

TekVPI® Probe Power Requirements On Digital Phosphor Oscilloscopes

The TekVPI probe interface on the Tektronix oscilloscopes provides power to most of the TekVPI voltage and current probes and accessories. The image below shows an example of the TekVPI inputs on an oscilloscope:



The internal power supplies of these oscilloscopes provide power to the TekVPI probe inputs located on the front of the oscilloscope (Channels 1, 2, 3, 4, Aux In, and RF). Because some of the available TekVPI probes can draw a significant amount of power, it is possible that multiple probes may exceed the oscilloscope's available internal power.

In the cases where the probe power requirements exceed the oscilloscope's available internal power, the oscilloscope will display a message that the power limit has been exceeded. For these applications on the MSO/DPO5000/B, MSO/DPO3000, and MSO/DPO2000/B Series, Tektronix offers an external power supply accessory (Tek Part Number 119-7465-xx or 119-8726-xx). The TekVPI external power supply can provide up to 50W of power to the TekVPI front panel probe inputs, enabling the usage of any combination of qualifying probes without exceeding power requirements.

Oscilloscope Series	Maximum Internal Probe Power Available
DPO7000, DPO7000C	50 W (no external power adapter required)
MSO5000/B, DPO5000/B	15 W ¹ (external power adapter required when probe power requirements exceed 15 W)
4/5/6 Series MSO	10 W per FlexChannel® input (no external power adapter required)
MDO4000/B/C, MSO4000/B, DPO4000/B	50 W (no external power adapter required)
MDO3000, 3 Series MDO	25 W (external power adapter is <u>not</u> supported)
MSO3000, DPO3000	20 W (external power adapter required when probe power requirements exceed 20 W)
MSO2000/B, DPO2000/B	external power adapter required whenever probe power is required
TBS2000	24 W (4-channel models) / 12 W (2-channel models) (external power adapter is <u>not</u> supported)

The table below lists the maximum power draw² associated with each type of TekVPI probe or accessory that can be used with the oscilloscopes. This table can help you determine if you potentially need the external power supply for your application.

TekVPI Probe/Accessory	Description	Max Power Draw
TAP1500 ³ TAP2500 ³ TAP3500 ³ TAP4000 ³	1.5 GHz Single-ended Active FET Voltage Probe 2.5 GHz Single-ended Active FET Voltage Probe 3.5 GHz Single-ended Active FET Voltage Probe 4 GHz Single-ended Active FET Voltage Probe	1.5 W
TCP0020	20 A, 50 MHz, AC/DC Current Probe	4.0 W
TCP0030/A	30 A, 120 MHz, AC/DC Current Probe	8.4 W
TCP0150	150 A, 20 MHz, AC/DC Current Probe	9.2 W
TDP0500 ³ TDP1000 ³	500 MHz Differential High Voltage Probe (± 42 V) 1 GHz Differential High Voltage Probe (± 42 V)	1.5 W
TDP1500 ³	1.5 GHz Differential Voltage Probe (± 8.5 V)	1.9 W
TDP3500 ³ TDP4000 ³	3.5 GHz Differential Voltage Probe (± 8.5 V) 4 GHz Differential Voltage Probe (± 8.5 V)	1.5 W
TDP7704 ⁸ TDP7706 ⁸ TDP7708 ⁸	4 GHz TriMode Probe with TekFlex connector 6 GHz TriMode Probe with TekFlex connector 8 GHz TriMode Probe with TekFlex connector	4.0 W
THDP0100 THDP0200 TMDP0200	100 MHz High-Voltage Differential Probe (± 6 kV) 200 MHz High-Voltage Differential Probe (± 1.5 kV) 200 MHz High-Voltage Differential Probe (± 750 V)	2.7 W
TIVH02/02L/05/05L/ 08/08L	200/500/800 MHz Optically-Isolated Differential Probe	5.0 W
TIVM02/02L/05/05L TIVM1/1L	200/500 MHz Optically-Isolated Differential Probe 1 GHz Optically-Isolated Differential Probe	5.0 W
TPA-BNC ^{4, 5}	TekVPI Interface Adapter that adapts TekProbe Level II Probes to a TekVPI Probe Input	2.5 W
TPA-N-VPI ⁷	N-to-TekVPI Adapter	0.0 W
TPA-N-PRE ⁷	9 kHz to 6 GHz RF Preamplifier	0.5 W
TEK-DPG	TekVPI Deskew Pulse Generator	1.5 W
TPP0100	100 MHz, 10x, <12pF Input Capacitance, 300V CAT II Passive Probe	0.0 W
TPP0250 ⁶	250 MHz, 10x, <4pF Input Capacitance, 300V CAT II Passive Probe	0.0 W
TPP0500/B ⁶	500 MHz, 10x, <4pF Input Capacitance, 300V CAT II Passive Probe	0.0 W
TPP0502 ⁶	500 MHz, 2x, 12.7pF Input Capacitance, 300V CAT II Passive Probe	0.0 W
TPP0850 ⁶	850 MHz, 50x, 1.8pF Input Capacitance, 1000V CAT II Passive Probe	0.0 W

TekVPI Probe/Accessory	Description	Max Power Draw
TPP1000 ⁶	1 GHz, 10x, <4pF Input Capacitance, 300V CAT II Passive Probe	0.0 W
TPR1000 TPR4000	1 GHz Single-Ended TekVPI Power Rail Probe 4 GHz Single-Ended TekVPI Power Rail Probe	1.5 W
TLP058 ⁸	8-channel Logic Probe	3.75 W typ

Note 1: With MSO/DPO5000 instrument software versions <6.3.0, the probe power was limited to 12W.

Note 2: The power numbers listed in the table are theoretical maximum values which are reported to the oscilloscope when the probe is attached. The actual power draw from the probe depends on several factors, including the parameters of the circuit being measured (especially for current probes) and the type of probe connected to the TPA-BNC adapter.

Note 3: The bandwidth of probe is lowered when used with oscilloscopes with 1 MOhm termination (such as the DPO2000/B and MSO2000/B series).

Note 4: The TPA-BNC will only draw a maximum of 2.5W of power from the oscilloscope no matter which TekProbe Level 2 interface probe is used with it.

Note 5: To use TekProbe Level 2 interface probes that are designed to drive 50 Ohm inputs with oscilloscopes with only 1 MOhm termination (such as the DPO2000/B or MSO2000/B series), an 1103 probe power supply and a 50 Ohm feed-thru terminator are required.

Note 6: The TPP0250, TPP0500/B, TPP0502, TPP0850, and TPP1000 passive probes are compatible only with MDO3000, DPO4000B, MSO4000B, MDO4000/B/C, DPO5000/B, MSO5000/B, and 3/4/5/6 Series oscilloscopes.

Note 7: The TPA-N-VPI adapter and TPA-N-PRE preamp are compatible only with the RF input on the MDO3000, MDO4000/B/C, and 3 Series mixed domain oscilloscopes.

Note 8: The TDP7704, TDP7706, TDP7708, and TLP058 probes are mechanically compatible only with 4/5/6 Series oscilloscopes.

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