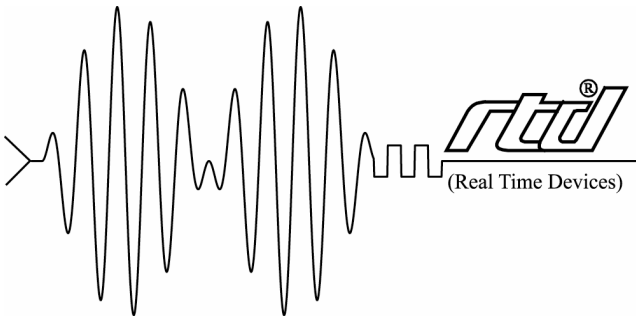
CMT56118 / IDAN-CMT56118
CompactFlash Carrier
utilityModules

User's Manual



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CompactFlash Carrier utilityModules
User's Manual

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Revision History

Rev. A	New Manual
Rev. B	Renamed manual to include “IDAN-CMT56118” in title. Correct drawings and designators to match PCB revisions 160002451BB (CMT56118). Removed references to 80-conductor cable; the board is designed to use only 40-conductor cables when cabling to off-board IDE devices. Noted that hot-swapping CompactFlash devices is not supported. Add a bullet to describe the purpose of the retention bracket. Add a chapter to describe the features of the IDAN-CMT56118. Describe CMT56118 and IDAN-CMT56118 configuration jumpers. Described the features provided by the Multifunction Connector (PC speaker, battery, ATX push button, system reset button, keyboard, and Bus Mouse) Reorganized chapters so the chapter on connecting is before the chapter on configuring. Add dimensional drawing for the IDAN-CMT56118HRS.

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Chapter 1 INTRODUCTION

This manual gives information on the CMT56118 CompactFlash Carrier utilityModule. This module attaches to the EIDE interface connector of RTD cpuModules, allowing a high speed CompactFlash drive interface.

CMT56118 CompactFlash Carrier utilityModule

The CMT56118 utilityModule was designed to provide a CompactFlash drive in a stack when used as a companion to RTD's family of cpuModules that have integrated EIDE controllers. It is very similar in function to the CMT56106.

Note:	The CMT56118 is not an IDE controller - It is a drive carrier. The CMT56118 must be used with a cpuModule that has an on-board IDE controller.
Warning:	Because the CompactFlash connector uses an ATA/IDE interface, hot-swapping is not supported.

