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MIL-STD-1553 PMC Card

www.ddc-web.com

MODEL: BU-65565



FEATURES

- Complete Off-the-Shelf Solution for Embedded MIL-STD-1553
- Designed for Harsh Environments
- Most Autonomous BC Architecture
- Remote Terminal Flexibility
- True Message Monitor
- Autonomous Built-In Self-Test
- FREE Supporting Software
- Applications
  - Mission Computers
  - Flight Computers
  - Communication Links
  - Spacecraft
  - Ground Vehicles

DESCRIPTION

The BU-65565 PCI Mezzanine (PMC) card offers a comprehensive COTS solution for interfacing between embedded PCI and MIL-STD-1553 buses. The conduction cooled version, built to VITA-20 specifications, features a conformally coated robust design with thermal vias, a heat spreading plane, and copper strips providing a thermal interface to baseboard rails. The card has passed extensive shock and vibration testing. The BU-65565 is also available as a convection-cooled card, with a choice of rear-panel, front-panel, or rear- and front-panel input/output.

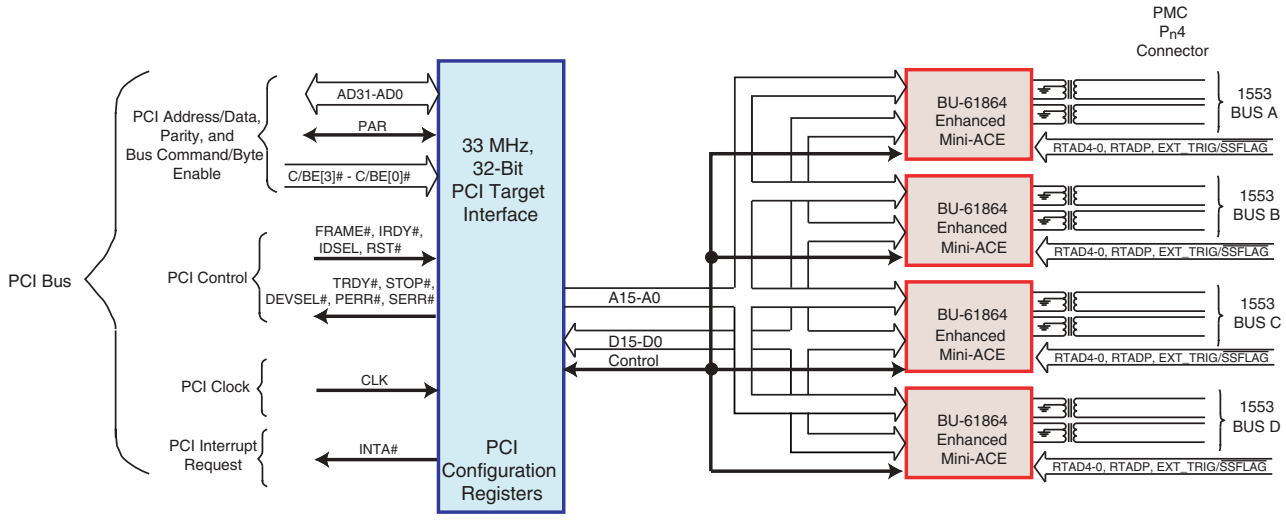
The BU-65565 includes one to four channels of DDC's field-proven, industry standard Enhanced Mini-ACE™. This advanced bus controller architecture provides a high degree of flexibility and autonomy: improving message scheduling control; minimizing host overhead for asynchronous message insertion; and facilitating bulk data transfers and double buffering, message retry and bus switching strategies, and data logging and fault reporting. In addition, the PMC card's remote terminal architecture meets all common MIL-STD-1553 protocols. RT data buffering and interrupt options offer robust support for synchronous and asynchronous messaging while ensuring data sample consistency and supporting bulk data transfers.



