SCM5B33
Isolated True RMS Input Modules

FEATURES

- INTERFACES RMS VOLTAGE (0 – 300V) OR RMS CURRENT (0 – 5A)
- DESIGNED FOR STANDARD OPERATION WITH FREQUENCIES OF 45HZ TO 1000HZ (EXTENDED RANGE TO 20Khz)
- COMPATIBLE WITH STANDARD CURRENT AND POTENTIAL TRANSFORMERS
- INDUSTRY STANDARD OUTPUTS OF EITHER 0-1MA, 0-20mA, 4-20MA, 0-5V OR 0-10VDC
- ±0.25% FACTORY CALIBRATED ACCURACY (ACCURACY CLASS 0.2)
- 1500 VRMS CONTINUOUS TRANSFORMER BASED ISOLATION
- INPUT OVERLOAD PROTECTED TO 480V MAX (PEAK AC & DC) OR 10A RMS CONTINUOUS
- ANSI/IEEE C37.90.1-1989 TRANSIENT PROTECTION
- REGULATORY COMPLIANCE (TO BE DETERMINED)

DESCRIPTION

Each SCM5B33 True RMS input module provides a single channel of AC input which is converted to its True RMS dc value, filtered, isolated, amplified, and converted to a standard process voltage or current output (Figure 1).

The SCM5B modules are 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 field voltage or current input signal is processed through a pre-amplifier and RMS converter on the field side of the isolation barrier. The converted dc signal is then chopped by a proprietary chopper circuit and transferred across the transformer isolation barrier, suppressing transmission of common mode spikes and surges. The computer side circuitry reconstructs, filters and converts the signal to industry standard outputs. Modules are powered from +5VDC, ±5%.

For current output models an external loop supply is required having a compliance voltage of 14 to 48VDC. Connection, with series load, is between Pin 20 (+) and Pin 19 (-).

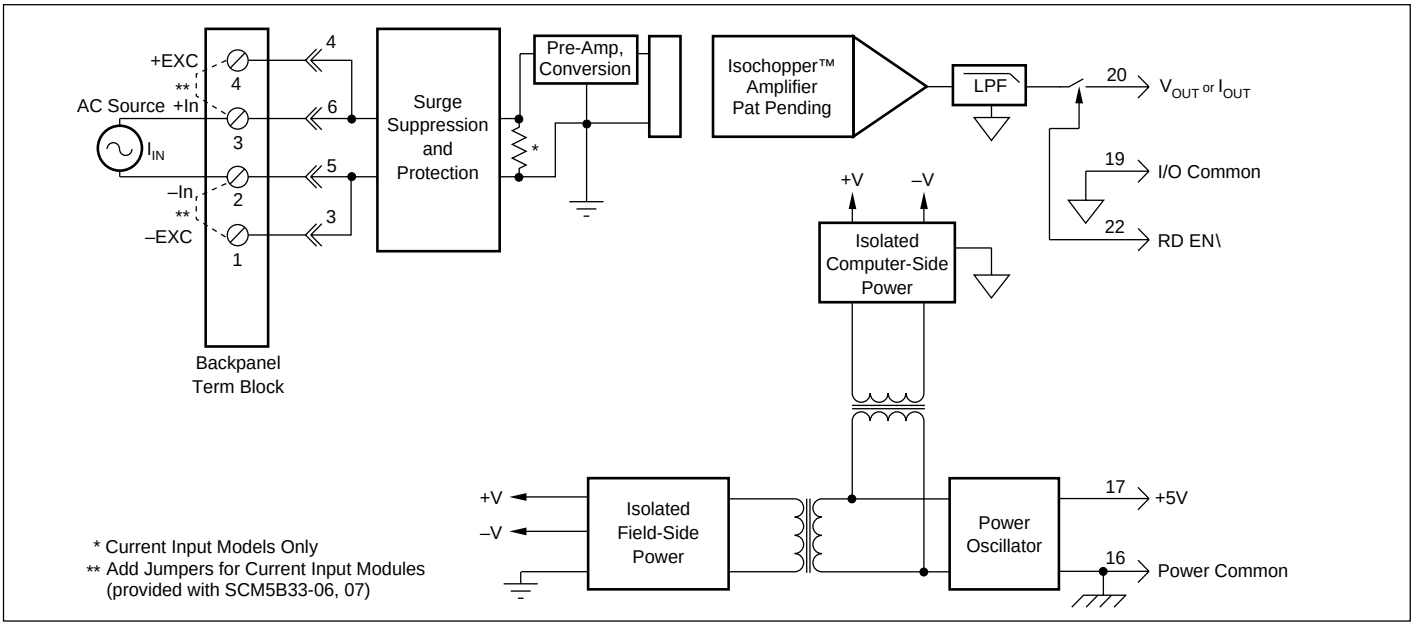


FIGURE 1. SCM5B33 Block Diagram.

SPECIFICATIONS Typical at T_A = +25°C and +5V power.