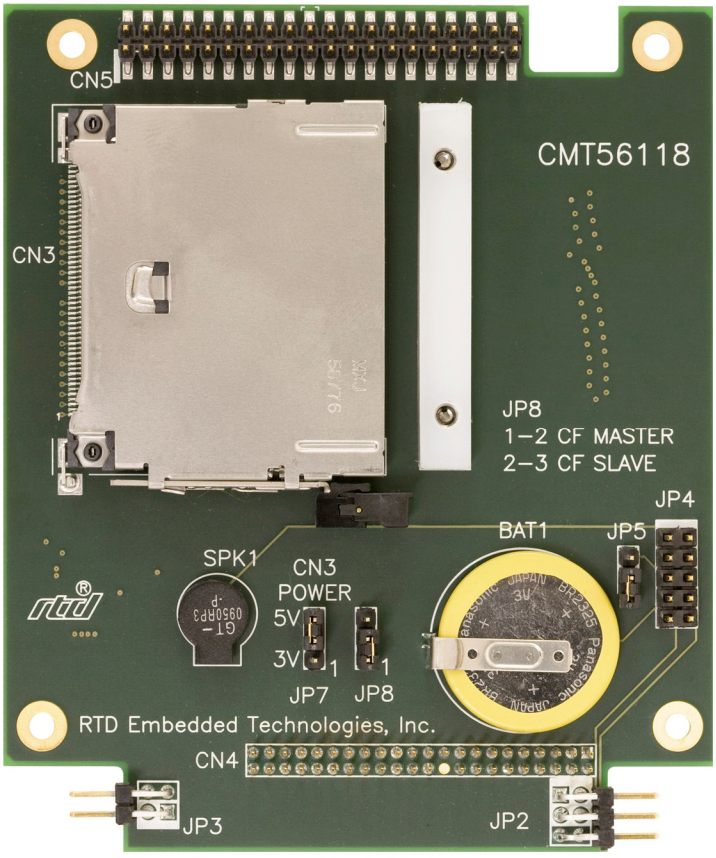

Figure 1.1 CMT56118 with Retention Bracket

Features

The following are major features of the CMT56118 utilityModule.

- Provides a drive interface up to UDMA Mode 2 (Ultra ATA/33) if supported by the cpuModule
- A standard +3.3V or +5V CompactFlash drive can be mounted directly onto the module
- An optional retention bracket provides a mechanism to prevent unwanted removal of the CompactFlash device
- A 0.1" 40-pin connector is provided to connect to a second drive, i.e. a CD-ROM drive.
- A stack-through connector is provided to allow for the combination of multiple boards from the CMT56118, CMT36106, and CMT56106 utilityModule families in one system.

Connectors

Connectors provided are:

- CN3: CompactFlash drive connector
- CN4: EIDE stack-through connector
- CN5: EIDE cable connector

Recommended Cables

A 40-conductor EIDE cable can be used to connect an external drive (hard drive or CD-ROM drive) to connector CN5 on the CMT56118.

General Specifications

The following operating conditions do not apply to the CompactFlash drive and may be limited by the IDE controller of the cpuModule

- Operating temperature: -40 to +85ºC
- Relative humidity: 0 - 95%, non-condensing
- Storage temperature: -55 to +125ºC

Chapter 2 INSTALLING THE UTILITYMODULE

Since the utilityModule uses an EIDE stack-through bus, it must be stacked directly above the cpuModule.

Recommended Procedure

We recommend you follow the procedure below to ensure that stacking of the modules does not damage connectors or electronics.

- Turn off power to the PC/104-*Plus* or PCI-104 system or stack.
- Select and install standoffs to properly position the utilityModule on the PC/104-*Plus* or PCI-104 stack.
- Touch a grounded metal part of the stack to discharge any buildup of static electricity.
- Remove the utilityModule from its anti-static bag.
- Verify the jumper settings of the utilityModule.
- Hold the utilityModule by its edges and orient it so the bus connector pins line up with the matching connector on the stack.
- Gently and evenly press the utilityModule onto the stack.

CAUTION: Do not force the module onto the stack! Wiggling the module or applying too much force may damage it. If the module does not readily press into place, remove it, check for bent pins or out-of-place keying pins, and try again.

Chapter 3 CONNECTING THE UTILITYMODULE

The following sections describe the connectors and jumpers of the utilityModule.

Connector and Jumper Locations

A white area silk-screened on the top side of the PC board indicates where pin 1 is located on the connectors. A square solder pad visible on the bottom of the PC board also shows where pin 1 is located. Make certain pin 1 is correctly identified before connecting to it. The connector locations of the CMT56118 are shown below.

