

MLC-A Test Report

Summary Report Page – All Tests

SNIA Solid State Storage Performance Test Specification (PTS)						Rev. PTS 1.0	
						Page 1 of 26	
Device Under Test (DUT)	MLC-A	SNIA SSS PTS Summary Report		Calypso Systems, Inc.		CALYPSO Systems	
DEVICE INFORMATION		TEST HARDWARE PLATFORM		TEST SOFTWARE		REPORT DATE	
SERIAL NO.	0000-0000-FFFF	SYSTEM	Calypso RTP 2.0	SYS OS	CENT OS 5.6	Report	06DEC11
FIRMWARE REV.	BFO1	Motherboard/cpu	Intel 5520HC / W5580	SW TOOL	Calypso CTS 6.5	Test Run	01NOV – 04DEC11
USER CAPACITY	MLC 256 GB	RAM	12GB ECC DDR3	SW Rev	1.19.10	Test Sponsor	Calypso
DEVICE INTERFACE	6 Gb/s SATA	Device Interface	LSA 9212-e 6Gb/s HBA	Release	Nov. 2011	Auditor	N/A

Testing Summary: Tests Run

PTS-C	TEST	Purge	DP	OIO	WIPC		WDPC		STEADY STATE	
					PC AR	TEST AR	AR AMT	SEGMENTS	WORKLOAD	TIME/GB
7.0	WSAT - OPTIONAL	Security Erase	RND	TC 16 QD 2	100%	100%	N/A	N/A	RND 4KiB W	24 Hrs 1.9 TB

PTS-C	TEST	Purge	DP	OIO	WIPC		WDPC		STEADY STATE	
					PC AR	TEST AR	AR AMT	SEGMENTS	WORKLOAD	ROUNDS
8.0	IOPS - REQUIRED	Security Erase	RND	TC 1 QD 8	100%	100%	16 GiB	2048	IOPS LOOP	2 - 6

PTS-C	TEST	Purge	DP	OIO	WIPC		WDPC		STEADY STATE	
					PC AR	TEST AR	AR AMT	SEGMENTS	WORKLOAD	ROUNDS
9.0	THROUGHPUT - REQUIRED	Security Erase	RND	TC 32 QD 32	100%	100%	16 GiB	2048	SEQ 1024KiB	1 - 5

PTS-C	TEST	Purge	DP	OIO	WIPC		WDPC		STEADY STATE	
					PC AR	TEST AR	AR AMT	SEGMENTS	WORKLOAD	ROUNDS
10.0	LATENCY - REQUIRED	Security Erase	RND	TC 1 QD 1	100%	100%	16 GiB	2048	LAT LOOP	4 - 8

Test Sponsor – Special Notes

ITEM	NOTATION	COMMENTS

MLC-A Test Report

Summary Report Page - WSAT

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Device Under Test (DUT)	MLC-A	SNIA SSS PTS Summary Report		Calypso Systems, Inc.		CALYPSO Systems	
DEVICE INFORMATION		TEST HARDWARE PLATFORM		TEST SOFTWARE		REPORT DATE	
SERIAL NO.	0000-0000-FFFF	SYSTEM	Calypso RTP 2.0	SYS OS	CENT OS 5.6	Report	06DEC11
FIRMWARE REV.	BFO1	Motherboard/cpu	Intel 5520HC / W5580	SW TOOL	Calypso CTS 6.5	Test Run	01NOV - 04DEC11
USER CAPACITY	MLC 256 GB	RAM	12GB ECC DDR3	SW Rev	1.19.10	Test Sponsor	Calypso
DEVICE INTERFACE	6 Gb/s SATA	Device Interface	LSA 9212-e 6Gb/s HBA	Release	Nov. 2011	Auditor	N/A

Test Description

Purpose	To observe the drive's performance evolution from a PURGED state to that of SETTLED state
Test Outline	Uses total outstanding IO settings that maximizes RND 4KiB Writes, first PURGE the drive, followed by immediate continuous RND 4KiB (4K-aligned) writes for lesser of 4 x User Capacity or 24 Hours
Preconditioning	FOB - No Pre Conditioning - PURGE followed by Test (note: tests may be run longer for plotting clarity)

Test Set Up

PTS-C	TEST	Purge	DP	OIO	WIPC		WDPC		STEADY STATE	
					PC AR	TEST AR	AR AMT	SEGMENTS	WORKLOAD	TIME/GB
7.0	WSAT - OPTIONAL	Security Erase	RND	TC 16 QD 2	100%	100%	N/A	N/A	RND 4KiB W	24 Hrs 1.9 TB

