

SCSI PC Card Drive - SDDS

GENERAL DESCRIPTION

- The Adtron SDDS product family connects a PC Card to a computer system's standard SCSI bus.
- This product family includes single and dual slot versions that mount in a 3.5-inch floppy drive bay.
- This SCSI PC Card Drive may be configured to emulate a removable disk, a fixed disk, or a removable DAT drive.
- The storage capacity equals the PC Card capacity, which today ranges from 16MBytes to 5GBytes in a PC Card.
- With the use of ATA flash PC Cards, the Adtron SDDS provides the durability and reliability of all solid-state, removable storage in extended temperature ranges.
- Adtron also offers SCSI connected PC Card drives on 6U VME cards, single slot external desktop, and CPCI 6U cards.

APPLICATIONS

- Telecommunications switches
- Network routers
- Military computer systems
- Factory automation
- Aviation and vehicle based computers
- Hardened industrial control systems
- Data transfer from portable to desktop computers
- Flight mission data transfer

FEATURES

- Removable PC Card Drive with an interface to the system SCSI bus
- Standard narrow SCSI interface on a 50-pin connector
- Compatible with the SCSI BIOS and drivers found in almost every computer system.
- Compliant with ANSI X3.13-1986 (American National Standard for Information Systems, SCSI)
- Field upgradable firmware prevents obsolescence
- Built-in active SCSI bus termination
- Drivers for Apple Macintosh and PowerPC
- Each slot in a dual slot drive is addressed as an independent logical unit
- In a dual slot drive each PC Card capacity may be combined into one logical unit
- Built-in support for 256 Byte and 512 Byte sector operation
- 5V only operation with optional 12V when required by PC Card V_{PP}
- Available in enhanced and industrial operating temperature ranges
- Warranty: 1 year

PC CARD COMPATIBILITY

- ATA flash and hard disk
- CompactFlash, SmartMedia, and MMC cards with PC Card adapter
- SRAM
- Fortezza



SCSI CONNECTOR CONFIGURATION

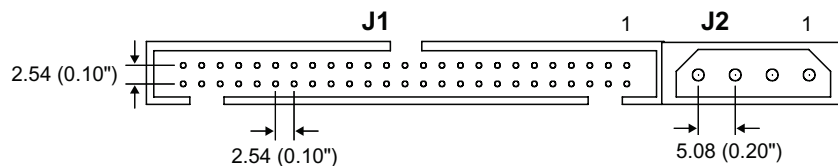
SCSI Connector Pinout

Pin Number	Signal	Signal	Pin Number
1	GND	-DB0	2
3	GND	-DB1	4
5	GND	-DB2	6
7	GND	-DB3	8
9	GND	-DB4	10
11	GND	-DB5	12
13	GND	-DB6	14
15	GND	-DB7	16
17	GND	-DBP	18
19	GND	GND	20
21	GND	GND	22
23	RSVD	RSVD	24
25	NC	TERMPWR	26
27	RSVD	RSVD	28
29	GND	GND	30
31	GND	-ATN	32
33	GND	GND	34
35	GND	-BSY	36
37	GND	-ACK	38
39	GND	-RST	40
41	GND	-MSG	42
43	GND	-SEL	44
45	GND	-C/D	46
47	GND	-REQ	48
49	GND	-I/O	50

Power Connector Pinout

Pin Number	Description
1	Optional 12V for PC Card V _{PP}
2	Ground
3	Ground
4	+5V

FIGURE 1: SCSI AND POWER CONNECTOR



Dimensions in mm (inches)

