

# Hardware Documentation

## *ADP-MIPI2RGB1 for HW Revision 1.10*

Version 001  
(2021-09-06)



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# About This Document

This document describes how to use the [ADP-MIPI2RGB1](#) adapter board with mechanical and electrical information. The Adapter is used to connect EDT Displays to F&S Boards with MIPI Interface. The latest version of this document can be found at:

<http://www.fs-net.de>.

## ESD Requirements



All F&S hardware products are ESD (electrostatic sensitive devices). All products are handled and packaged according to ESD guidelines. Please do not handle or store ESD-sensitive material in ESD-unsafe environments. Negligent handling will harm the product and warranty claims become void.

## History

Date	V	Platform	A,M,R	Chapter	Description	Au
11.08.2021	000	All		-	Initial Version	MW

V       Version  
A, M, R   Added, Modified, Removed  
Au       Author

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# 1 Physical Characteristics

ADP-MIPI2RGB1 is an adapter board that is able to convert MIPI-DSI signals into RGB signals. The board can produce 6-bit RGB signals from one channel (4-data lanes) MIPI-DSI signal interface. The board is designed to directly connect EDT Displays.

For more information's contact our sales team.

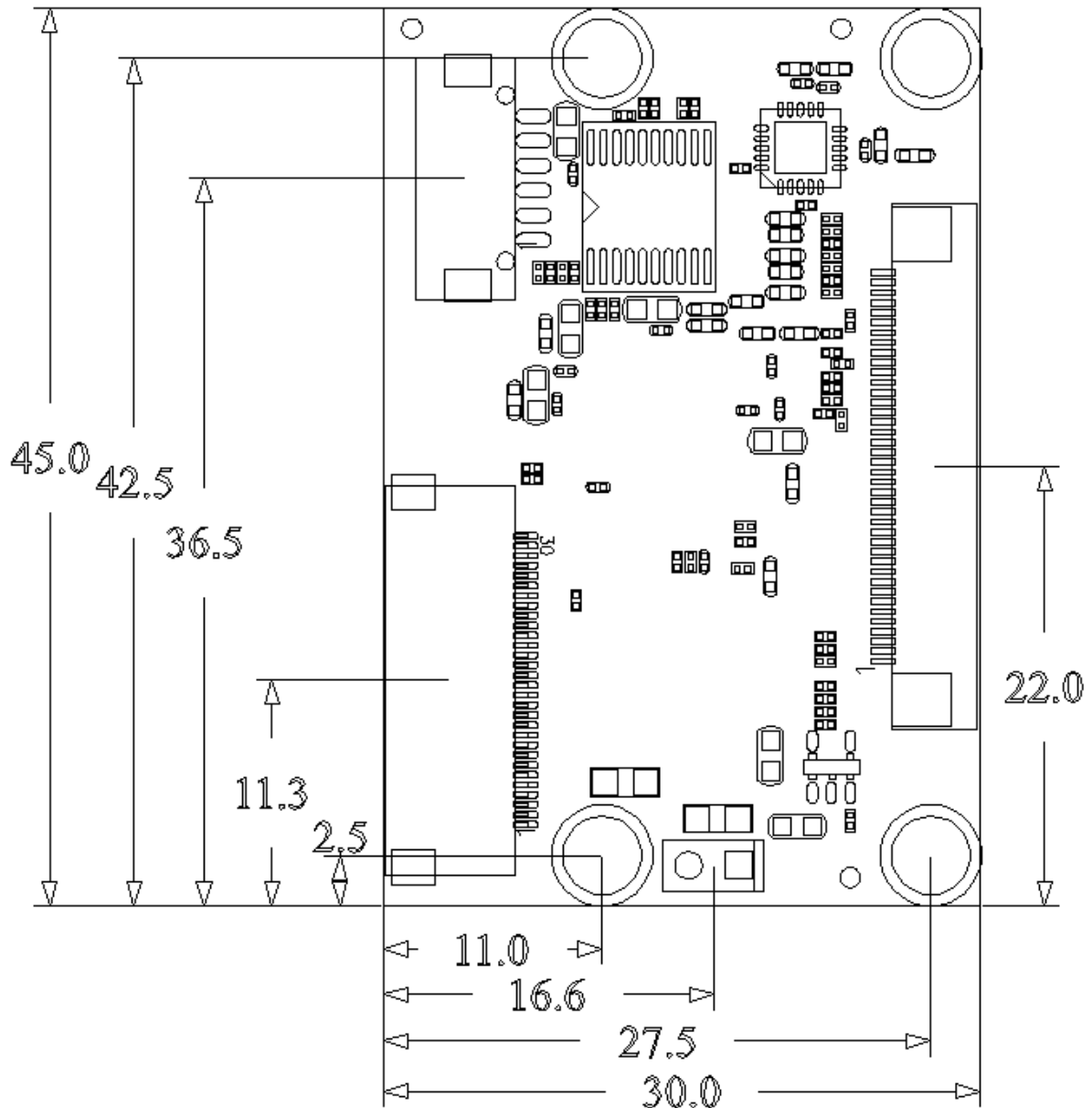


Figure 1: ADP-MIPI2RGB1 Adapter Board Top

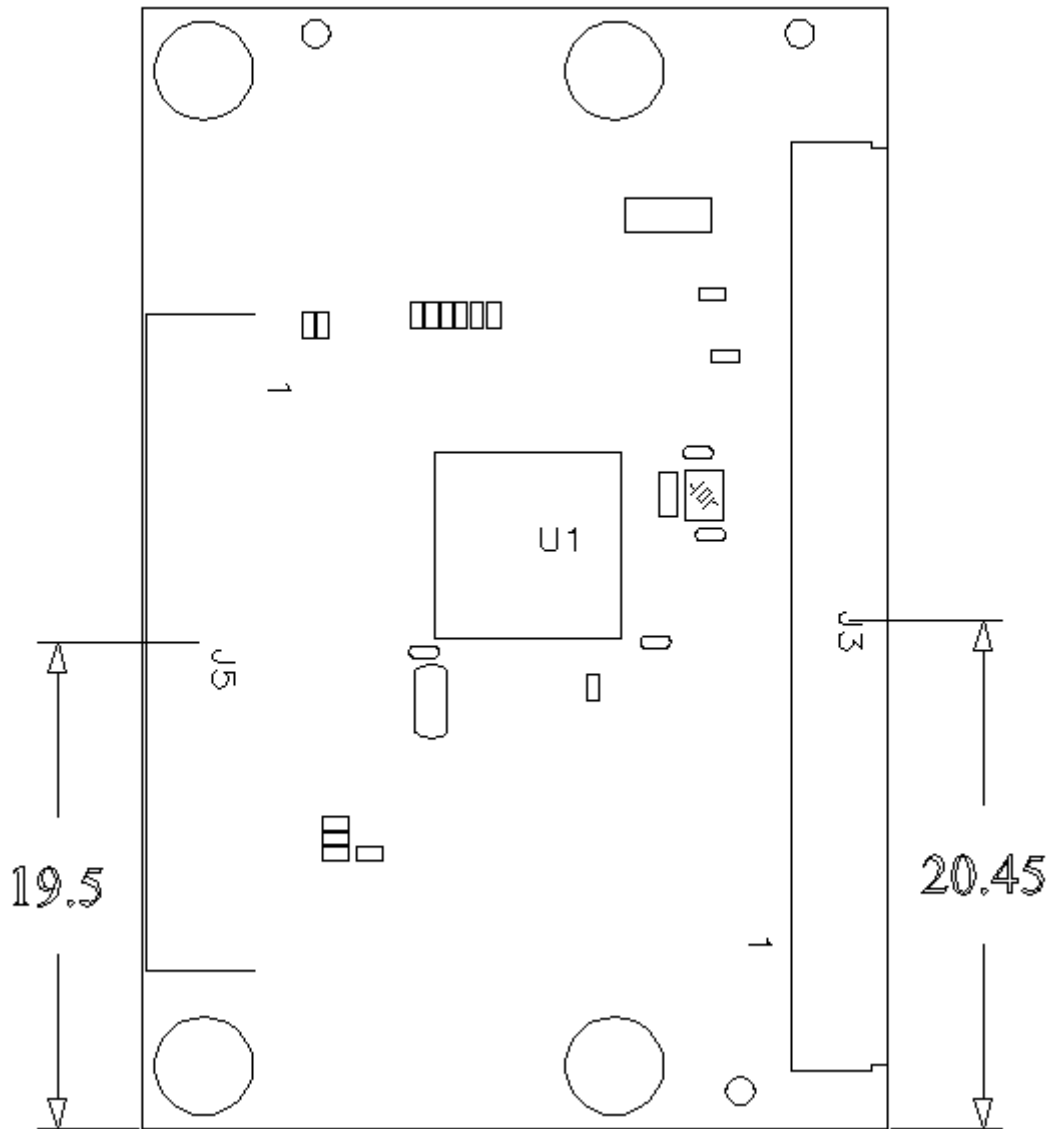


Figure 2: ADP-MIPI2RGB1 Adapter Board Bottom

Dimensions	Description
Size	30mm x 45mm
PCB Thickness	1.00mm ± 0.10mm
Height of the parts on the top side	3.7mm
Height of the parts on the bottom side	1.5mm
Weight	N/A

