

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

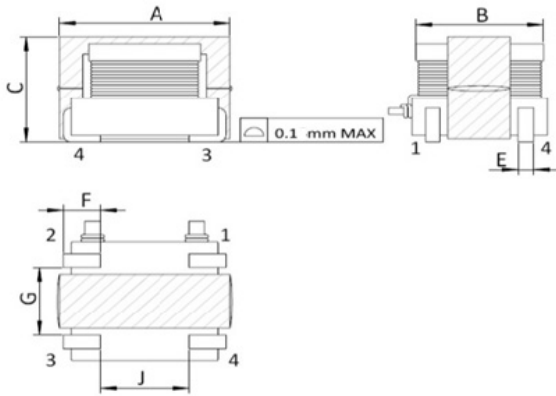


Product specifications

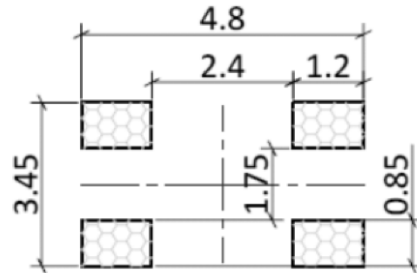
Part number ³	Turns ratio sec :pri	Secondary inductance (μH) @ 100 kHz 0.1 V minimum	DCR sec (Ω) maximum	DCR pri (mΩ) reference	Hi-pot pri to sec @ 2 mA 3 seconds 50 Hz	Sensed current ¹ (A) maximum
ECSTA1V0504-1020-R	20:1	33	0.35	3	500 Vac	7
ECSTA1V0504-1030-R	30:1	74	0.8	3	500 Vac	7
ECSTA1V0504-1040-R	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 @ +25°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

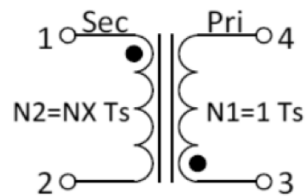
Mechanical parameters, schematic, pad layout (mm)



