

RoHS Compliant

Apacer Purge Application Note

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Apacer Technology Inc.

9/F, No. 100, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan

Tel: +886-2-2696-1666 Fax: +886-2-2696-1668

www.apacer.com

Revision History

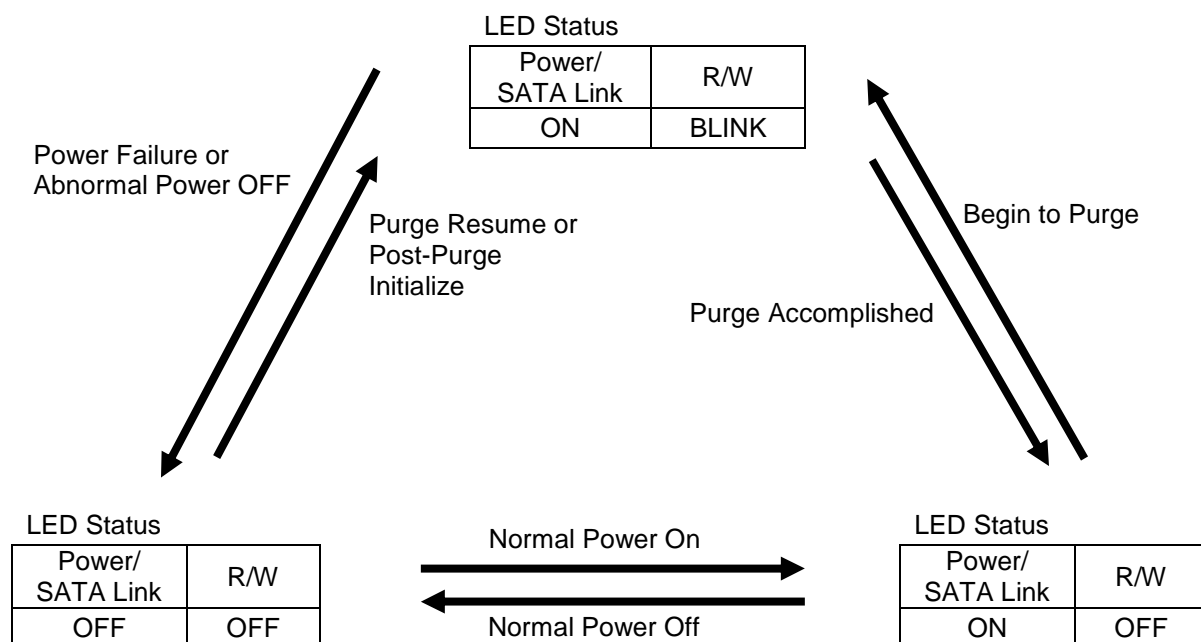
Revision	Date	Description	Remark
0.1	09/22/2008	Preliminary	
0.2	10/02/2008	Updated reference on processing time	
0.3	12/16/2008	Revised context	
0.4	01/09/2009	Revised context – Input command description	
0.5	01/13/2009	Update Sanitize/Purge command	
0.6	01/14/2009	Add State Flow of LED	
0.7	02/18/2009	Wording refined	
1.0	02/20/2009	Official release	

Purge (Sanitize)

Introduction

This application note describes in-application user level of purge (sanitize) command, and it outlines how to use this feature on the device. Within some easy steps, logically, the device can be wiped out and information previously stored on the device will be no longer available. Thus, the safe recycling or worry-free disposal can be achieved.

State Flow of LED status while purging



Overview of supported purge (sanitize) modes by proposed organizations

Below table lists purge (sanitize) procedure details and supported respective proposed organizations with Apacer's purge (sanitize) commands.

Organization	Function description
DoD 5220.22-M	<ul style="list-style-type: none"> ● Erase the media + overwrite with single character ● Erase the media
NSA Manual 130-2	<ul style="list-style-type: none"> ● Erase the media + overwrite with random (1st) ● Erase the media + overwrite with random (2nd) ● Erase the media + overwrite with single character
USA-AF AFSSI 5020	<ul style="list-style-type: none"> ● Erase the media + overwrite with random
USA-Army 380-19	<ul style="list-style-type: none"> ● Erase the media + overwrite with random ● Erase the media + overwrite with single character ● Erase the media + overwrite with complement of the character
USA Navy NAVSO P-5239-26	<ul style="list-style-type: none"> ● Erase the media + overwrite with random ● Erase the media
NISPOMSUP Chap 8, Sect. 8-501	<ul style="list-style-type: none"> ● Erase the media + overwrite with single character ● Erase the media + overwrite with complement of the character ● Erase the media + overwrite with random
IREC (IRIG) 106	<ul style="list-style-type: none"> ● Erase the media + overwrite with 0x55 ● Erase the media + overwrite with 0xAA ● Erase the media

Purge (Sanitize) process

1. Input command description

Based on ATA command format that is defined in ATA/ATAPI6 and SATA 2.5 specification, Apacer uses vendor specific command "0x80" as Apacer purge (sanitize) command. This command is a PIO out command and described as below table.

