

致尊敬的顾客

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瑞萨电子公司

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## M16C/64 群

### DMAC 的操作（重复传送模式）

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#### 1. 要点

在重复传送模式中，可以选择如表 1 中所列的各种功能。在表 1 中用符号“○”表示本篇资料所选的项目。

#### 2. 说明

本篇资料，适用于 M16C/64 群单片机。

本篇资料中的参考例程也适用于 M16C 族产品中与 M16C/64 群具有相同 SFR（特殊功能寄存器）定义的产品。

由于 M16C 系列产品中有些功能会有所改进，请参看用户手册。如果使用本篇资料中所列功能时，请仔细检查每一步操作。

### 3. 选定功能

表 1. 选定功能

设定项目	设定内容
传送地址空间	从 1MB 空间的任意地址到固定地址
	○ 从固定地址到 1MB 的任意空间
	从固定地址到固定地址
传送单位	8 位
	○ 16 位

### 4. 操作

(1) 如果选择软件触发，将软件 DMA 请求位置“1”，就产生一次 DMA 请求。

(2) 如果允许 DMAC，当数据传输时开始，由 DMAi 正向地址指针所指向的地址的内容被传送到由 DMAi 目标指针所指向的地址处。如果 DMAC 允许后，就开始数据传输，DMAi 传送计数器内的值将被重新加载到 DMAi 重加载传送计数器内，同时 DMAi 源指针被重新加载到 DMAi 正向地址指针内。每产生一次 DMA 请求，就传送两个字节的数据。DAMI 传送计数器进行减计数，DMAi 的正向地址指针进行加计数。

(3) 即便 DMAi 传送计数器发生下溢，DMAi 传送允许位仍然为“1”。同时，DMA 中断请求位置“1”。

(4) DMA 传送计数器下溢后，如果发生下一次 DMA 请求，就从(1)重新开始 DMA 传送。

工作时序图如下所示：

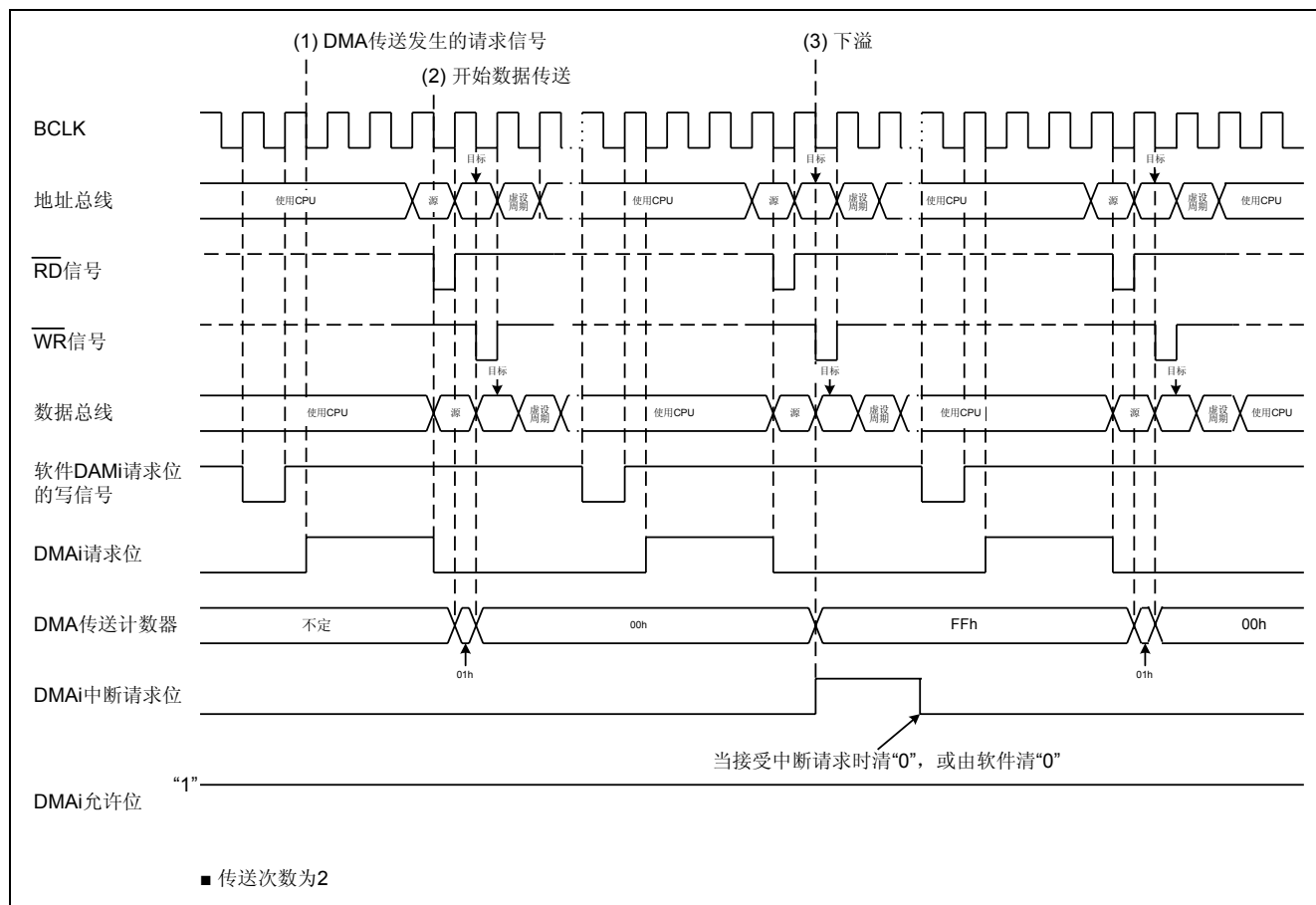
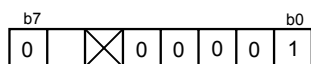


