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# **Embedded USB**

## *W7EU Series*

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## Revision History

<b>Revision</b>	<b>Month</b>	<b>Year</b>	<b>History</b>
1.00	October	2008	Initial Release (Preliminary)
1.01	August	2009	Add connector options and mounting heights
1.02	October	2009	Add Pin 10 NC configuration as option Add SM3252 controller as option
1.03	October	2009	Correct mounted connector height Correct Typo Update configuration options
1.04	November	2009	Add Vertical connector configuration Mechanical drawing
1.05	December	2009	Added pictures of various eUSB configurations
1.06	January	2010	Updated Block Diagram/Single voltage support
1.07	June	2010	Updated Storage temp spec/product image for standard connector
1.10	April	2011	Update the Naming guide

**Features:**

**GENERAL**

- Embedded USB 2.0 Device
- SLC NAND type flash
- 5V operational voltage
- Low profile
- RoHS Compliant



**PERFORMANCE**

- High performance SLC NAND
- Dual Channel - seq. RD/WR up to 32/27 MB/s
- Single channel version - seq. RD/WR up to 20/20 MB/s
- Low Power consumption



**RELIABILITY**

- No moving parts
- Capable of withstanding high impact and vibration shocks
- Built-in hardware engine 8/15 bits BCH ECC per 1K bytes
- Endurance up to 1,000,000 Write/Erase cycles
- 10 year typical data retention

**COMPATIBILITY**

- Fully compatible with USB 2.0 and backward compatible with USB 1.1 specification
- USB Mass Storage Class Specification 1.0
- 10 Pin 2x5 USB Socket with 2mm or 2.54mm pitch

**Description:**

The Wintec Embedded USB Flash Drive is a robust and reliable high performance storage and backup solution in a compact form factor. Fully USB 2.0 compatible with high data transfer rates. Superior reliability is achieved by using high quality SLC NAND and featuring extensive error correcting capabilities of 8/15 bits per 528 byte sector. Available in capacities from 512MB to 16GB (32GB capacities available using MLC NAND). Wintec's W7EU series embedded USB flash drives are ideal for embedded applications demanding high performance and reliability.

**Performance and Reliability:**

<b>Performance and Reliability</b>		
Performance	Up to 32MB/s (dual); 20MB/s (single)	
ECC	SM3252	15 bit BCH ECC per 528 Bytes
	SM3255	13/24/48 bit BCH ECC per 1KB
Endurance	1,000,000 Write / Erase cycles (SLC)	
Data Error Rate	1 in 10 <sup>15</sup> bits read	
Data Retention	10 years	

**Table 1 – Performance and Reliability Data**

<b>Environmental Characteristics</b>	
Operating Temperature (ambient)	+70°C Max
Storage Temperature (Min)	-55°C
Storage Temperature (Max)	+150°C
Non-Operating Shock	600G peak @ 2ms pulse
Non-Operating Vibration	5G peak @ 5-500 Hz
Operating Vibration	1.5G peak @ 5-40Hz
ESD	Withstand electrostatic discharge of +/- 4KV

