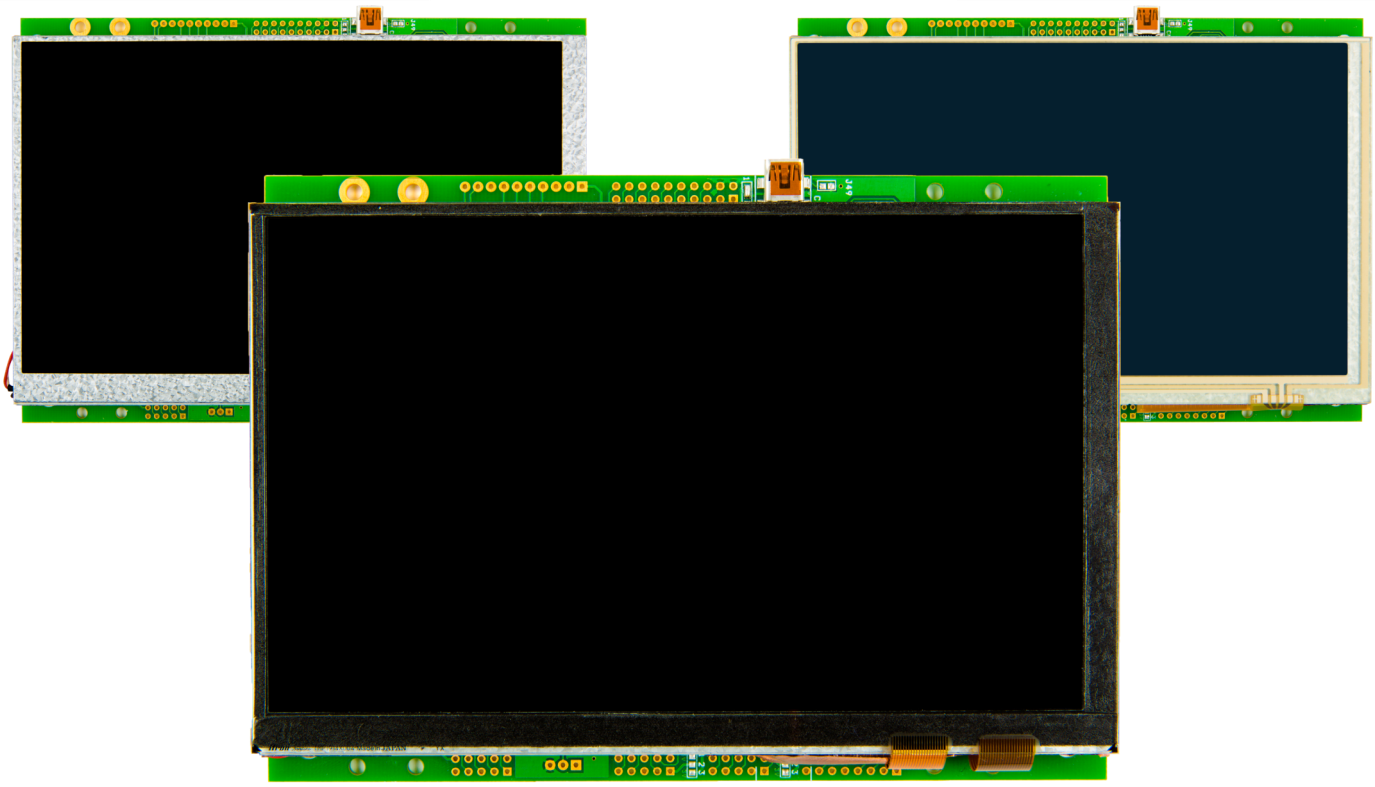

TW800X480C-K619SE4R2XX

7.0 INCH INTELLIGENT TFT MODULE SERIES

Itron UK's current midrange Itron Smart Series Embedded TFT TW-Series Modules developed from the successful TU range with proven capabilities and now supporting QT (Linux OS)

- Metallised Projective Capacitive Touch/Resistive Touch options
- Powerful enough to devolve Host functionality.
- Cost Effective
- TU / iDevOS compatible.

Metallised Touch, Resistive Touch and No Touch references MU, RU and NU respectively.

Features

CONTENTS

APPLICABLE PRODUCTS

Part Number	Touch	Ethernet	RS232 / 485	SD Slot	eMMC	DDR2
TW800x480C-K619SE4R2MU v7	MPCT	YES	YES	Up to 32GB x1	4GB	256MB
This product can be customised to your requirements. Contact our sales team for information. (MOQs apply.)						
Software Version	TW-SW2001-V.32.00					
Hardware Version	PCB800640A Issue 1, PN28L42C v6D					

Part Number	Touch	Ethernet	RS232 / 485	SD Slot	eMMC	DDR2
TW800X480C-K619SE4R2RU v6	Resistive	YES	YES	Up to 32GB x1	4GB	256MB
This product can be customised to your requirements. Contact our sales team for information. (MOQs apply.)						
Software Version	TW-SW2001-V.32.00					
Hardware Version	PCB800640A Issue 1, PN28L42C v6D					

Part Number	Touch	Ethernet	RS232 / 485	SD Slot	eMMC	DDR2
TW800X480C-K619SE4R2NU v3	None	YES	YES	Up to 32GB x1	4GB	256MB
This product can be customised to your requirements. Contact our sales team for information. (MOQs apply.)						
Software Version	TW-SW2001-V.32.00					
Hardware Version	PCB800640A Issue 1, PN28L42C v6D					

Standard Customisation Options	
Suffix C	FlexCan transceiver fitted
Suffix E	Product has EMI filter glass fitted between touch and TFT panels- e.g. UE
Suffix F	Product has EMI foil fitted on the rear and sides of the module- e.g. UF
Suffix H	Host USB connector fitted on rear of module- e.g. UH
Please contact the sales team before ordering.	

REVISION NOTES

Issue	Date	Remarks
1.0	June 2017	First Release
2.0	August 2017	Drawing updates, Change to CN2 definition
3.0	September	Overall drawing formatting

PRODUCT OVERVIEW

This module includes an 800x480 pixel TFT panel mounted on a printed circuit board with low profile construction.

Each pixel has red, green and blue striped elements with 18 bit colour control and 8 bit alpha blending.
The CPU block consists of a powerful 450MHz i.MX28 processor with up to 512M bytes of DDR2 RAM and the option to boot from SDHC card or internal eMMC NAND. A parallel µSDHC slot provides external SDHC module interface. The eMMC NAND also provides non-volatile storage for user application variables.

The module has a simple Ethernet connection to the Web. The Ethernet port can be directly wired to an RJ45 plug to provide FTP network communications over the local network and internet.

This module is designed to be RoHS compliant with sub class A EMI emission and 2kV human body contact model for metallised projective capacitive / resistive touch.

