

ECST1V0703

SMT current sense transformer



Product features

- EE4.6 SMT package (7.2 mm x 5.2 mm x 3.0 mm)
- Very low DC resistance
- Wide selection of turns ratios
- Sensed current – primary rated for 9 A
- Frequency range: 50 kHz to 1 MHz
- Moisture sensitivity level (MSL): 1

Applications

- Switching power supplies
- Feedback control
- Overload sensing
- Load drop/shut down detection

Environmental compliance and general specifications

- 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 (mH) @ 100 kHz 0.1 V minimum | DCR sec (Ω) maximum | DCR pri (m Ω) reference | Hi-pot pri to sec @ 2 mA 3 seconds 50 Hz | Sensed current ¹ (A) maximum |
|--------------------------|---------------------|---|------------------------------|---------------------------------|--|---|
| ECST1V0703-1020-R | 20:1 | 0.053 | 0.42 | 1.5 | 500 Vac | 9 |
| ECST1V0703-1050-R | 50:1 | 0.333 | 2.76 | 1.5 | 500 Vac | 9 |
| ECST1V0703-1070-R | 70:1 | 0.652 | 5.04 | 1.5 | 500 Vac | 9 |
| ECST1V0703-1100-R | 100:1 | 1.33 | 10.68 | 1.5 | 500 Vac | 9 |
| ECST1V0703-1150-R | 150:1 | 2.99 | 22.3 | 1.5 | 500 Vac | 9 |

1. Primary current of 9 A causes less than 40°C temperature rise @ +25°C ambient. Higher current causes a greater temperature rise

2. Electrical specifications at +25 °C

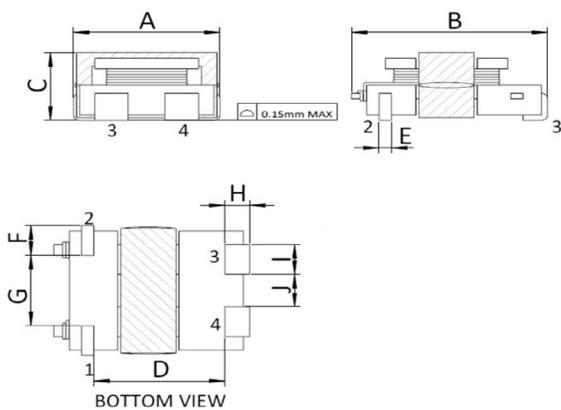
3. Part Number Definition: ECST1V0703-1xxx-R

ECST1V0703 = Product code and size

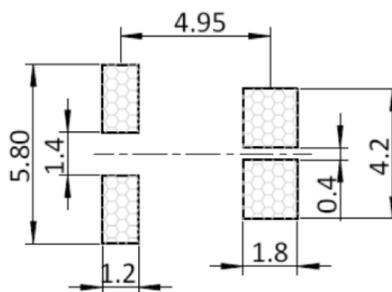
1xxx= Turns ratio sec:pri; 1=pri, xxx=sec; 1020= 20:1

-R suffix = RoHS compliant

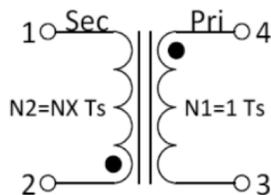
Mechanical parameters, schematic, pad layout (mm)



Recommended PCB Layout



Schematic



| Dimension | Value |
|-----------|--------------|
| A | 5.20 maximum |
| B | 7.20 maximum |
| C | 3.00 maximum |
| D | 4.05 |
| E | 0.4 |
| F | 1.1 |
| G | 2.6 |
| H | 1.2 |
| I | 1.1 |
| J | 1.2 |

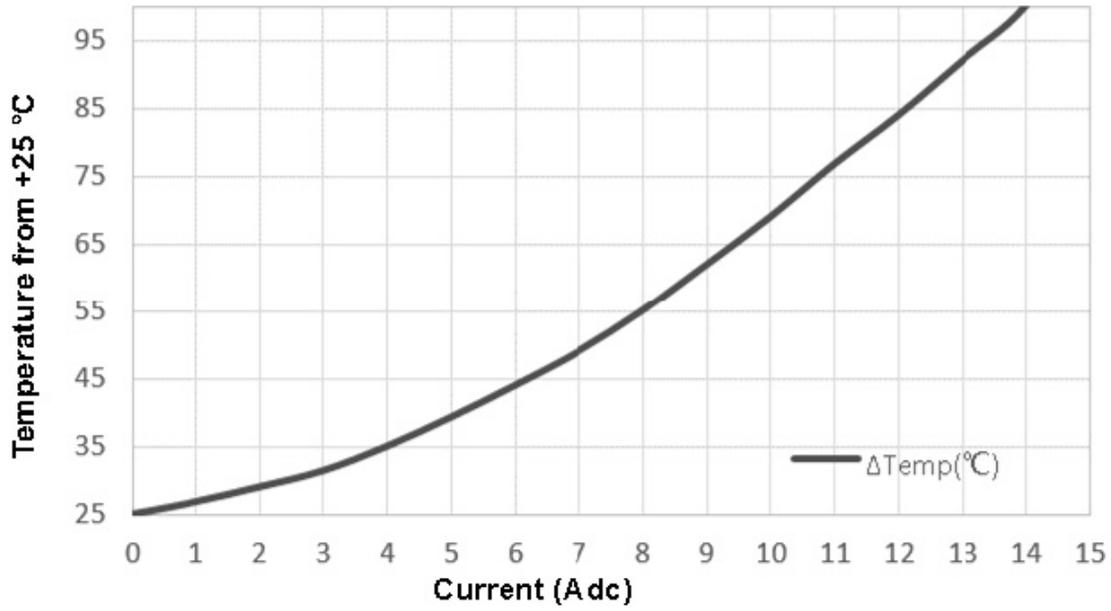
Part marking: White dot, Pin 2 indicator

