

SmartFusion Design Migration Considerations

From A2F200_060 (Virtual 060) to A2F060 (Real 060)

Introduction

This application note covers aspects of the design implementation flow involving the SmartFusion A2F200_060 (Virtual 060) customizable system-on-chip (cSoC) device, with eventual target to the A2F060 (Real 060) device. Virtual 060 means supporting A2F060 designs via the A2F200 device until the real A2F060 die is available from Microsemi. A2F200_060 is offered to enable faster time-to-market for your products. Even though A2F060 is a complete superset of A2F200_060, there are a few considerations that must be taken into account for successful migration. Every A2F200_060 design must be regenerated, resynthesized, recompiled and rerun through place-and-route when targeting to A2F060. Taking these aspects into consideration while creating the design ADB file in A2F200_060 minimizes the number of changes and in some cases the variation in performance when the design is retargeted to A2F060.

Feature Difference between A2F200_060 and A2F060

As a result of the difference in device size of A2F200_060 and A2F200 (on which A2F200_060 is based), coupled with the features added or changed in A2F060 for the target market, there are a few feature differences between these two that affect design implementation.

The major differences are highlighted below. Suggested ways of handling these during design implementation are described in subsequent sections. [Table 1](#) summarizes the I/O differences.

- Analog pins have been reconfigured, resulting in reassignment of analog services that belong to the only available ADC.
- Additional direct ADC inputs (11 rather than 6)
- No quadrant global availability

Table 1 • I/O Differences between A2F200_060 and A2F060

Device	A2F200_060 (Virtual 060)		A2F060 (Real 060)	
	CS288	FG256	CS288	FG256
Direct analog inputs	6	6	11	11
Shared analog inputs	4	4	4	4
Total analog inputs	10	10	15	15
Total analog outputs	1	1	1	1
MSS I/Os	28	25	28	26
FPGA I/Os	68	66	68	66
Total I/Os	107	102	112	108

MSS Configurator Modifications

Customers must regenerate the MSS after changing from A2F200_060 to A2F060, using **Libero > Project > Settings > Device**, even if there are no changes in the configuration. If this is not done and the user goes directly to Designer to recompile, the tool will force the user to go back and regenerate the MSS. Part of the reason for this is to make sure that the system boot code is updated.

Error: CMP906: MSS was created using the die 'A2F200M3F_060'. You need to regenerate your MSS.

ACE Configurator Automatic Changes

For designs using analog, the default procedure is renamed from ADC1_MAIN to ADC0_MAIN. This takes place automatically but the tool informs the user through a message. Note that there is physically only one ADC on A2F060.

Error: 'Core Validation' : ACE: Procedure ADC1_MAIN was removed because it is assigned to an invalid ADC.

In addition, analog services and VAREF assignments will be reconfigured to match the mapping of pins on A2F060. These pins have been remapped on the A2F060 device compared with A2F200. [Table 2](#) lists the analog pins in the FG256 package. If the user application uses any of the pins that are shown in bold in [Table 2](#), the pins are automatically remapped to the corresponding new service in the A2F060 device. Similar remapping occurs for the CS288 package (not shown in this document) and is taken care of automatically by the tool.

Table 2 • Analog Pad Remapping Table for FG256

FG256 Pin Number	A2F200_060 (Virtual)	A2F060 (Real)
R3	NC	ADC0
T2	NC	ADC1
T3	NC	ADC2
R4	NC	ADC3
N6	NC	ADC4
T9	VAREF1	VAREF0
R9	ADC7	ADC10
P9	ADC6	ADC9
N9	ADC5	ADC8
M9	ADC4	ADC7
T10	ABPS6	ABPS0
R10	ABPS7	ABPS1
N10	CM3	CM0
P10	TM3	TM0
M11	TM2 (ADC)	ADC6
M12	CM2 (ADC)	ADC5

The tool informs the user of these changes with a series of messages, as shown below:

Error: 'Core Validation' : MSS ACE errors detected. Correct these errors using the ACE configurator.

Info: The connection is being dropped from the net 'ADC4' because the pin 'ADC4' does not exist.

Info: The connection is being dropped from the net 'ABPS6' because the pin 'ABPS6' does not exist.

Info: The connection is being dropped from the net 'TM3' because the pin 'TM3' does not exist.

Info: The connection is being dropped from the net 'CM3' because the pin 'CM3' does not exist.

Info: The connection is being dropped from the net 'VAREF1' because the pin 'VAREF1' does not exist.

Assigning Direct ADC Services

There are 5 additional direct ADC services in A2F060. TM2 and CM2 in A2F200_060 become direct ADC services, accounting for 2 of these 5. The remaining 3 come from no connect (NC) pins in A2F200_060. These have been listed in [Table 2 on page 2](#). If the user application requires these analog services, they can be assigned to ADC0_MAIN or a user-defined procedure as services.

Global Resource Usage

A2F060 has only two sets of globals, which are chip-wide globals. These are the middle right (GCXXX) and middle left (GFXXX). There are no quadrant globals in this device. The four sets of quadrant globals that are available in A2F200_060 (GAXXX, GBXXX, GDXXX, GEXXX) are regular non-global resources in A2F060.

Users should be aware that only two globals are available in A2F060 when assigning globals and floor planning in A2F200_060. However, if the ADB created in A2F200_060 uses quadrant globals, the user should demote these globals to regular non-global resources and make sure the synthesis tool does not infer more than two globals during synthesis.

Requirement to Rebuild Application Project

Users must rebuild their software application using the drivers and driver files generated under the `<Libero_Project_Dir>/firmware` folder, including *drivers* and *drivers_config*.

For designs that use analog, however, this is absolutely essential. Failing to rebuild the application would result in incorrect design behavior on the silicon.

List of Changes

The following table lists critical changes that were made in each revision of the document.

Revision*	Changes	Page
Revision 1 (August 2011)	Table 1 • I/O Differences between A2F200_060 and A2F060 and the "Assigning Direct ADC Services" section were revised to reflect that the number of direct ADC inputs for real A2F060 is 11 instead of 20 (SAR 33070).	1, 3
	Table 2 • Analog Pad Remapping Table for FG256 was replaced.	2
	The "Global Resource Usage" section was clarified by changing "two globals" to "two sets of globals" and "four quadrant globals" to "four sets of quadrant globals."	3

Note: *The revision number is located in the part number after the hyphen. The part number is displayed at the bottom of the last page of the document. The digits following the slash indicate the month and year of publication.



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