華凌光電股份有限公司
WINSTAR WINSTAR Display Co., Ltd.

SMART DISPLAY SPECIFICATION

Think good, Do good, Be good !

WEB: https://www.winstar.com.tw *E-mail: sales@winstar.com.tw*

WINSTAR 華凌光電股份有限公司 WINSTAR Display Co., Ltd.

SPECIFICATION

CUSTOMER	WINSTAR
MODEL NO.	WL0F00050000FGXAANA00
CURRENT VERSION	A
RELEASE DATE	2026/2/23

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
Corina Ye	Ginger Xu	Eason Chang	Jason Chan

APPROVED BY: **(FOR CUSTOMER USE ONLY)**	

RECORDS OF REVISION

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2026/01/07		First issue
A	2026/02/23	P10, 11	Add connector type in the Interface.
B			
C			
D			
E			
F			
G			
H			
I			

Contents

1. Smart Display Classification Information

W	L	0F	000500	00F	G	X	AA	N	A	00
1	2	3	4	5	6	7	8	9	10	11

1	W: WINSTAR products			
2	Type: L:Standard K:Customization			
3	Display Type:	Standard:	0H: Character STN 0X: Graphic STN (TAB/COF) 0F: TFT EH: Character OLED EX: OLED (TAB/COF)	0G: Graphic STN 0P: Graphic STN (COG) EG: Graphic OLED EP: OLED (COG)
		Customization:	DH: Character DN: Graphic ED: OLED	DG: Graphic STN 0J: TFT
4	Display size: (diagonal) / Display format: (resolution)	Character STN: Graphic STN:	e.g., 8x1: 000801 16x2: 001602 24x4: 002404 e.g., 128x64: 012864 320x240: 320240	
		TFT Size (inch):	000096-0.96” / 000350-3.5” / 000430-4.3” / 000570-5.7” 000700-7.0” / 000800-8.0” / 001020-10.2” / 001210-12.1” (The last two digits are two digits after the decimal point)	
		OLED:	e.g., 128x64: 012864 Customization: 0001XX	
5	Serial No:	0A1 ~ 0ZZ	Customization STN: 000	
6	Touch Panel Type:	N: Without TP T: RTP G: CTP		
7	Model Interface:	A: CAN B: Bluetooth C:Controller Specified D: RS485 E: RS232 F: USART	G: Logic I/O H: HDMI R: Memory Specified N: Ethernet J: Analog I/O K: USB	L: WIFI M: Zigbee X: Combined Y: Proprietary interface
8	Interface Serial No.:	AA ~ ZZ		
9	Control Category:	S: Smart Display E: Entry N: Non-specified		
10	Special Code:	A → Generic B → Industrial C →Automotive D →Medical K → With Housing		
11	Model code:	00 ~ ZZ		

