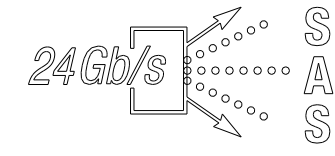


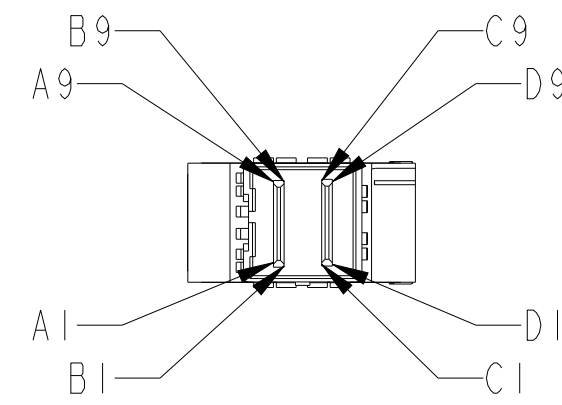
NOTES:

- DRAWING NOT TO SCALE.
- ELECTRICAL AND MECHANICAL PERFORMANCE SHALL MEET SAS 4.0 AND PCIE GEN 4 INDUSTRIAL SPECIFICATIONS.
- MARK LABEL (ITEM 4) WITH:  
24GBPS SAS 4 LOGO AS SHOWN IN VIEW A-A  
MINI SAS HD 4X PCIE4 X4  
BROADCOM PART NUMBER  
BROADCOM REVISION XXX  
DATE CODE DD/MMM/YY  
SECONDARY MARKING WITH MANUFACTURER PART NUMBER AND REVISION ACCEPTABLE.
- SEE ADDITIONAL SHEETS FOR CABLE WIRING TABLE, EEPROM DATA, AND RELATED NOTES.

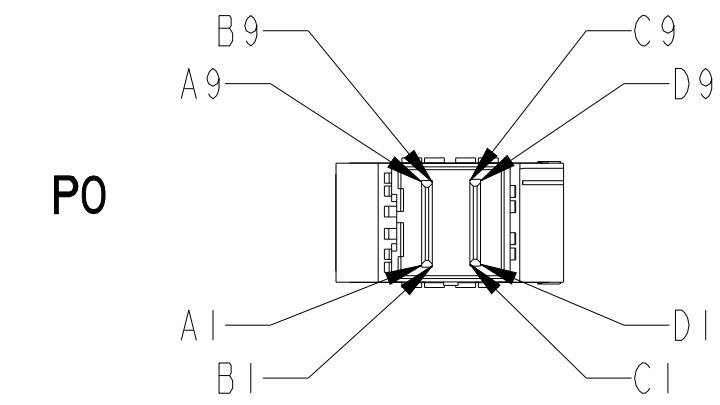


VIEW A-A  
24GBPS SAS4 LOGO

REVISIONS				
REV	ECO	DESCRIPTION	DATE	APPROVED
001		PRELIMINARY RELEASE	09JAN19	B. LIMA



S0



P0

PRELIMINARY

ITEM	CALLOUT	DESCRIPTION	QUANTITY	NOTES
4	LABEL	LABEL, 70X26MM, WHITE, R2, HF	A/R	SEE NOTE 3
3	EEPROM		2	SEE NOTE 4
2	CABLE	UL AWM STYLE 20276, 92.5Ω ±10% DIFF, 28-32AWG, SAS 4.0, PCIE GEN 4, PVC JKT, BLACK, 80°C, VW-I, HF	A/R	SEE NOTE 4
1	CONNECTOR	SFF-8644, 36P, STRAIGHT, X4, MINISAS HD, BLUE PULLTAB, SAS 4.0, PCIE GEN 4	2	SEE NOTE 4

APPROVALS		DATE
DRAWN BY	D. MONTGOMERY	23APR18
APPROVED BY	B. LIMA	09JAN19

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN MILLIMETERS.  
TOLERANCES:  
X.X ± 0.2 MM  
X.XX ± 0.15 MM  
X.XXX ± 0.050 MM  
ANGLES ± 1°