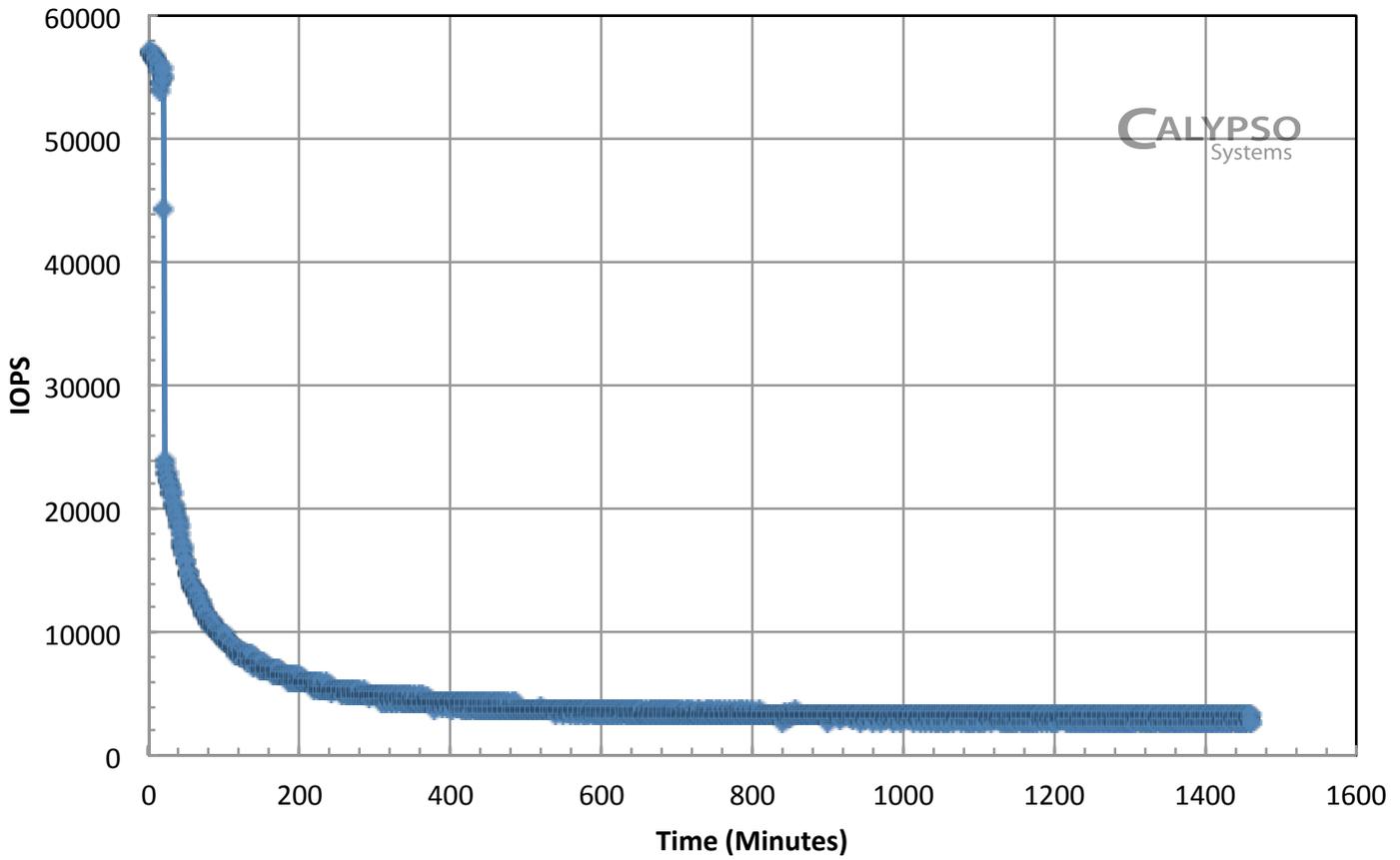
Select Performance Data

FOB IOPS	Steady State IOPS	Time	Total GB Written
56,896	2,714	20 Hours	18 TB

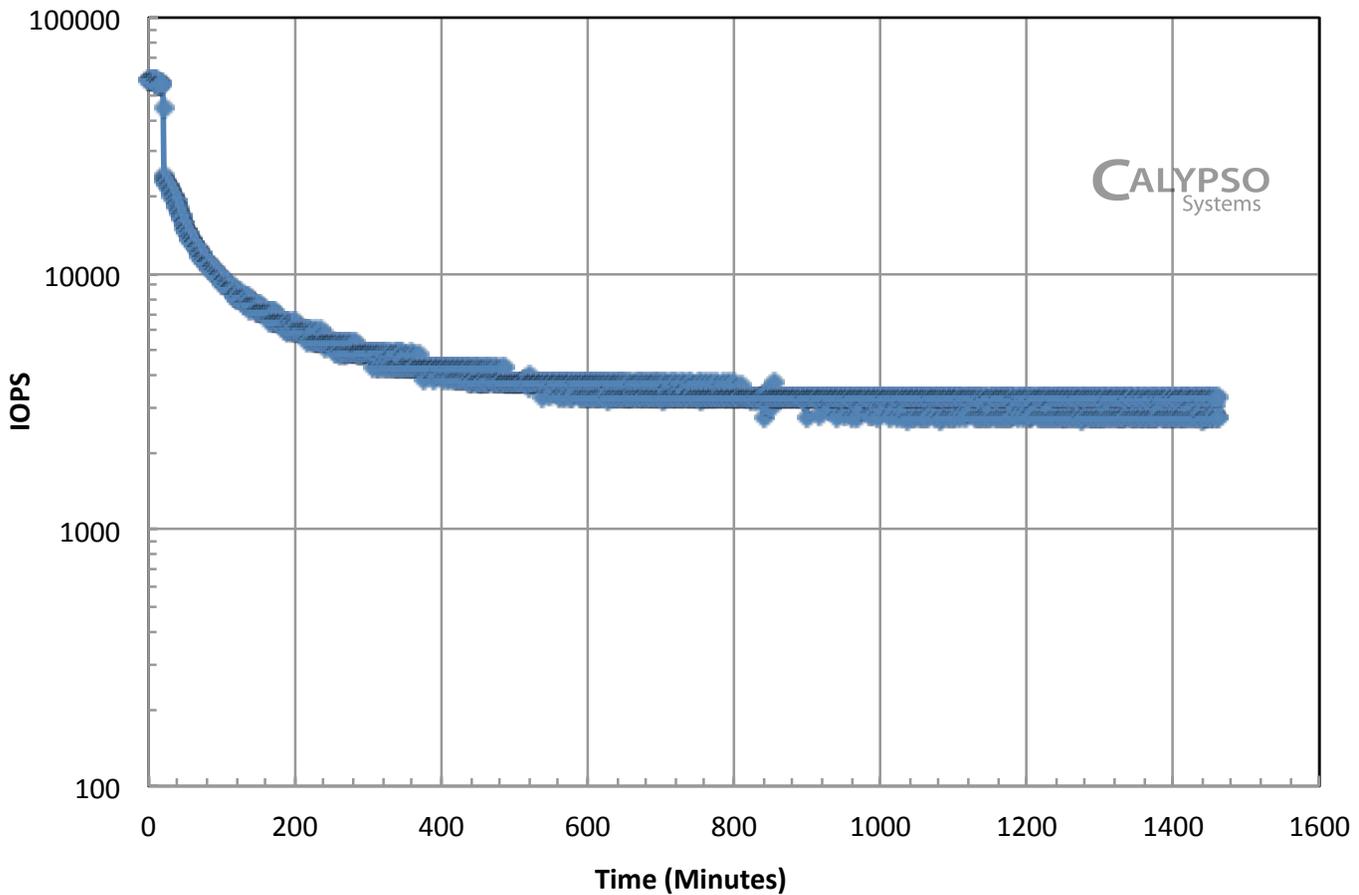
Test Sponsor – Special Notes

ITEM	NOTATION	COMMENTS

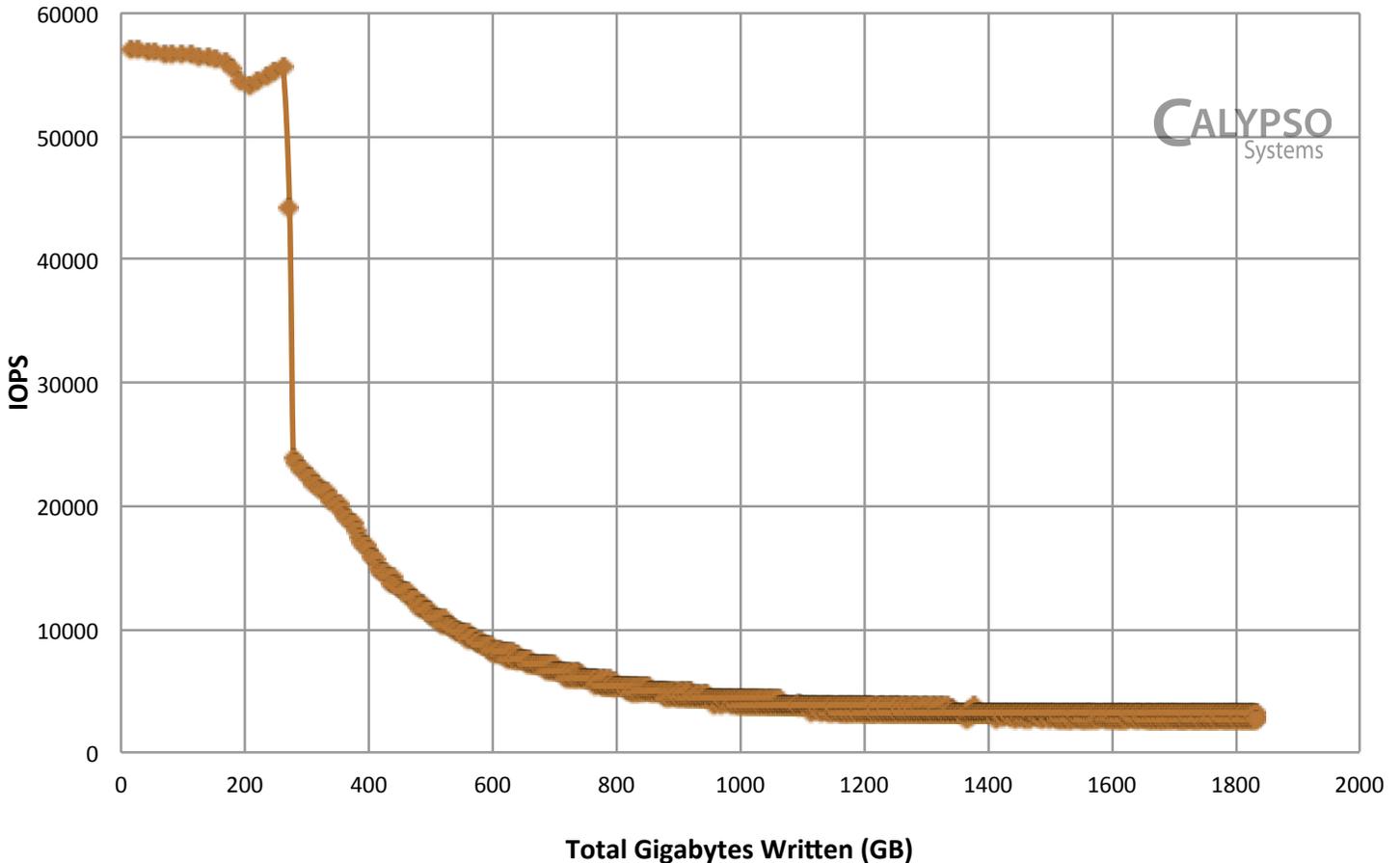
Test Run Date: 11/17/2011 09:30 AM		Report Run Date: 11/22/2011 12:44 PM	
Client WSAT (OPTIONAL) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
			Page 1 of 4
Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	Security Erase
Capacity	256 GB	Pre-Conditioning	
NAND Type	MLC	Workload Independent	N/A
Device I/F	6 Gb/s SATA	Workload Dep.	RND 4KiB
Test Platform	RTP 2.0 CTS 6.5		
		REQUIRED:	
		Data Pattern	RND
		Tester's Choice:	
		OIO/Thread (QD)	2
		Thread Count (TC)	16
		Steady State	
		Convergence	N/A
		Rounds	N/A
		PC AR	100%
		AR AMOUNT	100%
		AR Segments	N/A
Client IOPS (Linear) vs Time (Linear)			



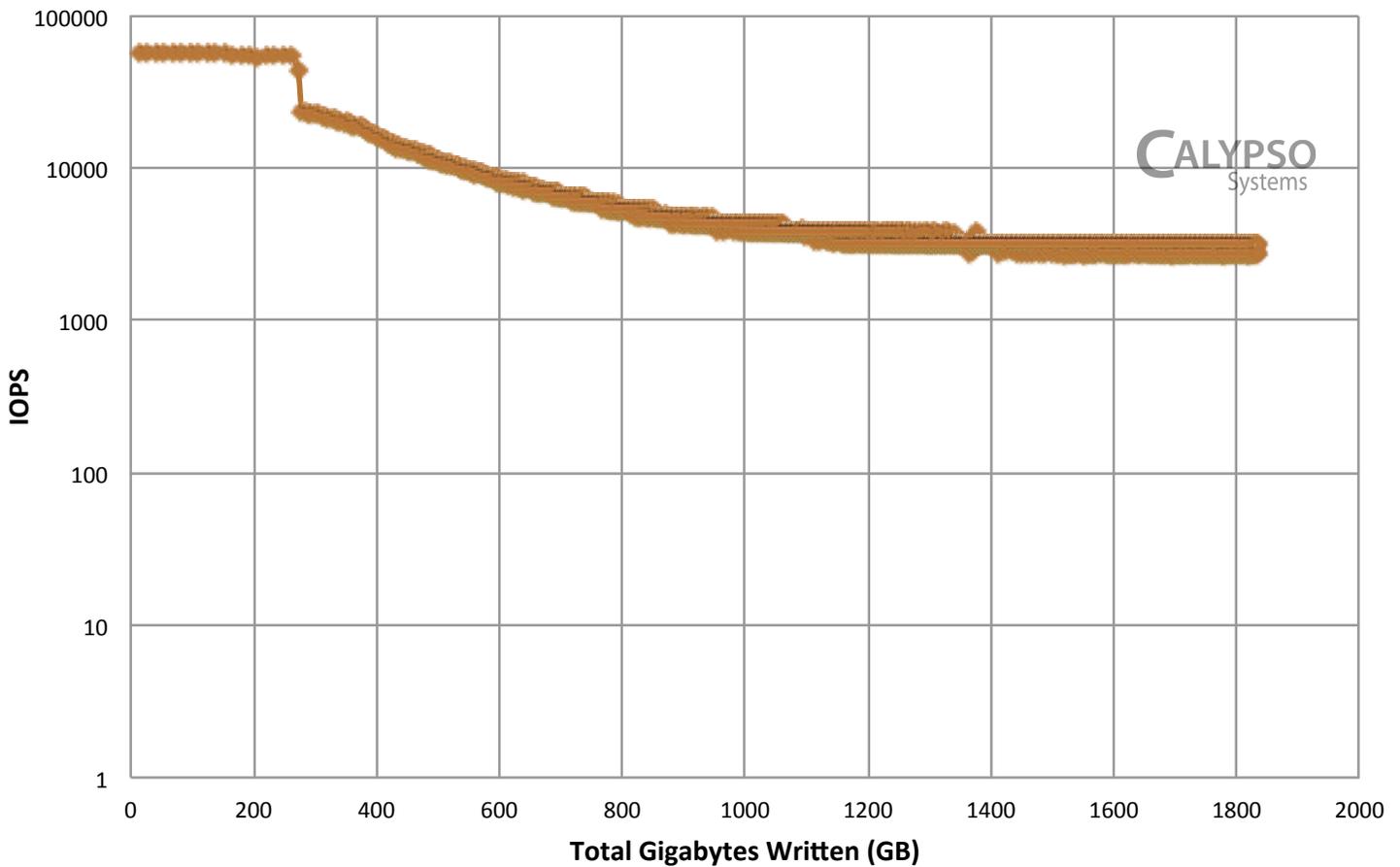
Test Run Date: 11/17/2011 09:30 AM		Report Run Date: 11/22/2011 12:44 PM	
Client WSAT (OPTIONAL) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
			Page 2 of 4
Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	Security Erase
Capacity	256 GB	Pre-Conditioning	
NAND Type	MLC	Workload Independent	N/A
Device I/F	6 Gb/s SATA	Workload Dep.	RND 4KiB
Test Platform	RTP 2.0 CTS 6.5	REQUIRED:	Steady State
		Data Pattern	RND
		Tester's Choice:	
		OIO/Thread (QD)	2
		Thread Count (TC)	16
		Convergence	N/A
		Rounds	N/A
		PC AR	100%
		AR AMOUNT	100%
		AR Segments	N/A
Client IOPS (Log10) vs Time (Linear)			



Test Run Date: 11/17/2011 09:30 AM		Report Run Date: 11/22/2011 12:44 PM	
Client WSAT (OPTIONAL) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
			Page 3 of 4
Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	REQUIRED:
Capacity	256 GB	Security Erase	Data Pattern
NAND Type	MLC	Pre-Conditioning	RND
Device I/F	6 Gb/s SATA	Workload Independent	Tester's Choice:
Test Platform	RTP 2.0 CTS 6.5	N/A	OIO/Thread (QD)
		Workload Dep.	2
		RND 4KiB	Thread Count (TC)
			16
		Steady State	Convergence
			N/A
			Rounds
			N/A
			PC AR
			100%
			AR AMOUNT
			100%
			AR Segments
			N/A
Client IOPS (Linear) vs Total Gigabytes Written (Linear)			



Test Run Date: 11/17/2011 09:30 AM		Report Run Date: 11/22/2011 12:44 PM	
Client WSAT (OPTIONAL) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
			Page 4 of 4
Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	Security Erase
Capacity	256 GB	Pre-Conditioning	
NAND Type	MLC	Workload Independent	N/A
Device I/F	6 Gb/s SATA	Workload Dep.	RND 4KiB
Test Platform	RTP 2.0 CTS 6.5		
		REQUIRED:	Steady State
		Data Pattern	RND
		Tester's Choice:	
		OIO/Thread (QD)	2
		Thread Count (TC)	16
		Convergence	N/A
		Rounds	N/A
		PC AR	100%
		AR AMOUNT	100%
		AR Segments	N/A
Client IOPS (Log10) vs Total Gigabytes Written (Lin)			



MLC-A Test Report

Summary Report Page - IOPS

SNIA Solid State Storage Performance Test Specification (PTS)						Rev. PTS 1.0	
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Device Under Test (DUT)	MLC-A	SNIA SSS PTS Summary Report		Calypso Systems, Inc.		CALYPSO Systems	
DEVICE INFORMATION		TEST HARDWARE PLATFORM		TEST SOFTWARE		REPORT DATE	
SERIAL NO.	0000-0000-FFFF	SYSTEM	Calypso RTP 2.0	SYS OS	CENT OS 5.6	Report	06DEC11
FIRMWARE REV.	BFO1	Motherboard/cpu	Intel 5520HC / W5580	SW TOOL	Calypso CTS 6.5	Test Run	01NOV - 04DEC11
USER CAPACITY	MLC 256 GB	RAM	12GB ECC DDR3	SW Rev	1.19.10	Test Sponsor	Calypso
DEVICE INTERFACE	6 Gb/s SATA	Device Interface	LSA 9212-e 6Gb/s HBA	Release	Nov. 2011	Auditor	N/A

