MSPM0 DMA module introduction

—— MSPM0 peripheral training series

MCU level overview

——MSPM0Lxx series

MSPM0L13xx/110x

1.62 - 3.6V
-40 to 125 C

CPU
Arm Cortex-M0+
32 MHz
NVIC / 3-ch DMA

On-chip Memory
- 8, 16, 32 or 64 kB flash
- 2 or 4 kB SRAM

Data Integrity & Security
- CRC accelerator (16 and 32 bit)

Programming & Debug
- ARM SWD interface
- UART & I2C bootloader

Power & Clocking
- POR / BOR / SVS
- Internal LF 32kHz (3%)
- Internal HF 4-32MHz (1%)

Communication
- UART w/ LIN (1)
- UART (1)
- SPI (1)
- I2C (2) w/ FastMode+

IO
- Up to 28 GPIO
- Up to 2 low Ib OPA inputs

Analog
- 12-bit ADC 1.45Msps (10-ch)
- Comparator w/ 8-bit DAC
- Zero-drift chopper op-amps (2)
- General purpose amp
- Internal ADC reference (1.5%)
- Temperature sensor

Timers
- Low power 16-bit 2 CC (4)
- Windowed watchdog

Leaded packages: SOT-16, VSSOP-20/28
No-lead packages: WQFN-16, VQFN-24/32

32 MHz MCU with up to 64kB flash, 32 pins, 12-bit ADC, dual zero-drift OPA/PGA, COMP

——MSPM0Gxx series

MSPM0G350x/310x/150x/110x

1.62 - 3.6V
-40 to 125 C

CPU
Arm Cortex-M0+
80 MHz
NVIC / MPU / 7-ch DMA

Accelerators
- Math (DIV, SQRT, TRIG, MAC)

On-chip Memory
- 32, 64, or 128 kB flash [ECC]
- 16 or 32 kB SRAM [ECC]

Data Integrity & Security
- CRC accelerator (16 and 32 bit)
- AES256 accelerator + TRNG

Programming & Debug
- ARM SWD interface
- UART & I2C bootloader

Power & Clocking
- POR / BOR / SVS
- External LF 32kHz XTAL
- External HF 4-48MHz XTAL
- Internal LF 32kHz (3%)
- Internal HF 4-32MHz (1%)
- PLL (up to 80 MHz)

Communication
- UART w/ LIN (1)
- UART (3)
- SPI (2)
- I2C (2) w/ FastMode+
- CAN-FD (1)

IO
- Up to 60 GPIO

Precision Analog
- 12-bit ADC 4Msps (9-ch)
- 12-bit ADC 4Msps (8-ch)
- Comparators w/ 8-bit DACs (3)
- 12-bit 1Msps buffered DAC (1)
- Zero-drift chopper op-amps (2)
- Internal reference (1.5%)
- General purpose amp (1)
- Temperature sensor

Timers
- Advanced control 16-bit 4 CC (1)
- Advanced control 16-bit 2 CC (1)
- General purpose 32-bit 2 CC (1)
- General purpose 16-bit 2 CC (2)
- Low power 16-bit 2 CC (2)
- Windowed watchdog (2)
- Real-time clock (1)