SCSI CONNECTOR CONFIGURATION

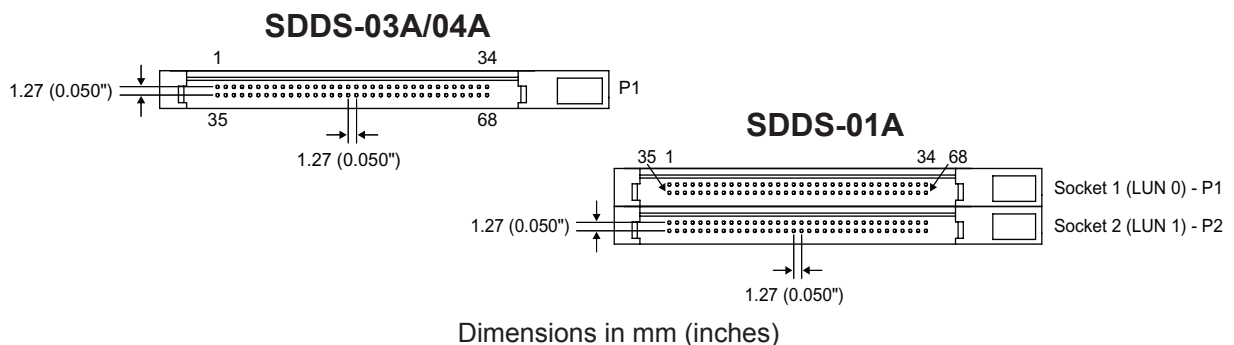
SCSI Connector Signal Descriptions

Signal Name	Pin Number(s)	Description
-BSY (BUSY)	36	An "OR-tied" signal that indicates that the SCSI bus is in use.
-SEL (SELECT)	44	An "OR-tied" signal used by an initiator to select a target or by a target to reselect an initiator.
-C/D (CONTROL/DATA)	46	A signal sourced by a target that indicates whether control or DATA phase information is on the DATA BUS. Asserted indicates CONTROL (i.e., COMMAND, STATUS, and MESSAGE phases).
-I/O (INPUT/OUTPUT)	50	A signal sourced by a target that controls the direction of data movement on the DATA BUS with respect to an initiator. Asserted indicates INPUT. This signal is also used to distinguish between SELECTION and RESELECTION phases.
-MSG (MESSAGE)	42	A signal sourced by a target to indicate the MESSAGE phase or a DATA phase depending on whether C/D is true or false. Asserted indicates MESSAGE or DT DATA.
-REQ (REQUEST)	48	A signal sourced by a target to indicate a request for an information transfer on the SCSI bus.
-ACK (ACKNOWLEDGE)	38	A signal sourced by an initiator to respond with an acknowledgment of an information transfer on the SCSI bus.
-ATN (ATTENTION)	32	A signal sourced by an initiator to indicate the ATTENTION condition.
-RST (RESET)	40	An "OR-tied" signal that indicates the RESET condition.
-DB(7-0) (DATA BUS)	2, 4, 6, 8, 10, 12, 14, 16	Eight data-bit signals that form the lower 8-bit DATA BUS
-DBP (PARITY)	18	This signal is associated with the DB (7-0) signals and is used to detect the presence of an odd number of bit errors within the byte. The parity bit is driven such that the number of logical ones in the byte plus the parity bit is odd.
TERMPWR	26	Normally sourced by the SCSI host adapter and used to supply Termination Power to SCSI devices on the bus. Standard configuration uses Vcc for TERMPWR.
GND	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 20-22, 29-31, 33-35, 37, 39, 41, 43, 45, 47, 49	Ground
RSVD	23, 24, 27, 28	Reserved
NC	25	No connect

PC CARD CONNECTOR CONFIGURATION

PC Card Connector Pinout			
Pin Number	Signal	Signal	Pin Number
1	GND	GND	35
2	D3	-CD1	36
3	D4	D11	37
4	D5	D12	38
5	D6	D13	39
6	D7	D14	40
7	-CE1	D15	41
8	A10	-CE2	42
9	-OE	NC	43
10	A11	-IOR	44
11	A9	-IOW	45
12	A8	A17	46
13	A13	A18	47
14	A14	A19	48
15	-WE	A20	49
16	RDY	A21	50
17	VCC	VCC	51
18	VPP	VPP	52
19	A16	A22	53
20	A15	A23	54
21	A12	A24	55
22	A7	A25	56
23	A6	-VS2	57
24	A5	RESET	58
25	A4	-WAIT	59
26	A3	-INP	60
27	A2	-REG	61
28	A1	BVD2	62
29	A0	BVD1	63
30	D0	D8	64
31	D1	D9	65
32	D2	D10	66
33	WP	-CD2	67

