Comparison Chart

Item	Capacitor Analyzer
Series	6632 Series
Product	
Test Frequency (Hz)	10Hz~10MHz
Frequency Resolution	6 digits
Basic Accuracy	±0.08% (typical±0.05%)
AC Drive Level	10mV~2Vrms (1m Vrms Resolution)
DC Drive Level	1Vdc (40mA max)
Output Impedance	25Ω/100Ω
ALC	●
List Mode	50 groups · Each group contains up to 15 steps
Bin	●
Comparator	●
Sweeping Function	●
Built-in the Dielectric constant (ε_r) Built-in the Permeability (μ_r)	●
Built-in ESR Measurement	R_{ESR}
Capacitor Frequency Sweep	●
Built-in DC Bias voltage	±12V
Output DC Bias voltage	±40V/200V/2000V
PC Link software	●
Interface	RS-232, Handler, USB Host, USB Device, LAN, GPIB
Display	800*480 7.0" TFT color screen

NOTE :
● With this function
— Without this function

The PC link software has standard and professional version

6632C precisely measures ESR frequency variations, providing true insight into capacitor performance.

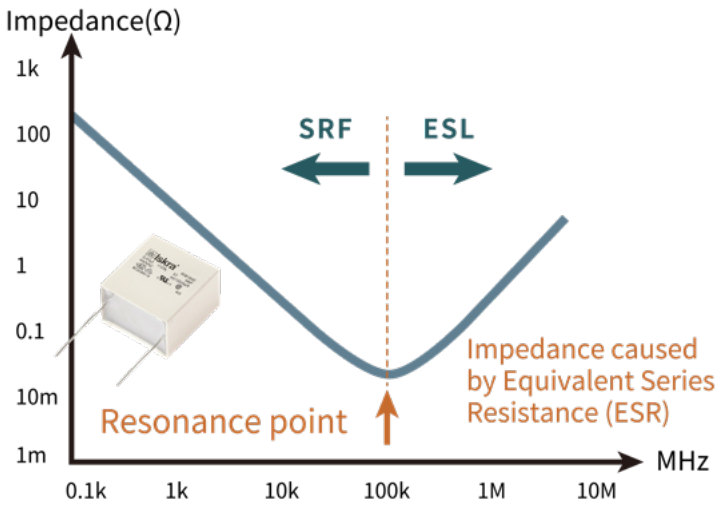
From the capacitor's equivalent-circuit model, a real capacitor is not ideal but comprises its capacitance (C) plus parasitic elements such as equivalent series resistance (ESR) and equivalent series inductance (ESL). ESR arises from the electrodes, conductors, dielectric, and material structure as a small series resistance, causing energy loss and heating in the low to mid frequency range key factors affecting efficiency and lifespan. ESL stems from lead wires, internal stacking, and packaging as parasitic inductance, impacting high-frequency performance. When C and ESL resonate, the self-resonant frequency (SRF) occurs; above this frequency, the capacitor loses its energy storage characteristic, behaves inductively, and can no longer effectively filter or decouple.

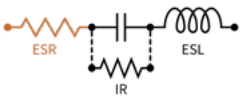
ESL (Equivalent Series Inductance)

The capacitor's leads and internal electrode structure introduce a small inductive effect, resulting in a parasitic inductance that coexists with the main capacitance.

SRF (Self-Resonant Frequency)

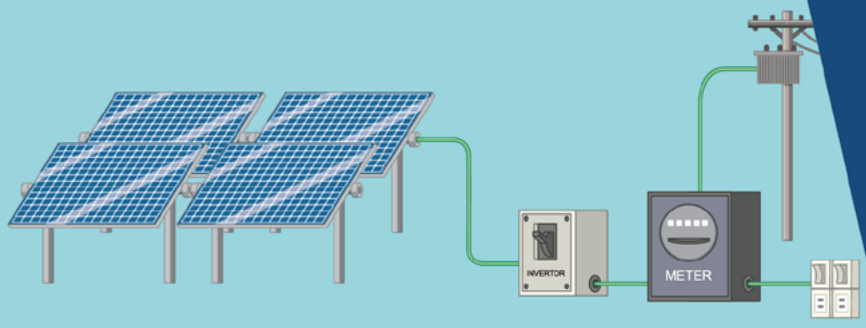
The SRF defines a capacitor's upper operating frequency limit; beyond resonance, it transitions from capacitive to inductive behavior, losing its filtering and decoupling capability.





