Android Display SW DDK Release Note

MPG

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Abstract

This document contains notes relating to the r1p0-05rel0 release of the Mali-DP Android SW DDK deliverables as supplied in the ARM deliverables bundle DP9060000-BU-00000-r1p0-05rel0.

Release Information

Proprietary Notice

Document Confidentiality Status

This document is Confidential. This document can only be distributed to ARM employees, and employees of companies that have signed a Non-Disclosure Agreement with ARM.

Product Quality Status

The following table describes the product quality for different supported HW.

Name	Revision	Expected quality
Mali-DP500	r1p1	EAC
Mali-DP550	r0p0-00rel0	EAC
Mali-DP550	r0p1-00rel0	EAC

Early Access Release status indicates that a deliverable has satisfactorily achieved all criteria for its promotion to a Mature Release status. It may be delivered in accordance with the contract and be expected to perform as described in the data-sheet or other specification. However, there remains some elements of uncertainty, solely for the reason that it cannot finally be validated until the deliverable has been successfully deployed by customers or partners. Accordingly, the recipient of a deliverable with Early Access-Release status, may be directly contributing to the final stage of approval of that deliverable.

ARM Web Address

The ARM website is located at the following address: http://www.arm.com

Feedback

ARM welcomes feedback on this product and its documentation.

Feedback on this product

If you have any comments or suggestions about this product, contact your supplier and give the following:

- The product name.
- The product revision or version.
- An explanation with as much information as you can provide. Include symptoms if appropriate.

Feedback on this document

If you have any comments on or about this document, please send email to errata@arm.com giving the following:

- The document title.
- The document number.
- The page number(s) to which your comments refer.
- A concise explanation of your comments.

General suggestion for additions and improvements are also welcome.

Support

Please contact support@arm.com regarding any issues with the installation and content of this release.

It should be noted that Support of the product will only be provided by ARM if such support is covered by a current contract with the recipient.

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1 PREFACE

This document contains general release information about the Mali-DP Android SW DDK r1p0-05rel0 deliverables and covers the following topics:

- Deliverables summary.
- Details of external tools required.
- Build instructions.
- Changes and fixes in this release.
- Known issues.
- Details of testing prior to release.

2 GLOSSARY

This document refers to the following terms and abbreviations:

Term	***Description***
Connect	connect.arm.com, ARM's web-based IP delivery mechanism
DDK	Driver Development Kit
SW	Software
AFBC	ARM Framebuffer Compression
FPGA	Field－Programmable Gate Array
GCC	GNU Compiler Collection

3 REFERENCES

Ref.	*Document Number*	*Author(s)*	*Title*
[1]	DP9060000-DC-10002	ARM Limited	Android Display SW DDK Integration Guide
[2]	DP9060000-DC-98000	ARM Limited	Android Display SW DDK Test Reports
[3]	DP9060000-DC-11001	ARM Limited	Android Display SW DDK Errata

4 PRODUCT DELIVERABLES

4.1 Parts

The deliverables are collectively delivered as a single UNIX compressed tar file which has been gzipped. The download filenames will be of the form:

`<download_name>.tgz`

where `<download_name>` is defined in the release notification.

The contents of this tar file consist of a number of categories of deliverables (as detailed in **Table 4-1**) bundled together to form the complete Mali-DP Android SW DDK package.

The parts are collectively held in the bundle DP9060000-BU-00000-r1p0-05rel0.

Deliverable Part Number	***Description***
DP9060000-SW-98001-r1p0-05rel0	Android Display SW DDK Source Code
DP9060000-DC-10002-r1p0-05rel0	Android Display SW DDK Integration Guide
DP9060000-DC-06002-r1p0-05rel0	Android Display SW DDK Release Note
DP9060000-SW-70013-r1p0-05rel0	Android Display SW DDK Validation Source Code
DP9060000-DC-98000-r1p0-05rel0	Android Display SW DDK Test Reports
DP9060000-SW-99002-r1p0-05rel0	GPLv2 Android Display Device Driver Source Code
DP9060000-DC-11001-r1p0-05rel0	Android Display SW DDK Errata

Table 4-1 Categories of Deliverables

4.2 Parts outside of the bundle

The following reference implementation parts are delivered outside of the bundle. Please contact ARM support for access to them:

4.2.1 Android Gralloc Module

TX041-SW-99005-r6p0-02rel0 Midgard Android Gralloc Module under Apache license. This may also be obtained from: http://malideveloper.arm.com/resources/drivers/open-source-mali-gpus-android-gralloc-module

5 DOCUMENTATION

5.1 Release Note

This document contains general release information about the Mali-DP Android SW DDK product.

5.2 Test Reports

These documents record the results obtained when running the integration tests on the deliverables.

5.3 Integration Manual

This document describes the process you must follow to integrate the deliverables into your Android platform.

6 REQUIRED TOOLS

Please refer to the *Integration Manual* **[1]***, Chapter 2*.

