CWT Ultra-mini

The CWT Ultra-mini has an extremely thin, clip-around Rogowski coil of typically 1.6mm cross-section. Such a thin coil enables currents to be measured in the most difficult to reach parts of a power electronic converter with negligible disruption to the circuit under test.

**Pulsed current:**
- 100Apk, 21μs
- Ch1-CWT (300A)
- Ch2-Co-ax shunt 2GHz
- Timebase 4μs/div

**Expanded rising edge:**
- 10 to 90% is 42ns
- Predictable time delay
- Timebase 40ns/div

This latest release of the CWT Ultra-mini has improved:
- high frequency (-3dB) bandwidth of 30MHz
- operating temperature range of -40°C to +125°C

**Applications**
- Switching current waveforms in power electronic circuits, for example
  - in MOSFET or IGBT devices as small as TO-220 or TO-47
  - in bond wires in power devices
  - to measure power losses in semiconductors
  - monitoring currents in small inductors, capacitors, snubber circuits, etc
- Measuring small AC currents in the presence of large DC currents (e.g. monitoring capacitor ripple)
- Power converter development and diagnostics
- Measuring high frequency sinusoidal, pulsed or transient currents
- Measuring high order harmonics

**Key features**
- Expanded operating temperature range -40°C to +125°C
- Extended (-3dB) bandwidth from a few Hz to 30MHz
- Current ratings from 30Apk to 6000Apk
- Improved peak di/dt capabilities up to 70kA/μs
- 1.7mm (max) cross-section, flexible, clip-around coil
- ±6V into 1MΩ, and 50Ω drive capability
- Loads the circuit under test by only a few pH
- Positional accuracy typically ±2%

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**CWT Ultra-mini**

### Performance

<table>
<thead>
<tr>
<th>Model</th>
<th>Sensitivity (mV/A)</th>
<th>Peak current (A)</th>
<th>Noise maximum (mVp-p)</th>
<th>Droop (%/ms)</th>
<th>LF (-3dB) bandwidth (Hz)</th>
<th>Peak di/dt (kA/μs)</th>
<th>HF (-3dB) bandwidth (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CWT015</td>
<td>200</td>
<td>30</td>
<td>20</td>
<td>80</td>
<td>116</td>
<td>2.0</td>
<td>30</td>
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<td>CWT03</td>
<td>100</td>
<td>60</td>
<td>20</td>
<td>65</td>
<td>67</td>
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<tr>
<td>CWT06</td>
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<td>15</td>
<td>35</td>
<td>34</td>
<td>8.0</td>
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<td>CWT1</td>
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<td>300</td>
<td>15</td>
<td>9.0</td>
<td>9.2</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>CWT3</td>
<td>10</td>
<td>600</td>
<td>10</td>
<td>6.0</td>
<td>6.2</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>CWT6</td>
<td>5.0</td>
<td>1200</td>
<td>10</td>
<td>3.0</td>
<td>3.2</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>CWT15</td>
<td>2.0</td>
<td>3000</td>
<td>5.0</td>
<td>2.0</td>
<td>2.0</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>CWT30</td>
<td>1.0</td>
<td>6000</td>
<td>5.0</td>
<td>2.0</td>
<td>2.0</td>
<td>70</td>
<td>30</td>
</tr>
</tbody>
</table>

**Output**
- ±6V peak corresponding to ‘Peak Current’ into ±100kΩ (e.g. DC 1MΩ oscilloscope)
- ±2V peak at half ‘Sensitivity’ into 50Ω (for long output cables)

**Accuracy**
- Variation with conductor position in the coil typically ±2% of reading (for a 2mm² conductor)
- Linearity (with current magnitude) 0.05% of reading

**Calibration**
- Calibrated to ±0.2% reading with conductor central in the coil loop

**DC offset**
- ±3mV maximum at 25°C

**Temperature**
- Coil and cable -40°C to +125°C. Integrator 0 to +40°C

**di/dt ratings**
- These are ‘Absolute maximum di/dt ratings’ and values must not be exceeded:
  - Absolute max. peak di/dt: 70kA/μs
  - Absolute max. rms di/dt: 1.0kA/μs (1.2kA/μs for models CWT1 and above)

**Coil voltage**
- 1.2kVpeak. Safe peak working voltage to earth. Rating established by a 3kVRms, 50Hz, 60sec flash test

**Key features**

1. Coil length (circumference) 80mm - longer coils available on request.
2. Coil cross-section (thickness) 1.7mm (max).
3. Cable length 1m (connecting cable coil to integrator) - longer cables available on request.
4. Battery options
   - B-Standard: 4 x AA 1.5V alkali batteries. Lifetime typically 25 hours.
   - R-Rechargeable: 4 x AA 1.2V NiMH batteries. Lifetime typically 10 hours.
   - External adaptor recharges batteries and powers unit.
5. Socket for external power adaptor (adaptor available from PEM as an option)
6. Electronics enclosure. Dimensions H=183mm, W=93mm, D=32mm.
7. Output BNC socket. Supplied with 0.5m BNC:BNC cable.

**Generating the part code**

<table>
<thead>
<tr>
<th>Range</th>
<th>Model</th>
<th>Power option</th>
<th>Cable length (m)</th>
<th>Coil length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UM</td>
<td>015</td>
<td>R</td>
<td>1</td>
<td>80</td>
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</table>

CWT Ultra-mini, peak current 30A, rechargeable battery, 1m cable, 80mm coil.

If you have any queries regarding the CWT or require specifications outside our standard ranges please contact us.

www.powertekuk.com