ESR (Equivalent Series Resistance)

Under AC conditions, energy losses from internal conductors, electrode materials, and junctions manifest as the capacitor's equivalent series resistance (ESR). This ESR impacts filtering efficiency and thermal behavior, making it a critical parameter in high frequency power supply design.



Filter Capacitors in Solar Inverter Systems

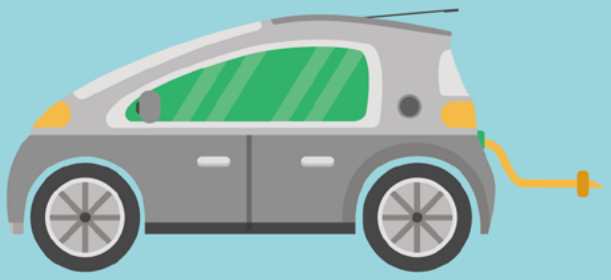
Capacitors are primarily used to smooth the DC output after rectification or switching power conversion, suppressing ripple voltage and current.

In solar inverter systems, high voltage, high frequency, and continuous ripple currents are generated. It is crucial to control the Equivalent Series Resistance (ESR) to suppress thermal effects and ensure stable filtering performance.

DC-Link Film Capacitors for Three-Phase Motor Drives

Capacitors are primarily used to buffer high-frequency DC currents and transient voltages after three-phase rectification.

ESR (Equivalent Series Resistance) determines whether a capacitor can safely absorb PWM ripple currents, preventing thermal runaway or failure.



DC-Link Film Capacitors for On-Board Charger (OBC) Systems in Electric Vehicles

Capacitors are primarily used for filtering after high power bridge conversion.

In OBC (On-Board Charger) modules, capacitors must withstand high voltages of 400V / 800V / 1200V and endure prolonged exposure to fast, high frequency current ripples. If the ESR is too high, it can lead to abnormal temperature rise, accelerating material degradation and causing reliability issues such as dielectric shrinkage and cracking.

6632C precisely measures ESR across varying frequencies truly mastering capacitor performance.

6632C Capacitor Analyzer

- Built-in ESR measurement
- Sweep mode

Capacitor Analyzer

6632C

Test Frequency
10Hz~10MHz

MICROTEST
www.microtest.com.tw

MICROTEST Capacitor Analyzer 6632C is designed for precise ESR measurement of capacitors, covering a wide frequency range from 10 Hz to 10 MHz. In meter mode, it provides real-time ESR readings; in Sweep Mode, it analyzes Impedance (Z) and Phase (θ) to identify the Self-Resonant Frequency (SRF).

Built-in ±12 V DC bias allows direct C-V curve testing without external power. The instrument also supports automatic Dielectric constant (ε_r) calculation, saving time and improving efficiency. The 6632C is the ideal solution for capacitor analysis in both R&D and production.

Application

Aluminum Electrolytic Capacitors | Measure ESR to evaluate aging and filtering efficiency

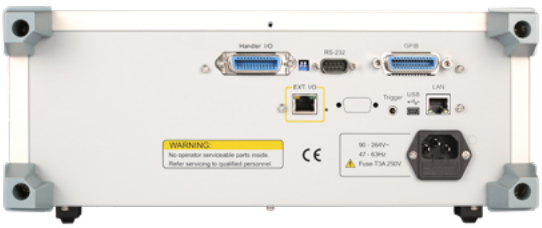
Conductive Polymer Solid Aluminum Capacitors | Measure ultra-low ESR characteristics to meet high-speed digital power supply requirements

MLCCs for Power Supply Decoupling | Measure ESR to assess power filtering, decoupling performance, and EMI suppression

Film Capacitors | In high-frequency, high-power applications, measure ESR to evaluate energy loss and thermal effects, enhancing component reliability

