ	100 kΩ	100 kΩ	10 kΩ	NA	100 kΩ
20 MΩ	100 kΩ	100 kΩ	100 kΩ	100 kΩ	NA	100 kΩ
200 MΩ	100 kΩ	100 kΩ	100 kΩ	NA	NA	100 kΩ

电容测量的源阻抗

范围	典型源阻抗				
	U1731C/U1732C/U1733C			U1732C/U1733C	U1733C
	100 Hz	120 Hz	1 kHz	10 kHz	100 kHz
20 mF	100 Ω	100 Ω	NA	NA	NA
2000 µF	100 Ω	100 Ω	100 Ω	NA	NA
200 µF	100 Ω	100 Ω	100 Ω	100 Ω	NA
20 µF	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω
2000 nF	1 kΩ	1 kΩ	100 Ω	100 Ω	100 Ω
200 nF	10 kΩ	10 kΩ	1 kΩ	100 Ω	100 Ω
20 nF	100 kΩ	100 kΩ	10 kΩ	1 kΩ	100 Ω
2000 pF	100 kΩ	100 kΩ	100 kΩ	10 kΩ	1 kΩ
200 pF	NA	NA	100 kΩ	10 kΩ	1 kΩ
20 pF	NA	NA	NA	100 kΩ	1 kΩ

电感测量的源阻抗

范围	典型源阻抗				
	U1731C/U1732C/U1733C			U1732C/U1733C	U1733C
	100 Hz	120 Hz	1 kHz	10 kHz	100 kHz
20 µH	NA	NA	NA	100 Ω	100 Ω
200 µH	NA	NA	100 Ω	100 Ω	100 Ω
2000 µH	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω
20 mH	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω
200 mH	100 Ω	100 Ω	100 Ω	1 kΩ	1 kΩ
2000 mH	100 Ω	100 Ω	1 kΩ	10 kΩ	1 kΩ
20 H	1 kΩ	1 kΩ	10 kΩ	10 kΩ	1 kΩ
200 H	10 kΩ	10 kΩ	100 kΩ	100 kΩ	NA
2000 H	100 kΩ	100 kΩ	100 kΩ	NA	NA

一般技术指标

参数	U1731C	U1732C	U1733C
测量	Z/L/C/R/D/Q/θ/ESR	Z/L/C/R/D/Q/θ/ESR	Z/L/C/R/D/Q/θ/ESR/DCR
显示	主显示屏：最多显示19,999计数，第二显示屏：最多显示999计数，自动极性指示		
测试频率（精度＝实际测试频率的±0.1%）	100 Hz, 120 Hz, 1 kHz	100 Hz, 120 Hz, 1 kHz, 10 kHz	100 Hz, 120 Hz, 1 kHz, 10 kHz, 100 kHz
背光	无	有	有
测试信号电平	选择	测试信号电平	测试频率
	100 Hz	0.74 Vrms	100 Hz
	120 Hz	0.74 Vrms	120.481 Hz
	1 kHz	0.74 Vrms	1 kHz
	10 kHz[1]	0.74 Vrms	10 kHz
	100 kHz[2]	0.74 Vrms	100 kHz
	DCW	+1.235 V	NA
容限模式	1 %, 5%, 10%, 20%		
范围调整模式	自动和手动		
测量速率	1次／秒，额定		
响应时间	约1秒/DUT（被测件）		
自动关机	无操作 -0-99 分钟之后		
电源	一节标准的9 V电池（碱性或碳锌）或可选电源适配器		
功耗	225 mVA最大功耗（背光关闭）		
输入保护保险丝	可重设为过流保护		
电池寿命	16小时（使用碱性电池）		
低电位告警指示	[▭] 将在电压降至 -7.2 V以下时显示		
工作温度范围	-10至55°C, 0至80% R.H.		
存储温度范围	-20至70°C, 0至80% R.H.（不带电池）		
温度系数	0.1 x（规定精度）/Pf(-10至18°C或28至55°C)		
相对湿度	温度30°C时，相对湿度80%; 55°C时，相对湿度线性降低至50%		
重量	337克（带电池）		
尺寸（H x W x D）	184 mm x 87 mm x 41 mm		
安全和静电保护标准	符合EN61 01 0-1（IEC61 01 0-1 :2001）低电压指令，污染等级II 环境、磁化和发射（EMC）：商业许可EN61326-1		
校准	建议校准周期为一年		
保修	• 主单元为3年 • 标配配件为3个月		