2. Summary

5-inch HMI Display Development Board Feature

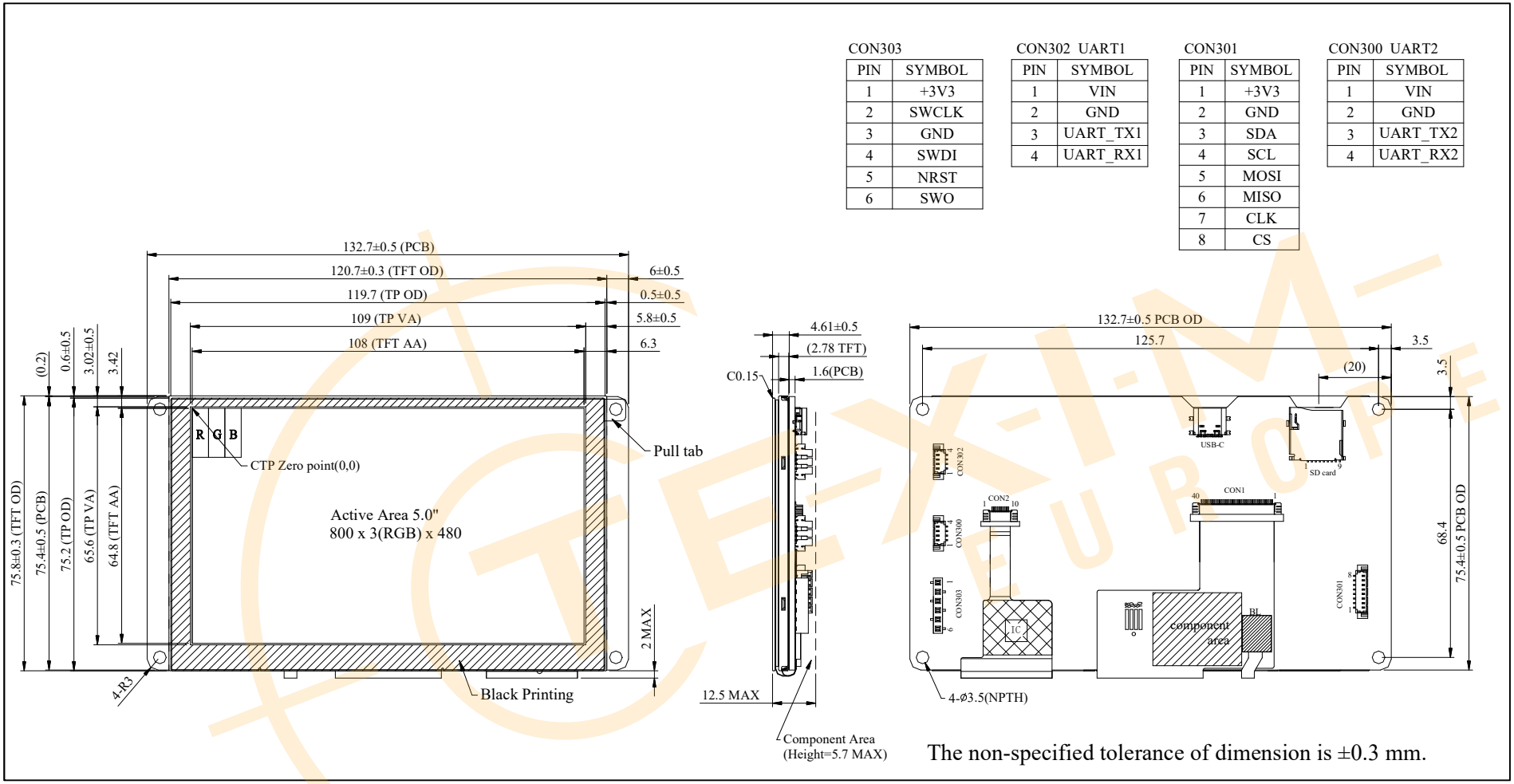
1. TFT Module: WF50FTWAGDNG0# 5” IPS, normally black transmissive TFT with 80/80/80/80 wide viewing angle, 800×480 resolution, 24-bit RGB color depth (16.7M colors), typ. 400 cd/m² brightness, 50,000 hours LED backlight lifetime, and integrated I²C capacitive touch panel.
2. MCU: STM32U599ZIT6Q ultra-low-power MCU with 2 MB Flash, ~2.5 MB SRAM, integrated GPU2D and LTDC, and TrustZone-based secure boot, providing efficient GUI processing for low-power HMI systems.
3. Memory: W25Q128JVSIQT 128-Mbit (16 MB) serial Flash provides additional storage for fonts, images and application data beyond the MCU’s internal memory.
4. Power Input: Wide-range VIN input 5–28 V or 5 V via USB-C.
5. Interfaces: USB-C (USB 2.0 OTG HS, power + data), Micro SD card slot, RS-485 / UART, SPI, I²C, UART, SWD debug interface, plus PWM backlight and GPIO buzzer control.
6. Development Support: Supplied with Initial Code Project compatible with STM32CubeMX, STM32CubeIDE, STM32Cube Programmer and TouchGFX Designer, enabling rapid application development; hardware schematic is available under NDA to assist developers with system integration and secondary development.

3. Product Information

General information

Item	Standard Value	Unit
Operating voltage	5~28	Vdc
Communication Interface	USB-C	—
	Micro SD Card	—
	CON300: Option for RS485, UART	—
	CON301: SPI	—
	CON301: I²C	—
	CON302: UART	—
MCU	STM32U599ZIT6 (2MB Flash, 2.5MB RAM)	N/A
Flash Memory	16	MB
LCD display size	5	inch
Dot Matrix	800 x R.G.Bx480(TFT)	dot
Module dimension	132.7(W) x 75.8(H) x 12.5(D)	mm
Active area	108 (W) x 64.8(H)	mm
Pixel pitch	0.135(W) x 0.135(H)	mm
Brightness	Min:300; Typ:400	
LCD type	TFT, Normally Black, Transmissive	
View Direction	80/80/80/80	
Aspect Ratio	15:9	
With /Without TP	With CTP	
Surface	Glare	

4. Contour Drawing



5. Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-30	—	+80	℃
Storage Temperature	TST	-30	—	+80	℃

