Data sheet

SIPLUS S7-300 SM 326F DO8 according to EN 50155 T1 Cat 1 Cl A/ B with conformal coating Based on 6ES7326-2BF41-0AB0 . Digital output F-DO 8x 24 V DC/2A PM fail-safe digital output Sinkingsourcing up to Category 4 (EN 954-1), SIL 3 (IEC 61508)



Figure similar

Supply voltage		
Rated value (DC)	24 V; 1L+	
Reverse polarity protection	Yes	
Load voltage L+		
Rated value (DC)	24 V; 2L+, 3L+	
Reverse polarity protection	No	
Input current		
from supply voltage 1L+, max.	75 mA	
from load voltage 2L+ (without load), max.	100 mA	
from load voltage 3L+ (without load), max.	100 mA	
from backplane bus 5 V DC, max.	100 mA	
Power loss		
Power loss, typ.	12 W	
Digital outputs		
Number of digital outputs	8	
Short-circuit protection	Yes	

Limitation of inductive shutdown voltage to Switching capacity of the outputs on lamp load, max. Output voltage • for signal "1", min. Utuput current • for signal "1" rated value • for signal "1" permissible range for 0 to 40 °C, min. • for signal "1" permissible range for 0 to 40 °C, min. • for signal "1" permissible range for 0 to 40 °C, min. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "1" permissible range for 40 to 60 °C, max. • for signal "0" residual current, max. O.5 mA Switching frequency • with resistive load, max. • on lamp load, max. • up to 40 °C, max. — up to 40 °C, max. — up to 40 °C, max. Vertical installation — up to 40 °C, max. • shielded, max. • unshielded, max. • loagnostic information Alarms • Diagnostic information readable Potential separation digital outputs • between the channels yes • between the channels in groups of • between the channels in groups of • between the channels and backplane bus		
on lamp load, max. Output vortlage of or signal "1", min. Output current of or signal "1" permissible range for 0 to 40 °C, min. of or signal "1" permissible range for 0 to 40 °C, min. of or signal "1" permissible range for 0 to 40 °C, min. of or signal "1" permissible range for 40 to 60 °C, min. of or signal "1" permissible range for 40 to 60 °C, min. of or signal "1" permissible range for 40 to 60 °C, min. of or signal "1" permissible range for 40 to 60 °C, min. of or signal "1" permissible range for 40 to 60 °C, min. of or signal "0" residual current, max. of or signal "1" permissible range for 40 to 60 °C, max. of or signal "1" permissible range for 40 to 60 °C, max. of or signal "1" permissible range for 40 to 60 °C, max. of or signal "1" permissible range for 40 to 60 °C, max. of or signal "1" permissible range for 40 to 60 °C, max. of of signal "1" permissible range for 40 to 60 °C, max. of of signal "1" permissible range for 40 to 60 °C, max. of of signal "1" permissible range for 40 to 60 °C, max. of of signal "1" permissible range for 40 to 60 °C, max. of of signal "1" permissible range for 40 to 60 °C, max. of of signal "1" permissible range for 40 to 60 °C, ma	Limitation of inductive shutdown voltage to	L+ (-33 V)
Output voltage • for signal "1", min. Cutput current • for signal "1" rated value • for signal "1" permissible range for 0 to 40 °C, min. • for signal "1" permissible range for 0 to 40 °C, max. • for signal "1" permissible range for 0 to 60 °C, max. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "0" residual current, max. • for signal "0" residual current, max. • on lamp load, max. • with inductive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • up to 40 °C, max. — up to 40 °C, max. — up to 60 °C, max. — up to 60 °C, max. — up to 60 °C, max. — up to 40 °C, max. — up to 60 °C, max. • shielded, max. • unshielded, max. • unshielded, max. • unshielded, max. • Diagnostic sistatus information Alarms • Diagnostic information readable Diagnostic information readable • Fall-safe operation • Yes Diagnostic information readable • Fall-safe operation • Yes Potential separation Potential separation digital outputs • between the channels, in groups of 4 L+ (-1.0 V) 2A with horizontal installation, 1 A with vertical installation 7 mA min. • Can with horizontal installation 1 A with horizontal installation 1 A with horizontal installation 1 A with horizontal installation 1 A; for horizontal	Switching capacity of the outputs	
• for signal "1", min. Cutput current • for signal "1" rated value • for signal "1" permissible range for 0 to 40 "C, min. • for signal "1" permissible range for 0 to 40 "C, max. • for signal "1" permissible range for 40 to 60 "C, min. • for signal "1" permissible range for 40 to 60 "C, min. • for signal "1" permissible range for 40 to 60 "C, min. • for signal "1" permissible range for 40 to 60 "C, min. • for signal "0" residual current, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • for signal "1" permissible range for 40 to 60 "C, max. • fo	● on lamp load, max.	5 W
Output current • for signal "1" rated value • for signal "4" permissible range for 0 to 40 °C, min. • for signal "1" permissible range for 0 to 40 °C, min. • for signal "1" permissible range for 0 to 40 °C, min. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "0" residual current, max. • on lamp load, max. • with inductive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • up to 40 °C, max. — up to 40 °C, max. — up to 40 °C, max. — up to 60 °C, max. vertical installation — up to 40 °C, max. 200 m; 200 m for SiL3, AK 6, Cat 4 200 m Interrupts/diagnostics/status information Alarms • Diagnostic alarm • Diagnostic information readable • Fall-safe operation • Creation separation Potential separation	Output voltage	
for signal "1" rated value 2 A 7 mA 7 max 2 A; with horizontal installation, 1 A with vertical installation max. for signal "1" permissible range for 0 to 40 "C, max. for signal "1" permissible range for 40 to 60 "C, min. for signal "1" permissible range for 40 to 60 "C, min. for signal "1" permissible range for 40 to 60 "C, min. for signal "0" residual current, max. for signal "0" residual current of the outputs (per group) for signal installation for signal for signal max. for signal for signa	● for signal "1", min.	L+ (-1.0 V)