**Table 2 – Environmental Characteristics**

**Functional Block Diagram**

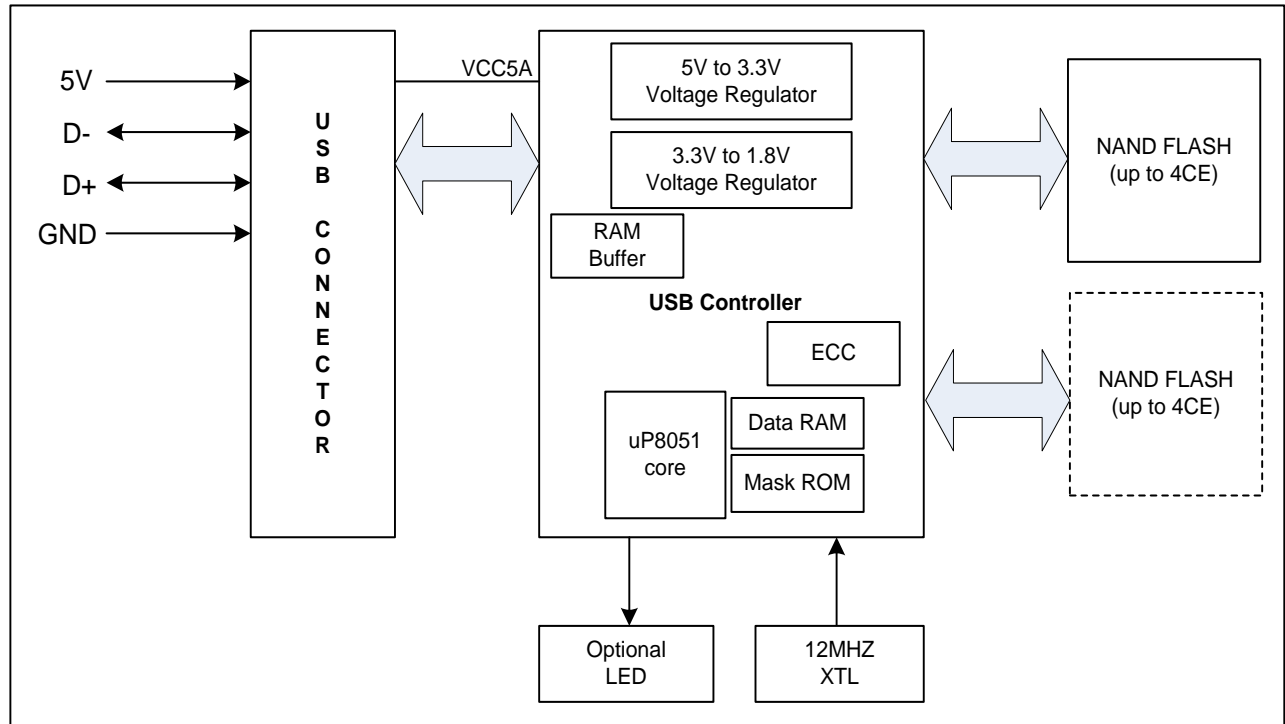


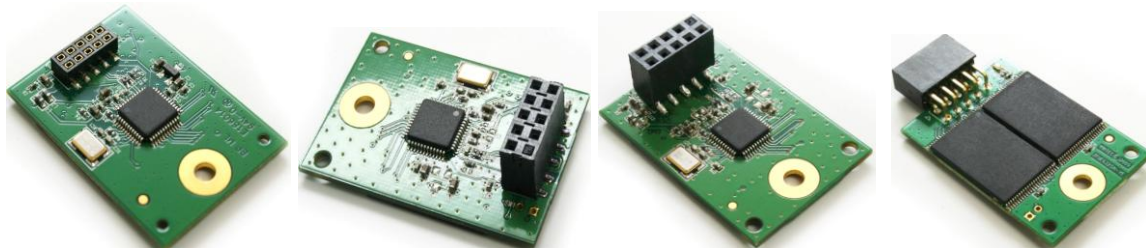
Figure 1

**Physical Dimensions:**

Wintec’s Embedded USB module has the following dimensions.

<b>eUSB Physical Specification</b>				
	<b>Low Profile</b>	<b>Standard</b>	<b>Ultra High</b>	<b>Right Angle</b>
PCB length	1.45in. (36.9mm)	1.45in. (36.9mm)	1.45in. (36.9mm)	1.45in. (36.9mm)
PCB width	1.05in. (26.6mm)	1.05in. (26.6mm)	1.05in. (26.6mm)	1.05in. (26.6mm)
Connector pitch	0.08in. (2.00mm)	0.10in. (2.54mm)	0.10in. (2.54mm)	0.10in. (2.54mm)
Mounted connector height	0.110in. (2.80mm)	0.291in. (7.4mm)	0.385in. (9.78mm)	0.334in. (8.50mm)

