Specification document of MAX6605MXK

Component manufacturer	Maxim Integrated		
Model number	MAX6605MXK		
Datasheets	MAX6605 DS (maximintegrated.com)		
Specification Ver	01.00.00	Oct 04,2022	New release
Documentation provided	Rui Long Lab Inc. https://rui-long-lab.com/		

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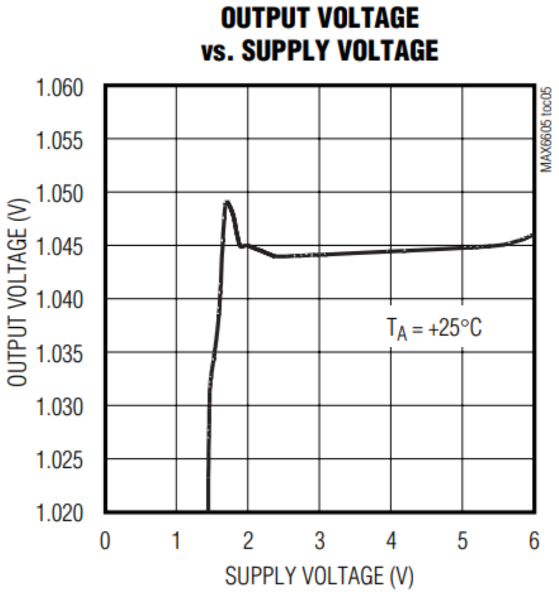
1. Component datasheet

Temperature accuracy	±0.75° C (25° C)
Temperature range	-55 to +125° C
Range of power supply voltage (Vdd)	2.7 to 5.5[V]
Output voltage (Vout)	Linear 11.9×Vdd/3.3 [mV/° C] Typ. Vdd = 3.3 [V] 0 [° C] 0.744[V] Typ.

Calculation	Vout = 0.744V + (0.0119 V/° C × Ta)
	Ta = (Vout – 0.744V) / 0.0119 V/° C

More accurate temperature calculation

Vout = 0.744V + (0.0119 V/° C × Ta) + (1.604 ×10^{-6} × Ta^2)



Applications

IoT etc

- Cellular Phones
- Battery Packs
- GPS Equipment
- Digital Cameras

2. Component Software IF specification

The software interface specifications based on the MAX6605MXK component specifications are as follows.

The voltage value-to-physical value conversion equation is a linear conversion equation as shown in the equation below.

ADC value to voltage value conversion formula

$$vi = (ai \times iADC\_vdd) / 2^{iADC\_bit} \quad [V]$$

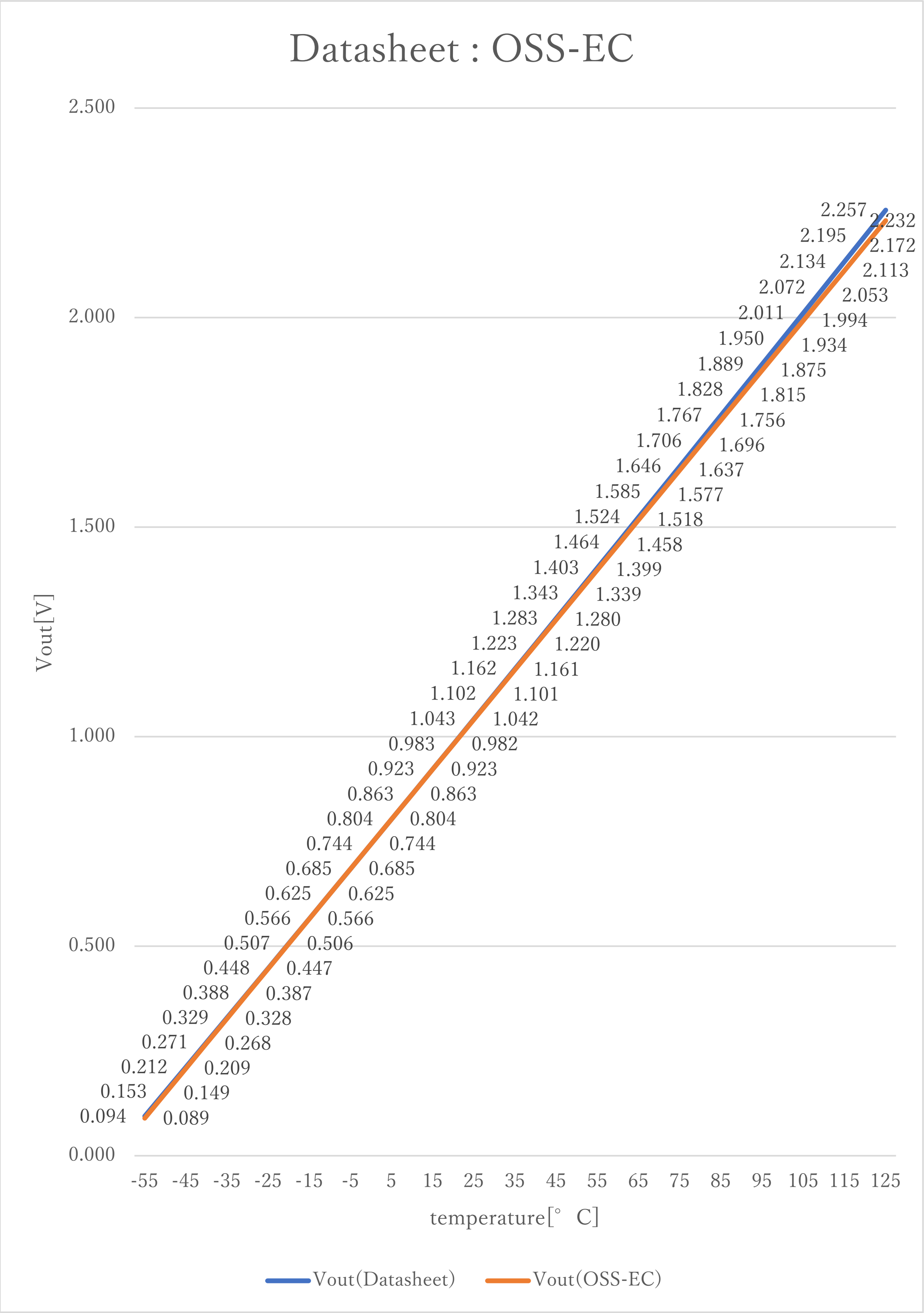
Voltage value to physical value conversion formula