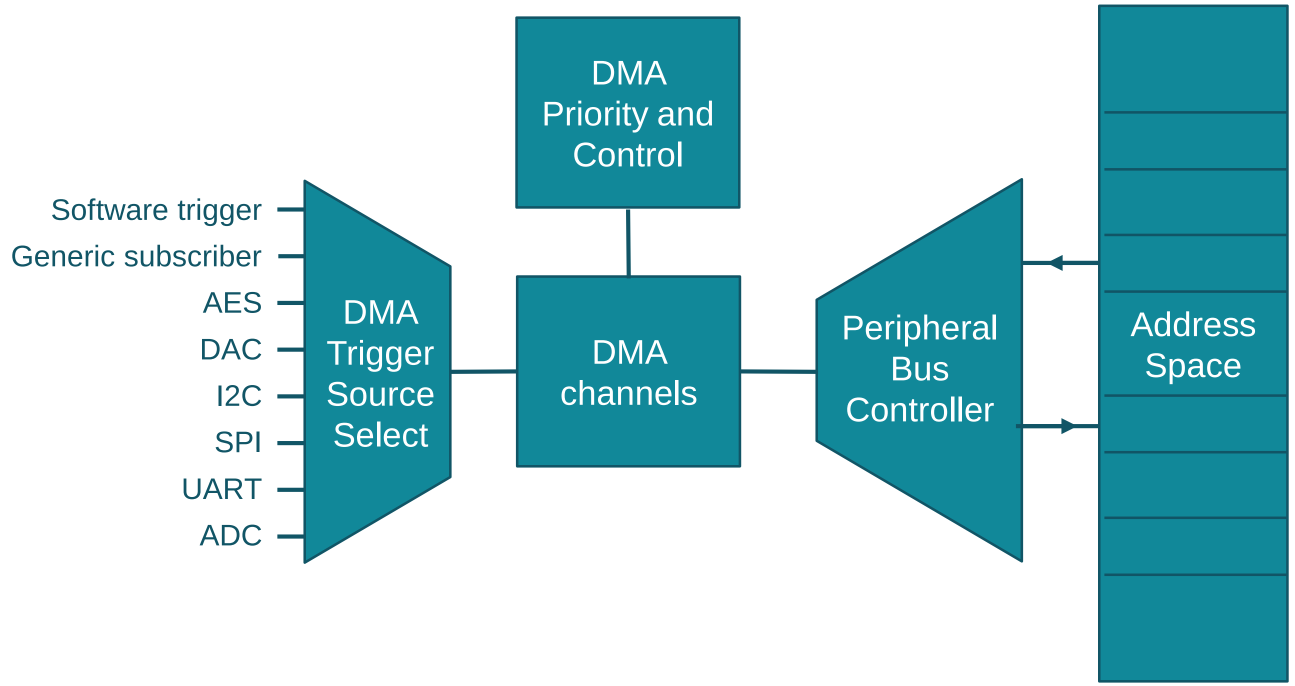
Leaded packages: VSSOP-20/28, LQFP-48/64
No-lead packages: VQFN-24/32/48, nFBGA-64, WCSP-28

80 MHz MCU with up to 128kB flash, 64 pins, advanced analog, AES/TRNG, CAN-FD

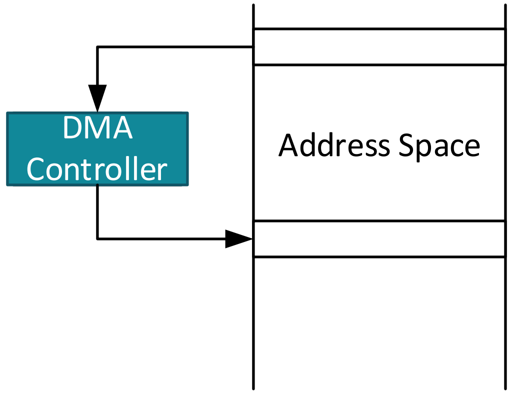
MSPM0 DMA module introduction

Key features

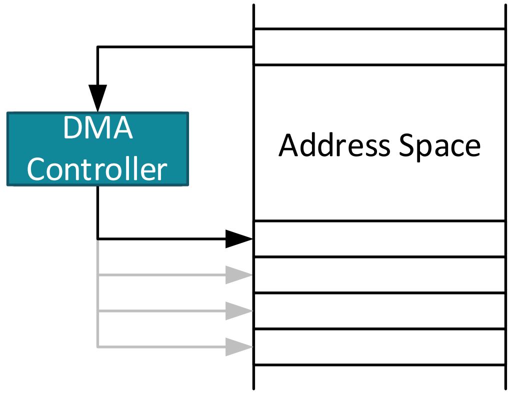
- Up to **sixteen** independent transfer channels
- MSPM0G350x MCUs have 7 DMA channels and MSPM0Lxx MCUs have 3 DMA channels
- Configurable DMA **channel priorities**
- Byte, short word, word and long word or mixed byte and word transfer capability
- Transfer counter block size supports up to **64k transfers of any data type**
- Configurable DMA transfer **trigger selection**
- **Six flexible addressing modes**
    1. Fixed address to fixed address
    2. Fixed address to block of addresser
    3. Block of addresser to fixed address
    4. Block of address to block of addresser
    5. Fill data to block of address
    6. Data table to specific address
- Single or block transfer modes
- Repeated transfer modes