• for signal "1" permissible range for 0 to 40 °C, min. • for signal "1" permissible range for 0 to 40 °C, max. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "1" permissible range for 40 to 60 °C, max. • for signal "0" residual current, max. 0.5 mA Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • up to 40 °C, max. — up to 40 °C, max. — up to 60 °C, max. — up to 60 °C, max. — up to 60 °C, max. — up to 40 °C, max. Shielded, max. • unshielded, max. • unshielded, max. • unshielded, max. • Diagnostic alarm Diagnostic information readable Diagnostic information readable Potential separation Potential separation digital outputs • between the channels • for the view the for 40 to 60 °C, max 1 A for horizontal installation 1 A for horizontal installation 1 A fo	Output current	
min. • for signal "1" permissible range for 0 to 40 °C, max. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "1" permissible range for 40 to 60 °C, max. • for signal "0" residual current, max. • for signal "0" residual current, max. • or signal "0" residual current, max. • or signal "0" residual current, max. • with inductive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. • on lamp load, max. • up to 40 °C, max. — up to 40 °C, max. — up to 60 °C, max. 4 A vertical installation — up to 40 °C, max. 20 m; 200 m for SIL3, AK 6, Cat 4 • unshielded, max. • unshielded, max. • Diagnostic alarm Diagnostic sinformation readable • Diagnostic information readable • Pail-safe operation • Group error SF (red) • Potential separation Potential separation • Detential separation Potential separation • Detential separation groups of	● for signal "1" rated value	2 A
max. • for signal "1" permissible range for 40 to 60 °C, min. • for signal "1" permissible range for 40 to 60 °C, max. • for signal "0" residual current, max. 0.5 mA Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. 10 Hz Total current of the outputs (per group) horizontal installation — up to 40 °C, max. — up to 60 °C, max. — up to 60 °C, max. Vertical installation — up to 40 °C, max. — 200 m; 200 m for SIL3, AK 6, Cat 4 • unshielded, max. • unshielded, max. • unshielded, max. • Diagnostic alarm Polagnostic information readable Diagnostics indication LED • Fail-safe operation • Group error SF (red) Potential separation Potential separation digital outputs • between the channels, in groups of		7 mA
min. • for signal "1" permissible range for 40 to 60 °C, max. • for signal "0" residual current, max. 0.5 mA Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. • on lamp load, max. 10 Hz Total current of the outputs (per group) horizontal installation — up to 40 °C, max. — up to 60 °C, max. — up to 60 °C, max. — up to 40 °C, max. — up to 40 °C, max. SA Cable length • shielded, max. • unshielded, max. • unshielded, max. • Diagnostic alarm Diagnostic information readable Diagnostic information readable Diagnostic information readable • Fail-safe operation • Group error SF (red) Potential separation digital outputs • between the channels, in groups of 4 A		2 A; with horizontal installation, 1 A with vertical installation
max. • for signal "0" residual current, max. 0.5 mA Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. 10 Hz Total current of the outputs (per group) horizontal installation — up to 40 °C, max. — up to 60 °C, max. 4 A vertical installation — up to 40 °C, max. 5 A Cable length • shielded, max. • unshielded, max. 10 Hz 200 m; 200 m for SIL3, AK 6, Cat 4 200 m Interrupts/diagnostics/status information Alarms • Diagnostic alarm Diagnostic information readable Diagnostic information readable Polagnostics indication LED • Fail-safe operation • Group error SF (red) Potential separation Potential separation Potential separation (gital outputs • between the channels • between the channels, in groups of		7 mA
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max. 10 Hz Total current of the outputs (per group) horizontal installation — up to 40 °C, max. — up to 60 °C, max. — up to 40 °C, max. SA Cable length • shielded, max. • unshielded, max. • unshielded, max. • unshielded, max. 200 m; 200 m for SIL3, AK 6, Cat 4 • unshielded, max. 200 m Interrupts/diagnostics/status information Alarms • Diagnostic alarm Poiagnostic information readable Piagnostic information readable Fail-safe operation • Group error SF (red) Potential separation Potential separation Potential separation Potential separation groups of • between the channels • between the channels • between the channels, in groups of		1 A; for horizontal installation
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with inductive load, max. on lamp load, max. 10 Hz Total current of the outputs (per group) horizontal installation — up to 40 °C, max. — up to 60 °C, max. 4 A vertical installation — up to 40 °C, max. 5 A Cable length shielded, max. ounshielded, max. unshielded, max. unshielded, max. 200 m; 200 m for SIL3, AK 6, Cat 4 unshielded, max. 200 m Interrupts/diagnostics/status information Alarms Diagnostic alarm Yes; Parameterizable Diagnostic information readable Pali-safe operation Group error SF (red) Potential separation Potential separation Potential separation digital outputs between the channels between the channels between the channels, in groups of	Switching frequency	
on lamp load, max. Total current of the outputs (per group) horizontal installation — up to 40 °C, max. — up to 60 °C, max. — up to 40 °C, max. — up to 40 °C, max. — up to 40 °C, max. SA Cable length • shielded, max. • unshielded, max. • unshielded, max. • unshielded, max. • Diagnostics/status information Alarms • Diagnostic alarm Diagnostic messages • Diagnostic information readable Diagnostic information readable Pail-safe operation Fail-safe operation Potential separation Potential separation Potential separation digital outputs • between the channels • between the channels • between the channels, in groups of Potential separation in groups of	• with resistive load, max.	30 Hz