**Table 3 – Physical Dimensions**



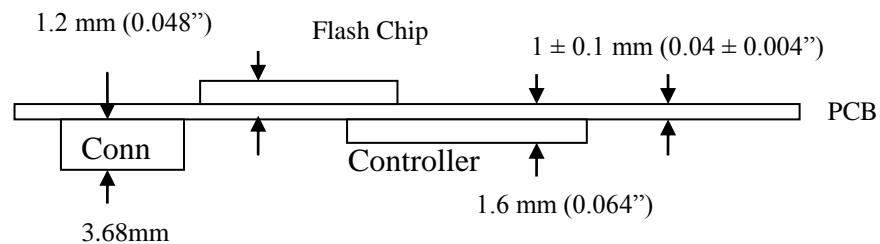
Low Profile

Standard

Ultra High

Right Angle

**Mechanical Profile – Side View:**

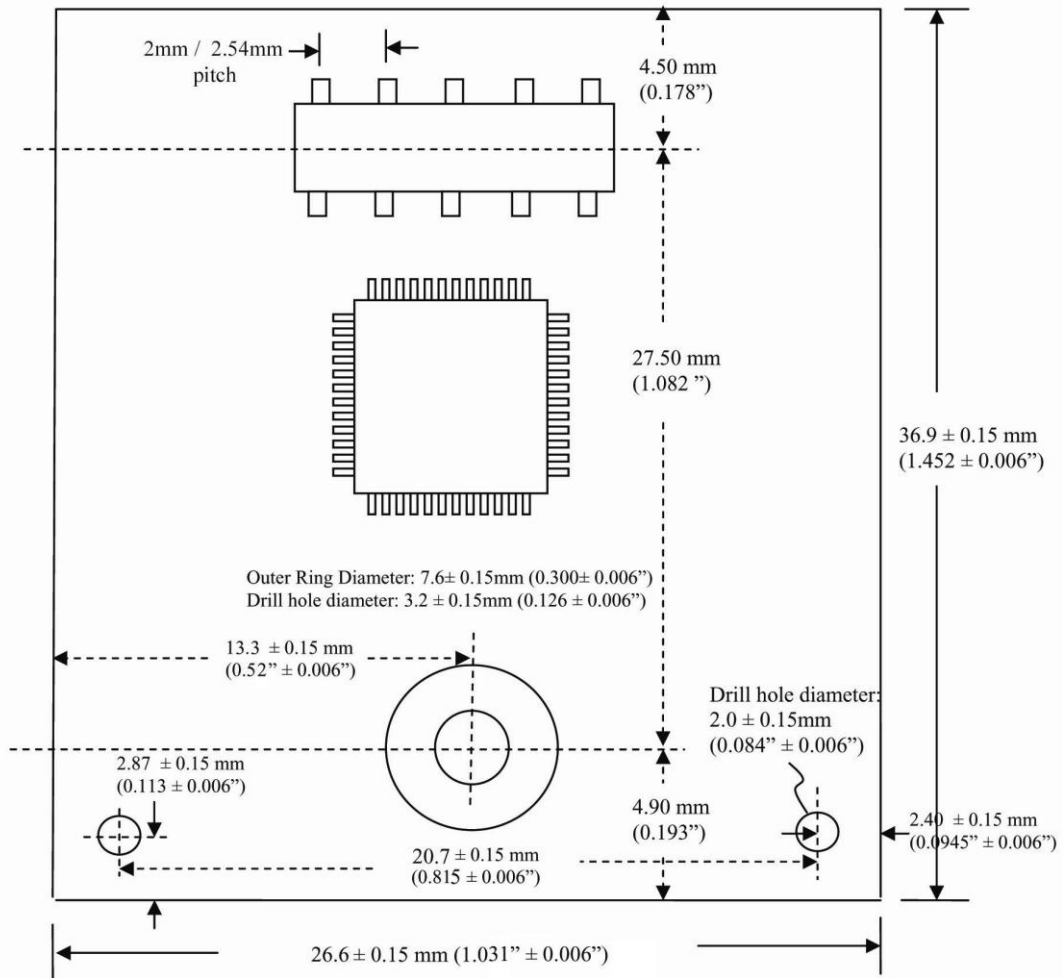


Note: PCB thickness is 40 mils ± 4 mils (1 ± 0.1")