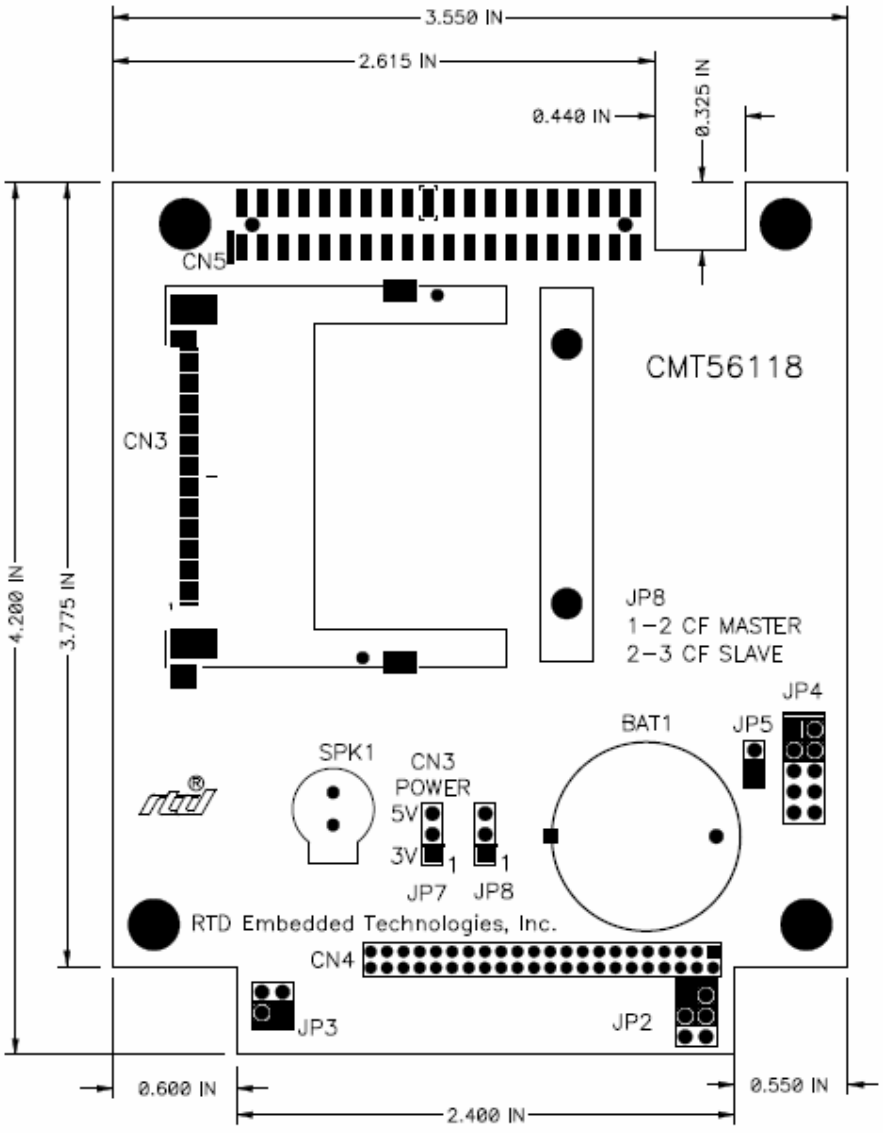

Figure 3.1 CMT56118 Connector and Jumper Locations

CMT56118 Top Side Connectors and Jumpers		
Designator	**Function**	**Size**
CN3	CompactFlash Connector	50 pin
CN4	EIDE Stack-through Connector	44 pin
CN5	EIDE Cable Connector	40 pin
JP2	Keyboard and Push-Button Reset	6 pin
JP3	Bus Mouse	4 pin
JP4	Multifunction Connector	10 pin
JP5	ATX Power Switch Connector	2 pin
JP7	CompactFlash voltage selection	3 pin
JP8	CompactFlash master/slave selection	3 pin
SPK1	PC Speaker (Factory Installed)	2 pin
BAT1	Battery (Factory Installed)	2 pin
CMT56118 Bottom Side Connectors and Jumpers		
Designator	**Function**	**Size**
B5	Solder Jumper (to bypass battery protection diode)	2 pin

CompactFlash Connector, CN3 (CN1 - IDAN-CMT56118 only)

Connector CN3 supports +3.3V and +5V CompactFlash devices. For information on configuring the supply voltage and master/slave setting of a device installed in the connector, refer to Chapter 4 .

Warning: Because the CompactFlash connector uses an ATA/IDE interface, hot-swapping is not supported.

Note: In addition to CN3, the IDAN-CMT56118 (described in Chapter 5) has a second CompactFlash connector (CN1) which also supports +3.3V and +5V CompactFlash devices.