Table 1: Mechanical Dimensions

# 2 Connector Layout

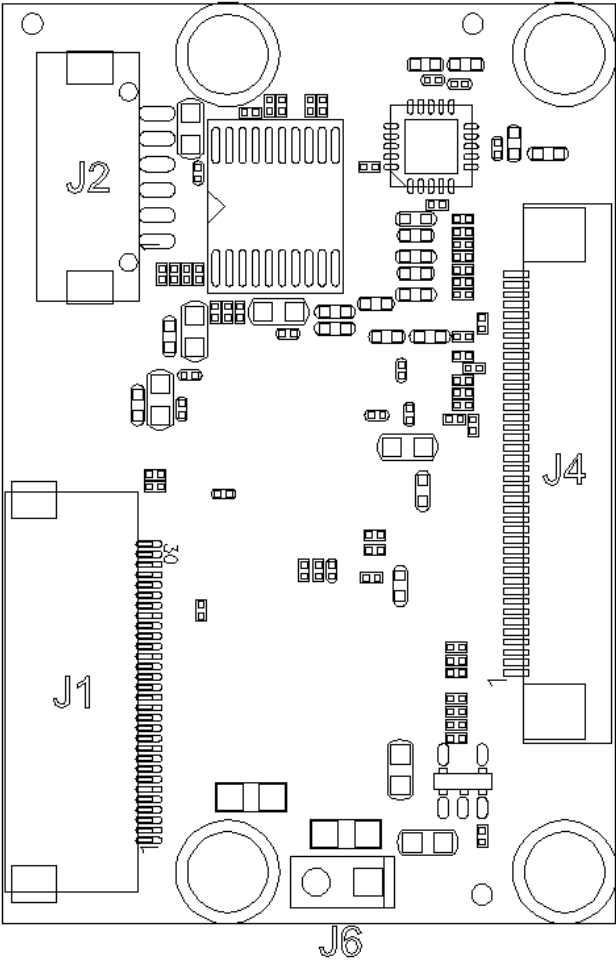


Figure 3: Connector Layout Top

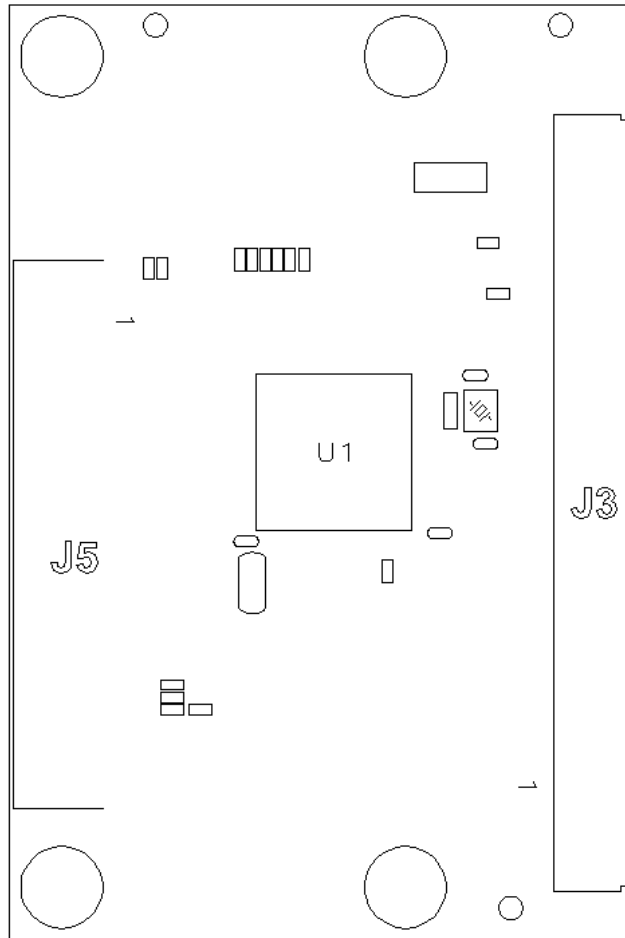


Figure 4: Connector Layout Bottom

Ref.	Description	I/O	No. of Pins	Connector Type
J1	MIPI-DSI Connector	Input	30	FH28D-30S-0.5SH
J2	Touch Controller Connector	Input	6	DF13-6P-1.25H(20)
J3	MIPI-DSI Connector	Input	30	FI-X30SSLA-HF-R2500
J4	Digital RGB Connector	Output	40	TE 4-1734839-0
J5	Digital RGB Connector	Output	40	TE 4-1734839-0
J6	Backlight Voltage Connector	Input	2	2.54mm Pitch Connector
---	Mating Connector for J2	-	6	DF13-6S-1.25C
---	Mating Connector for J3	-	30	FI-X30H & FI-X30HL

Table 2: Connectors List and Types

### 3 Connector Pin Layouts

J1: MIPI-DSI Connector - Input				
Pin	Signal Name	I/O	Voltage	Description
1	VDD 3V3	PWR	3.3V	
2	VDD 3V3	PWR	3.3V	
3	GND			
4	GND			
5	BL_PWM	I	3.3V	Backlight PWM
6	BL_ON	I	3.3V	Backlight On (Enable)
7	GND			
8	MIPI_DSI_D3_P	I		MIPI-DSI Data Lane 3+