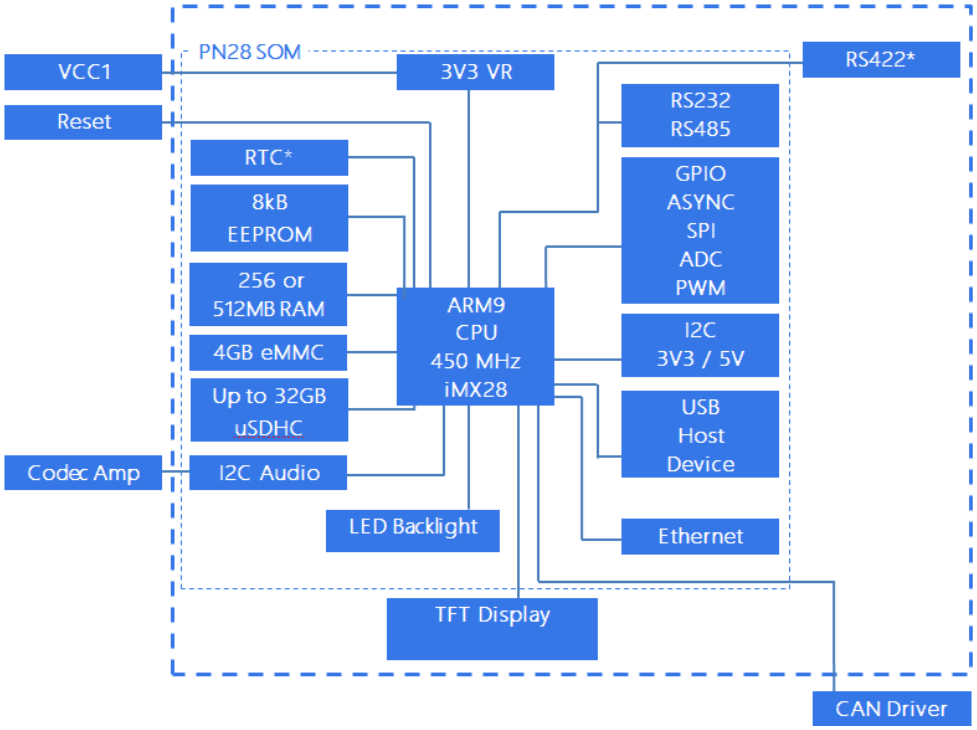

Figure 1 - Circuit Block Diagram.
** Optional.*

TECHNICAL DATA

CPU			
Type	Freescale 450MHz ARM9 CPU		
Features	L1 cache, 32 KB for instruction, 32 KB for data, RTC (Optional)		
Memory			
Standard	256 MB		
Maximum	512 MB		
eMMC NAND	4 GB		
microSD card	up to 32 GB		
Interfaces			
USB (Type mini B connector, Type A for host)	USB 2.0 OTG host/device USB 2.0 High-Speed host – 480 Mbps USB host/device mass storage support USB Device – CDC Serial		
CAN bus	2 x FlexCAN Interfaces (option)		
Asynchronous	RS232, RS485 half-Duplex, RS422 Full-Duplex (option) 3 x Asynchronous serial interface (3V3)		
Synchronous	2 x I2C Master/Slave, 3V3/5V(option) logic levels 2 x SPI Master, 3V3/5V(option) logic levels		
Network	10/100 Mbps Ethernet + magnetics FTP, Ethernet Switch support		
Audio	SAIF (Serial Audio Interface), MIDI protocol		
GPIO	Up to 32 user GPIO		
ADC	Up to 7 ADCs		
PWM	Up to 7 PWM Outputs		
Encoder	Rotary encoder support		
Display			
Area	152.4 x 91.4 – 7.0 inch diagonal		
Type	Transmissive		
Resolution	800 x 480 pixels		
Prime Viewing Angle	12 o'clock (colour inversion at 6 o'clock)		
Backlight	460 cd/m^2		
RGB Colours	262,144 (18 bit)		
User Input			
USB Host HID	Full HID Mouse/Keyboard/Hub/Barcode reader support		
Power Supply			
Supply	5.0-9.0V		
Current	MU: 880-950* mA	RU: 750 – 830* mA	NU: 790 – 830* mA
Environment			
Operating Temperature	-20°C to +70°C		
Storage Temperature	-30°C to +70°C		
Storage Humidity	30 to 80% RH @ 25°C Non condensing		
ESD	Designed to comply with 2kV human body contact model (BS EN 6100-4-2)		
EMC	Designed to comply with sub class A EMI emission (BS EN 6100-4-6)		
Software			
Operating System	IDevOS		

*Note, the use of peripherals can lead to a higher drawing of power, user responsible.

ELECTRICAL CHARACTERISTICS

Section	Parameter	Symbol	Min	Typ	Max	Unit	Condition
MU: 5V Input Power Supply	Supply Voltage	Vcc1	5.0	5.0	9.0	VDC	GND = 0V
	Supply Current	Icc1	880	920	950*	mA	Vcc1=5V - All pixels ON Backlight 100%
		Icc3	50	60	70	mA	Vcc1=5V – Reset LOW
RU: 5V Input Power Supply	Supply Voltage	Vcc1	5.0	5.0	9.0	VDC	GND = 0V
	Supply Current	Icc1	750	810	830*	mA	Vcc1=5V - All pixels ON Backlight 100%
		Icc3	50	60	70	mA	Vcc1=5V – Reset LOW
NU: 5V Input Power Supply	Supply Voltage	Vcc1	5.0	5.0	9.0	VDC	GND = 0V
	Supply Current	Icc1	790	809	830*	mA	Vcc1=5V - All pixels ON Backlight 100%
		Icc3	50	60	70	mA	Vcc1=5V – Reset LOW
3V3 Output Power Supply	Supply Voltage	Vcc2	3.2	3.3	3.4	VDC	GND = 0V
	Supply Current	Icc2	-	-	200	mA	Vcc1=5V
Data Interfaces and GPIO Ports	Logic Input Low	VIL	0	-	0.5	VDC	Vcc2=3V3 K0-K30, SDHC, ADC Maximum sink current 10mA per port Total sink current 70mA
	Logic Input High	VIH	2.0	-	Vcc2	VDC	
	Logic Output Low	VOL	0	-	0.7	VDC	
	Logic Output High	VOH	3.0	-	3.4	VDC	
RS485 Interface	Diff drive output	VoD	1.5	-	-	VDC	RL=54Ω
	Rx diff threshold	VTH	-0.2	-	0.2	VDC	
RS232 interface (RX)	Logic Input Low	VIL	-15.0	-	0.6	VDC	Vcc2=3V3
	Logic Input High	VIH	2.0	-	+15.0	VDC	Vcc2=3V3
RS232 interface (TX)	Logic Output Low	VOL	-	-3.0	-2.0	VDC	Vcc2=3V3
	Logic Output High	VOH	4.0	7.0	-	VDC	Vcc2=3V3
/RESET	Logic Input Low	VIL	0	-	1.2	VDC	Vcc1=5V
	Logic Input High	VIH	2.2	-	3.4	VDC	Vcc1=5V

If data signals are applied before the power supply stabilizes, the module CPU may not start correctly until a watchdog timeout.
*Note, the use of peripherals can lead to a higher drawing of power, user responsible. Test conducted with a 5V DC power supply.

OPTICAL CHARACTERISTICS

Visual Parameter	Value
Display Area (X x Y mm)	152.4 x 91.4 – 7.0 inch diagonal
Display Format (X x Y)	800 x 480 pixels
Dot Size/Pitch (X x Y mm)	0.19 x 0.19
RGB Colours	262,144 (18 bit)
Display Type	Transmissive
Prime Viewing Angle	12 o'clock (colour inversion at 6 o'clock)

Visual Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Contrast Ratio		CR	250	400	-	-	At optimized viewing angle
Colour Chromaticity	White	Wx	0.25	0.30	0.35	-	Θ=0° Φ=0°
		Wy	0.28	0.33	0.38	-	Θ=0° Φ=0°
Viewing Angle	Hor.	Θ	60	70	-	Deg.	CR≥10
	Ver.	Φ	60	70	-	Deg.	CR≥10
Brightness		-	300	350	-	cd/m^2	Center of Display
LED Backlight Lifetime		-	10,000	20,000	-	Hours	50% of brightness @ 25°C

*applied to the screen's characteristics, excluding Touch panel.

MECHANICAL DRAWING METALLISED PROJECTIVE CAPACITIVE TOUCH

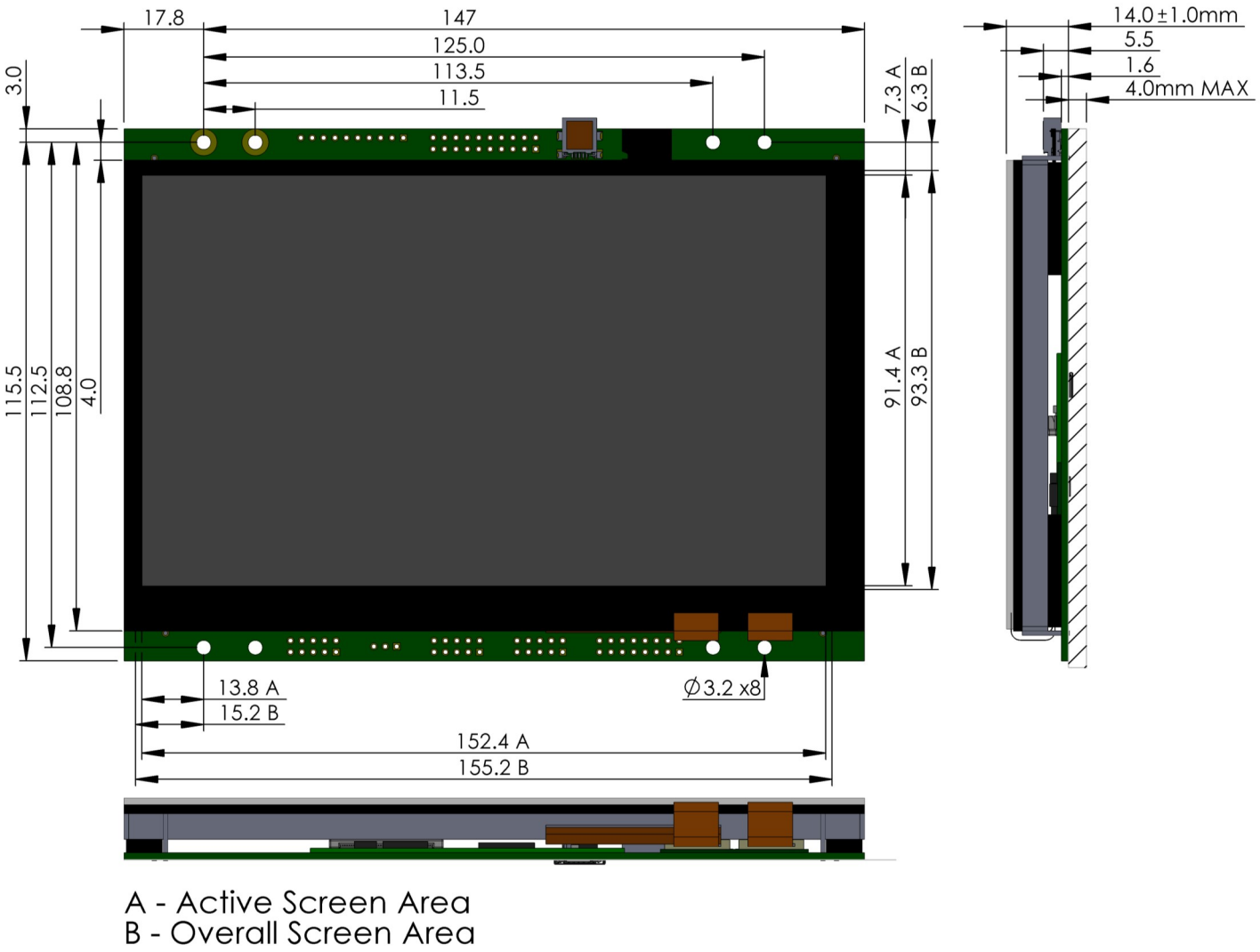

Figure 2 – TW800x480C-K619SE4R2MU Mechanical drawing. Reference dimensions only.