Total current of the outputs (per group) horizontal installation — up to 40 °C, max. — up to 60 °C, max. — up to 40 °C, max. 4 A vertical installation — up to 40 °C, max. 5 A Cable length • shielded, max. • unshielded, max. • unshielded, max. 200 m; 200 m for SIL3, AK 6, Cat 4 200 m Interrupts/diagnostics/status information Alarms • Diagnostic alarm Polagnostic information readable Fail-safe operation • Group error SF (red) Potential separation Potential separation Potential separation digital outputs • between the channels • between the channels, in groups of 4 A	• with inductive load, max.	2 Hz
horizontal installation — up to 40 °C, max. — up to 60 °C, max. — up to 60 °C, max. Vertical installation — up to 40 °C, max. 5 A Cable length • shielded, max. • unshielded, max. 200 m; 200 m for SIL3, AK 6, Cat 4 200 m Interrupts/diagnostics/status information Alarms • Diagnostic alarm Polagnostic information readable Fail-safe operation • Group error SF (red) Potential separation Potential separation digital outputs • between the channels • Determination of the company of the company of the channels Potential separation of the channels • between the channels, in groups of	• on lamp load, max.	10 Hz
up to 40 °C, max up to 60 °C, max. up to 60 °C, max. up to 40 °C, max. -	Total current of the outputs (per group)	
- up to 60 °C, max. vertical installation - up to 40 °C, max. 5 A Cable length • shielded, max. • unshielded, max. 200 m; 200 m for SIL3, AK 6, Cat 4 200 m Interrupts/diagnostics/status information Alarms • Diagnostic alarm Potagnostic information readable Fail-safe operation • Group error SF (red) Potential separation Potential separation Potential separation digital outputs • between the channels • between the channels, in groups of	horizontal installation	
vertical installation — up to 40 °C, max. Cable length • shielded, max. • unshielded, max. • unshielded, max. • Diagnostics/status information Alarms • Diagnostic alarm Diagnostic information readable Diagnostics indication LED • Fail-safe operation • Group error SF (red) Potential separation Potential separation digital outputs • between the channels • between the channels, in groups of	— up to 40 °C, max.	7.5 A
— up to 40 °C, max. Cable length • shielded, max. • unshielded, max. 100 m Interrupts/diagnostics/status information Alarms • Diagnostic alarm Diagnostic messages • Diagnostic information readable Piail-safe operation • Fail-safe operation Potential separation Potential separation Potential separation digital outputs • between the channels • between the channels, in groups of 4	— up to 60 °C, max.	4 A
Cable length • shielded, max. • unshielded, max. 200 m; 200 m for SIL3, AK 6, Cat 4 200 m Interrupts/diagnostics/status information Alarms • Diagnostic alarm Potential separation Potential separation Potenter the channels • between the channels, in groups of 4	vertical installation	
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Interrupts/diagnostics/status information Alarms • Diagnostic alarm Diagnostic messages • Diagnostic information readable Piagnostics indication LED • Fail-safe operation • Group error SF (red) Potential separation Potential separation digital outputs • between the channels • between the channels, in groups of	• shielded, max.	200 m; 200 m for SIL3, AK 6, Cat 4
Alarms • Diagnostic alarm Piagnostic messages • Diagnostic information readable Piagnostics indication LED • Fail-safe operation • Group error SF (red) Potential separation Potential separation digital outputs • between the channels • between the channels, in groups of	• unshielded, max.	200 m
Diagnostic alarm Ves; Parameterizable Diagnostic messages Diagnostic information readable Pail-safe operation Group error SF (red) Potential separation Potential separation digital outputs between the channels between the channels, in groups of Yes; Parameterizable Yes Yes Yes Yes Yes Yes	Interrupts/diagnostics/status information	
Diagnostic messages Diagnostic information readable Piagnostics indication LED Fail-safe operation Group error SF (red) Potential separation Potential separation digital outputs between the channels between the channels, in groups of	Alarms	
 Diagnostic information readable Diagnostics indication LED Fail-safe operation Group error SF (red) Yes Potential separation Potential separation digital outputs between the channels between the channels, in groups of 4 	Diagnostic alarm	Yes; Parameterizable
Diagnostics indication LED • Fail-safe operation • Group error SF (red) Potential separation Potential separation digital outputs • between the channels • between the channels, in groups of	Diagnostic messages	
 Fail-safe operation Group error SF (red) Potential separation Potential separation digital outputs between the channels between the channels, in groups of 	Diagnostic information readable	Yes
Group error SF (red) Potential separation Potential separation digital outputs between the channels between the channels, in groups of Yes 4	Diagnostics indication LED	
Potential separation Potential separation digital outputs • between the channels • between the channels, in groups of 4	Fail-safe operation	Yes
Potential separation digital outputs • between the channels • between the channels, in groups of 4	• Group error SF (red)	Yes
 between the channels between the channels, in groups of 	•	
• between the channels, in groups of 4	Potential separation digital outputs	
2 - 1 - 2 - 1 - 1 - 2 - 1 - 2 - 2 - 2 -	• between the channels	Yes
• between the channels and backplane bus Yes	between the channels, in groups of	4
	• between the channels and backplane bus	Yes