9	MIPI_DSI_D3_N	I		MIPI-DSI Data Lane 3-
10	GND			
11	MIPI_DSI_D2_P	I		MIPI-DSI Data Lane 2+
12	MIPI_DSI_D2_N	I		MIPI-DSI Data Lane2-
13	GND			
14	MIPI_DSI_CLK_P	I		MIPI-DSI Clock Signal+
15	MIPI_DSI_CLK_N	I		MIPI-DSI Clock Signal-
16	GND			
17	MIPI_DSI_D1_P	I		MIPI-DSI Data Lane 1+
18	MIPI_DSI_D1_N	I		MIPI-DSI Data Lane 1-
19	GND			
20	MIPI_DSI_D0_P	I		MIPI-DSI Data Lane 0+
21	MIPI_DSI_D0_N	I		MIPI-DSI Data Lane 0-
22	GND			
23	MIPI_RST	I	3.3V	MIPI Reset Signal
24	VDD 3V3	PWR	3.3V	
25	VDD 3V3	PWR	3.3V	
26	N.C.	X	X	Not Connected
27	I2C_SCL	I	3.3V	I2C Clock
28	I2C_SDA	I/O	3.3V	I2C Serial Data
29	I2C_RSTn	I	3.3V	I2C Reset
30	I2C_IRQn	I	3.3V	I2C Interrupt

Table 3: MIPI-DSI Connector Pin Layout



J2:Power and I2C Connector - Input				
Pin	Signal Name	I/O	Voltage	Description
1	VDD_3V3	PWR	3.3V	Voltage Power Supply
2	I2C_SDA	I/O	3.3V	I2C Serial Data
3	I2C_SCL	I	3.3V	I2C Clock
4	I2C_RSTn	I	3.3V	I2C Reset
5	I2C_INTn	I	3.3V	I2C Interrupt
6	GND			