EIDE Stack-through Connector, CN4

The EIDE stack-through connector is a 44-pin 2mm DIL connector. The pin connections of this connector are shown below.

EIDE Hard Drive Connector, CN3			
Pin	**Signal**	**Function**	**in/out**
1	RESET*	Reset HD	out
2	GND	Ground signal	--
3	HD7	HD data 7	in/out
4	HD8	HD data 8	in/out
5	HD6	HD data 6	in/out
6	HD9	HD data 9	in/out

7	HD5	HD data 5	in/out
8	HD10	HD data 10	in/out
9	HD4	HD data 4	in/out
10	HD11	HD data 11	in/out
11	HD3	HD data 3	in/out
12	HD12	HD data 12	in/out
13	HD2	HD data 2	in/out
14	HD13	HD data 13	in/out
15	HD1	HD data 1	in/out
16	HD14	HD data 14	in/out
17	HD0	HD data 0	in/out
18	HD15	HD data 15	in/out
19	GND	Ground signal	--
20	n.c.		--
21	AEN	Address Enable	out
22	GND	Ground signal	--
23	IOW*	I/O Write	out
24	GND	Ground signal	--
25	IOR*	I/O Read	out
26	GND	Ground signal	--
27	IOCHRDY	I/O Channel Ready	in
28	BALE	Bus Address Latch Enable	out
29	n.c.		
30	GND	Ground signal	--
31	IRQ	Interrupt Request	in
32	IOCS16*	16 bit transfer	in
33	A1	Address 1	out
34	GND	Ground signal	--
35	A0	Address 0	out
36	A2	Address 2	out
37	HCS0*	HD Select 0	out
38	HCS1*	HD Select 1	out
39	LED	HDD activity LED (-)	in
40	GND	Ground signal	--
41	+5V	Logic Power	Pwr
42	+5V	Motor Power	Pwr
43	GND	Power Ground	--
44	n.c.		

EIDE Cable Connector, CN5

The EIDE cable connector is a 40-pin 0.1" DIL connector. The pin out of this connector is the same as pins 1-40 of CN3.

Keyboard and Push-Button Reset, JP2

The Keyboard and Push-Button Reset connectors provide the following features which may be cabled to the cpuModule via the Multifunction Connector (JP4):

- AT keyboard
- System reset input

The following table gives the pinout of JP2.

Keyboard and Push-Button Reset, JP2			
Pin	**Signal**	**Function**	**Input/Output**
1	KBP_SPKR-	Keyboard Power (+5V)	Output
2	CPU_GND	CPU Ground	--
3	KBD	Keyboard Data	Input
4	KBC	Keyboard Clock	Output
5	RESET*	Manual push button reset	Input
6	CPU_GND	CPU Ground	--

Keyboard

An AT compatible keyboard can be connected to JP2. Usually PC keyboards come with a cable ending with a 5-pin male PS/2 connector. The following table lists the relationship between the pins on JP2 and a standard PS/2 keyboard connector.

Keyboard Connector Pins on JP2			
JP2	**Signal**	**Function**	**PS/2**
1	KBP_SPKR-	Keyboard Power (+5 Volts)	4
2	CPU_GND	CPU Ground	3
3	KBD	Keyboard Data	1
4	KBC	Keyboard Clock	5

System Reset

Pin 5 of JP2 allows connection of an external push-button to manually reset the system. The push-button should be normally open, and connect to ground when pushed.

Bus Mouse, JP3

The Bus Mouse connector provides an input for connecting a mouse to the system. The Bus Mouse may be routed to the cpuModule by running a cable from the Multifunction Connector (JP4).

Facing the connector pins, the pinout of JP3 is:

Bus Mouse, JP3			
Pin	**Signal**	**Function**	**Input/Output**
1	KBP_SPKR-	Speaker output (+5V)	Output
2	CPU_GND	CPU Ground	--
3	MCLK	Mouse Clock	Output
4	MDATA	Mouse Data	Input/Output

Multifunction Connector, JP4

The Multifunction Connector may be used to cable the following CMT56118 functions to the cpuModule:

- Speaker
- AT Keyboard
- Bus Mouse
- System Reset
- Battery
- ATX Power Button

Note: If a cable is not connected to the Multifunction Connector, the features listed above are unused by the system.

