

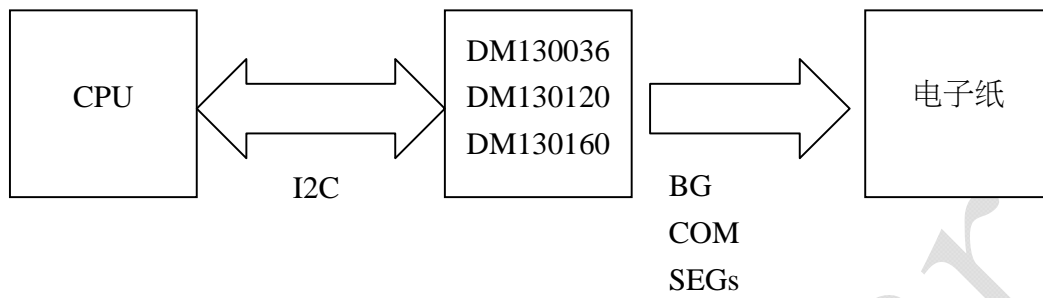


***EPD  
Application Notes***

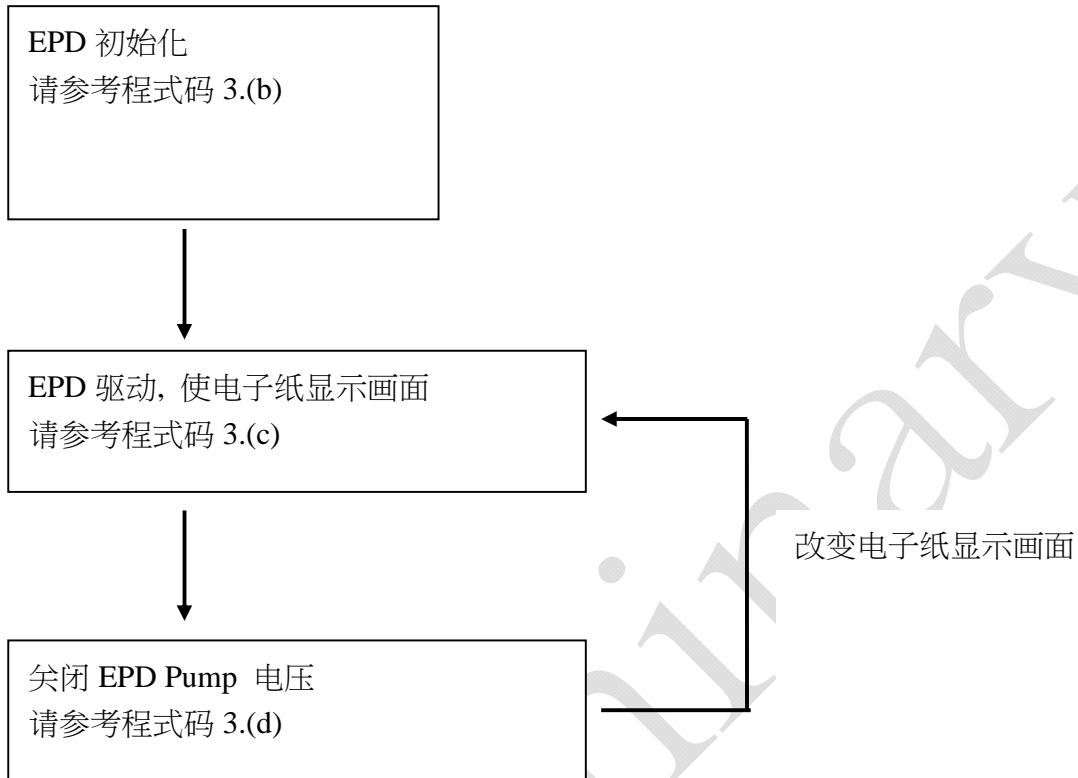
*Preliminary*

***Technical Reference Manual  
Davicom Semiconductor, Inc***

1. 此 application note 旨在说明如何控制 EPD (DM130036/DM130120/DM130160), 进而让电子纸成功的显示画面. 下图是典型的应用架构.



