SCM5B40/41

Analog Voltage-input Modules, Wide Bandwidth

DESCRIPTION

Each SCM5B40 and SCM5B41 wide-bandwidth, voltage-input module provides a single channel of analog-input which is amplified, isolated, and converted to a high-level analog voltage output (Figure below). This voltage output is logic-switch controlled, allowing these modules to share a common analog bus without the requirement of external multiplexers.

The SCM5B module family is designed with a completely isolated computer-side circuit which can be floated to ±50V from Power Common, pin 16. This complete isolation means that no connection is required between I/O Common and Power Common for proper operation of the output switch. If desired, the output switch can be turned on continuously by simply connecting pin 22, the Read-Enable pin, to I/O Common, pin 19.

The input signal is processed through a wide bandwidth pre-amplifier on the field side of the isolation barrier. After amplification, the input signal is chopped by a proprietary chopper circuit. Isolation is provided by transformer coupling, again using a proprietary technique to suppress transmission of common-mode spikes or surges. The module is powered from +5VDC, ±5%.

A special input circuit on the SCM5B40 and SCM5B41 modules provides protection against accidental connection of power-line voltages up to 240VAC.

FEATURES

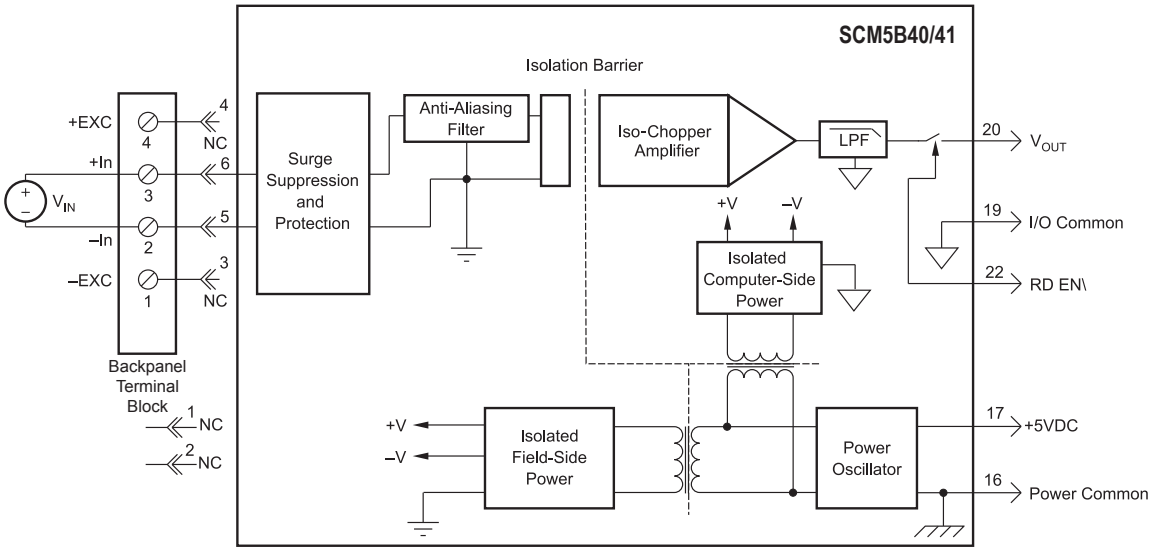
- Accepts Millivolt and Voltage Level Signals
- High-level Voltage Outputs
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Input Protected to 240VAC, Continuous
- 100dB CMR
- 10kHz Signal Bandwidth
- ±0.03% Accuracy
- ±0.01% Linearity
- ±1µV/°C Drift
- CSA C/US Certified
- CE and ATEX Compliant
- Manufactured per RoHS III Directive 2015/863
- Mix and Match SCM5B Types on Backpanel

BENEFITS

- Protects User Equipment from Lightning and Heavy Equipment Power-line Voltage
- Reduces EMC Concerns and Electrical Noise in Measured Signals
- Convenient System Expansion and Repair
- Signal Filtering in Noisy Environments
- Simplifies Sensor Interface and Signal Conditioning Design
- Provides Isolation of External Sensors
- Breaks Ground Loops

APPLICATIONS

- Analog Signal Conditioning
- Analog Signal Isolation
- Analog Signal Filtering
- Industrial Process Control
- Test and Measurement
- System and Signal Monitoring



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SCM5B40/41 Block Diagram - For Module Dimensions and Pinouts, See Page 1-44

