



Figure similar

SIPLUS S7-1200 SM 1231 4AI 13 bit based on 6ES7231-4HD32-0XB0 with conformal coating, -20...+60 °C, analog input, 4 AI, +/-10 V, +/-5 V, +/-2.5 V, or 0-20 mA 12-bit+ sign bit (13 bit ADC)

| General information                                                   |                                           |
|-----------------------------------------------------------------------|-------------------------------------------|
| Product type designation                                              | SM 1231, AI 4x13 bit                      |
| based on                                                              | <a href="#">6ES7231-4HD32-0XB0</a>        |
| Supply voltage                                                        |                                           |
| Rated value (DC)                                                      | 24 V                                      |
| Input current                                                         |                                           |
| Current consumption, typ.                                             | 45 mA                                     |
| from backplane bus 5 V DC, typ.                                       | 80 mA                                     |
| Power loss                                                            |                                           |
| Power loss, typ.                                                      | 1.5 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.                                        | 625 µs                                    |
| 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)                                   | ≥9 MOhm                                   |
| • -2.5 V to +2.5 V                                                    | Yes                                       |
| — Input resistance (-2.5 V to +2.5 V)                                 | ≥9 MOhm                                   |
| • -5 V to +5 V                                                        | Yes                                       |
| — Input resistance (-5 V to +5 V)                                     | ≥9 MOhm                                   |
| Input ranges (rated values), currents                                 |                                           |
| • 0 to 20 mA                                                          | Yes                                       |
| — Input resistance (0 to 20 mA)                                       | 280 Ω                                     |
| • 4 mA to 20 mA                                                       | Yes                                       |
| — Input resistance (4 mA to 20 mA)                                    | 280 Ω                                     |
| Analog value generation for the inputs                                |                                           |
| Integration and conversion time/resolution per channel                |                                           |
| • Resolution with overrange (bit including sign), max.                | 12 bit; + sign                            |

|                                                                                                                                                                   |                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Integration time, parameterizable</li> <li>Interference voltage suppression for interference frequency f1 in Hz</li> </ul> | Yes<br>40 dB, DC to 60 V for interference frequency 50 / 60 Hz                                                                                                                                                             |
| <b>Smoothing of measured values</b>                                                                                                                               |                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>parameterizable</li> <li>Step: None</li> <li>Step: low</li> <li>Step: Medium</li> <li>Step: High</li> </ul>                | Yes<br>Yes<br>Yes<br>Yes<br>Yes                                                                                                                                                                                            |
| <b>Errors/accuracies</b>                                                                                                                                          |                                                                                                                                                                                                                            |
| Temperature error (relative to input range), (+/-)                                                                                                                | 25 °C ±0.1%, to 55 °C ±0.2% total measurement range                                                                                                                                                                        |
| <b>Basic error limit (operational limit at 25 °C)</b>                                                                                                             |                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>Voltage, relative to input range, (+/-)</li> <li>Current, relative to input range, (+/-)</li> </ul>                        | 0.1 %<br>0.1 %                                                                                                                                                                                                             |
| <b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>                                                  |                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>Common mode voltage, max.</li> </ul>                                                                                       | 12 V                                                                                                                                                                                                                       |
| <b>Interrupts/diagnostics/status information</b>                                                                                                                  |                                                                                                                                                                                                                            |
| Alarms                                                                                                                                                            | Yes                                                                                                                                                                                                                        |
| Diagnostics function                                                                                                                                              | Yes                                                                                                                                                                                                                        |
| <b>Alarms</b>                                                                                                                                                     |                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>Diagnostic alarm</li> </ul>                                                                                                | Yes                                                                                                                                                                                                                        |
| <b>Diagnoses</b>                                                                                                                                                  |                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>Monitoring the supply voltage</li> <li>Wire-break</li> </ul>                                                               | Yes<br>Yes                                                                                                                                                                                                                 |
| <b>Diagnostics indication LED</b>                                                                                                                                 |                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>for status of the inputs</li> <li>for maintenance</li> </ul>                                                               | Yes<br>Yes                                                                                                                                                                                                                 |
| <b>Degree and class of protection</b>                                                                                                                             |                                                                                                                                                                                                                            |
| IP degree of protection                                                                                                                                           | IP20                                                                                                                                                                                                                       |
| <b>Standards, approvals, certificates</b>                                                                                                                         |                                                                                                                                                                                                                            |
| <b>Ecological footprint</b>                                                                                                                                       |                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>environmental product declaration</li> </ul>                                                                               | Yes                                                                                                                                                                                                                        |
| <b>Global warming potential</b>                                                                                                                                   |                                                                                                                                                                                                                            |
| — global warming potential, (total) [CO2 eq]                                                                                                                      | 43.1 kg                                                                                                                                                                                                                    |
| — global warming potential, (during production) [CO2 eq]                                                                                                          | 7.62 kg                                                                                                                                                                                                                    |
| — global warming potential, (during operation) [CO2 eq]                                                                                                           | 36 kg                                                                                                                                                                                                                      |
| — global warming potential, (after end of life cycle) [CO2 eq]                                                                                                    | -0.544 kg                                                                                                                                                                                                                  |
| <b>Ambient conditions</b>                                                                                                                                         |                                                                                                                                                                                                                            |
| <b>Free fall</b>                                                                                                                                                  |                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>Fall height, max.</li> </ul>                                                                                               | 0.3 m; five times, in product package                                                                                                                                                                                      |
| <b>Ambient temperature during operation</b>                                                                                                                       |                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>                                                                                              | -20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C<br>60 °C; = Tmax                                                                                                                                                |
| <b>Ambient temperature during storage/transportation</b>                                                                                                          |                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>                                                                                              | -40 °C<br>70 °C                                                                                                                                                                                                            |
| <b>Altitude during operation relating to sea level</b>                                                                                                            |                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>Installation altitude above sea level, max.</li> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>       | 5 000 m<br>Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m) |
| <b>Relative humidity</b>                                                                                                                                          |                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>                                               | 100 %; RH incl. condensation/frost (no commissioning under condensation conditions)                                                                                                                                        |
| <b>Resistance</b>                                                                                                                                                 |                                                                                                                                                                                                                            |
| <b>Coolants and lubricants</b>                                                                                                                                    |                                                                                                                                                                                                                            |
| — Resistant to commercially available coolants and lubricants                                                                                                     | Yes; Incl. diesel and oil droplets in the air                                                                                                                                                                              |