**BROADCOM**

TITLE: CABLE, X4 SFF-8644 TO X4 SFF-8644, 3M

SCALE: 1.500

SIZE: D

DWG NO.: 5067-9643

REV: 001

SHEET: 1 OF 4

CONNECTOR SIGNAL	CONNECTOR	PIN/PAD	PIN/PAD	CONNECTOR	CONNECTOR SIGNAL	WIRE/CABLE	NOTES
	S0	SHELL	SHELL	P0	SHIELD	ITEM 2	
GND		D9	B9		GND	ITEM 2	
Tx2-		D8	B8		Rx2-	ITEM 2	
Tx2+		D7	B7		Rx2+	ITEM 2	
GND		D6	B6		GND	ITEM 2	
Tx1-		D5	B5		Rx1-	ITEM 2	
Tx1+		D4	B4		Rx1+	ITEM 2	
GND		D3	B3		GND	ITEM 2	
MGTPWR	EEPROM	D2	B2		CBLPRSNT# (GND)		GND P0 END
NC		D1	B1		NC		NC BOTH ENDS
SCL	EEPROM	C1	A1	EEPROM	CADDR		
SDA	EEPROM	C2	A2		CINT# (NC)		NC P0 END
GND		C3	A3		GND	ITEM 2	
Tx0+		C4	A4		Rx0+	ITEM 2	
Tx0-		C5	A5		Rx0-	ITEM 2	
GND		C6	A6		GND	ITEM 2	
Tx3+		C7	A7		Rx3+	ITEM 2	
Tx3-		C8	A8		Rx3-	ITEM 2	
GND		C9	A9		GND	ITEM 2	
GND		B9	D9		GND	ITEM 2	
Rx2-		B8	D8		Tx2-	ITEM 2	
Rx2+		B7	D7		Tx2+	ITEM 2	
GND		B6	D6		GND	ITEM 2	
Rx1-		B5	D5		Tx1-	ITEM 2	
Rx1+		B4	D4		Tx1+	ITEM 2	
GND		B3	D3		GND	ITEM 2	
CBLPRSNT# (GND)		B2	D2	EEPROM	MGTPWR		GND S0 END
NC		B1	D1		NC		NC BOTH ENDS
CADDR	EEPROM	A1	C1	EEPROM	SCL		
CINT# (NC)		A2	C2	EEPROM	SDA		NC S0 END
GND		A3	C3		GND	ITEM 2	
Rx0+		A4	C4		Tx0+	ITEM 2	
Rx0-		A5	C5		Tx0-	ITEM 2	
GND		A6	C6		GND	ITEM 2	
Rx3+		A7	C7		Tx3+	ITEM 2	
Rx3-		A8	C8		Tx3-	ITEM 2	
GND		A9	C9		GND	ITEM 2	
		SHELL	SHELL		SHIELD	ITEM 2	

EEPROM	PIN/PAD	CONNECTOR SIGNAL
	A1	CADDR
	C1	SCL
	C2	SDA
	D2	MGTPWR


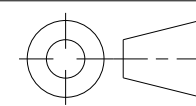
EEPROM CONNECTION TABLE  
2 PLACES, S0 AND P0  
NO CROSS CONNECTIONS

NOTES:

- CABLE ASSEMBLY SHALL MEET SHIELDING EFFECTIVENESS REQUIREMENT OF 35dB MINIMUM FROM 1-10GHz AND 20dB MINIMUM FROM 10-18GHz.

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UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS. TOLERANCES: X.X ± 0.2 MM X.XX ± 0.15 MM X.XXX ± 0.050 MM ANGLES ± 1°			
		TITLE CABLE, X4 SFF-8644 TO X4 SFF-8644, 3M	
SCALE 1.500		SIZE D	DWG NO. 5067-9643
		REV 001	SHEET 2 OF 4