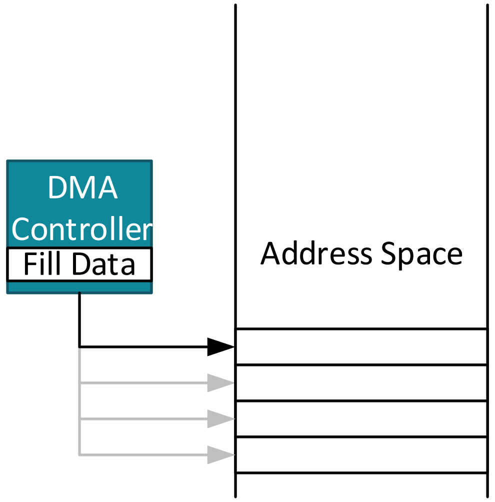
DMA addressing modes



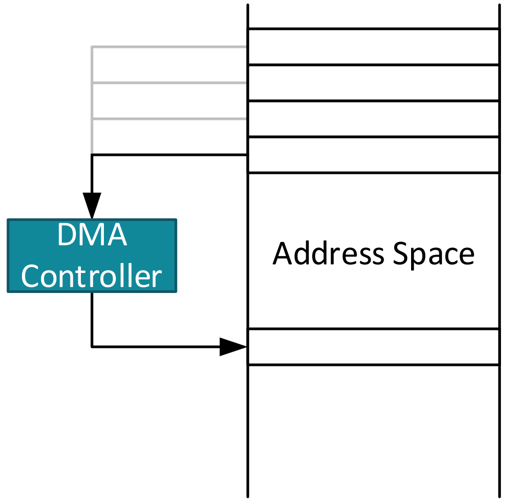
Fixed Address To Fixed Address



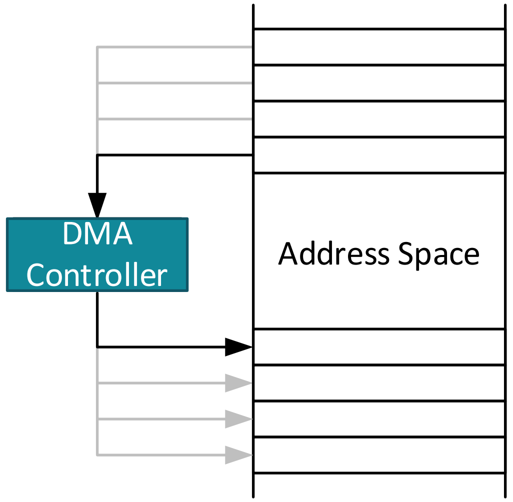
Fixed Addresses To Block Of Addresses



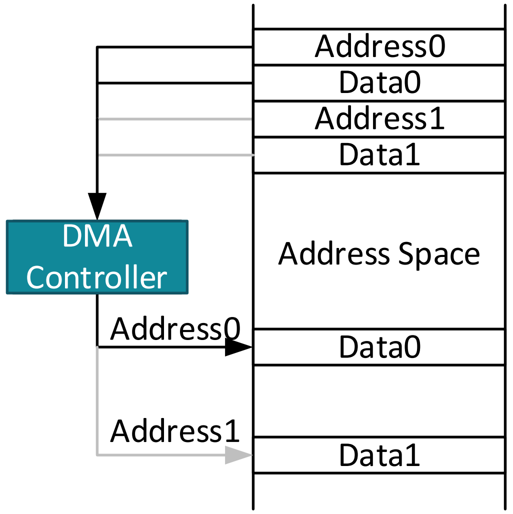
Fill Data To Block Of Addresses



Block Of Addresses To Fixed Address



Block Of Addresses To Block Of Addresses



Data Table To Specific Address

DMA module quick start

Academy

DMA introduction lab

Driverlib Examples

MSPM0G350x:

- dma_block_transfer
- dma_fill_data
- dma_table_transfer

MSPM0L13xx:

