Mini-ACE® Mark3 and PCI Mini-ACE Mark3

Product Brief
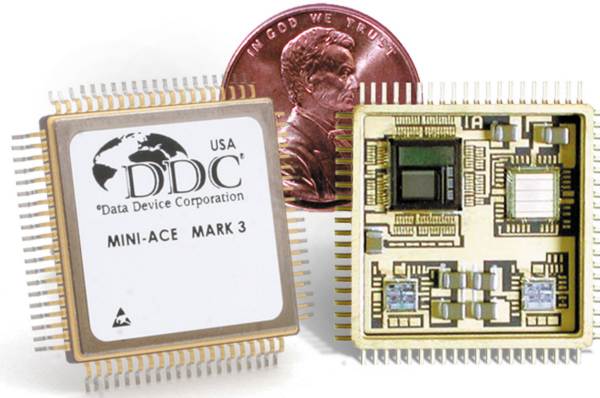
Mini-ACE Mark3... the world's first 3.3V MIL-STD-1553 terminal with transceivers eliminates the cost and space required for a 5V power supply, while providing the smallest ceramaic 1553 terminal with a compact 0.88 in² footprint that is ideal for use where PC board space is at a premium.

Key Features

- 1 Dual Redundant MIL-STD-1553 Channel (Requires External Transformers)
  - BC, RT, MT or MT/RT Functionality
  - Supports MIL-STD-1553 A/B
  - Supports MIL-STD-1760
  - Supports MacAir
  - Supports STANAG 3838
  - 4K or 64K x 16 RAM
  - Tx Inhibit Pin for MT Only Applications
  - RT Only Version Available
- Small Ceramic Package
  - 80-pin Ceramic Flatpack or Gull Wing
  - .88" x .88" CQFP
  - .130" Max Height
- Extended Military Temperature Range
  - -55°C to +125°C
- DO-254 Certifiable
- +3.3V or +5V Operation
- Generic Processor or PCI Interface

Benefits

- Proven & Reliable Technology
- Small Footprint Reduces:
  - Space, Power, Weight, Cost
- Software Compatible with ACE, Mini-ACE®, and Enhanced Mini-ACE® Series
- Ceramic Package for Extreme Conditions

Applications

- Mission Computers
- Data Recorders
- LRU's
- Displays
- Ground Vehicles
- Commercial Aerospace

Product Overview

Mini-ACE Mark3 and PCI Mini-ACE Mark3

The Mini-ACE Mark3 is the first MIL-STD-1553 terminal which can be powered entirely by 3.3 volts, thus eliminating the need for a 5 volt power supply. The BU-6474X RT only, and BU-6484X/6486X BC/RT/MT Mini-ACE Mark3 family of MIL-STD-1553 terminals comprise a complete integrated interface between a host processor and a MIL-STD-1553 bus. The Mini-ACE Mark3 is available in a 0.88 square inch flat pack or gull wing package with a "toe-to-toe" dimension of 1.110 inches. The Mini-ACE Mark3 is the industry's smallest ceramic gull-lead 1553 terminal, enabling its use in applications where board space is at a premium.

The Mini-ACE Mark3 Series is fully software and architecturally compatible with DDC's ACE, Enhanced Mini-ACE, Micro-ACE, and Total-ACE series.

The Mini-ACE Mark3 provides complete multiprotocol support of MIL-STD-1553A/B/MacAir and STANAG 3838. The Mark3 integrates dual transceiver, protocol logic, and either 4K or 64K words of internal RAM. The BU-6486X BC/RT/MT terminal includes 64K words of internal RAM, with built-in parity checking.

The Mini-ACE Mark3 includes dual 3.3 volt or 5.0 volt voltage source transceivers for improved line driving capability, with options for MIL-STD-1760 and MacAir compatibility. Mark3 versions with 64K x 17 RAM offer an additional transceiver power-down (SLEEPIN) option to further reduce device power consumption. To provide further flexibility, the Mini-ACE Mark3 may operate with a choice of 10, 12, 16, or 20 MHz clock inputs.

