

MK-CY-043

4.3 Inch Capacitive Touch Display

January 2016
Revision C



Amulet
Technologies

DATASHEET

Introduction

The MK-CY-043 is a 4.3" fully integrated, production ready color module with smartphone-like features.

Compatible with GEMstudio™ for quick and easy GUI design, these production-ready units support GIF, JPEG, PNG, and more graphic formats in 24-bit color, plus 8-bit alpha blending (transparency channel) found in high-end consumer electronic products.

The MK-CY-043 has 256Mb (32Mx8) of SDR SDRAM for image caching, and 32Mb of serial data flash for code storage. The module has a 480 x 272 WQVGA TFT LCD with a capacitive touch panel.

Amulet's Graphical OS Chip™ handles all the graphics processing and control as well as the communication to a host controller.

Features

Module

- Amulet GEM Graphical OS Chip™ with Royalty-free Graphical Operating System™
- Operating Temperature: -20°C to 70°C
- On-Board Memory - 32 Megabit serial flash for storing GUI pages
- Color Supported- up to 24 bit plus 8 bit alpha channel
- Supports Unicode - Foreign language character sets

Display

- 480x272 TFT LCD
- 350 nit (cd/m²)
- Contrast Ratio: 450:1
- Viewing Angle: 6 o'clock (software controlled rotation)
- PWM controlled brightness

Touch Panel

- Projected capacitive touch (Cypress TrueTouch® Controller)

- Touch area exposed allowing for customized cover glass
- Multi-touch gestures

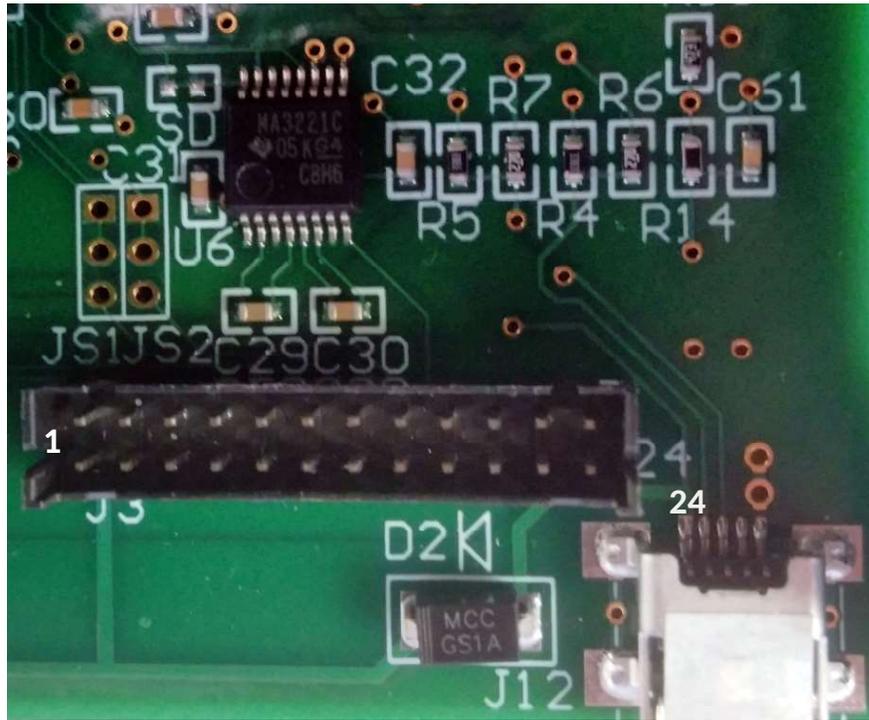
Communication Interfaces

- 1x UART-TTL
- 1x UART RS232
- 1x SPI with 2 Chip Selects
- 1x I2C
- 2x PWM
- USB 2.0 Device Interface

Power

- 5V DC (through USB or I/O header)

