

ECSTA1V0805

Automotive grade SMT current sense transformer



Product features

- AEC-Q200 qualified
- EE5.0 SMT package (8.38 mm x 8.0 mm x 5.5 mm)
- Very low DC resistance
- Wide selection of turns ratios
- Sensed current – primary rated for 10 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

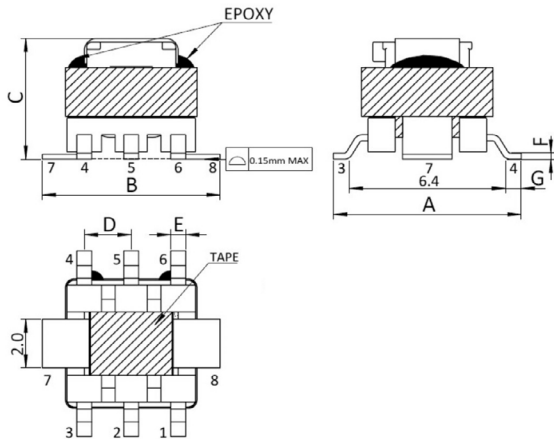


Product specifications

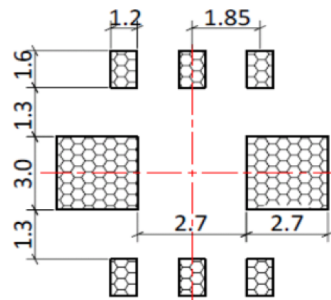
| Part number ³ | Turns ratio sec :pri | Secondary inductance (μH) @ 100 kHz 0.1 V minimum | DCR sec (Ω) maximum | DCR pri (mΩ) reference | Hi-pot pri to sec @ 0.5 mA 3 sec- onds 50 Hz | Sensed current ¹ (A) maximum |
|--------------------------|-------------------------|--|------------------------|---------------------------|---|---|
| ECSTA1V0805-1020-R | 20:1 | 80 | 0.4 | 0.7 | 500 Vac | 10 |
| ECSTA1V0805-1030-R | 30:1 | 180 | 0.87 | 0.7 | 500 Vac | 10 |
| ECSTA1V0805-1040-R | 40:1 | 320 | 1.14 | 0.7 | 500 Vac | 10 |
| ECSTA1V0805-1050-R | 50:1 | 500 | 1.85 | 0.7 | 500 Vac | 10 |
| ECSTA1V0805-1060-R | 60:1 | 730 | 2.3 | 0.7 | 500 Vac | 10 |
| ECSTA1V0805-1070-R | 70:1 | 980 | 4.75 | 0.7 | 500 Vac | 10 |
| ECSTA1V0805-1100-R | 100:1 | 2000 | 5.5 | 0.7 | 500 Vac | 10 |
| ECSTA1V0805-1125-R | 125:1 | 3000 | 11.5 | 0.7 | 500 Vac | 10 |

1. Primary current of 10 A causes less than 40°C temperature rise @ +25°C ambient. Higher current causes a greater temperature rise
2. Electrical specifications at +25 °C
3. Part Number Definition: ECSTA1V0805-1xxx-R
ECSTA1V0805 = Product code and size
1xxx= Turns ratio sec:pri 1=pri, xxx=sec; 1020= 20:1
-R suffix = RoHS compliant

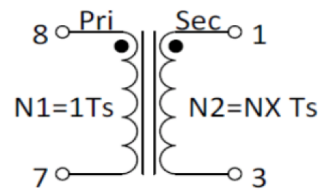
Mechanical parameters, schematic, pad layout (mm)