All the dimensions above are in mm, with a tolerance of ± 0.1mm unless stated otherwise. When an EMI filter glass is fitted, the overall thickness of the module increases by 1.0mm. The mounting pins connect the TFT panel frame to the PCB for placement accuracy, shielding and fixing.

For 3D CAD drawings, please refer to the website at www.itrontft.com.

MECHANICAL DRAWING RESISTIVE TOUCH

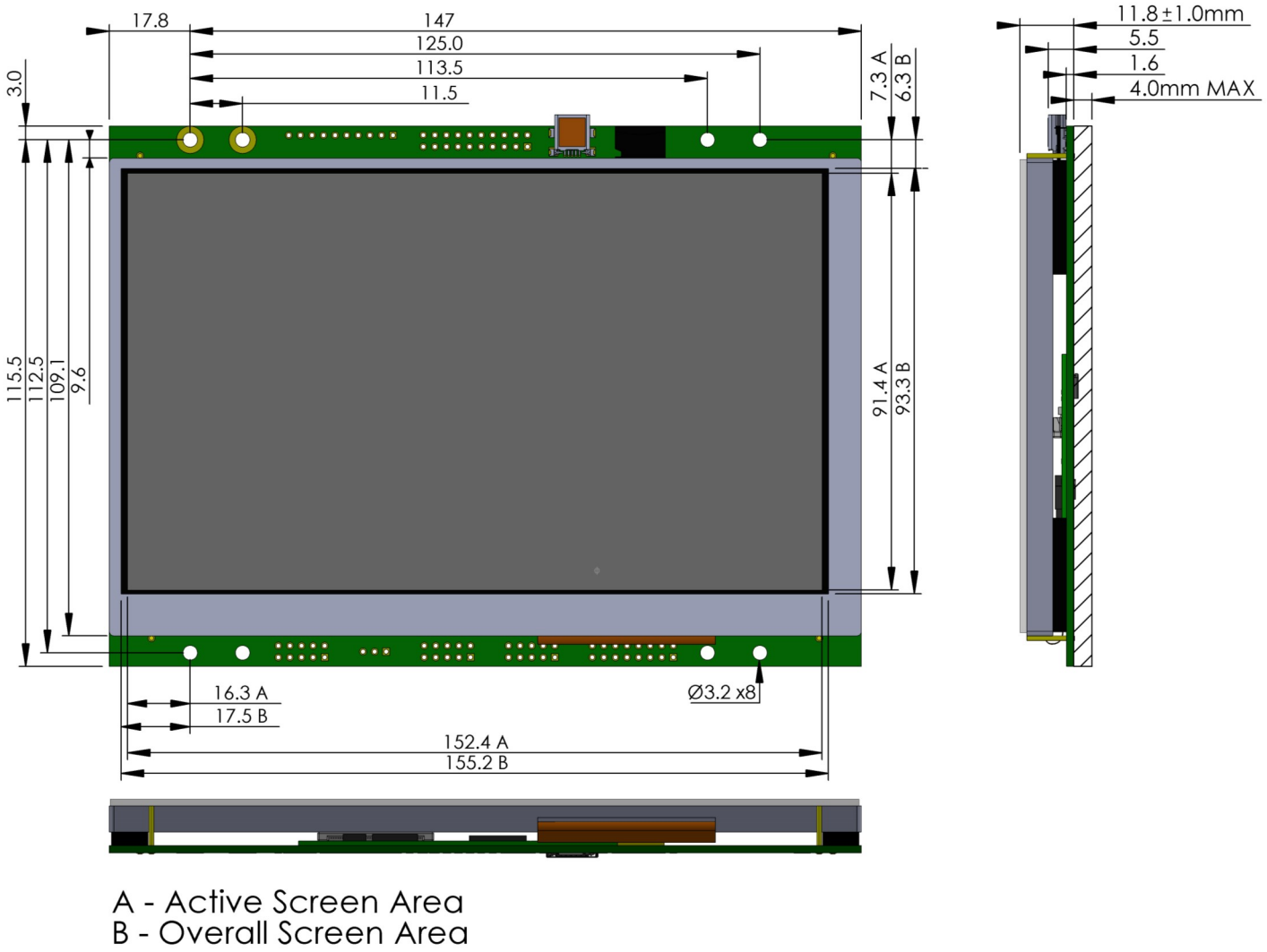

Figure 3 – TW800x480C-K619SE4R2RU Mechanical drawing. Reference dimensions only.

All the dimensions above are in mm, with a tolerance of ± 0.1mm unless stated otherwise. When an EMI filter glass is fitted, the overall thickness of the module increases by 1.0mm. The mounting pins connect the TFT panel frame to the PCB for placement accuracy, shielding and fixing.

For 3D CAD drawings, please refer to the website at www.itrontft.com.

MECHANICAL DRAWING NO TOUCH

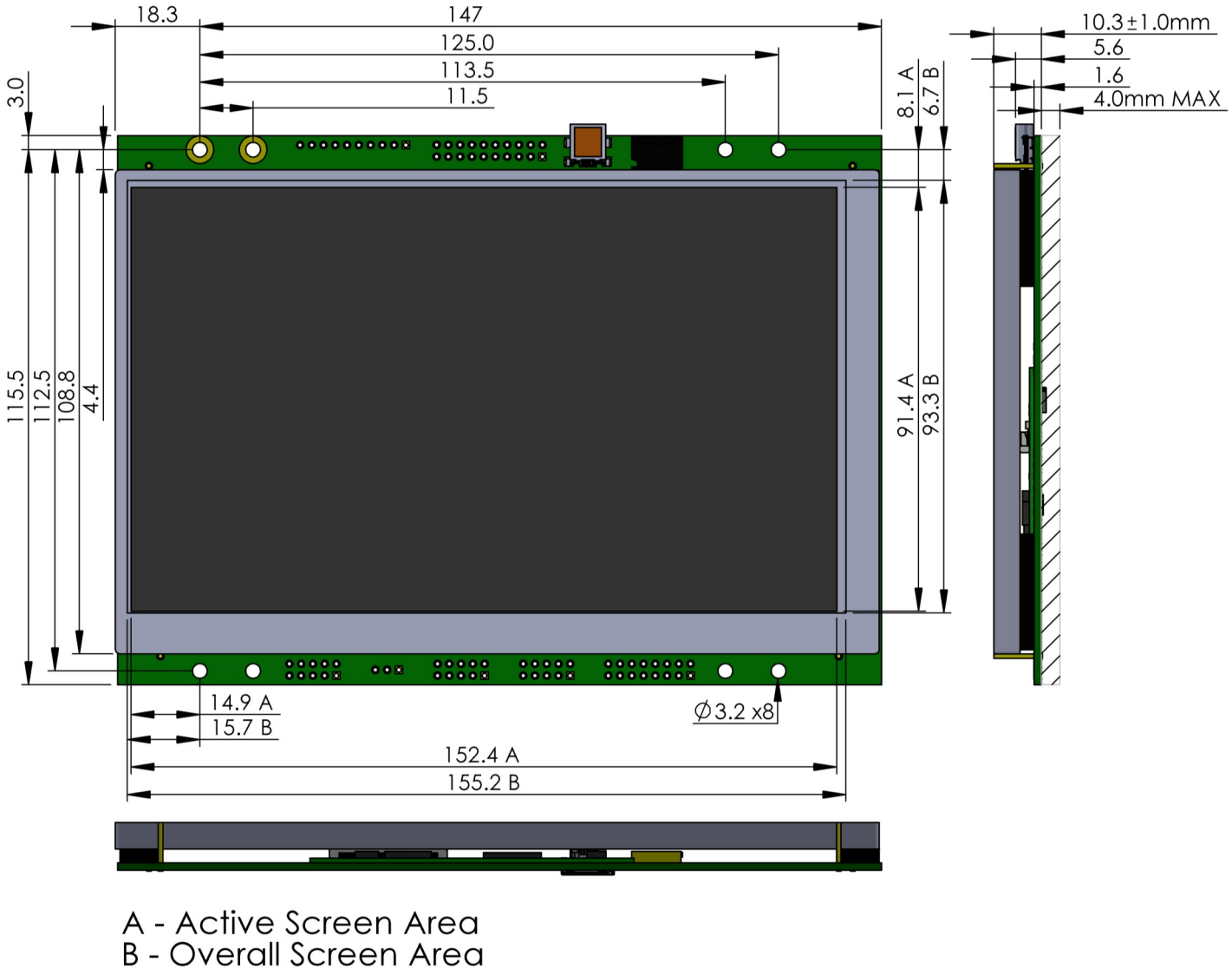

Figure 4 – TW800x480C-K619SE4R2NU Mechanical drawing. Reference dimensions only.

All the dimensions above are in mm, with a tolerance of ± 0.1mm unless stated otherwise. When an EMI filter glass is fitted, the overall thickness of the module increases by 1.0mm. The mounting pins connect the TFT panel frame to the PCB for placement accuracy, shielding and fixing.

For 3D CAD drawings, please refer to the website at www.itrontft.com.