1. 仅适用于U1732C/U1733C
2. 仅适用于U1733C

订货信息

标配附件:

标准U1731C、U1732C和U1733C订单包括:

- 快速入门指南
- 校准证书(CoC)
- 鳄鱼夹引线
- 9V碱性电池

推荐的附件

U1731P		组合套件 包括1个U1731C系列手持式仪表和5个附件: • U5491A便携包 • U1173A IR-USB电缆 • U1780A交流适配器 • U1782A SMD镊子 • U1176A LED手电
U1732P		组合套件 包括1个U1732C系列手持式仪表和5个附件: • U5491A便携包 • U1173A IR-USB电缆 • U1780A交流适配器 • U1782A SMD镊子 • U1176A LED手电
U1733P		组合套件 包括1个U1733C系列手持式仪表和5个附件: • U5491A便携包 • U1173A IR-USB电缆 • U1780A交流适配器 • U1782A SMD镊子 • U1176A LED手电
U1174A		便携包
U5481A		IR-USB电缆
U1782A		SMB镊子
U1780A		电源适配器和电源线(符合当地国家/地区标准)
U1781A		鳄鱼夹引线

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Agilent U1730C Series Handheld LCR Meters

Take your expectations higher with the latest LCR meters

Data Sheet

Agilent's U1730C Series handheld LCR meters allow you to measure at frequencies as high as 100 kHz—a capability typically found only in benchtop meters. Get measurements done faster using the one-touch automatic identification function button which displays component type and more detailed component analysis such as Z, ESR, and DCR. Ideal for testing on the go, these LCR meters operate on a battery that lasts up to 16 hours. With the U1730C Series that is built for your convenience, you can perform quick and basic LCR measurements at an affordable price.

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Features

Key features

- 20,000 counts resolution
- 0.2% basic accuracy
- Wide LCR ranges with three to five selectable test frequencies (up to 100 kHz for U1733C)
- Auto identification (*Ai*) automatically determines and displays component type and measurements
- Detailed component analysis with DCR, ESR, Z, D, Q, and θ functions
- Battery life of 16 hours/ AC-powered
- IR-to-USB connectivity for data logging to PC

Frequency up to 100 kHz

The test frequency now extends as high as 100 kHz, providing more flexibility to test a wider range of components. A higher test frequency, for example 100 kHz, is useful for applications such as testing aluminum electrolytic capacitors used in switching power supply circuits.

Automated identification

With *Ai* the testing and measuring experience is easy; eliminating unnecessary trial and error time—with just a single push of a button. This unique feature automatically specifies L, C, or R with parallel and series mode, without the need to manually change buttons.

Detailed component analysis

The handheld LCR meters allows you to test various component types, including secondary components of Dissipation Factor (D), Quality Factor (Q), and Angle Indication of Impedance (θ). This new handheld series also includes other functions that result in a more detailed component analysis. For example, the built-in Equivalent Series Resistance (ESR) function helps you better understand the inherent resistance behavior typically found in capacitors across selected frequencies. DCR is a built-in DC resistance measurement that eliminates the use of a separate digital multimeter (DMM) for component test.

