

DMA

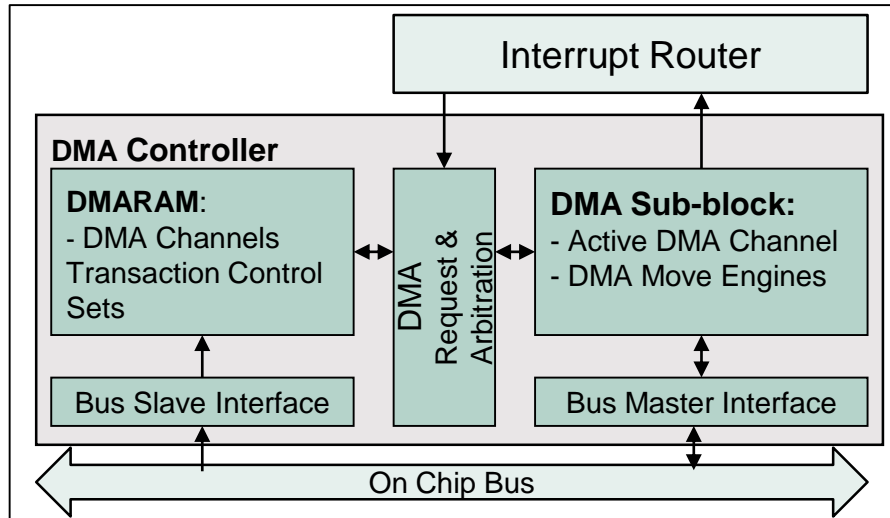
Direct Memory Access

AURIX™ Microcontroller Training
V1.0 2019-03



DMA

Direct Memory Access



Highlights

- > The DMA moves data from source locations to destination locations without the intervention of the CPU or other on chip devices.
- > Up to 128 individually programmable DMA channels

Key Features

Flexible DMA channels requests

DMA double buffering

DMA linked list

Customer Benefits

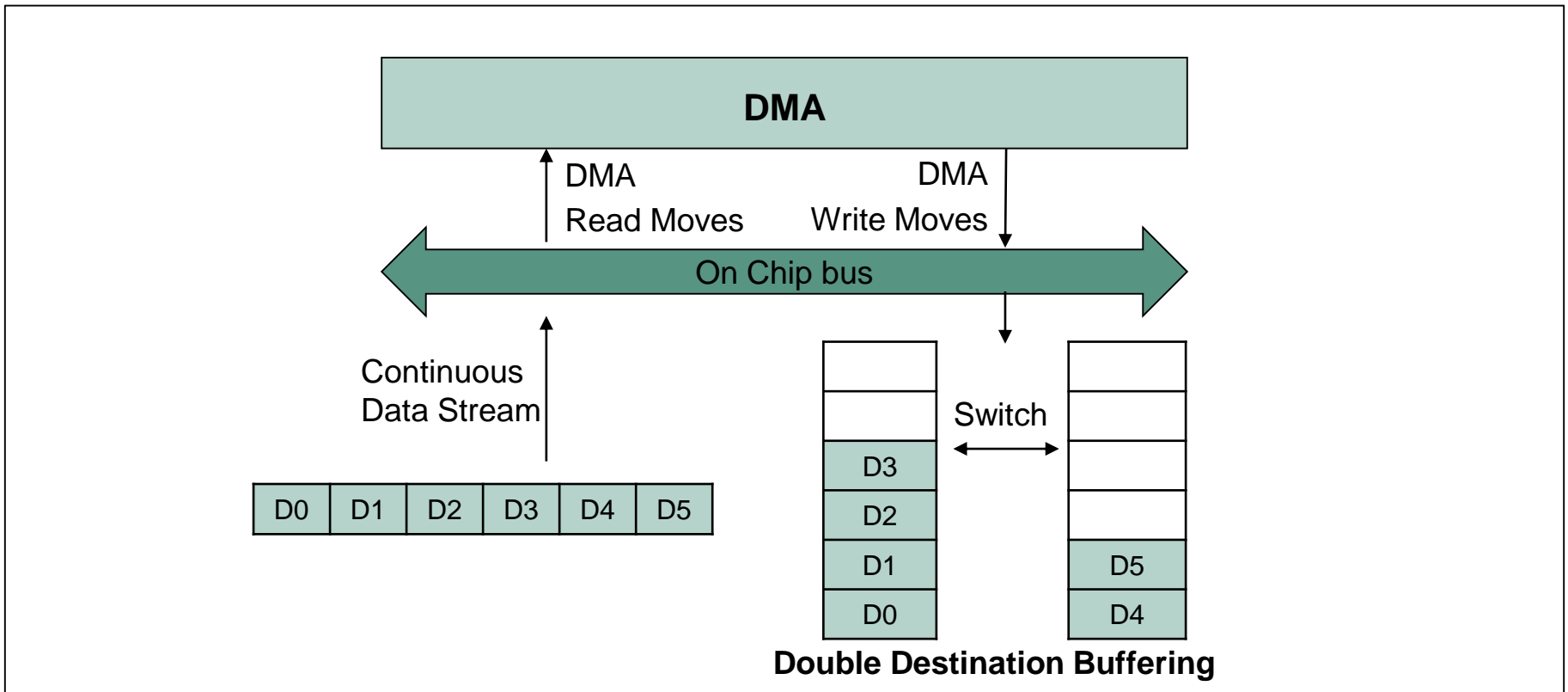
- > Possible configuration of the request type (SW, HW, Auto, ..) per DMA channel
- > Transfer continuous data stream to two destination buffers
- > Perform multi DMA transactions from non contiguous Memory regions