CONNECTOR LOCATION AND FUNCTION

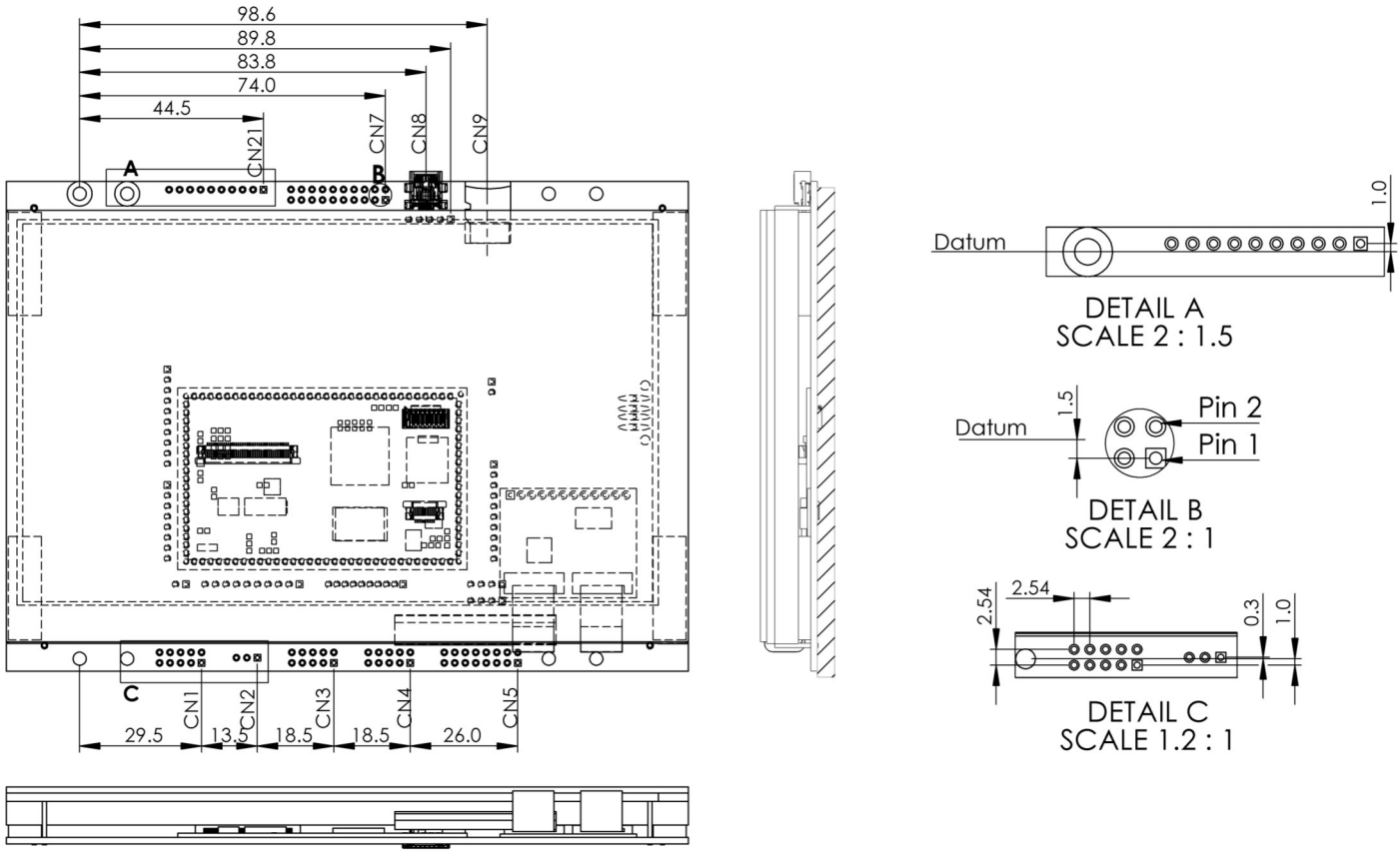

Figure 5- TW800x480C-K619SE4R2MU Connector Location drawing. Reference dimensions only.
Note: RU and NU connector locations are the same as the image above.

CN1: RS232, RS485, RS422 *, PWM, IO Ports

The RS232 interface has a maximum baud rate of 250K bits per second subject to inter-connection. The interface buffer IC provides a limited negative and positive supply (-3V, +7V) suitable for short distance, low load applications. The baud rate, data orientation, stop bits, handshaking, buffer size and associated interrupts can be configured by the firmware. CTS and RTS can be selected depending on the required handshaking method. RS485 can be used at the same time as RS232 RXD/ TXD/CTS/RTS. The Tx/Rx lines are high impedance when not used. Care must be taken not to exceed the maximum loading of 8 devices per line. Please consult us if a higher loading is required. Line termination should be external.

Please note that the RS422 interface is an option, an extra transceiver IC has to be fitted on the carrier board and extra links are required for its full functionality.

Please refer to CN4 and CN7 for PWM and GPIO ports definitions respectively.

Pin	Signal	Function
1	TxRx+, Tx+*, PWM1	RS485 TxRx+ or RS422 Tx+ – transmit positive (* only for RS422 option) or PWM1 output
2	NC, Rx-*	No connection or RS422 Rx- – receive negative (* only for RS422 option)
3	TXD	RS232 transmit output
4	CTS	RS232 flow control input
5	RXD	RS232 receive input
6	RTS	RS232 flow control output
7	NC, Rx+*	No connection or RS422 Rx+ – receive positive (* only for RS422 option)
8	TxRx-, Tx-*, PWM0, K31	RS485 TxRx- or RS422 Tx- – transmit negative (* only for RS422 option) or PWM0 output or K31 user GPIO
9	GND	0V
10	Vcc1.0	Fused 5-9Vin (When J47 is soldered)

CN2: POWER, BUZZER, PWM, I2C1 DATA

This connector is ideal to be used as a power source due to the protection provided by the fuse.

Pin 2 on CN2 is dedicated to the IDevOS command (BUZZ) allowing 3V3 piezoelectric buzzers to be directly controlled by software.

Please refer to CN4 and CN3 for PWM and I2C definitions respectively.

Pin	Signal	Function
1	Vcc1.0	Fused 5-9Vin
2	PWM1 (BUZZ), I2C1-SDA	PWM 1 output (BUZZER) or I2C1 SDA data
3	GND	0V

CN3: AS1, I2C1, IO Ports

The TW Series has three asynchronous interfaces: AS1, AS2 and AS3.
The asynchronous logic level (3V3) interfaces have a maximum baud rate of 250K per second subject to application.
The baud rate, data orientation, stop bits, handshaking, buffer size and associated interrupts can be configured by the firmware.
AS1 output MB - Module Busy and input HB - Host Busy support hardware handshaking between master and slave.

The I2C is a standard two-wire serial interface used to connect the chip with peripherals or host controllers.
This interface provides a standard bit rate up to 100 kbps, and a fast bit rate up to 400 kbps I2C connection to multiple devices with the chip acting in either I2C master or I2C slave mode.

Please refer to CN7 for IO ports definition.

Pin	Signal	Function
1	VIO*, Vcc2	VIO* or 3V3 out depending on jumper J27 (VIO*: 1-2; 3V3: 2-3)
2	K24, I2C1-SCL	I2C1 SCL clock or K24 user GPIO
3	AS1-RX, K25, CAN0 TX	AS1 serial input or K25 user GPIO or FlexCAN0 TX
4	K26, I2C1-SDA	I2C1 SDA data or K26 user GPIO
5	GND	0V
6	/IRQ1, K27	/IRQ1 interrupt request or K27 user GPIO
7	AS1-TX, K28, CAN0 RX	AS1 serial output or K28 user GPIO or FlexCAN0 RX
8	/RESET	Master reset - active LOW
9	AS1-RTS, K29, CAN1 RX	AS1 request to send flow control or K29 user GPIO or FlexCAN1 RX
10	AS1-CTS, K30, CAN1 TX	AS1 clear to send flow control or K30 user GPIO or FlexCAN1 TX

*Voltage IN/OUT

CN4: ADC, PWM, SAIF, IO Ports

There are 7 PWM outputs available that can be used by the user. The polarity (on/off), cycle time in microseconds (160Hz-1MHz), duty in percentage. (0-100) and pre-scale value of (1, 2, 4, 8, 16, 64, 256, 1024), the default is 1.

Please refer to CN19, CN16, and CN7 for ADC, SAIF and IO ports definition respectively.

Pin	Signal	Function
1	ADC1	ADC 1 input
2	ADC6	ADC 6 input
3	GND	0V
4	VIO, Vcc2	VIO or 3V3 out depending on jumper J26 (VIO: 1-2; 3V3: 2-3)
5	PWM4, K18	PWM 4 output or K18 user GPIO
6	PWM3, K19	PWM 3 output or K19 user GPIO
7	SA-D0, PWM6, K20	SAIF Data0 or PWM 6 output or K20 user GPIO
8	SA-BITCLK, PWM5, K21	SAIF BITCLK or PWM 5 output or K21 user GPIO
9	SA-LRCLK, PWM 4, K22	SAIF LRCLK or PWM 4 output or K22 user GPIO
10	SA-MCLK, PWM 3, K23	SAIF MCLK or PWM 3 output or K23 user GPIO

CN5: USB0, SDHC Expansion

The USB0 element provides high-performance host functionality (up to 480 Mbps), compliant with the USB 2.0 specification. The element has DMA capabilities for handling data transfer between internal buffers and system memory. The jumper J55 (Host) can be used to allow the USB0 host to supply power to the device.

Please refer to CN9 for SDHC definition.

