BYD Semiconductor Co., Ltd.

BST5-150ICV1M

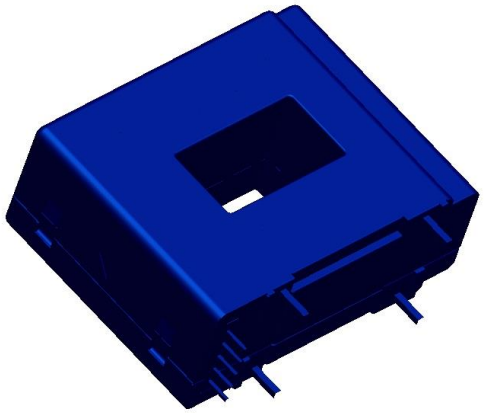
Current Sensors

Description

For the electronic measurement of current: DC, AC, pulsed…, with galvanic isolation between the primary (high power) and the secondary circuit (electronic circuit).

Features

- Closed loop multi-range current sensors
- Voltage output
- Unipolar supply voltage



Advantages

- Very low offset drift
- Very good dv/dt immunity

Applications

- Uninterruptible Power Supplies (UPS)
- Power supplies for welding applications
- Switched-Mode Power Supplies (SMPS)
- Solar inverters
- AC variable speed and servo motor drives

Standards

- IEC 61800-1:1997
- IEC 61800-2:2015
- IEC 61800-3:2004
- IEC 61800-5-1:2007
- IEC 62109-1:2010
- IEC 62477-1:2012

Application Domain

- industrial
- Battery supplied applications

Absolute maximum ratings

Parameter	Symbol	Unit	Value
Maximum supply voltage	Vc max	V	7
Maximum primary conductor temperature	$T_{B\ max}$	℃	110
ESD rating ,Human Body Model(HBM)	$U_{ESD\ HBM}$	KV	4
RMS voltage for AC isolation test, 50/60Hz/1min	V_d	KV	3
Insulation resistance, @500VDC	R_i	GΩ	200
Clearance (pri. –sec.)	d_{cl}	mm	12.9
Creepage distance (pri. –sec.)	d_{cp}	mm	12.9

Stresses above these ratings may cause permanent damage .Exposure to absolute maximum ratings for extended periods may degrade reliability.

Environment and mechanical characteristics

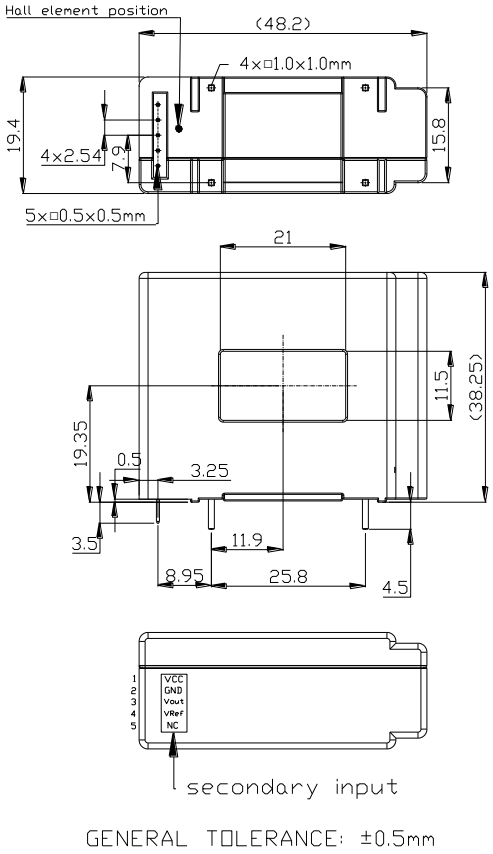
Parameter	Symbol	Unit	Min	Type	Max	Comment
Ambient operating temperature	T_A	℃	-40		85	
Ambient storage temperature	T_S	℃	-55		125	
Mass	m	g		46		

