Amulet Technologies

GEMexpress ™

GCC-1

Data Sheet

Introduction:

It is a fast, inexpensive production solution for adding a graphic user interface to an embedded product. GEMexpress™ allows for greater design flexibility and a shorter time to market. This new hardware approach to GUI integration contains all of Amulet's bill of materials, which is everything needed to drive the user interface. It just needs to be attached to a simple display interface board and the human interface is ready for production. As it's easy to integrate, Amulet sees it as the "express" lane to production: fast, easy and cost effective.

Features:

- Amulet AGB75LC04-BG-E 225-ball LFBGA Graphical OS Chip™
- Integrated resistive 4 or 5 wire touch panel decoder
- Storage Capacity – 32megabit SerialFlash for storing GUI pages
- 64megabit SDRAM (frame buffer)
- Serial Interfaces – 3.3v UART, TWI, USB
- Two 50 Pin Interface Connectors for LCD signals, power and serial communication
- Dedicated Crystal for System
- Small and compact 1.5" x 3.0", fits within the outline of a 3.5" TFT.

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Electrical Characteristic

3.1 Recommended Operating Conditions

5V	4.75V - 20V 5V Recommended
5V Current	500mA

3.2 DC Characteristics

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

Pin Descriptions

Pin Type
 I = Input
 O = Output
 P = Power Supply

Pin #	Signal	Type	Description
1	5V	P	5V @ 500mA
2	5V	P	
3	3V	P	3V @ 500mA Output
4	3V	P	
5	GND	P	Ground
6	GND	P	Ground
7	N/C		
8	N/C		
9	N/C		
10	N/C		
11	N/C		
12	N/C		
13	TWI SDA	I/O	Serial Data
14	TWI SCLK	I/O	Serial Clock
15	GND	P	Ground
16	GND	P	Ground
17	COMMU TXD	O	Asynchronous Serial-Data Output
18	COMMU RXD	I	Asynchronous Serial-Data Input
19	GND	P	Ground
20	PWM2	O	Programmable clock 2
21	GND	P	Ground
22	PWM1	O	Programmable clock 1
23	P MODE	I	System Power Up Mode (1 = Program, 0 = Run Note:1
24	PWM0	O	Programmable clock 0
25	TPC	I	Touch Panel Cal. (0 = Normal, 1 = CALIBRATE) Note:1

Note:1 Internally pulled up. Only pull to ground

Table 1. Header J1

| Pin #	Signal	Type	Description
26	GND	P	Ground
27	GPIO 4	I/O	100K Programmable Pull-up
28	GPIO 12	I/O	
29	GPIO 3	I/O	
30	GPIO15	I/O	
31	GPIO 14	I/O	
32	GPIO 2	I/O	
33	GND	P	Ground
34	PROGU RXD	I	Asynchronous Serial-Data Input
35	PROGU TXD	O	Asynchronous Serial-Data Output
36	GND	P	Ground
37	VBUS	I	Monitor for host detection
38	DDP	I/O	USB Device Port Data+
39	GND	P	Ground
40	DDM	I/O	USB Device Port Data-
41	GND	P	Ground
42	SPI CS3	O	SPI Chip Select
43	SPI CS2	O	SPI Chip Select
44	SPI CS1	O	SPI Chip Select
45	SCLK	I/O	SPI Clock
46	MOSI	O	SPI Data Out
47	MISO	I	SPI Data In
48	GND	P	Ground
49	N/C		
50	/RESET	I	Reset Active Low

Note:1 Internally pulled up. Only pull to ground

Table 2. Header J1

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Pin #	Signal	Type	Description
1	GND	P	Ground
2	R0	O	LCD Pixel Data Red
3	R1	O	LCD Pixel Data Red
4	R2	O	LCD Pixel Data Red
5	R3	O	LCD Pixel Data Red
6	R4	O	LCD Pixel Data Red
7	R5	O	LCD Pixel Data Red
8	R6	O	LCD Pixel Data Red
9	R7	O	LCD Pixel Data Red
10	GND	P	Ground
11	G0	O	LCD Pixel Data Green
12	G1	O	LCD Pixel Data Green
13	G2	O	LCD Pixel Data Green
14	G3	O	LCD Pixel Data Green
15	G4	O	LCD Pixel Data Green
16	G5	O	LCD Pixel Data Green
17	G6	O	LCD Pixel Data Green
18	G7	O	LCD Pixel Data Green
19	GND	P	Ground
20	B0	O	LCD Pixel Data Blue
21	B1	O	LCD Pixel Data Blue
22	B2	O	LCD Pixel Data Blue
23	B3	O	LCD Pixel Data Blue
24	B4	O	LCD Pixel Data Blue
25	B5	O	LCD Pixel Data Blue