Test Description

Purpose	To measure RND IOPS matrix using different BS and R/W Mixes
Test Outline	PURGE, then apply preconditioning until Steady State is achieved according to the SNIA PTS
Preconditioning	PURGE followed by SNIA PTS prescribed WIPC & WDPC

Test Set Up

PTS-C	TEST	Purge	DP	OIO	WIPC		WDPC		STEADY STATE	
8.0	IOPS - REQUIRED	Security Erase	RND	TC 1 QD 8	PC AR	TEST AR	AR AMT	SEGMENTS	WORKLOAD	ROUNDS
					100%	100%	16 GiB	2048	IOPS LOOP	2 - 6

Select Performance Data

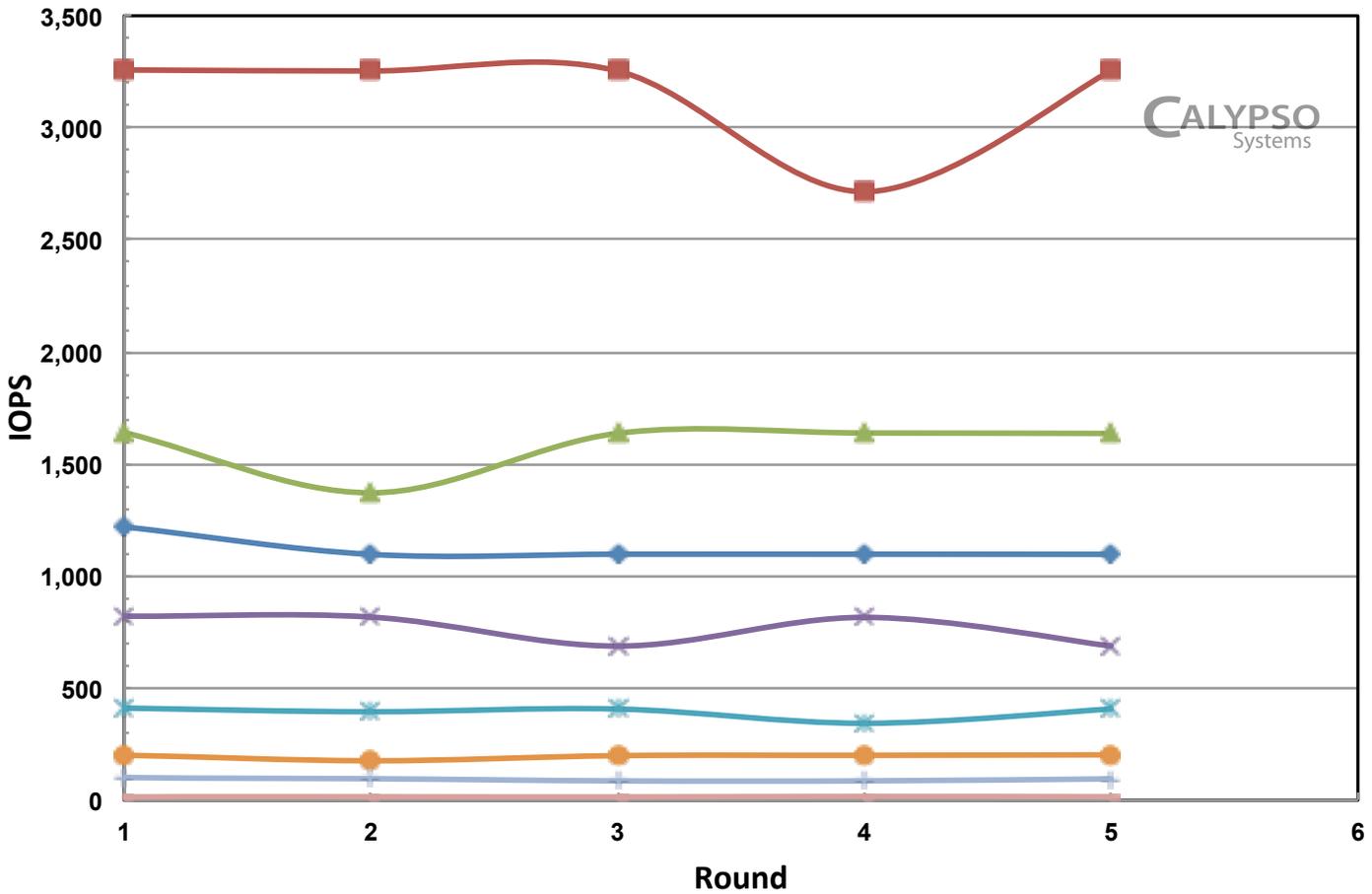
RND 4KiB W	RND 4KiB R	RND 8KiB W	RND 8KiB R
3,147	29,876	1,584	21,723

Test Sponsor – Special Notes

ITEM	NOTATION	COMMENTS

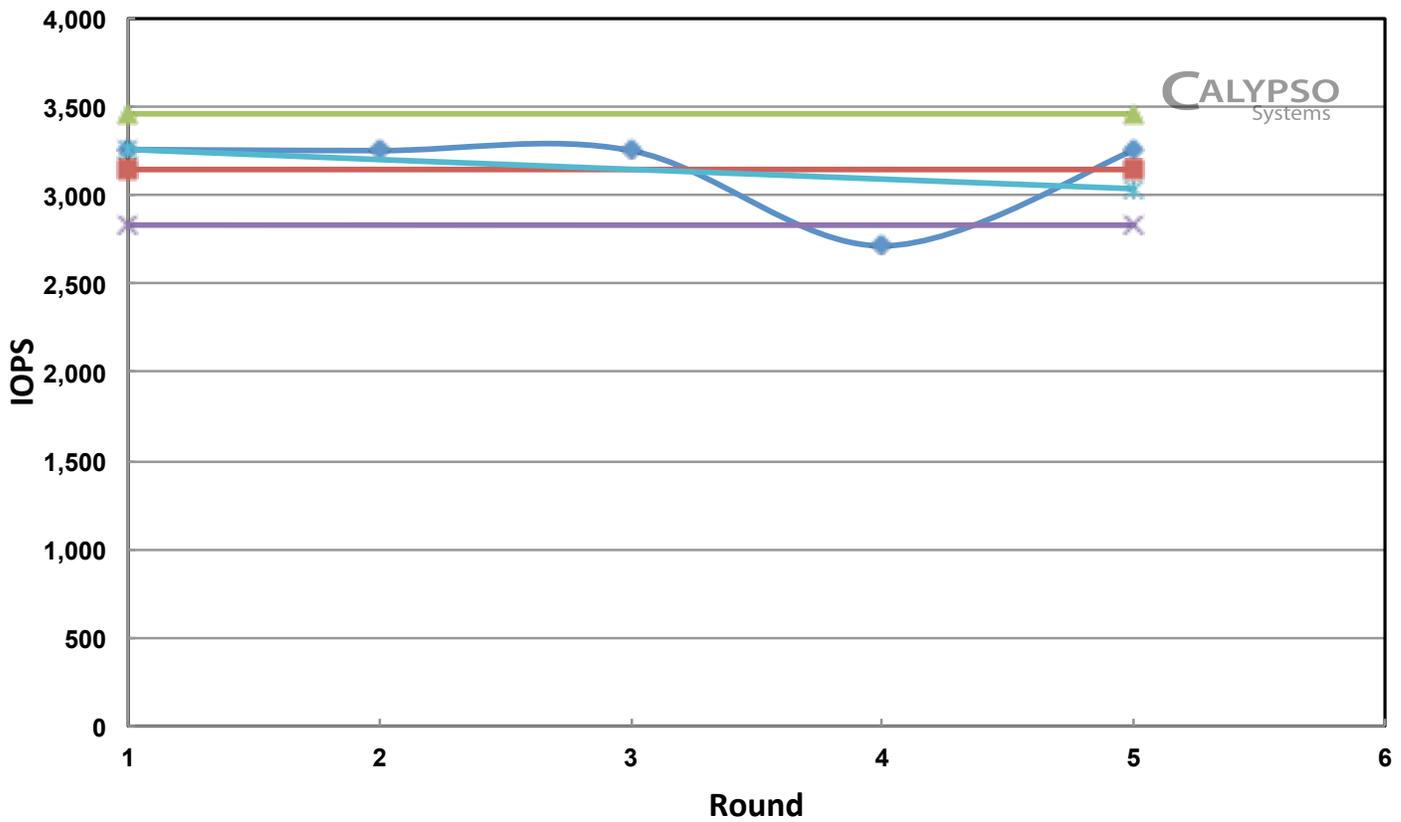
Test Run Date: 11/14/2011 12:39 AM		Report Run Date: 11/21/2011 04:12 PM	
Client IOPS (REQUIRED) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
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Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	Security Erase
Capacity	256 GB	REQUIRED:	
NAND Type	MLC	Data Pattern	
Device I/F	6 Gb/s SATA	RND	
Test Platform	RTP 2.0 CTS 6.5	Workload Independent	2X SEQ/128KiB
		Workload Dep.	Full IOPS Loop
		Tester's Choice:	
		OIO/Thread (QD)	8
		Thread Count (TC)	1
			Steady State
			Convergence
			YES
			Rounds
			1-5
			PC AR
			100%
			AR AMOUNT
			16 GiB
			AR Segments
			2048
Steady State Convergence Plot - All Block Sizes			

◆ BS=0.5 KiB
■ BS=4 KiB
▲ BS=8 KiB
✕ BS=16 KiB
✕ BS=32 KiB
● BS=64 KiB
◆ BS=128 KiB
■ BS=1024 KiB



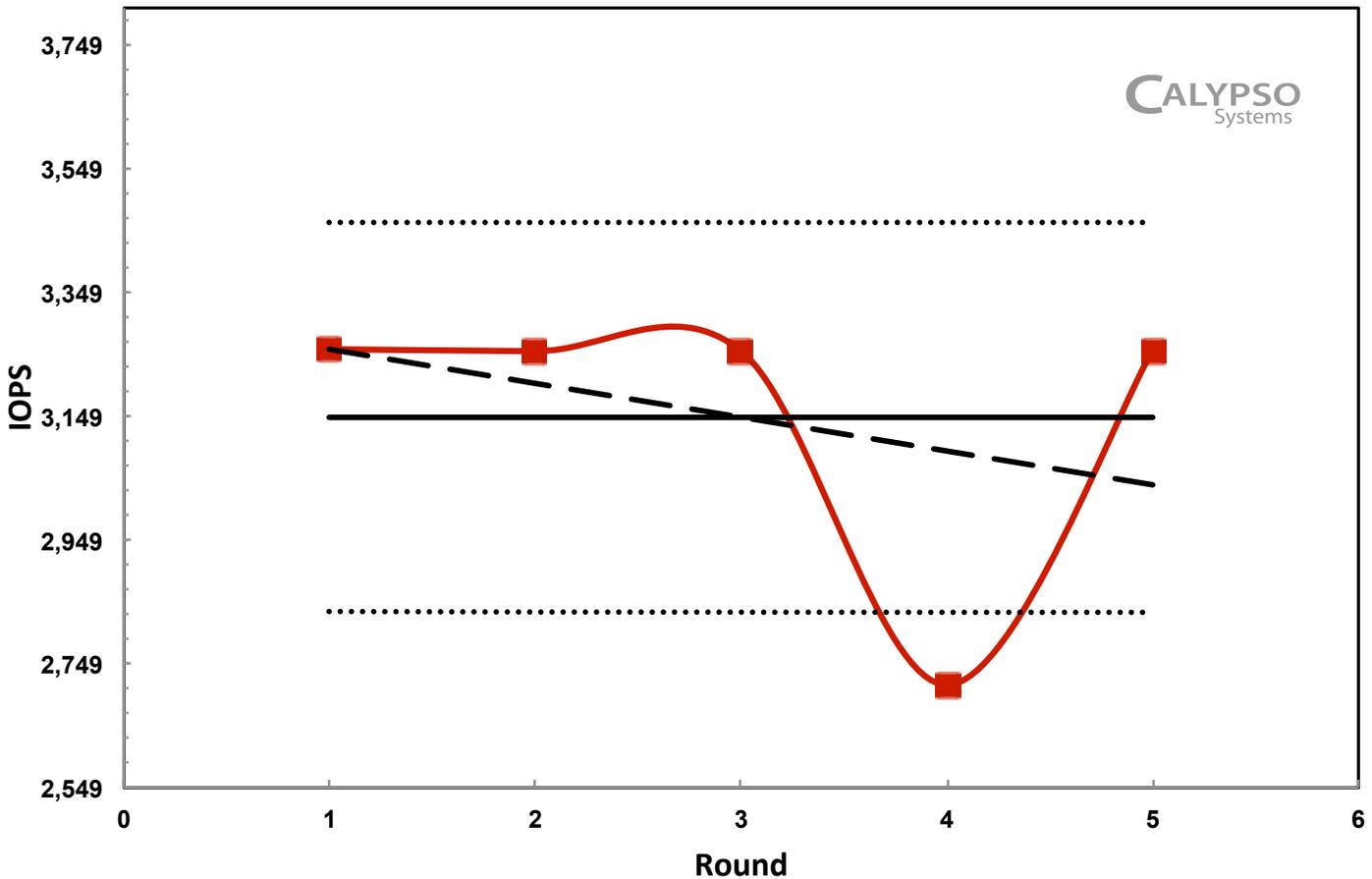
Test Run Date: 11/14/2011 12:39 AM		Report Run Date: 11/21/2011 04:12 PM	
Client IOPS (REQUIRED) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
			Page 2 of 6
Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	Security Erase
Capacity	256 GB	Pre-Conditioning	
NAND Type	MLC	Workload Independent	2X SEQ/128KiB
Device I/F	6 Gb/s SATA		
Test Platform	RTP 2.0 CTS 6.5	Workload Dep.	Full IOPS Loop
			REQUIRED:
			Data Pattern
			RND
			Tester's Choice:
			OIO/Thread (QD)
			8
			Thread Count (TC)
			1
Steady State			
			Convergence
			YES
			Rounds
			1-5
			PC AR
			100%
			AR AMOUNT
			16 GiB
			AR Segments
			2048
Steady State Measurement Window			

