

ECSTA1V0504

Automotive grade SMT current sense transformer



Product features

- AEC-Q200 qualified
- EE4.4 SMT package (4.8 mm x 3.65 mm x 3.55 mm)
- Very low DC resistance
- Wide selection of turns ratios
- Sensed current – primary rated for 7 A
- Frequency range: 50 kHz to 1 MHz
- Moisture sensitivity level (MSL): 1

Applications

- Motor drive
- On-board chargers
- DC/DC converters
- Wireless chargers
- Battery management systems (BMS)
- EV charging
- Feedback control
- Overload sensing

Environmental compliance and general specifications

- Storage temperature (component): -40 °C to +125 °C
- Operating temperature range: -40 °C to +125 °C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant

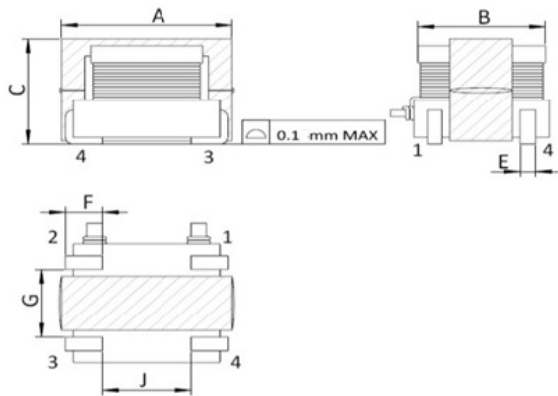


Product specifications

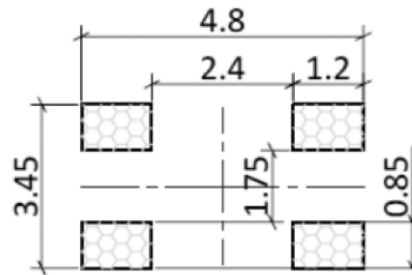
| Part number ³ | Turns ratio sec :pri | Secondary inductance (μH) @ 100 kHz 0.1 V minimum | DCR sec (Ω) maximum | DCR pri (mΩ) reference | Hi-pot pri to sec @ 2 mA 3 seconds 50 Hz | Sensed current ¹ (A) maximum |
|--------------------------|----------------------|---|---------------------|------------------------|--|---|
| ECSTA1V0504-1020-R | 20:1 | 33 | 0.35 | 3 | 500 Vac | 7 |
| ECSTA1V0504-1030-R | 30:1 | 74 | 0.8 | 3 | 500 Vac | 7 |
| ECSTA1V0504-1040-R | 40:1 | 132 | 1.6 | 3 | 500 Vac | 7 |
| ECSTA1V0504-1050-R | 50:1 | 205 | 2.5 | 3 | 500 Vac | 7 |
| ECSTA1V0504-1060-R | 60:1 | 295 | 3.6 | 3 | 500 Vac | 7 |
| ECSTA1V0504-1070-R | 70:1 | 400 | 4.6 | 3 | 500 Vac | 7 |
| ECSTA1V0504-1100-R | 100:1 | 820 | 9.5 | 3 | 500 Vac | 7 |
| ECSTA1V0504-1125-R | 125:1 | 1280 | 13 | 3 | 500 Vac | 7 |
| ECSTA1V0504-1150-R | 150:1 | 1800 | 21 | 3 | 500 Vac | 7 |

1. Primary current of 7 A causes less than 40°C temperature rise @ +2 5°C ambient. Higher current causes a greater temperature rise
2. Electrical specifications at +25 °C
3. Part Number Definition: ECSTA1V0504-1xxx-R
ECSTA1V0504 = Product code and size
1xxx= Turns ratio sec:pri 1=pri, xxx=sec; 1020= 20:1
-R suffix = RoHS compliant

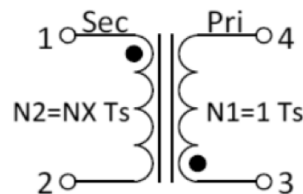
Mechanical parameters, schematic, pad layout (mm)



