SCM7B39

Isolated Process Current Output Modules

DESCRIPTION

SCM7B39 process current modules accept high-level signals from the process control system and provide either 0-20mA or 4-20mA current to the field.

These modules incorporate a five-pole filtering approach to maximize both time and frequency response by taking advantage of both Thomson (Bessel) and Butterworth characteristics. One pole of the filter is on the process control system side of the isolation barrier, and the other four poles are on the field side.

After the initial process control system side filtering, the signal is chopped by a proprietary chopper circuit and transferred across the transformer isolation barrier, suppressing transmission of common mode spikes and surges. The signal is then reconstructed, filtered, and converted to a process current for output to the field.

Modules accept a wide 18-35VDC power supply range (+24VDC nominal). Their compact packages (2.13"x1.705"x0.605") save space and are ideal for high channel density applications. They are designed for easy DIN-rail mounting using any of the DIN backpanels.

FEATURES

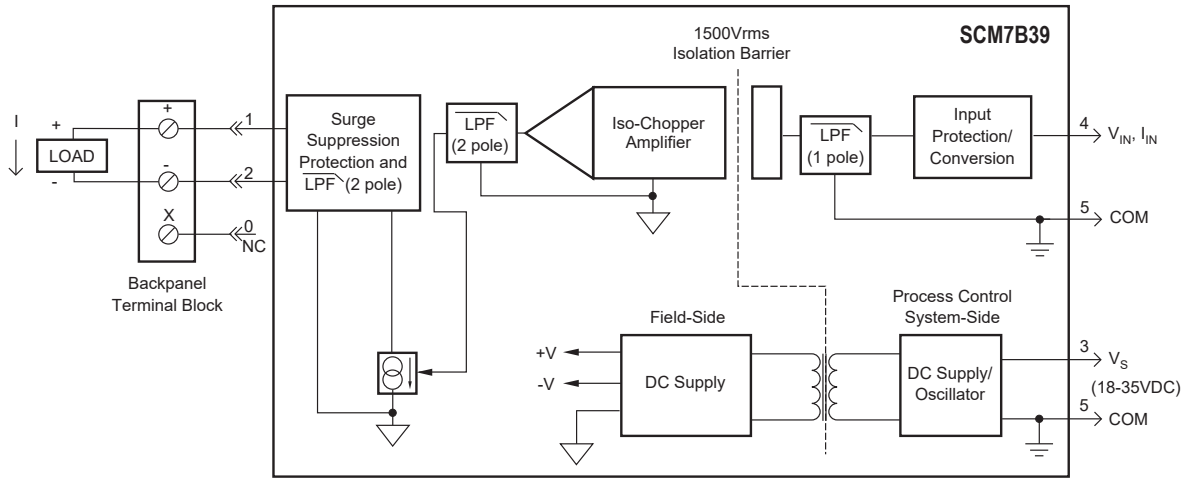
- Accepts High-level Voltage Input
- Provides 0-20mA or 4-20mA Current Output
- 1500Vrms Transformer Isolation
- Accuracy, ±0.03% of Span (typ) ±0.1% (max)
- ANSI/IEEE C37.90.1 Transient Protection
- Output Protected to 120Vrms, Continuous
- Noise, 46µAp-p (5MHz), 4µArms (100kHz)
- 110dB CMRR
- Easy DIN-rail Mounting
- CSA C/US Certified
- CE and ATEX Compliant
- Manufactured per RoHS III Directive 2015/863

BENEFITS

- Small Form-factor for High-density Applications
- Protects User Equipment from Lightning and Heavy Equipment Power-line Voltage
- Reduces 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
- Reduces EMC Concerns

APPLICATIONS

- Analog Signal Conditioning
- Industrial Process Control
- Test and Measurement
- System and Signal Monitoring
- Temperature Measurement
- Torque Measurement
- Civil Engineering
- Geotechnical Monitoring



SCM7B39 Block Diagram - For Module Dimensions and Pinouts, See Page 2-26

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Specifications

Typical* at T_A = +25°C and +24VDC

Module	SCM7B39-01,-02,-03	SCM7B39-04
Output		
Signal Range(1)	4-20mA, 0-20mA	4-20mA
Effective Available Power(1)	320mW	320mW
Protection		
Continuous	120Vrms (max)	120Vrms (max)
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
Current Limit	32mA	32mA
Input		
Signal Range	1 to +5V, 0 to +10V	4-20mA
Bias Current	±1nA	N/A
Resistance		
Normal	10MΩ	270Ω
Power Off	30kΩ (min)	>20kΩ
Overload	30kΩ (min)	N/A
Protection	±35Vpeak (no damage)	±7.5V peak
Compliance	N/A	35VDC (max)
CMV (Input-to-Output)		
Continuous	1500Vrms	1500Vrms
Transient	ANSI/IEEE C37.90.1	ANSI/IEEE C37.90.1
CMRR (50 or 60Hz)	110dB	110dB
Accuracy(2)	±0.03% Span (typ) ±0.1% Span (max)	±0.03% Span (typ) ±0.1% Span (max)
Linearity(3)	±0.01% Span (typ) ±0.02% Span (max)	±0.01% Span (typ) ±0.02% Span (max)
Stability (–40°C to +85°C)		
Gain	±25ppm/°C	±50ppm/°C
Output Offset	±0.0035% Span/°C	±0.0045% Span/°C
Noise		
Peak at 5MHz B/W	46µA	46µA
RMS at 10Hz to 100kHz B/W	4µA	4µA
Peak at 0.1Hz to 10Hz B/W	42nA	42nA
Frequency and Time Response		
Bandwidth, –3dB	100Hz	100Hz
NMR (–3dB at 100Hz)	80dB per Decade Above 100Hz	80dB per Decade Above 100Hz
Step Response, 90% Span	5ms	5ms
Supply Voltage	18 to 35VDC	18 to 35VDC
Current(1)	56mA	56mA
Sensitivity	±0.0003%/%V_S	±0.0003%/%V_S
Mechanical Dimensions (h)x(w)x(d)	2.13" x 1.705" x 0.605" (54.1mm x 43.3mm x 15.4mm)	2.13" x 1.705" x 0.605" (54.1mm x 43.3mm x 15.4mm)
Environmental		
Operating Temperature Range	–40°C to +85°C	–40°C to +85°C
Storage Temperature 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 or your local Dataforth sales office for maximum values.
(1) Output Range and Supply Current specifications are based on maximum output load resistance. Maximum output load resistance is calculated by P_E/I_{OUT}^2 where P_E is the Output Effective Available Power that guarantees output range, accuracy, and linearity specifications. Output effective available power is independent of supply voltage.
(2) Accuracy includes the effects of repeatability, hysteresis, and linearity.
(3) Linearity is calculated using the best-fit straight line method.

Ordering Information

Model	Input Range	Output Range
SCM7B39-01	+1 to +5V	4-20mA
SCM7B39-02	0 to +10V	0-20mA
SCM7B39-03	0 to +10V	4-20mA
SCM7B39-04	4-20mA	4-20mA

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