◆ IOPS
 ■ Average
 ▲ 110%*Average
 × 90%*Average
 ◆ Slope



Test Run Date: 11/14/2011 12:39 AM		Report Run Date: 11/21/2011 04:12 PM	
Client IOPS (REQUIRED) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
			Page 3 of 6
Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	Security Erase
Capacity	256 GB	Pre-Conditioning	
NAND Type	MLC	Workload Independent	2X SEQ/128KiB
Device I/F	6 Gb/s SATA		
Test Platform	RTP 2.0 CTS 6.5	Workload Dep.	Full IOPS Loop
		REQUIRED:	Data Pattern
		Tester's Choice:	RND
		OIO/Thread (QD)	8
		Thread Count (TC)	1
		Convergence	YES
		Rounds	1-5
		PC AR	100%
		AR AMOUNT	16 GiB
		AR Segments	2048
Steady State Measurement Window – RND/4KiB			

■ IOPS
 — Average
 110%*Average
 90%*Average
 - - - Slope



Steady State Determination Data

Average IOPS:	3147.0		
Allowed Maximum Data Excursion:	629.4	Measured Maximum Data Excursion:	542.4
Allowed Maximum Slope Excursion:	314.7	Measured Maximum Slope Excursion:	217.6
Least Squares Linear Fit Formula:	-54.407 * R + 3310.267		

Test Run Date: 11/14/2011 12:39 AM		Report Run Date: 11/21/2011 04:12 PM					
Client IOPS (REQUIRED) - Report Page							
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0				
			Page 4 of 6				
Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR 				
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters				
Firmware Rev	BF01	Purge	Security Erase				
Capacity	256 GB	Pre-Conditioning					
NAND Type	MLC	Workload Independent	2X SEQ/128KiB				
Device I/F	6 Gb/s SATA						
Test Platform	RTP 2.0 CTS 6.5	Workload Dep.	Full IOPS Loop				
		REQUIRED:	Data Pattern				
		Tester's Choice:	RND				
		OIO/Thread (QD)	8				
		Thread Count (TC)	1				
		Steady State	Convergence				
			YES				
			Rounds				
			1-5				
			PC AR				
			100%				
			AR AMOUNT				
			16 GiB				
			AR Segments				
			2048				
Client IOPS - ALL RW Mix & BS - Tabular Data							
Block Size (KiB)	Read / Write Mix %						
	0/100	5/95	35/65	50/50	65/35	95/5	100/0
0.5	1,122.3	1,162.2	1,654.6	1,965.6	2,717.7	11,970.0	29,860.1
4	3,147.0	2,896.6	3,044.4	3,454.4	3,779.3	13,005.8	29,876.3
8	1,584.9	1,589.7	2,055.0	2,238.9	2,898.1	11,568.2	21,723.1
16	765.8	786.3	1,028.1	1,272.6	1,604.9	6,208.3	12,482.5
32	392.7	401.0	525.8	652.7	963.8	4,129.6	7,011.6
64	196.4	205.9	291.3	352.3	565.4	2,372.7	3,791.5
128	92.5	97.1	139.9	185.4	377.9	1,410.2	2,015.3
1024	16.4	16.5	23.3	27.3	90.8	191.4	266.7

Test Run Date: 11/14/2011 12:39 AM

Report Run Date: 11/21/2011 04:12 PM

Client IOPS (REQUIRED) - Report Page

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Device Under Test (DUT)

VENDOR:
ABC CO.

SSD MODEL NO:
MLC-A 256 GB

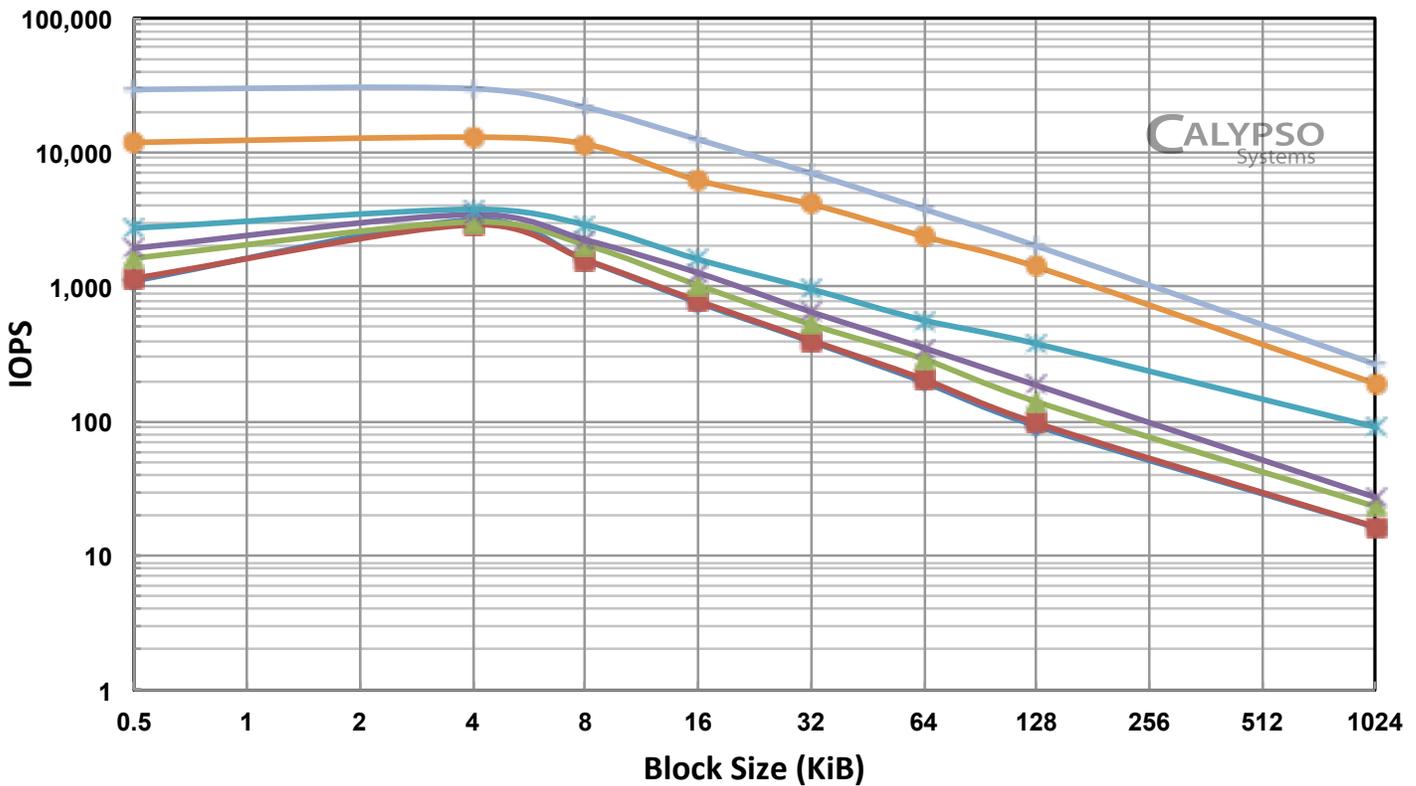
TEST SPONSOR



Serial No.	0000-0000-FFFF	DUT Preparation		Test Loop Parameters		Steady State	
Firmware Rev	BF01	Purge	Security Erase	REQUIRED: Data Pattern	RND	Convergence	YES
Capacity	256 GB	Pre-Conditioning				Tester's Choice: OIO/Thread (QD)	Rounds
NAND Type	MLC	Workload Independent	2X SEQ/128KiB	Thread Count (TC)	8	PC AR	100%
Device I/F	6 Gb/s SATA		Workload Dep.	Full IOPS Loop	1	AR AMOUNT	16 GiB
Test Platform	RTP 2.0 CTS 6.5						AR Segments