Recommended PCB Layout



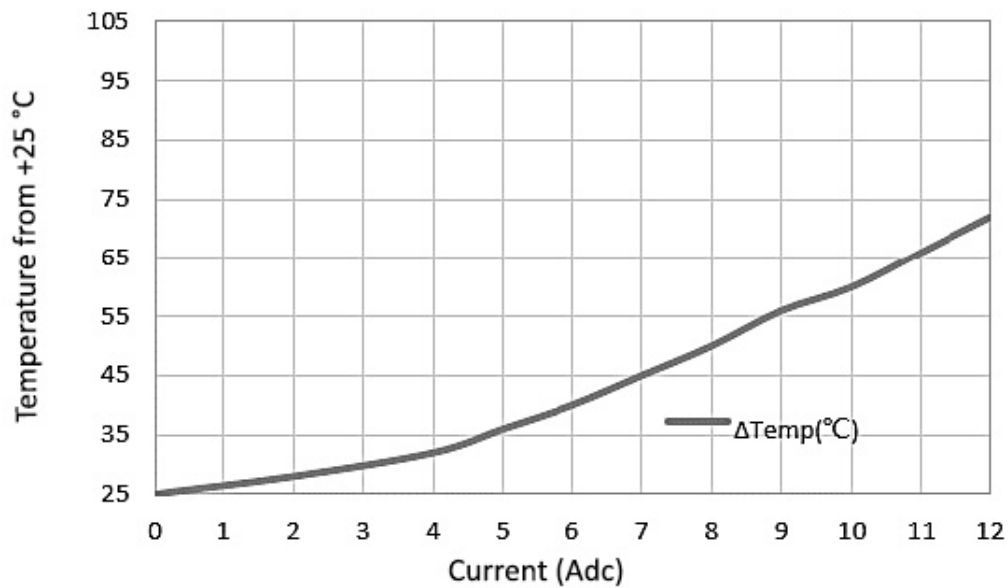
Schematic



| Dimension | Value |
|-----------|--------------|
| A | 8.38 maximum |
| B | 8.00 maximum |
| C | 5.50 maximum |
| D | 1.85 ±0.3 |
| E | 0.6 |
| F | 0.25 |
| G | 0.7 ±0.2 |

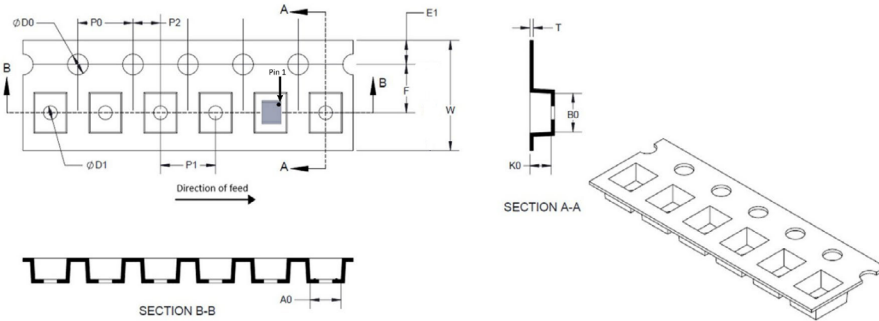
Part marking: White dot, Pin 1 indicator
All soldering surfaces to be coplanar within 0.15 millimeters
Tolerances are ±0.1 millimeters unless stated otherwise
Traces or vias underneath the inductor is not recommended

Temperature rise vs current

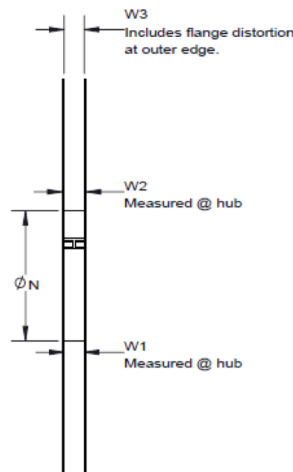
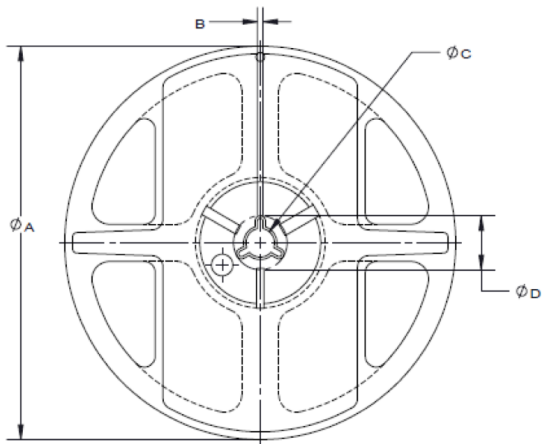


Packaging information (mm)

