Enhanced Mini-ACE® 1553 Terminal

Model: BU-6174X/6184X/6186X

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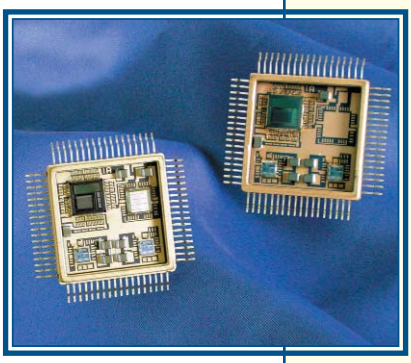

FEATURES:

- Fully Integrated 1553A/B Notice 2, McAir, STANAG 3838 Interface Terminal
- Compatible with older ACE and Mini-ACE, series.
- Choice Of:
  - RT or BC/RT/MT In Same Footprint
  - RT or BC/RT/MT with 4K RAM
  - BC/RT/MT with 64K RAM, and RAM parity
- Choice of 5V or 3.3V Logic
- -1" Square Ceramic Flatpack or Gull Wing
- +5V Transceiver with 1760 and McAir Compatible Options
- Comprehensive Built-In Self-Test
- Flexible Processor/Memory Interface, with Reduced Host Wait Time
- Choice of 10, 12, 16, or 20 MHz Clock
- Highly Autonomous BC with Built-In Message Sequence Control:
  - Frame Scheduling
  - Branching
  - Asynchronous Message Insertion
  - General Purpose Queue
  - User-defined Interrupts
- Advanced RT Functions
  - Global Circular Buffering
  - Interrupt Status Queue
  - 50% Circular Buffer Rollover Interrupts
- Selective Message Monitor
  - Selection by Address,T/R Bit, Subaddress
  - Command and Data Stacks
  - 50% and 100% Stack Rollover Interrupts
- Available with Full Military Temperature Range and Screening

DESCRIPTION

The Enhanced Mini-ACE family of MIL-STD-1553 terminals provides complete interfaces between a host processor and 1553 bus, integrating dual transceiver,protocol logic, and 4K or 64K words of RAM.

The terminals offer a choice of 5V or 3.3V logic,and feature multi-protocol support of MIL-STD-1553A/B and STANAG 3838, including versions incorporating McAir compatible transmitters. There is a choice of 10,12,16, or 20 MHz clocks. The BC/RT/MT versions with 64K words of RAM include built-in RAM real-time parity checking.

BC features include a built-in programmable message sequence control engine with a set of 20 instructions. This feature provides an autonomous means of implementing multi-frame message scheduling, message retry schemes, data double buffering, asynchronous message insertion, and reporting to the host CPU.

The RT offers the same choices of subaddress buffering as the ACE and Mini-ACE, along with a global circular buffering option, 50% rollover interrupt for circular buffers, an interrupt status queue, and an "Auto-boot" option to support MIL-STD-1760.

The Enhanced Mini-ACE incorporates a fully autonomous built-in self-test engine, providing comprehensive testing of the internal protocol logic and/or RAM.

The terminals provide the same flexibility in host interface configurations as the ACE and Mini-ACE, along with a reduction in the host processor's worst case hold-off time. Most software features are compatible with the previous generations of ACE and Mini-ACE series. Enhanced Mini-ACE architecture is also available in several new package styles, supply voltages and backend interfaces in the Mini-ACE Mark3, Micro-ACE TE series components. (See Separate Product Brief).

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Figure 1. Enhanced Mini-ACE 1553 Terminal

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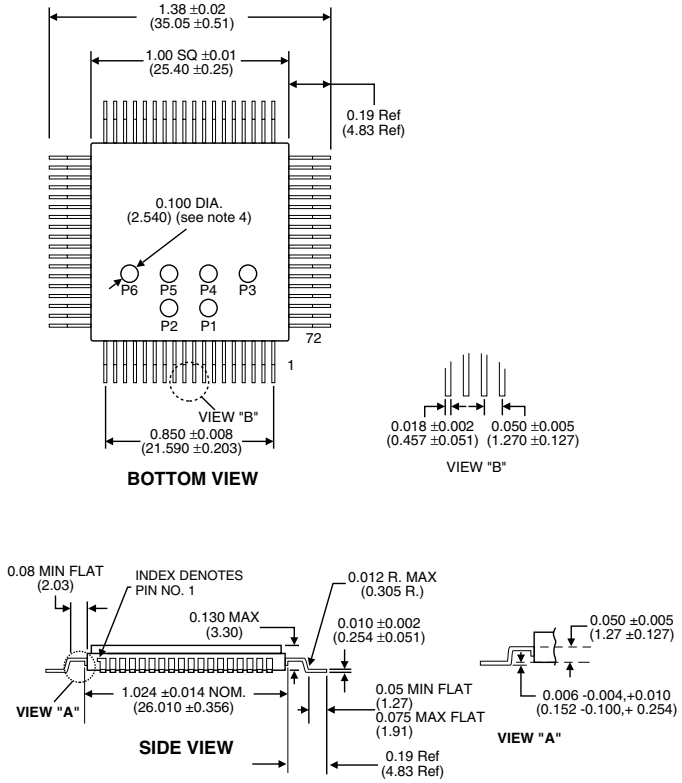