J3 Interface Connector



1	3	5	7	...	21	23
2	4	6	8	...	22	24

24 Pin I/O Socket - J3

Details	Description	Pins Number		Description	Details
Supply Voltage In	5 VDC IN	1	2	5 VDC IN	Supply Voltage In
Common Ground	GND	3	4	GND	Common Ground
I ² C - Serial Clock Line	I2C_SCL	5	6	I ² C_SDA	I2C - Serial Data Line
UART0 Receive	UART0_RXD	7	8	UART0_TXD	UART0 Transmit
Pulse Width Modulation Port 1	PWM1	9	10	PWM2	Pulse Width Modulation Port 2
Program Mode, Active Low	PROG_MODE ¹	11	12	PWM0	Pulse Width Modulation Port 0
RS-232 Transmit Port	RS232 TXD	13	14	T_CAL ¹	Touchpanel Calibration Active Low
UART1 Receive TTL levels	UART1_RXD	15	16	UART1_TXD	UART1 Transmit TTL levels
SPI - Chip Select 3	SPI_CS3	17	18	RS232 RXD	RS-232 Receive Port
SPI - Chip Select 2	SPI_CS2	19	20		
SPI - Master Input, Slave Output	SPI_MISO	21	22	SPI_SCLK	SPI - Serial Clock
System Reset, Active Low	RESET ¹	23	24	SPI_MOSI	SPI - Master Out, Slave In

Note 1: Internally Pulled Up

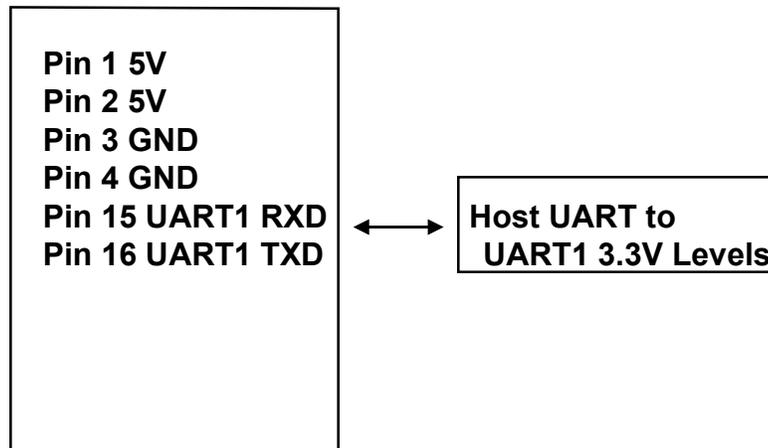
Header J3 24 pin, 2mm, Hirose DF-11-24DP-2DSA