Free BU-69090 software with a library supports all modes of operation, VxWorks®, Linux®, Integrity®, and Windows® device drivers (including source code), and an offline development

BU-65565 Block Diagram

Figure 1



Complete Off-the-Shelf Solution for Embedded MIL-STD-1553

- Conduction or Convection Cooled PMC Card
- One to Four MIL-STD-1553 Channels
- FREE Library and VxWorks® Software Available
- Each Channel Individually Programmable as BC, RT, Monitor, or RT/Monitor
- 64K X 17 RAM Per Channel
  - PCI Interface
  - 33 MHz, 32-bit
  - Target Interface
  - 5V and 3.3V-Powered (5V-only Option)
- Operates in 3.3V or 5V PCI Signaling Environments PCI Local Bus Specification Revision 2.2
- Transformer Coupled 1553 I/O
- Option for Direct Coupling

Designed for Extended Environments

- Conduction Cooled Version
  - -55 to +85° C Temperature Range
  - Constructed in Accordance with VITA-20
  - Rear-Panel I/O
  - Thermal Vias under Hottest Chips (transceivers)
- Convection Cooled Versions
  - 0 to +70° C Temperature Range
  - Rear-Panel, Front-Panel, or Front and Rear-Panel I/O Options
- Shock and Vibration Test Data Available
  - Shock: Three Pulses, Half Sine on Six (6) Axes
  - Vibration: Random Input, One Hour Each Axes Three Hours Total, 15 to 2000 Hz

Most Autonomous BC Architecture

- Built-in Message Sequence Control Engine
- Defined Set of 20 Instructions
- Control/Status Blocks for Individual Messages
- Minor and Major Frame Scheduling
- Asynchronous Message Insertion
- Conditional Branching and Subroutines
- General Purpose Queue: Message Status, Time Tag, Immediate Data, Indirect Data
- Fully User-definable Interrupts
- Legacy Mode for Compatibility with ACE and Mini-ACE Applications

Remote Terminal Flexibility

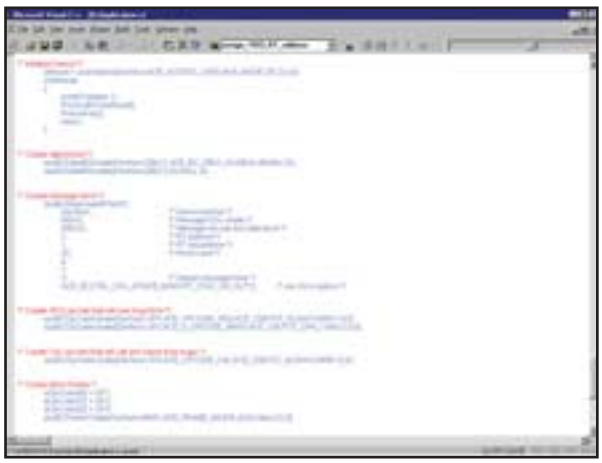
- Compatibility with ACE and Mini-ACE Applications
- Multiprotocol: MIL-STD-1553A/B, STANAG-3838
- Choice of Subaddress Single Message, Double Buffering, or Circular Buffering; or Global Circular Buffering
  - 50% and 100% Circular Buffer Rollover Interrupts
- Stack with Descriptors for Individual Messages
  - Message Status, Time Tag, Command Word, Data Pointer
- Hardware (via connector) or Software-Programmable RT Address
- Programmable Command Illegalization
- Programmable Busy by Subaddress
- Interrupts on All Messages, or Individual Subaddresses and/or Mode Codes
- 32-Entry Interrupt Status Queue
- Available with Option for RT AUTO-BOOT with BUSY Bit Set for MIL-STD-1760 Applications

True Message Monitor

- Selective Message Monitor
  - Filter Based on RT Address, T/$\overline{R}$ bit, Subaddress
- True Message Monitor
- Command Stack
  - Message Status, Time Tag, Command Word, Data Pointer
- Data Stack
  - All Monitored Words Following (first) Command Word
- 50% and 100% Rollover Interrupts for Command and Data Stacks
- 32-Entry Interrupt Status Queue
- Simultaneous RT/Message Monitor Option