Pin	Signal	Function
1	SD0-DA2	SD Card data 2
2	SD0-DA3	SD Card data 3
3	SD0-CDA	SD Card command
4	Vcc2	3V3 out
5	SD0-CK	SD0 clock enabled via jumper J22
6	GND	0V
7	SD0-DA0	SD Card data 0
8	SD0-DA1	SD Card data 1
9	GND	0V
10	SD0-CD	SD Card detect
11	GND	0V
12	Vcc1.2	Regulated 5V out for Host USB1
13	USB1-	USB1 Host data-
14	USB1+	USB1 Host data+
15	NC	Not connected
16	GND	0V

CN7: FlexCAN, IO Ports

There are two FlexCAN implementations CAN0 and CAN1 requiring just an external interface buffer IC. The Controller Area Network
(CAN) protocol is a message based protocol used for serial data. It was designed specifically for automotive but is also used in industrial control and medical applications. The FlexCAN module is a full implementation of the CAN protocol specification, Version 2.0B, which supports both standard and extended message frames. The Message Buffers are stored in an embedded RAM dedicated to the FlexCAN module. The serial clock can be set from 10 kbps to 1Mbps.

Many GPIO ports have dual or triple functions as a general purpose logic level inputs/outputs or a fixed function interface. During reset and power on the GPIO ports can have a *floating* state, hence it is imperative to provide an inverting circuit to ensure a low condition where required.

Pin	Signal	Function
1	Vcc1.1, Vcc1.2	Unfused 5-9Vin or regulated 5V out depending on jumper J55 (device: 1-2; host: 2-3)
2	GND	0V
3	Vcc2	3V3 out
4	GND	0V
5	K0	K0 user GPIO
6	K1	K1 user GPIO
7	K2, CAN1TX	K2 user GPIO or FlexCAN1 transmit output
8	K3, CAN1RX	K3 user GPIO or FlexCAN1 receive input
9	K4, CAN0TX	K4 user GPIO or FlexCAN0 transmit output
10	K5, CAN0RX	K5 user GPIO or FlexCAN0 receive input
11	K6	K6 user GPIO
12	K7	K7 user GPIO
13	K8	K8 user GPIO
14	K9	K9 user GPIO
15	K10	K10 user GPIO
16	K11	K11 user GPIO
17	K12	K12 user GPIO
18	K13	K13 user GPIO
19	K14	K14 user GPIO
20	K15	K15 user GPIO

CN8: USB0

See CN5 USB0 definition.

Pin	Signal	Function
CN8	MINI USB	MINI TYPE B USB Socket for USB0 host/device depending on jumper J55 (device:1-2; host:2-3)

CN9: SDHC0

The module supports micro SD card storage devices up to 32 GB.

Pin	Signal	Function
CN9	MICRO SD CARD	MICRO SD Card Socket for SDHC0

CN15: USB0 HOST

See CN5 for USB Host definition

Pin	Signal	Function
1	Vcc1.1, Vcc1.2	Unfused 5-9Vin or regulated 5V out depending on jumper J55 (device: 1-2; host: 2-3)
2	USB0-	USB data-
3	USB0+	USB data+
4	USB0 ID	USB0 Host / Device selector
5	GND	0V

CN16: SAIF, AS3, PWM, I2C1, IO Ports

SAIF provides a half-duplex serial port for communication with a variety of serial devices, including industry-standard codecs and DSPs. It supports a continuous range of sample rates from 8 kHz–192 kHz using a high-resolution fractional divider driven by the PLL. The APBX DMA interface, a FIFO service interrupt, or software polling is used to transfer data in the FIFO pipe-line.

Please refer to CN3, CN4 and CN7 for AS3, PWM, IC2, and IO ports definition respectively.

Pin	Signal	Function
1	SA-D1, PWM7	SAIF data 1 or PWM 7 output
2	SA-D0, PWM6, K20/AS3-TX	SAIF data 0 or PWM 6 output or K20 user GPIO or AS3 serial output
3	SA-BITCLK, PWM5, K21, AS3-RX	SAIF BITCLK or PWM 5 output or K21 user GPIO or AS3 serial input
4	SA-LRCLK, PWM4, K22	SAIF LRCLK or PWM 4 or K22 user GPIO
5	SA-MCLK, PWM3, K23	SAIF MCLK or PWM 3 or K23 user GPIO
6	GND	0V
7	Vcc1.2	Regulated 5V out
8	I2C1 SDA, K26	I2C1 SDA data or K26 user GPIO
9	I2C1 SCL, K24	I2C1 SCL clock or K24 user GPIO
10	NC	Not connected

CN17: SPI, PWM2 BL, IO Ports

Two SPI interfaces are available: SPI2 and SPI3. The maximum bit rate is 250K bits per second subject to inter-connection. The order of data bits and the rising or falling edge of clock can be defined in software. Internal display receive / transmit logic is reset and resynchronized on the rising edge of /SS. Data is clocked into input MOSI and out of output MISO simultaneously on the software selected edge of SCK.
The MB port can be enabled to signal the module is busy. In master mode the /SS or other GPIO ports can be software configured as slave select to interface to multiple devices. Data is clocked out of output MOSI and in to input MISO simultaneously on the software selected edge of SCK.

The PWM output on this connector is used for backlight control.

Please refer to CN4, CN7 for PWM and IO ports definition respectively.

Pin	Signal	Function
1	GND	0V
2	SP13-CLK	SPI3 clock
3	SP13-MOSI	SPI3 MOSI data
4	SP13-MISO	SPI3 MISO data
5	K16, SPI3-/SS0	SPI3 Slave Select /SS0 or K16 user GPIO
6	K17, SPI2-/SS1	SPI2 Slave Select /SS1 or K17 user GPIO
7	SPI2-/SS2	SPI2 Slave Select /SS2
8	PWM2-BL	PWM 2 for backlight dimming control by default
9	Vcc1.0	Fused 5-9Vin
10	GND	0V

CN18: BATT, PSWITCH, WDOG, RES

At POWER ON the internal and external 3V3 supply will rise in <20ms to supply the CPU and peripheral circuits.
On /RESET, the peripheral supply is disconnected until 3V3 OUTPUT is enabled.
The watchdog and brownout protection are internal functions of the CPU but an external supervisor can also be used.

Pin	Signal	Function
1	GND	0V
2	Vcc2	3V3 out
3	PSWITCH	Internal use only
4	WDOG	Watchdog strobe output
5	Do not connect	Factory use only
6	/RESET	Master reset - active LOW
7	Vcc1.1	Unfused 5-9Vin
8	GND	0V

CN19: ADC, RS485-DIR

The ADC reference voltage is connected to the 3V3 supply. The ADCs have a 12 bit resolution producing conversion values of between 0 for 0V and 4095 for 3V3 with a tolerance of 5. Since the value at 0V may not be 0, it is important to take this into consideration when designing your analogue interface circuit if a zero value is important. The maximum sample rate is 428kHz and is available for processing according to the firmware configuration. Calibration values can be retained in the host and stored in the on board EEPROM.

Pin	Signal	Function
1	GND	0V
2	ADC2	ADC 2 input / Touch
3	ADC3	ADC 3 input / Touch
4	ADC4	ADC 4 input / Touch
5	ADC5	ADC 5 input / Touch
6	EN3V3	Enable line for additional external 3V3 regulator
7	DIR-485	RS485 direction control
8	GND	0V

CN20: USB1 (HOST)

The controller operates as host-only high-speed USB controller. The system also has USB Mass Storage Device, USB HID keyboard, mouse and barcode scanner support.

Pin	Signal	Function
CN20	USB	USB Socket for USB1 (Host)

CN21: ETHERNET

The Ethernet controller (ENET) consists of two MACs (media access controllers), each with its own dedicated uDMA (unified DMA) module. The MAC module is third party IP from "More Than IP" (MTIP). The MACs interface to 10 Mbps and 100 Mbps Ethernet/IEEE 802.3™networks. MAC0 is provided on the SOM (PN28) as standard. MAC1 is provided as custom for external PHY.
The interface can be connected to an RJ45 connector with integrated magnetics on the carrier board and status LEDs to provide other data communications over the local network and internet.

Pin	Signal	Function
1	Vcc2	3V3 out
2	GND	0V
3	NC	No connection
4	ENET-LRX+	Magnetic Ethernet LRX+ – receive positive
5	ENET-LRX-	Magnetic Ethernet LRX- – receive negative
6	ENET-LTX+	Magnetic Ethernet LTX+ – transmit positive
7	ENET-LTX-	Magnetic Ethernet LTX- – transmit negative
8	NC	No connection
9	ENET-LED1	Ethernet LED1
10	ENET-LED2	Ethernet LED2

CN22: AS2, I2C0, SPI2

Please refer to CN3 for AS2, I2C definitions and CN17 for SPI.

Pin	Signal	Function
1	AS2-RX	AS2 serial input
2	AS2-TX	AS2 serial output
3	I2C0-DA	I2C0 SDA data
4	I2C0-CK	I2C0 SCL clock
5	GND	0V
6	AS1 TX, SPI2-/SS0	SPI2 Slave Select /SS0 or AS1 serial output
7	AS1 RX, SPI2-MISO	SPI2 MISO data or AS1 serial input
8	AS2 TX, SPI2-MOSI	SPI2 MOSI data or AS2 serial output
9	AS20-RX, SPI2-CLK	SPI2 SCK clock or AS2 serial input
10	Vcc2	3V3 out

CN23: ADC0

Please refer to CN19 for ADC definition.

Pin	Signal	Function
1	NC	NC
2	NC	NC
3	ADC0	ADC 0 input
4	GND	0V

DB1: DEBUG, PWM, I2C1 SCL

This port should be reserved for debugging purposes. DB1 is an asynchronous port that shares characteristics with CN3. The main differences being the lack of hardware handshaking and the boot information given out by this port when the device is turned on.
Please refer to CN4 for PWM definition.

