Der ee lcr meter de-5000 manual

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 Page 2 1 2 3 4 5 6 7 7 1 7 8 9 10 11 12 13 14 15 16 17 18 19 LCD Display: Double 1999/ 1999/ 1999 display - bar chart 51 segment Speed Measurement: Approximately. 2 Times Per Second Range: Automatic Overload:OL Display on LCD Low Battery: Display on LCD Auto Power Off: In 5 minutes about. Battery:9V x1 Safety Standard:IEC 61326-1 - IEC 61326-2-2 Measuring Ranges: Precision: ± (% from reading - number of least significant numbers) at 23 degrees Celsius ± 5 degrees Celsius, 1. The specifications are based on measurements made on input sockets or terminals using the Test Lead Case alligator body (TL-21) after a short open calibration. 2. DUT (device tested) - test wires must be properly protected for GUARD if necessary. 3. To make better precision measurements on extremely high or low impedance ranges of L,C,R, it is highly recommended that do OPEN/SHORT calibration before measuring for following ranges marked with * Resistance(Parallel / Series mode): Range Resolution 100/120Hz 1kHz 10kHz 100kHz 20.000Ω 0.001Ω ─ 1.0%+3* 1.0%+3* 2.0%+3* 200.00Ω 0.01Ω 1.0%+3 0.3%+2 0.3%+2 0.6%+3 2.0000kΩ 0.0001kΩ 0.3%+2 0.3%+2 0.3%+2 0.6%+3 20.000kΩ 0.001kΩ 0.3%+2 0.3%+2 0.3%+2 0.6%+3 200.00kΩ 0.01kΩ 0.5%+2 0.5%+2 0.5%+2 1.0%+3 2.0000MΩ (2.000MΩ) 0.0001MΩ 1.0%+3 1.0%+3 1.0%+3 ─ 0.001MΩ ─ ─ ─ 2.0%+3* 20.000MΩ (20.00MΩ) 0.001MΩ 2.0%+3* 2.0%+3* ─ ─ 0.01MΩ ─ ─ 2.0%+3* ─ 200.0MΩ 0.1MΩ 2.0%+3* 2.0%+3* ─ ─ * Do open/short calibration before measuring for above ranges with * to have better precision measurements. DCR 200.00 0.01 1.0% x 2.0000k 0.0001k 0.2%:2%2 20.000k 0.001k 0.2% 2 200.00k 0.01k 0.5%-22.2.2 0000M 0.0001Mz 1.0%-3 20.000M 0.001M 2.2.000M 0%-3 20.0% 3 - Make open/short calibration before measuring the above ranges with to have better measurement accuracy. Capacity (parallel/ series mode): Resolution range 100/120 Hz 100 kHz 200.00pF 0.01pF 2.0% - 0.3% - 2 0.6% - 3 20.000nF 0.001nF 2.0% - 0.3% - 2 0.3% - 2 0.6% - 3 200,00nF 0.01nF 0.3% 2 0.3% 2 0.3% 2 0.6% 3 2000.0 nF 0.1nF 0.3% 2 0.3% 20,000 KF (20.00 EURO) 0.001 kF 0.3% 0.6% x 2 1.2% 200.00 euro (200.0 KF) 0.01 kF 0.6% x 2 1.0% 2000.0 'F (2000 kF) 0.1 F 1.0%3 20.00mF 0.01mF 1.2% Induction (parallel/series mode). Resolution range 100/120 Hz 1kHz 10 kHz 100 kHz 20,000 GG 0.001 gHz 200.00 g x 0.01 g (1.2% x 5 0.6% 3 2000.0 g 0.1 g. 2. 0%-5 0.6%3 0.6% 3 20,000 mH 0.001 mH 1.2% x 5 1.0 %-5 0.3%-2 0.6% - 3,200.00 mG 0.01 mN 0.3% - 2 0.6% 1,2% »5» 2000.0mH 0.1mH 0.3% » 2 0.3% » 2 0.6% »3 » 20.000H 0.001H 0.3% » 2 0.6% » 3 1.2 %-5 - 200.0H 0.1H 0.6% - 3 1,2% - 5 - 2.000KH 0.001KH 1.2% Точность v.s. Сопротивление (DUT) DCR 100/120 Гц 1кГц 10кГц 100 кГц 0,1 115 1,2% x 5 1,2% 1,2% 5 2,5% 10 0,6%3 0,6% x 0,6% 0,6% 3 1,2% 5 10 100k 0,3% 2 0,3% 2 0,3% %-2 0,6%-3 100к-1МЗ 0,6% - 3 0,6% - 3 0,6% , 3 0,6%, 3 2,5% 5 1,2%5 1,2% 5 2,5% 5 >20МЗ 2,5% 5 2,5% 5 2,5% 5 - сделать открытую / короткую калибровку перед измерением для вышеуказанных диапазонов с , чтобы иметь лучшую точность измерений. TEMP./Humidity: Operation:0'C-50'C (32'F-122'F)/ Storage:-20'C'60'C (-4'F-140'F)/ Dimension: 188(L)x95 (W)x52(H)mm Approx.350g (excluding battery) Accessory : Alligator lead test case (TL-21) x 1 AC/DC Adapter x 1 Guard Line (TL-23) x 1 DC 9V Battery x1 Instruction X1 Carry Case x 1 Additional Accessories for WITH USB FEATURE: Optical IR for USB PC Link x 1 CD Rom (Software) x 1 TL-22 SMD Tweezers x 1 Auto L/C/R check/120/1K/10K/100K/100K Hz frequency test 20,000/2000 calculates Display Backlight Ls/Lp/Cs/Rs/RP/DCR/D/θ 10 <9>/ESR Measuring Relative Series Modes/Parallel Modes/ Parallel Modes The 、 ± ± sorting components function 0.5%、± 1%、±2%、±5%、±10%、±20%、-20%-80% Low battery rate 4-wire Kelvin measuring $1207.08 $214.50 ShippingAdd All to have a CartThis item does not belong on this page. Thank you, we'll see about that. DE-5000 LCR Meter DE-5003 Digital