图 1. 单次传送模式时的工作时序图

## 5. 寄存器设置

为了能够实现定义在“4. 操作”的功能，下列寄存器必须按步骤顺序进行设置。对于每个寄存器的具体结构，请参考 M16C/64 群的硬件手册。

### 设定DMAi请求源选择寄存器



DMA0请求源选择寄存器 DM0SL 【地址 0398h】  
DMA1请求源选择寄存器 DM1SL 【地址 039Ah】  
DMA2请求源选择寄存器 DM2SL 【地址 0390h】  
DMA3请求源选择寄存器 DM3SL 【地址 0392h】

<DSEL4~DSEL0> DMA请求源选择位

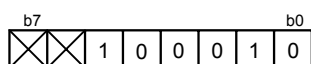
b4 b3 b2 b1 b0

0 0 0 0 1: 软件触发

<DSR> 软件DMA请求位

请设置为“0”

### 设定DMAi控制寄存器



DMA0控制寄存器 DM0CON 【地址 018Ch】  
DMA1控制寄存器 DM1CON 【地址 019Ch】  
DMA2控制寄存器 DM2CON 【地址 01ACh】  
DMA3控制寄存器 DM3CON 【地址 01BCh】

<DMBIT> 传送单位选择位

0: 16位

<DMASL> 重复传送模式选择位

1: 重复传送

<DMAS> DMA请求位

0: DMA无请求

<DMAE> DMA允许位

0: 禁止

<DSD> 传送源地址方向选择位

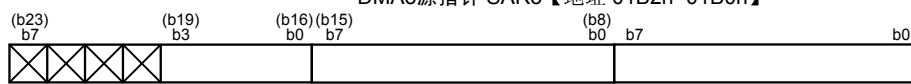
0: 固定 (bit4和bit5不能同时设置为“1”)

<DAD> 传送目标地址方向选择位

1: 正向 (bit4和bit5不能同时设置为“1”)

### 设定DMAi源指针

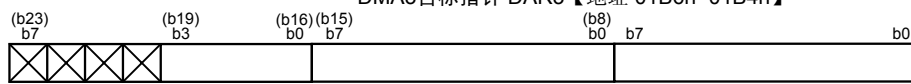
DMA0源指针 SAR0 【地址 0182h~0180h】  
DMA1源指针 SAR1 【地址 0192h~0190h】  
DMA2源指针 SAR2 【地址 01A2h~01A0h】  
DMA3源指针 SAR3 【地址 01B2h~01B0h】



源指针  
保存传送源地址

### 设定DMAi目标指针

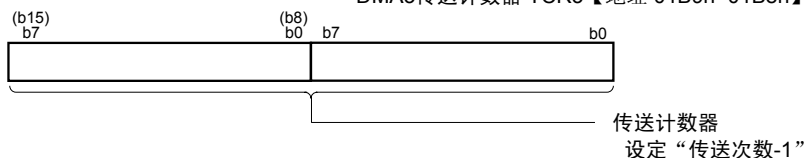
DMA0目标指针 DAR0 【地址 0186h~0184h】  
DMA1目标指针 DAR1 【地址 0196h~0194h】  
DMA2目标指针 DAR2 【地址 01A6h~01A4h】  
DMA3目标指针 DAR3 【地址 01B6h~01B4h】



目标指针  
保存传送目标地址

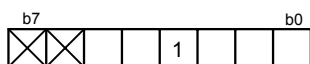
设定DMAi传送计数器

DMA0传送计数器 TCR0 【地址 0189h~0188h】  
 DMA1传送计数器 TCR1 【地址 0199h~0198h】  
 DMA2传送计数器 TCR2 【地址 01A9h~01A8h】  
 DMA3传送计数器 TCR3 【地址 01B9h~01B8h】



设定DMAi控制寄存器

DMA0控制寄存器 DM0CON 【地址 018Ch】  
 DMA1控制寄存器 DM1CON 【地址 019Ch】  
 DMA2控制寄存器 DM2CON 【地址 01ACh】  
 DMA3控制寄存器 DM3CON 【地址 01BCh】



注：请再次将DMA请求位同时清“0”

当软件DMA请求位=“1”

开始DAM传送

## 6. 参考文献

数据手册

M16C/64 群硬件手册

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		页	要点
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