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Superior ESD Testing Solutions

Wave Appraise – Quick Start Guide

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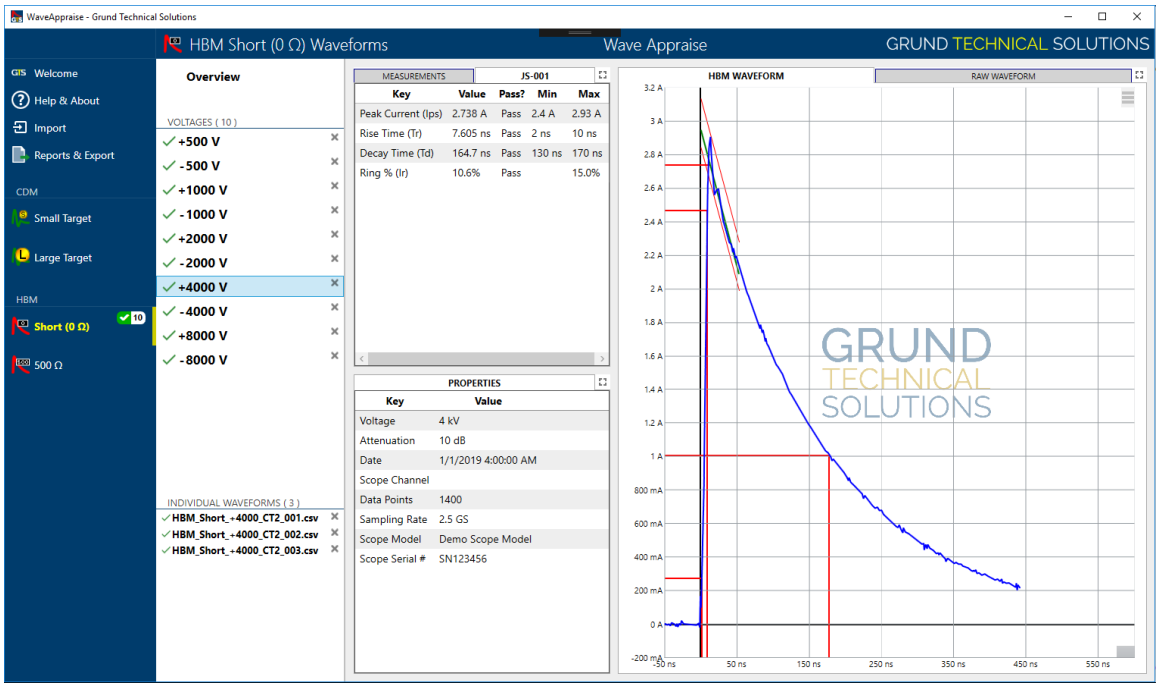
What is Wave Appraise?

Wave Appraise is a modern, efficient tool for analyzing HBM and CDM waveforms from virtually any source. It will tell you if your HBM or CDM waveforms pass JS-001/JS-002 using open-source verifiable calculations. You can import multiple waveforms together as a batch, and generate reports as pictures, CSV, or PDF.



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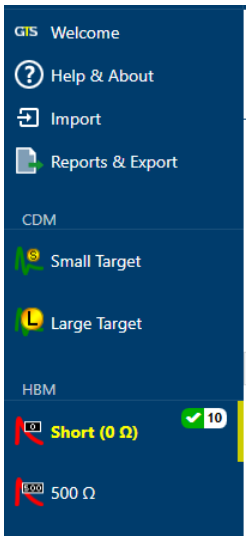
Navigation



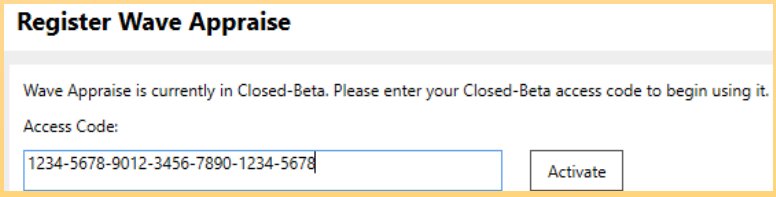
Navigate around Wave Appraise by clicking a section on the blue navigation bar.

- **Welcome** – Shown when launched. Has the latest news from GTS
- **Help & About** – Read documentation and manage your license
- **Import** – Helps you import your raw waveform files for analysis
- **Reports & Export** – Shows different ways to export your analyzed waveforms
- **Waveforms** (**CDM**, **HBM**) –

  Shows the analysis for waveforms you've imported. Notification bubbles next to each indicate how many are passing or failing.