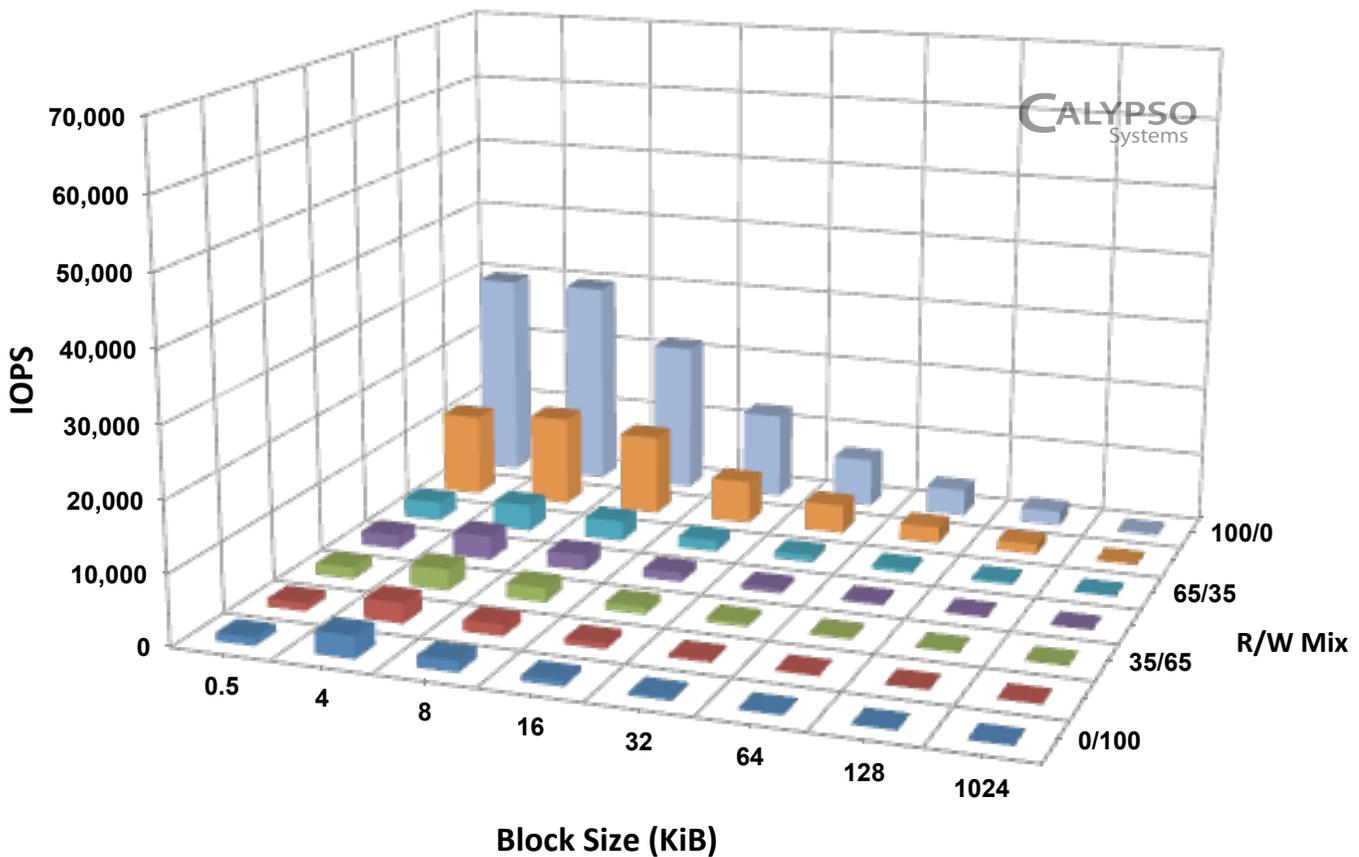
Client IOPS - ALL RW Mix & BS - 2D Plot

0/100 5/95 35/65 50/50 65/35 95/5 100/0



Test Run Date: 11/14/2011 12:39 AM		Report Run Date: 11/21/2011 04:12 PM	
Client IOPS (REQUIRED) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
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Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	Security Erase
Capacity	256 GB	Pre-Conditioning	
NAND Type	MLC	Workload Independent	2X SEQ/128KiB
Device I/F	6 Gb/s SATA		
Test Platform	RTP 2.0 CTS 6.5	Workload Dep.	Full IOPS Loop
		REQUIRED:	Data Pattern
		Tester's Choice:	RND
		OIO/Thread (QD)	8
		Thread Count (TC)	1
		Steady State	Convergence
			YES
			Rounds
			1-5
			PC AR
			100%
			AR AMOUNT
			16 GiB
			AR Segments
			2048
Client IOPS - ALL RW Mix & BS - 3D Columns			

0/100 5/95 35/65 50/50 65/35 95/5 100/0



MLC-A Test Report

Summary Report Page - THROUGHPUT

SNIA Solid State Storage Performance Test Specification (PTS)

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Device Under Test (DUT)

MLC-A

**SNIA SSS PTS
Summary Report**

**Calypso
Systems, Inc.**



DEVICE INFORMATION		TEST HARDWARE PLATFORM		TEST SOFTWARE		REPORT DATE	
SERIAL NO.	0000-0000-FFFF	SYSTEM	Calypso RTP 2.0	SYS OS	CENT OS 5.6	Report	06DEC11
FIRMWARE REV.	BFO1	Motherboard/cpu	Intel 5520HC / W5580	SW TOOL	Calypso CTS 6.5	Test Run	01NOV - 04DEC11
USER CAPACITY	MLC 256 GB	RAM	12GB ECC DDR3	SW Rev	1.19.10	Test Sponsor	Calypso
DEVICE INTERFACE	6 Gb/s SATA	Device Interface	LSA 9212-e 6Gb/s HBA	Release	Nov. 2011	Auditor	N/A

Test Description

Purpose	To measure Large Block SEQ TP using different BS and R/W Mixes
Test Outline	PURGE, then apply preconditioning until Steady State is achieved according to the SNIA PTS
Preconditioning	PURGE followed by SNIA PTS prescribed WIPC & WDPC

Test Set Up

PTS-C	TEST	Purge	DP	OIO	WIPC		WDPC		STEADY STATE	
					PC AR	TEST AR	AR AMT	SEGMENTS	WORKLOAD	ROUNDS
9.0	THROUGHPUT - REQUIRED	Security Erase	RND	TC 32 QD 32	100%	100%	16 GiB	2048	SEQ 1024KiB	1 - 5

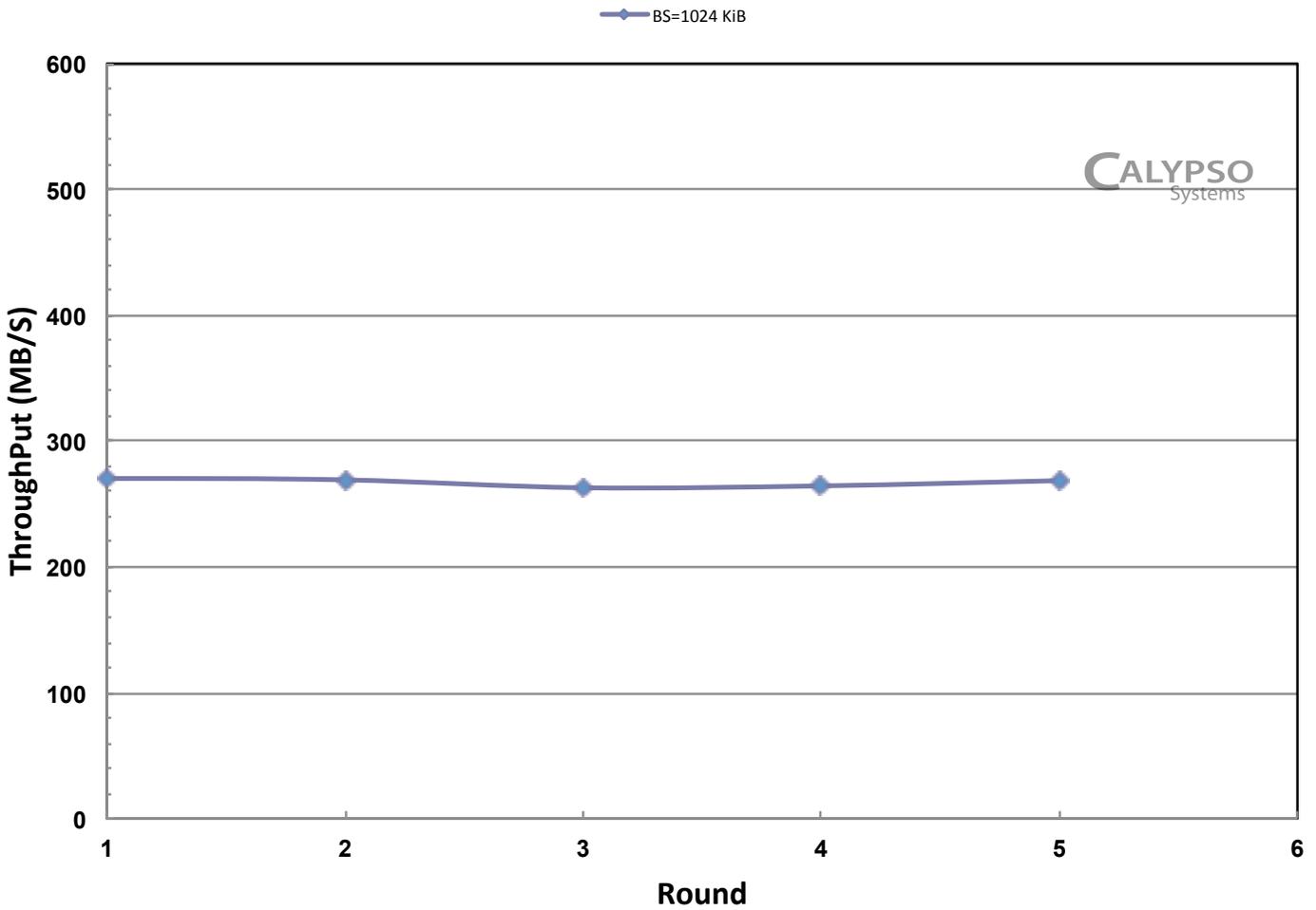
Select Performance Data

	SEQ 1024KiB R	SEQ 1024KiB W
	417 MB/S	267 MB/S

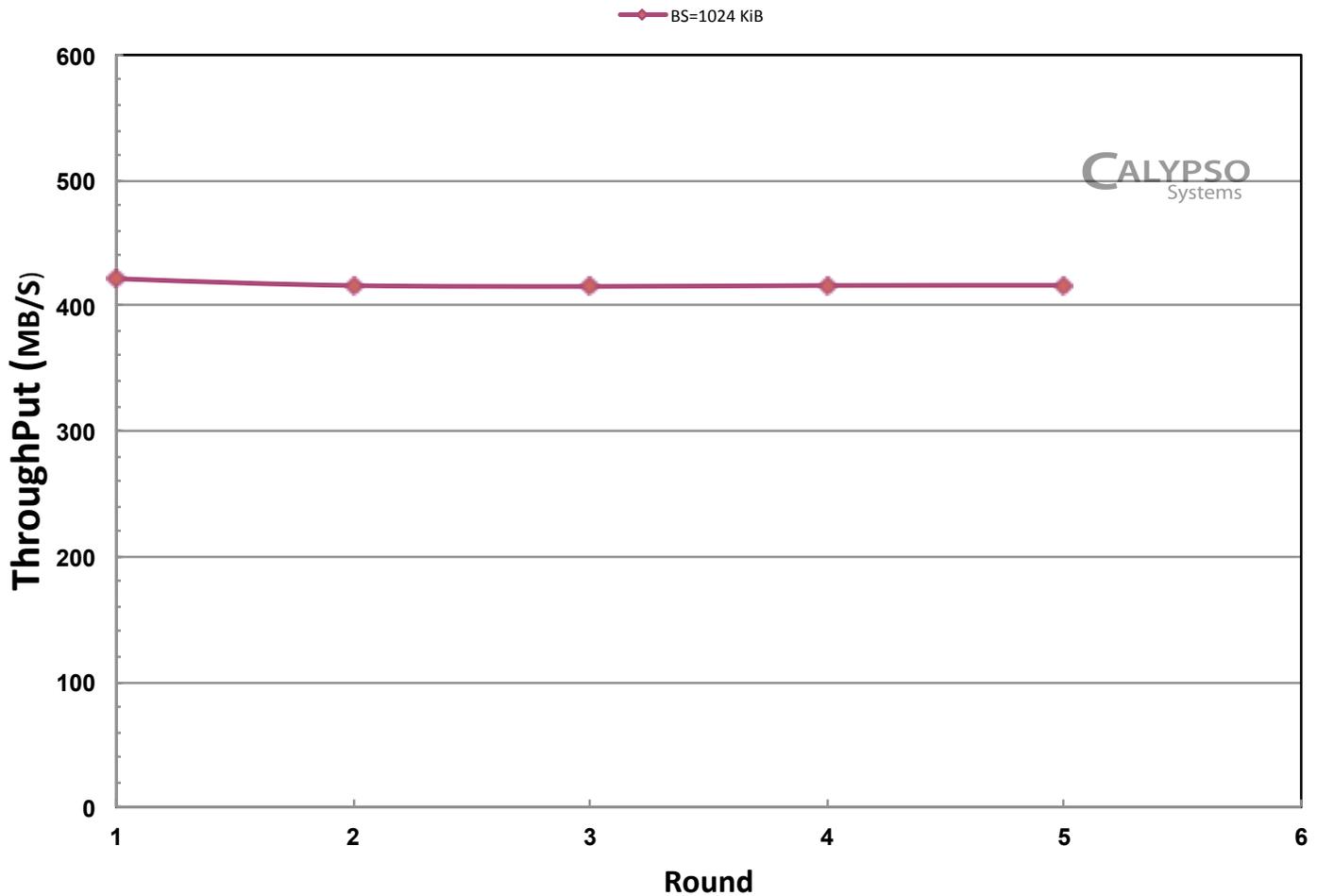
Test Sponsor – Special Notes

ITEM	NOTATION	COMMENTS

Test Run Date: 11/13/2011 10:24 AM		Report Run Date: 11/21/2011 04:03 PM	
Client Throughput Test (REQUIRED) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
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Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	Security Erase
Capacity	256 GB	REQUIRED:	
NAND Type	MLC	Data Pattern	
Device I/F	6 Gb/s SATA	RND	
Test Platform	RTP 2.0 CTS 6.5	Tester's Choice:	
		OIO/Thread (QD)	32
		Thread Count (TC)	32
		Workload Independent	2X SEQ/128KiB
		Workload Dep.	SEQ 1024KiB
		Convergence	YES
		Rounds	1-5
		PC AR	100%
		AR AMOUNT	16 GiB
		AR Segments	2048
Steady State Convergence Plot – All Block Sizes - Write			