Recommended PCB Layout



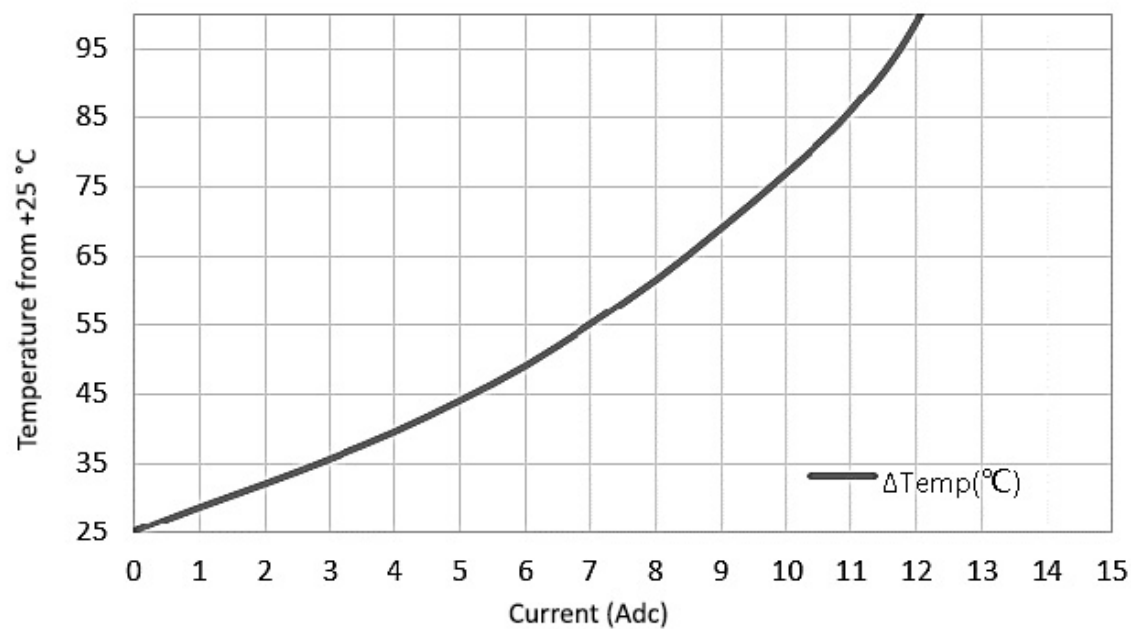
Schematic



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

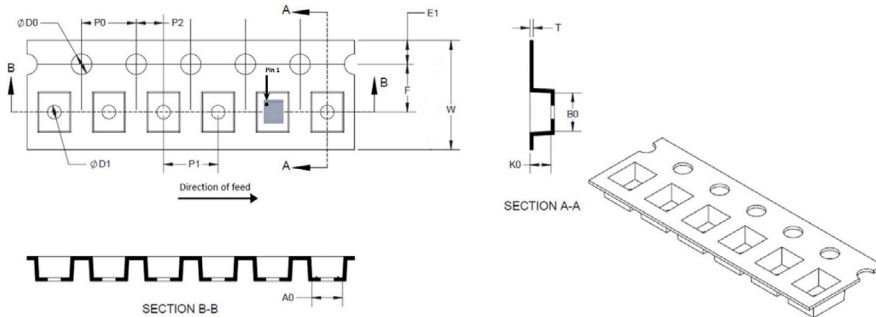
Part marking: White dot, Pin 1 indicator
All soldering surfaces to be coplanar within 0.1 millimeters
Tolerances are ±0.1 millimeters unless stated otherwise
Traces or vias underneath the inductor is not recommended

Temperature rise vs current

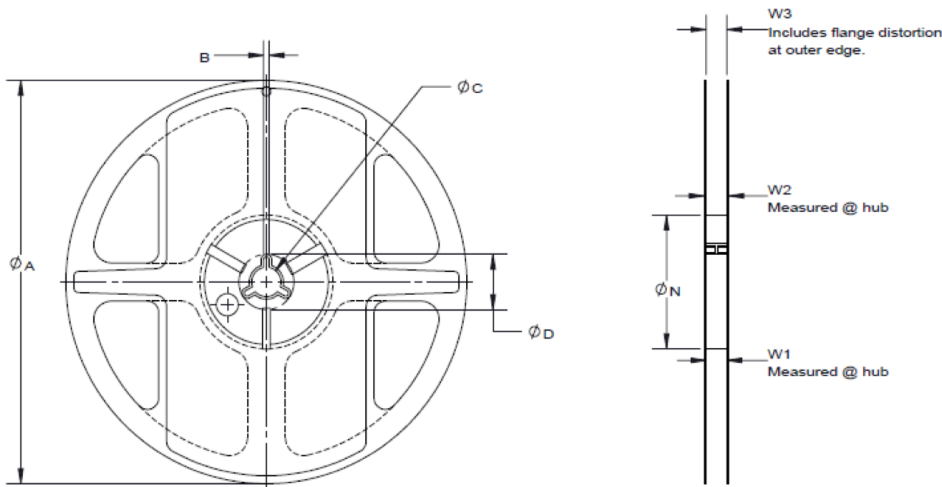


Packaging information (mm)

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

Solder reflow profile

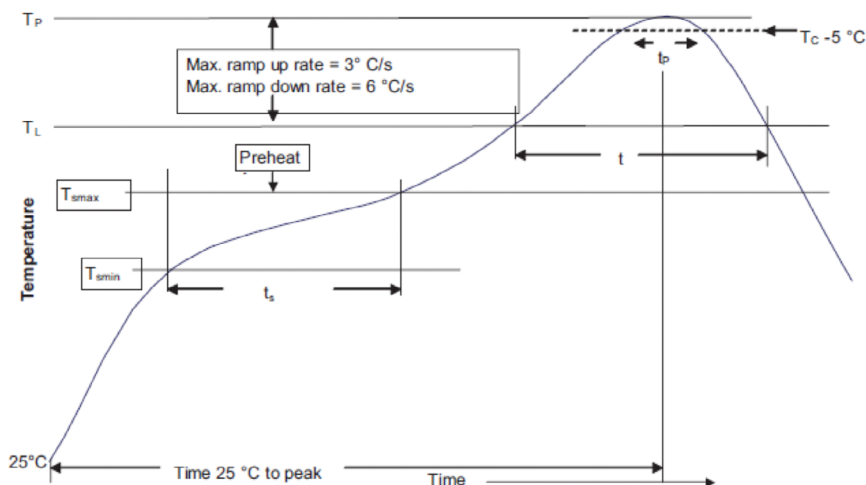


Table 1 - Standard SnPb solder (T_C)

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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