Getting Started

Wave Appraise requires a license key, which is free with registration. You will be prompted for your activation code (dashes required) the first time you run Wave Appraise. Internet access is required for activation.



SAMPLE DATA - Navigate to the **Welcome** section and click a Sample Data button for HBM or CDM.

IMPORT YOUR DATA - Refer to the **Import** section of this document.

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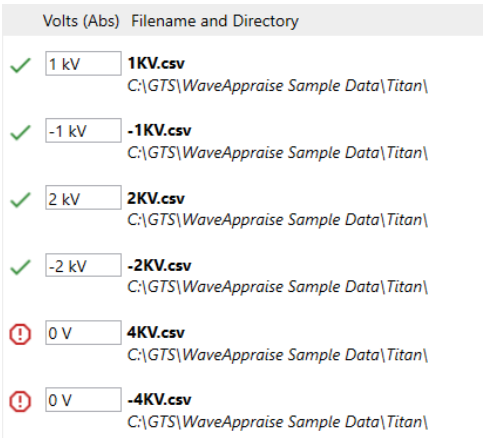
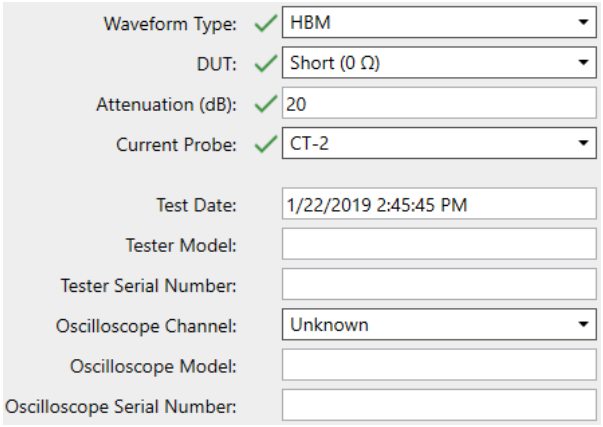
Import

Wave Appraise can import data from a variety of sources including text and CSV files from oscilloscopes.

1. Navigate to the **Import** section, then click the button **Open Waveforms From Files…**
2. Select the waveform(s) you wish to import. You can select more than one.
    a. *Multiple waveforms of the same voltage will automatically be averaged together.*
3. Valid waveform files will be listed. Type in the Voltage for each waveform
    a. *Don't worry about polarity, Wave Appraise automatically determines positive/negative*



4. Provide required details about the waveforms being imported:



   a. **Waveform Type** – Choose **CDM** or **HBM**
   b. **DUT** – For **CDM** choose **Large/Small**, for **HBM** choose **0Ω/500Ω**
   c. **Attenuation (dB)** – Enter the attenuator value (dB) that was placed on front of the oscilloscope, or 0 if none used.
   d. **Current Probe** (HBM only) – Choose the current probe that was used to record data:
      i. **CT-1** – Tektronix CT-1 current probe or equivalent (5 mV/mA)
      ii. **CT-2** – Tektronix CT-2 current probe or equivalent (1 mV/mA)
      iii. **Ground-Current** – Current signal terminated in the oscilloscope (applies to GTS PurePulse equipment)
   e. ***Sampling Rate*** **(Gigasamples)** – (Only visible if required) If the raw waveform data does not contain time (X) values, you will need to provide the sampling rate in Gigasamples per second.
      i. Sampling Rate = #DataPoints / ΔTime
      ii. Example: 800 DataPoints per division, 80ns per division = 10 GS

5. (Optional) Provide extra details about the waveforms:
   a. **Test Date**
   b. **Tester Model**
   c. **Tester Serial Number**
   d. **Oscilloscope Channel**
   e. **Oscilloscope Model**
   f. **Oscilloscope Serial Number**

6. Click **Finish Importing** to begin analyzing the waveforms.

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Analyzing Waveforms

When you finish importing waveforms, you'll automatically be shown the analysis.

1. Voltages are listed here. When a **voltage** is selected, the analysis represents the **average** of all waveforms with matching voltage.
2. Individual waveforms that make up the average for a given voltage are shown here. When an **individual waveform** is selected, the analysis represents just that single waveform.
3. Waveform with analysis markup is shown here. You can click the **Raw Waveform** tab to see the original waveform as received from the oscilloscope.
4. Measurements and pass/fail outcome are shown here. Click the standard tab (JS-001/JS-002) to see the min/max criteria for passing.
5. Properties about the waveform are shown here.
6. Click **Overview** to see the waveforms of all the voltages overlaid together.
7. The selected section is highlighted with yellow, and a pass/fail bubble shows you how many voltages passed or failed at a glance.