**Figure 2**



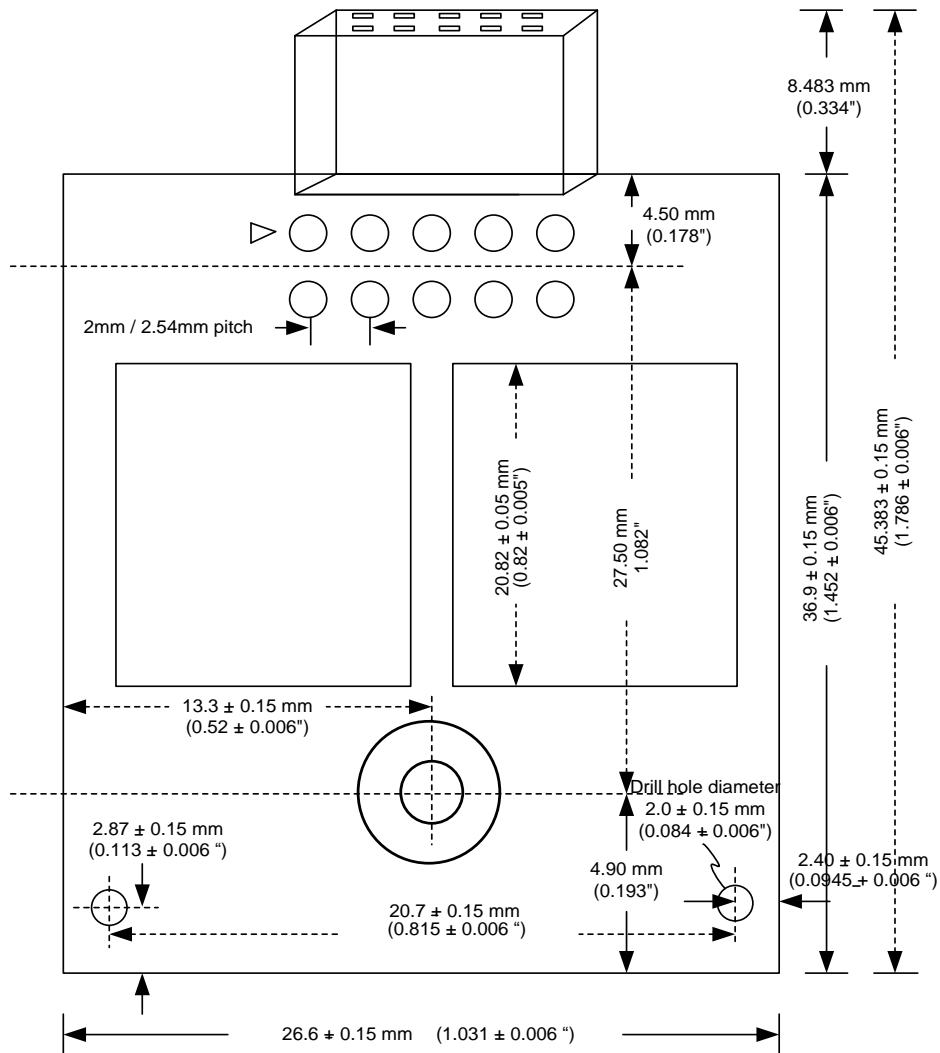
**Mechanical Profile – Bottom View (Low Profile, Standard and Ultra High):**



**Figure 3**

Note: The above dimensions can be used for low profile, standard and ultra high connector configurations. Connector dimensions are listed in Table 3.

**Mechanical Profile – Top View (Vertical connector):**

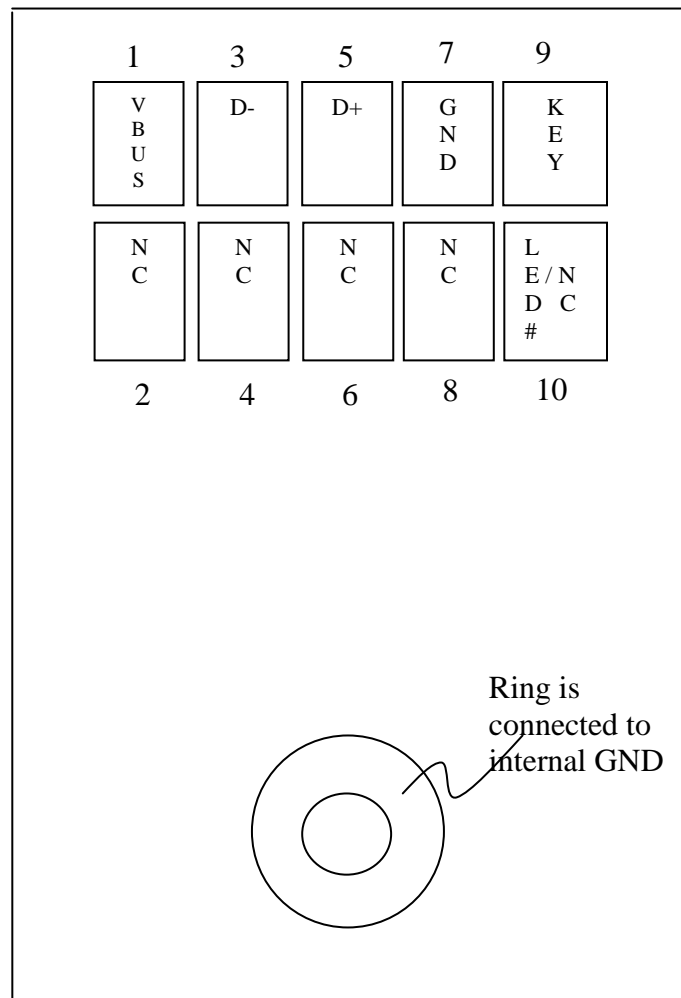


**Figure 4**

Note: The above dimensions can be used for vertical (right angle) connector configuration. Connector dimensions are listed in Table 3.