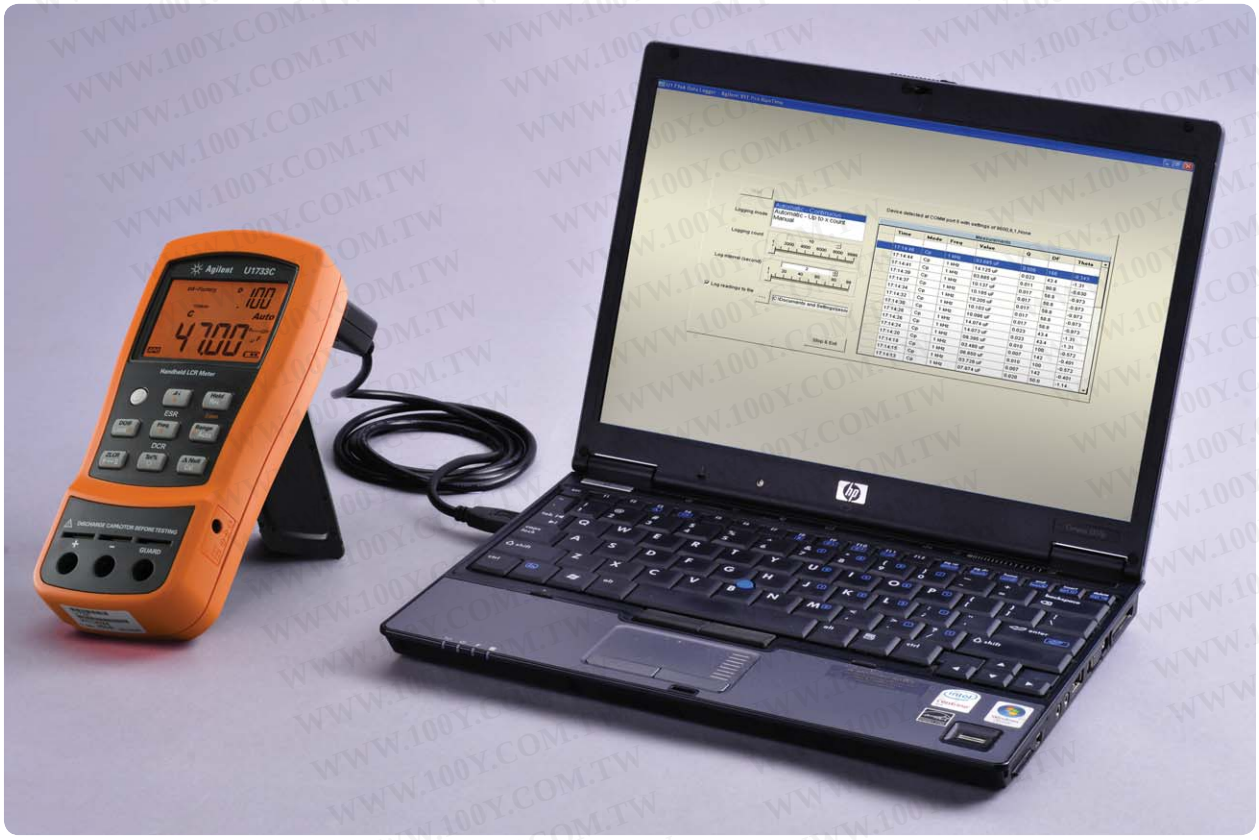

Figure 1. Automate the recording of continuous readings when you hook the U1731C/U1732C/U1733C to a PC

Take a Closer Look

Visible and audible tolerance mode for component sorting

Maximum, Minimum and Average values recording

Ai helps identify L, C, and R components automatically according to level of impedance

ESR function for capacitance series resistance analysis

Auto calculation of Phase Angle, Dissipation Factor, and Quality Factor

To select desired Z, L, C, or R function

To enter rolerance range of 1%, 5%, 10%, and 20%

Backlight function to ease viewing in subdued lighting (only in U1732C/U1733C)

Secondary display

20,000 counts resolution

Data Hold function to freeze and save measured values

Allows manual or auto ranging to be used interchangeably

To select desired test frequency:

- U1731C: Up to 1 kHz
- U1732C: Up to 10 kHz
- U1733C: Up to 100 kHz

To enable DCR measurement (only in U1733C)

To enter relative mode and stores display reading as a reference value

Figure 2. Front view of the U1733C

U1731C/U1732C/U1733C Electrical Specifications

Accuracy is given as ±(% of reading + counts of least significant digit) at 23 °C ± 5 °C, with relative humidity less than 80%. Please refer to the User Guide about the measuring mode specified for each range of L/C/R, series or parallel mode. Measurements performed at the test socket and necessary Open and Short corrections must prior be done. The accuracy is verified by design and specified type tests.

Impedance/Resistance

Range	Resolution	Accuracy = AZ + Offset					
		U1731C/U1732C/U1733C			U1732C/U1733C	U1733C	
		100 Hz	**120 Hz**	**1 kHz**	**10 kHz**	**100 kHz**	**DCR**
2 Ω[1]	0.0001 Ω	0.7% + 50	0.7% + 50	0.7% + 50	0.7% + 50	1.0% + 50	0.7% + 50
20 Ω[1]	0.001 Ω	0.7% + 8	0.7% + 8	0.7% + 8	0.7% + 8	0.7% + 8	0.7% + 8
200 Ω[1]	0.01 Ω	0.2% + 3	0.2% + 3	0.2% + 3	0.2% + 3	0.5% + 5	0.2% + 3
2000 Ω	0.1 Ω	0.2% + 3	0.2% + 3	0.2% + 3	0.2% + 3	0.5% + 5	0.2% + 3
20 kΩ	0.001 kΩ	0.2% + 3	0.2% + 3	0.2% + 3	0.2% + 3	0.5% + 5	0.2% + 3
200 kΩ	0.01 kΩ	0.5% + 5	0.5% + 5	0.5% + 5	0.5% + 5	0.7% + 8	0.5% + 5
2000 kΩ	0.1 kΩ	0.5% + 5	0.5% + 5	0.5% + 5	0.7% + 5	NA	0.5% + 5
20 MΩ	0.001 MΩ	2.0% + 8	2.0% + 8	2.0% + 8	5.0% + 8	NA	2.0% + 8
200 MΩ	0.01 MΩ	6.0% + 80	6.0% + 80	6.0% + 80	NA	NA	6.0% + 80

1. This accuracy for the ranges of 2~ 200 Ω is specified after Math Null which is used to substrate the resistance of test leads and the contact resistance.