SFF-8636 CONTENT		SFF-8636		EEPROM DATA		VALUES		R/W		NOTES		
BYTE		EXTERNAL CABLE		EXTERNAL CABLE								
0	IDENTIFIER	CABLE IDENTIFIER		CABLE IDENTIFIER		0Fh		RO			x4 WIDTH	
1	STATUS	REVISION		RESERVED		08h		RO			REV 2.8 & 2.9 OF 8636 SPEC	
2		STATUS INDICATORS		STATUS INDICATORS		04h		RO			STATUS REMAINS UNCHANGED	
3	INTERRUPT FLAGS	INTERRUPT FLAGS-LOS		INTERRUPT FLAGS-LOS		00h		RO			NOT SUPPORTED	
4		LANE SPECIFIC INTERRUPTS		RESERVED		00h		RO			NOT SUPPORTED	
5		LANE SPECIFIC INTERRUPTS					00h		RO		NOT SUPPORTED	
6		INTERRUPT FLAGS-TEMP ALARM		INTERRUPT FLAGS-TEMP ALARM		00h		RO			NOT SUPPORTED	
7		INTERRUPT FLAGS-VOLTAGE ALARM		INTERRUPT FLAGS-VOLTAGE ALARM		00h		RO			NOT SUPPORTED	
8		VENDOR DEFINED ALARM		RESERVED		00h		RO			NOT SUPPORTED	
9-10		INPUT POWER ALARMS				00h		RO			NOT SUPPORTED	
11-12		TX BIAS ALARMS				00h		RO			NOT SUPPORTED	
13-14		TX OUTPUT POWER ALARMS				00h		RO			NOT SUPPORTED	
15-16		RESERVED FOR LANE SPECIFIC MONITORING, SET 4				00h		RO			NOT SUPPORTED	
17-18		RESERVED FOR LANE SPECIFIC MONITORING, SET 5				00h		RO			NOT SUPPORTED	
19-20		VENDOR SPECIFIC				00h		RO			NOT SUPPORTED	
21		VENDOR SPECIFIC				00h		RO			NOT SUPPORTED	
22-23		MODULE LEVEL MONITORS	MODULE MONITORS-TEMPERATURE		MODULE MONITORS-TEMPERATURE		00h		RO			NOT SUPPORTED
24-25			RESERVED		RESERVED		00h		RO			NOT SUPPORTED
26-27			MODULE MONITORS-SUPPLY VOLTAGE		MODULE MONITORS-SUPPLY VOLTAGE		00h		RO			NOT SUPPORTED
28-29	RESERVED			RESERVED		00h		RO			NOT SUPPORTED	
30-33	VENDOR SPECIFIC				00h		RO			NOT SUPPORTED		
34-41	LANE-SPECIFIC MONITORS	RXI-4 INPUT POWER				00h		RO			NOT SUPPORTED	
42-49		RXI-4 BIAS				00h		RO			NOT SUPPORTED	
50-57		TX OUTPUT POWER				00h		RO			NOT SUPPORTED	
85-65		RESERVED LANE-SPECIFIC SET 4				00h		RO			NOT SUPPORTED	
66-73		RESERVED LANE-SPECIFIC SET 5				00h		RO			NOT SUPPORTED	
74-81	VENDOR SPECIFIC				00h		RO			NOT SUPPORTED		
82-85	RESERVED				00h		RO					