Autonomous Built-In Self-Test

- Protocol Self-Test
- RAM Self-Test
- Online Loopback Test
- Capability for CH. A-to-CH. B Wraparound Test
- Capability to Test Transmitter Timeout Function



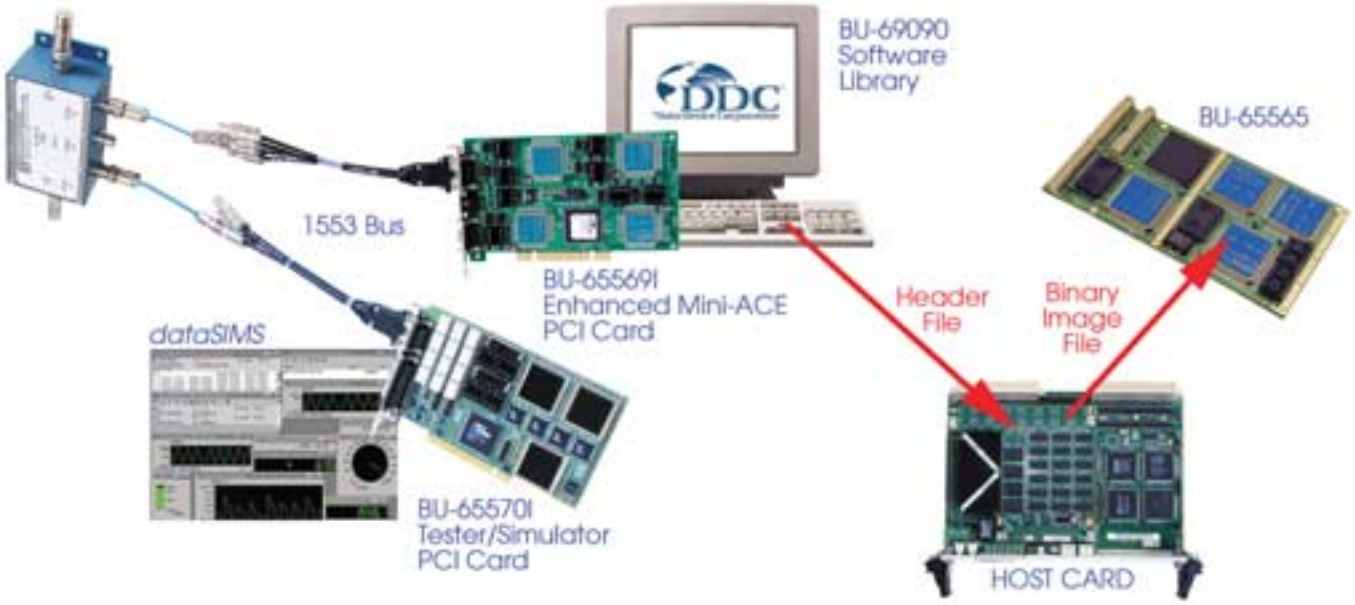
FREE Supporting Software

- Complete BU-69090 Library
- VxWorks, Linux, Integrity, and Windows Drivers
- High-Level Register/Memory Initialization Routines
- For All Modes, Creation of Consolidated Status + Data Structures for Individual Messages in Host Memory
- Memory Management Software
- Open/Access/Close Model
- Memory Allocation Performed Transparent to Application Program
- Management of Data Structures in Card RAM and Host Memory

- BC Software
  - Supports Full Use of BC Instruction Set
  - Manages Creation of Data Blocks
  - Creates BC Messages
  - Create and Start BC Frames
  - Creation of Message Control/Status Blocks
- RT Software
  - Allocates RT Data Blocks
  - Map Data Blocks to Subaddresses
  - Command Illegalization
  - Read Consolidated Message Structures From Host Buffers
  - Initialize and Manage Circular Buffers
- Monitor Software
  - Enable Monitor Filtering for Specified Address/ T-R/Subaddresses
  - Copy Monitored Messages Into Consolidated Structures in Host Buffers
  - Read Last Unread Message From Host Buffer
  - Read Most Recent Message From Host Buffer
- VxWorks Driver
  - Designed for Version 5.2 of Wind River's VxWorks
  - For Power PC, Developed Using 750 Processor
  - Version for Intel Pentium Platform Available
  - Source Code Available
- Support of Offline Development Environment
  - Allows Development on Desktop PC
  - Generates Binary Image and 'C' Header Files
  - Results in Reduced Embedded Code Size
  - Reduced Computational Resources
  - Reduces Software Validation and Documentation