Recommended PCB Layout



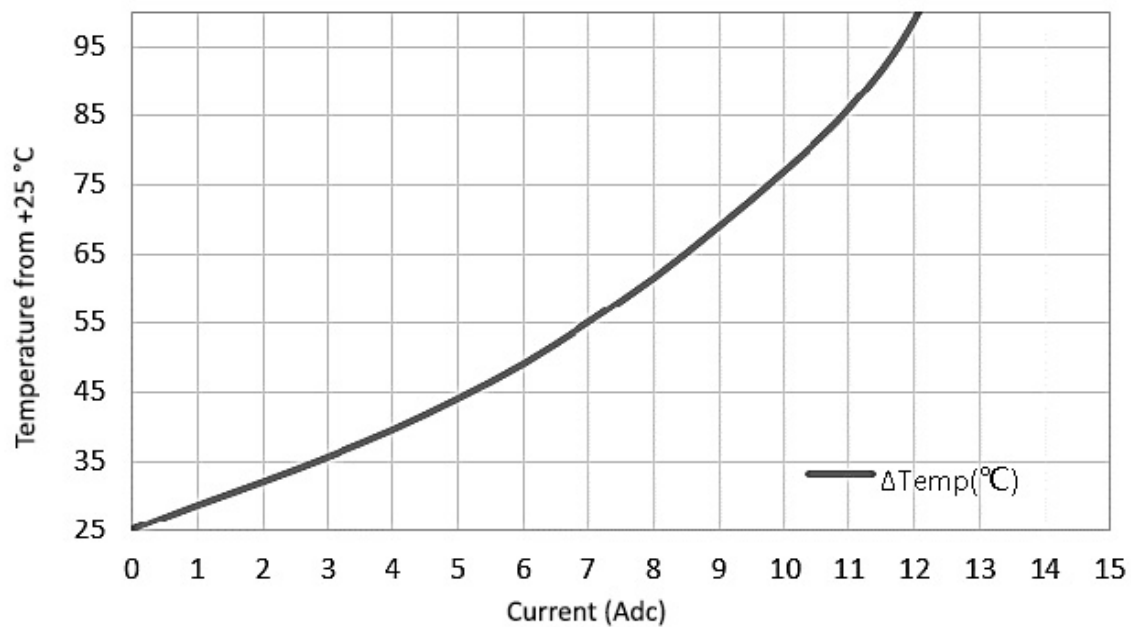
Schematic



| Dimension | Value |
|-----------|--------------|
| A | 4.80 maximum |
| B | 3.65 maximum |
| C | 3.55 maximum |
| E | 0.4 |
| F | 0.85 |
| G | 2.10 |
| J | 2.50 |

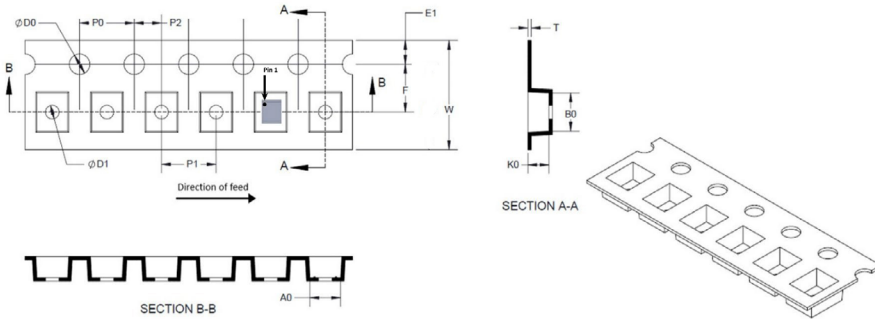
Part marking: White dot, Pin 1 indicator
All soldering surfaces to be coplanar within 0.1 millimeters
Tolerances are ±0.1 millimeters unless stated otherwise
Traces or vias underneath the inductor is not recommended

Temperature rise vs current

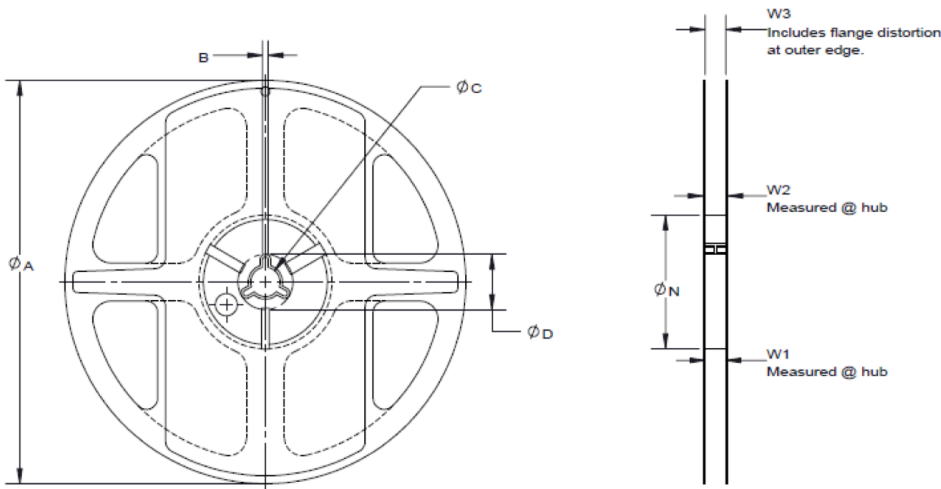


Packaging information (mm)

Supplied in tape and reel packaging, 13" diameter reel (EIA-481 compliant)
2000 parts per reel



| Dimension | Value |
|-----------|-----------------|
| W | 12.0 \pm 0.3 |
| P1 | 8.0 \pm 0.1 |
| E1 | 1.75 \pm 0.1 |
| F | 5.50 \pm 0.05 |
| P2 | 2.0 \pm 0.05 |
| D0 | 1.5 +0.1/-0 |
| D1 | 1.5 +0.1/-0 |
| B0 | 4.4 \pm 0.1 |
| A0 | 4.8 \pm 0.1 |
| K0 | 3.5 \pm 0.1 |
| P0 | 4.0 \pm 0.1 |
| T | 0.35 \pm 0.05 |



| Dimension | Value |
|-----------|----------------|
| A | 330 \pm 3.0 |
| B | 2.6 \pm 0.3 |
| N | 100 \pm 1.0 |
| C | 13+0.5/-0.2 |
| D | 21.5 \pm 0.5 |
| W1 | 12.4+2.0/-0.0 |
| W2 | 18.4 max |
| W3 | na |