Notes:

a. For the ranges of 20 MΩ and 200 MΩ, the R.H. is specified for < 60%

b. Resistance is specified to Q < 10 and D > 0.1, otherwise the accuracy is (AZ + Offset) x $\sqrt{1 + Q^2}$

c. Equivalence Series Resistance (ESR) measurement is determined by impedance measurement and range. The maximum display is up to 199.99 kΩ and the accuracy is (AZ + Offset) x $\sqrt{1 + Q^2}$

Capacitance

Range	Resolution	Accuracy = AC + Offset				
		U1731C/U1732C/U1733C			U1732C/U1733C	U1733C
		100 Hz	**120 Hz**	**1 kHz**	**10 kHz**	**100 kHz**
20 mF	0.001 mF	0.5% + 8	0.5% + 8	NA	NA	NA
2000 µF	0.1 µF	0.5% + 5	0.5% + 5	0.5% + 8	NA	NA
200 µF	0.01 µF	0.3% + 3	0.3% + 3	0.5% + 5	0.5% + 8	NA
20 µF	0.001 µF	0.2% + 3	0.2% + 3	0.2% + 3	0.5% + 5	5.0% + 10
2000 nF	0.1 nF	0.2% + 3	0.2% + 3	0.2% + 3	0.2% + 3	0.7% + 10
200 nF	0.01 nF	0.2% + 3	0.2% + 3	0.2% + 3	0.5% + 3	0.7% + 10
20 nF	0.001 nF	0.5% + 5	0.5% + 5	0.2% + 3	0.5% + 3	0.7% + 10
2000 pF[1]	0.1 pF	0.5% + 10	0.5% + 10	0.5% + 5	0.5% + 3	2.0% + 10
200 pF[1]	0.01 pF	NA	NA	0.5% + 10	0.8% + 10	2.0% + 10
20 pF[1]	0.001 pF	NA	NA	NA	1.0% + 20	2.5% + 10

1. This accuracy for the ranges of 20 pF~2000 pF is specified after Math Null which is used to substrate the stray capacitances for test leads.

Notes:

a. The accuracy for the ceramic capacitor will be influenced depending on the dielectric constant (K) of the material used to make the ceramic capacitor. For related influence factors, please refer to the *Component dependency factors* section in the *Impedance Measurement Handbook*, downloadable for free at **http://www.agilent.com/find/lcrmeters**

U1731C/U1732C/U1733C Electrical Specifications

Inductance

Range	Resolution	Accuracy = AL + Offset				
		U1731C/U1732C/U1733C			U1732C/U1733C	U1733C
		100 Hz	**120 Hz**	**1 kHz**	**10 kHz**	**100 kHz**
20 µH	0.001 µH	NA	NA	NA	1.0% + 5	2.5% + 20
200 µH	0.01µH	NA	NA	1.0% + 5	0.7% + 3	2.5% + 20
2000 µH	0.1 µH	0.7% + 10	0.7% + 10	0.5% + 3	0.5% + 3	0.8% + 20
20 mH	0.001 mH	0.5% + 3	0.5% + 3	0.2% + 3	0.3% + 3	0.8% + 10
200 mH	0.01 mH	0.5% + 3	0.5% + 3	0.2% + 3	0.2% + 3	1.0% + 10
2000 mH	0.1 mH	0.2% + 3	0.2% + 3	0.2% + 3	0.5% + 5	1.0% + 10
20 H	0.001 H	0.2% + 3	0.2% + 3	0.5% + 5	1.0% + 5	2.0% + 10
200 H	0.01 H	0.7% + 5	0.7% + 5	1.0% + 5	2.0% + 8	NA
2000 H	0.1 H	1.0% + 5	1.0% + 5	2.0% + 8	NA	NA

Phase Angle of Impedance

Range	Resolution	Accuracy (θe)	Condition
–180° ~180°	0.1°/1°	(AZ + Offset/Zx) x180/π	D < 1 or Q > 1