Pin	Signal	Function
1	Vcc2	3V3 out
2	DBG TX, PWM1	DBG transmit output or PWM 1 output
3	DBG RX, PWM0, I2C1 SCL	DBG receive input or PWM 0 output or I2C1 clock
4	GND	0V

J1: SDHC1

Please refer to CN9 for SDHC definition.

Pin	Signal	Function
J1	MICRO SD CARD	MICRO SD Card Socket for SDHC1

J2: eMMC NAND

The on-board eMMC offers 4GB of Flash memory for the user.

Pin	Signal	Function
J2	eMMC NAND	Access to eMMC NAND

JUMPER SETTINGS

Name	Description	Function
J6	VIO selection; CN7-1: 5-9Vin, 5V out	5-9Vin, 5V out selector for CN7-1: 1-2 for 5-9Vin, 2-3 for 5V out
J10, J11, J12, J14	Boot Mode	Internal boot selection, do not change
J21	BL Control Option	BL control: disabled BL no links, 1-2 for PWM2 control, 2-3 for force on
J22	CN5-5: SD0-CK	Solder this jumper to enable SD0 clock in pin CN5-5
J26	CN4-4: VIO, Vcc2	VIO, 3V3 out selector for CN4-4: 1-2 for VIO, 2-3 for 3V3 out
J27	CN3-1: VIO, Vcc2	VIO, 3V3 out selector for CN3-1: 1-2 for VIO, 2-3 for 3V3 out
J31	BL Current Doubler	Internal setting, do not change
J32	BL Voltage Booster	Internal setting, do not change
J47	CN1-10: fused 5-9Vin	Solder this jumper for fused 5-9Vin for pin CN1-10
J49	USB Screen	USB Screen, Default: not connected
J52	Chassis to signal ground	Chassis to signal ground connection, Default: not connected
J55	USB0: Device/Host	5-9Vin or 5V out selector for USB0: 1-2 for 5V out (Device), 2-3 for Vin (Host)

USB CAPABILITIES

The USB port can be utilised for HID mouse, keyboard, barcode reader and it has USB device mass storage and serial support. For example applications and usage please refer to the website at www.itrontft.com.

HID Mouse

The mouse appears as an additional touch interface in iDevOS and will act the same as a touch screen, moving the TOUCHX and TOUCHY coordinates and the left mouse button will trigger touch key presses. Attachment/detachment status of the mouse can be setup for monitoring in iDevOS.

Please note the following restrictions apply:

- Only HID "boot protocol" mice are supported
- Only Left Hand Mouse button is supported; equivalent to "touchscreen presses"
- Scroll wheels are not supported

HID Keyboard

The keyboard appears as a serial port in iDevOS. Special keys such as ALT, CTRL, SHIFT and function keys (F1-F12) can be configured such that it triggers an action when it's pressed (i.e. acts like "interrupts").

Please note the following restrictions apply:

- Only HID "boot protocol" keyboards are supported

HID Barcode Reader

The barcode reader appears as a serial port in iDevOS. In iDev, the code is converted to ASCII characters followed by a terminator character (e.g. CR and/or LF). Interrupts can be configured for each read and process data and execute functions as required.
Please note the following restrictions apply:

- Only HID "boot protocol" barcode readers are supported – same driver as USB keyboard is used

USB Device Mass Storage and Serial

In iDev, both USB device mass storage class (drive) and CDC (serial) are supported. All the USB configurations can be changed in iDev such as device mode (CDC-serial or MSD-drive) and initial USB mass storage drive (SDHC or RAM Disk). Please note that it is not possible to access the EMMC drive directly; for security reasons and to prevent accidental overwriting of data. The user should use the RAM disk (RAMD) as an intermediary drive.

METALLISED PROJECTIVE CAPACITIVE TOUCH PANEL

The projective capacitive touch panel uses two pieces of glass, 'X' electrodes on one, 'Y' electrodes on another. These are 'sandwiched' together with insulation between. The touch panel controller scans the X electrodes and measures capacitance effects on the Y electrodes. An EMI filter window can be mounted between the TFT and the touch to prevent TFT scan interference.

The module works with up to 8mm glass or 4mm plastic on top with no optical bonding required. Please note that the distances mentioned include air gap.

The firmware can adjust touch parameters, such as, de-bounce sensitivity and auto-calibrates the touch screen at power on.

Proximity of the touch panel or flexi-cable to metal parts may cause interference; ensure that the front glass cover is larger than the touch panel.

RESISTIVE TOUCH PANEL

The resistive touch panel uses a glass substrate with ITO coating and micro spacers to separate an overlay also coated with ITO.

Conductive bars on each layer allow an X and Y voltage to be applied across each layer in turn while the other layer is connected to ADC inputs to measure the potential difference where a touch occurs. The firmware can adjust sample rate, de-bounce and acceptance area. Use a neoprene or silicon gasket between the enclosure front panel and the touch panel to prevent false touches.

The touch panel ADC inputs can be externally connected via CN19 as ADC2-ADC5 or via FPC connector CN26