86	CONTROL	RESERVED FOR CONTROL BYTES				00h		RO				
87		RX RATE SELECT CONTROL				00h		RO			NOT SUPPORTED	
88		TX RATE SELECT CONTROL				00h		RO			NOT SUPPORTED	
89-92		RESERVED				00h		RO				
93	POWER CONTROL				00h		RO			NOT SUPPORTED		
94-97	RESERVED				00h		RO					
98	TX/RX CDR CONTROL				00h		RO			NOT SUPPORTED		
99	RESERVED	STATE MACHINE CONTROL ENABLE				00h		RO			NOT SUPPORTED	
100	LANE-SPECIFIC INDICATOR INTERRUPT MASKS	RESERVED FOR LANE-SPECIFIC MASKS				00h		RO				
101		TX INPUT FAULT MASK				00h		RO			NOT SUPPORTED	
102	RESERVED FOR LANE-SPECIFIC MASKS					00h		RO				
103	MODULE LEVEL INTERRUPT MASKS	MODULE STATE CHANGED FLAG MASK				00h		RO			NOT SUPPORTED	
104		DATA PATH STATE CHANGED FLAG MASK				00h		RO			NOT SUPPORTED	
105-106	RESERVED FOR MODULE LEVEL MASKS					00h		RO			NOT SUPPORTED	
107	MODULE PROPERTIES	MODULE PROPERTIES				00h		RO			NOT SUPPORTED	
108-109		PROPAGATION DELAY		PROPAGATION DELAY		<CABLE PROPERTY PER SAS USAGE (SFF-8636)>		RO			MULTIPLES OF 10ns	
110	ADVANCED LOW POWER MODE		RESERVED			00h		RO			<=1.5W, NO FAR SIDE MANAGEMENT, 3.3V	
111	PCI EXPRESS USE	CABLED PCI EXPRESS CAPABILITIES 1		CABLED PCI EXPRESS CAPABILITIES 1		0Fh		RO			CAPABLE UP TO 16Gb/s	
112		CABLED PCI EXPRESS CAPABILITIES 2		CABLED PCI EXPRESS CAPABILITIES 2		02h		RO			x4 WIDE (NOT BUNDLED, SUB-CABLE ID 0)	
113	MODULE PROPERTIES	IMPLEMENTATION		RESERVED		10h		RO			x4 ON BOTH ENDS	
114		DATAPATHDEINIT_MAXDURATION				00h		RO			MAX STATE DURATION <1ms	
115		MODSELL_WAIT TIME				00h		RO			NOT SUPPORTED	
116	SECONDARY EXTENDED SPEC COMPLIANCE CODE	SECONDARY EXTENDED SPEC COMPLIANCE CODE				00h		RO			NOT SUPPORTED	
117-118	RESERVED	RESERVED				00h		RO			UNSUPPORTED	
119-122	PASSWORD CHANGE ENTRY	PASSWORD CHANGE		PASSWORD CHANGE		00h		RO			UNSUPPORTED	
123-126	PASSWORD ENTRY AREA	PASSWORD ENTRY		PASSWORD ENTRY		00h		RO			UNSUPPORTED	
127	PAGE SELECT BYTE	PAGE SELECT		PAGE SELECT		00h		RO			ONLY PAGE 0 SUPPORTED	

