

ECSTA1V0703

Automotive grade SMT current sense transformer



Product features

- AEC-Q200 qualified
- 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

- 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 (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
ECSTA1V0703-1020-R	20:1	0.053	0.42	1.5	500 Vac	9
ECSTA1V0703-1050-R	50:1	0.333	2.76	1.5	500 Vac	9
ECSTA1V0703-1070-R	70:1	0.652	5.04	1.5	500 Vac	9
ECSTA1V0703-1100-R	100:1	1.33	10.68	1.5	500 Vac	9
ECSTA1V0703-1150-R	150:1	2.993	22.3	1.5	500 Vac	9

1. Primary current of 9 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

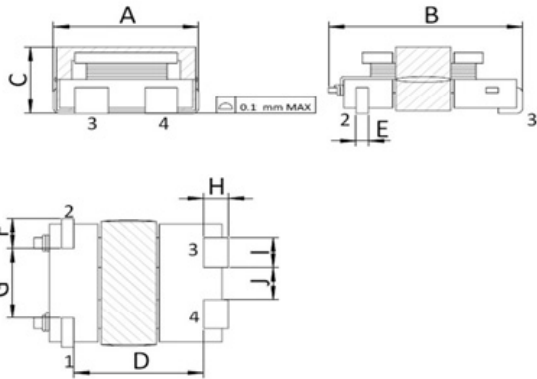
3. Part Number Definition: ECSTA1V0703-1xxx-R

ECSTA1V0703 = Product code and size

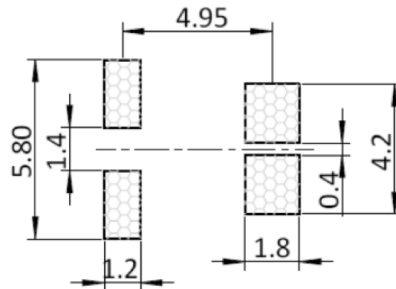
1xxx= Turns ratio sec:pri 1=pri, xxx=sec; 1020= 20:1

-R suffix = RoHS compliant

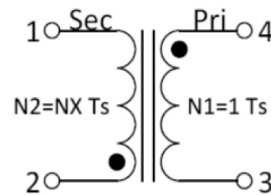
Mechanical parameters, schematic, pad layout (mm)



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

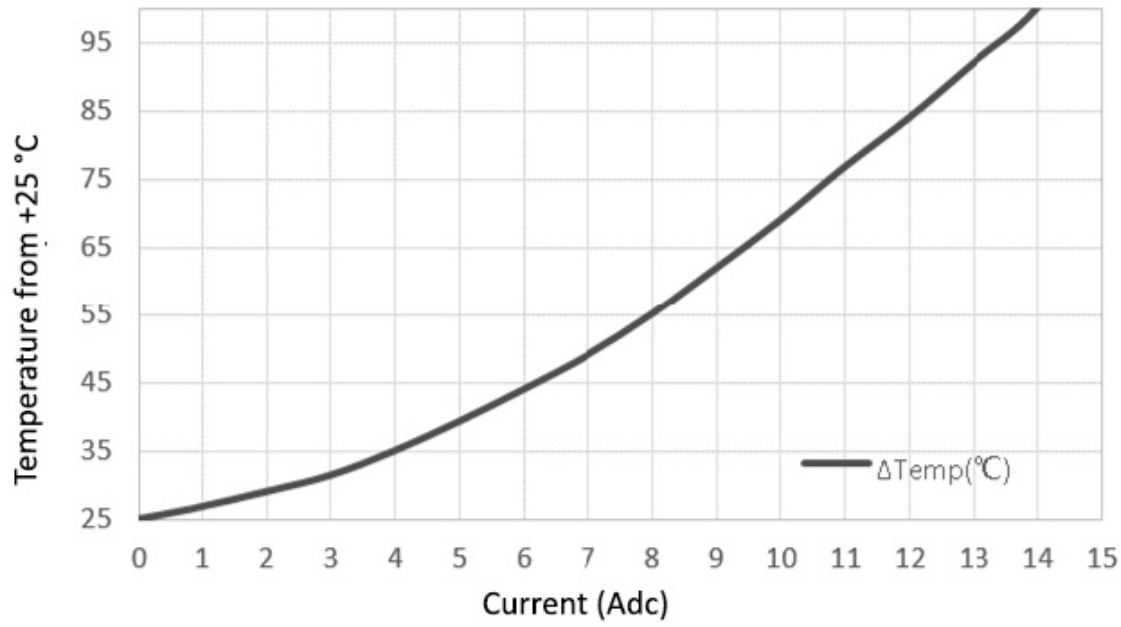
Part marking: White dot, Pin 2 indicator

All soldering surfaces to be coplanar within 0.1 millimeters

Tolerances are ± 0.1 millimeters unless stated otherwise

Traces or vias underneath the inductor is not recommended

Temperature rise vs current



Solder reflow profile

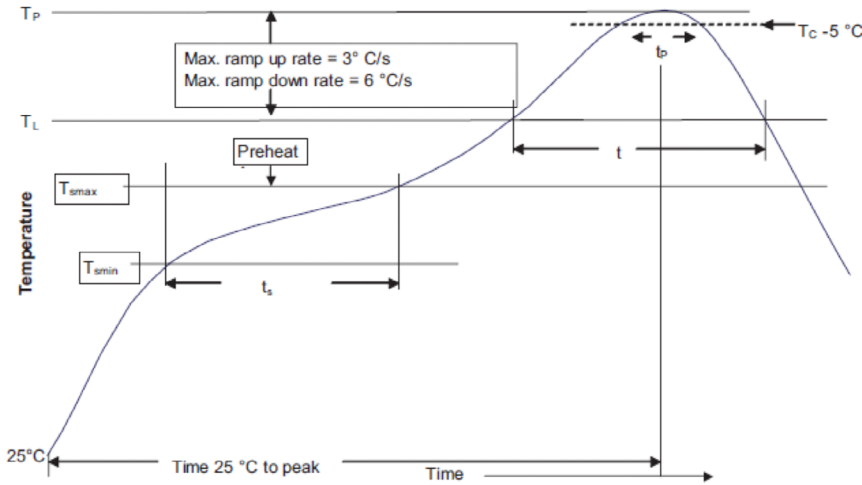


Table 1 - Standard SnPb solder (T_c)

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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