Supplied in tape and reel packaging, 13" diameter reel (EIA-481 compliant)
1000 parts per reel



| Dimension | Value |
|-----------|-------------|
| W | 16.0 ±0.3 |
| P1 | 12.0 ±0.1 |
| E1 | 1.75 ±0.1 |
| F | 7.50 ±0.05 |
| P2 | 2.0 ±0.05 |
| D0 | 1.5 +0.1/-0 |
| D1 | 1.5 +0.1/-0 |
| B0 | 8.45 ±0.1 |
| A0 | 7.70 ±0.1 |
| K0 | 5.50 ±0.1 |
| P0 | 4.0 ±0.1 |
| T | 0.40 ±0.05 |



| Dimension | Value |
|-----------|---------------|
| A | 330 ±3.0 |
| B | 2.6 ±0.3 |
| N | 100 ±1.0 |
| C | 13+0.5/-0.2 |
| D | 21.5 ±0.5 |
| W1 | 16.4+2.0/-0.0 |
| W2 | 22.4 max |
| W3 | na |

Solder reflow profile

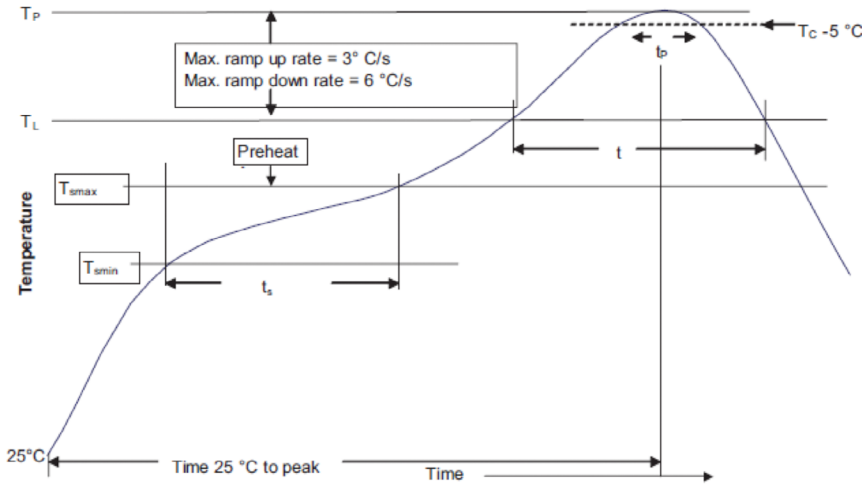


Table 1 - Standard SnPb solder (T_c)

| Package Thickness | Volume mm ³ <350 | Volume mm ³ ≥350 |
|-------------------|-----------------------------|-----------------------------|
| <2.5 mm) | 235 °C | 220 °C |
| ≥2.5 mm | 220 °C | 220 °C |

Table 2 - Lead (Pb) free solder (T_c)

| Package thickness | Volume mm ³ <350 | Volume mm ³ 350 - 2000 | Volume mm ³ >2000 |
|-------------------|-----------------------------|-----------------------------------|------------------------------|
| <1.6 mm | 260 °C | 260 °C | 260 °C |
| 1.6 – 2.5 mm | 260 °C | 250 °C | 245 °C |
| >2.5 mm | 250 °C | 245 °C | 245 °C |

Reference J-STD-020

| Profile feature | Standard SnPb solder | Lead (Pb) free solder |
|---|----------------------|-----------------------|
| Preheat and soak | | |
| • Temperature min. (T _{smin}) | 100 °C | 150 °C |
| • Temperature max. (T _{smax}) | 150 °C | 200 °C |
| • Time (T _{smin} to T _{smax}) (t _s) | 60-120 seconds | 60-120 seconds |
| Ramp up rate T _L to T _p | 3 °C/ second max. | 3 °C/ second max. |
| Liquidous temperature (T _L) | 183 °C | 217 °C |
| Time (t _L) maintained above T _L | 60-150 seconds | 60-150 seconds |
| Peak package body temperature (T _p)* | Table 1 | Table 2 |
| Time (t _p)* within 5 °C of the specified classification temperature (T _c) | 20 seconds* | 30 seconds* |
| Ramp-down rate (T _p to T _L) | 6 °C/ second max. | 6 °C/ second max. |
| Time 25 °C to peak temperature | 6 minutes max. | 8 minutes max. |

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

Manual solder

30 W soldering iron. +350 °C ±10 °C, 3 seconds maximum. Do not touch product with iron. Generally manual, hand soldering is not recommended.

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