All soldering surfaces to be coplanar within 0.15 millimeters

Tolerances are ± 0.1 millimeters unless stated otherwise

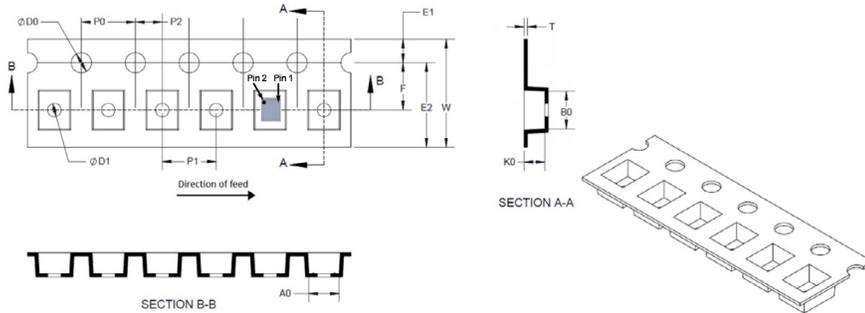
Traces or vias underneath the inductor is not recommended

Temp rise vs current

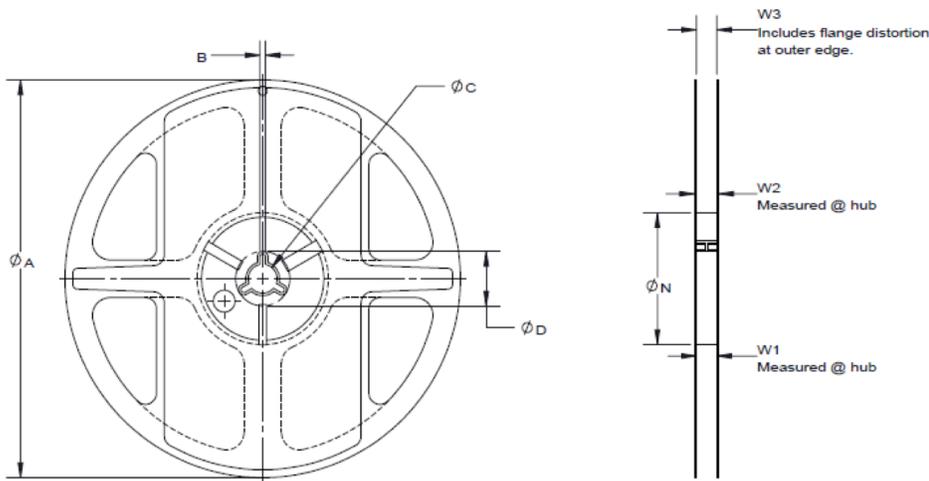


Packaging information (mm)

Supplied in tape and reel packaging, 13" diameter reel (EIA-481 compliant)
2500 parts per reel



| Dimension | Value |
|-----------|-------------|
| W | 16 ±0.3 |
| P1 | 8.0 ±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 | 7.2 ±0.1 |
| A0 | 5.2 ±0.1 |
| K0 | 2.9 ±0.1 |
| P0 | 4.0 ±0.1 |
| T | 0.35 ±0.05 |



| Dimension | Value |
|-----------|---------------|
| A | 330 ±3.0 |
| N | 100 ±1.0 |
| C | 13+0.5/-0.2 |
| W1 | 16.4+2.0/-0.0 |

Solder reflow profile

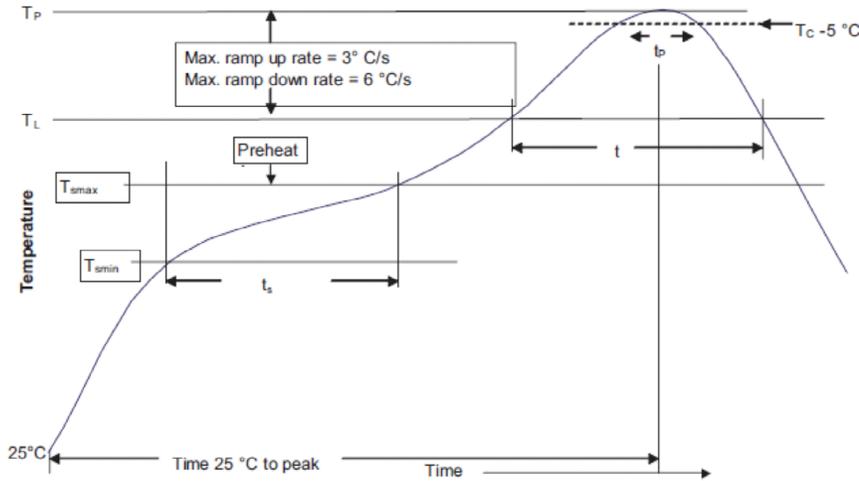


Table 1 - Standard SnPb solder (T_C)

| 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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Printed in USA
Publication No. ELX1186 BU-ELX22046
April 2022

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