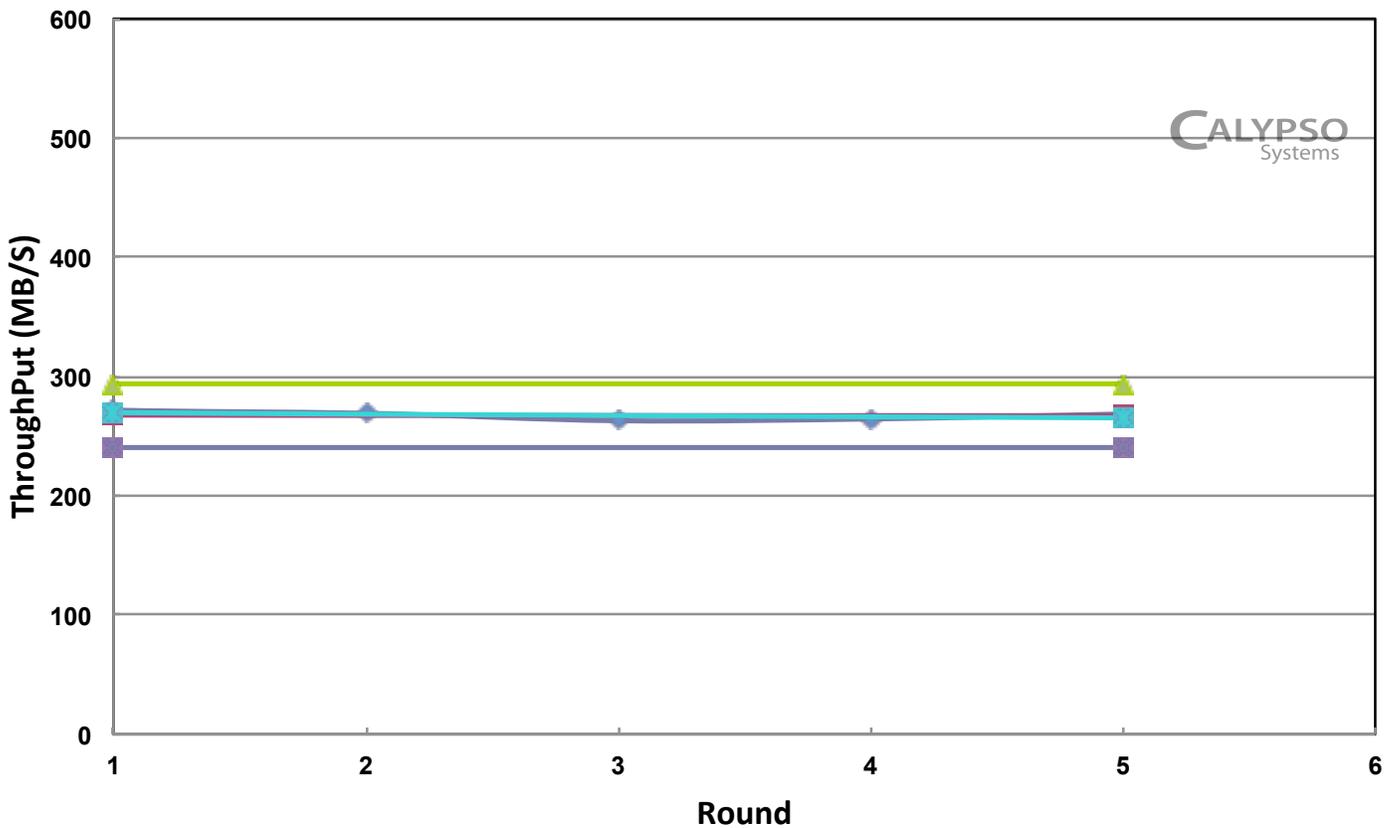


Test Run Date: 11/13/2011 10:24 AM		Report Run Date: 11/21/2011 04:03 PM	
Client Throughput Test (REQUIRED) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
			Page 2 of 5
Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	Security Erase
Capacity	256 GB	Pre-Conditioning	
NAND Type	MLC	Workload Independent	2X SEQ/128KiB
Device I/F	6 Gb/s SATA		
Test Platform	RTP 2.0 CTS 6.5	Workload Dep.	SEQ 1024KiB
		REQUIRED:	Data Pattern
		Tester's Choice:	RND
		OIO/Thread (QD)	32
		Thread Count (TC)	32
		Steady State	Convergence
			YES
			Rounds
			1-5
			PC AR
			100%
			AR AMOUNT
			16 GiB
			AR Segments
			2048
Client Throughput Test - SS Convergence - Read			



Test Run Date: 11/13/2011 10:24 AM		Report Run Date: 11/21/2011 04:03 PM	
Client Throughput Test (REQUIRED) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
			Page 3 of 5
Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	Security Erase
Capacity	256 GB	REQUIRED:	
NAND Type	MLC	Data Pattern	
Device I/F	6 Gb/s SATA	RND	
Test Platform	RTP 2.0 CTS 6.5	Tester's Choice:	
		OIO/Thread (QD)	32
		Thread Count (TC)	32
		Steady State	
		Convergence	YES
		Rounds	1-5
		PC AR	100%
		AR AMOUNT	16 GiB
		AR Segments	2048
Client - Steady State Measurement Window – SEQ/1024 KiB			

◆ IOPS
■ Average
▲ 110%*Average
■ 90%*Average
■ Slope



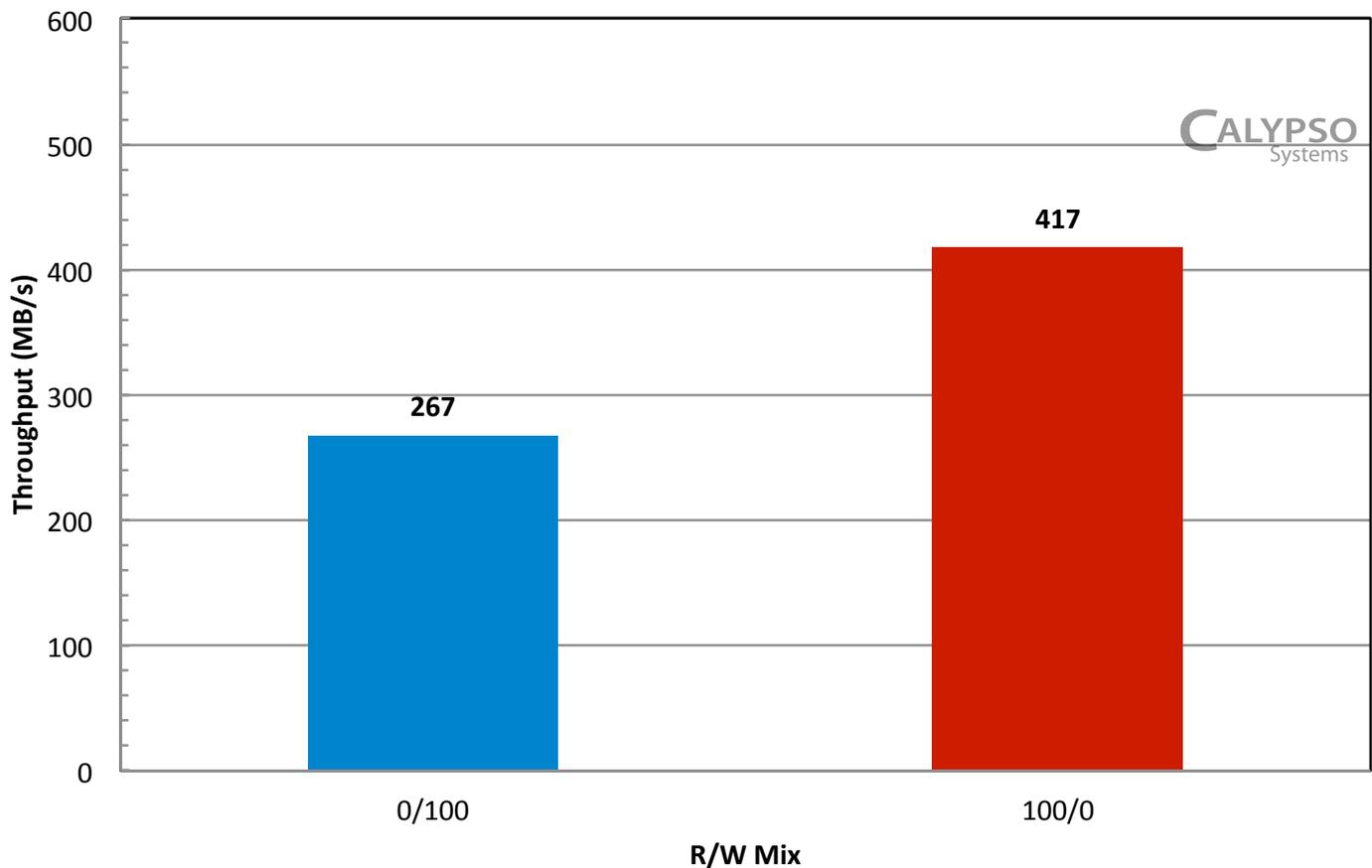
Steady State Determination Data

Average ThroughPut:	267.2		
Allowed Maximum Data Excursion:	53.4	Measured Maximum Data Excursion:	7.9
Allowed Maximum Slope Excursion:	26.7	Measured Maximum Slope Excursion:	3.7
Least Squares Linear Fit Formula:	-0.924 * R + 269.947		

Test Run Date: 11/13/2011 10:24 AM		Report Run Date: 11/21/2011 04:03 PM				
Client Throughput Test (REQUIRED) - Report Page						
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)					Rev. PTS-C 1.0	
					Page 4 of 5	
Device Under Test (DUT)		VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB		TEST SPONSOR 	
Serial No.	0000-0000-FFFF	DUT Preparation		Test Loop Parameters		
Firmware Rev	BF01	Purge	Security Erase	REQUIRED:	Steady State	
Capacity	256 GB	Pre-Conditioning			Convergence	YES
NAND Type	MLC	Workload Independent	2X SEQ/128KiB	Data Pattern	Rounds	1-5
Device I/F	6 Gb/s SATA			Workload Dep.	SEQ 1024KiB	Tester's Choice: OIO/Thread (QD) Thread Count (TC)
Test Platform	RTP 2.0 CTS 6.5					
					AR Segments	2048
Client Throughput - ALL RW Mix & BS - Tabular Data						

Block Size (KiB)	Read / Write Mix %	
	0/100	100/0
1024	267.2	416.9

Test Run Date: 11/13/2011 10:24 AM		Report Run Date: 11/21/2011 04:03 PM	
Client Throughput Test (REQUIRED) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
			Page 5 of 5
Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	Security Erase
Capacity	256 GB	REQUIRED:	
NAND Type	MLC	Pre-Conditioning	Data Pattern RND
Device I/F	6 Gb/s SATA	Workload Independent	2X SEQ/128KiB
Test Platform	RTP 2.0 CTS 6.5	Workload Dep.	SEQ 1024KiB
		Tester's Choice:	OIO/Thread (QD) 32
			Thread Count (TC) 32
			Steady State
		Convergence	YES
		Rounds	1-5
		PC AR	100%
		AR AMOUNT	16 GiB
		AR Segments	2048
Client Throughput - ALL RW Mix & BS - 2D Plot			