- NOTES:
- VALUES IN <BOLD> SHALL BE SUPPLIED BY MANUFACTURER.
  - DEVICE ADDRESS: CONFIGURABLE VIA CADDR, A0h FOR CADDR = 0, A2h FOR CADDR = 1

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN MILLIMETERS.  
TOLERANCES:  
X.X ± 0.2 MM  
X.XX ± 0.15 MM  
X.XXX ± 0.050 MM  
ANGLES ± 1°



TITLE CABLE, X4 SFF-8644 TO X4 SFF-8644, 3M

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SCALE 1.500		SIZE D	DWG NO. 5067-9643	REV 001	SHEET 3 OF 4
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EEPROM DATA UPPER PAGE (0x00)						
BYTE	SFF-8636 CONTENT	SFF-8636	EXTERNAL CABLE	VALUES	R/W	NOTES
128	IDENTIFIER	CABLE IDENTIFIER	CABLE IDENTIFIER	0Fh	RO	MUST MATCH BYTE 0
129	BASE ID FIELDS	EXTENDED IDENTIFIER	RESERVED	00h	RO	POWER CLASS 1.5W / POWER CLASS UNSPECIFIED
130		CONNECTOR TYPE		00h	RO	UNSPECIFIED
131		SPECIFICATION COMPLIANCE		00h	RO	OCULINK DIFFERENT USE, NON-CONFLICTING
132-138		SPECIFICATION COMPLIANCE		00h	RO	NOT SUPPORTED
133		SAS/SATA COMPLIANCE		F0h	RO	SAS USAGE
134-138		SPECIFICATION COMPLIANCE		00h	RO	NOT SUPPORTED
139		ENCODING		00h	RO	NOT SUPPORTED
140		NOMINAL BIT RATE		5Ah	RO	22.5Gb/s
141		EXTENDED RATE SELECT COMPLIANCE		00h	RO	NOT SUPPORTED
142		LENGTH (SMF)		00h	RO	SINGLE CABLE
143		LENGTH (OM3 50µM)		00h	RO	SINGLE CABLE
144		LENGTH (OM2 50µM)		00h	RO	SINGLE CABLE
145		COPPER CABLE ATTEN OR LENGTH (OM1 62.5µM)		<CABLE ATTENUATION @ 25.78GHz IN UNITS OF 1dB>	RO	CABLE/VENDOR DEPENDENT
146		LENGTH (PASSIVE/ACTIVE COPPER OR OM4 50µM)		<CABLE LENGTH IN UNITS OF 1 METER>	RO	UNITS OF 1 METER
147		DEVICE TECHNOLOGY	CABLE TECHNOLOGY	A0h	RO	UNEQUALIZED COPPER
148-163		VENDOR NAME	VENDOR NAME	42h52h4fh41h44h43h4fh4dh20h20h20h20h20h20h20h20h20h20h20h20h	RO	"BROADCOM"
164		EXTENDED MODULE CODES	RESERVED	00h	RO	INFINBAND USAGE
165-166	VENDOR OUI	PCI-SIG VENDOR ID	14E4h	RO	PCI-SIG VENDOR ID FOR BROADCOM	
167	VENDOR OUI	RESERVED	00h	RO	NOT SUPPORTED - USES PCI-SIG ID	
168-183	VENDOR PART NUMBER	VENDOR PART NUMBER	<BROADCOM PART NUMBER FOR CABLE>	RO		
184-185	VENDOR REVISION	VENDOR REVISION	30h31h	RO	REV 01	
186	ATTENUATION 2.5GHz	ATTENUATION 1.25GHz	<CABLE ATTENUATION AT 2.5GHz>	RO	USE SAS FIELD USAGE	
187	ATTENUATION 5.0GHz	ATTENUATION 2.5GHz	<CABLE ATTENUATION AT 5.0GHz>	RO	USE SAS FIELD USAGE	
188	ATTENUATION 7.0GHz	ATTENUATION 4.0GHz	<CABLE ATTENUATION AT 7.0GHz>	RO	USE SAS FIELD USAGE	
189	ATTENUATION 12.9GHz	ATTENUATION 8.0GHz	<CABLE ATTENUATION AT 12.9GHz>	RO	USE SAS FIELD USAGE	
190	MAXIMUM CASE TEMP	MAX CASE TEMP	00h	RO	NOT SUPPORTED / 70C	
191	BASE ID CHECK CODE	CHECKSUM - BASE	CHECKSUM BASE	<BYTES 128-190 CHECKSUM>	RO	
192	EXTENDED ID	EXTENDED SPECIFICATION COMPLIANCE CODES	RESERVED	00h	RO	NOT SUPPORTED
193		TX INPUT EQ CONTROL IMPL		00h	RO	NOT SUPPORTED
194		OPTIONS		00h	RO	NOT SUPPORTED
195		RATE SELECT IMPLEMENTED	OPTIONS	00h	RO	NOT SUPPORTED
196-211		VENDOR SERIAL NUMBER	VENDOR SERIAL NUMBER	<ASCII SERIAL NUMBER>	RO	LEFT ALIGNED
212-217		VENDOR DATE CODE	VENDOR DATE CODE	<ASCII YYMMDD>	RO	
218-219			VENDOR LOT CODE	<VENDOR LOT CODE>	RO	
220		DIAGNOSTIC MONITORING TYPE	RESERVED	00h	RO	NOT SUPPORTED
221		ENHANCED OPTIONS		00h	RO	NOT SUPPORTED
222		EXTENDED BIT RATE		00h	RO	NOT SUPPORTED
223	EXTENDED ID CHECK CODE	CHECKSUM - EXTENDED	CHECKSUM EXTENDED	<BYTES 192-222 CHECKSUM>	RO	
224-255	VENDOR SPECIFIC ID	VENDOR SPECIFIC INFORMATION	VENDOR SPECIFIC DATA	00h	RO	NOT SUPPORTED

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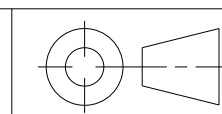


TITLE CABLE, X4 SFF-8644 TO X4 SFF-8644, 3M

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