Product Specifications

1553 Bus Monitor (MT)
- Filter based on RT Address, T/R bit, Subaddress
- Programmable Interrupt Conditions
- Command/Data Stack
- 32-Entry Interrupt Status Queue

1553 Bus Controller (BC)
- Message Control Engine Offloads Host Processor
- Minor/Major Frame Scheduling to Control Timing of 1553 Messages
- High and Low Priority Asynchronous Message Insertion
- Modify Messages or Data while BC is Running
- Programmable Interrupt Conditions

1553 Remote Terminal (RT)
- Multiprotocol: MIL-STD-1553 A/B, STANAG 3838
- Multiple Buffering Techniques
- Programmable Command Illegalization
- Programmable Busy to Subaddress
- Concurrent Bus Monitor
- RT AUTO Boot

Autonomous Built-In Self-Test
- Protocol Self-Test*
- RAM Self-Test
- Online Loopback Test
- Capability to Test Transmitter Timeout Function

Processor or PCI Interface Flexibility
- Direct Interface to 8,16, or 32-bit Microprocessor or Microcontrollers
- Support DMA Interface to External RAM
- PCI Mini-ACE Mark3 includes 33 MHz, 32-bit PCI target interface.
- Supports 3.3 Volt Logic Interface

*Not available for PCI Mini-ACE Mark3

Mini-ACE Mark3 3.3V Interface to MIL-STD-1553 Bus
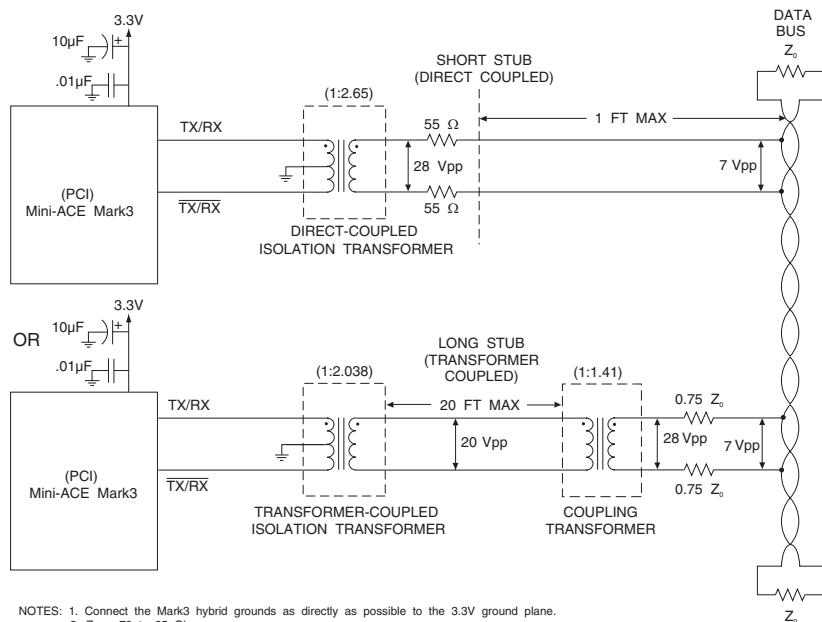
NOTES: 1. Connect the Mark3 hybrid grounds as directly as possible to the 3.3V ground plane.
2. Zo = 70 to 85 Ohms.
3. Transformer center tap capcotprs: use 10µF tantalum for low inductance, and a 0.10µF ceramic. Both must be mounted as close as possible, and with the shortest leads to the transceiver power input and ground
4. See Data Sheet for 5.0 Volt Interface Diagram