Table 4: Power and I2C Connector Pin Layout

J3: MIPI-DSI Connector - Input				
Pin	Signal Name	I/O	Voltage	Description
1	MIPI_DSI_D0_N	I		MIPI-DSI Data Lane 0-
2	MIPI_DSI_D0_P	I		MIPI-DSI Data Lane 0+
3	MIPI_DSI_D1_N	I		MIPI-DSI Data Lane 1-
4	MIPI_DSI_D1_P	I		MIPI-DSI Data Lane 1+
5	MIPI_DSI_D2_N	I		MIPI-DSI Data Lane 2-
6	MIPI_DSI_D2_P	I		MIPI-DSI Data Lane 2+
7	GND			
8	MIPI_DSI_CLK_N	I		MIPI-DSI Clock Signal-
9	MIPI_DSI_CLK_P	I		MIPI-DSI Clock Signal+
10	MIPI_DSI_D3_N	I		MIPI-DSI Data Lane 3-
11	MIPI_DSI_D3_P	I		MIPI-DSI Data Lane 3+
12	N.C.	X	X	Not Connected
13	N.C.	X	X	Not Connected
14	GND			
15	N.C.	X	X	Not Connected
16	N.C.	X	X	Not Connected
17	GND			
18	N.C.	X	X	Not Connected
19	N.C.	X	X	Not Connected
20	N.C.	X	X	Not Connected
21	N.C.	X	X	Not Connected
22	N.C.	X	X	Not Connected
23	N.C.	X	X	Not Connected
24	GND			
25	I2C_SDA	I/O	3.3V	I2C Serial Data
26	I2C_IRQn	I	3.3V	I2C Interrupt
27	I2C_SCL	I	3.3V	I2C Clock
28	I2C_RSTn	I	3.3V	I2C Reset
29	VDD 3V3	PWR	3.3V	
30	VDD 3V3	PWR	3.3V	

Table 5: MIPI-DSI Connector Pin Layout

**J4: Digital RGB Connector - Output**

Pin	Signal Name	I/O	Voltage	Description
1	VLCD_ON	O	3.3V	
2	Touch_RST	O	3.3V	
3	LCD_B7	O	3.3V	
4	LCD_B6	O	3.3V	
5	LCD_B5	O	3.3V	
6	LCD_B4	O	3.3V	
7	LCD_B3	O	3.3V	
8	LCD_B2	O	3.3V	
9	GND			
10	LCD_G7	O	3.3V	
11	LCD_G6	O	3.3V	
12	LCD_G5	O	3.3V	
13	LCD_G4	O	3.3V	
14	LCD_G3	O	3.3V	
15	LCD_G2	O	3.3V	
16	GND			
17	LCD_R7	O	3.3V	
18	LCD_R6	O	3.3V	
19	LCD_R5	O	3.3V	
20	LCD_R4	O	3.3V	
21	LCD_R3	O	3.3V	
22	LCD_R2	O	3.3V	
23	GND			
24	LCD-CLK	O	3.3V	Display Clock
25	HIGH / LOW		3.3V	Pin can mounted to 3.3V or GND
26	LCD-HSYNC	O	3.3V	
27	LCD-VSYNC	O	3.3V	
28	LCD-DE	O	3.3V	
29	BL_ON	O	3.3V	Backlight On
30	VDD 3V3	PWR	3.3V	
31	GND			
32	GND			

33	VDD 3V3	PWR	3.3V	
34	VDD 3V3	PWR	3.3V	
35	I2C_IRQn	O	3.3V	Mounting option for resistive Touch or I2C Touch
36	BL_PWM	O	3.3V	Backlight Dimming
37	I2C_SCL / TOUCH_Y+	O	3.3V	Mounting option for resistive Touch or I2C Touch
38	TOUCH_X+	O	3.3V	Mounting option for resistive Touch or I2C Touch
39	I2C_SDA / TOUCH_Y-	O	3.3V	Mounting option for resistive Touch or I2C Touch
40	TOUCH_X-	O	3.3V	Mounting option for resistive Touch or I2C Touch

*Table 6: Digital RGB Connector Pin Layout*

**J5: Digital RGB Connector - Output**

Pin	Signal Name	I/O	Voltage	Description
1	TOUCH_X-	O	3.3V	Mounting option for resistive Touch or I2C Touch
2	I2C_IRQn / TOUCH_Y-	O	3.3V	Mounting option for resistive Touch or I2C Touch
3	I2C_SCL / TOUCH_X+	O	3.3V	Mounting option for resistive Touch or I2C Touch
4	I2C_SDA / TOUCH_Y+	O	3.3V	Mounting option for resistive Touch or I2C Touch
5	VDD 3V3	PWR	3.3V	
6	GND			
7	GND*			Pin can be open by mounting Option
8	ROTATE	O	3.3V	
9	LCD_DE	O	3.3V	
10	LCD-VSYNC	O	3.3V	
11	LCD-HSYNC	O	3.3V	
12	GND			
13	LCD-CLK	O	3.3V	Display Clock
14	LCD_R2	O	3.3V	
15	LCD_R3	O	3.3V	
16	LCD_R4	O	3.3V	
17	LCD_R5	O	3.3V	
18	LCD_R6	O	3.3V	
19	LCD_R7	O	3.3V	
20	GND			
21	LCD_G2	O	3.3V	
22	LCD_G3	O	3.3V	
23	LCD_G4	O	3.3V	
24	LCD_G5	O	3.3V	
25	LCD_G6	O	3.3V	
26	LCD_G7	O	3.3V	
27	GND			
28	LCD_B2	O	3.3V	
29	LCD_B3	O	3.3V	
30	LCD_B4	O	3.3V	