Features

- Frequency range: DC, 10Hz~10MHz
- Built-in Equivalent Series Resistance (ESR) Measurement Function
- Built-in DC Bias Voltage ±12V (±12V)
- Built-in the Dielectric constant-ε_r
- Built-in the Permeability-μ_r
- Automatic Level Control Function
- Output Impedance 25Ω/100Ω
- Open circuit/ Short circuit/ Load Correction Function
- Cable Compensation (0/ 0.5/ 1/ 2m)
- Support Meter Mode, List Mode and Sweep Mode
- 7"TFT, color screen (Display 3 Sets of Parameters)
- Simultaneous AC/DC Measurement
- Basic accuracy up to ±0.08%
- Store Setup Files, Measurement Data, and Screenshots via USB
- Supports Output DC Bias (Option F420006)



CE

Standard Interfaces

RS-232 | USB Host
Handler | USB Device
LAN | GPIB
EXT. I / O

Specification

Model	6632C	
Test Frequency	10Hz~10MHz	
Points of Test Frequency	Programmable	
Frequency Resolution	100mHz, 6 digits of setting	
Frequency Output Accuracy	±0.01%	
Basic Accuracy	±0.08% (typical±0.05%)	
AC Drive Level	Voltage	10mV~2Vrms(FREQ. ≦ 1MHz), 10mV~1Vrms(FREQ.>1MHz or FREQ. ≦ 1MHz and RO=25Ω)
	Current	100μA~20mArms(RO=100Ω), 200μA~40mArms(RO=25Ω)
	Voltage Minimum Resolution	1mV
	Current Minimum Resolution	10μA
DC Drive Level	DCR Voltage	1Vdc (40mA max.)
ALC	ALC ON：6% * Voltage ±2mV ALC OFF：10% * Voltage ±2mV	
Output Impedance	25Ω, 100Ω (switchable)	
Test Time (Fastest)	<3mS	
Built-in DC Bias Voltage	±12V	
Measurement Parameters and Ranges	|Z|	0.000mΩ~9999.99MΩ
	R, X	±0.000mΩ~9999.99MΩ
	|Y|	0.00000μS~999.999kS
	G, B	±0.00000μS~999.999kS
	θRAD	±0.00000~3.14159
	θDEG	±0.000°~180.000°
	Cs, Cp	±0.00000pF~9999.99F
	Ls, Lp	±0.00nH~9999.99kH
	D	0.00000~9999.99
	Q	0.00~9999.99
	Δ	±0.00%~9999.99%
	Rdc	0.00mΩ~99.9999MΩ
	ε_r' ε_r''	0~100000
	μ_r' μ_r''	0~100000
	R_{AC}	±0.000mΩ~9999.99MΩ
	R_{ESR}	±0.000mΩ~9999.99MΩ

General

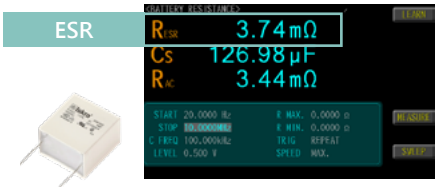
Measurement Mode	Meter mode, list mode, sweep mode	
Measurement Circuit	Series/ Parallel	
Correction	Open Circuit/ Short Circuit/ Load correction	
Cable Compensation	0/ 0.5/ 1/ 2m	
List Mode	50 groups of Multi-steps setting (Each group contains up to 15 steps)	
Bulit-in DC Bias	-12 to +12V, 0.3% ±1.5mV, 100Hz to 10MHz	
BIN	9	
Comparator	ABS, ΔABS, Δ%, OFF	
Bulit-in Storge	100 sets LCR Meter setting documents, 50 sets list mode setting documents	
USB Host Storge	LCR setting documents, list mode setting documents,BMP graphics, Sweep screen and test result data	
Trigger Test	Auto/ Manual/ RS-232/ GPIB/ Handler	
Interface	RS-232/ GPIB/ Handler/ LAN/ USB Host/ USB Device	
Option	PC link software	
	MLCC Component Measurement (Option FX-LR0001)	MLCC (Class 2) AC Voltage Level Compensation Test Function
	Output DC Bias Voltage/ Current (Option F420005)	0~±40V/±100mA
Power Supply	Voltage：100~240Vac	
	Frequency：50~60Hz	
	Low power consumption：Maximum 30W	
Power Consumption	30VA	
Display	7"TFT, color screen (800*480)	
Environment	Temperature：10~40℃, Humidity：20~80%RH	
Dimension (W*H*D)	336×147×340mm	
Weight	3.95Kg	

Functions

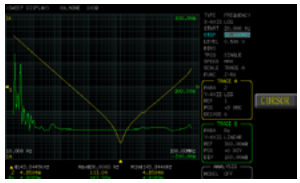
6632C built-in ESR (equivalent series resistance) measurement and supports sweep analysis.