$$y = (vi - iMAX6605MXK\_xoff) / iMAX6605MXK\_gain + iMAX6605MXK\_yoff \quad [℃]$$

$$iMAX6605MXK\_min \leqq y \leqq iMAX6605MXK\_max$$

ai	A/D conversion value
vi	Sensor output voltage value [V]
iADC_vdd	Sensor supply voltage value [V]
iADC_bit	A/D conversion bit length
y	Temperature value [℃]

```
#define iMAX6605MXK_xoff 0.744F                  // X offset [V]
#define iMAX6605MXK_yoff 0.0F                    // Y offset [℃]
#define iMAX6605MXK_gain 0.0119F                 // Gain [V/℃]
#define iMAX6605MXK_max  125.0F                  // Temperature Max [℃]
#define iMAX6605MXK_min  -55.0F                  // Temperature Min [℃]
```



$$\mathrm{Vout(Datasheet)} = 0.744\mathrm{V} + (\ 0.0119\ \mathrm{V}/°\ \mathrm{C} \times \mathrm{Ta}\ ) + (1.604 \times 10^{-6} \times \mathrm{Ta}^{2})$$

3. File Structure and Definitions

MAX6605MXK.h

```
#include "user_define.h"

// Components number
#define iMAX6605MXK         110U                        // Maxim Integrated MAX6605MXK

// MAX6605MXK System Parts definitions
#define iMAX6605MXK_xoff    0.744F                      // X offset [V]
#define iMAX6605MXK_yoff    0.0F                        // Y offset [℃]
#define iMAX6605MXK_gain    0.0119F                     // Gain [V/℃]
#define iMAX6605MXK_max     125.0F                      // Temperature Max [℃]
#define iMAX6605MXK_min     -55.0F                      // Temperature Min [℃]

extern const tbl_adc_t tbl_MAX6605MXK;
```

MAX6605MXK.cpp

```
#include        "MAX6605MXK.h"
#if     iMAX6605MXK_ma == iSMA                         // Simple moving average filter
static float32 MAX6605MXK_sma_buf[iMAX6605MXK_SMA_num];
static const sma_f32_t MAX6605MXK_Phy_SMA =
{
        iInitial ,                                     // Initial state
        iMAX6605MXK_SMA_num ,                         // Simple moving average number & buf size
        0U ,                                           // buffer position
        0.0F ,                                         // sum
        &MAX6605MXK_sma_buf[0]                         // buffer
};
#elif   iMAX6605MXK_ma == iEMA                         // Exponential moving average filter
static const ema_f32_t MAX6605MXK_Phy_EMA =
{
        iInitial ,                                     // Initial state
        0.0F ,                                         // Xn-1
        iMAX6605MXK_EMA_K                              // Exponential smoothing factor
};
#elif   iMAX6605MXK_ma == iWMA                         // Weighted moving average filter
static float32 MAX6605MXK_wma_buf[iMAX6605MXK_WMA_num];
static const wma_f32_t MAX6605MXK_Phy_WMA =
{
        iInitial ,                                     // Initial state
        iMAX6605MXK_WMA_num ,                        // Weighted moving average number & buf size
        0U ,                                           // buffer poition
        iMAX6605MXK_WMA_num * (iMAX6605MXK_WMA_num + 1)/2 ,  // kn sum
        &MAX6605MXK_wma_buf[0]                         // Xn buffer
};
#else                                                  // Non-moving average filter
#endif

#define iDummy_adr      0xffffffff                     // Dummy address

const tbl_adc_t tbl_MAX6605MXK =
{
        iMAX6605MXK                ,
        iMAX6605MXK_pin            ,
        iMAX6605MXK_xoff           ,
        iMAX6605MXK_yoff           ,
        iMAX6605MXK_gain           ,
        iMAX6605MXK_max            ,
        iMAX6605MXK_min            ,
        iMAX6605MXK_ma             ,

#if     iMAX6605MXK_ma == iSMA                          // Simple moving average filter
        &MAX6605MXK_Phy_SMA        ,
        (ema_f32_t*)iDummy_adr   ,
        (wma_f32_t*)iDummy_adr
#elif   iMAX6605MXK_ma == iEMA                          // Exponential moving average filter
        (sma_f32_t*)iDummy_adr   ,
        &MAX6605MXK_Phy_EMA        ,
        (wma_f32_t*)iDummy_adr
#elif   iMAX6605MXK_ma == iWMA                          // Weighted moving average filter
        (sma_f32_t*)iDummy_adr   ,
        (ema_f32_t*)iDummy_adr   ,
        &MAX6605MXK_Phy_WMA
#else                                                 // Non-moving average filter
        (sma_f32_t*)iDummy_adr   ,
        (ema_f32_t*)iDummy_adr   ,
        (wma_f32_t*)iDummy_adr
#endif

};
```