Notes:
1) Dimensions are in inches(mm)
2) Package Material: Alumina(AL_2O_3)
3) Lead Material: Kovar, Plated by 50μ in. minimum nickel under 60μ in. minimum gold.
4) There are 6 test pads located on the bottom of the package.These pads are recessed so as not to interfere when mounting the hybrid. There are no user connections to these pads.

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

- Multiprotocol: MIL-STD-1553A/B, STANAG-3838
- Choice of Subaddress Single Message, Double Buffering, Circular Buffering, or Global Circular Buffering
- 50% and 100% Circular Buffer Rollover Interrupts
- Hardware 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
- Option for RT AUTO-BOOT: Initialize to RT Mode with Busy bit Set Following Power-Up for MIL-STD-1760 Applications.

True Message Monitor

- Selective Message Monitor
- Filter Based on RT Address, T/R bit, Subaddress
- Command and Data Stacks
- 50% and 100% Rollover Interrupts
- 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 to Test Transmitter Timeout Function

Processor Interface Flexibility

- Direct Interface to 8,16, or 32-bit Microprocessor or Microcontrollers
- Supports DMA Interface to External RAM
- Supports 3.3 Volt Logic Interface
- +5 Volt-Tolerant Logic Signals

Extensive User Configurability

- Software programmable divider selects master 1553 clock of 10, 12, 16 or 20 MHz

Specifications

PARAMETER	MIN	TYP	MAX	UNITS
POWER SUPPLY REQUIREMENTS				
Voltages/Tolerance				
+3.3V (Logic)	3.0	3.3	3.6	V
+5.0V Transceiver (Ch. A, Ch. B)	4.75	5.0	5.25	V
+5.0V(Logic),5 V-RAM (64K RAM for 61864/65)	4.5	5.0	5.5	V
CURRENT DRAIN (Total Hybrid)				
BU-61743X3/4-XX0 & BU-61843X3/4-XX0				
+5V(Ch. A, Ch. B)				
0% Transmit/Monitor		65	100	mA
25% Duty Transmitter Cycle		169	205	mA
50% Duty Transmitter Cycle		273	310	mA
75% Duty Transmitter Cycle		377	415	mA
+3.3V (Logic)		25	40	mA
BU-61745X3/4-XX0 & BU-61845X3/4-XX0				
+5V(Logic, RAM, CH A, CH B)				
0% Transmit/Monitor		116	160	mA
25% Duty Transmitter Cycle		222	265	mA
50% Duty Transmitter Cycle		328	370	mA
75% Duty Transmitter Cycle		434	475	mA
BU-61864X3/4-XX0				
+5V (Ch. A, Ch. B)				
0% Transmit/Monitor		66	120	mA
25% Duty Transmitter Cycle		163	225	mA
50% Duty Transmitter Cycle		260	330	mA
+75% Duty Transmitter Cycle		357	435	mA
+3.3V (Logic)		25	40	mA
BU-61865X3/4-XX0				
+5V (Logic RAM Ch. A, Ch. B)				
0% Transmit/Monitor		116	180	mA
25% Duty Transmitter Cycle		217	285	mA
50% Duty Transmitter Cycle		318	390	mA
75% Duty Transmitter Cycle		419	495	mA
POWER DISSIPATION (See Note)				
Total Hybrid				
BU-61743X3/4 & BU-61843X3/4-XX0				
0% Transmit/Monitorl		0.41	0.63	W
25% Duty Transmitter Cycle		0.70	0.85	W
50% Duty Transmitter Cycle		0.94	1.07	W
75% Duty Transmitter Cycle		1.17	1.29	W