|                                                                                                                         |                                                                                                                                                                                     |         |                |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|
| Use in stationary industrial systems                                                                                    |                                                                                                                                                                                     |         |                |
| — to biologically active substances according to EN 60721-3-3                                                           | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request                                                                                  |         |                |
| — to chemically active substances according to EN 60721-3-3                                                             | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *                                                                                            |         |                |
| — to mechanically active substances according to EN 60721-3-3                                                           | Yes; Class 3S4 incl. sand, dust, *                                                                                                                                                  |         |                |
| Use on ships/at sea                                                                                                     |                                                                                                                                                                                     |         |                |
| — to biologically active substances according to EN 60721-3-6                                                           | Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request                                                                                                       |         |                |
| — to chemically active substances according to EN 60721-3-6                                                             | Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *                                                                                            |         |                |
| — to mechanically active substances according to EN 60721-3-6                                                           | Yes; Class 6S3 incl. sand, dust; *                                                                                                                                                  |         |                |
| Usage in industrial process technology                                                                                  |                                                                                                                                                                                     |         |                |
| — Against chemically active substances acc. to EN 60654-4                                                               | Yes; Class 3 (excluding trichlorethylene)                                                                                                                                           |         |                |
| — Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04                            | Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil) |         |                |
| Remark                                                                                                                  |                                                                                                                                                                                     |         |                |
| — Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04             | * The supplied plug covers must remain in place over the unused interfaces during operation!                                                                                        |         |                |
| Conformal coating                                                                                                       |                                                                                                                                                                                     |         |                |
| • Coatings for printed circuit board assemblies acc. to EN 61086                                                        | Yes; Class 2 for high reliability                                                                                                                                                   |         |                |
| • Protection against fouling acc. to EN 60664-3                                                                         | Yes; Type 1 protection                                                                                                                                                              |         |                |
| • Military testing according to MIL-I-46058C, Amendment 7                                                               | Yes; Discoloration of coating possible during service life                                                                                                                          |         |                |
| • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A | Yes; Conformal coating, Class A                                                                                                                                                     |         |                |
| Connection method                                                                                                       |                                                                                                                                                                                     |         |                |
| required front connector                                                                                                | Yes                                                                                                                                                                                 |         |                |
| Mechanics/material                                                                                                      |                                                                                                                                                                                     |         |                |
| Enclosure material (front)                                                                                              |                                                                                                                                                                                     |         |                |
| • Plastic                                                                                                               | Yes                                                                                                                                                                                 |         |                |
| Dimensions                                                                                                              |                                                                                                                                                                                     |         |                |
| Width                                                                                                                   | 45 mm                                                                                                                                                                               |         |                |
| Height                                                                                                                  | 100 mm                                                                                                                                                                              |         |                |
| Depth                                                                                                                   | 75 mm                                                                                                                                                                               |         |                |
| Weights                                                                                                                 |                                                                                                                                                                                     |         |                |
| Weight, approx.                                                                                                         | 180 g                                                                                                                                                                               |         |                |
| Classifications                                                                                                         |                                                                                                                                                                                     |         |                |
|                                                                                                                         |                                                                                                                                                                                     | Version | Classification |
|                                                                                                                         | eClass                                                                                                                                                                              | 14      | 27-24-22-01    |
|                                                                                                                         | eClass                                                                                                                                                                              | 12      | 27-24-22-01    |
|                                                                                                                         | eClass                                                                                                                                                                              | 9.1     | 27-24-22-01    |
|                                                                                                                         | eClass                                                                                                                                                                              | 9       | 27-24-22-01    |
|                                                                                                                         | eClass                                                                                                                                                                              | 8       | 27-24-22-01    |
|                                                                                                                         | eClass                                                                                                                                                                              | 7.1     | 27-24-22-01    |
|                                                                                                                         | eClass                                                                                                                                                                              | 6       | 27-24-22-01    |
|                                                                                                                         | ETIM                                                                                                                                                                                | 10      | EC001420       |
|                                                                                                                         | ETIM                                                                                                                                                                                | 9       | EC001420       |
|                                                                                                                         | ETIM                                                                                                                                                                                | 8       | EC001420       |
|                                                                                                                         | ETIM                                                                                                                                                                                | 7       | EC001420       |
|                                                                                                                         | IDEA                                                                                                                                                                                | 4       | 3562           |
|                                                                                                                         | UNSPSC                                                                                                                                                                              | 15      | 32-15-17-05    |
| Approvals / Certificates                                                                                                |                                                                                                                                                                                     |         |                |
| General Product Approval                                                                                                |                                                                                                                                                                                     |         |                |

[Manufacturer Declaration](#)



[China RoHS](#)



[Metrological Approval](#)

EMV

For use in hazardous locations

Maritime application

[KC](#)



Environment



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