Mating Connectors: Hirose DF11-24DS-2R26

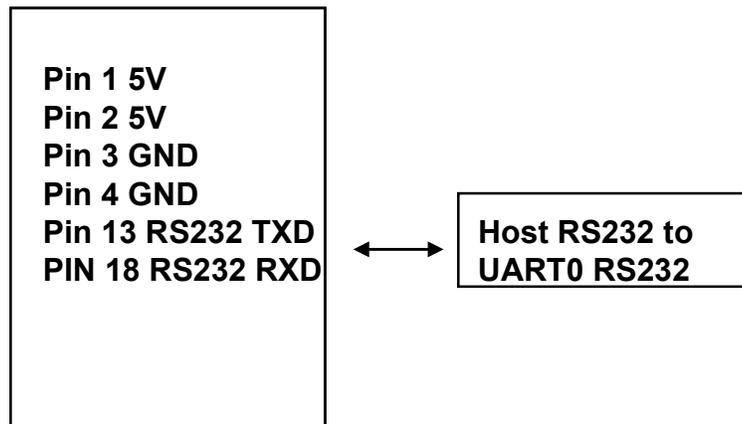
JST PHDR-24VS

UART Connections

For UART TTL-level Communication

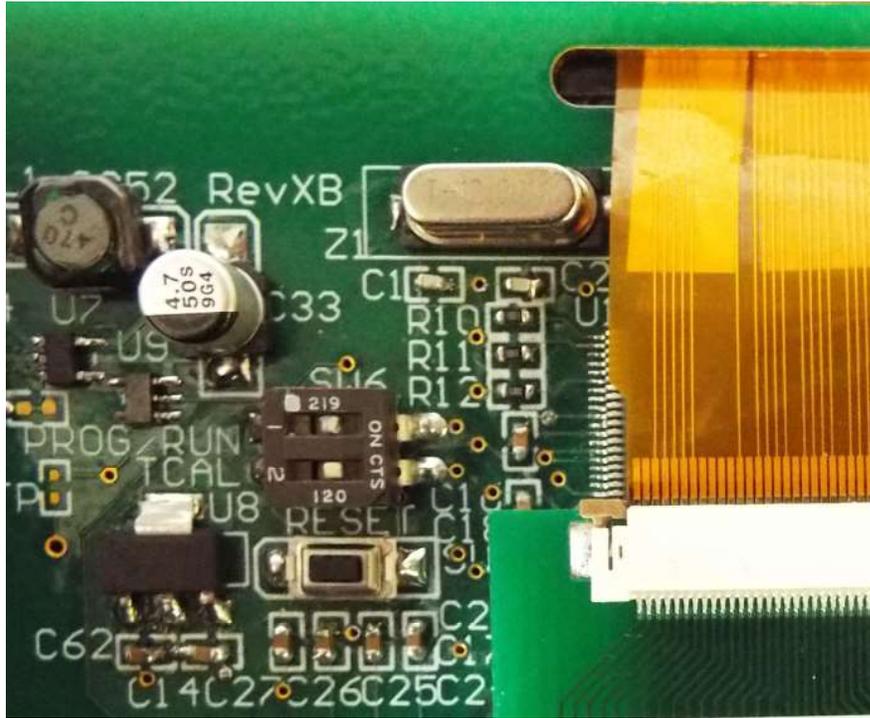


For UART RS232 Communication



Note: If RS232 is not required, the MK-CY-043 can be hardware configured to utilize UART0 as another TTL-level UART in addition to UART1. Please contact our support department at support@amulettechnologies.com for details. For I/O requirements through SPI or I²C, also contact Amulet's support department

SW6 DIP Switch



For normal operation the DIP switch remains in the default setting with switch 1 in the RUN position and switch 2 in the TCAL position. See figure above for the default settings.

During the development of GEMstudio Projects it is possible to place the module into a non responsive state. This is not uncommon, and is recoverable in the field with minimal effort. Please follow the following steps to recover the GEMmodule.

- 1 Disconnect the module from all USB and power connections.