PARAMETER	MIN	TYP	MAX	UNITS
BU-61745X3/4 & BU-61845X3/4-XX0				
0% Transmit/Monitor		0.64	0.88	W
25% Duty Transmitter Cycle		0.93	1.11	W
50% Duty Transmitter Cycle		1.22	1.33	W
75% Duty Transmitter Cycle		1.52	1.65	W
BU-61864X3/4-XX0				
0% Transmit/Monitor		0.44	0.80	W
25% Duty Transmitter Cycle		0.75	1.03	W
50% Duty Transmitter Cycle		1.05	1.26	W
75% Duty Transmitter Cycle		1.36	1.49	W
BU-61865X3/4-XX0				
0% Transmit/Monitor		0.64	0.99	W
25% Duty Transmitter Cycle		0.93	1.22	W
50% Duty Transmitter Cycle		1.22	1.45	W
75% Duty Transmitter Cycle		1.51	1.68	W
Hottest Die (Transceiver Chip)				
0% Transmit/Monitor		0.18	0.28	W
25% Duty Transmitter Cycle		0.42	0.51	W
50% Duty Transmitter Cycle		0.66	0.75	W
75% Duty Transmitter Cycle		.90	.985	W
CLOCK INPUTS				
Frequency: Nominal Value				
Default Mode		16.0		MHz
Option		12.0		MHz
Option		10.0		MHz
Option		20.0		MHz
THERMAL				
Thermal Resistance, Junction-to-Case, Hottest Die (θjc,)		9	11	°C/W
Operating Junction Temperature	-55		+150	°C
Storage Temperature	-65		+150	°C
PHYSICAL CHARACTERISTICS				
Size		1.0 X 1.0 X 0.130		in.
Ceramic Flat Pack/ Gull Wing		(25.4 x 25.4 x 3.3)		mm
Weight		0.6		oz.
		17		g

Note:
Power dissipation specifications assume a transformer coupled configuration with external dissipation (while transmitting) of 0.14 watts for the active isolation transformer, 0.80 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.

STANDARD DDC PROCESSING FOR HYBRID AND MONOLITHIC HERMETIC PRODUCTS

TEST	MIL-STD-883	
	METHODS	CONDITION(S)
INSPECTION	2009, 2010, 2017, and 2032	—
SEAL	1014	A and C
TEMPERATURE CYCLE	1010	C
CONSTANT ACCELERATION	2001	3000g
BURN-IN	1015(note1), 1030(note2)	TABLE 1

Notes:
1. For Process Requirement "B" (refer to ordering information), devices may be non-compliant with MIL-STD-883, Test Method 1015, Paragraph 3.2. Contact factory for details.
2. When applicable.

Ordering Information

BU-61XXX - XXXX

Supplemental Process Requirements:
S = Pre-Cap Source Inspection
L = 100% Pull Test
Q = 100% 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 Option 4 "McAir" compatible")

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

Case Temperature Range /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
3 = +5 Volts rise/fall times = 100 to 300ns (-1553B)
4 = +5 Volts rise/fall times = 200 to 300ns (-1553B and McAir Compatible)(not available with Test Criteria option 2 "MIL-STD-1760 Amplitude Compliant")

Package Type:
F = 72-Lead Enhanced Mini-ACE Flat Pack
G = 72-Lead Enhanced Mini-ACE"Gull-Wing" (Formed Lead)

Logic/RAM Voltage (for BU-6186X versions, 64K x 17K RAM voltage is always 5V)
3 = 3.3 Volt (Applicaable only for BU-61743 and BU-61843)
4 = 3.3 and 5 Volt (Applicaable only for BU-61864)
5 = 5 Volt

Product Type:
BU-6174 = RT Only with 4K X 16 RAM
BU-6184 = BC/RT/MT with 4K X 16 RAM
BU-6186 = BC/RT/MT with 64K X 17 RAM

Notes:
1. Standard DDC processing with burn-in and full temperature test. See table on preceding page.
2. MIL-PRF- 38534 product grading is designated with the following dash numbers:
Class H is a -11X, 13X, 14X, 15X, 41X, 43X, 44X, 45X
Class G is a -21X, 23X, 24X, 25X, 51X, 53X, 54X, 55X
Class D is a -31X, 33X, 34X, 35X, 81X, 83X, 84X, 85X
3. The above products contain tin-lead solder finish as applicable to solder dip requirements.

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