FIGURE 2: PC CARD CONNECTOR



PC CARD CONNECTOR CONFIGURATION

PC Card Connector Signal Descriptions

Signal Name	Pin Number(s)	Description
A[25:0]	8, 10-14, 19-29, 46-50, 53-56	Address Bus
D[15:0]	2-6, 30-32, 37-41, 64-66	Data Bus
BVD1, BVD2	63, 62	Battery Voltage Detect - used to reflect the PC Card's battery condition (SRAM only).
-CD1, -CD2	36, 67	Card Detect - used to detect a proper PC Card insertion.
-CE1, -CE2	7, 42	Chip Enable - CE1 enables even numbered address bytes. CE2 enables odd numbered address bytes.
-IOR	44	I/O Read - used to read from PC Card's I/O space.
-IOW	45	I/O Write - used to write to PC Card's I/O space.
-INP	60	Input Acknowledge - Asserted when the PC Card can respond to an I/O read cycle at the address on the address bus.
-OE	9	Output Enable - used to gate Memory Read data from a PC Card.
-REG	61	Control line used to access attribute memory.
RDY	16	Ready - negated to indicate that the PC Card is busy or initializing.
RESET	58	Reset - clears the PC Card's configuration registers and places card in an unconfigured (Memory Only interface) state.
VCC	17, 51	PC Card voltage
VPP	18, 52	Programming and Peripheral Voltages - typically used for programming/writing to the PC Card.
-WAIT	59	Wait - asserted by PC Card to delay completion of an access cycle in progress.
-WE	15	Write Enable - used to strobe Memory Write data into a PC Card.
WP	33	Write Protect - indicates PC Card's Write Protect switch.
-VS2	57	PC Card voltage sense #2 - intended to notify the host of the PC Card's voltage requirements.
GND	1, 34, 35, 68	Ground
NC	43	No Connect

For an in-depth description of the signals, refer to PC Card Standard (1995).

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Units
V _{CC}	V _{CC}	-0.3 to +6.7	V
V _{PP} (PC Card dependent)	V _{PP}	14.5	V
All input/output voltages	V _{in} , V _{out}	-0.3 to V _{CC} +0.5	V
Storage temperature range	T _{stg}	-55 to +90	°C

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Units
V _{CC}	V _{CC}	4.5	5	5.5	V
Commercial operating temperature	T _a	0	25	+60	°C
Enhanced operating temperature	T _a	-25	—	+75	°C
Industrial operating temperature	T _a	-40	—	+85	°C

ENVIRONMENTAL

Parameter	Operating Conditions
Humidity	8% to 90% 85°C relative humidity, noncondensing
Altitude	21,336m (70,000 ft.)

POWER REQUIREMENTS (SDDS only - no media)

Parameter	Value	Units
Standby current	0.190 (max)	A
Active	0.375 (max)	A

PC CARD SOCKET POWER OUTPUT SPECIFICATIONS (per socket)

Parameter	Value
V _{CC}	5V only @ 1A (max)
V _{PP}	5/12V @ 200mA (max)

PHYSICAL CHARACTERISTICS

Parameter	SDDS-01, -03	SDDS-04
Height	25.4mm [1.00"] (max)	41.3mm [1.625"] (max)
Width	101.5mm [3.995"] (max)	101.5mm [3.995"] (max)
Length	158.8mm [6.250"] (max)	158.8mm [6.250"] (max)
Weight	204g [7.2oz] (max)	255g [9.0oz] (max)

PERFORMANCE

Media	Read (Sustained) MBytes/sec (Note 1)	Write (Sustained) MBytes/sec (Note 1)	Read (Burst) MBytes/sec (Note 2)	Write (Burst) MBytes/sec (Note 2)
IBM 340MB Microdrive	2.2	1.8	2.4	4.8
Toshiba 5GB HDD PC Card	2.0	2.6	2.5	4.8
IBM 1MB SRAM PC Card	0.8	1.0	2.2	4.8
Hitachi 1.6GB PC Card	1.3	1.6	2.5	4.8

Note 1: 128 blocks/transfer, Pentium 200, Adaptec AHA2940UW, Win98 SE, SCSI Pro™ sequential transfer.

