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Data sheet 6ES7233-4HF50-0XB0



Figure similar

SIMATIC S7-1200 G2: SM 1233 analog I/O, 4 AI/4 AO; inputs: 4x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA); outputs: 4x AQ 14 bit DAC (+/-10 V, 0-20 mA or 4-20 mA)

General information	
Product type designation	SM 1233, AI 4x 14 bit/AQ 4x 14 bit
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, typ.	40 mA
from backplane bus 5 V DC, typ.	80 mA
Power loss	
Power loss, typ.	4.7 W
Analog inputs	
Number of analog inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	0.625 ms; at 400 Hz rejection
Input ranges	
● Voltage	Yes; ±10V, ±5V, ±2.5V
● Current	Yes; 4 to 20 mA, 0 to 20 mA
● Thermocouple	No
● Resistance thermometer	No
● Resistance	No
Input ranges (rated values), voltages	
● -10 V to +10 V	Yes
— Input resistance (-10 V to +10 V)	≥1 MOhm
● -2.5 V to +2.5 V	Yes
— Input resistance (-2.5 V to +2.5 V)	≥1 MOhm
● -5 V to +5 V	Yes
— Input resistance (-5 V to +5 V)	≥1 MOhm
Input ranges (rated values), currents	
● 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	< 290 Ω, > 270 Ω
● 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	< 290 Ω, > 270 Ω
Cable length	
● shielded, max.	100 m; shielded, twisted pair
Analog outputs	

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Number of analog outputs	4; Current or voltage
Output ranges, voltage	
● -10 V to +10 V	Yes
Output ranges, current	
● 0 to 20 mA	Yes
● 4 mA to 20 mA	Yes
Load impedance (in rated range of output)	
● with voltage outputs, min.	1 000 Ω
● with current outputs, max.	600 Ω
Cable length	
● shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Measurement principle	successive approximation
Integration and conversion time/resolution per channel	
● Resolution with overrange (bit including sign), max.	13 bit; + sign
● Integration time, parameterizable	Yes
● Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
Smoothing of measured values	
● parameterizable	Yes
● Step: None	Yes
● Step: low	Yes
● Step: Medium	Yes
● Step: High	Yes
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	
● Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1 % / -20 °C to 60 °C ±0.2 % of the full-scale deflection
Temperature error (relative to output range), (+/-)	25 °C ±0.3 % / -20 °C to 60 °C ±0.6 % of the full-scale deflection
Basic error limit (operational limit at 25 °C)	
● Voltage, relative to input range, (+/-)	0.1 %
● Current, relative to input range, (+/-)	0.1 %
● Voltage, relative to output range, (+/-)	0.3 %
● Current, relative to output range, (+/-)	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
● Common mode voltage, max.	2 V
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
● Diagnostic alarm	Yes
Diagnoses	
● Monitoring the supply voltage	Yes
● Wire-break	Yes
● Short-circuit	Yes
Diagnostics indication LED	
● DIAG LED	Yes
● for status of the inputs	Yes
● for status of the outputs	Yes
Potential separation	
Potential separation analog inputs	
● between the channels and the power supply of the electronics	No
Potential separation analog outputs	
● between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	No

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UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	No
Marine approval	No
Ambient conditions	
Free fall	
● Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
● min.	-20 °C
● max.	40 °C; at max. voltages and max. specifications
● horizontal installation, min.	-20 °C
● horizontal installation, max.	60 °C; at rated voltages, 50 % of max. specification and alternate IO active
● vertical installation, min.	-20 °C
● vertical installation, max.	50 °C; at rated voltages, 50 % of max. specification and alternate IO active
Ambient temperature during storage/transportation	
● min.	-40 °C
● max.	70 °C
Air pressure acc. to IEC 60068-2-13	
● Operation, min.	540 hPa
● Operation, max.	1 140 hPa
● Storage/transport, min.	540 hPa
● Storage/transport, max.	1 140 hPa
Altitude during operation relating to sea level	
● Installation altitude, min.	-1 000 m
● Installation altitude, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	
● Operation at 25 °C without condensation, max.	95 %
Vibrations	
● Vibration resistance during operation acc. to IEC 60068-2-6	3.5 mm from 5 - 8.4 Hz, 1g from 8.4 - 150 Hz
● Operation, tested according to IEC 60068-2-6	Yes
Shock testing	
● tested according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
Pollutant concentrations	
● SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
connection method	
required front connector	No
Mechanics/material	
Enclosure material (front)	
● Plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	174 g

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