TW800x480C-K619SE4R2MU PRODUCT IMAGE

Front View

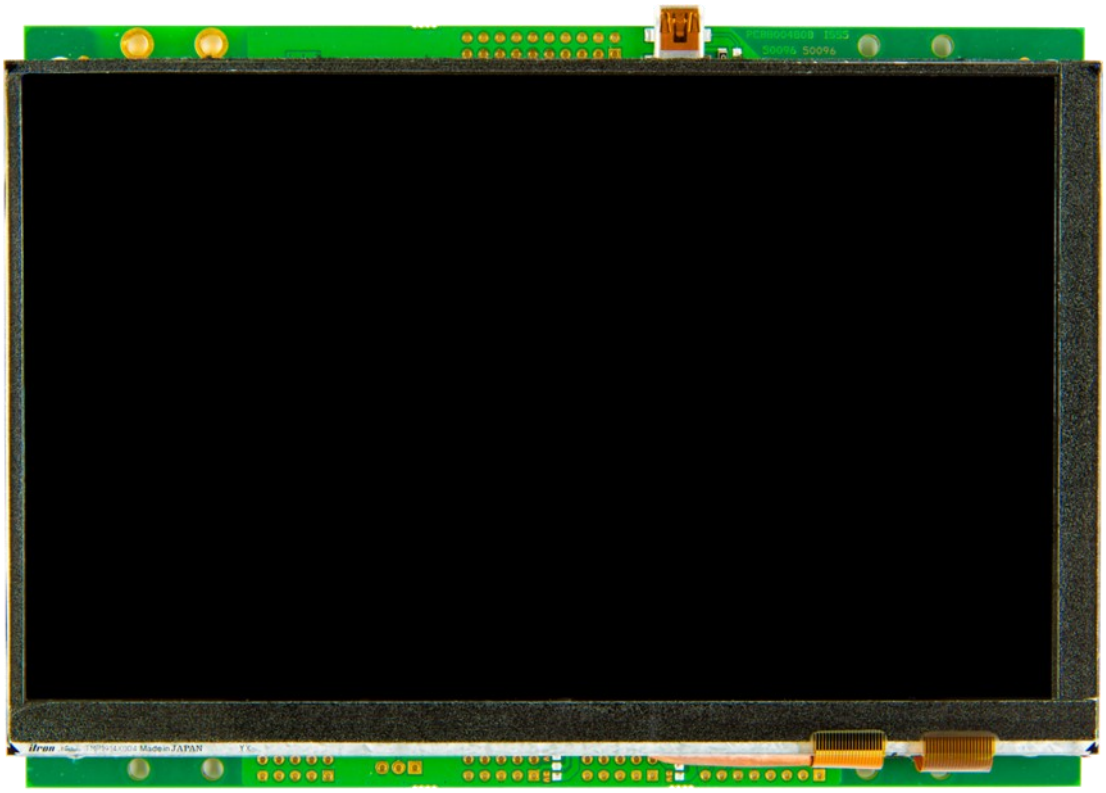

Figure 6 - TW800x480C– K619SE4R2MU Front View

Rear View

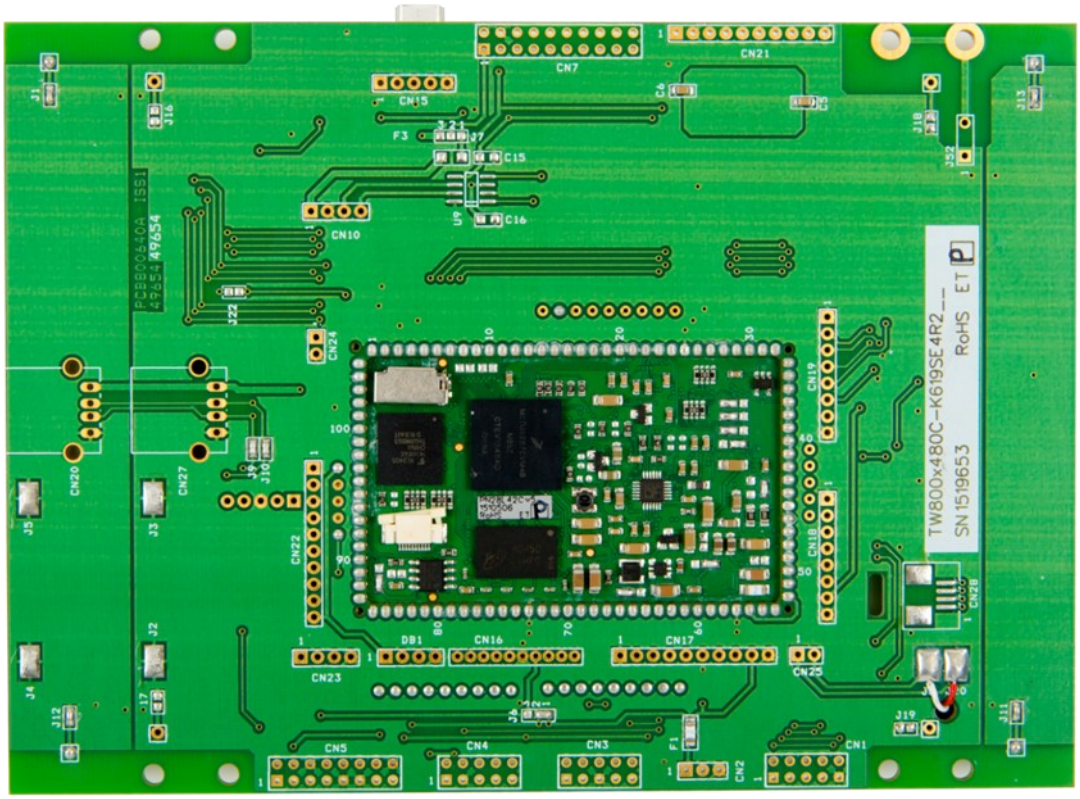

Figure 7 - TW800x480C– K619SE4R2MU Rear View

TW800x480C-K619SE4R2RU PRODUCT IMAGE

Front View

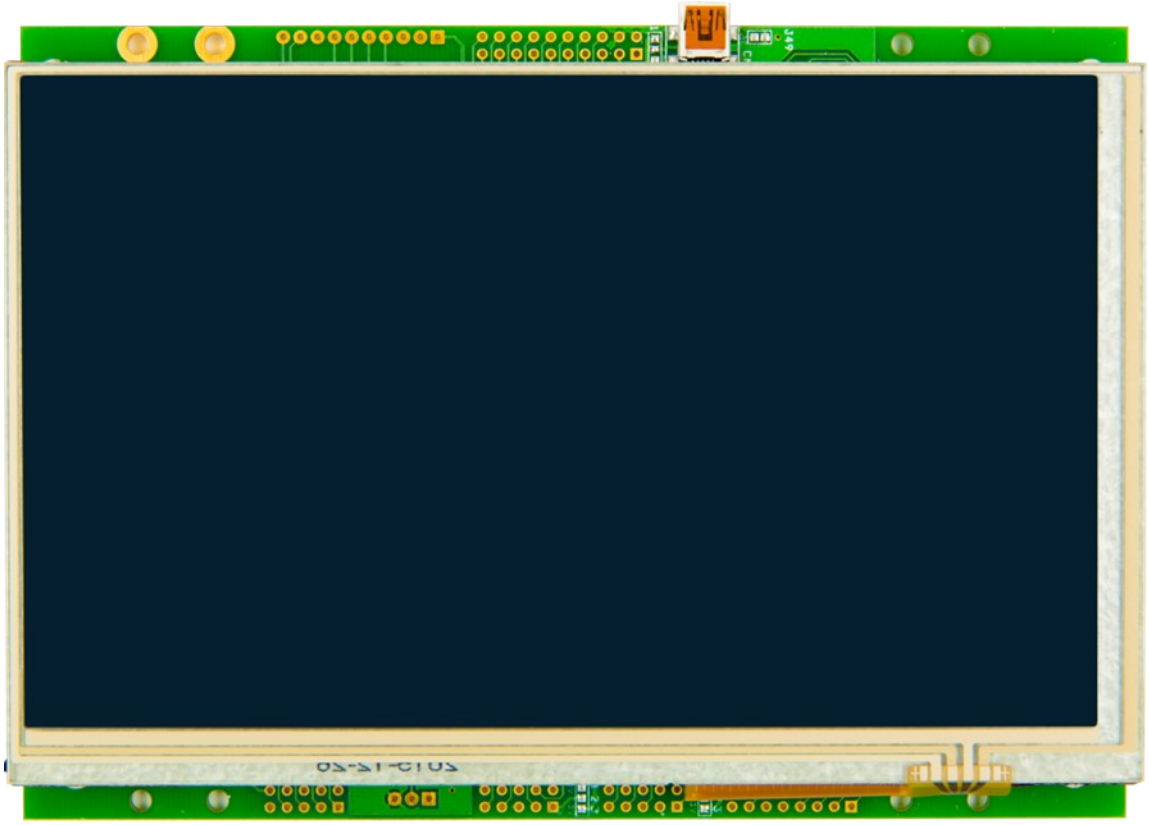

Figure 8 - TW800x480C– K619SE4R2RU Front View

Rear View

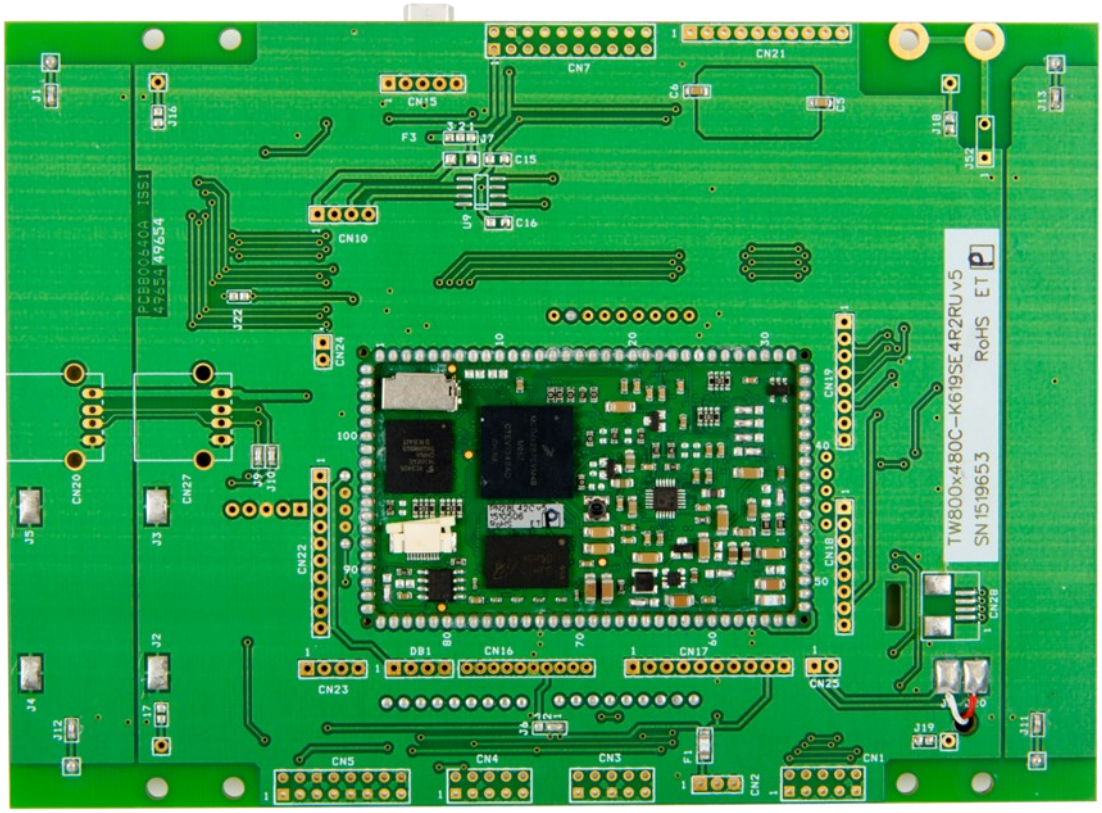

Figure 9 - TW800x480C– K619SE4R2RU Rear View

TW800x480C-K619SE4R2NU PRODUCT IMAGE

Front View

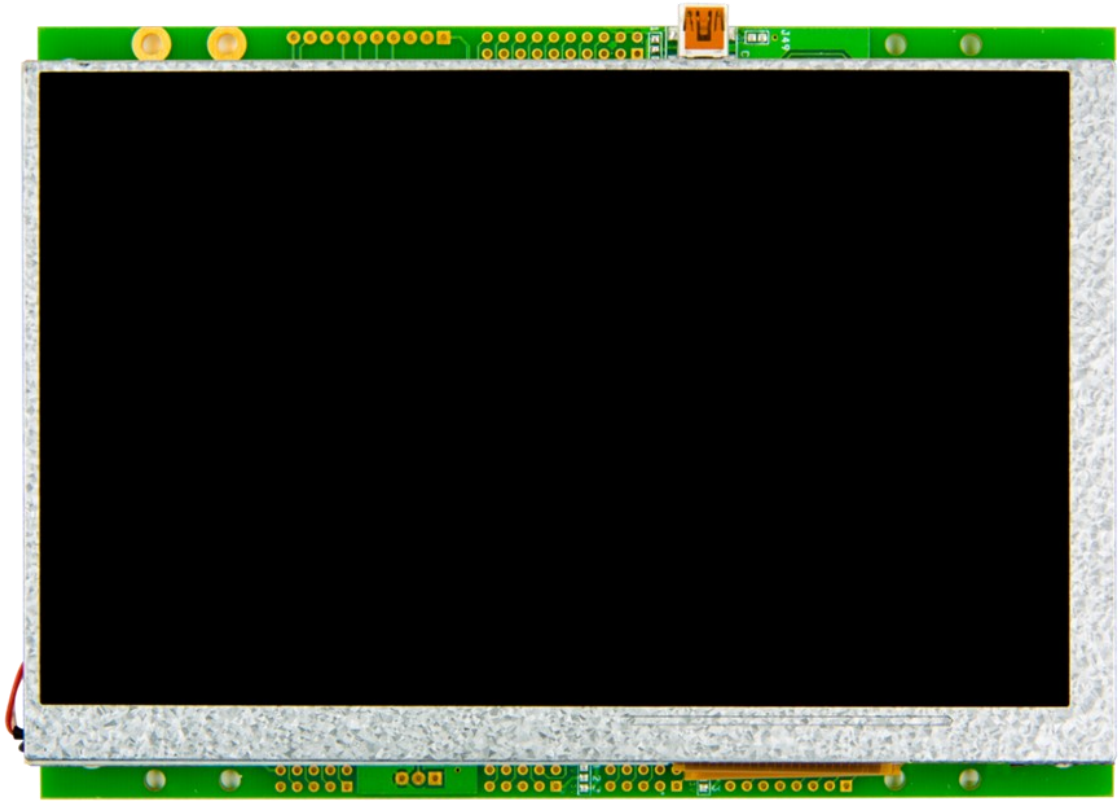

Figure 10- TW800x480C– K619SE4R2NU Front View

Rear View

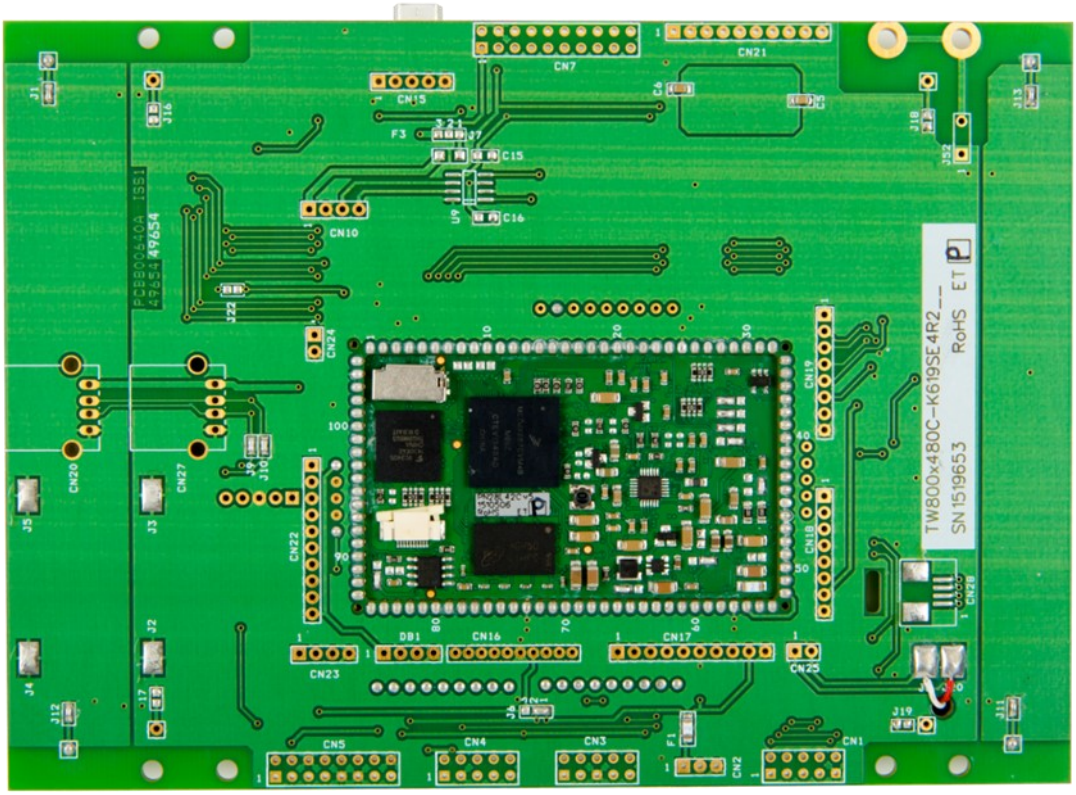

Figure 11 - TW800x480C– K619SE4R2NU Rear View

CONNECTOR ASSIGNMENT

PIN	SIGNAL	PIN	SIGNAL
CN1: RS232, RS422[*1], PWM, IO Ports			
1	TxRx+, Tx+[*1], PWM1	2	NC, Rx-[*1]
3	TXD	4	CTS
5	RXD	6	RTS
7	NC/Rx+[*1]	8	TxRx-, Tx-[*1], PWM0, K31
9	GND	10	Vcc1.0[*2]
CN2: POWER, PWM BUZZ, I2C1 SDA			
1	Vcc1.0	2	PWM1 (BUZZ), I2C1 SDA
3	GND		
CN3: AS1, I2C1, IO Ports			
1	VIO, Vcc2[*3]	2	K24, I2C1-SCL
3	AS1-RX,K25,CAN0,TX	4	K26, I2C1-SDA
5	GND	6	/IRQ1, K27
7	AS1-TX,K28,CAN0,RX	8	/RESET
9	AS1-RTS,K29,CAN1, RX	10	AS1-CTS, K30, CAN1 TX
CN4: ADC, PWM, SAIF, IO Ports			
1	ADC1	2	ADC6
3	GND	4	VIO, Vcc2[*4]
5	PWM4, K18	6	PWM3, K19
7	SA-D0, PWM6, K20	8	SA-BITCLK, PWM5, K21
9	SA-LRCLK, PWM4, K22	10	SA-MCLK, PWM3, K23
CN5: USB, SDHC Expansion			
1	SD0-DA2	2	SD0-DA3
3	SD0-CDA	4	Vcc2
5	SD0-CK	6	GND
7	SD0-DA0	8	SD0-DA1
9	GND	10	SD0-CD
11	GND	12	Vcc1.2
13	USB1-	14	USB1+
15	NC	16	GND
CN7: FlexCAN, IO Ports			
1	Vcc1.1/Vcc1.2[*5]	2	GND
3	Vcc2	4	GND
5	K0	6	K1
7	K2, CAN1TX	8	K3, CAN1RX
9	K4, CAN0TX	10	K5, CAN0RX
11	K6	12	K7
13	K8	14	K9
15	K10	16	K11
17	K12	18	K13
19	K14	20	K15