Multi-Meter zCR DE-5004 Digital Multi-Meter LCR Author Theme: Der EE DE-5000 Unboxing and Tears (read 64394 times) 0 Members and 2 Guest view of the topic. Share with me: zenith and zenith. The author has no radio-technical education and can be a nonsense. Foreword: The washing machine has broken down. Guarantee Called the master from the authorized service center. The master estimated the replacement of the fee at 6,000 rubles. I went to the radio parts store, bought a couple of capacitors for 12 rubles. The machine has been working properly since then (year). Similar to the computer: stopped turning on, replaced the capacitor in the duty supply of Thermaltake, now works. Electrolytic capacitors do not have an outstanding lifespan (especially when heated or in HF circuits, where ESR works on the heating of the capacitor), but in abundance are found in modern technology. Sometimes a faulty capacitor is visible visually (bloating), sometimes not. Depending on the location of application, different parameters of capacitors may be critical: capacity, ESR, constant current of leakage. For example, in the primary power supply (2x50Hz) capacity will be important, and in the secondary (where frequencies are about 3 decimal orders above) electrolytic capacitors will be selected for reasons of acceptable ESR, not capacity. When the electrolytic capacitor dries, the ESR may increase to the point where the device stops working properly, but the capacity (if measured by a multimeter) will still correspond to the face (or will increase slightly). Total wanted a magic device, poking which in the fee could learn what capacitors need to change. Theory (cautiously, there may be nonsense): If through a chain built of ideal resistors to miss the current, the drop voltage will be proportional to the current. Om's actual law: U q I'R. You can also calculate chain resistance when sequentially connected: R'R1'R2 and R=R1*R2/(R1+R2). That is, an arbitrary chain of resistors can be put in line with one equivalent resistor of some denomination. Or back: to collect the right denomination of several resistors. Example: To get resistance 11 Om you can consistently connect two resistors with denominations 10 Om and 1 Om. And to get resistance 0.5 Om can simultaneously connect two resistors denominated 1 Om. With reactive elements more interesting: for DC ideal capacitor and coil inductivity will look like a break of the chain and conductor respectively. But for the alternating sinusoidal current will be not only linear dependence of the amplitude of tension from the amplitude of the current, but also a phase shift of current from tension. For example, the capacitor will charge and discharge back to the source. That is, instead of one parameter (resistance) it turns out two: the ratio of voltage amplitude to the toe and the magnitude of the phase shift. However, if we consider the sinusoidal current of some fixed frequency, you can use the above formulas, if you use complex numbers, and instead of resistance to use impedance: as a valid part to put an active (resistive) load, and as an imaginary - reactive (difference of inductive and resistance). From here, if the chain of resistors can be replaced with one equivalent resistor, then the chain of resistors, capacitors, coils of inductivity can be replaced with an equivalent scheme of two elements: resistance and capacitor (or inductivity coils depending on the sign part of the impedance). If you combine them consistently, you get an equivalent consistent chain. Similarly, an equivalent parallel chain is built. In addition to the capacity and equivalent sequential resistance (ESR), the diagram can be presented as a variety of pairs of numbers, such as: capacity and d-factor (the ratio of the actual (active) part of the impedance to the imaginary (reactive)); inductivity and q-factor (kindness, the attitude of the imaginary