Note 2: 1 block/transfer, Pentium 200, Adaptec AHA2940UW, Win98 SE, SCSI Pro™ sequential transfer.

SCSI BUS INTERFACE DC CHARACTERISTICS

Parameter	Parameter	Test	Min	Max	Unit
Symbol	Description	Conditions			
V _{IH}	Input High Voltage		2.0	V _{CC} + 0.5	V
V _{IL}	Input Low Voltage		V _{SS} - 0.5	0.8	V
V _{OH}	Output High Voltage	I _{OH} = -2mA	2.4	V _{CC}	v
V _{OL}	Output Low Voltage	I _{OL} = 48mA	V _{SS}	0.5	V

PC CARD BUS INTERFACE DC CHARACTERISTICS

Symbol	Description	Test Conditions	Min	Max	Unit
V _{IH}	Input High Voltage		2.0	5.5	V
V _{IL}	Input Low Voltage		0	0.8	V
V _{OH}	Output High Voltage	I _{OH} = -2 mA	2.4	V _{DD}	V
V _{OL}	Output Low Voltage	I _{OL} = 2 mA	0	0.5	V
I _{OH}	Output High Current	V _{OH} = 2.4V	-2.0	—	mA
I _{OL}	Output Low Current	V _{OL} = 0.5V	2.0	—	mA
C _{IN}	Input Capacitance			10.0	pF
C _{OUT}	Output Capacitance			10.0	pF

SCSI COMMAND SET

For a detailed description of supported commands, refer to the Adtron SCSI Command Set OEM Manual (PN: 610200044, EN: J15047).

Command	Command Code	Type	See Note
Card Information	C0h	V	
Erase	19h	M	6
Format Unit	04h	M	2
Inquiry	12h	M	
Locate	2Bh	O	6
Log Sense	4Dh	O	6
Mode Select (6)	15h	O	3
Mode Select (10)	55h	O	
Mode Sense (6)	1Ah	O	
Mode Sense (10)	5Ah	O	
Read (6)	08h	M	
Read (10)	28h	M	
Read Capacity	25h	M	
Read Position	34h	O	6
Release	17h	M	
Request Sense	03h	M	
Reserve	16h	M	
Reset Card	C1h	V	
Rewind	01h	M	6
Seek (6)	0Bh	O	1
Seek (10)	2Bh	O	1
Send Diagnostic	1Dh	M	4
Space	11h	M	6
Start/Stop Unit	1Bh	O	
Test Unit Ready	00h	M	
Verify	2Fh	O	
Write (6)	0Ah	M	
Write (10)	2Ah	M	
Write and Verify	2Eh	O	5
Write FileMarks	10h	M	6

Type: M = Mandatory, O = Optional, V = Vendor Unique

Notes:

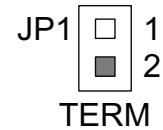
1. No operation; returns good status.
2. FmtData and CmpLst bits are not supported.
3. Only page list (PC=0x00) and HP capacity page (PC=0x31) are supported.
4. Performs self-test only; optional features are not supported.
5. Data verification performed by media.
6. DAT only.

JUMPERS

JP1: SCSI Termination Jumper

SCSI Termination is supplied by onboard Active SCSI Terminators, consisting of laser-trimmed 110 ohm termination resistors with a 2% tolerance. Termination is enabled by default and can be disabled by placing a jumper on JP1.

