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
	01.00.01	Oct 18,2022	Corrected license content
Documentation provided	Rui Long Lab Inc. https://rui-long-lab.com/		

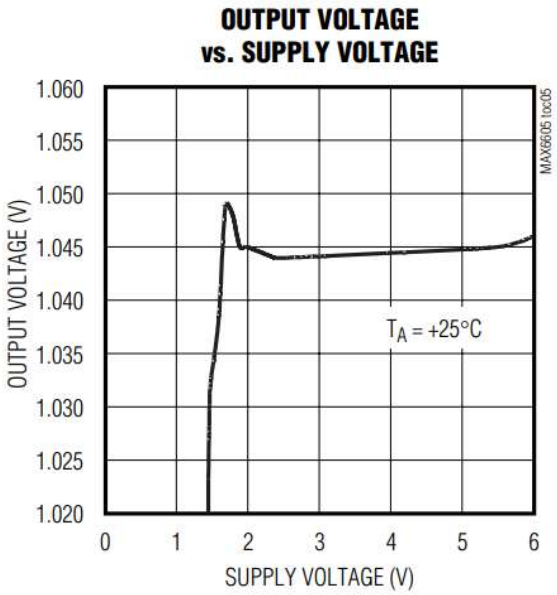
1. Component datasheet 2
2. Component Software IF specification 3
3. File Structure and Definitions 5

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

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



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

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

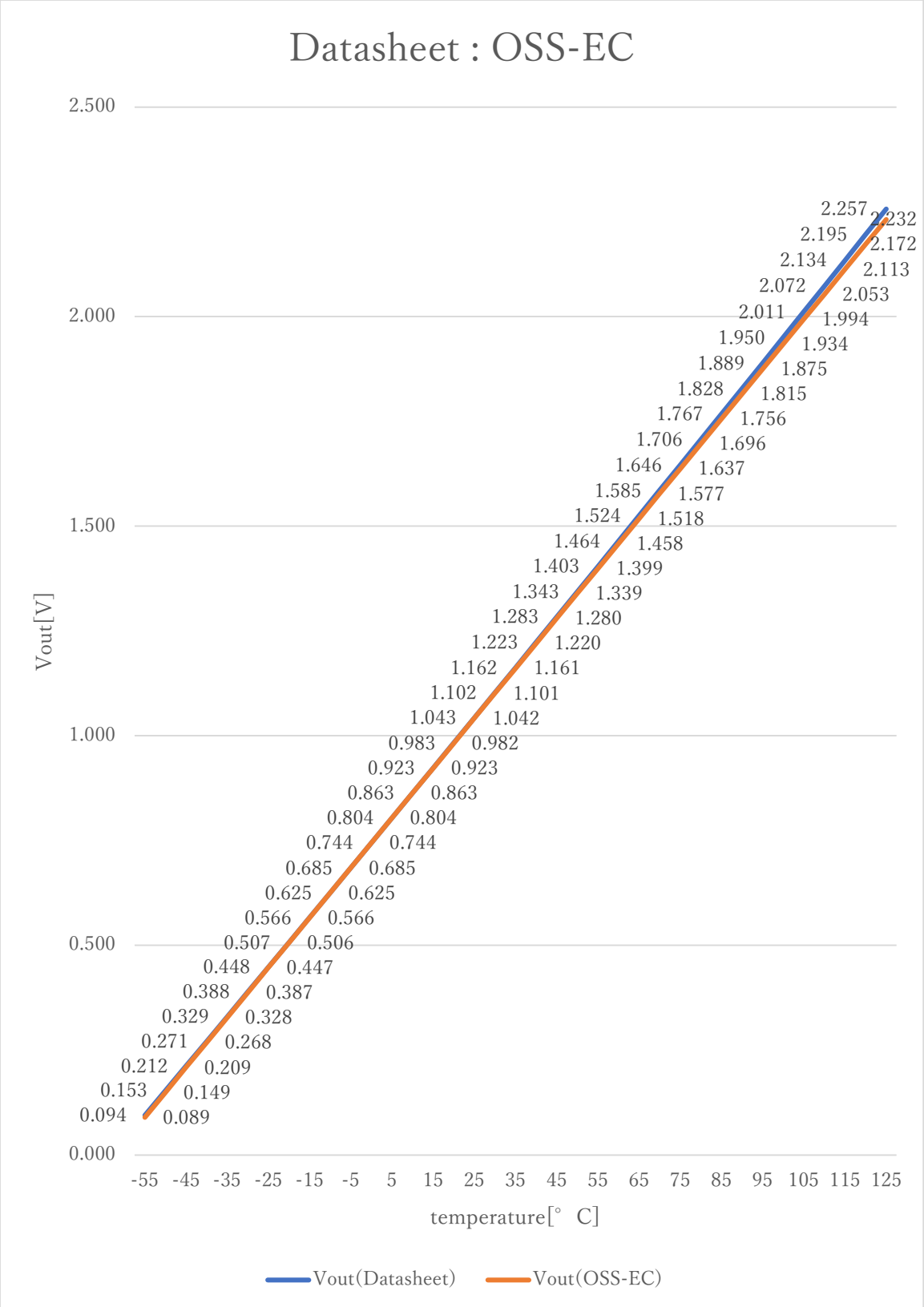
Voltage value to physical value conversion formula

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

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

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 [℃]
```



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

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

};
```