MLC-A Test Report

Summary Report Page - LATENCY

SNIA Solid State Storage Performance Test Specification (PTS)						Rev. PTS 1.0	
						Page 20 of 26	
Device Under Test (DUT)	MLC-A	SNIA SSS PTS Summary Report		Calypso Systems, Inc.		CALYPSO Systems	
DEVICE INFORMATION		TEST HARDWARE PLATFORM		TEST SOFTWARE		REPORT DATE	
SERIAL NO.	0000-0000-FFFF	SYSTEM	Calypso RTP 2.0	SYS OS	CENT OS 5.6	Report	06DEC11
FIRMWARE REV.	BFO1	Motherboard/cpu	Intel 5520HC / W5580	SW TOOL	Calypso CTS 6.5	Test Run	01NOV - 04DEC11
USER CAPACITY	MLC 256 GB	RAM	12GB ECC DDR3	SW Rev	1.19.10	Test Sponsor	Calypso
DEVICE INTERFACE	6 Gb/s SATA	Device Interface	LSA 9212-e 6Gb/s HBA	Release	Nov. 2011	Auditor	N/A

Test Description

Purpose	To measure AVE & MAX Response times at selected BS & RW Mixes measured in mSec
Test Outline	PURGE, then apply preconditioning until Steady State is achieved according to the SNIA PTS
Preconditioning	PURGE followed by SNIA PTS prescribed WIPC & WDPC

Test Set Up

PTS-C	TEST	Purge	DP	OIO	WIPC		WDPC		STEADY STATE	
10.0	LATENCY - REQUIRED	Security Erase	RND	TC 1 QD 1	PC AR	TEST AR	AR AMT	SEGMENTS	WORKLOAD	ROUNDS
					100%	100%	16 GiB	2048	LAT LOOP	4 - 8

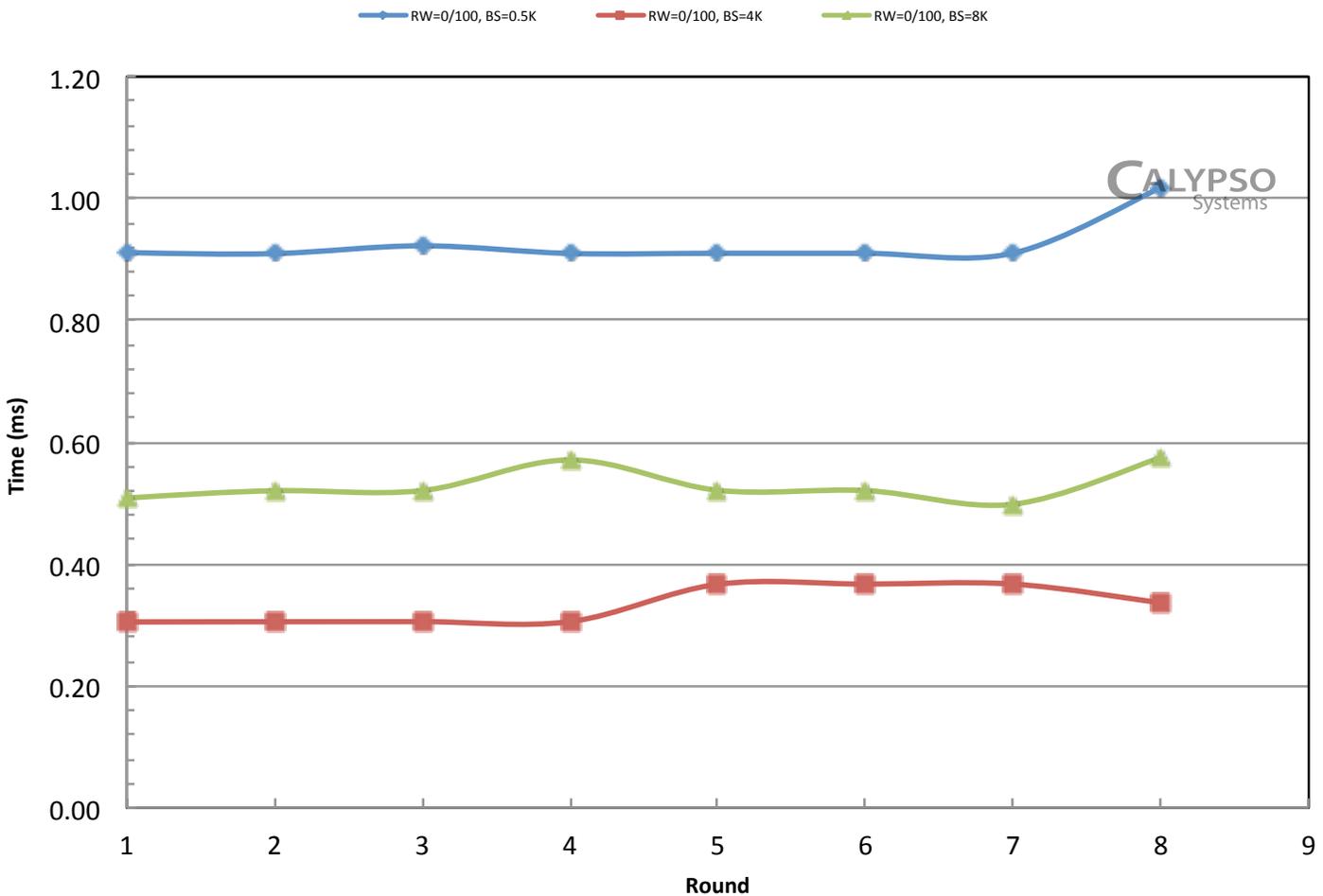
Select Performance Data

RND 4KiB R AVE	RND 4KiB W AVE	RND 4KiB R MAX	RND 4KiB W MAX
0.203 mSec	0.309 mSec	1.600 mSec	51.000 mSec