• between the channels and the power supply of
the electronics

Yes

the electronics	
solation	
Isolation tested with	500V AC for 1 min (internal voltage limiting to ±120V)
Standards, approvals, certificates	
CE mark	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
Highest safety class achievable in safety mode	
● acc. to EN 954	Cat. 4
• SIL acc. to IEC 61508	SIL 3
Railway application	
● EN 50155	Yes; Sections 4, 5 and 12; no further agreements apply; T1, Category 1, Class A/B, EN 50155:2007
mbient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	60 °C; = Tmax; the rated temperature range of -25 +55 °C (T1) applies for the use on railway vehicles according to EN50155
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
 Ambient air temperature-barometric pressure- altitude 	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m)
Relative humidity	
 With condensation, tested in accordance with IEC 60068-2-38, max. 	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
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 land craft, rail vehicles and special-purpose	vehicles
 to biologically active substances according to EN 60721-3-5 	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
 to chemically active substances according to EN 60721-3-5 	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
 to mechanically active substances according to EN 60721-3-5 	Yes; Class 5S3 incl. sand, dust; *
Remark	

Note regarding classification of environmental conditions acc. to EN 60721

* 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

 Electronic equipment on rolling stock acc. to EN 50155

• Military testing according to MIL-I-46058C, Amendment 7

 Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A Yes; Class 2 for high availability

Yes; Class PC2 protective coating acc. to EN 50155:2017

Yes; Discoloration of coating possible during service life

Yes; Conformal coating, Class A

Connection method	
required front connector	40-pin
Dimensions	
Width	80 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	465 g

last modified: 12/14/2018