2. EPD 的设置流程:



## 3. 源码范例:

## (a) Global variables:

```
uint32_t ControlAddress = 0x05; //DM130036 的 register address 00H~05H 或是
//uint32_t ControlAddress = 0x10; //DM130120 的 register address 00H~10H
//uint32_t ControlAddress = 0x15; //DM130160 的 register address 00H~15H
uint32_t DeviceID = 0xF0; //I2C device id = 0xF0
void Write_I2C_Reg(uint32_t, uint32_t, uint32_t); //此函示叙述请看下行
//void Write_I2C_Reg(device id, address, data)
```

## (b) 初始化源码范例:

```
void EpaperOpen()
{
    uint32_t i = 0;

    //I2C, for DM130036, device id = 0xF0, register address = 00H~04H 或是
    //I2C, for DM130120, device id = 0xF0, register address = 00H~0FH
    //I2C, for DM130160, device id = 0xF0, register address = 00H~14H
    for (i = 0; i < ControlAddress; ++i) {
        Write_I2C_Reg(DeviceId, i, 0x00); //registers 所有输出为 LOW
    }

    //I2C, for DM130036, internal pumping, 设定 05H, 开启 PUMP (15V) 或是
    //I2C, for DM130120, internal pumping, 设定 10H, 开启 PUMP (15V)
    //I2C, for DM130160, internal pumping, 设定 15H, 开启 PUMP (15V)
    Write_I2C_Reg(DeviceId, ControlAddress, 0xA8);
    Write_I2C_Reg(DeviceId, ControlAddress, 0xA0);

    Delay(300ms);
}
```

(c) 电子纸显示画面源码范例:

DM130036/DM130120/DM130160 的 COM, BG, Segments 输出需参考电子纸规格.

```
void EpaperShow()
{
    uint32_t i = 0;
    uint32_t Data; //表示任意数值

    //I2C, Data 为 segments/COM/BG 输出, 须参考电子纸规格
    for (i = 0; i < ControlAddress ; ++i) {
        Write_I2C_Reg(DeviceId, i, Data);
    }
    //或是可针对 COM/BG 另行设定, 请参考 datasheet
    //DM130036, register 04H, bit 6~7 (Y39, Y40)為 COM, bit 4~5 (Y37, Y38)為 BG
    //DM130120, register 0FH, bit 0 (Y121)為 COM, bit 1 (Y122)為 BG
    //DM130160, register 14H, bit 0 (Y161)為 COM, bit 1 (Y162)為 BG
    //Write_I2C_Reg(DeviceId, ControlAddress - 1, Data);

    //I2C, for DM130036, internal pumping, 设定 05H, 开启 PUMP (15V) 或是
    //I2C, for DM130120, internal pumping, 设定 10H, 开启 PUMP (15V)
    //I2C, for DM130160, internal pumping, 设定 15H, 开启 PUMP (15V)
    Write_I2C_Reg(DeviceId, ControlAddress, 0xA8);
    Write_I2C_Reg(DeviceId, ControlAddress, 0xA0);

    Delay(300ms);
}
```

