

## Product Datasheet - Technical Specifications



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# SCM5B39

## Current Output Modules



### Description

Each SCM5B39 current output module provides a single channel of analog output. The track-and-hold circuit in the input stage can be operated in a hold mode where one DAC can supply many output modules, or a track mode where one DAC is dedicated to each module. In addition to the track-and-hold circuit, each module provides signal buffering, isolation, filtering, and conversion to a high-level current output (Figure 1).

Setting of the track or hold mode is controlled by the logic state of WR EN $\setminus$ , module pin 23. When pin 23 is low, the track mode is enabled. If pin 23 is high, the hold mode is enabled. The module is designed with a completely isolated computer side circuit which can be floated to  $\pm 50V$  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 track and hold circuit. For a low state, simply connect pin 23, the Write-Enable pin, to I/O Common, pin 19.

The SCMPB02 and SCMPB06 backpanels allow host computer control of the WR EN $\setminus$  control line, which allows multiplexing of one host DAC to up to 64 SCM5B39 output modules. During power-up, the output remains at 0mA for 100ms on all models except the SCM5B39-07, which allows the track-and-hold circuit to be initialized.

A special circuit in the output stage of the module provides protection against accidental connection of power-line voltages up to 240VAC on all models.

### Features

- Accepts High-Level Voltage or Process Current Input
- Unipolar or Bipolar Current Output
- 1500Vrms Transformer Isolation
- ANSI/IEEE C37.90.1 Transient Protection
- Output Protected to 240VAC Continuous
- 110dB CMR
- 400Hz Signal Bandwidth
- $\pm 0.03\%$  Accuracy
- $\pm 0.005\%$  Linearity
- CSA C/US Certified
- CE and ATEX Compliant
- Mix and Match SCM5B Types on Backpanel