Offline Development (Software) Environment

Figure 2



Specifications

PARAMETER	MIN	TYP	MAX	UNITS
ABSOLUTE MAXIMUM RATINGS				
Supply Voltage				
+3.3V	-0.3		4.6	V
+5V	-0.3		6.0	V
POWER SUPPLY REQUIREMENTS				
Voltages/Tolerance				
+3.3 V (logic power)	3.0	3.3	3.6	V
+5 V (RAM and transceiver power)	4.75	5.0	5.25	V
Current Drain (Total Hybrid)				
BU-65565X1				
+5 V				
0% Transmit/Monitor			100	mA
75% Duty Transmitter Cycle			430	mA
+3.3 V (Logic)			80	mA
BU-65565X2				
+5 V				
0% Transmit/Monitor			200	mA
75% Duty Transmitter Cycle			860	A
+3.3 V (Logic)			120	mA
BU-65565X3				
+5 V				
0% Transmit/Monitor			300	mA
75% Duty Transmitter Cycle			1.29	A
+3.3 V (Logic)			160	mA
BU-65565X4				
+5 V				
0% Transmit/Monitor			400	mA
75% Duty Transmitter Cycle			1.72	A
+3.3 V (Logic)			200	mA

PARAMETER	MIN	TYP	MAX	UNITS
THERMAL				
Operating Temperature				
BU-65565MX				
(measured at thermal interface)	-55		85	°C
BU-65565C/F/BX				
(measured at component case)	0		70	°C
Operating Junction Temperature	-55		160	°C
Storage Temperature	-65		160	°C
Thermal Resistance, Junction to Thermal Interface (BU-65565MX)			39	°C/W

MECHANICAL DESIGN

Shock: Three pulses, half sine on six (6) axes	40g's, 11 msec/axes
Vibration: Random input, one hour each axes, three hours total, 15 to 2000 Hz	14g's rms
Resonant Frequency: BU-65565M2 (calculated)	12 Hz

PHYSICAL CHARACTERISTICS

Size	5.87 X 2.91	in.
	149 X 74	mm
Weight		
BU-65565X1	2.7 (76.5)	oz. (g)
BU-65565X2	3.3 (93.56)	oz. (g)
BU-65565X3	3.9 (110.6)	oz. (g)
BU-65565X4	4.5 (127.6)	oz. (g)

Ordering Information

BU-65565 X X - X00X

(blank) = No Conformal Coating
N = Conformal Coating (See Note)

Temperature Range
3 = 0°C to +70°C (Convection cooling method only)
9 = -55°C to +85°C (Convection cooling method only)

Number of Channels
1 = 1 Dual Redundant 1553 Channel
2 = 2 Dual Redundant 1553 Channels
3 = 3 Dual Redundant 1553 Channels
4 = 4 Dual Redundant 1553 Channels

Cooling Method
F = Convection Cooled, Front Panel I/O
C = Convection Cooled, Rear Panel I/O
B = Convection Cooled, Front and Rear Panel I/O
M = Conduction Cooled Conformally Coated with "Humiseal 1A33," Rear Panel I/O

Base Product
BU-65565 = MIL-STD-1553 PMC Card

Notes: 1. For BU-65565MX, conformal coating is standard and this digit should be blank. For BU-65565CX, BU-65565FX, or BU-65565BX, conformal coating is optional and this digit can be either blank or "N".
2. These products contain tin-lead solder.

The information in this product brief is believed to be accurate; however, no responsibility is assumed by Data Device Corporation for its use, and no license or rights are granted by implication or otherwise in connection therewith. Specifications are subject to change without notice.

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