Current Sense Transformers CST7030

- AEC-Q200 Grade 1 (−40°C to +125°C)
- Small surface mount current sensors
- Sensed current up to 20 A; Frequency range up to 1 MHz
- Very low primary DC resistance
- 500 Vrms, one minute isolation (hipot) between windings
- Designed for: Continuous AC current monitoring in switched-mode power supply; Overload and short-circuit protection; Current measurement in traction motor and battery management systems in conventional and xEV (EV, HEV, FCEV) vehicles.
- Can also be used in 48 V vehicle electrical systems

### Typical Circuit

![Typical Circuit Diagram](images/typical_circuit.png)

- **Core material**: Ferrite
- **Terminations**: Terminations RoHS compliant tin-silver-copper over tin over nickel over phos bronze
- **Weight**: 0.16 g
- **Ambient temperature**: −40°C to +125°C
- **Maximum part temperature**: +165°C (ambient + temp rise)
- **Storage temperature**: Component: −40°C to +125°C. Tape and reel packaging: −40°C to +80°C
- **Resistance to soldering heat**: Max three 40 second reflows at +260°C, parts cooled to room temperature between cycles
- **Moisture Sensitivity Level (MSL)**: 1 (unlimited floor life at <30°C / 85% relative humidity)
- **Failures in Time (FIT) / Mean Time Between Failures (MTBF)**: 10.06 per billion hours / 9.940E+07 hours, calculated per Telcordia SR-332
- **Packaging**: 600/7″ reel; 2500/13″ reel Plastic tape: 16 mm wide, 0.35 mm thick, 8 mm pocket spacing, 3.0 mm pocket depth
- **PCB washing**: Tested to MIL-STD-202 Method 215 plus an additional aqueous wash. See Doc787_PCB_Washing.pdf.

### Specifications

<table>
<thead>
<tr>
<th>Part number1</th>
<th>Turns (N) pri: sec</th>
<th>Inductance2 min (mH)</th>
<th>DCR max (Ohms) pri sec</th>
<th>Frequency range (kHz)</th>
<th>Volt-time product3 (Vµsec)</th>
<th>Sensed current In max (A)</th>
<th>Terminating resistance Rt (Ohms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CST7030-020L_</td>
<td>1:20</td>
<td>0.053</td>
<td>0.0015 0.420</td>
<td>78-1000</td>
<td>6.4</td>
<td>20</td>
<td>1.0</td>
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<tr>
<td>CST7030-050L_</td>
<td>1:50</td>
<td>0.333</td>
<td>0.0015 2.76</td>
<td>31-1000</td>
<td>16.0</td>
<td>20</td>
<td>2.5</td>
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<td>CST7030-070L_</td>
<td>1:70</td>
<td>0.652</td>
<td>0.0015 5.04</td>
<td>22-1000</td>
<td>22.4</td>
<td>20</td>
<td>3.5</td>
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<tr>
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<td>1.330</td>
<td>0.0015 10.68</td>
<td>16-1000</td>
<td>32.0</td>
<td>20</td>
<td>5.0</td>
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<tr>
<td>CST7030-150L_</td>
<td>1:150</td>
<td>2.993</td>
<td>0.0015 22.30</td>
<td>10-1000</td>
<td>48.0</td>
<td>20</td>
<td>7.5</td>
</tr>
</tbody>
</table>

1. When ordering, please specify packaging code:
   - **CST7030-150LC**
   - **Packaging**: C = 7″ machine-ready reel. EIA-481 embossed plastic tape (600 parts per full reel). Quantities less than full reel available: in tape (not machine ready) or with leader and trailer ($25 charge).
   - B = Less than full reel. In an effort to simplify our part numbering system, Coilcraft is eliminating the need for multiple packaging codes. When ordering, simply change the last letter of your part number from B to C.
   - D = 13″ machine-ready reel. EIA-481 embossed plastic tape. Factory order only, not stocked (2500 parts per full reel).

2. Inductance measured between secondary pins at 100 kHz, 0.1 Vrms, 0 Adc.
3. Volt-time product is for the secondary, between pin 1 and 2.
4. Primary current of 20 A causes less than 25°C temperature rise from 25°C ambient. Higher current causes a greater temperature rise (see Temperature Rise vs Current curve).
5. Terminating resistance (Rt) value is based on 1 Volt output with 20 Amps flowing through the primary. Varying terminating resistance increases or decreases output Voltage/Ampere according to the following equation: \( R_t = \frac{V_{out} \times N_{sec}}{I_{in}} \).
6. Electrical specifications at 25°C.

Refer to Doc 362 “Soldering Surface Mount Components” before soldering.

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CST7030 SMT Current Sense Transformers

Temperature Rise vs Current

Temperature rise (from 25°C) vs Current (Amps)

Dimensions

Dimensions are in inches

Recommended Land Pattern

Dimensions are in mm