FIGURE 3: SCSI TERMINATION JUMPER

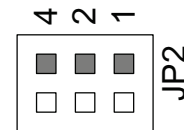


Note: Grayed pin is Ground.

JP2: SCSI ID Jumpers

SCSI ID	JP2 "4"	JP2 "2"	JP2 "1"
0	OFF	OFF	OFF
1	OFF	OFF	ON
2	OFF	ON	OFF
3	OFF	ON	ON
4	ON	OFF	OFF
5	ON	OFF	ON
6	ON	ON	OFF
7	ON	ON	ON

FIGURE 4: SCSI ID JUMPERS

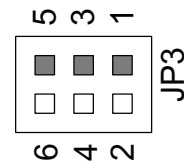


Note: Grayed pins are Ground.

JP3: Option Jumpers

1-2	Swap sockets (LUNs)
3-4	Gang sockets (LUNs)
5-6	Disable SCSI Disconnects

FIGURE 5: OPTION JUMPERS



Note: Grayed pins are Ground.

Swap Sockets

Normally, socket 1 (top) is LUN 0 and socket 2 (bottom) is LUN 1. Placing a jumper on 1-2 swaps the socket so that socket 1 is LUN 1 and socket 2 is LUN 0. (Refer to Figure 6.)

Gang Sockets

Normally each socket is an independent LUN. Placing a jumper on 3-4 combines the capacity of two identical ATA flash cards into one LUN (LUN 0).

Disable SCSI Disconnects

Placing a jumper on 5-6 disables SCSI disconnects.