Note:1 Internally pulled up. Only pull to ground

Table 3. Header J2

Pin #	Signal	Type	Description
26	B6	O	LCD Pixel Data Blue
27	B7	O	LCD Pixel Data Blue
28	GND	P	Ground
29	DISP	O	Display Control Signal. LCD power (1 = ON, 0 = OFF)
30	OE	O	Output Enable
31	Vsync	O	TFT LCD First frame synchronization.
32	Hsync	O	Output goes active for one clock period after all the serial data for the current line has been shifted out.
33	PC	O	LCD Drive Signal. LCD crystal polarization clock.
34	GND	P	Ground
35	A2D6	I	A2D
36	A2D5	I	A2D
37	A2D4	I	A2D
38	TOUCH X+	I	Touch Panel X+
39	TOUCH Y+	I	Touch Panel Y+
40	TOUCH X-	I	Touch Panel X-
41	TOUCH Y-	I	Touch Panel Y-
42	GND	P	Ground
43	SPI CS3	O	SPI Chip Select
44	SPI CS2	O	SPI Chip Select
45	SPI CS1	O	SPI Chip Select
46	SCLK	I/O	SPI Clock
47	MOSI	O	SPI Data Out
48	MISO	I	SPI Data In
49	GND	P	Ground
50	GND	P	Ground