Impedance	Zx	AZ	Offset	θe
1999.9 Ω	19999	0.2%	3	±0.12 °
199.9 Ω	1999	0.2%	3	±0.20 °
19.9 Ω	199	0.2%	3	±0.98 °
1.9 Ω	19	0.2%	3	±9.16 °

Notes:

a. Specifications are applicable to all models (U1731C, U1732C, and U1733C) unless specified

b. The “AZ” and Offset are the accuracy specified at impedance

c. The “π” is approximately 3.14159

Dissipation/Quality Factor

Function	Range	Accuracy (De)	Condition
Z	0.001~999	AZ + Offset/Zx x 100% + 3	D < 1 or Q > 1
L	0.001~999	AL + Offset/Lx x 100% + 3	D < 1 or Q > 1
C	0.001~999	AC + Offset/Cx x 100% + 3	D < 1 or Q > 1

Capacitance	Cx	AC	Offset	De
88.88 µF	8888	0.2%	3	0.203% + 3

Notes:

1. Specifications are applicable to all models (U1731C, U1732C, and U1733C) unless specified
2. The “AZ, AL, AC” and Offset are the accuracy specified at Impedance, Inductance, and Capacitance, respectively
3. The Zx, Lx, and Cx are the display count of the reading. For example, the Cx is 8888 as if the capacitance is 88.88 µF for the range of 200 µF.
4. The Quality Factor is the reciprocal of Dissipation Factor

U1731C/U1732C/U1733C Electrical Specifications

Test Signal

Model	Selection	Test signal level		Test frequency	
		Level	Accuracy	Frequency	Accuracy
U1731C/U1732C/U1733C	100 Hz	0.74 Vrms	0.05 Vrms	100 Hz	0.01%
	120 Hz	0.74 Vrms	0.05 Vrms	120.481 Hz	0.01%
	1 kHz	0.74 Vrms	0.05 Vrms	1 kHz	0.01%
U1732C/1733C	10 kHz	0.70 Vrms	0.05 Vrms	10 kHz	0.01%
U1733C	100 kHz	0.70 Vrms	0.05 Vrms	100 kHz	0.01%
	DCR	+1.235 V	0.05 V	NA	NA

Source Impedance of Impedance/Resistance Measurement

Range	Typical source impedance					
	U1731C/U1732C/U1733C			U1732C/U1733C	U1733C	
	100 Hz	**120 Hz**	**1 kHz**	**10 kHz**	**100 kHz**	**DCR**
2 Ω	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω
20 Ω	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω
200 Ω	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω
2000 Ω	1 kΩ	1 kΩ	1 kΩ	1 kΩ	1 kΩ	1 kΩ
20 kΩ	10 kΩ	10 kΩ	10 kΩ	10 kΩ	1 kΩ	10 kΩ
200 kΩ	100 kΩ	100 kΩ	100 kΩ	10 kΩ	1 kΩ	100 kΩ
2000 kΩ	100 kΩ	100 kΩ	100 kΩ	10 kΩ	NA	100 kΩ
20 MΩ	100 kΩ	100 kΩ	100 kΩ	100 kΩ	NA	100 kΩ
200 MΩ	100 kΩ	100 kΩ	100 kΩ	NA	NA	100 kΩ

Source Impedance of Capacitance Measurement

Range	Typical source impedance				
	U1731C/U1732C/U1733C			U1732C/U1733C	U1733C
	100 Hz	**120 Hz**	**1 kHz**	**10 kHz**	**100 kHz**
20 mF	100 Ω	100 Ω	NA	NA	NA
2000 µF	100 Ω	100 Ω	100 Ω	NA	NA
200 µF	100 Ω	100 Ω	100 Ω	100 Ω	NA
20 µF	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω
2000 nF	1 kΩ	1 kΩ	100 Ω	100 Ω	100 Ω
200 nF	10 kΩ	10 kΩ	1 kΩ	100 Ω	100 Ω
20 nF	100 kΩ	100 kΩ	10 kΩ	1 kΩ	100 Ω
2000 pF	100 kΩ	100 kΩ	100 kΩ	10 kΩ	1 kΩ
200 pF	NA	NA	100 kΩ	10 kΩ	1 kΩ
20 pF	NA	NA	NA	100 kΩ	1 kΩ