6632C Capacitor Analyzer supports high frequency measurements from 10 Hz to 10 MHz and features built-in ESR (equivalent series resistance) measurement. In meter mode, it rapidly acquires RESR values to help engineers assess capacitor losses and thermal stability in real time.

In sweep mode, Impedance (Z) and Phase (θ) versus frequency to identify the Self-Resonant Frequency (SRF). By examining the capacitor's frequency response curve, engineers can optimize filter and power decoupling designs, ensuring component performance at different operating frequencies and enhancing the reliability and effectiveness of filtering, decoupling, and power applications.



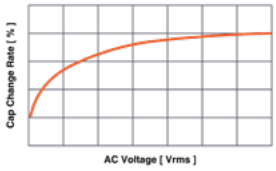
Meter mode-Built-in RESR



Sweep mode-Capacitor frequency-response curve

AC Signal Level Enhancement Solution for Accurate MLCC

The regulations (JIS C 5101-1-1998) stipulate standards for test signals. When measuring MLCC capacitance, the LCR Meter must enable the Automatic Level Control (ALC) function. This function introduces a stable level circuit into the test circuit to automatically correct any level offset back to the user-set voltage signal value.



ALC Open

External AC Voltage Level Compensation Box (FX-LR0001)	
Test Frequency	100Hz~100kHz
Voltage compensation (ALC ON)	0.1Vrms~1Vrms
Current compensation (ALC ON)	0.15A

The figure below shows the measured MLCC capacitance value. Without enabling the ALC function, the measured capacitance value (7.85uF) is lower than the standard value. By using an External AC Voltage Level Compensation Box (FX-LR0001), the measured capacitance value under stable level signals is closer to the standard value (9.09uF).

Material Analysis - Dielectric Constant

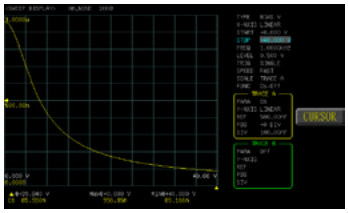
Many materials in everyday life possess electrical properties related to dielectrics, such as the DC bus capacitors used in new energy vehicles, which require dielectric materials with high dielectric constants. For electric vehicles, the performance of the power battery directly determines the range capability, and the dielectric properties of the battery's electrode materials are key to performance. The relative dielectric constant can be measured using 6632 Impedance Analyzer, which provides an AC excitation signal to the material, while simultaneously monitoring the actual voltage on the material. By measuring the material's dimensions and its capacitance value along with the loss factor D, the material's relative dielectric constant ε_r is obtained.

Monitoring $\varepsilon_r'/\varepsilon_r''$ in Meter mode

Capacitor DC-Bias Voltage Characterization Solution

In electronic circuits, capacitors serve filtering, decoupling, energy storage, and voltage stabilization, but their capacitance can drop sharply under DC bias. Applied DC voltage suppresses dielectric polarization, especially in high-k ceramics, leading to significant capacitance loss. Ignoring this effect in power modules, decoupling networks, DC-DC converters, or high speed communications can cause increased ripple, instability, and EMI issues.

MICROTEST 6632C built-in ±12 V DC Bias voltage measurement capability for precise analysis of capacitor bias characteristics. Additionally, it offers the following external DC Bias testing solutions:



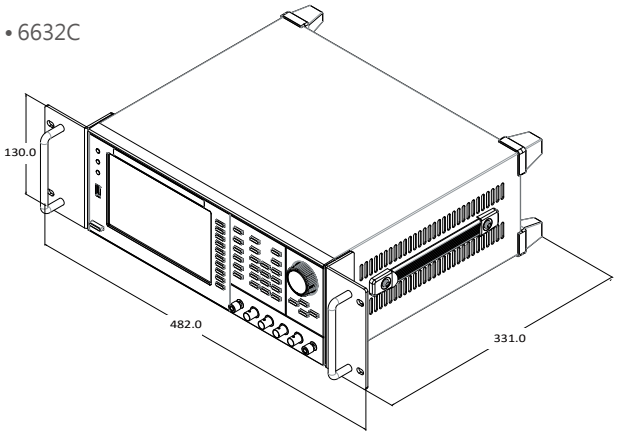
Sweep Mode:Capacitance Drop Curve

F420003	F420005	F420001	F420006
±40V	±40V/±100mA	±200V	±2000V
100Hz~1MHz	≤ 30 MHz	100Hz~1MHz	100Hz~1MHz
			