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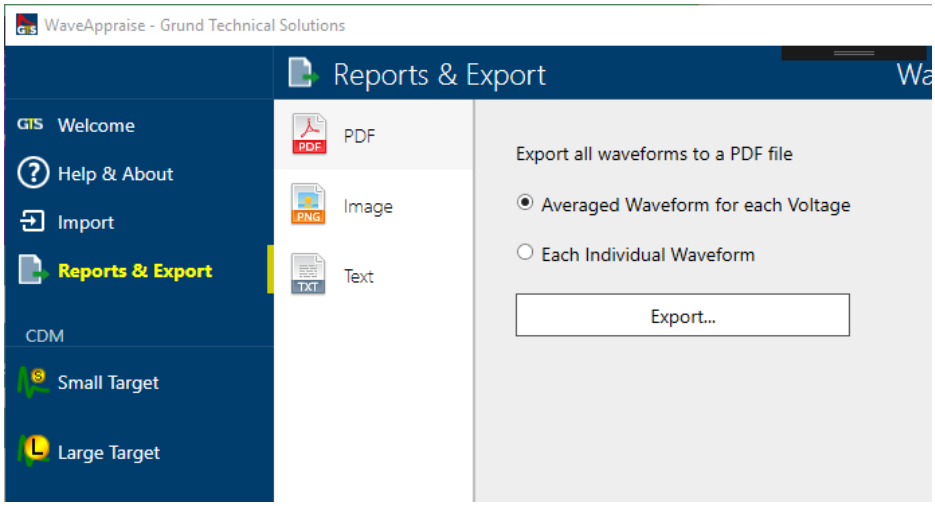
Reports & Export



You can export your data as pictures, CSV, or PDF.

1. Navigate to the **Reports & Export** section
2. Select an export format
3. Choose to export the averaged or individual waveforms
4. Click Export…, then choose a save location
5. It may take a few minutes to export a large number of waveforms.

Integration with Maestro

Maestro is the software that powers GTS' Scorpion CDM and PurePulse TLP/HBM tools. With Maestro you can automatically push the validation data to Wave Appraise, saving you time and eliminating errors during data import.

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Revision History – Quick Start Guide

2019-09-10

- Updated for release with Wave Appraise v1.1

2019-01-22

- Initial version – created for release with Wave Appraise v0.4

Revision History – Wave Appraise

v1.9 May 26, 2022
- Importing WAVEX format now parses oscilloscope properties properly
- WAVEX export (XML) now handles large numbers of waveforms properly

v1.8 February 8, 2022
- CDM Peak Current calculation now averages a number of points around the top-most data point
- ESDWaveformVerifier.dll updated to v1.0.4

v1.7.1 August 11, 2021
- Checking for updates and culling logs occurs on a separate thread to speed up app startup

v1.7 July 8, 2021
- Individual waveforms' rising edge moved to zero-time prior to averaging
- WAVEX export (XML) now handles large 5000+ datapoint waveforms properly

v1.6 June 10, 2021
- HBM 0Ω noise cancelling reverted to 2019 method

v1.5 January 20, 2021
- CDM & HBM risetime now pays attention to threshold % settings
- Export plugin framework added, custom export is now available

v1.4 February 14, 2020
- Exporting to non-existent directory fixed for PDF export

v1.3 February 7, 2020
- Exporting to non-existent directory no longer causes crash
- Invalid HBM 0-Ohm data handling improved
- Exporting individual waveforms name collision fixed

v1.2 September 26, 2019

- Importing data points with identical time values (due to rounding) is now handled better
- HBM 0-Ohm now handles truncated waveforms better when calculating decay time
- PDF report now contains filenames and paths of each waveform
- Registering WaveAppraise automatically starts the 90-day premium trial now

v1.1 September 10, 2019

- Voltage parsing tuning
- XML export now saves as ".wavex" but is actually a zip file
- XML export tuning

v1.0 (Public Release) August 20, 2019

- Initial Public Release
- Voltage is parsed from filename automatically (Premium feature)
- Rigol oscilloscope CSV files with multiple channels now imports
- Properties of imported waveforms can now be edited
- Error log zip archive can now be generated
- Non-english CSV parsing now handles culture better
- PDF export tuning