



ME5066 Barcode Image Engine User Manual



Version: ME5066_UM_EN_V1.0.7

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Notice

- 1) Reserve sufficient space for the scan engine to reduce heat dissipation.
- 2) ESD protection: The scan engine is packed with an ESD bag. Be careful when unpacking the scan engine and ensure that the working area is well grounded. It is recommended to wear an electrostatic ring to operate the engine.
- 3) Dust protection: The scan engine must be sealed enough around the engine to prevent fine dust particles from entering the engine and lens. Fine dust particles and other external contaminants can degrade engine scanning performance.
- 4) The wavelength range of the illumination LED and the aiming LED is safe, but the light beam should be avoided directly to the human eye during use.
- 5) Please read this manual carefully before using the engine.
- 6) Please keep this manual properly for future reference.
- 7) The contents of this manual are subject to change without prior notice.



Warning

Do not use the engine in a high-temperature environment

This may lead to engine heating, resulting in increased image noise, reduced image quality, and affected scanning performance.



Warning

Do not turn on the engine lighting for a long time, and the ambient temperature should not exceed the maximum operating temperature of the engine.

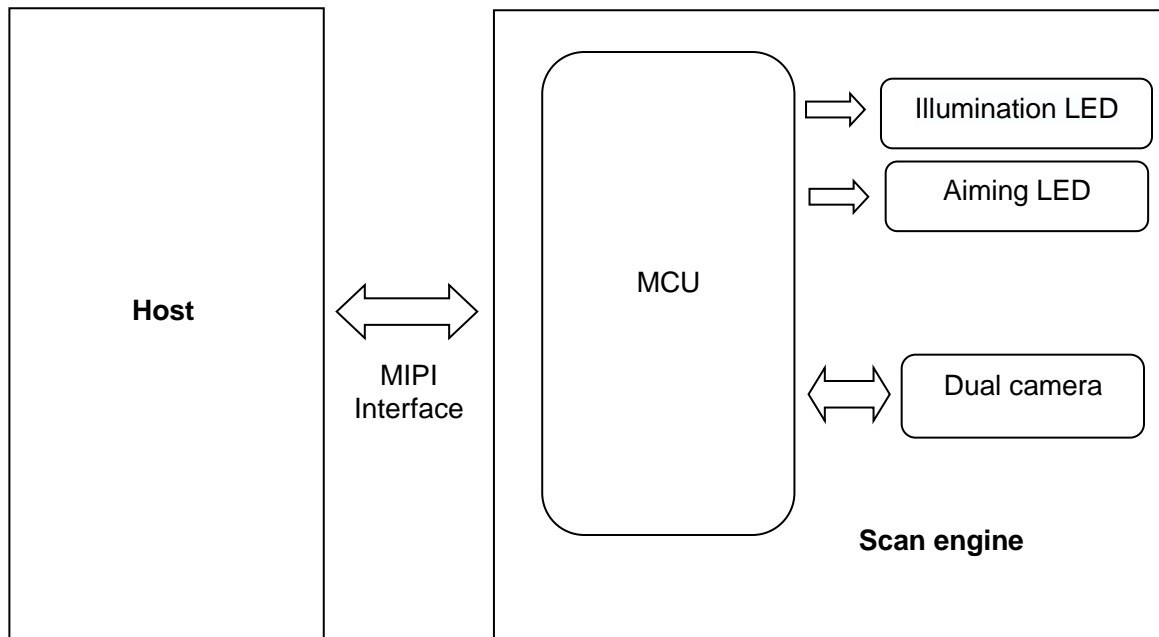
Otherwise, the scan performance of the engine may be reduced, the service life of the engine may be shortened, and the engine may be permanently damaged.

1 Introduction and Parameters

1-1 Product introduction

The ME5066 is an ultra-thin soft decoding scan engine that can read 1D and 2D barcodes and can be integrated into mobile devices, PDA, tablets or other OEM devices.

To facilitate integration, we also provide Mindeo Software Decoder SDK, which users can develop and use according to the API interface.