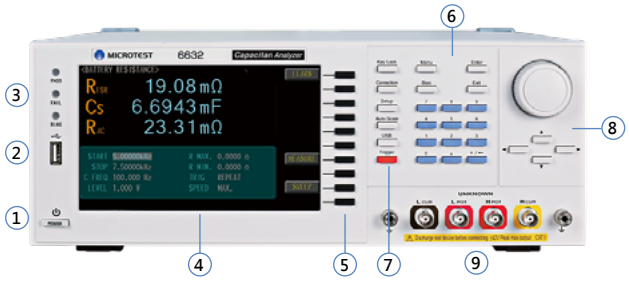
Automatic Chassis Dimension

• Dimension (mm)

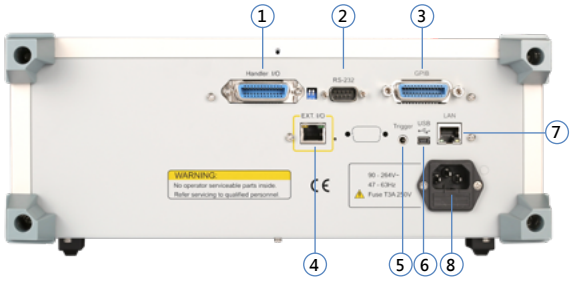
• 6632C



Appearance



1. Power switch
2. USB
3. PASS/ FAIL/ BIAS
4. LCD Screen
5. Function
6. setup and number key
7. Trigger
8. Direction
9. BNC terminal



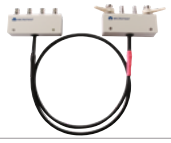
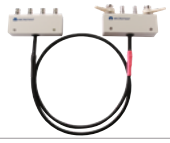
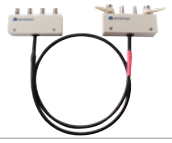
1. Handler
2. RS232
3. GPIB
4. EXT. I/O
5. Trigger
6. USB
7. LAN
8. Power jack/ Fuse block

Ordering Information

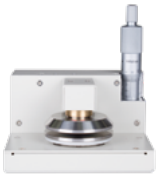
6632C Capacitor Analyzer	Standard	Optional
• 6632C(Test Frequency 10Hz~1MHz)	• FX-000C19 DIP Test Fixture • Power cord	• F423906A Kelvin Clip Leads (100cm) • F423906B Kelvin Clip Leads (50cm) • F663001A BNC Test Leads (50cm) • F663001B BNC Test Leads (100cm) • F663001C BNC Test Leads (200cm) • F420001 External Voltage Bias(±200V/1MHz) • F420003 External Voltage Bias(±40V/1MHz) • F420005 External Voltage/ Current Bias(±40V/100mA) • F420006 External Voltage Bias(±2000V/1MHz) • FX-0000C6 DIP Test Fixture • FX-0000C7 Dielectric Material • FX-0000C8 Magnetic Material Test Fixture • FX-0000C9 Material Testing Fixture • FX-000C10 Bottom Electrode SMD Test Fixture • FX-000C11 SMD Tweezers Test Leads • FX-000C12 SMD Test Fixture • FX-000C20 Liquid Dielectric Material Test Fixture • FX-LR0001 Automatic Level Compensation Fixture • FX-0000C4 DIP Test Fixture • TL-000003 RS-232 Cable (180cm) • TL-000007 USB Cable (180cm I Type-A TO Type-B) • PC Link software

Fixture & Accessories

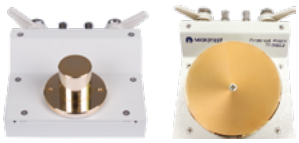
	FX-000C19 DIP Test Fixture	F423906A Kelvin Clip Leads (100cm)	F423906B Kelvin Clip Leads (50cm)
			
