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# Production State Awareness (PSA) for e.MMC Device

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**Associated Part : S40FC004xxx**

## 1 Introduction

This application note AN200007 provides information on the Production State Awareness (PSA) for SkyHigh e.MMC 4GB memory device. By enabling the PSA, the eMMC device could use special internal operation for loading data prior to device soldering that will reduce the possibility of data corruption in production mode. For SkyHigh S40FC004xxx device, PSA mode must be enabled using the vendor commands described in this document.

This document applies to the following SkyHigh device:

- S40FC004xxx e.MMC device

## 2.1 Enable/Disable PSA

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CMD60 (0x534D4900) → CMD60 (0x55550000) → CMD6 (0XXXXXXXX)

This vendor command allows Host to control the mechanism of PSA. The argument of CMD6 (0XXXXXXXX) determines whether PSA is enabled or not. When the argument is non-zero, PSA is enabled; otherwise, it is disabled. This setting is able to be checked by VCMD depicted in Section 2.3.

Value of CMD6 argument:

- 0x00: Disable PSA
- Others: Enable PSA

## 2.2 Set Preloading Size

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CMD60 (0x534D4900) → CMD60 (0x55550001) → CMD6 (0XXXXXXXX)

When PSA is enabled, preloading data size is set as half size of UDA in default. However, the Host is able to set preloading data size via vendor command. The argument of CMD6 indicates the data size that Host wants to configure. Three rules should be followed as depicted below; otherwise, device will return SWITCH ERROR for the last CMD6. This setting is able to be checked by VCMD depicted in Section 2.3 .

Argument of CMD6:

- Should be less than half size of UDA
- The argument will be automatically aligned to Write Protected Group Size.
- Preloading data size will be set as one Write Protected Group Size if input argument is zero.

## 2.3 Read SHM Configuration

CMD60 (0x534D4900) → CMD60 (0x5555000F) → CMD8 (0)

Host is able to check the status of PSA through this vendor command.

Structure:

- BYTE[16]:
  - 0x00: PSA is disabled.
  - 0x01: PSA is active, receiving data with SLC mode.
  - 0x10: PSA is disabled because timing speed is switched to HS200 or HS400.
  - 0x20: PSA is disabled because SLC write count exceeds the preloading size set by VCMD.
  - 0x30: PSA is disabled because GC is required (Even SLC write count is less than the preloading size).
- BYTE[35:32]: PSA preloading size set by VCMD
- BYTE[51:48]: Current SLC write count

Figure 15 shows the status of PSA :

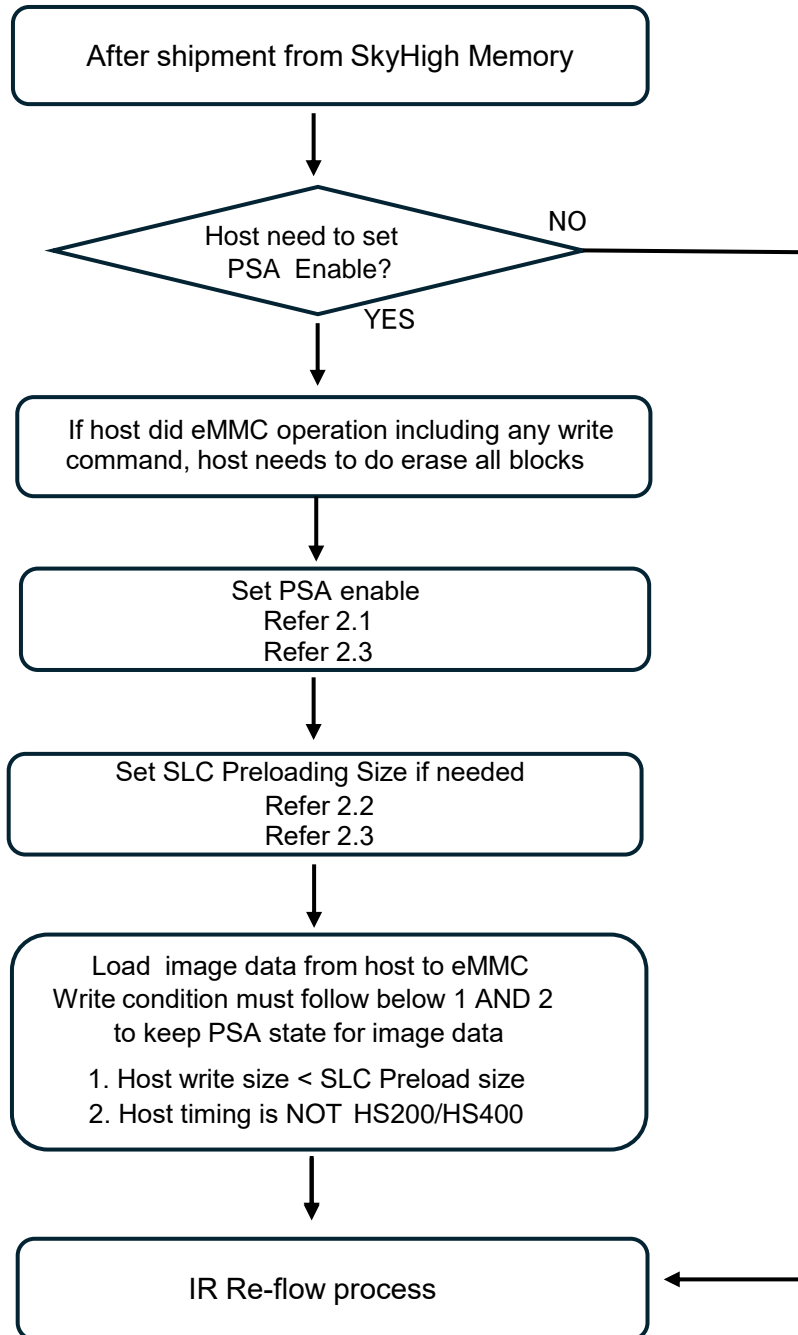
- PSA is disabled because SLC write count exceeds the preloading size set by VCMD.
- The setting of preloading size is 0x8000.
- Total SLC write count is 0x9000.

Figure 15: Status of PSA

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=====EXT_CSD TABLE=====
  [0][1][2][3][4][5][6][7][8][9][A][B][C][D][E][F]
=====
[ 0] 1  0  0  0  0  0  0  0  0  0  0  0  0  0  0
[ 10] 20  0  0  0  0  0  0  0  0  0  0  0  0  0  0
[ 20]  0 80  0  0  0  0  0  0  0  0  0  0  0  0  0
[ 30]  0 90  0  0  0  0  0  0  0  0  0  0  0  0  0
[ 40]  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
[ 50]  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
[ 60]  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
  
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2.4 SLC Program For IR-Reflow



### 3 Conclusion

The vendor commands described in this application note must be used to enable the the Production State Awareness (PSA) for SkyHigh 4GB eMMC device (S40FC004xxx),

## 4 Document History Page

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