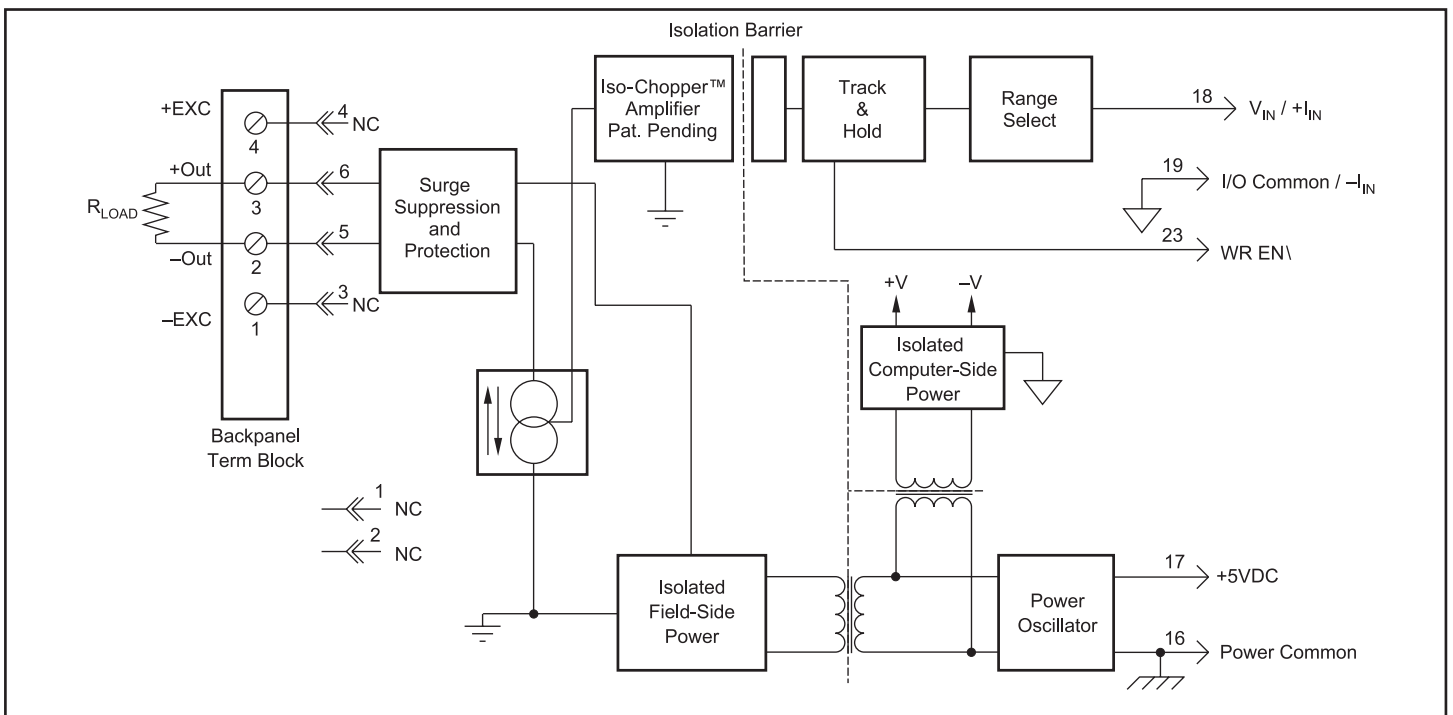


Figure 1: SCM5B39 Block Diagram

**Specifications** Typical\* at  $T_A = +25^\circ\text{C}$  and +5VDC power

Module	Unipolar Output Current SCM5B39-01,-02,-03,-04,-05	Bipolar Output Current SCM5B39-07
Input Voltage Range	$\pm 5\text{V}$ or $0\text{V}$ to $+5\text{V}$	$\pm 10\text{V}$
Input Current Range (-05)	$0$ to $20\text{mA}$	N/A
Input Voltage Maximum	$\pm 36\text{V}$ (no damage)	*
Input Current, Maximum (-05)	$75\text{mA}$ (no damage)	N/A
Input Resistance	$50\text{M}\Omega$	$2\text{M}\Omega$
Input Resistance (-05)	$250\Omega$	N/A
Output Current Range	$0$ to $20\text{mA}$ or $4$ to $20\text{mA}$	$\pm 20\text{mA}$
Power-Up Delay <sup>(1)</sup>	$100\text{ms}$	N/A
Current Out	$0\text{mA}$	N/A
Over Range Capability	$10\%$	*
Output Compliance Voltage (Open Circuit)	$22\text{VDC}$	$\pm 15\text{VDC}$
Load Resistance Range	$0$ to $650\Omega$ ( $0$ to $750\Omega$ for Power Supply Voltage greater than $4.95\text{VDC}$ )	$0$ to $450\Omega$ ( $0$ to $500\Omega$ for Power Supply Voltage greater than $4.95\text{VDC}$ )
Output I Under Fault, max Output Protection	$26\text{mA}$	*
Continuous	$240\text{Vrms}$ max	*
Transient	ANSI/IEEE C37.90.1	*
CMV, Output to Input		
Continuous	$1500\text{Vrms}$ max	*
Transient	ANSI/IEEE C37.90.1	*
CMR (50Hz or 60Hz)	$110\text{dB}$	*
NMR (-3dB)	$80\text{dB}$ per Decade above $400\text{Hz}$	$80\text{dB}$ per Decade above $275\text{Hz}$
Accuracy	$\pm 0.03\%$ Span	$\pm 0.05\%$ Span
Linearity	$\pm 0.005\%$ Span	$\pm 0.03\%$ Span
Stability		
Offset	$\pm 0.5\mu\text{A}/^\circ\text{C}$	*
Gain	$\pm 20\text{ppm}/^\circ\text{C}$	$\pm 40\text{ppm}/^\circ\text{C}$
Noise		
Output Ripple, 100kHz	$10\mu\text{A}$ -p-p	*
Bandwidth, -3dB	$400\text{Hz}$	$275\text{Hz}$
Rise Time, 10 to 90% Span	$1.0\text{ms}$	$1.2\text{ms}$
Sample and Hold		
Output Droop Rate	$40\mu\text{A}/\text{s}$	*
Acquisition Time	$50\mu\text{s}$	*
Track-and-Hold Enable Control		
Max Logic "0"	$+0.8\text{V}$	*
Min Logic "1"	$+2.4\text{V}$	*
Max Logic "1"	$+36\text{V}$	*
Input Current "0"	$0.5\mu\text{A}$	*
Power Supply Voltage	$+5\text{VDC} \pm 5\%$	*
Power Supply Current	$170\text{mA}$	$130\text{mA}$
Power Supply Sensitivity	$\pm 0.5\mu\text{A}/\%$ typ	*
Mechanical Dimensions (h)(w)(d)	$2.28" \times 2.26" \times 0.6"$ ( $58\text{mm} \times 57\text{mm} \times 15\text{mm}$ )	*
Environmental		
Operating Temp. Range	$-40^\circ\text{C}$ to $+85^\circ\text{C}$	*
Storage Temp. Range	$-40^\circ\text{C}$ to $+85^\circ\text{C}$	*
Relative Humidity	$0$ to $95\%$ Noncondensing	*
Emissions EN61000-6-4	ISM, Group 1	*
Radiated, Conducted	Class A	*
Immunity EN61000-6-2	ISM, Group 1	*
RF	Performance A $\pm 0.5\%$ Span Error	*
ESD, EFT	Performance B	*

**Ordering Information**

Model	Input Range	Output Range	Bandwidth
SCM5B39-01	$0\text{V}$ to $+5\text{V}$	$4\text{mA}$ to $20\text{mA}$	$400\text{Hz}$
SCM5B39-02	$-5\text{V}$ to $+5\text{V}$	$4\text{mA}$ to $20\text{mA}$	$400\text{Hz}$
SCM5B39-03	$0\text{V}$ to $+5\text{V}$	$0\text{mA}$ to $20\text{mA}$	$400\text{Hz}$
SCM5B39-04	$-5\text{V}$ to $+5\text{V}$	$0\text{mA}$ to $20\text{mA}$	$400\text{Hz}$
SCM5B39-05	$0\text{mA}$ to $20\text{mA}$	$0\text{mA}$ to $20\text{mA}$	$400\text{Hz}$
SCM5B39-07	$-10\text{V}$ to $+10\text{V}$	$-20\text{mA}$ to $+20\text{mA}$	$275\text{Hz}$

Refer to SCM5B392 specifications, p.27, for additional current output models.

## NOTES:

\*Contact factory or your local Dataforth sales office for maximum values.

\* Same as -01, -02, -03, -04, -05 modules.

(1) See Product Description for further details.