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

1. Temp. ≦60℃, 90% RH MAX. Temp.＞60℃, Absolute humidity shall be less than 90% RH at 60℃

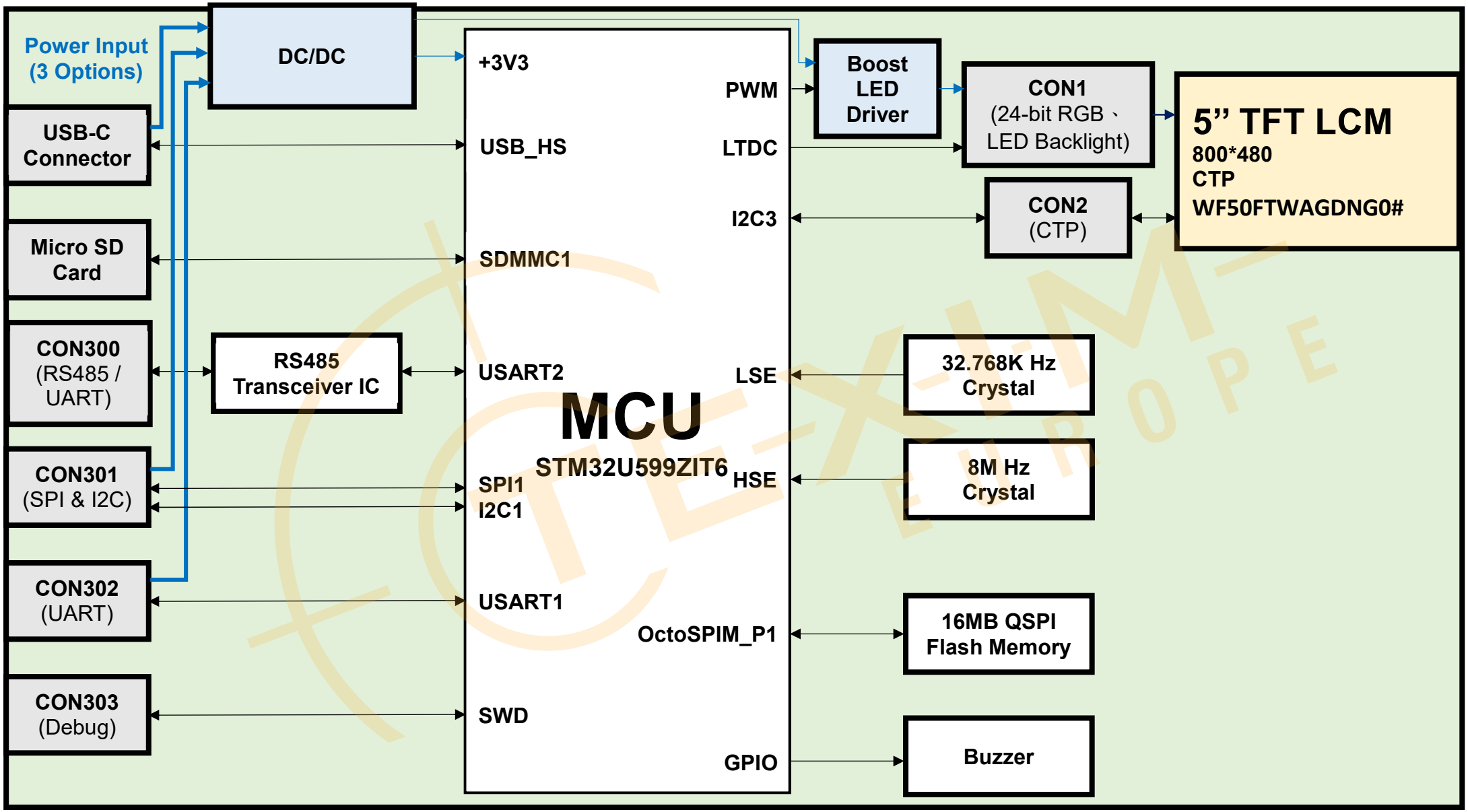
6. Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage	VCC	—	5	12	28	V
Supply LCM current	I(mA)	-	--	150	--	mA

7. BOM

Item	Description	Remark
LCM	WF50FTWAGDNG0#	
PCBA	SV10005R000FJ00N0100	

8.Block diagram



10. Interface

CON300 definition:

Pin	Symbol	Function	Remark
1	VIN	Power supply 5V~28V input	Input
2	GND	Power supply GND input	Input
3	UART_TX2	USART TX2 interface	I/O
4	UART_RX2	USART RX2 interface	I/O

Note:

1. Pin 3 and Pin 4 share the same USART2 port and operate in RS-485 mode by default (on-board transceiver enabled). When the RS-485 driver is disabled via software, the pins function as a 3.3 V TTL UART. The external wiring must match the selected mode.
2. Connector Type: Molex 0532610471 (1.25 mm pitch, 4-pin) or equivalent.