part of impedance to valid); ESR and phase angle. It is not difficult to bring the formulas for the recalculation of one to another. Reactive resistance depends on the frequency of the sinusoidal signal. For example, meanders can be thought (by virtue of Fourier's transformation) as the sum of sinusoidal waves of different frequency. Therefore, the meander can lose its rectangular shape if different frequencies are weakened in different ways. Due to this mechanism, the RC filter (consisting of resistance and capacitor) discards high frequencies and misses low frequencies. Real electronic components differ from ideal: capacitors and coils of inductivity in addition to reactive resistance have and active. The capacity of some types of capacitors changes when the frequency, variable voltage and constant voltage component change. The equivalent chain will be equivalent only to the chosen frequency. For the sinusoidal current of another frequency there will be another equivalent chain. The LCR meter should be able to measure both (active and reactive) components of complex impedance and the ability to measure at different frequencies. Expensive devices allow more: to build a sweep on the frequency, to choose voltage for testing and so on. Intra-in-se measurements. Silicon diodes and transistors have a relatively high loss of voltage. If you take measurements at voltage lower than the loss of voltage on semiconductors, the semiconductors will look like a chain break. In some cases, this allows you to determine the malfunction of the electrolytic capacitor without falling out. Some don't allow it: imagine 2 capacitors connected in parallel, one with a good (low ESR), the other with a bad one (high ESR). If they are not disconnected, the measurements will show the ESR of a good capacitor. Types of meters that caught the eye: - Stationary devices. Very expensive. Portable LCR meters with very rich-looking boards. Like Agilen U1733C for $400. www.youtube.com/watch?v=Mp0n-Gu0aKk#t=185 is a Cyrustek ES51919/ES51920 LCR. Characteristics are not inferior to the previous category, but more affordable, because everything is crammed inside the chip. That is, the fee is almost empty. www.youtube.com/watch?v=ji-UT7HJm0Q#t=527 is The Pincets. For example, NV-12 ($4,000) or Smart Tweezers ST-5S ($400). ESR meters. Example: MESR-100 ($50). Some devices in this category have protection against charged capacitors. Testeders based on MK and Marcus scheme. Cheap (from $20). The last two categories, first, as a rule, do not allow to choose the frequency, secondly for testing use not very sinusoidal signal, as a result are tested not at a certain frequency, but on the sum of harmonics. I liked the characteristics of the Cyrustek ES51919/ES51920 www.cyrustek.com.tw/spec/ES51920.pdf chip and stopped. On this chip, different companies produce devices in different cases: 1. CEM DT-9935, Aktakom AMM-3035. www.eevblog.com/forum/testgear/cheap-lcr-meter-cem-dt-9935/ Flaw: does not support a four-wire measurement scheme. 2. Mastech MS5308 www.eevblog.com/forum/testgear/mastech-ms5308-lcr-meter-with-esr-measurement-on-discount-at-the-moment/ Disadvantages: hefty case, power supply distorts readings, calibration button hidden. 3. UNI-T UT612, Tenma 72-10465 www.eevblog.com/forum/testgear/review-and-tear-down-of-uni-t-ut612-lcr-meter/ Disadvantages: does not support a four-wire measurement scheme, complaints about screen viewing angles. 4. V&A VA520/VA520B, Voltcraft LCR 300, PeakTech 2170, Axiomet AX-LCR42A, Aktakom AMM-3320, Kusam KM-520B www.eevblog.com/forum/testgear/voltcraft-lcr-300-micro-review/ www.eevblog.com/forum/reviews/some-photos-from-a-peaktech-2170-teardown/ 5. Lutron LCR-9184, Extech LCR200 www.eevblog.com/forum/repair/extech-lcr-200-repair/ 6. IET, DER EE DE5000, Asita AS250, IET Labs