Electrical data BST5-150ICV1M

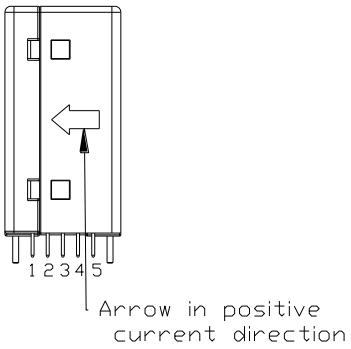
At T=25℃,Vc=+5V,N_p=1turn, R_L=10kΩ

Parameter	Symbol	Unit	Min	Type	Max	Comment
Primary nominal current rms	I_{PN}	A		150		
Primary current, measuring range	I_{PM}	A	-450		450	
Supply voltage	V_C	V	4.75	5	5.25	
Current consumption	I_C	mA		8+I_P(mA)/N_S	20+I_P(mA)/N_S	N_S=1600 turns
Reference voltage @ I_P=0A	V_{REF}	V	2.485	2.5	2.515	Internal reference
Output voltage	V_{OUT}	V	0.25	V_{REF} ± (0.625*I_P/I_{PN})	4.75	With Vc=5V
Output voltage @ I_P=0	V_{OUT}	V		V_{REF}		
Electrical offset voltage	V_{OE}	mV	-2.5		2.5	100% tested V_{out}-V_{ref}
Electrical offset current referred to primary	I_{OE}	mA	-600		600	100% tested
Temperature coefficient of V_{ref}	TCV_{ref}	ppm/K	-100		100	Internal reference
Temperature coefficient of V_{OUT} @I_P=0A	TCV_{OUT}	ppm/K	-30		30	ppm/K of 2.5V -40℃…85℃
Theoretical sensitivity	G_{th}	mV/A		4.166		625mV/I_{PN}
Sensitivity error	ε_G	%	-0.8		0.8	100% tested(typical value)
Temperature coefficient of S	TCS	ppm/K			75	-40℃…85℃
Linearity error	ε_L	% of I_{PN}	-0.10		0.10	
Magnetic offset voltage (6.66*I_{PN}) referred to primary	V_{OM}	mV	-2		2	
Response time @ 80% of I_{PN}	T_{D80}	uS			3	di/it=50A/μs primary busbar with the full size of hole dimensions: 11*20.5[H*W in mm]
Frequency bandwidth (±3dB)	BW	KHz	200			
Total error	ε_{tot}	% of I_{PN}			1	
Total error @T_A=85℃	ε_{tot}	% of I_{PN}			1.4	
Sum of sensitivity and linearity	ε_{SL}	% of I_{PN}			0.83	
Sum of sensitivity and linearity @ T_A=85℃	ε_{SL}	% of I_{PN}			1.2	

Dimensions BST5-150ICV1M (in mm. 1 mm = 0.0394 inch)

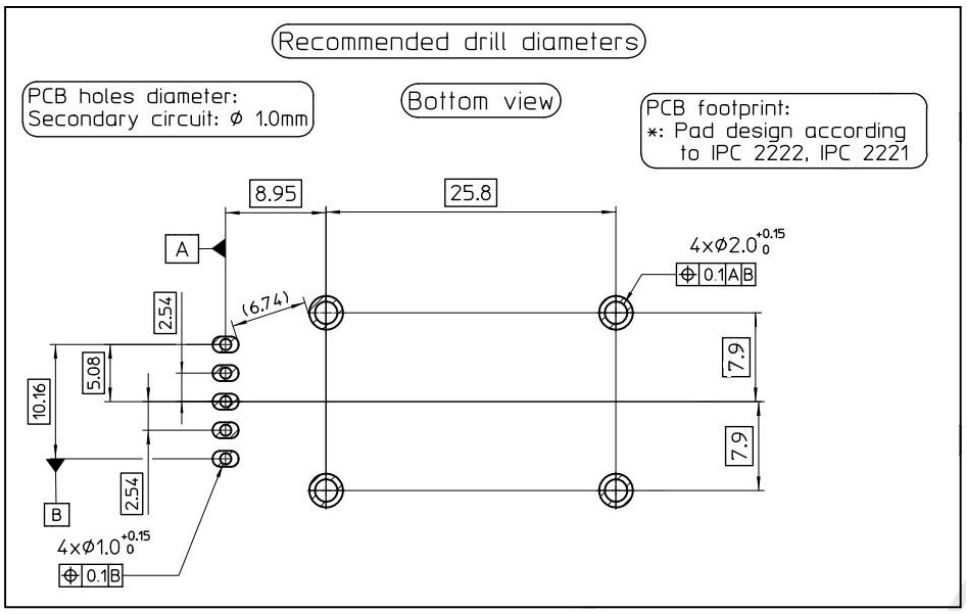


1	VCC
2	GND
3	Vout
4	Vref
5	NC



GENERAL TOLERANCE: ±0.5mm

PCB footprint



Assembly on PCB

- Recommended PCB hole diameter 1 mm for secondary pin
  2 mm for retention pin
- Maximum PCB thickness 2.4 mm
- Wave soldering profile maximum 260℃ for 10 s
  No clean process only

Instructions of use

1. When the test current passes through the sensor, you can get the size of the output current. (Warning: wrong connection may lead to sensors damage)
2. I_s is positive when I_p flows in the direction of the arrow.
3. In order to achieve the best magnetic coupling, the primary windings have to be wound over the top edge of the device.
4. According to user needs, different rated input currents and output currents of the sensors can be customized.

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