Technical Data

PARAMETER			MIN	TYP	MAX
ABSOLUTE MAXIMUM RATINGS					
Supply Voltage	Logic +3.3V		-0.3	–	4.1
	Logic +5V / RAM +5V		-0.3	–	6.0
	Transceiver +3.3V (not during transmit)	V	-0.3	–	6.0
	Transceiver +3.3V (during transmit)		-0.3	–	4.5
	Transceiver +5V		-0.3	–	7.0
Logic	+3.3V / +5V Logic Input Range		-0.3	–	6.0
POWER SUPPLY REQUIREMENTS					
Voltages/Tolerance	Logic +3.3V		3.00	3.3	3.60
	Logic +5V		4.5	5.0	5.5
	RAM +5V	V	4.5	5.0	5.5
	Transceiver +3.3V		3.14	3.3	3.46
	Transceiver +5V		4.75	5.0	5.25
POWER DISSIPATION (Notes 1 and 2)					
BU-64863x8 (1553/1760 with 64K RAM, 3.3V Logic and Transceivers)	Idle with Transceiver SLEEPIN Enable		–	0.9	0.23
	25% Transmitter Duty Cycle	W	–	0.53	0.74
	50% Transmitter Duty Cycle		–	0.93	1.12
	100% Transmitter Duty Cycle		–	1.36	1.87
THERMAL					
Thermal Resistance, Junction-to-Case, Hottest Die (θ_{JC})		°C/W	–	9	11
Operating Case Temperature	-1XX and -4XX options	°C	-55	–	+125
Storage Temperature			-65	–	+150
PHYSICAL CHARACTERISTICS					
Package Body Size	80-pin Flatpack or Gull Wing	in	0.88 x 0.88 x 0.13		
		mm	22.3 x 22.3 x 3.3		
Lead Toe-to-Toe Distance	80-pin Gull Wing	in	1.1		
		mm	28.194		
Weight		oz	0.353		
		g	10		

Notes:
1. Power dissipation specifications assume a transformer coupled configuration with external dissipation (while transmitting) of 0.14 watts for the active isolation transformer, 0.08 watts for the active bus coupling transformer, 0.45 watts for each of the two bus isolation resistors, and 0.15 watts for each of the two bus termination resistors.
2. Use BETA Transformer Technology Corp., "LVB" Series of isolation transformers (Refer to BETA's WEB page www.bttc-beta.com)
3. For full specifications and additional information refer to the BU-6474X/6484X/6486X Mini-ACE Mark3/Micro-ACE-TE Data Sheet (DS-BU-6474X) available on the web site.

Mini-ACE Mark3 Gull Wing Mechanical Outline

Note: Dimensions are in inches (mm).
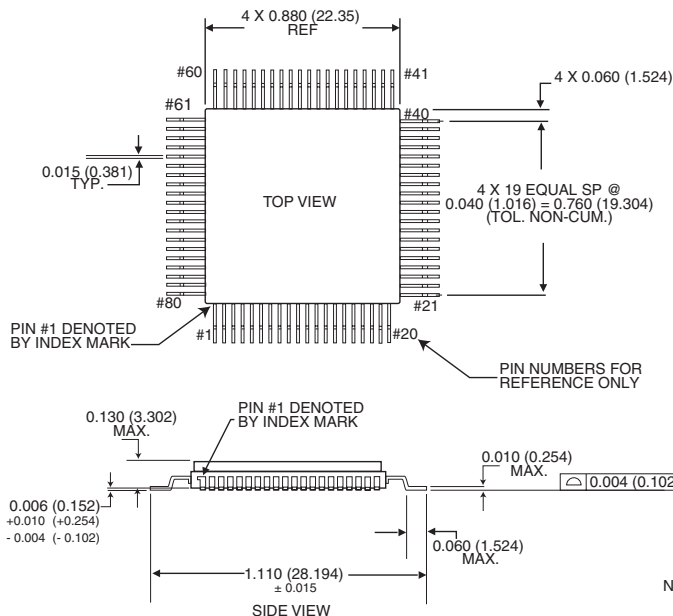
Ordering Information

