Specifications

These condensed specifications provide a valuable overview of the SourceMeter family. For complete specifications, visit our web site (www.keithley.com) or call us at 1-888-KEITHLEY (534-8453) to speak with one of our experienced applications engineers or to ask for data sheets of the models that interest you.

SourceMeter® Family

	2400(-C)	2410(-C)	2420(-C)	2425(-C)	2430(-C)	2440(-C)	6430
Volts Ranges	0.2, 2, 20, 200 V	0.2, 2, 20, 1000 V	0.2, 2, 20, 60 V	0.2, 2, 20, 100 V	0.2, 2, 20, 100 V	0.2, 2, 20, 40 V	0.2, 2, 20, 200 V
Basic V Source Accuracy	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Basic V Measure Accuracy	0.015%	0.015%	0.015%	0.015%	0.015%	0.015%	0.015%
I Ranges	1, 10, 100 µA 1, 10, 100 mA 1 A	1, 10, 100 µA 1, 10, 100 mA 1 A	10, 100 µA 1, 10, 100 mA 1 A, 3 A	10, 100 µA 1, 10, 100 mA 1 A, 3A	10, 100 µA 1, 10, 100 mA 1 A, 3 A, 10 A	10, 100 µA 1, 10, 100 mA 1 A, 5 A	1, 10, 100 pA 1, 10, 100 nA 1, 10, 100 µA 1, 10, 100 m A
Basic I Source Accuracy	0.045%	0.045%	0.045%	0.045%	0.045%	0.045%	0.045%
Basic I Measure Accuracy	0.035%	0.035%	0.035%	0.035%	0.035%	0.035%	0.035%
Ohms Ranges	20, 200 Ω 2, 20, 200 kΩ 2, 20, 200 MΩ	20, 200 Ω 2, 20, 200 kΩ 2, 20, 200 MΩ	2, 20, 200 Ω 2, 20, 200 kΩ 2, 20 MΩ	2, 20, 200 Ω 2, 20, 200 kΩ 2, 20 MΩ	2, 20, 200 Ω 2, 20, 200 kΩ 2, 20 MΩ	2, 20, 200 Ω 2, 20, 200 kΩ 2, 20 MΩ	20, 200 Ω 2, 20, 200 kΩ 2, 20, 200 MΩ 2, 20, 200 GΩ 2, 20 TΩ
Basic Ohms Measure Accuracy	0.06%	0.07%	0.06%	0.06%	0.06%	0.06%	0.06%

Additional Source Specfications

VOLTAGE REGULATION: Line: 0.01% of range. **Load:** 0.01% of range + 100µV.

NOISE 10Hz–1MHz (p-p): 10mV (50mV typ., Models 2430 and 2440).

OVER VOLTAGE PROTECTION: User selectable values, 5% tolerance. Factory default = none.

CURRENT LIMIT: Bipolar current limit (compliance) set with single value. Min. 0.1% of range.

OVERSHOOT: <0.1% typical (full scale step, resistive load, 10mA range).

CURRENT REGULATION: Line: 0.01% of range. **Load:** 0.01% of range (except Model 2440 5A range 0.5% + 100pA).

VOLTAGE LIMIT: Bipolar voltage limit (compliance) set with single value. Min. 0.1% of range.

OVERSHOOT: <0.1% typical (1mA step, R_L = 10kΩ, 20V range for Model 2400, 2410, 2420, 2425, 2430) (10V range for Model 2440).

OUTPUT SETTLING TIME: Time required to reach 0.1% of final value after command is processed. 100µs typical. Resistive load. 10µA to 100mA range.

DC FLOATING VOLTAGE: Output can be floated up to ±250V DC (Model 2440 ±40V DC) from chassis ground.

REMOTE SENSE: Up to 1V drop per load lead.

COMPLIANCE ACCURACY: Add 0.3% of range and ±0.02% of reading to base specification.

Additional Measure Specification

SOURCE I MODE, MANUAL OHMS: Total uncertainty = I source accuracy + V measure accuracy (4-wire remote sense).

SOURCE V MODE, MANUAL OHMS: Total uncertainty = V source accuracy + I measure accuracy (4-wire remote sense).

6-WIRE OHMS MODE: Available using active ohms guard and guard sense. Max. Guard Output Current: 50mA (except 1, 3, 5, 10A and 1000V ranges). Accuracy is load dependent. Refer to White Paper No. 2033 for calculation formula.

GUARD OUTPUT IMPEDANCE: <0.1Ω in ohms mode.

Contact Check Specifications

SPEED: 350µs for verification and notification.

CONTACT CHECK:	2 Ω	15 Ω	50 Ω
No contact check failure	<1.00 Ω	<13.5 Ω	<47.5 Ω
Always contact check failure	>3.00 Ω	>16.5 Ω	>52.5 Ω

System Speeds

Measurement[1]

MAXIMUM RANGE CHANGE RATE: 75/second.