31	LCD_B5	O	3.3V	
32	LCD_B6	O	3.3V	
33	LCD_B7	O	3.3V	
34	VLCD_ON	O	3.3V	
35	BL_PWM	O	3.3V	Backlight Dimming
36	BL_ON	O	3.3V	Backlight On
37	VDD 3V3	PWR	3.3V	
38	VDD 3V3	PWR	3.3V	
39	GND			
40	GND			

*Table 7: Digital RGB Connector Pin Layout*

To connect for example an "ET070080DH6" form EDT, you have to mirror the cable: Pin 1 is Pin 40 and Pin 40 is Pin 1.

J6: Backlight Voltage Connector - Output				
Pin	Signal Name	I/O	Voltage	Description
1	N.C.	X	X	Not Connected
2	GND			

*Table 8: Backlight Voltage Connector Pin Layout*

## 4 Backlight / GPIO Controller

To control the following GPIOs on the module is a PCA9634PW mounted:

- BL\_ON\*
- BL\_PWM\*
- ROTATE
- MIPI\_RST\*
- VLCD\_ON
- TOUCH\_RST

\* These Signals can be optionally driven directly by the CPU via Connector J1.

## 5 Resistive Touch Controller

Optionally the Module includes a “TSC2004” resistive Touch controller.

## 6 Electrical Characteristics

Signal Name	Description	Min	Typ.	Max	Unit
VDD_3V3	Input Supply Voltage	3.0	3.3	3.6	V
GND	Ground	-	-	-	-

Table 9: Electrical Characteristics



## 7 ESD and EMI Implementation

We highly recommend using the adapter board with wires as short as possible.

ESD Rating of the chip is  $\pm 2$  kV (HBM). The chip has limited built-in ESD protection. There is no ESD protection on the RGB and MIPI-DSI connectors.

A helpful guide is available from TI; just search for slva680 at ti.com.

## 8 Second source rules

F&S qualifies their second sources for parts autonomously, as long as this does not touch the technical characteristics of the product. This is necessary to guarantee delivery times and product life. A setup of release samples with released second sources is not possible.

F&S does not use broker components without the consent of the customer.

## 9 Storage conditions

Maximum storage on room temperature with non-condensing humidity: 6 months

Maximum storage on controlled conditions  $25 \pm 5$  °C, max. 60% humidity: 12 months

For longer storage, we recommend vacuum dry packs.

## 10 ROHS and REACH statement

All F&S designs are created from lead-free components and are completely ROHS compliant.

The products we supply do not contain any substance on the latest candidate list published by the European Chemicals Agency according to Article 59(1,10) of Regulation (EC) 1907/2006 (REACH) in a concentration above 0.1 mass %.

Consequently, the obligations in No. 1 and 2 paragraphs in Annex are not relevant here.

Please understand that F&S is not performing any chemical analysis on its products to testify REACH compliance and is therefore not able to fill out any detailed inquiry forms.

## 11 Packaging

All F&S ESD-sensitive products will shipping either in trays or in bags.

## 12 Matrix Code Sticker

All F&S hardware will ship with a matrix code sticker including the serial number. Enter your serial number here <https://www.fs-net.de/en/support/serial-number-info-and-rma/> to get information on shipping date and type of board.



*Figure 5: Matrix Code Sticker*

# 13 Appendix

## Important Notice

The information in this publication has been carefully checked and is believed to be entirely accurate at the time of publication. F&S Elektronik Systeme (“F&S”) assumes no responsibility, however, for possible errors or omissions, or for any consequences resulting from the use of the information contained in this documentation.

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