

# USB Power Compliance Solution

## USBPWR Automated Datasheet



## Features and Benefits

### Compliance Testing

- Compliance testing to the USB2.0 Battery Charger Specification V1.1 and IEC 62684
- Complete set of real-time measurements using an oscilloscope, builds confidence in design under test

### Automated Testing

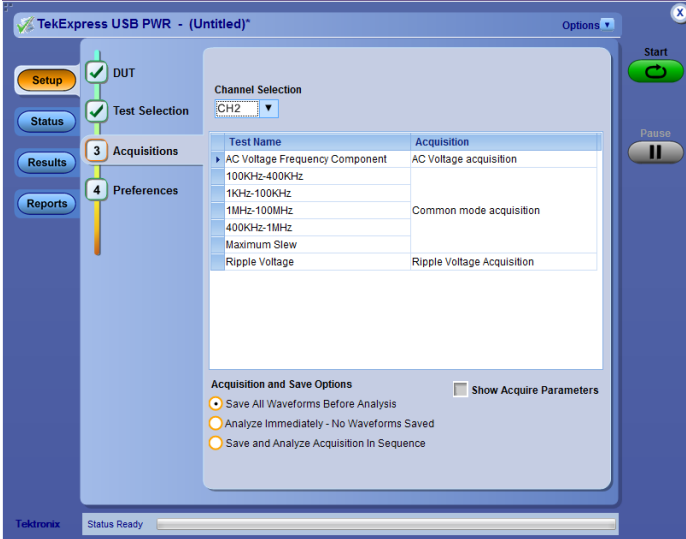
- Saves significant amount of test time compared to manual methods of performing the same tests, and increases manufacturing throughput
- Reduces operator errors, and improve yields
- Avoids the need to be an expert in compliance test procedures
- Provides repeatability of test results

## Reports

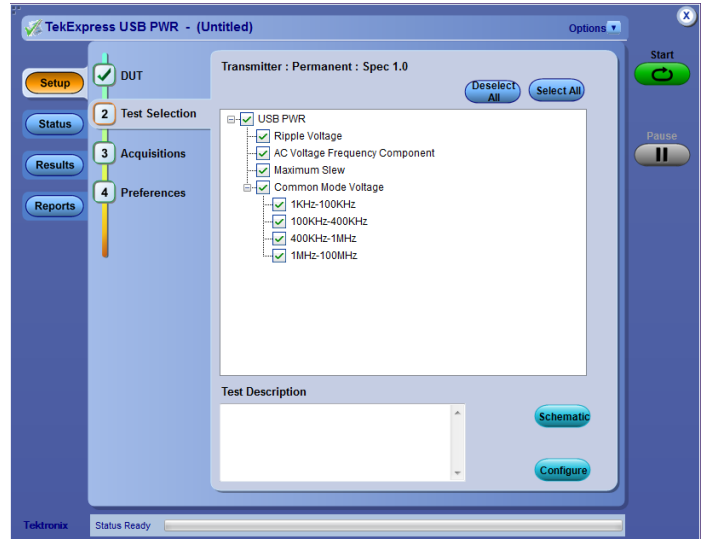
- A single printable test report of all tests simplifies sharing and archiving of test results

## Applications

- Compliance testing of USB battery chargers with permanent cable
- Compliance testing of USB battery chargers with detachable cable
- External power supply (EPS) design and Compliance testing to IEC62684 specification
- System integration and validation of data enabled mobile telephones that use USB 2.0 interface for battery charging
- Manufacturing test
- The Tektronix MSO/DPO5000, DPO7000C, and DPO/DSA/MSO70000C series oscilloscopes enabled with option USBPWR provide automated setup for design validation and compliance testing of USB battery chargers and external power supplies. The Tektronix USBPWR solution serves the needs of engineers designing USB based battery chargers and external power supplies, as well as those validating the electrical compliance of the devices to the new IEC62684 Specification and USB 2.0 Battery Charger specification v1.1.