MAXIMUM MEASURE AUTORANGE TIME: 40ms (fixed source).[2]

Sweep Operation[3] ReadingRates (rdg./second) for 60Hz (50Hz):

SPEED	NPLC/TRIGGER ORIGIN	MEASURE TO MEM.	MEASURE TO GPIB	SOURCE-MEASURE[5] TO MEM.	SOURCE-MEASURE[5] TO GPIB	SOURCE-MEASURE PASS/FAIL TEST[4, 5] TO MEM.	SOURCE-MEASURE PASS/FAIL TEST[4, 5] TO GPIB	SOURCE-MEMORY[4] TO MEM.	SOURCE-MEMORY[4] TO GPIB
Fast	0.01 / internal	2081(2030)	1754	1551(1515)	1369	902(900)	981	165(162)	165
IEEE-488.1 Mode	0.01 / external	1239(1200)	1254	1018(990)	1035	830(830)	886	163(160)	163
Fast	0.01 / internal	2081(2030)	1198(1210)	1551(1515)	1000(900)	902(900)	809(840)	165(162)	164(162)
IEEE-488.2 Mode	0.01 / external	1239(1200)	1079(1050)	1018(990)	916(835)	830(830)	756(780)	163(160)	162(160)
Medium	0.10 / internal	510(433)	509(433)	470(405)	470(410)	389 (343)	388(343)	133(126)	132(126)
IEEE-488.2 Mode	0.10 / external	438(380)	438(380)	409(360)	409(365)	374(333)	374(333)	131(125)	131(125)
Normal	1.00 / internal	59 (49)	59 (49)	58 (48)	58 (48)	56 (47)	56 (47)	44 (38)	44 (38)
IEEE-488.2 Mode	1.00 / external	57 (48)	57 (48)	57 (48)	57 (47)	56 (47)	56 (47)	44 (38)	44 (38)

Single reading operation reading rates (rdg./second) for 60Hz (50Hz):

SPEED	NPLC/TRIGGER ORIGIN	MEASURE TO GPIB	SOURCE-MEASURE[5] TO GPIB	SOURCE-MEASURE PASS/FAIL TEST[4,5] TO GPIB
Fast (488.1)	0.01 / internal	537	140	135
Fast (488.2)	0.01 / internal	256(256)	79(83)	79(83)
Medium(488.2)	0.10 / internal	167(166)	72(70)	69(70)
Normal (488.2)	1.00 / internal	49 (42)	34(31)	35(30)

Component for 60Hz (50Hz):[4, 6]

SPEED	NPLC/TRIGGER ORIGIN	MEASURE TO GPIB	SOURCE PASS/FAIL TEST	SOURCE-MEASURE PASS/FAIL TEST[5, 7] TO GPIB
Fast	0.01 / external	1.04 ms (1.08 ms)	0.5 ms (0.5 ms)	4.82 ms (5.3 ms)
Medium	0.10 / external	2.55 ms (2.9 ms)	0.5 ms (0.5 ms)	6.27 ms (7.1 ms)
Normal	1.00 / external	17.53 ms (20.9 ms)	0.5 ms (0.5 ms)	21.31 ms(25.0 ms)

[1] Reading rates applicable for voltage or current measurements. Auto zero off, autorange off, filter off, display off, trigger delay = 0, and binary reading format.

[2] Purely resistive lead. 1μA and 10μA ranges <65ms.

[3] 1000 point sweep was characterized with the source on a fixed range.

[4] Pass/Fail test performed using one high limit and one low math limit.

[5] Includes time to re-program source to a new level before making measurement.

[6] Time from falling edge of START OF TEST signal to falling edge of END OF TEST signal.

[7] Command processing time of :SOURce:VOLTage|CURRent:TRIGgered <nrf> command not included.

GENERAL

Noise Rejection:

	NPLC	NMRR	CMRR
Fast	0.01	—	80 dB
Medium	0.1	—	80 dB
Slow	1	60 dB	100 dB[1]

[1] Except lowest 2 current ranges = 90dB.

LOAD IMPEDANCE: Stable into 20,000pF typical.

COMMON MODE VOLTAGE: 250V DC (40V DC for Model 2440).

COMMON MODE ISOLATION: >10^9Ω, <1000pF.

OVERRANGE: 105% of range, source and measure.

MAX. VOLTAGE DROP BETWEEN INPUT/OUTPUT AND SENSE TERMINALS: 5V.

MAX. SENSE LEAD RESISTANCE: 1MΩ for rated accuracy.

SENSE INPUT IMPEDANCE: >10^{10}Ω.

GUARD OFFSET VOLTAGE: <300μV, typical.

SOURCE OUTPUT MODES:

Pulse (Model 2430 only)
Fixed DC level
Memory List (mixed function)
Stair (linear and log)

SOURCE MEMORY LIST: 100 points max.

MEMORY BUFFER: 5,000 readings @ 5 digits (two 2,500 point buffers). Includes selected measured value(s) and time stamp. Lithium battery backup (3 yr+ battery life).

PROGRAMMABILITY: IEEE-488 (SCPI-1995.0), RS-232, 5 user-definable power-up states plus factory default and *RST.

DIGITAL INTERFACE:

Interlock: Active low input.

Handler Interface: Start of test, end of test, 3 category bits. +5V@ 300mA supply.

Digital I/O: 1 trigger input, 4 TTL/Relay Drive outputs (33V @ 500mA, diode clamped).

POWER SUPPLY: 100V to 240V rms, 50–60Hz (automatically detected at power up). **Model 2400:** 190VA. **Model 2410:** 210VA. **Model 2420:** 220VA. **Model 2425, 2430:** 250VA. **Model 2440:** 240VA.

COOLING: (Model 2410, 2420, 2425, 2430, 2440): Forced air, variable speed.

WARRANTY: 1 year.

EMC: Conforms to European Union Directive 89/336/EEC, EN 61326-1.

SAFETY: Conforms to European Union Directive 73/23/EEC, EN61010-1.

WARM-UP: 1 hour to rated accuracies.

DIMENSIONS: 89mm high × 213mm wide × 370mm deep (3 1/2 in × 8 3/8 in × 14 9/16 in). **Bench Configuration (with handle & feet):** 104mm high × 238mm wide × 370mm deep (4 1/8 in × 9 3/8 in × 14 9/16 in).