CN8: USB0			
Mini USB (USB0)*6			
CN9: SDHC0			
Micro SD Card Socket for SDHC0			
CN15: USB0			
1	Vcc1.1, Vcc1.2[*7]	2	USB0-
3	USB0+	4	USB0 ID
5	GND		
CN16: SAIF, AS3, PWM, I2C1, IO Ports			
1	SA-D1, PWM7	2	SA-D0, PWM6, K20,AS3-TX
3	SA-BITCLK, PWM5, K21, AS3-RX	4	SA-LRCLK, PWM4, K22
5	SA-MCLK, PWM3, K23	6	GND
7	Vcc1.2	8	I2C1 SDA, K26
9	I2C1 CLK, K24	10	NC

PIN	SIGNAL	PIN	SIGNAL
CN1: RS232, RS422[*1], PWM, IO Ports			
1	GND	2	SP13-CLK
3	SP13-MOSI	4	SP13-MISO
5	K16, SPI3-/SS0	6	K17, SPI2-/SS1
7	SPI2-/SS2	8	PWM2-BL
9	Vcc1.0	10	GND
CN18: BATT, PSWITCH, WDOG, RES			
1	GND	2	Vcc2
3	PSWITCH	4	WDOG
5	BATT	6	/RESET
7	Vcc1.1	8	GND
CN19: ADC, RS485-DIR			
1	GND	2	ADC2
3	ADC3	4	ADC4
5	ADC5	6	EV3V3
7	DIR-485	8	GND
CN20: USB1			
USB socket for USB1			
CN21: ETHERNET			
1	Vcc2	2	GND
3	NC	4	ENET-LRX+
5	ENET-LRX-	6	ENET-LTX+
7	ENET-LTX-	8	NC
9	ENET-LED1	10	ENET-LED2
CN22: AS2, I2C0, SPI2			
1	AS2-RX	2	AS2-TX
3	I2C0-DA	4	I2C0-CK
5	GND	6	SPI2 /SS0, AS1 TX
7	MISO2, AS1-RX, SP12-MISO	8	MOSI2, AS2-TX,SPI2 - MOSI
9	SCK2, AS2-RX, SPI2-CLK	10	Vcc2
CN23: ADC			
1	NC	2	NC
3	ADC0	4	GND
CN25: BACKLIGHT			
1	BLLED-A	2	BLLED-K
DB1: DEBUG			
1	Vcc2	2	DBG TX, PWM1
3	DBG,RX,PWM0,I2C1, SCL	4	GND
J1: SDHC1			
Micro SD Card Socket for SDHC1			
J2: eMMC NAND			
Access to eMMC NAND			

*1 - option;
*2 - when J47 soldered;
*3 - selectable via jumper J27 (5V: 1-2; 3V3: 2-3)
*4 - selectable via jumper J26 (VIO: 1-2; 3V3: 2-3);
*5 - selectable via jumper J7 (4-9Vin: 1-2; 5V: 2-3);
*6 - selectable via jumper J55 (device: 1-2; host: 2-3)
*7 - selectable via jumper J55 (device: 1-2; host: 2-3)
Vcc1.0 - fused 5-9Vin; Vcc1.1-unfused 5-9Vin;
Vcc1.2 - regulated 5V out; Vcc2-regulated 3V3 out;
VIO-Vcc1.1/Vcc1.2, selectable via J6 (Vcc1.0: 1-2; Vcc1.2: 2-3)