Note:1 Internally pulled up. Only pull to ground

Table 4. Header J2

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External Circuit Diagram

Touch Panel Filter+

Touch Panel

4	Touch X+
3	Touch Y+
2	Touch X-
1	Touch Y-

0.01uF   0.01uF   0.01uF   0.01uF

Touch Panel Filter

USB Interface

USB DDM ——[27 ohm]—— 2 [   ] 1 ——[27 Kohm]—— VBUS

USB DDP ——[27 ohm]—— 3 [   ] 4

330 Kohm   330 Kohm

47 Kohm
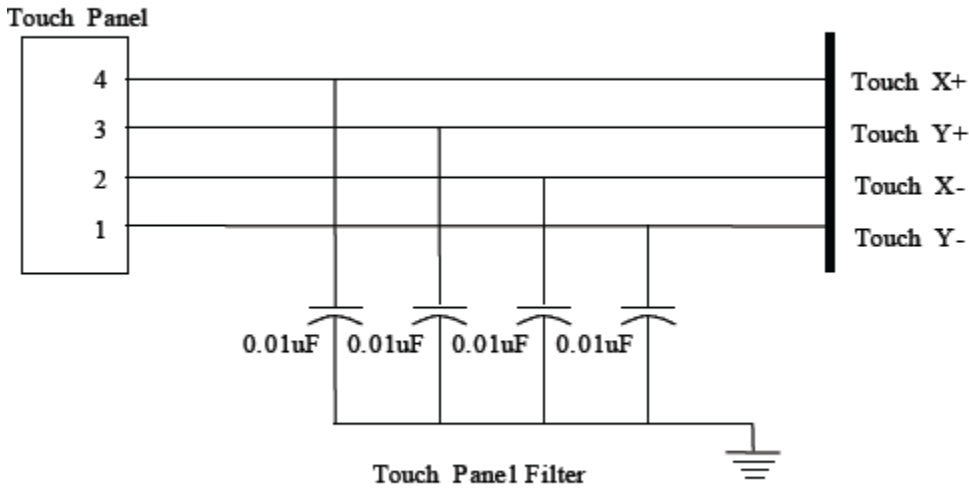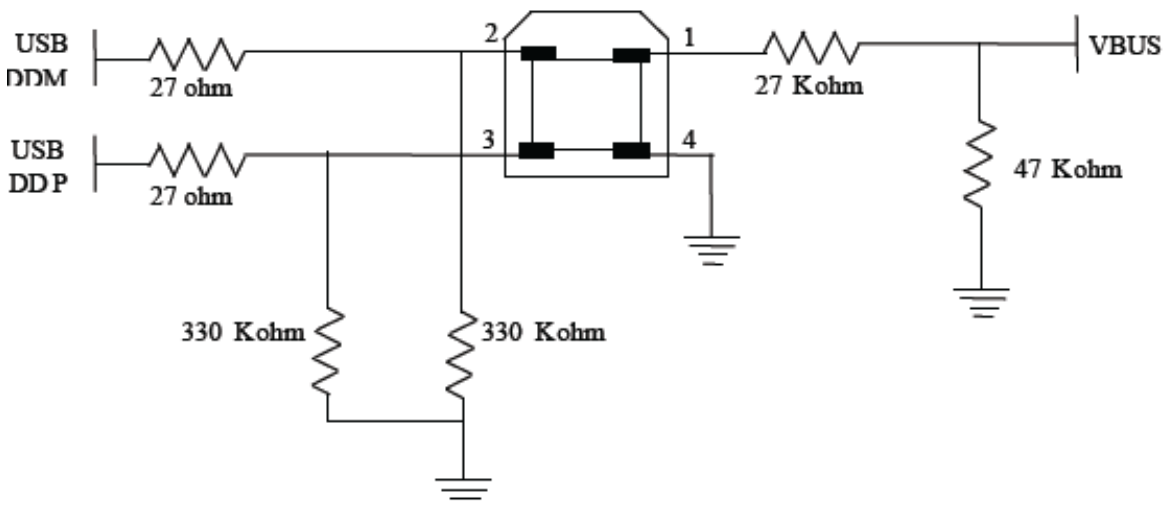
Dimensions

Header 2 x 25 2mm pitch
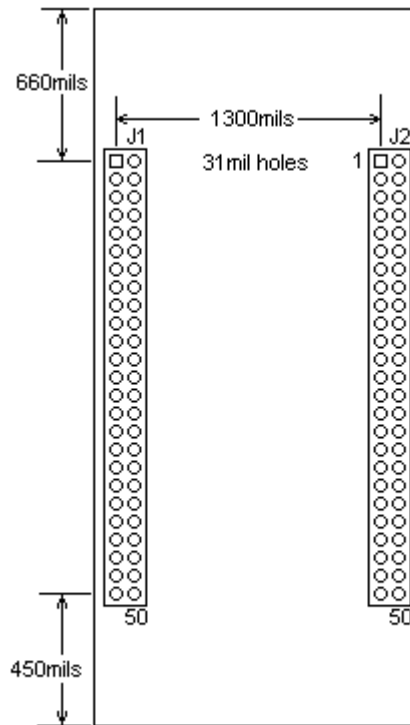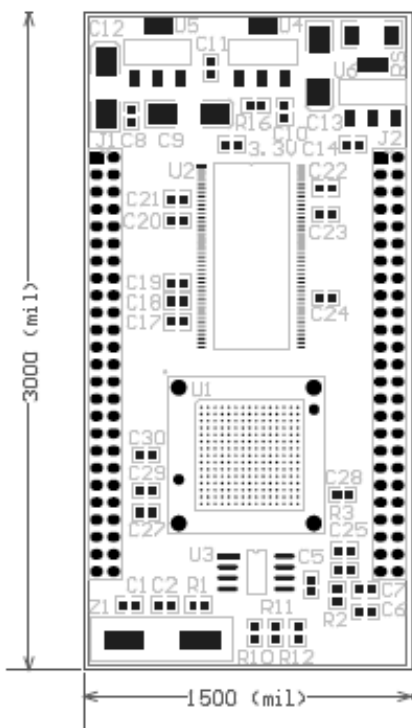
Tel (408) 374-4956
Fax (408) 374-4941
http://www.AmuletTechnologies.com
Sales@AmuletTechnologies.com
Support@AmuletTechnologies.com
700 Gale Drive, Suite 190
Campbell, CA 95008 USA

Mouser Electronics

Authorized Distributor

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