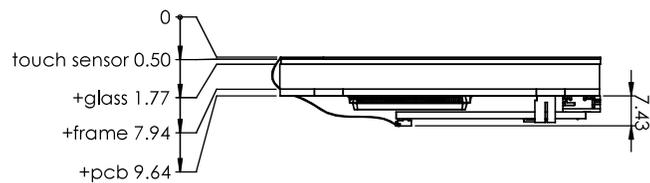
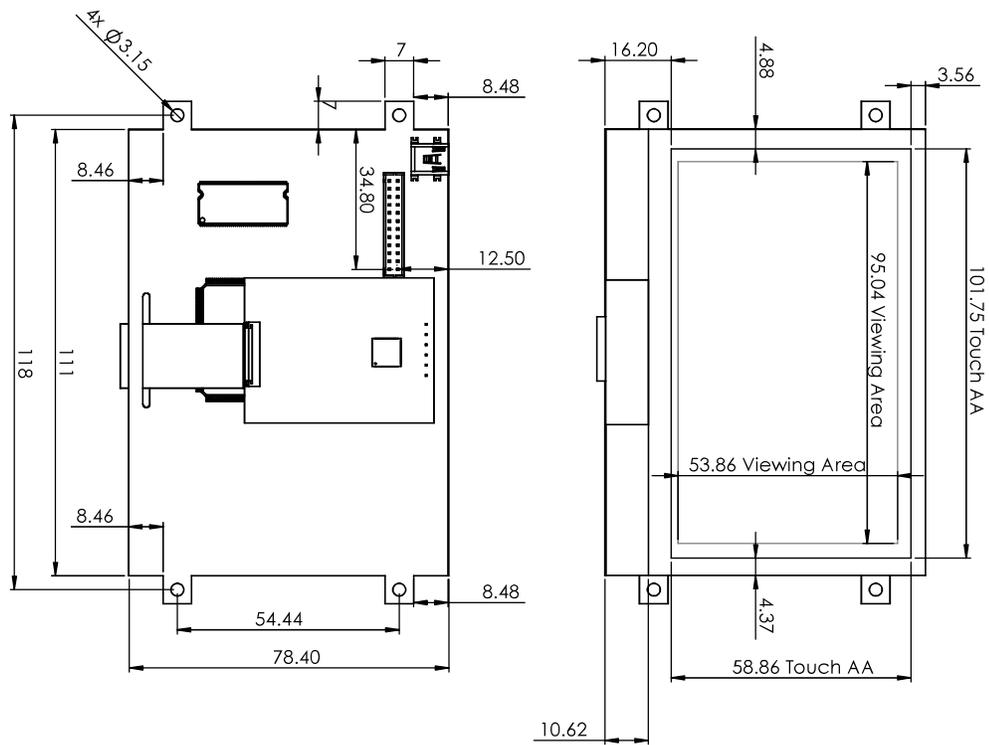
- 2 Flip switch 1 to the OFF position. This will tell the GEMmodule to operate in PROG mode instead of RUN mode.
- 3 Start GEMstudio/GEMcompiler.
- 4 Connect the GEMmodule to USB and power if required.
- 5 In GEMstudio navigate to the File Menu and select 'Restore Amulet OS'.

The system reset switch, labeled RESE, is directly below the SW6.



Mechanical Specification

Note: Touchpanel on top of glass. A cover glass is recommended on top of touch panel with thickness from 2mm-6mm.



Recommended Operating Conditions

Parameter	Conditions	Min	Typ	Max	Units
Supply Voltage	Stable external supply required	4.5	5	5.5	Vdc

DC Characteristics

Parameter	
Vcore Supply Current	22mA @1.2V
V input Low Level	-0.3V to 0.8V
V input High Level	2V to (Vcc + 0.3V)
Pull Up Resistors	70K to 175K Ohms
IO Output Current	8mA
Static Current Excluding Power on Reset; Vcore = 1.2V	600uA
Static Current Logic cells consumption, including Power on Reset and all input drivers; Vcore = 1.2V	30uA

Environmental Specification

Parameter	Min	Typ	Max	Units
Storage Temp	-30		80	°C
Operating Temp	-20		70	°C

Notes:

- 6 Communication and Program UARTs can be used for programming as well as for communication with the application's host processor.
- 7 If you wish to program via UART, make sure you can get to the Reset and the Program Mode pins. These will only be needed if a serious programming issue occurs.
- 8 To switch the module into Program Mode, reset must be applied after the DIP switch has been toggled.
- 9 In System programming information can be found in the GEMstudio Pro User's Guide under the section titled, "GEMstudio Production File".
- 10 GEMstudio Pro User's Guide found under Support/Documentation on the website: <http://www.amulettechnologies.com>

Revision History

Date	Revision	Notes
13 July 2015	A	Publication
12 September 2015	B	Format change. Uart descriptions. DIP switch descriptions. Mechanical drawings
11 January 2016	C	Added DC Characteristics





Contact Us:

You have Embedded GUI Questions. We have Answers.

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