USBPWR solution automatically configures the oscilloscope settings, and acquires signals with predefined compliance parameters



USBPWR solution provides 100% test coverage of compliance tests using an oscilloscope

## Automated Testing – Save Time and Resources

There is no longer a need to be an expert on IEC62684 testing procedures. Remembering the exact steps to take each measurement is time consuming and often requires going back to the IEC62684 specification and the USB battery charging specification. USBPWR Automated Solution takes the guesswork out of conducting compliance testing.

For compliance testing, it is difficult to remember the test procedures or to set up the correct parameters, such as applying the correct record length and sampling rates. USBPWR Automation Solution provides standard specific details and predefined scope settings for each measurement, so the user does not need to be an expert. USBPWR Automated Solution minimizes the setup initialization problems, reduces the complexity of executing USBPWR tests and enables you to test designs faster.

## 100% Test Coverage

USBPWR automates the complete set of measurements to be performed using a real-time oscilloscope for devices with permanent cable as well as designs with detachable cable. Measurements include:

- Ripple Voltage for the combination of the following settings:
  - AC frequency: 47 Hz, 50 Hz, 60 Hz, and 63 Hz
  - AC voltage: 90 V, 120 V, 207 V, and 253 V
  - Load: 0%, 25%, 50%, 75%, and 100% of the rated output current
  - Temperature: 0 °C, 25 °C, and 45 °C
- AC Voltage Frequency Component
- Maximum Slew
- Common Mode Voltage at the following frequency bands:
  - 100 kHz-400 kHz
  - 1 kHz-100 kHz
  - 1 MHz-100 MHz
  - 400 kHz-1 MHz

## Results

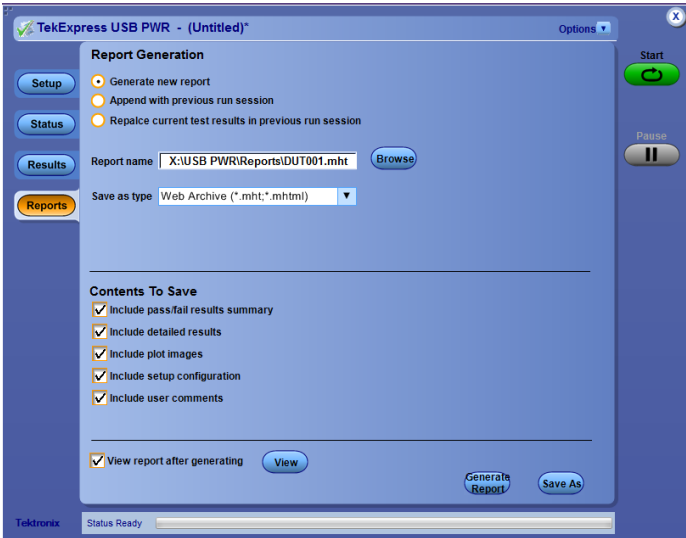
USBPWR Results section helps design engineers look at the test results quickly and clearly for pass or fail summary. It provides visual representation of pass/fail status and test execution status in color codes.



USBPWR provides quick summary of test results

## Detailed Reports

The USBPWR automation generates thorough .MHT/.XLS/HTML reports that capture the details of each test including Limits, Measured Value, Pass/Fail Results, Margin, common mode voltage plots, frequency component plot, etc. It also captures test execution time, and hyper-links to saved test waveforms for each test. Report generation also provides features such as report appending, auto incrementing report naming, inserting user comments, etc. Reports appending feature enables adding results from different test conditions and test scenarios, and create a single-printable-report for sharing the results.