FIGURE 6: FRONT PANEL

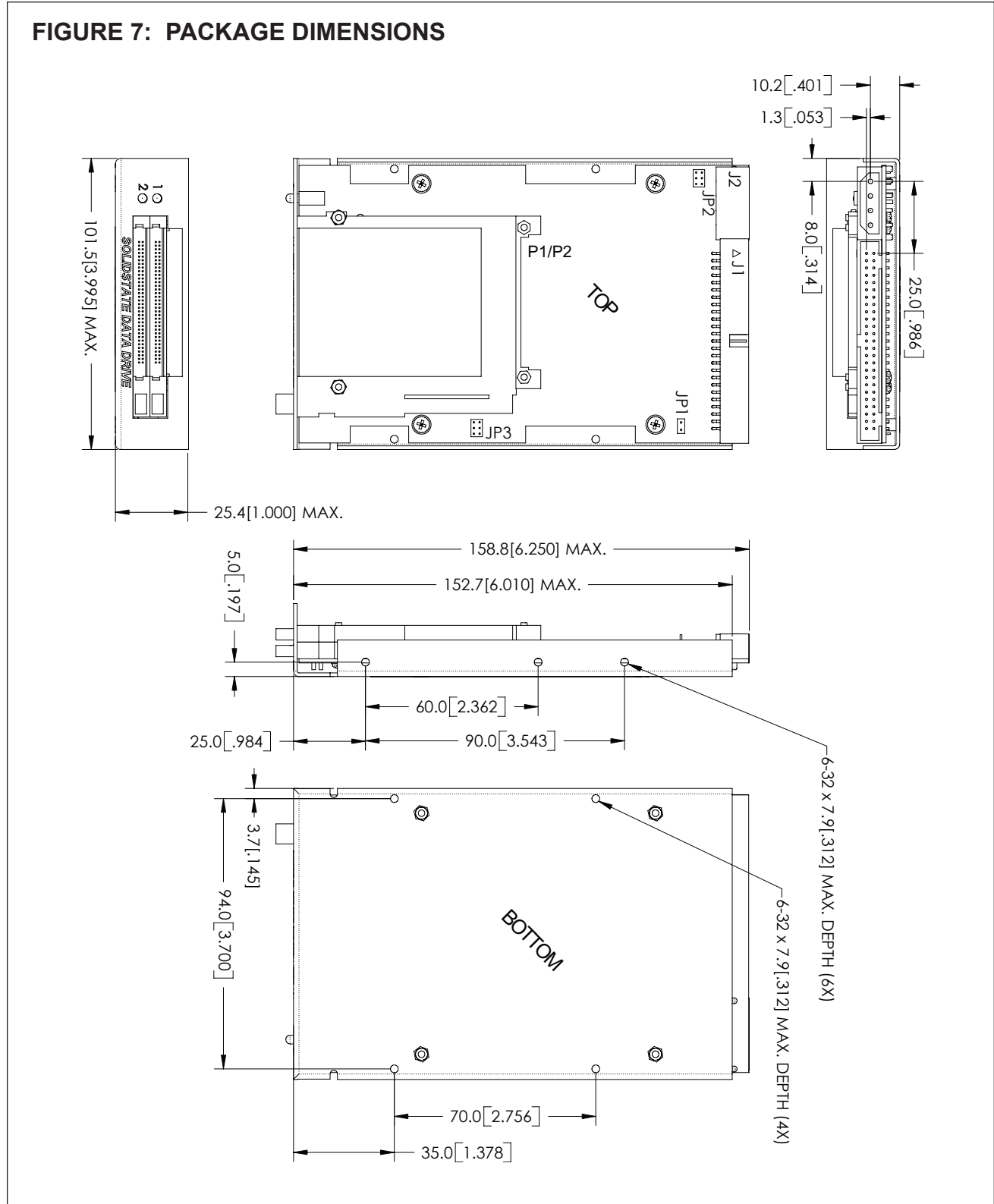


Socket 1 (LUN 0)
Socket 2 (LUN 1)

PACKAGE DIMENSIONS: SDDS-01A

Refer to the figure below for enclosure and mounting dimensions of the SDDS-01A Drive.

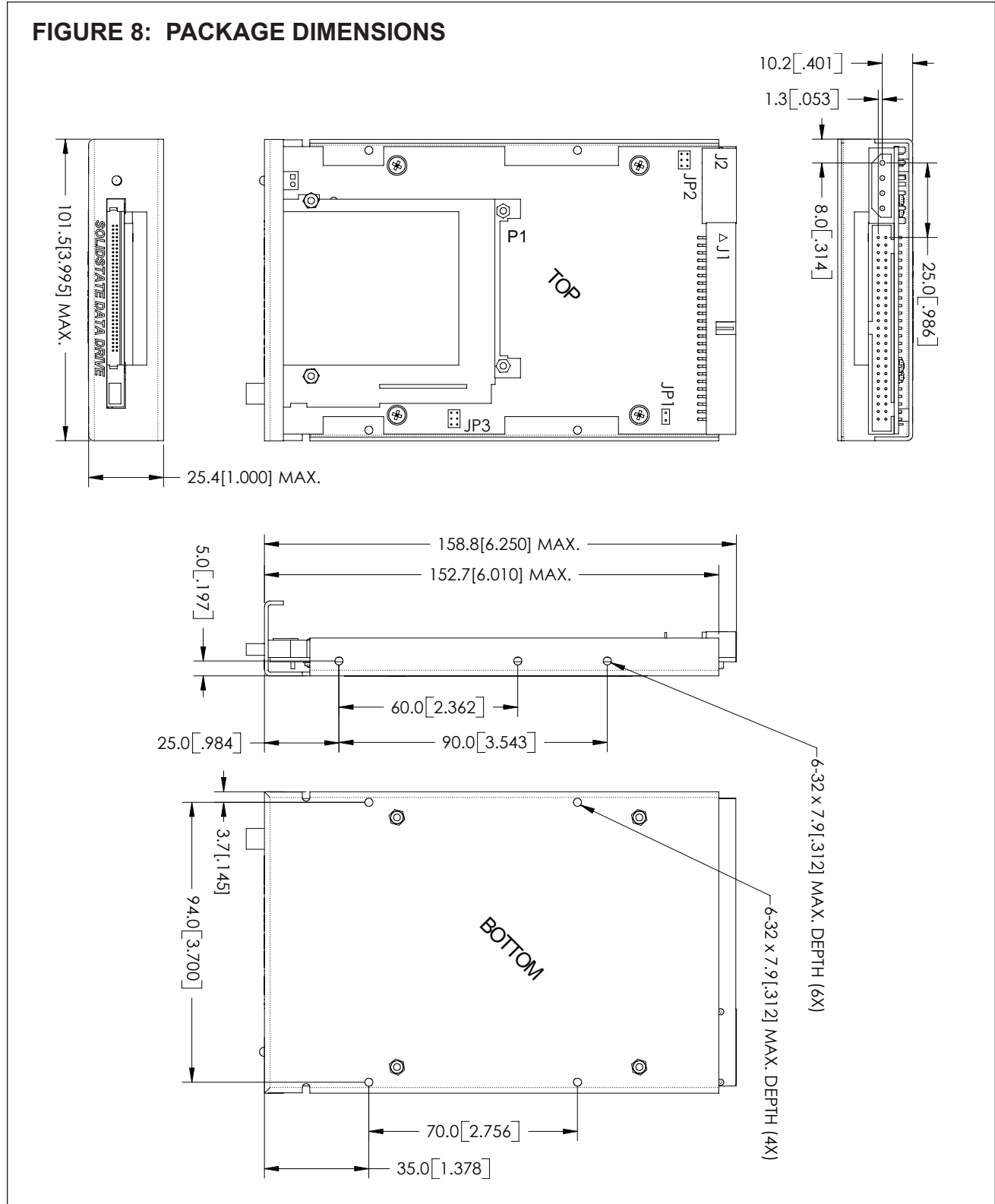
Dimensions shown in mm [inches].



