

BM829, BM827, BM822 & BM821 GENERAL SPECIFICATIONS

Display:
 9999 counts: ACV, DCV, Hz & nS
 6000 counts: mV, μ A, mA, A, Ohm & Capacitance
Polarity: Automatic
Update Rate:
 Digital Display: 5 per second nominal;
 41 Segments Bar-graph: 60 per second max
Low Battery: Below approx. 7V
Operating Temperature: 0°C to 45°C
Relative Humidity: Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 45°C
Pollution degree: 2
Storage Temperature: -20°C to 60°C, < 80% R.H. (with battery removed)
Altitude: Operating below 2000m
Temperature Coefficient: nominal 0.15 x (specified accuracy)/ °C @ (0°C ~ 18°C or 28°C ~ 45°C), or otherwise specified

Electrical Specifications

Accuracy is \pm (% reading digits + number of digits) or otherwise specified, at 23°C \pm 5°C & less than 75% relative humidity.
 True RMS voltage & current accuracies are specified from 10% to 100% of range or otherwise specified. Maximum Crest Factor < 2:1 at full scale & < 4:1 at half scale, and with frequency components within the specified frequency bandwidth for non-sinusoidal waveforms.

DC Voltage

Function	RANGE	Accuracy
mV	60.00mV	0.12%+2d
	600.0mV	0.06%+2d
V	9.999V, 99.99V, 999.9V	0.08%+2d

Input Impedance: 10M Ω , 50pF nominal (80pF nominal for 600mV range)

AC Voltage

Function	RANGE	Accuracy
50Hz ~ 60Hz		
mV	60.00mV, 600.0mV	0.5% + 3d
	V	
40Hz ~ 500Hz		
mV	60.00mV, 600.0mV	0.8% + 4d
	V	9.999V, 99.99V
V	999.9V	2.0%+4d
	500Hz ~ 1kHz	
mV	60.00mV, 600.0mV	2.0% + 3d
	V	9.999V, 99.99V
V	999.9V	2.0%+4d
	1kHz ~ 3kHz	
mV	60.00mV, 600.0mV	2.0%+3d
	V	9.999V, 99.99V, 999.9V
3kHz ~ 20kHz		
mV	60.00mV ¹⁾ , 600.0mV ¹⁾	2%+3d
	V	9.999V ²⁾ , 99.99V
V	999.9V	Unspec'd

¹⁾Specified from 30% to 100% of range.

²⁾for 3kHz ~ 15kHz only

Input Impedance: 10M Ω , 50pF nominal (80pF nominal for mV ranges)

dBm

At 600 Ω , -11.76dBm to 54.25dBm,
 Accuracy: \pm 0.25dB + 2d (@40Hz ~ 20kHz)
 Input Impedance: 10M Ω , 50pF nominal
 Selectable reference Impedance of 4, 8, 16, 32, 50, 75, 93, 110, 125, 135, 150, 200, 250, 300, 500, 600, 800, 900, 1000, 1200 Ω

AutoCheck™ (DCV)

RANGE	Accuracy
9.999V, 99.99V, 999.9V	0.5%+3d

Lo-Z DCV Threshold:
 > +1.5VDC or < -1.0VDC nominal

Lo-Z DCV Input Impedance:

Initially approx. 3.0k Ω , 165pF nominal; Impedance increases abruptly within a fraction of a second as display voltage is above 50V (typical). Ended up impedances vs display voltages typically are:
 18k Ω @100V
 125k Ω @ 300V
 320k Ω @ 600V
 500k Ω @ 1000V

DC AC & AC+DC AC Voltage¹⁾

Function	RANGE	Accuracy
DC, 50Hz ~ 60Hz		
mV	60.00mV, 600.0mV	0.7% + 6d
	V	
40Hz ~ 1kHz		
mV	60.00mV, 600.0mV	1.0%+6d
	V	9.999V, 99.99V, 999.9V
1kHz ~ 20kHz		
mV	60.00mV ²⁾ , 600.0mV ²⁾	2.2%+6d
	V	9.999V ³⁾ , 99.99V
V	999.9V	Unspec'd

¹⁾Specified from 10% to 100% of range for Model 821

²⁾Specified from 30% to 100% of range.

³⁾for 1kHz ~ 15kHz only

Input Impedance: 10M Ω , 50pF nominal (80pF nominal for mV ranges)

Sensing:

BM829: AC+DC True RMS
 BM827 & 822: AC True RMS
 BM821: Average Sensing
Safety: Double insulation per IEC61010-1 2nd Ed., EN61010-1 2nd Ed., UL61010-1 2nd Ed. & CAN/CSA C22.2 No. 61010.1-0.92 to Category IV 1000Vac & Vdc.
Transient protection: 12kV (1.2/50 μ s surge)
Terminals (to COM) Measurement Category:
 V: Category IV 1000Vac & Vdc
 mA μ A: Category IV 600Vac and 300Vdc
 A: Category IV 600Vac and 300Vdc
Overload Protections:
 μ A & mA: 1A/600Vac, IR 10kA or better, F fuse
 A: 10A/600Vac, IR 100kA or better, F fuse
 V: 1050Vrms, 1450Vpeak
 mV, Ω , & Others: 600Vdc and Vac rms
E.M.C.: Meets EN61326-1:2006 (EN55022, EN61000-3-2,

EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11)
 In an RF field of 3V/m:
 Capacitance function is not specified
 Other function ranges:
 Total Accuracy = Specified Accuracy + 100 digits
 Performance above 3V/m is not specified
Power Supply: Single 9V battery; NEDA1604G, JIS006P IEC6F22, NEDA1604A, JIS6AM6 or IEC6LF22
Power Consumption: 5 mA typical
APD Timing: Idle for 30 minutes
APD Consumption: 50 μ A typical
Dimension: L208mm X W103mm X H64.5mm with holster
Weight: 635 gm with holster
Accessories: Test lead pair; battery installed; user's manual; BKP60 banana plug type-K thermocouple (BM829 & BM827 only)
Optional purchase accessories: USB interface kit BU-86K; BKB32 banana plug to type-K socket plug adaptor

