SD NAND 存储功能描述（9）切换功能

开关功能状态

开关功能状态是返回的数据块，其中包含功能和当前消耗信息。块长度预定义为 512 位，不需要使用 SET_BLK_LEN 命令。状态数据结构如下表所示。响应的状态位包含功能组的信息。最大电流消耗仅用于通过该命令添加的新功能。

在这种情况下，CSD 寄存器中的 VDD_R_CURR_MIN, VDD_W_CURR_MIN, VDD_R_CURR_MAX 和 VDD_W_CURR MAX 值提供了所有卡功能设置为默认状态时的当前消耗，并且可以由 spec 1.01 兼容主机使用。

Bits	Description	Width
511:496	Maximum current consumption (0:Error, 1:1mA, 2:2mA... , 65,535:65,535mA) under the function shown with [399:376] bits. The voltage to calculate current consumption is defined by ACMD41 (SD memory card) or CMD5 (SD I/O card). Maximum current consumption indicates the total card current (memory portion) if the functions are switched. The host should check the maximum current consumption and verify that it can supply the necessary current before mode 1 operation. Maximum current consumption is average over 1second. Especially in UHS-I mode, CMD6 mode 0 indicates the maximum current of a selected UHS-I mode regardless of the setting of Current Limit. CMD6 mode 1 indicates the maximum current of a selected UHS-I mode depending on the setting of Current Limit.	16
495:480	Function group 6, information. If a bit i is set, function i is supported	16
479:464	Function group 5, information. If a bit i is set, function i is supported	16
463:448	Function group 4, information. If a bit i is set, function i is supported	16
447:432	Function group 3, information. If a bit i is set, function i is supported	16
431:416	Function group 2, information. If a bit i is set, function i is supported	16
415:400	Function group 1, information. If a bit i is set, function i is supported	16
399:396	mode 0 - The function which can be switched in function group 6. mode 1 - The function which is result of the switch command, in function group 6. 0xF shows function set error with the argument.	4
395:392	mode 0 - The function which can be switched in function group 5. mode 1 - The function which is result of the switch command, in function group 5. 0xF shows function set error with the argument.	4
391:388	mode 0 - The function which can be switched in function group 4. mode 1 - The function which is result of the switch command, in function group 4. 0xF shows function set error with the argument.	4
387:384	mode 0 - The function which can be switched in function group 3. mode 1 - The function which is result of the switch command, in function group 3. 0xF shows function set error with the argument.	4
383:380	mode 0 - The function which can be switched in function group 2. mode 1 - The function which is result of the switch command, in function group 2. 0xF shows function set error with the argument.	4

Bits	Description	Width
379:376	mode 0 - The function which can be switched in function group 1. mode 1 - The function which is result of the switch command, in function group 1. 0xF shows function set error with the argument.	4
375:368	Data Structure Version 00h – bits 511:376 are defined 01h – bits 511:272 are defined 02h-FFh – reserved	8
367:352	Reserved for Busy Status of functions in group 6. If bit [i] is set, function [i] is busy. This field can be read in mode 0 and mode 1	16
351:336	Reserved for Busy Status of functions in group 5. If bit [i] is set, function [i] is busy. This field can be read in mode 0 and mode 1	16
335:320	Reserved for Busy Status of functions in group 4. If bit [i] is set, function [i] is busy. This field can be read in mode 0 and mode 1	16
319:304	Reserved for Busy Status of functions in group 3. If bit [i] is set, function [i] is busy. This field can be read in mode 0 and mode 1	16
303:288	Busy Status of functions in group 2. If bit [i] is set, function [i] is busy. This field can be read in mode 0 and mode 1	16
287:272	Reserved for Busy Status of functions in group 1. If bit [i] is set, function [i] is busy. This field can be read in mode 0 and mode 1	16
271:0	Reserved (All '0')	272

功能忙状态指示

每一位[367-272]表示对应功能的忙状态:0 表示 ready，1 表示 busy。当状态为 busy 时，主机不应更改相应的功能。Switch 命令模式 1 只能应用于 ready 功能。

如果函数在模式 1 操作中切换失败，并且在响应中返回当前函数号，则认为该函数忙。模式 1 操作可能会影响函数的行为。模式 0 操作应该用于检查函数的忙状态，因为它不会影响其行为，特别是对于下面定义的功能组 2。

Function Group 2															
303	302	301	300	299	298	297	296	295	294	293	292	291	290	289	288
0	VS	0	0	0	0	0	0	0	0	0	ASSD	0	0	eC	0

Note: 0: Ready 1: Busy

Busy Status of 'Command System'

数据结构版本号

数据结构版本表示 Switch 功能状态的有效位字段。卡片可以设定 00h 或 01h。当该字段设置为 01 时，表示繁忙状态指示生效。

Data Structure Version	Fields of Status Data Structure
00h	511:376 are defined
01h	511:272 are defined
02h-FFh	Reserved

Data Structure Version

Switch 命令功能表

功能开关的可能组合如下面 3 个表所示。“参数”为交换机命令参数中指定的 4 位码(23-0 位)。“Busyl“状态”表示函数忙，如下所示。“状态码”表示状态数据结构中的 4 位码，位为 399 ~ 376。

Argument	Busy Status	Status Code	Comment
0	Don't Care	0	Status indicates a default function, which is always supported.
Supported function	Ready	=Arg.	Status indicates that the function specified in the argument is supported and can be switched.
	Busy	Current Selected	Status indicates that the function specified in the argument is supported but cannot be switched because the function is busy.
Not Supported function	Don't Care	Fh	Status indicates that the function specified in the argument is not supported.
Fh	Don't Care	Current Selected	Status indicates current selected function

Status Code of Mode 0 to Supported Function Group

Argument	Busy Status	Status Code	Comment
0	Don't Care	0	Default function can always be switched.
Supported function	Ready	=Arg.	Status indicates the same function number as specified in the argument, which means successful function change.
	Busy	Current Selected	Switch function is canceled and status indicates current selected function.
Not Supported function	Don't Care	Fh	If one of the function groups indicates an error code (Fh), switch requests to all switch functions are canceled and the rest of the data in the Status Data Structure should be ignored.
Fh	Don't Care	Current Selected	Status indicates current selected function

Status Code of Mode 1 to Supported Function Group

Argument	Busy Status	Status Code	Comment
0	Don't Care	0	Status always indicates 0.
Eh-1h	Don't Care	Fh	Status always indicates Fh.
Fh	Don't Care	0	Status always indicates 0.

Status Code of Mode 0 and 1 to Unsupported Function Group