USBPWR report contents are configurable for additional details

**Tektronix** TekExpress USB PWR  
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### Test Report

Setup Information	
DUT ID : DUT001	Scope Model : MS072004C
Suite Type : Detachable	Scope Serial No. : C230691
MOI/CTS/Spec Version : Spec 1.0	Scope FW Version : 6.4.0 Build 8
Date/Time : 10-12-2012 20:57:52	Scope Calibration Status : PASS,PASS
Overall Execution Time : 1 min 6 sec	TekExpress App Version : 1.0.0.49
Overall Test Result : <b>Pass</b>	TekExpress FW Version : 3.0.0.6
DUT Comment : General Comment - USB PWR Cable DUT	

Test Name Summary Table	
AC Voltage Frequency Component	<b>Pass</b>
Maximum Slew	<b>Pass</b>
Ripple Voltage	<b>Pass</b>

AC Voltage Frequency Component						
Measurement Details	Measured value	Test Result	Margin	Low Limit	High Limit	Comments
AC Voltage Frequency Component	0.0086	<b>Pass</b>	94.9914 V	NA	95.0	

[Back To Summary Table](#)

Maximum Slew						
Measurement Details	Measured value	Test Result	Margin	Low Limit	High Limit	Comments
Maximum Slew	0.0	<b>Pass</b>	1.25 V	NA	1.25	

[Back To Summary Table](#)

Ripple Voltage						
Measurement Details	Measured value	Test Result	Margin	Low Limit	High Limit	Comments
AC Frequency 47Hz AC Voltage 90V Load 0%	0.056	<b>Pass</b>	0.024 V	NA	0.08	

USBPWR provides detailed reports

## Characteristics

### Characteristic Description

Specifications	IEC62684 Interoperability specifications of common external power supply (EPS) for use with data-enabled mobile telephones USB-IF USB 2.0 Battery Charging Spec V1.1 (USB BC 1.1)
Tests Coverage	Ripple Voltage for combination of following settings: AC frequency: 47 Hz, 50 Hz, 60 Hz and 63 Hz AC voltage: 90 V, 120 V, 207 V and 253 V Load: 0%, 25%, 50%, 75% and 100% of the rated output current Temperature: 0 °C, 25 °C and 45 °C AC Voltage Frequency Component Maximum Slew Common Mode Voltage at following frequency bands: 100 KHz - 400 KHz 1 KHz - 100 KHz 1 MHz - 100 MHz 400 KHz - 1 MHz
Report Generation Format	.xls, .mht, and HTML

## Ordering Information

### Option USBPWR

USB Power Adapter/ EPS Compliance Automated Test Solution

Model	New Instrument Orders	Product Upgrades	Floating Licenses
MSO/DPO5000/GSA Series (350 MHz and above)	Opt. USBPWR	DPO-UP Opt.USBPWR	DPOFL-USBPWR
DPO7000C/GSA Series	Opt. USBPWR	DPO-UP Opt.USBPWR	DPOFL-USBPWR
**DPO/DSA/MSO70000C/GSA Series	Opt. USBPWR	DPO-UP Opt.USBPWR	DPOFL-USBPWR

\*\* D-Series oscilloscopes are not supported for Option USBPWR

## Recommended Accessories

One set of TPP0500, TPP1000, P6139B, or P5100A probes with standard accessories is recommended. Additionally, one set of TCA-BNC converter and TCA-1MEG TekConnect 1 MΩ Adapter is recommended when using a P6139B or P5100A probe with a DPO/DSA/MSO70000C/GSA series oscilloscope. Please refer to [www.tek.com/probes](http://www.tek.com/probes) for further information on the recommended models of probes and any necessary probe adapters.

## Additional Information

Tektronix offers a range of solutions for power analysis and compliance testing. To see comprehensive listing, and download the latest resources, visit [www.tek.com/power](http://www.tek.com/power). USBPWR solution updates and up-to-date instrument software upgrades are available at [www.tek.com/downloads](http://www.tek.com/downloads)



Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.



Product(s) complies with IEEE Standard 488.1-1987, RS-232-C, and with Tektronix Standard Codes and Formats.



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**For Further Information.** Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit [www.tektronix.com](http://www.tektronix.com)



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