**Pin Specifications and Signal Descriptions:**

**Pin Assignment (Bottom View) for 2x5 Connector:**  
(Pin pitch of either 2.54mm (0.1”) or 2mm is available)



**Figure 4**

**Pin / Signal Descriptions:**

PIN #	Signal Name	Signal Type	Signal Description
1	VBUS	Power	5V Power supply connection
2	NC	Input	No Connect
3	D-	I / O	Negative differential data pin
4	NC	-	No Connect
5	D+	I / O	Positive differential data pin
6	NC	-	No Connect
7	GND	Ground	Ground Connection
8	NC	-	No Connect
9	KEY	Power	KEY
10	LED# (Optional) / NC	LVTTL Output	An Active low, up to 10mA pull-down (see note) to indicate a USB transaction is taking place. The signal enables the user to bring the LED control to external panel display. The pin can be left open if not used.

**Table 4 – Pin and Signal Descriptions**

Note: An LED indicator is built on module to enable users to visualize the embedded Flash module activities. The LVTTL output driver is capable of sinking 24mA. An optional on-board LED draws 1mA of current ( $\pm 20\%$ ), if installed. If the on-board LED is installed, the maximum external LED# sink current is not to exceed 20mA.

**Electrical Characteristics – DC Parameters:**

Parameter	Symbol	Min	Nom	Max	Unit
Supply Voltage	VBUS	4.2	5.0	5.5	V
Input Leakage Current		-10	-	10	$\mu\text{A}$
Output Leakage Current		-10	-	10	$\mu\text{A}$
Peak Voltage on all Lines		-0.5	-	3.6	V
Output High Voltage ( $V_{OH}$ )	$V_{OH}$	2.4 (at $I_{OH} = -2\text{mA}$ )	-		V
Output Low Voltage ( $V_{OL}$ )	$V_{OL}$		-	0.4	V
Input High ( $V_{IH}$ )	$V_{IH}$	2.0	-	-	V
Input Low ( $V_{IL}$ )	$V_{IL}$	-0.3	-	0.8	V

**Table 5 – DC Parameters**

**Ordering Guide:**

Card Capacity	Part Number
512 MB	W7EU512Mtuv(I)-ww0xx-yyy.zz
1 GB	W7EU001Gtuv(I)-ww0xx-yyy.zz
2 GB	W7EU002Gtuv(I)-ww0xx-yyy.zz
4 GB	W7EU004Gtuv(I)-ww0xx-yyy.zz
8 GB	W7EU008Gtuv(I)-ww0xx-yyy.zz
16 GB	W7EU016Gtuv(I)-ww0xx-yyy.zz

**(t) Configuration Options**

- 1 : Default (With LED)
- T : Pin 10 NC

**(u) Disk/Interface Options**

- X : Removable Disk
- T : Fixed Disk

**(v) Form Factor Options**

- C : Embedded 2mm pitch
- D : Embedded 2.54mm pitch
- E : Embedded 2.54mm pitch High profile
- F : Through-hole Right Angle Connector

**(ww) Controller Options**

- SM : SM325
- S2 : SM3252
- S5 : SM3255

**(xx) NAND Flash IC Mfg. & Die Revision**

- P : Samsung    A: A Die
- M : Micron    B: B Die
- I : Intel       C: C Die
- H : Hynix

**(yyy) Component Flash type**

- 001: 1-Nand Flash chip
- 01D: 1-Nand, Dual Die, 1-CE
- 1D2: 1-Nand, Dual Die, 2-CE
- 1Q2: 1-Nand, Quad Die, 2-CE
- 002: 2-Nand Flash chips
- 02D: 2-Nand, Dual Die, 1-CE
- 2D2: 2-Nand, Dual Die, 2-CE
- 2Q2: 2-Nand, Quad Die, 2-CE

**Firmware Revision/Options (Optional)**

Please contact the factory for the latest firmware revisions and/or custom labeling and programming identification.

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### **About Wintec Industries, Inc.**

Wintec, founded in 1988, is headquartered in Milpitas, California. Wintec, a leading third party memory module manufacturer, specializes in a variety of module design and manufacturing, such as memory module, flash module, Handspring module, modem module, game module, etc. Besides a complete line of DDR, SDR, and EDO/FPM legacy memory modules, Wintec also distribute CPU, motherboard, peripherals, PC software, and consumer Flash products (such as MMC, SD, SMC, Compact Flash, PC Card, etc.). With excellent design engineering and manufacturing capability, Wintec provides a wide range of design and manufacturing services for our valuable customers from concept design to final product delivery. Wintec is ISO9001- 2000 certified.

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