Flexible DMA channels requests

- › The DMA Channel supports the following types of requests:
 - **DMA Software Request:** initiated by CPU
 - **DMA Hardware Request:** Any peripheral that can trigger an interrupt can initiate a DMA transaction through the Interrupt Router
 - **DMA Daisy Chain Request:** DMA transaction initiated by the next higher priority DMA channel
 - **DMA Auto Start Request:** initiated by the loading of the next Transaction Control Set (TCS) during a DMA Linked List operation

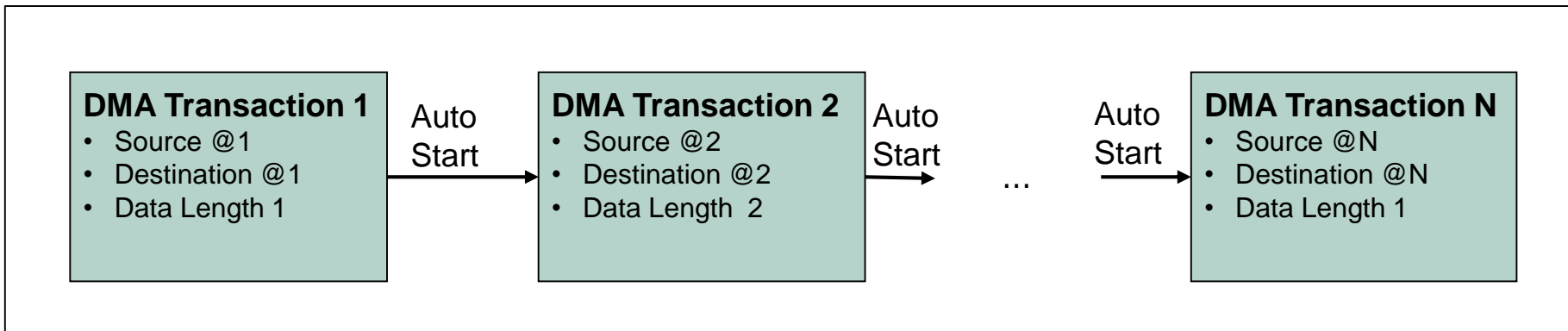
DMA double buffering

- › Double buffer could be selected for source or destination buffering
- › The application is able to freeze one of the destination buffers for cyclic software tasks while the other buffer continues to be filled