DE-6000. www.eevblog.com/forum/testgear/der-ee-de-5000-unboxing-and-teardown/ www.eevblog.com/forum/testgear/de-500-lcr-meter-oem/ www.eevblog.com/forum/testgear/der-de-5000-measurement-accuracy/ www.eevblog.com/forum/testgear/iet-de-5000-lcr-meter-in-uk/ www.youtube.com/watch?v=ji-UT7HJm0Q pricing for the latter is quite interesting. It is manufactured by Taiwanese company DER EE. It is shipped to Japan under the manufacturer's brand at 4,700 JPY akizukidenshi.com/catalog/g/gM-06264/ In other countries it is sold under the brand IET for $350. That is, the mark-up for the IET brand is approximately 666%. I ended up ordering a DER EE DE-5000 from Japan. Instructions: akizukidenshi.com/download/ds/deree/DE-5000_manu_en2p.pdf Features: Measurement Frequency Choice: 100/120/1k/10k/100k/100k Hz Measuring by variable current: equivalent parallel and consistent resistance (ESR), capacity, inductivity, d-factor, q-factor (kindness), phase shift. Measuring resistance by constant current. Double screen: 1999/1999 backlighting. Item sorting mode. Relative measurements. I came in such a set: DE-5000, TL-21, TL-22, a pair of origami. After unpacking we have: the DE-5000 measurer itself, TL-22 tweezers, TL-21 crocodile adapter, alkaline 9v battery, instruction in Japanese (link to English instruction above). Other delivery kits can include a power supply network, a guard TL-23, a PC connection (USB) and a software drive. The battery bolts are twisted into the metal back, rather than self-cutters into the plastic like some other manufacturers. Along the perimeter there is a groove in which the lid enters, and not just applied on top. There are rubber inserts so that the device does not slide on the table. The folding stand has a slant at the bottom, which makes it easy to expose. Some other manufacturers have a difficult time to pick up a stand. Adapters connect through the slot. The slot supports 5 contacts: z force and zsence (when the adapter is inserted, the two-way circuit board of the adapter pushes the force and sence, one is on top of the board, the other is on top of the board), the other is similar to -force, -sence and the fifth is the guard. The buttons are very nice, it is felt when the button is pressed. In addition, there is a sound indication of the click of a button. If a button is pressed that is inactive in this mode, there will be a double signal. It's also very convenient. The screen is contrasting, when tilted is not inverted. The illumination is uniform at the force tweezers and sence are connected a couple of centimeters from the tip. This is how the parasitic containers and resistance of the cable are extinguished. The adapter with crocodiles has a 5-wire connection that extinguishes the parasitic resistance of the corrosiun and cables, but the crocodiles themselves do not Kelvin's real clamps, as the halves of crocodiles are electrically connected to each other. So I bought a $5 Kelvin clip for $5. Their halves are electrically isolated from each other. One half will go force, on the other sense. This method of connectivity eliminates from the measurements the resistance of the pin and radio component contact point. References to the forum where I checked the readings of the device with a stationary device for $6000 I pointed out above. You can also see photos and video of the showdown from these links. Pros: - The cheapest option on the Crisp Cyrustek ES51919/ES51920 with excellent features and precision. Very good quality of production and attention to detail. No wonder IET asks for $350 for it. IET on LCR measurements the dog ate. Support measurements on 4 wires. Disadvantages: - No protection against charged capacitors. You need to carefully discharge the capacitors before measuring. The complete adapter with crocodiles is not very comfortable because of the short wires. The wires are easily changed to long screened, and crocodiles to Kelvin clamps. PS: I apologize for the quality of the photos. Photos.