U1731C/U1732C/U1733C Electrical Specifications

Source Impedance of Inductance Measurement

Range	Typical source impedance				
	U1731C/U1732C/U1733C			U1732C/U1733C	U1733C
	100 Hz	**120 Hz**	**1 kHz**	**10 kHz**	**100 kHz**
20 µH	NA	NA	NA	100 Ω	100 Ω
200 µH	NA	NA	100 Ω	100 Ω	100 Ω
2000 µH	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω
20 mH	100 Ω	100 Ω	100 Ω	100 Ω	100 Ω
200 mH	100 Ω	100 Ω	100 Ω	1 kΩ	1 kΩ
2000 mH	100 Ω	100 Ω	1 kΩ	10 kΩ	1 kΩ
20 H	1 kΩ	1 kΩ	10 kΩ	10 kΩ	1 kΩ
200 H	10 kΩ	10 kΩ	100 kΩ	100 kΩ	NA
2000 H	100 kΩ	100 kΩ	100 kΩ	NA	NA

General Specifications

Parameter	U1731C	U1732C	U1733C
Measurements	Z/L/C/R/D/Q/θ/ESR	Z/L/C/R/D/Q/θ/ESR	Z/L/C/R/D/Q/θ/ESR/DCR
Display	Primary display: Maximum display 19,999 counts Secondary display: Maximum display 999 counts Automatic polarity indication		
Test frequency (Accuracy = ± 0.1% of actual test frequency)	100 Hz, 120 Hz, 1 kHz	100 Hz, 120 Hz, 1 kHz, 10 kHz	100 Hz, 120 Hz, 1 kHz, 10 kHz, 100 kHz
Backlight	No	Yes	Yes
Test signal level	Selection	Test signal level	Test frequency
	100 Hz	0.74 Vrms	100 Hz
	120 Hz	0.74 Vrms	120.481 Hz
	1 kHz	0.74 Vrms	1 kHz
	10 kHz[1]	0.74 Vrms	10 kHz
	100 kHz[2]	0.74 Vrms	100 kHz
	DCR[2]	+1.235 V	NA
Tolerance mode	1%, 5%, 10%, 20%		
Ranging mode	Auto and manual		
Measurement rate	1 time/second, nominal		
Response time	Approximately 1 second/DUT (Device Under Test)		
Auto power-off	~0-99 mins without operation		
Power supply	Single standard 9 V battery (alkaline or carbon-zinc) or optional power adaptor		
Power consumption	225 mVA maximum without backlight		
Input protection fuse	Resettable over-current protection		
Battery life	16 hours based on alkaline battery		
Low battery indicator	[▭] will appear when voltage drops below ~7.2 V		
Operating temperature	–10 to 55 °C, 0 to 80% R.H.		
Storage temperature	–20 to 70 °C, 0 to 80% R.H. without battery		
Temperature coefficient	0.1 × (specified accuracy)/°C (from –10 to 18 °C or 28 to 55 °C)		
Relative humidity	Maximum 80% R.H. for temperature up to 30 °C decreasing linearly to 50% R.H. at 55 °C		
Weight	337 grams with battery		
Dimensions (H x W x D)	184 mm x 87 mm x 41 mm		
Safety and EMC Compliance	In compliance with EN61010-1 (IEC61010-1:2001) for low voltage directive and Pollution Degree II Environment. Susceptibility and Emissions (EMC): Commercial Limits per EN61326-1		
Calibration	One-year calibration cycle recommended		
Warranty	• 3 years for main unit • 3 months for standard shipped accessories		

1. *Only applicable for U1732C/U1733C*
2. *Only applicable for U1733C*

Ordering Information

Standard shipped items

Standard U1731C, U1732C, and U1733C ordering include:

- Quick Start Guide
- Certificate of Calibration (CoC)
- Alligator clip leads
- 9 V alkaline battery

Recommended accessories

U1731P		Combo Kit Includes one U1731C Series handheld and four accessories: • U5491A soft carrying case • U5481A IR-to-USB cable • U1780A AC adaptor • U1782A SMD tweezer
U1732P		Combo Kit Includes one U1732C Series handheld and four accessories: • U5491A soft carrying case • U5481A IR-to-USB cable • U1780A AC adaptor • U1782A SMD tweezer
U1733P		Combo Kit Includes one U1733C Series handheld and four accessories: • U5491A soft carrying case • U5481A IR-to-USB cable • U1780A AC adaptor • U1782A SMD tweezer
U1174A		Soft carrying case
U5481A		IR-to-USB cable
U1782A		SMB tweezer
U1780A		Power adaptor and cord (according to country)
U1781A		Alligator clip leads

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