DMA linked list

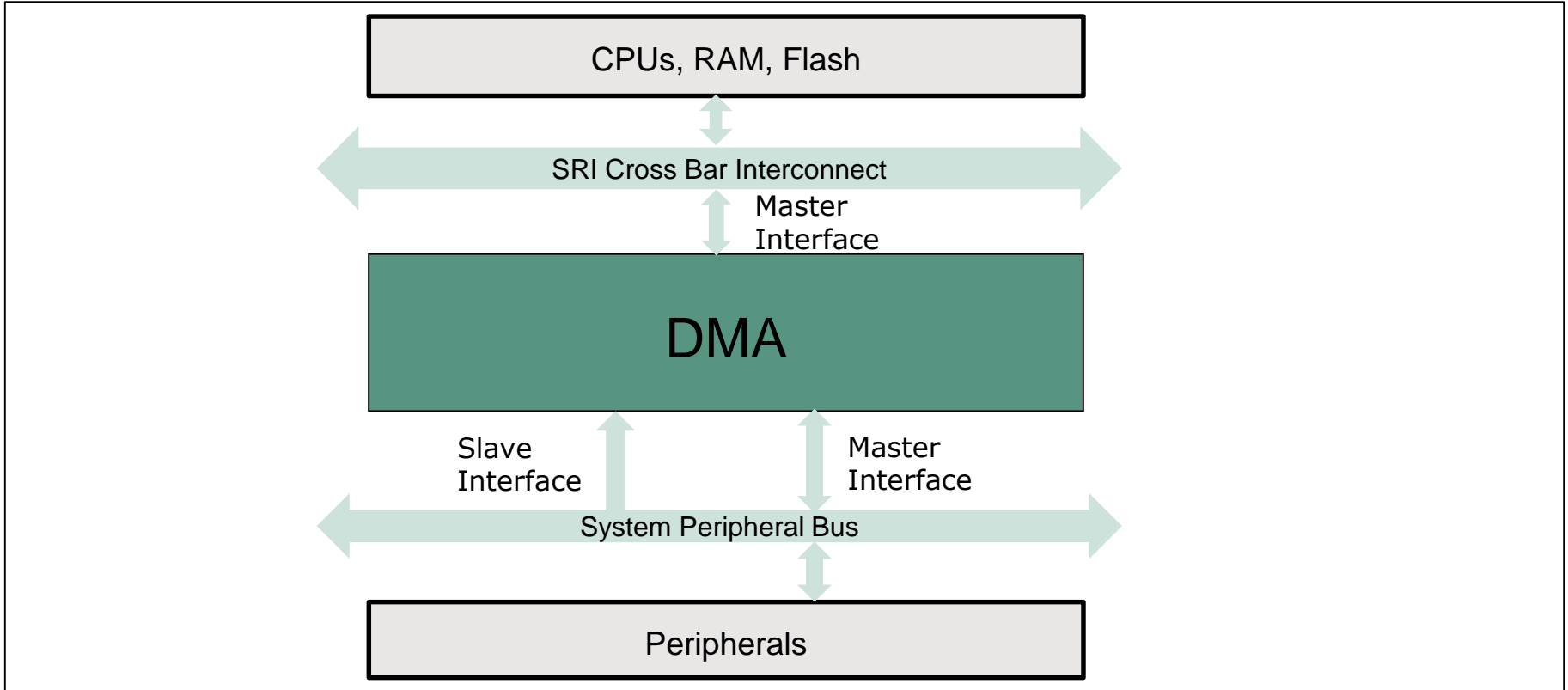
- › A linked list operation consists of a series of DMA transactions executed by **the same DMA channel**. Each DMA transaction has an unique configuration Set
- › If the Auto start request is selected, a DMA transaction will be triggered after the end of the previous one in the list → no HW or SW trigger is needed



- › DMA linked are useful when user wants to transfer data from/to non contiguous memory locations using **one** DMA channel and/or **one** service request