The following table gives the pinout of JP4.

Multifunction Connector, JP4			
Pin	**Signal**	**Function**	**Input/Output**
1	SPKR+	Speaker output (open collector)	Input
2	KBP_SPKR-	Speaker output (+5V)	Input
3	RESET*	Manual push button reset	Output
4	PWR_BUTTON	ATX Power Button	Output
5	KBD	Keyboard Data	Output
6	KBC	Keyboard Clock	Input
7	CPU_GND	CPU Ground	--
8	MCLK	Mouse Clock	Input
9	BAT+	Battery output	Output
10	MDATA	Mouse Data	Input/Output

ATX Power Button, JP5

The ATX power button input may be routed to the cpuModule by running a cable from the Multifunction Connector (JP4). The push-button should be normally open, and connect to ground when pushed.

Power Button, JP5			
Pin	**Signal**	**Function**	**Input/Output**
1	GND	Ground	--
2	PWR_BUTTON	Soft Power Button	Input

Battery, BAT1 (Factory Installed)

Connection BAT1 on the CMT56118 is the system connection for a backup battery (in the range 2.40 V to 4.15 V; typically 3.0 or 3.6 V). The battery may be routed to the cpuModule by running a cable from the Multifunction Connector (JP4). Consult the cpuModule's hardware manual for how it uses the battery.

Battery, BAT1			
Pin	**Signal**	**Pin**	**Signal**
1	Battery +	2	Battery -

Solder Jumper, B5 (to bypass battery protection diode)

To bypass the onboard battery protection diode, short pins one and two of solder jumper B5.

PC Speaker, SPK1 (Factory Installed)

A speaker is available on pins 1 and 2 of SPK1. The speaker may be routed to the cpuModule by running a cable from the Multifunction Connector (JP4)

These outputs are controlled by a transistor to supply 0.1 watt of power to an external speaker. The factory installed speaker has an impedance of 8 ohms and is connected between pins 1 and 2.

PC Speaker, SPK1			
Pin	**Signal**	**Function**	**Input/Output**
1	SPKR+	Speaker Output (open collector)	Output
2	KBP_SPKR-	Speaker output (+5 volts)	Output

Chapter 4 CONFIGURING THE UTILITYMODULE

The following sections contain information on configuring the utilityModule.

Important: The EIDE bus connection on the CMT56118 which provides the electrical connections to the CompactFlash connector (CN3) and the EIDE cable connector (CN5) connects to the CPU's IDE controller via the EIDE stack-through connector (CN4). While this IDE channel connection supports multiple boards, up to two storage devices (e.g., CompactFlash cards, 2.5" disk drives, IDE drives, CD-ROM drives, ATA/IDE Disk Chip) are permitted throughout this electrical bus.

To prevent a conflict with a device already on the bus, it is important to know the number of devices already residing on the bus, as well as their master/slave configuration.

CF Voltage Select Jumper, JP7 (JP9 – IDAN-CMT56118 only)

Jumper JP7 is a 3-pin jumper used to select the supply voltage for the CompactFlash device residing in connector CN3.

To configure the operating voltage for 3.3V, set JP7 to close pins 1-2. To configure the operating voltage for 5V, set JP7 to close pins 2-3.

Note: The IDAN-CMT56118 (described in Chapter 5) has a second jumper (JP9) to configure the CF supply voltage of a second CompactFlash connector (CN1). The jumper behaves the same as JP7, with the same pinout.

Master/Slave Selection Jumper, JP8

Jumper JP7 is a 3-pin jumper used to configure the CompactFlash device in connector CN3 such that it does not conflict with another device connected to the system's EIDE stack-through connector. The bus should have only one master and one slave device.