(d) 关闭模块源码范例:

```
void EpaperClose()
{
    uint32_t i = 0;

    //I2C, for DM130036, device id = 0xF0, register address = 00H~04H 或是
    //I2C, for DM130120, device id = 0xF0, register address = 00H~0FH
    //I2C, for DM130160, device id = 0xF0, register address = 00H~14H
    for (i = 0; i < ControlAddress; ++i) {
        Write_I2C_Reg(DeviceId, i, 0x00);           //registers 所有输出为 LOW
    }

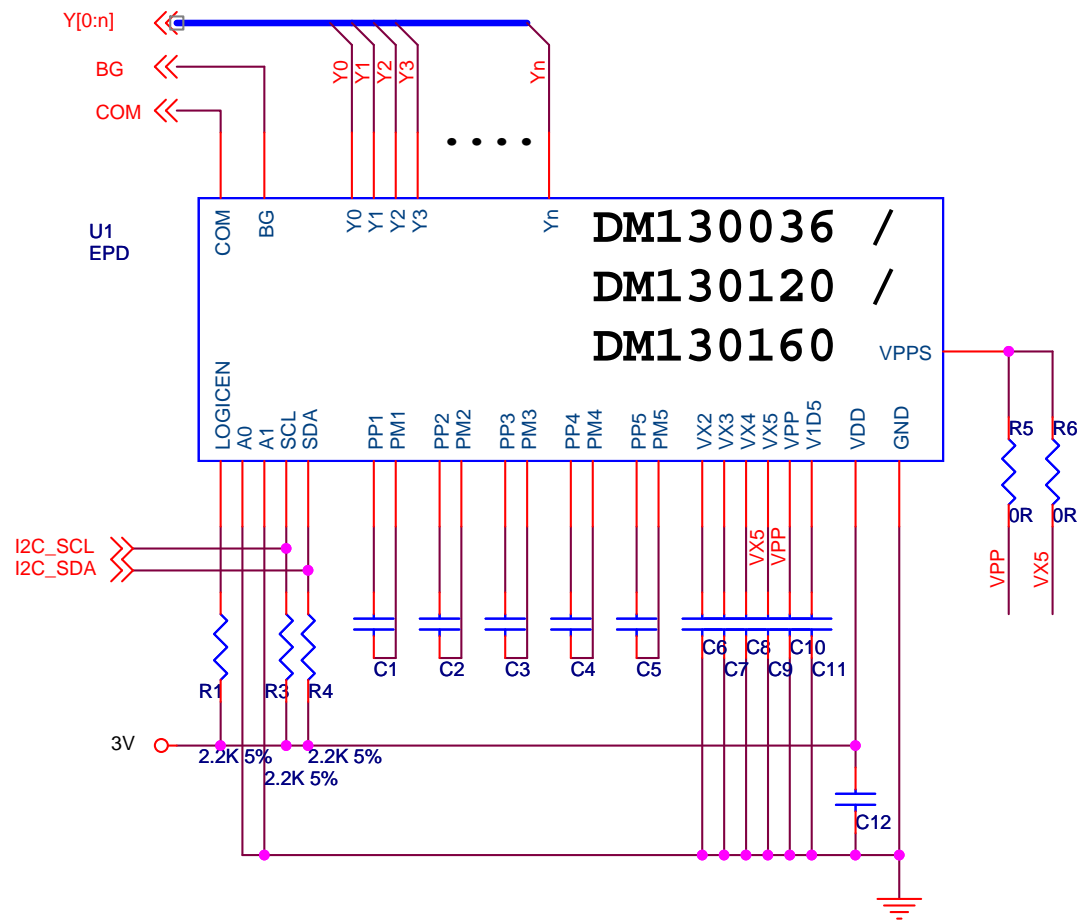
    //I2C, for DM130036, internal pumping, 设定 05H, 开启 PUMP (15V) 或是
    //I2C, for DM130120, internal pumping, 设定 10H, 开启 PUMP (15V)
    //I2C, for DM130160, internal pumping, 设定 15H, 开启 PUMP (15V)
    Write_I2C_Reg(DeviceId, ControlAddress, 0xA8);
    Write_I2C_Reg(DeviceId, ControlAddress, 0xA0);

    //I2C, for DM130036, internal pumping, 设定 05H, 关闭 PUMP
    //I2C, for DM130120, internal pumping, 设定 10H, 关闭 PUMP
    //I2C, for DM130160, internal pumping, 设定 15H, 关闭 PUMP
    Write_I2C_Reg(DeviceId, ControlAddress, 0x00);
}
```

4. 注意事项:

- (1) 电子纸每次显示画面后, 必须关闭EPD(DM130036/DM130120/DM130160) 的 PUMP 电压, 以避免烧坏电子纸, 等到下次改变画面时, 再重新执行第三页的流程.
- (2) 驱动 EPD 的 COM, BG, Segments, 须配合电子纸的规格, 才能正确地显示画面.
- (3) 参考原理图请见下页.

Preliminary



**Note:**

**1. 15V application:**

- C1 = 0.022uF/25V/X7R/0402
- C2 = 0.022uF/25V/X7R/0402
- C3 = 0.01uF/25V/X7R/0402
- C4 = 0.01uF/25V/X7R/0402
- C5 = 0.01uF/25V/X7R/0402
- C6 = 0.022uF/25V/X7R/0402
- C7 = 0.022uF/25V/X7R/0402
- C8 = 0.01uF/25V/X7R/0402
- C9 = 0.01uF/25V/X7R/0402
- C10 = 0.01uF/25V/X7R/0402
- C11 = 0.022uF/10V/X7R/0402
- C12 = 0.1uF/10V/X7R/0402

**2. DM130036 HAS NO LOGICEN**

**3. ONLY DM130160 HAS VPPS**

- FOR 15V,
- R6 = 0 ohm, R5 = DO NOT USE
- FOR 30V,
- R6 = DO NOT USE, R5 = 0 ohm

Title		
EPD REFERENCE CIRCUIT		
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