Module	SCM5B33
Input	
Signal Range	100mV to 300V rms, 0 to 5A rms
Standard Frequency Range	45Hz to 1000Hz
Extended Frequency Range	1kHz to 20kHz
Impedance	1 MΩ ±1% shunted by 100pF (-01 thru -05), 0.10Ω (-06), 0.025Ω (-07)
Coupling	AC
Protection(1)	
Continuous (-01 thru -05)	300V rms
Continuous (-06 thru -07)	10A rms
Transient (-01 thru -05)	ANSI/IEEE C37.90.1-1989
Transient (-06 thru -07)	See note 2
Output	
Signal Range	0-5V or 0-10V or 0-1mA or 0-20mA or 4-20mA
Current Limit	1.4mA (0-1mA models), 30mA (0/4-20mA models), 8mA (0-5, 0-10V models)
Voltage Limit	±18V (0-5, 0-10V models)
Resistance	50Ω (0-5, 0-10V models)
Protection	Continuous Short to Ground
Ripple and Noise (100Khz)	0.025% Span rms
Accuracy(3)(4)	
Sinusoid	
50/60 Hz	±0.25% Span
45Hz to 1kHz	±0.25% Reading Additional Factor
1kHz to 20kHz	±0.75% Reading Additional Factor
Non-Sinusoid	
Crest Factor = 1 to 2	±0.05% Reading Additional Error
Crest Factor = 2 to 3	±0.15% Reading Additional Error
Crest Factor = 3 to 4	±0.30% Reading Additional Error
Crest Factor = 4 to 5	±0.40% Reading Additional Error
Vs. Temperature	±100ppm/°C
Isolation (Common Mode)	
Input to Output, Input to Power	
Continuous	1500Vrms max
Transient	ANSI/IEEE C37.90.1-1989
Output to Power	
Continuous	50Vdc max
Rejection (50-60Hz Common Mode)	100dB
Response Time (0 to 99%)	<400ms
Output Enable Control	
Selection Time	6.0µS @ C_{LOAD} = 0 to 2000pF
Voltage	
Max Logic "0"	+0.8V
Min / Max Logic "1"	+2.4V / +36V
Current, "0,1"	0.5µA
Loop Voltage	+7.5Vdc min, +26Vdc max, -40˚C to +85˚C
Load Resistance (maximum)	(Loop Voltage - 14) / (Loop Current)
Supply Voltage	+5VDC ±5%
Current	120mA
Sensitivity	±200ppm/%
Environmental	
Operating Temp. Range	-40˚C to +85˚C
Storage Temp. Range	-40˚C to +85˚C
Relative Humidity	0 to 90% noncondensing
Emissions	EN50081-1, ISM Group 1, Class A (Radiated, Conducted)
Immunity	EN50082-1, ISM Group 1, Class A (ESD, RF, EFT)
Dimensions	2.28" x 2.26" x 0.60" (58mm x 57mm x 15mm)

NOTE:
(1) SCM5B33 and SCMPB01, 02, 03, 04, 05, 06, 07, XEV rating only. Backpanels obtained from other sources may have lower ratings.
(2) For 1 to 25 seconds the max allowable transient current rating is $\sqrt{2500 / (\text{event time})}$. For less than 1 second, ANSI/IEEE C-37.90.1-1989 applies with a 0.05Ω load. For greater than 25 seconds, the 10A rms continuous rating applies.
(3) At standard 60Hz factory calibration. Consult factory for calibration at other frequencies.
(4) For 10-100% rated span. Add an additional 0.25% error for 0-10% Span measurements. Accuracy includes nonlinearity, hysteresis and repeatability but not source or external shunt inaccuracy (if used).

ORDERING INFORMATION

MODEL	INPUT* (rms)	OUTPUT* (dc)
SCM5B33-01	0-100mV	0-5V
SCM5B33-02	0-1V	0-5V
SCM5B33-03	0-10V	0-5V
SCM5B33-04	0-150V	0-5V
SCM5B33-05	0-300V	0-5V
SCM5B33-06	0-1A	0-5V
SCM5B33-07	0-5A	0-5V
SCM5B33-01B	0-100mV	0-1mA
SCM5B33-02B	0-1V	0-1mA
SCM5B33-03B	0-10V	0-1mA
SCM5B33-04B	0-150V	0-1mA
SCM5B33-05B	0-300V	0-1mA
SCM5B33-06B	0-1A	0-1mA
SCM5B33-07B	0-5A	0-1mA
SCM5B33-01C	0-100mV	4-20mA
SCM5B33-02C	0-1V	4-20mA
SCM5B33-03C	0-10V	4-20mA
SCM5B33-04C	0-150V	4-20mA
SCM5B33-05C	0-300V	4-20mA
SCM5B33-06C	0-1A	4-20mA
SCM5B33-07C	0-5A	4-20mA
SCM5B33-01D	0-100mV	0-10V
SCM5B33-02D	0-1V	0-10V
SCM5B33-03D	0-10V	0-10V
SCM5B33-04D	0-150V	0-10V
SCM5B33-05D	0-300V	0-10V
SCM5B33-06D	0-1A	0-10V
SCM5B33-07D	0-5A	0-10V
SCM5B33-01E	0-100mV	0-20mA
SCM5B33-02E	0-1V	0-20mA
SCM5B33-03E	0-10V	0-20mA
SCM5B33-04E	0-150V	0-20mA
SCM5B33-05E	0-300V	0-20mA
SCM5B33-06E	0-1A	0-20mA
SCM5B33-07E	0-5A	0-20mA

* Modules can be ordered with other input/output ranges. Consult factory for ordering details and specifications.

Call 800-444-7644
For Information and Assistance
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