To set the CompactFlash card as the master, close pins 1-2 of JP8. To set the CompactFlash card as the slave, close pins 2-3.

Note: The IDAN-CMT56118 (described in Chapter 5) is designed such that when one of the CF sockets is configured as master, the other is configured as slave. JP8 may be set as follows:

Close pins 1-2: CN1 master, CN3 slave
Close pins 2-3: CN3 master, CN1 slave

Connecting External IDE Devices

External EIDE drives such as additional hard drive or CD-ROM drive can be connected to CN5 of the CMT56118 with an IDE cable. Only 40-conductor IDE cables are supported, which permit transfer speeds of up to UDMA Mode 2 (Ultra ATA/33).

When connecting an external drive to the CMT56118, the device's master/slave jumper must be configured such that it does not conflict with the master/slave setting of any other device connected to the system's EIDE stack-through connector (for example, the CompactFlash connector, when a CF card is present in the socket).

Chapter 5 IDAN-CMT56118

A variation of the CMT56118 called the IDAN-CMT56118 is also available which offers two CompactFlash connectors. Unlike the CMT56118, it does not include a multifunction connector, battery, or speaker.

Connector and Jumper Locations

A white area silk-screened on the top side of the PC board indicates where pin 1 is located on the connectors. A square solder pad visible on the bottom of the PC board also shows where pin 1 is located. Make certain pin 1 is correctly identified before connecting to it. The connector locations of the IDAN-CMT56118 are shown below.