PACKAGE DIMENSIONS: SDDS-03A

Refer to the figure below for enclosure and mounting dimensions of the SDDS-03A Drive.

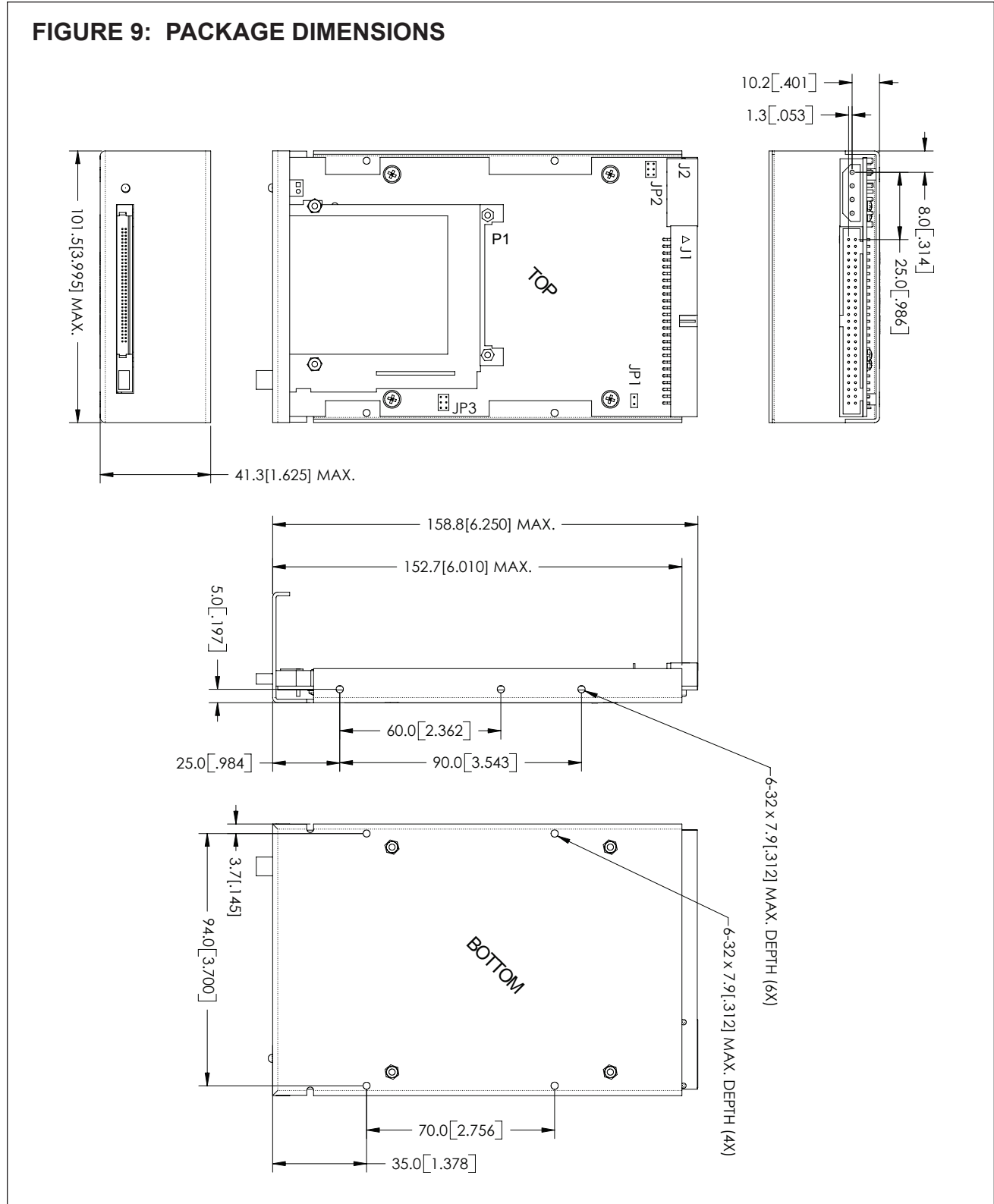
Dimensions shown in mm [inches].



