High Voltage Intelligent Battery Shunt Sensor

FEATURES

- Current measurement
  - Low TCR shunt resistor (down to < ±10 ppm)
  - Low thermal EMF (as low as < 1.25 µV/°C)
  - Very low inductance (< 5 nH)
  - Easy to connect to a busbar
  - Continuous current rating up to 1800 A
  - 5 s overload up to 9000 A
- Three channel voltage measurement
  - Voltage measurement up to 1200 V
  - Precision to ± 0.5 % with low TCR tracking to 10 ppm/°C utilizing thick film technology
- Analog frontend
  - 24-bit analog-digital converter
  - Up to 32 ksps output rate
- Hardware features
  - I/O isolation test voltage 3.5 kVDC
  - 9 V to 24 V power supply
  - CANFD interface
  - NTC temperature measurement

DESCIPTION

The Intelligent Battery Shunt Sensor (IBSS) is based on Low TCR shunt resistor and high precision low tracing error voltage divider allowing high bandwidth, high accuracy current and voltage measurements over a wide range of temperatures without the need for temperature compensation.

The HV-IBSS-CAN/CANFD is available with multiple shunt values to match the user’s measurement ranges Table 1.

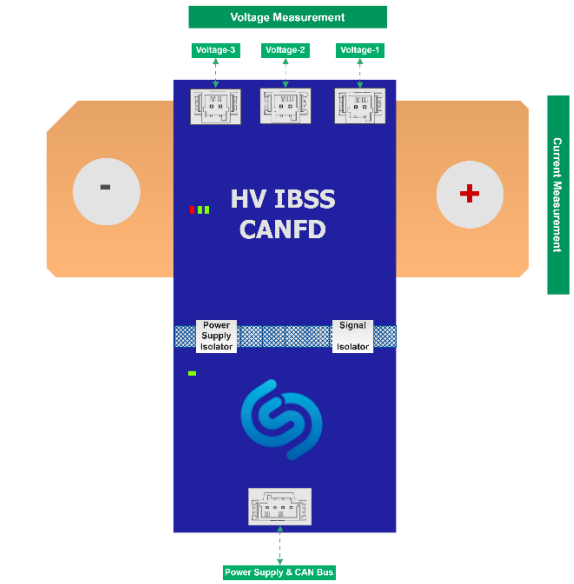
APPLICATIONS

- Automotive and industry
- Industrial and server computing
- Networking, telecom, and base station power supplies
- Battery management systems
- EV test environment
- Solar installations
- Home automation

Order number	SSA001C06A	SSA001C05A	SSA001C04A	SSA001C03A	SSA001C02A	SSA001C01A
CURRENT MEASUREMENT						
Shunt resistance	100 µΩ	50 µΩ	30 µΩ	50 µΩ	25 µΩ	15 µΩ
Power rating (70 °C)	36 W	36 W	36 W	50 W	50 W	50 W
Continuous current	600 A	849 A	1095 A	1000 A	1414 A	1826 A
Short time overload (5x for 5 s)	3000 A	4245 A	5475 A	5000 A	7070 A	9130 A
Max. measurable current (ADC limit, gain 8)	1500 A	3000 A	5000 A	3000 A	6000 A	10000 A
Max. measurable current (ADC limit, gain 8)	3000 A	5000 A	5000 A	6000 A	6000 A	10000 A
Shunt resistance accuracy (%)	5%	5%	5%	5%	5%	5%
Shunt load life (resistance change over 1000 h)	1%	1%	1%	1%	1%	1%
Shunt TCR (max.)	± 10 ppm/K	± 10 ppm/K	± 10 ppm/K	± 10 ppm/K	± 10 ppm/K	± 10 ppm/K
Shunt thermal EMF (max.)	1.25 µV/K	1.25 µV/K	1.25 µV/K	1.25 µV/K	1.25 µV/K	1.25 µV/K
Shunt temperature operating range	-65 °C to +170 °C	-65 °C to +170 °C	-65 °C to +170 °C	-65 °C to +170 °C	-65 °C to +170 °C	-65 °C to +170 °C
VOLTAGE MEASUREMENT						
Resistor Range	8000 kΩ	8000 kΩ	8000 kΩ	8000 kΩ	8000 kΩ	8000 kΩ
Voltage divider ratio	0.001	0.001	0.001	0.001	0.001	0.001
Voltage divider accuracy	1%	1%	1%	1%	1%	1%
Voltage divider ratio accuracy	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
Voltage measurement range	1200	1200	1200	1200	1200	1200

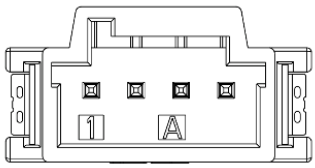
Table 1. Available Current and Voltage Ranges

1. PIN CONFIGURATION



1.1. Power Supply and CAN Bus Pins

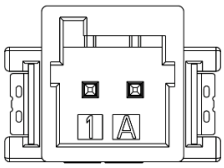
Pin	Name	Description
1	Ground	DC supply input / Vss (-)
2	CAN Bus Low	CAN Bus communication pin
3	CAN Bus High	CAN Bus communication pin
4	12V-24V	DC supply input / Vcc (+)



Power Supply and CAN Bus Connector (1-2232829-4)

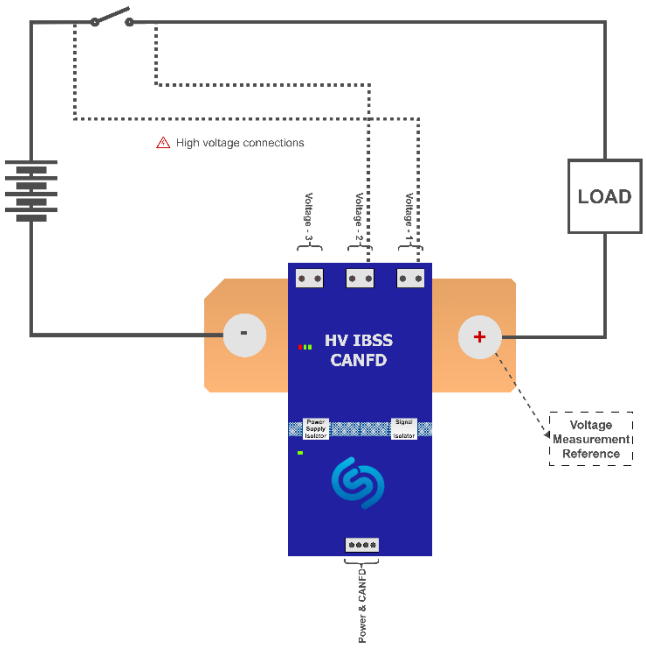
1.2. Voltage Measurement Pins

Pin	Name	Description
1, 2	Voltage Input-1	CH-1 Voltage Sensing
1, 2	Voltage Input-2	CH-2 Voltage Sensing
1, 2	Voltage Input-3	CH-3 Voltage Sensing



Voltage Measurement Connector (1-2232829-2)

2. TYPICAL APPLICATION CIRCUIT



3. LED INDICATORS

- 3.3 V power LED indicates availability of “hot” 3.3 V rail
- CAN bus frame TX LED indicates data transmission
- Measurement data ready LED indicates completion of ADC conversion
- 12V / 24V power LED indicates availability of supply voltage