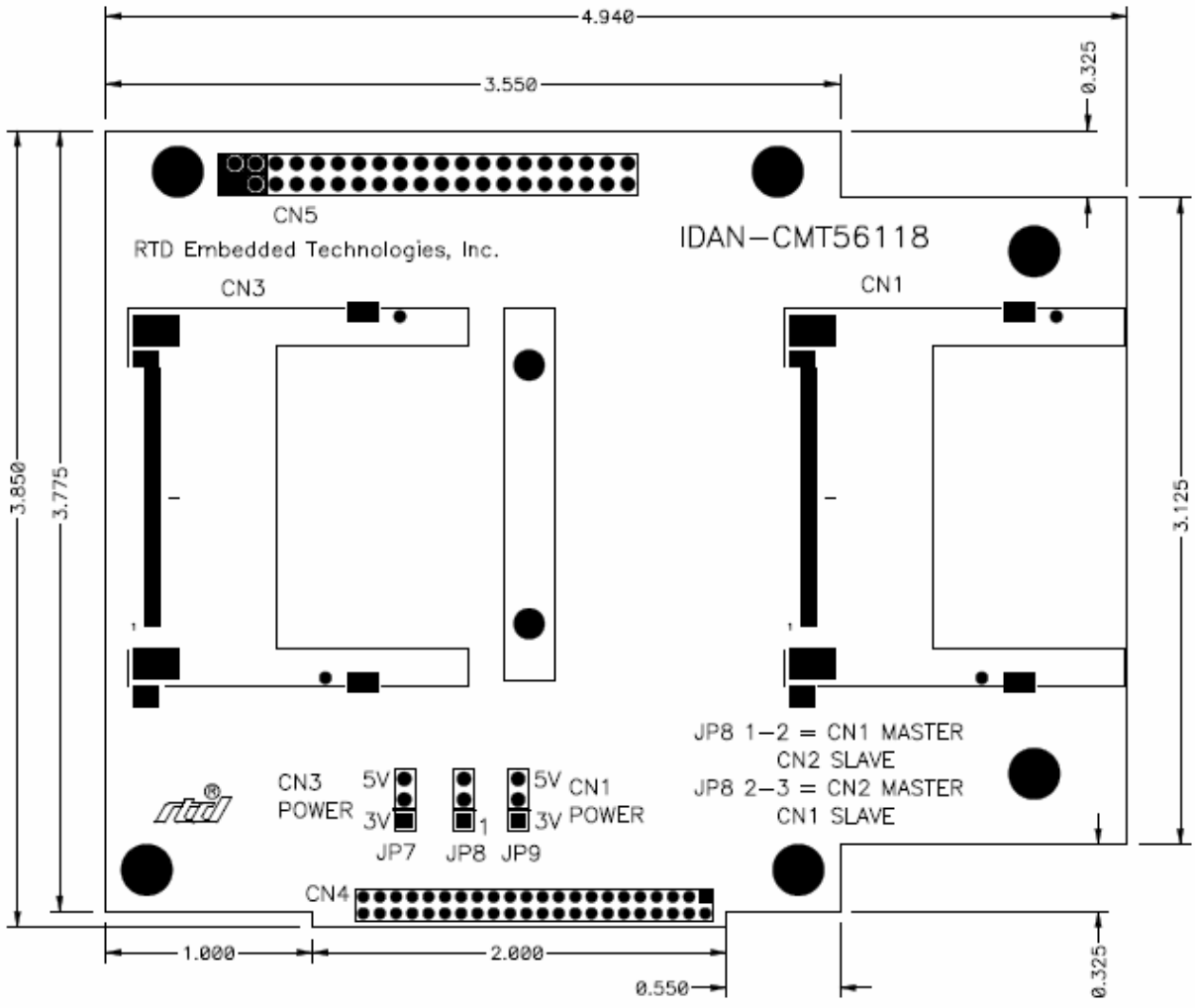

Figure 5.1 IDAN-CMT56118 Connector Locations

IDAN-CMT56118HRS Top Side Connectors and Jumpers			
Designator	**Function**	**Size**	**Reference Chapter**
CN1	CompactFlash Connector (Externally Removable)	50 pin	Chapter 3
CN3	CompactFlash Connector (Internal Socket with CF Retainer)	50 pin	Chapter 3
CN4	EIDE Stack-through Connector	44 pin	Chapter 3
CN5	EIDE Cable Connector	40 pin	Chapter 3
JP7	CompactFlash voltage selection for CN3	3 pin	Chapter 4
JP8	CompactFlash master/slave selection	3 pin	Chapter 4
JP9	CompactFlash voltage selection for CN1	3 pin	Chapter 4

Chapter 6 IDAN-CMT56118HRS

To purchase the IDAN-CMT56118 in a single height IDAN frame as shown below, the ordering model number is IDAN-CMT56118HRS.

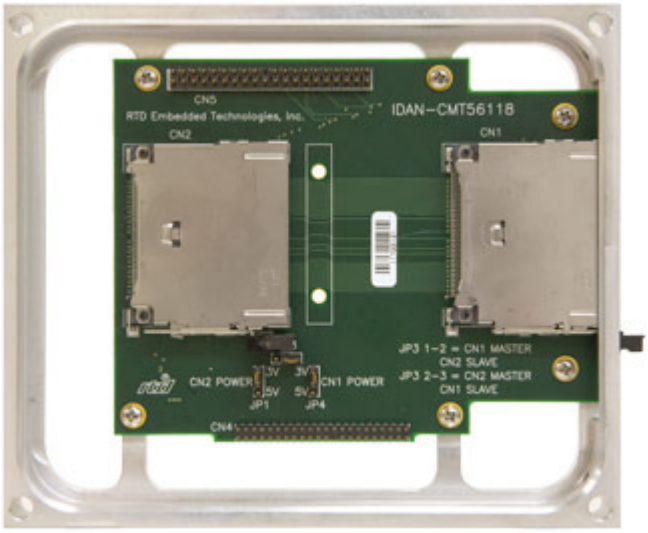

Figure 6.1 IDAN-CMT56118HRS Top View

Figure 6.2 IDAN-CMT56118HRS Front View

Dimensional Drawing

The figure below shows the dimensional drawings of the IDAN-CMT56118HRS.