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Specifications

Typical* at T_A = +25°C and +5VDC Power

Module	SCM5B40	SCM5B41
Input Range	±10mV to ±1V	±1V to ±40V
Input Bias Current	±0.5nA	±0.05nA
Input Resistance		
Normal	200MΩ	650kΩ (-01 thru -04) 2MΩ (-05 thru -10)
Power Off	40kΩ	650kΩ (-01 thru -04) 2MΩ (-05 thru -10)
Overload	40kΩ	650kΩ (-01 thru -04) 2MΩ (-05 thru -10)
Input Protection		
Continuous	240Vrms (max)	240Vrms (max)
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMV, Input to Output		
Continuous	1500Vrms (max)	1500Vrms (max)
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMR (50Hz or 60Hz)	100dB	100dB
NMR (–3dB at 10kHz)	120dB per Decade Above 10kHz	120dB per Decade Above 10kHz
Accuracy(1)	±0.03% Span	±0.03% Span
Linearity	±0.01% Span	±0.01% Span
Stability		
Input Offset	±1µV/°C	±20µV/°C
Output Offset	±40µV/°C	±40µV/°C
Gain	±25ppm/°C	±50ppm/°C
Noise		
Input, 0.1 to 10Hz	0.4µVrms	2µVrms
Output, 100kHz	10mVp-p	10mVp-p
Bandwidth, –3dB	10kHz	10kHz
Rise Time, 10 to 90% Span	35µs	35µs
Settling Time, to 0.1%	250µs	250µs
Output Range	See Ordering Information	See Ordering Information
Output Resistance	50Ω	50Ω
Output Protection	Continuous Short-to Ground	Continuous Short-to-Ground
Output Selection Time	6µs at C_{LOAD} = 0 to -000pF	6µs at C_{LOAD} = 0 to 2000pF
(to ±1mV of V_{OUT})		
Output Current Limit	±8mA	±8mA
Output Enable Control		
Max Logic “0”	+0.8V	+0.8V
Min Logic “1”	+2.4V	+2.4V
Max Logic “1”	+36V	+36V
Input Current “0,1”	0.5µA	0.5µA
Power Supply Voltage	+5VDC ±5%	+5VDC ±5%
Power Supply Current	30mA	30mA
Power Supply Sensitivity	±2µV/% RTI(2)	±200µV/% RTI(2)
Mechanical Dimensions	2.28” x 2.26” x 0.60”	2.28” x 2.26” x 0.60”
(h)x(w)x(d)	(58mm x 57mm x 15mm)	(58mm x 57mm x 15mm)
Environmental		
Operating Temp. Range	–40°C to +85°C	–40°C to +85°C
Storage Temp. Range	–40°C to +85°C	–40°C to +85°C
Relative Humidity	0 to 95% Noncondensing	0 to 95% Noncondensing
Emissions EN61000-6-4	ISM, Group 1	ISM, Group 1
Radiated, Conducted	Class A	Class A
Immunity EN61000-6-2	ISM, Group 1	ISM, Group 1
RF	Performance A ±0.5% Span Error	Performance A ±0.5% Span Error
ESD,EFT	Performance B	Performance B

NOTES:
*Contact factory for maximum values.
(1) Includes linearity, hysteresis and repeatability.
(2) RTI = Referenced to input.
(3) Same as SCM5B41-01 with 200MΩ input resistance.

Ordering Information

Model	Input Range	Output Range
SCM5B40-01	–10mV to +10mV	–5V to +5V
SCM5B40-01D	–10mV to +10mV	–10V to +10V
SCM5B40-02	–50mV to +50mV	–5V to +5V
SCM5B40-02D	–50mV to +50mV	–10V to +10V
SCM5B40-03	–100mV to +100mV	–5V to +5V
SCM5B40-03D	–100mV to +100mV	–10V to +10V
SCM5B40-04	–10mV to +10mV	0V to +5V
SCM5B40-04D	–10mV to +10mV	0V to +10V
SCM5B40-05	–50mV to +50mV	0V to +5V
SCM5B40-05D	–50mV to +50mV	0V to +10V
SCM5B40-06	–100mV to +100mV	0V to +5V
SCM5B40-06D	–100mV to +100mV	0V to +10V
SCM5B40-07(3)	–1V to +1V	–5V to +5V
SCM5B40-07D(3)	–1V to +1V	–10V to +10V
SCM5B41-01	–1V to +1V	–5V to +5V
SCM5B41-01D	–1V to +1V	–10V to +10V
SCM5B41-02	–5V to +5V	–5V to +5V
SCM5B41-02D	–5V to +5V	–10V to +10V
SCM5B41-03	–10V to +10V	–5V to +5V
SCM5B41-03D	–10V to +10V	–10V to +10V
SCM5B41-04	–1V to +1V	0V to +5V
SCM5B41-04D	–1V to +1V	0V to +10V
SCM5B41-05	–5V to +5V	0V to +5V
SCM5B41-05D	–5V to +5V	0V to +10V
SCM5B41-06	–10V to +10V	0V to +5V
SCM5B41-06D	–10V to +10V	0V to +10V
SCM5B41-07	–20V to +20V	–5V to +5V
SCM5B41-07D	–20V to +20V	–10V to +10V
SCM5B41-08	–20V to +20V	0V to +5V
SCM5B41-08D	–20V to +20V	0V to +10V
SCM5B41-09	–40V to +40V	–5V to +5V
SCM5B41-09D	–40V to +40V	–10V to +10V
SCM5B41-10	–40V to +40V	0V to +5V
SCM5B41-10D	–40V to +40V	0V to +10V

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