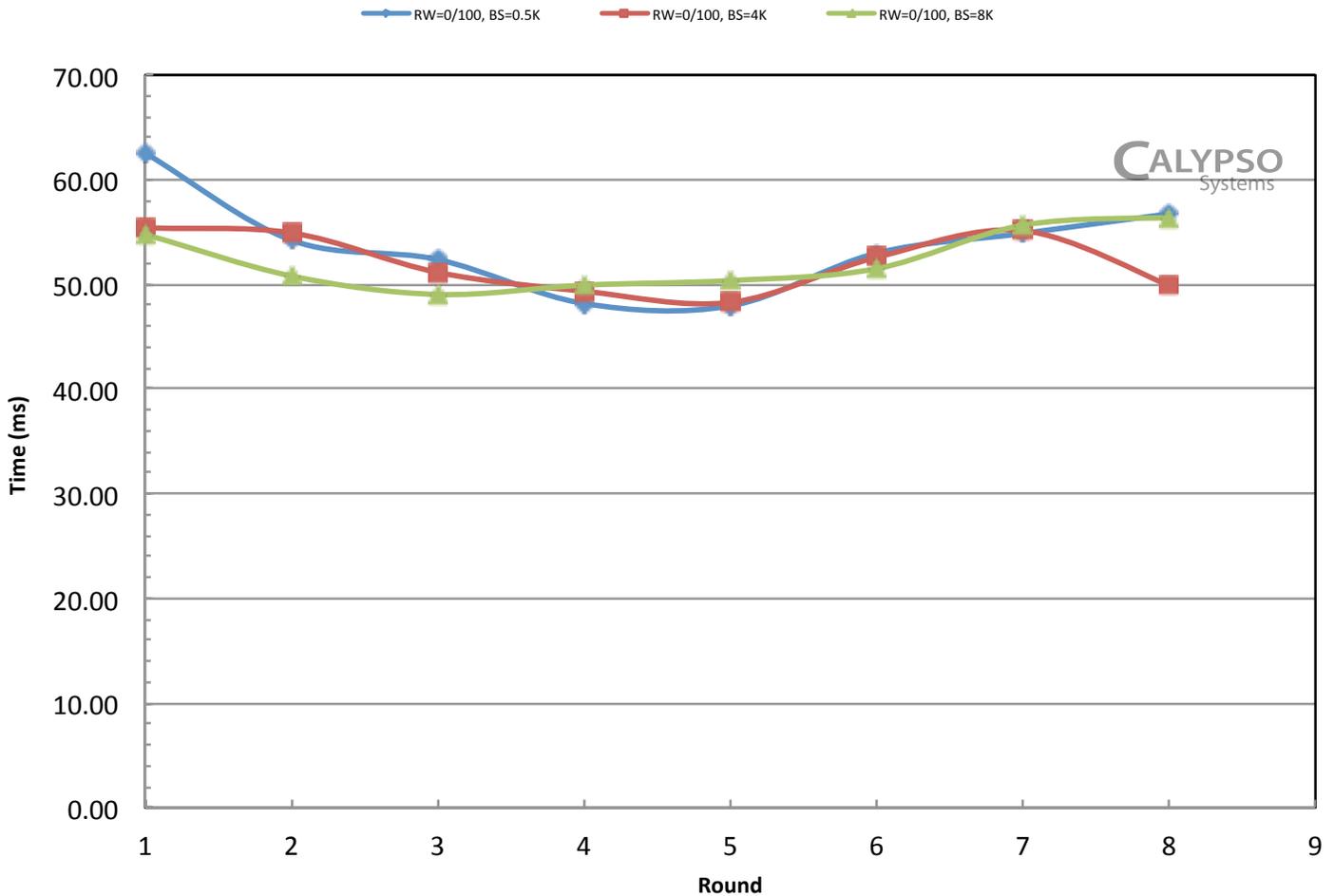
Test Sponsor – Special Notes

ITEM	NOTATION	COMMENTS

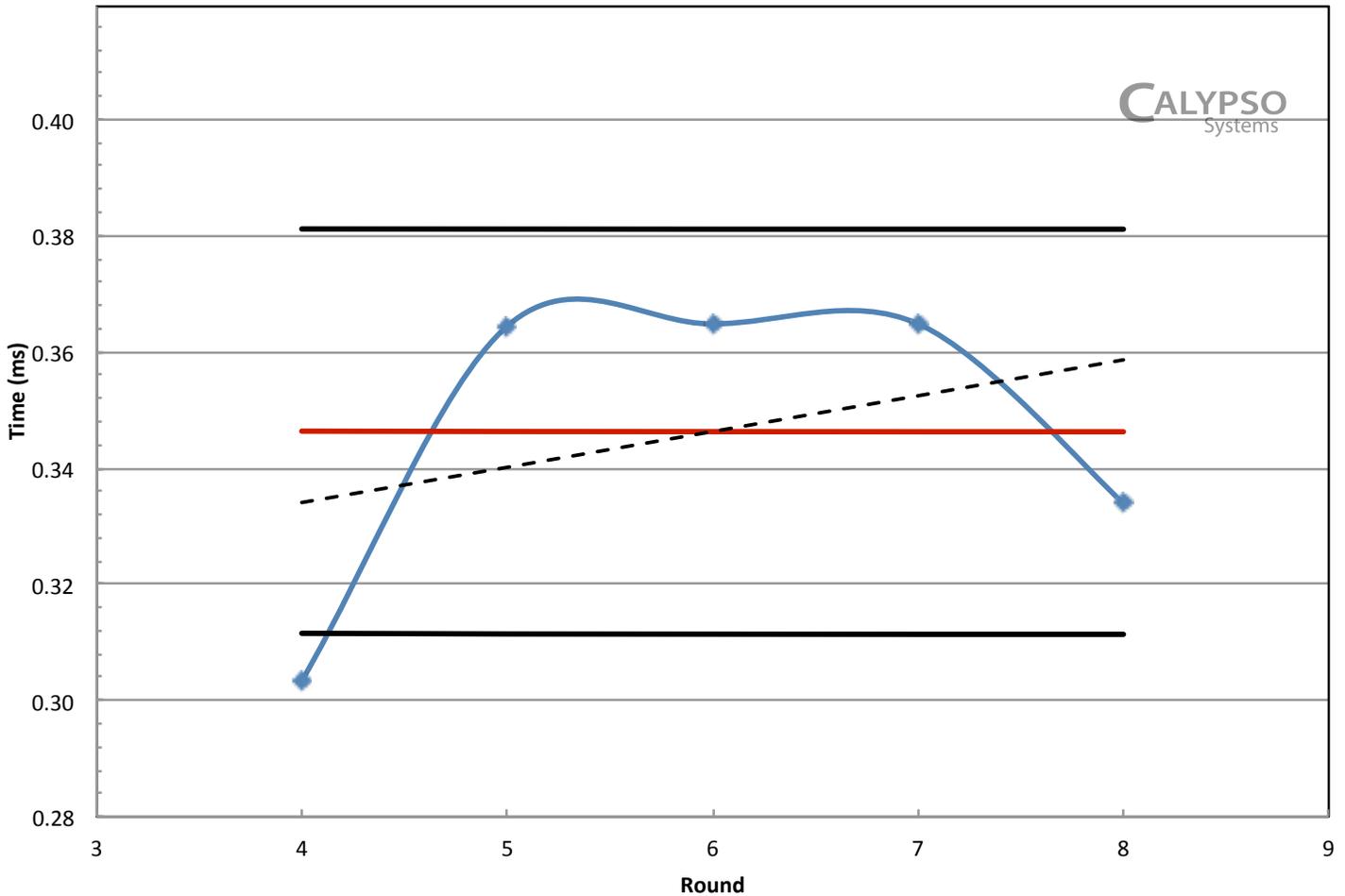
Test Run Date:		11/11/2011 09:53 AM		Report Run Date:		11/15/2011 03:34 PM		
Client Latency (REQUIRED) - Report Page								
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)						Rev.	PTS-C 1.0	
						Page	1 of 6	
Device Under Test (DUT)		VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB		TEST SPONSOR	CALYPSO Systems		
Serial No.	0000-0000-FFFF	DUT Preparation		Test Loop Parameters				Steady State
Firmware Rev	BF01	Purge	Security Erase		REQUIRED:		Convergence	YES
Capacity	256 GB	Pre-Conditioning		Data Pattern	RND	Rounds	4-8	
NAND Type	MLC	Workload Independent	2X SEQ/128KiB		Tester's Choice:		PC AR	100%
Device I/F	6 Gb/s SATA		Full Latency Loop		OIO/Thread (QD)	1	AR AMOUNT	16 GiB
Test Platform	RTP 2.0 CTS 6.5	Workload Dep.			Thread Count (TC)	1	AR Segments	2048
Client - Steady State Convergence Plot – AVE Latency - 100% Writes								



Test Run Date:		11/11/2011 09:53 AM		Report Run Date:		11/15/2011 03:34 PM		
Client Latency (REQUIRED) - Report Page								
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)						Rev.	PTS-C 1.0	
						Page	2 of 6	
Device Under Test (DUT)		VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB		TEST SPONSOR	CALYPSO Systems		
Serial No.	0000-0000-FFFF	DUT Preparation		Test Loop Parameters		Steady State		
Firmware Rev	BF01	Purge	Security Erase		REQUIRED: Data Pattern	RND	Convergence	YES
Capacity	256 GB	Pre-Conditioning		Tester's Choice: OIO/Thread (QD)			1	Rounds
NAND Type	MLC	Workload Independent	2X SEQ/128KiB		Thread Count (TC)	1		PC AR
Device I/F	6 Gb/s SATA		Workload Dep. Full Latency Loop				AR AMOUNT	16 GiB
Test Platform	RTP 2.0 CTS 6.5	AR Segments			2048			
Client Steady State Convergence Plot - MAX Latency - 100% Writes								



Test Run Date:		11/11/2011 09:53 AM		Report Run Date:		11/15/2011 03:34 PM		
Client Latency (REQUIRED) - Report Page								
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)						Rev.	PTS-C 1.0	
						Page	3 of 6	
Device Under Test (DUT)		VENDOR:	SSD MODEL NO:		TEST SPONSOR	CALYPSO Systems		
		ABC CO.	MLC-A 256 GB					
Serial No.	0000-0000-FFFF	DUT Preparation		Test Loop Parameters		Steady State		
Firmware Rev	BF01	Purge	Security Erase		REQUIRED:	Convergence	YES	
Capacity	256 GB	Pre-Conditioning		Data Pattern	RND	Rounds	4-8	
NAND Type	MLC	Workload Independent	2X SEQ/128KiB		Tester's Choice:	PC AR	100%	
Device I/F	6 Gb/s SATA		Full Latency Loop			OIO/Thread (QD)	1	AR AMOUNT
Test Platform	RTP 2.0 CTS 6.5	Workload Dep.			Thread Count (TC)	1	AR Segments	2048
Client - Steady State Measurement Window - RND/4KiB								



Steady State Determination Data

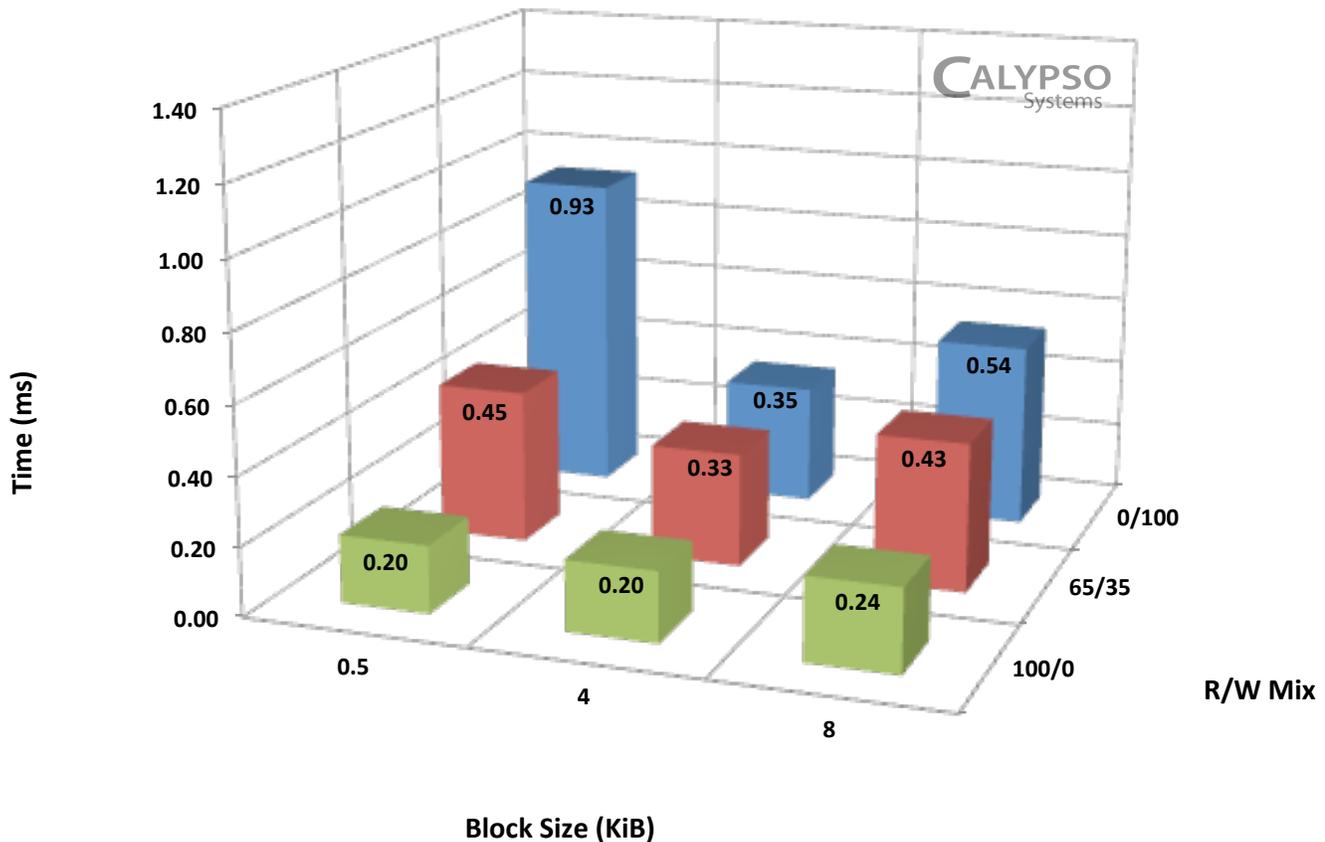
Average Latency (ms):		0.349	
Allowed Maximum Data Excursion:	0.070	Measured Maximum Data Excursion:	0.062
Allowed Maximum Slope Excursion:	0.035	Measured Maximum Slope Excursion:	0.025
Least Squares Linear Fit Formula:		0.006 * R + 0.312	

Test Run Date:		11/11/2011 09:53 AM		Report Run Date:		11/15/2011 03:34 PM		
Client Latency (REQUIRED) - Report Page								
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)						Rev.	PTS-C 1.0	
						Page	4 of 6	
Device Under Test (DUT)		VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB		TEST SPONSOR	CALYPSO Systems		
Serial No.	0000-0000-FFFF	DUT Preparation		Test Loop Parameters				Steady State
Firmware Rev	BF01	Purge	Security Erase		REQUIRED:	Convergence	YES	
Capacity	256 GB	Pre-Conditioning		Data Pattern	RND	Rounds	4-8	
NAND Type	MLC	Workload Independent	2X SEQ/128KiB		Tester's Choice:	PC AR	100%	
Device I/F	6 Gb/s SATA		Full Latency Loop			OIO/Thread (QD)	1	AR AMOUNT
Test Platform	RTP 2.0 CTS 6.5	Workload Dep.			Thread Count (TC)	1	AR Segments	2048
Client - AVE and MAX Response Time - ALL RW Mix & BS - Tabular Data								

Average Response Time (ms)			
	Read / Write Mix %		
Block Size (KiB)	0/100	65/35	100/0
0.5	0.932	0.449	0.196
4	0.349	0.332	0.203
8	0.537	0.432	0.240

Maximum Response Time (ms)			
	Read / Write Mix %		
Block Size (KiB)	0/100	65/35	100/0
0.5	52.1	50.2	1.0
4	51.0	50.0	1.6
8	52.8	53.3	39.5

Test Run Date: 11/11/2011 09:53 AM		Report Run Date: 11/15/2011 03:34 PM	
Client Latency (REQUIRED) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
			Page 5 of 6
Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge	Security Erase
Capacity	256 GB	REQUIRED:	
NAND Type	MLC	Data Pattern	
Device I/F	6 Gb/s SATA	RND	
Test Platform	RTP 2.0 CTS 6.5	Tester's Choice:	
		OIO/Thread (QD)	1
		Thread Count (TC)	1
		Steady State	
		Convergence	YES
		Rounds	4-8
		PC AR	100%
		AR AMOUNT	16 GiB
		AR Segments	2048
Client - AVE Latency vs BS and R/W Mix - 3D Plot			



Test Run Date: 11/11/2011 09:53 AM		Report Run Date: 11/15/2011 03:34 PM	
Client Latency (REQUIRED) - Report Page			
SNIA SSS TWG: Solid State Storage Performance Test Specification (PTS)			Rev. PTS-C 1.0
			Page 6 of 6
Device Under Test (DUT)	VENDOR: ABC CO.	SSD MODEL NO: MLC-A 256 GB	TEST SPONSOR CALYPSO Systems
Serial No.	0000-0000-FFFF	DUT Preparation	Test Loop Parameters
Firmware Rev	BF01	Purge Security Erase	REQUIRED:
Capacity	256 GB	Pre-Conditioning	Data Pattern RND
NAND Type	MLC	Workload Independent 2X SEQ/128KiB	Tester's Choice:
Device I/F	6 Gb/s SATA	Workload Dep. Full Latency Loop	OIO/Thread (QD) 1
Test Platform	RTP 2.0 CTS 6.5		Thread Count (TC) 1
		Steady State	Convergence YES
			Rounds 4-8
			PC AR 100%
			AR AMOUNT 16 GiB
			AR Segments 2048
Client - MAX Latency vs BS and R/W Mix - 3D Plot			