Apacer Purge (Sanitize) command input

Register	7	6	5	4	3	2	1	0
Features	Subcommand code							
Sector count	Parameter 1							
LBA Low	Parameter 2							
LBA Mid	Parameter 3							
LBA High	Purge (Sanitize) code							
Device	obs	LBA	Obs	Dev	Reserved			
Command	0x80 (Apacer Sanitize/Purge command)							

To activate the purge command:

Protocol: PIO out Command

Command Register: 0x80

Features Register: Subcommand code

Sector Count Register: Parameter 1

Cylinder Low Register: Parameter 2

Cylinder Mid Register: Parameter 3

Cylinder High Register: 0x00

Drive/Head Register: 0x00

Data Format (the data buffer transfer to SSD and start from byte 0)

unsigned char Buffer[512]="ns_Bocg#n*N9q&#t",

2. Set desired purge (sanitize) standard

Select respective subcommand cod and parameters listed below for desired sanitize/purge standard before engaging the command.

Apacer Purge (Sanitize) subcommand codes and parameters

Mode	Subcommand code	Parameter		
		1	2	3
DoD 5220.22-M	0xB4 (10110100b)	char	0x01	0x00
NSA Manual 130-2	0xAC (10101100b)	0x02	char	0x00
USA-AF AFSSI 5020	0x60 (01100000b)	0x01	0x00	0x00
USA-Army 380-19	0xEF (11101111b)	0x01	char	~char
USA Navy NAVSO P-5239-26	0xA4 (10100100b)	0x01	0x01	0x00
NISPOMSUP Chap 8, Sect. 8-501	0xFE (11111110b)	char	~char	0x01
IREC (IRIG) 106	0xFD (11111101b)	0x55	0xAA	0x01

3. Set purge (sanitize) code

Purge (Sanitize) code is defined as below.

Purge (Sanitize) code format

Bit	0	1	2	3	4	5	6	7
Value	EXC	DMS	RESERVED					

EXC and DMS bits description

EXC	DMS	Description
0	1	Set Default Mode and not execute Purge (Sanitize) command immediately
1	0	Execute Purge (Sanitize) command immediately, which Sanitize procedure will be executed depend on "Subcommand" code and "Parameters".
1	1	Set Default Mode and execute Purge (Sanitize) command immediately.
0	0	This command is illegal, the SAFD will return Error.

4. When purge (sanitize) code, subcommand code, and respective parameters are all set, the input command is ready to be executed. The result will be returned as the format listed below.

Register	7	6	5	4	3	2	1	0
Error	Status Report							
Sector ocunt	N/A							
LBA Low	N/A							
LBA Mid	N/A							
LBA High	N/A							
Device	N/A							
Status	BSY	RDRY	DF	na	Na	na	na	ERR

If the command is executed successfully, the ERR bit should be set to "0"; otherwise, the ERR bit would be set to "1". Status Report is reserved for future use.

Note: As purge (sanitize) command is executed, the device is no longer available and recoverable. For further help on the command, please contact Apacer.

Conclusion

Apacer's purge (sanitize) command will definitely destroy any possible retrieval to the previous stored data on the drive, and hence elevate the level of reliable securing information on the device. It takes some schemes to work out the configuration, but it pays to prevent from mishaps.

Reference

Apacer Purge (Sanitize) processing time on different modes

Mode	Time (seconds)
DoD 5220.22-M	460
NSA Manual 130-2	450
USA-AF AFSSI 5020	440
USA-Army 380-19	1290
USA Navy NAVSO P-5239-26	690
NISPOMSUP Chap 8, Sect. 8-501	1290
IREC (IRIG) 106	885

Note: Based on the SAFD253 32GB model. Time consumed varies from different capacities and models.

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Hsichih, Taipei County 221, Taiwan
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www.apacer.com

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