PACKAGE DIMENSIONS: SDDS-04A

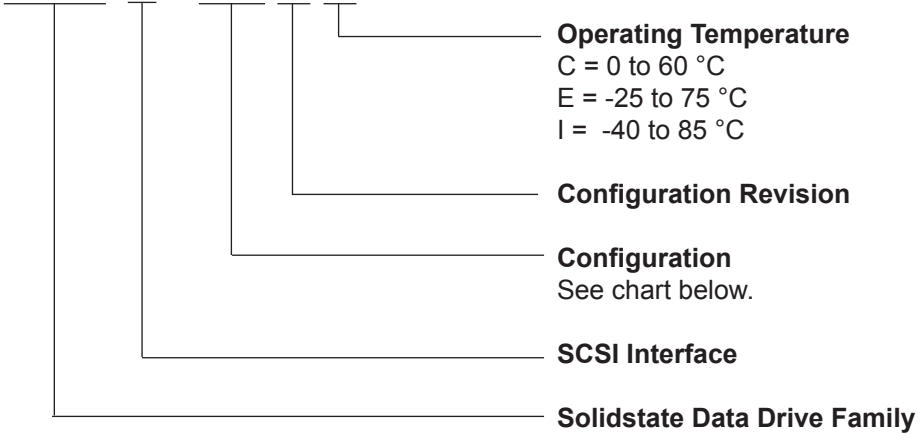
Refer to the figure below for enclosure and mounting dimensions of the SDDS-04A Drive.

Dimensions shown in mm [inches].



ORDERING INFORMATION

SDD S - VV A T



MODEL	FEATURES	MECHANICAL/MOUNTING
SDDS-01A	Dual slot, Type II + III, removable disk emulation	4" x 1" tall, floppy drive bay mounting
SDDS-03A	Single slot, Type III, removable disk emulation	4" x 1" tall, floppy drive bay mounting
SDDS-04A	Single slot, Type II, DAT emulation	4" x 1.625" tall, tape drive bay mounting

Adtron Corporation
www.adtron.com
 4415 E. Cotton Center Blvd. Suite 100
 Phoenix, AZ 85040
 Tel: (602) 735-0300 • Fax: (602) 735-0359
 Email: info@adtron.com

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