Frequency	DC~50MHz	DC~1MHz	DC~1MHz
Max. Voltage/ Current	±42V	±42V	±42V
DUT Size	-	Max. 6mm	Max. 6mm
Applicable Models	6632/ 6621/ 6630/ 6363~6367	6632/ 6621/ 6630/ 6363~6367	6632/ 6621/ 6630/ 6363~6367

	F663001A BNC Test Leads (50cm)	F663001B BNC Test Leads (100cm)	F663001C BNC Test Leads (200cm)
			
Frequency	DC~20M	DC~10M	DC~5MHz
Max. Voltage/ Current	±200V	±200V	±200V
DUT Size	-	-	-
Applicable Models	6632/ 6621/ 6630/ 6363~6367	6632/ 6621/ 6630/ 6363~6367	6632/ 6621/ 6630/ 6363~6367

	F420001 External Voltage Bias (±200V/1MHz)	F420003 External Voltage Bias (±40V/1MHz)	F420005 External Voltage/Current Bias (±40V/100mA)
			
Frequency	100Hz~1MHz	100Hz~1MHz	≤ 30 MHz
Max. Voltage/ Current	±200V	±40V	DC ±40V
Accessory Description	-	-	DC ±100mA
Applicable Models	6632/ 6621/ 6630/ 6363~6367	6632/ 6621/ 6630/ 6363~6367	6632/ 6621/ 6630

	F420006 External Voltage Bias (±2000V/1MHz)	FX-0000C6 DIP Test Fixture	FX-0000C7 Dielectric Material
			
Frequency	100Hz~1MHz	DC~30MHz	≤30MHz
Max. Voltage/ Current	±2000V	±42V	±42V
DUT Size	-	-	≤10mm (Electrode Diameter：38mm、5mm)
Applicable Models	6632/ 6621/ 6630/ 6363~6367	6632/ 6621/ 6630/ 6363~6367	6632/ 6621/ 6630

FX-0000C8
Magnetic Material Test Fixture



FX-0000C9
Material Testing Fixture

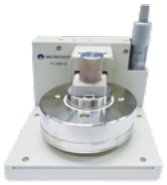
FX-000C10
Bottom Electrode SMD Test Fixture

Frequency	≤30MHz	DC~30MHz	DC~30MHz
Max. Voltage/ Current	±42V	±42V	±42V
DUT Size	Type A：OD 8, ID 3.1, H 3mm Type B：OD 20.5, ID 4.8, H 11mm Type C：OD 65.5, ID 7.1, H 28mm	≤10mm	≤9x9x5mm
Applicable Models	6632/ 6621/ 6630	6632/ 6621/ 6630/ 6363~6367	6632/ 6621/ 6630/ 6363~6367

FX-000C11
SMD Tweezers Test Leads

FX-000C12
SMD Test Fixture

FX-000C20
Liquid Dielectric Material Test Fixture



Frequency	DC~10MHz	DC~30MHz	DC~30MHz
Max. Voltage/ Current	±42V	±42V	±42V
DUT Size	≤10mm	≤7mm	Electrode Diameter：38mm Gap of electrodes：0.3/0.5/1/2/3/5mm
Applicable Models	6632/ 6621/ 6630/ 6363~6367	6632/ 6621/ 6630/ 6363~6367	6632/ 6621/ 6630

FX-LR0001
Automatic Level Compensation Fixture

Frequency	100Hz~100kHz
Output impedance	10 Ω (ON), 25 Ω/ 100 Ω (OFF)
Output Voltage swimming range	AC 0.1 ~ 1V rms (ALC ON)
Max. output current	0.15A
Applicable Models	6632/ 6621/ 6630

FX-0000C4
DIP Test Fixture

Frequency	DC~1MHz
Max. Voltage/ Current	±42V
DUT Size	Max. 64mm
Applicable Models	6632/ 6621/ 6630/ 6363~6367

TL-000003
RS-232 Cable

TL-000007
USB Cable

Applicable Models	6632/ 6621/ 6630/ 6363~6367	6632/ 6621/ 6630
Accessory Description	180cm	Type-A TO Type-B I 180cm