AutoCheck™ (ACV)

RANGE	Accuracy
50Hz ~ 60Hz	
9.999V, 99.99V, 999.9V	1.0%+4d

Lo-Z ACV Threshold:
 > 3VAC (50/60Hz) nominal

Lo-Z ACV Input Impedance:

Initially approx. 3.0k Ω , 150pF nominal; Impedance increases abruptly within a fraction of a second as display voltage is above 50V (typical). Ended up impedances vs display voltages typically are:
 18k Ω @100V
 125k Ω @ 300V
 320k Ω @ 600V
 460k Ω @ 1000V

Ohms

RANGE	Accuracy
600.0 Ω , 6.000k Ω , 60.00k Ω , 600.0k Ω	0.1%+3d
6.000M Ω	0.4%+3d
60.00M Ω	1.5%+5d
99.99nS	0.8%+10d

Open Circuit Voltage: < 1.2VDC (< 1.0VDC for 60M Ω range)

AutoCheck™ (Ohms)

RANGE	Accuracy
600.0 Ω , 6.000k Ω , 60.00k Ω , 600.0k Ω	0.5%+4d
6.000M Ω	0.8%+3d
60.00M Ω	2.0%+5d

Open Circuit Voltage: < 1.2VDC (< 1.0VDC for 60M Ω range)

Audible Continuity Tester

Audible threshold: between 20 Ω and 300 Ω ; Response time < 100 μ s

Capacitance

RANGE	Accuracy ¹⁾
60.00nF, 600.0nF	0.8% + 3d
6.000 μ F	1.0% + 3d
60.00 μ F	2.0% + 3d
600.0 μ F ²⁾	3.5% + 5d
6.000mF ²⁾	5.0% + 5d
25.00mF ²⁾	6.5% + 5d

¹⁾Accuracies with film capacitor or better

²⁾In manual-ranging mode, measurements not specified below 50.0 μ F, 0.54mF and 5.4mF for 600.0 μ F, 6.000mF and 25.00mF ranges respectively

AC & AC+DC Current

RANGE	Accuracy	Burden voltage
50Hz ~ 60Hz		
600.0 μ A, 6000 μ A	0.6%+3d	0.08mV/ μ A
60.00mA		1.5mV/mA
600.0mA	1.0%+3d	0.04V/A
6.000A, 10.00A ¹⁾	0.8%+6d	
40Hz ~ 1kHz		
600.0 μ A, 6000 μ A	0.8%+4d	0.08mV/ μ A
60.00mA		1.5mV/mA
600.0mA	1.0%+4d	0.04V/A
6.000A, 10.00A ¹⁾	0.8%+6d	

¹⁾10A continuous, >10A to 15A for 30 second max with 5 minutes cool down interval

DC Current

RANGE	Accuracy	Burden voltage
600.0 μ A, 6000 μ A	0.2%+4d	0.08mV/ μ A
60.00mA, 600.0mA		1.5mV/mA
6.000A, 10.00A ¹⁾	0.04V/A	

¹⁾10A continuous, >10A to 15A for 30 second max with 5 minutes cool down interval

Line Level Frequency (-Hz)

Function Range	Frequency	Sensitivity (Sine RMS)
AC 60.00mV	15.00 ~ 50.00kHz	40mV
AC 600.0mV		60mV
AC 9.999V	15.00 ~ 10.00kHz	2.5V
AC 99.99V		25V
AC 999.9V	15.00 ~ 3.00kHz	100V
AC 600.0 μ A		60 μ A
AC 6000 μ A	600 μ A	
AC 60.00mA	40mA	
AC 600.0mA	60mA	
AC 6.000A	4A	
AC 10.00A	6A	

Accuracy: 0.04%+4d

Logic Level Frequency (\square Hz) & Duty Cycle (D%)

@ DCmV Function	Range	Accuracy ¹⁾
Frequency	5.00Hz ~ 1.000MHz	0.04%+4d
Duty Cycle	0.00% ~ 100.0%	3d/kHz+2d ²⁾

¹⁾Sensitivity: 2.5Vp (Square wave) for 3V & 5V Logic Family

²⁾Specified Frequency: 5Hz ~ 10kHz

Non-Contact EF-Detection

Typical Voltage	Bar Graph Indication
20V (tolerance: 10V~36V)	-
55V (tolerance: 23V ~ 83V)	-
110V (tolerance: 59V ~ 165V)	-
220V (tolerance: 124V ~ 330V)	-
440V (tolerance: > 250V)	-

Indication: Bar graph segments & audible beep tones proportional to the field strength

Detection Frequency: 50/60Hz

Detection Antenna: Top end of the meter

Probe-Contact EF-Detection:

For more precise indication of live wires, such as distinguishing between live and ground connections, use the Red (+) test probe for direct contact measurements.

Crest mode (Instantaneous Peak Hold)

Accuracy: Specified accuracy adds 250 digits for changes > 1.0 ms in duration

Record mode

Accuracy: Specified accuracy adds 10 digits for changes > 100 ms in duration

Diode Tester

RANGE	Accuracy
2.000V	1.0%+1d

Test Current (Typically): 0.4mA

Open Circuit Voltage: < 3.5 VDC

Temperature

RANGE	Accuracy
-50°C to 1000°C	0.3%+2°C
-58°F to 1832°F	0.3%+5°F

Type-K thermocouple range & accuracy not included



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