- dma_block_transfer
- dma_fill_data
- dma_table_transfer

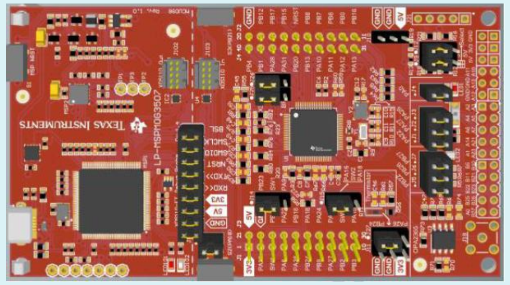
Related Links

MSPM0 online resource
MSPM0 quick start guide
MSPM0 Sysconfig user's guide

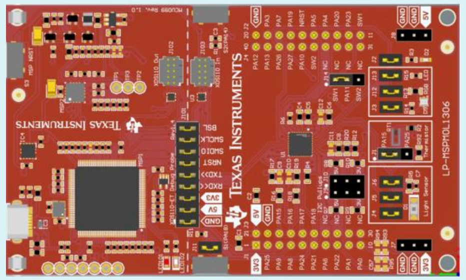
MSPM0G350x datasheet
MSPM0L13xx datasheet
MSPM0Gxx technical reference manual
MSPM0Lxx technical reference manual

Launchpad

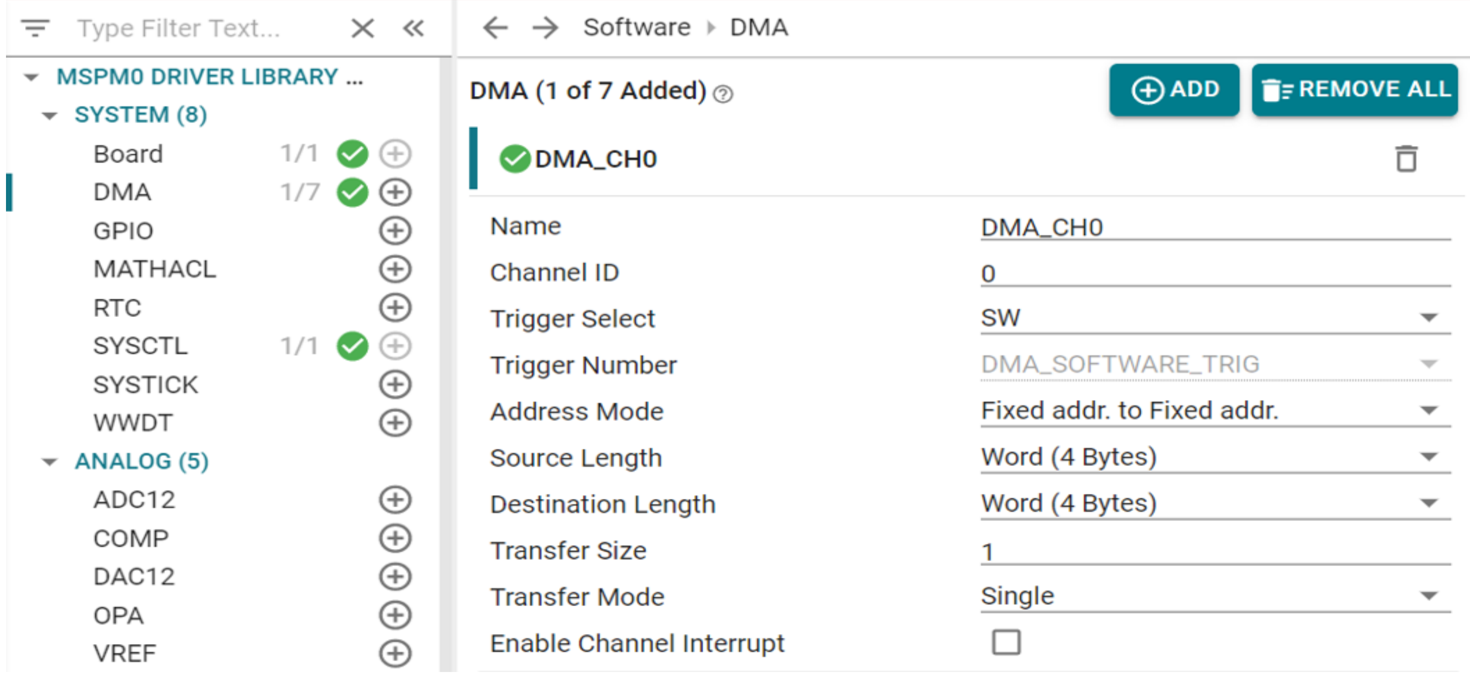
LP-MSPM0G3507



LP-MSPM0L1306



Sysconfig Entrance for DMA Setting



To learn more about MSPM0, please visit:

- MSPM0 MCUs
- MSPM0 SDK
- MSPM0 Academies