BU-64863G8-110X

Supplemental Process Requirements:
- S = Pre-Cap Source Inspection
- L = 100% Pull Test
- Q = Pull Test and Pre-Cap Source Inspection
- K = One Lot Date Code
- W = One Lot Date Code and Pre-Cap Source Inspection
- Y = One Lot Date Code and 100% Pull Test
- Z = One Lot Date Code, Pre-Cap Source Inspection, and 100% Pull test
- Blank = None of the Above

Test Criteria:
- 0 = Standard Testing
- 2 = MIL-STD-1760 Amplitude Compliant (not available with Voltage / Transceiver Options
- 0 "Transceiverless, or 4 and 9 "MacAir Compatible")

Process Requirements:
- 0 = Standard DDC Processing, no Burn-In
- 1 = MIL-PRF-38534 Compliant
- 2 = B*
- 3 = MIL-PRF-38534 Compliant with PIND Testing
- 4 = MIL-PRF-38534 Compliant with Solder Dip
- 5 = MIL-PRF-38534 Compliant with PIND Testing and Solder Dip
- 6 = B* with PIND Testing
- 7 = B* with Solder Dip
- 8 = B* with PIND Testing and Solder Dip
- 9 = Standard DDC Processing with Solder Dip, no Burn-In

Temperature Grade/Data Requirements:
- 1 = -55°C to +125°C
- 2 = -40°C to +85°C
- 3 = 0°C to +70°C
- 4 = -55°C to +125°C with Variables Test Data
- 5 = -40°C to +85°C with Variables Test Data
- 6 = Custom Part (Reserved)
- 7 = Custom Part (Reserved)
- 8 = 0°C to +70°C with Variables Test Data

Voltage/Transceiver Option:
- 0 = Tranceiverless (Contact Factory for Availability)
- 3 = +5V rise/fall times = 100 to 300 ns (-1553B)
- 4 = +5V rise/fall times = 200 to 300 ns (-1553B & MacAir compatible; not available with test criteria option 2 "MIL-STD-1760 Amplitude Compliant")
- 8 = +3.3V, rise/fall times = 100 to 300 ns (-1553B) (Not recommended for new designs)
- 9 = +3.3V, rise/fall times = 200 to 300 ns (-1553B & McAir compatible; not available with test criteria - XX2 "MIL-STD-1760 Compliant") (Not recommended for new designs)
- C = +3.3V, rise/fall times = 100 to 300 ns (-1553B), recommended for new designs
- D = +3.3V, rise/fall times = 200 to 300 ns (-1553B & McAir compatible; not available with test criteria) recommended for new designs

Package Type:
- F = 80-lead Flat Pack
- G = 80-lead Gull Wing (Formed Lead)

Logic/RAM Voltage:
- 3 = 3.3 Volt
- 5 = 5.0 Volt (only available with BU-6474 and BU-6484 with voltage/transceiver options 3 or 4)

Product Type:
- BU-6474 = RT-only Mini-ACE Mark3 with 4K x 16 RAM
- BU-6484 = BC/RT/MT Mini-ACE Mark3 with 4K X 16 RAM
- BU-6486 = BC/RT/MT Mini-ACE Mark3 with 64K X 17 RAM
- BU-6574 = RT-only PCI Mini-ACE Mark3 with 4K X 16 RAM
- BU-6584 = BC/RT/MT PCI Mini-ACE Mark3 with 4K X 16 RAM
- BU-6586 = BC/RT/MT PCI Mini-ACE Mark3 with 64K X 17 RAM

Notes:
1. Standard DDC processing with burn-in and full temperature test.
2. These products contain tin-lead solder finish as applicable to solder dip requirements.

For ordering assistance and technical support,
Call: 1-800-DDC-5757
E-mail: service@ddc-web.com
Visit: www.ddc-web.com

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