CON301 definition:

Pin	Symbol	Function	Remark
1	+3V3	Power supply +3V3 output	Output
2	GND	Power supply GND output	Output
3	SDA	Serial Data Line	I/O
4	SCL	Serial Clock Line	Output
5	MOSI	Master Out Slave In	I/O
6	MISO	Master In Slave Out	I/O
7	CLK	Clock	I/O
8	CS	Chip Select	I/O

Note:

1. Connector Type: Molex 0532610871 (1.25 mm pitch, 8-pin) or equivalent.

CON302 definition:

Pin	Symbol	Function	Remark
1	VIN	Power supply 5V~28V input	Input
2	GND	Power supply GND input	Input
3	UART_TX1	USART TX1 interface	I/O
4	UART_RX1	USART RX1 interface	I/O

Note:

1. Connector Type: Molex 0532610471 (1.25 mm pitch, 4-pin) or equivalent.

CON303 definition:

Pin	Symbol	Function	Remark
1	+3V3	3.3V power for JTAG interface	Output
2	SWCLK	CLK pin for JTAG interface	Input
3	GND	GND for JTAG interface	Output
4	SWDI	Data pin for JTAG interface	I/O
5	NRST	Reset pin for JTAG interface	Input
6	SWO	Serial Wire Output	Output

Note:

1. Connector Type: Würth Elektronik 61300611821 (2.54 mm pitch, 6-pin) or equivalent.

11. Reliability

Content of Reliability Test (Wide temperature, -30℃~80℃)

Environmental Test			
Test Item	**Content of Test**	**Test Condition**	**Note**
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80℃ 96hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30℃ 96hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	80℃ 96hrs	——
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-30℃ 96hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60 ℃,90%RH max	60℃,90%RH 96hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of operation -30℃ 25℃ 80℃  30min 5min 30min 1 cycle	-30℃/80℃ 10 cycles	——
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes	3
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=±2KV~±6KV (contact), ±2KV~±8KV(air) RS=330Ω CS=150pF 10 times	——

Note1: No dew condensation to be observed.
Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.
Note3: The packing have to including into the vibration testing.

12. Product Inspection Check List

Check samples by meter V_{IN}, I system

Item	No 1	Note
VIN (V)	5	
I System(mA)	354	

WEB: https://www.winstar.com.tw
E-mail: sales@winstar.com.tw
TFT Display Inspection Specification: https://www.winstar.com.tw/technology/download.html
Precaution in use of TFT module:
https://www.winstar.com.tw/technology/download/declaration.html

Disclaimer

ALL PRODUCTS, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Texim Europe B.V. its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Texim”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Texim makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product.

It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application.

Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time.

All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts.

Please contact us if you have any questions about the contents of the datasheet.

This may not be the latest version of the datasheet. Please check with us if a later version is available.

Texim Europe - contact details

Headquarters & Warehouse

Elektrostraat 17
NL-7483 PG Haaksbergen
The Netherlands

T: +31 (0)53 573 33 33
E: info@texim-europe.com
Homepage: www.texim-europe.com

The Netherlands

Elektrostraat 17
NL-7483 PG Haaksbergen

T: +31 (0)53 573 33 33
E: nl@texim-europe.com

Belgium

Zuiderlaan 14, box 10
B-1731 Zellik

T: +32 (0)2 462 01 00
E: belgium@texim-europe.com

UK & Ireland

St Mary's House, Church Lane
Carlton Le Moorland
Lincoln LN5 9HS

T: +44 (0)1522 789 555
E: uk@texim-europe.com

Germany

Bahnhofstrasse 92
D-25451 Quickborn

T: +49 (0)4106 627 07-0
E: germany@texim-europe.com

Germany

Martin-Kollar-Strasse 9
D-81829 München

T: +49 (0)89 436 086-0
E: muenchen@texim-europe.com

Austria

Martin-Kollar-Strasse 9
D-81829 München

T: +49 (0)89 436 086-0
E: austria@texim-europe.com

Nordic

Stockholmsgade 45
2100 Copenhagen

T: +45 88 20 26 30
E: nordic@texim-europe.com

Italy

Martin-Kollar-Strasse 9
D-81829 München

T: +49 (0)89 436 086-0
E: italy@texim-europe.com