6.1 Toolchain

6.1.1 Toolchain for 32bit target platform

In order to build the Linux kernel and kernel drivers for the Mali-DP Android SW DDK for Android KitKat the following compiler toolchain should be used:

`arm-eabi-gcc (GCC) 4.7`	Obtained from the AOSP source tree under `prebuilts/gcc/linux-x86/arm/arm-eabi-4.7`

6.1.2 Toolchain for 64bit target platform

In order to build the Linux kernel and kernel drivers for the Mali-DP Android SW DDK for Android Lollipop the following compiler toolchain should be used:

`Aarch64-linux-gnu-gcc (GCC) 4.9`	Obtained from the Linaro https://wiki.linaro.org/WorkingGroups/ToolChain Linaro GCC 4.9

7 INSTALLATION

Please refer to the *Integration Manual* **[1]***, Chapter 2*.

8 BUILDING

Please refer to the *Integration Manual* **[1]***, Chapter 7*.

9 INTEGRATION

Please refer to the *Integration Manual* **[1]***, Chapters 3, 4, 5, 6*.

10 CHANGES IN FUNCTIONALITY FROM PREVIOUS RELEASES

10.1 Difference from previous release r0p0-01rel0

10.1.1 Bug fixes

- Fix clock handling incorrect issue
- Fix YV12 format support broken issue
- Memory corruption when memory write-out not in use

10.1.2 New Functionality

10.1.2.1 AArch64 support

This release adds support for 64-bit (AArch64) devices

10.1.2.2 Android 5.0 (Lollipop) support

This release adds support for version 5.0 of the Android Open Source Project

10.1.2.3 Mali-DP550 support

This release adds complete support for the Mali-DP550 product.

10.1.2.4 HDMI daughter board support

This release adds support for the ARM V2C-HDMI-0336A Daughterboard. The V2C-HDMI-0336A provides dual HDMI output connectors for use on the Juno development boards

10.1.2.5 Debug options for gamma conversion

This release adds three debug options for enable/disable input/output gamma conversion.

mali.hwc.gamma_output

Controls how the driver sets the gamma co-efficients for the gamma correction in the display output pipeline. This option only takes effect if it is set before the driver is initialized.

Property Value	Description
"off" (default)	The userspace driver will disable the gamma correction block
"panel"	Driver assumes all internal processing is 'linear' and calculates the coefficients based on a conversion from linear to the panel-defined gamma value

mali.hwc.disable_igamma

Controls whether the Display DDK forcibly disables the automatic inverse gamma correction performed on all YUV buffers

Property Value	Description
0	YUV buffers will have an inverse gamma correction operation performed on them before the composition stage of the display pipeline
1 (default)	YUV buffers will have all inverse gamma correction forcibly disabled

mali.hwc.force_srgb

Controls whether the Display DDK forces all RGB buffers to be treated as sRGB data

Property Value	Description
0 (default)	RGB buffers will be treated as linear data except where explicitly defined as an Android sRGB format.
1	All RGB buffers are treated as sRGB and converted to linear values before the composition stage of the display pipeline

11 TESTING

For details of how to build and run the integration tests provided with the deliverables, please refer to the *Integration Manual* **[1]***, Chapter 8*.

12 KNOWN ISSUES AND LIMITATIONS

The known issues for this release are described below. Any issues found subsequent to this release will be documented in new versions of the Android Display SW DDK Errata.

12.1 Known product issues

12.1.1 Kernel driver build failure

An upstream kernel bug can cause the kernel driver build to fail, with errors similar to the following:

```
drivers/video/adf/arm/malidp_iommu.c: In function 'malidp_iommu_fault_handler':

drivers/video/adf/arm/malidp_iommu.c:343:2: error: implicit declaration of function
'DEFINE_DYNAMIC_DEBUG_METADATA' [-Werror=implicit-function-declaration]

drivers/video/adf/arm/malidp_iommu.c:343:2: error: 'descriptor' undeclared (first use in this function)
drivers/video/adf/arm/malidp_iommu.c:343:2: note: each undeclared identifier is reported only once for each
function it appears in

drivers/video/adf/arm/malidp_iommu.c:343:2: error: implicit declaration of function '__dynamic_pr_debug' [-
Werror=implicit-function-declaration]

drivers/video/adf/arm/malidp_iommu.c:341:17: warning: unused variable 'dpdev' [-Wunused-variable]
```

A fix for this is available in the mainline kernel, merged in 3.12:
http://git.kernel.org/cgit/linux/kernel/git/torvalds/linux.git/commit/?id=8ef2d6511f7eba89ef5fe41cc83008ae63368aa2
This should be cherry-picked onto the kernel tree in order to fix this error.

12.1.2 Leaked ion buffer in integration test

An upstream bug in the ADF framework means that any buffers posted using the simple-post method are not correctly reference counted, and as a result don't get properly freed.

This bug does not affect the functionality of the Mali-DP Android SW DDK but will cause the *test_ion_buffer_simple_post* integration test to fail, reporting a leaked ion allocation. This leaked allocation will persist until the process ends, at which point it will be correctly freed by ion.

Please contact ARM support for a patch if you require this feature.