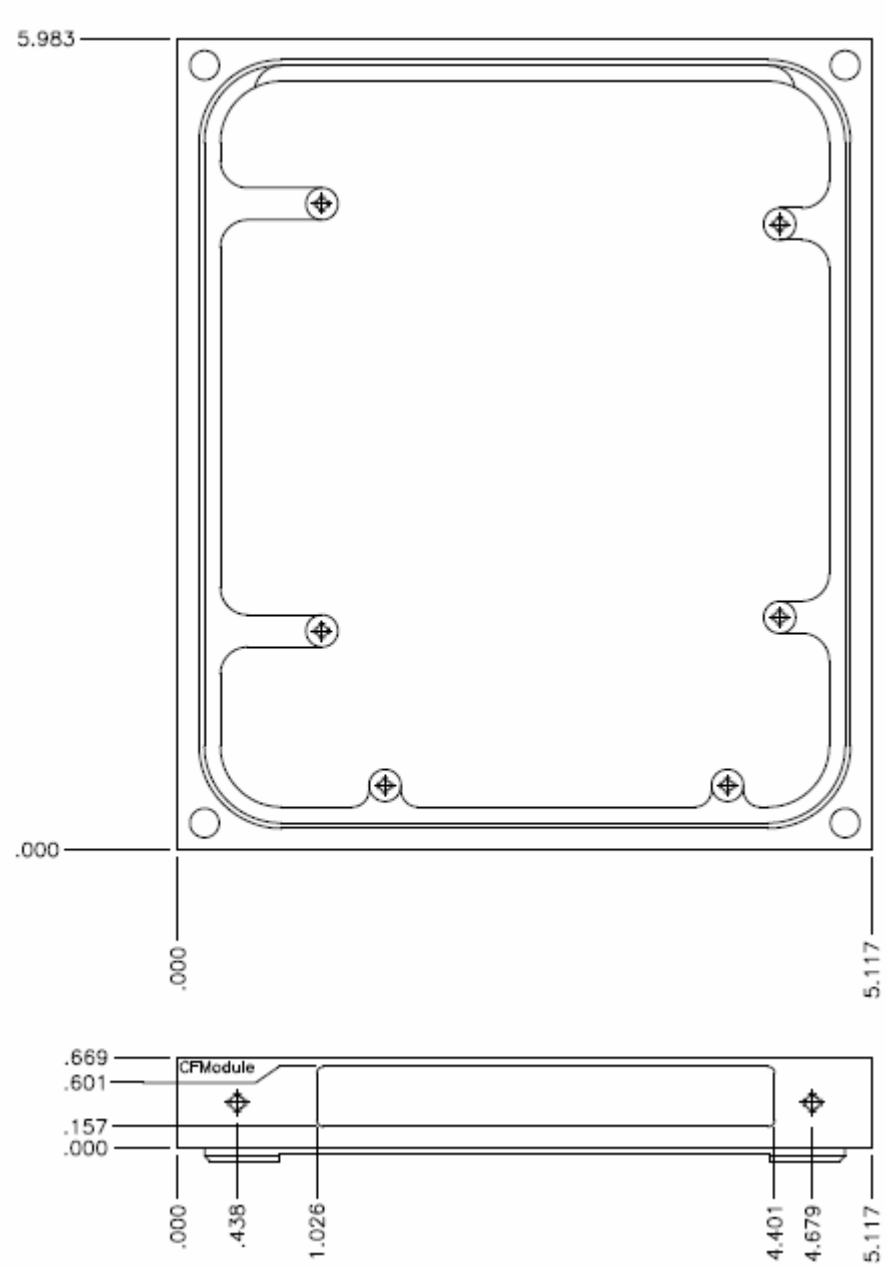

Figure 6.3 IDAN-CMT56118HRS Dimensional Drawing

Chapter 7 GETTING TECHNICAL SUPPORT

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- Phone: +1-814-234-8087
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Be sure to check the RTD web site (http://www.rtd.com) frequently for product updates, including newer versions of the board manual and application software.

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