DMA

System integration

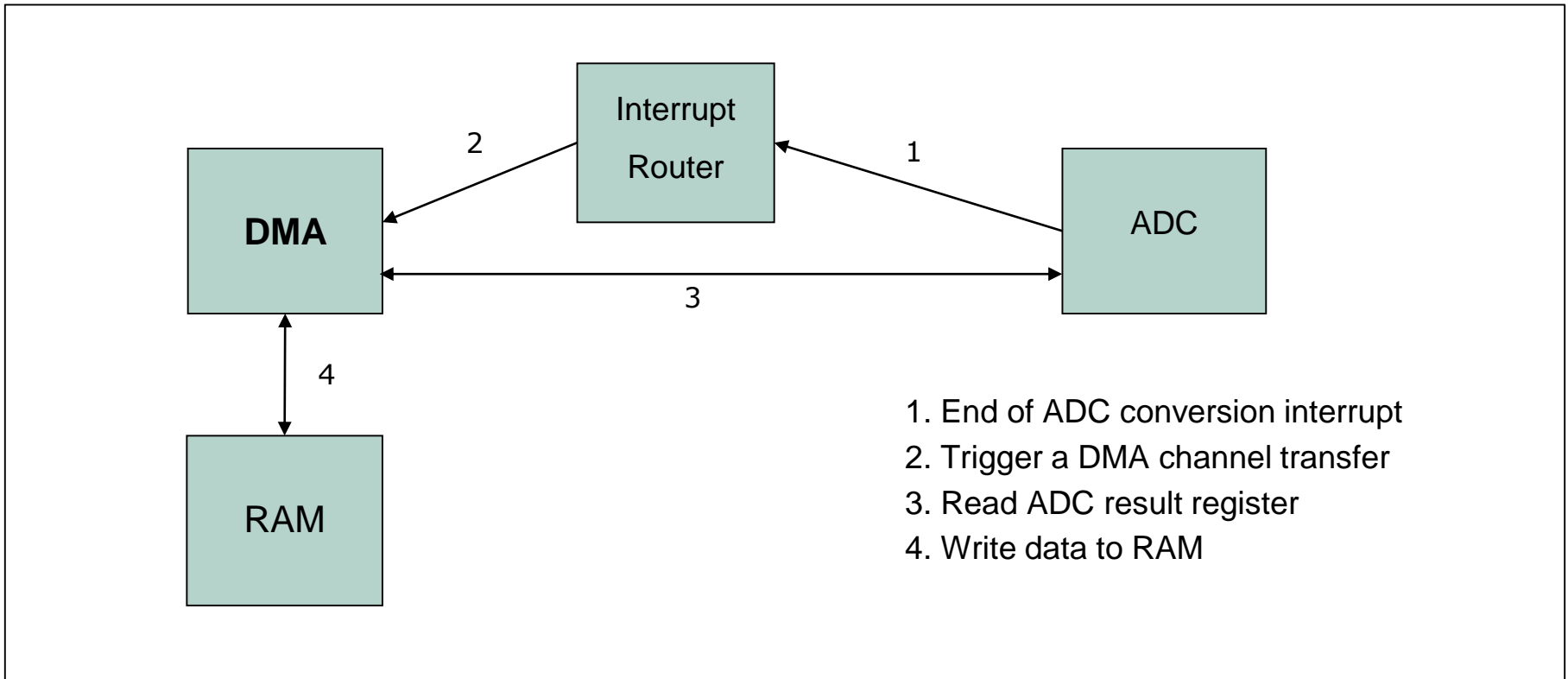


- › The DMA is connected to both SRI and SPB with master interfaces
- › This enables the DMA to read and write data from/to any module

Application example

DMA hardware requests

- › In this example, data is transferred from the ADC output registers to internal memory without any CPU intervention



Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

Edition 2019-03

Published by

**Infineon Technologies AG
81726 Munich, Germany**

**© 2019 Infineon Technologies AG.
All Rights Reserved.**

Do you have a question about this document?

Email: erratum@infineon.com

Document reference

AURIX_Training_1_

Direct_Memory_Access

IMPORTANT NOTICE

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics (“Beschaffenheitsgarantie”).

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer’s compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer’s products and any use of the product of Infineon Technologies in customer’s applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer’s technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office (www.infineon.com).

WARNINGS

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies’ products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.