1-2 Technical specifications

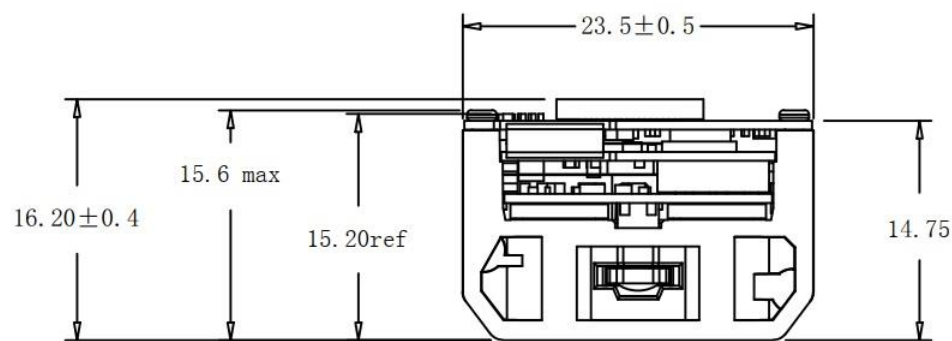
Dimensions	H × W × D: 6.8 mm × 23.5 mm × 16.2 mm	
Weight	3.5 g	
Interface	MIPI	
Scan Mode	Command, Level	
Cable	34 Pin FPC	
Input Voltage	3.3 ± 5% VDC	
Current	VIN_3V3_IMGR (Average) Scanning: 84mA Standby: 27mA VIN_3V3_LED (Average) Scanning: 388mA Standby: 353μA	
Illumination LED	White LED	
Aiming LED	Green LED, wavelength: 525 nm	
Image Size	1280×1024 pixels	
Field of View	Sensor 1: Horizontal: 48° , vertical: 41° Sensor 2: Horizontal: 26° , vertical: 22°	
Scanning Angle	±70° , ±75° , 360° (Skew, Pitch, Roll)	
Print Contrast	20% minimum reflectance difference	
Minimum Resolution	1D (Code 39): 3 mil	
Decoding Capability	1D: UPC-A, UPC-E, UPC-E1, EAN-13, EAN-8, ISBN (Bookland EAN), ISSN, Code 39, Code 39 full ASCII, Code 32, Trioptic Code 39, Interleaved 2 of 5, Industrial 2 of 5 (Discrete 2 of 5), Matrix 2 of 5, Codabar (NW7), Code 128, UCC/EAN 128, ISBT 128, Code 93, Code 11 (USD-8), MSI/Plessey, UK/Plessey, China Post, GS1 DataBar(GS1 DataBar Truncated), GS1 DataBar Limited, GS1 DataBar Expanded 2D: PDF417, MicroPDF417, QR Code, Aztec Code, HanXin Code, DataMatrix, Micro QR, Codablock F Code, Maxicode	
Decoding Depth	3 mil Code 39 (3 chars)	50 – 100 mm
	5 mil Code 39 (3 chars)	38 – 250 mm
	10 mil Code 39 (3 chars)	25 – 480 mm
	13 mil UPC (6 chars)	25 – 630 mm
	20 mil Code 39 (1 char)	30 – 880 mm
	10 mil QR (20 chars)	30 – 340 mm
	10 mil DM (20 chars)	30 – 330 mm
	20 mil QR (150 chars)	35 – 600 mm
Temperature	Operating: -20℃ to 50℃ (-13°F to 122°F) Storage: -40℃ to 85℃ (-40°F to 185°F)	
Humidity	5% to 95% (non-condensing)	
Mechanical Vibration	IEC60068-2-6 Un-powered engine withstands a random vibration along each of the X, Y and Z axes for a period of one hour per axis, define as follows: 20 to 80 Hz, Ramp up to 0.04 G2/Hz at the rate of 3 dB/oct; 80 to 350 Hz, 0.04G2/Hz; 350 Hz to 2000 Hz, Ramp down at the rate of 3 dB/oct	

Mechanical Shock	IEC60068-2-27 Shock pulse: 0.5 ms, Maximal acceleration: 1500 G, Shock direction & time: \pm X-axis, \pm Y-axis, \pm Z-axis, 3 times for each direction, total of 18 times.
Safety	EMC: EN55032, EN55035 Electrical Safety: EN62638 Photobiological Safety: EN62471:2008 RF Immunity: IEC61000-4-3, 10 V/m Artificial Light Immunity: 100,000 Lux

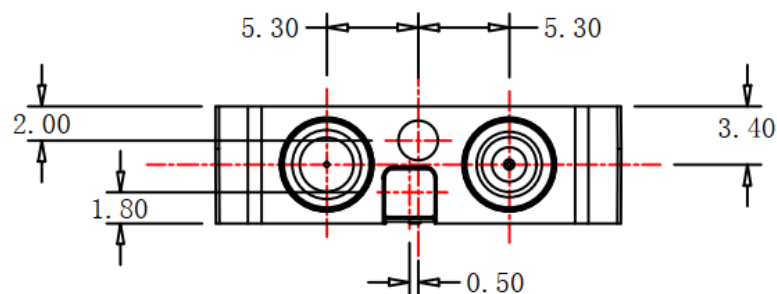
2 Structure design

2-1 Dimensions

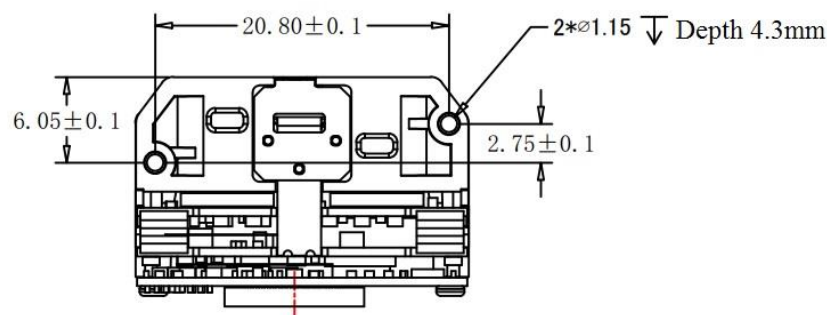
Unit: mm



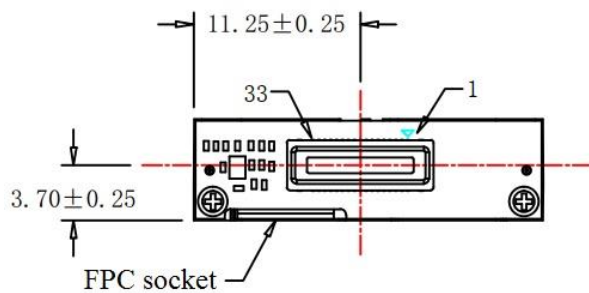
Top view



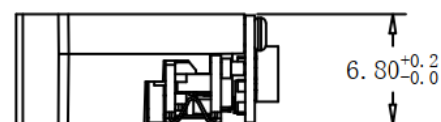
Front view



Bottom view



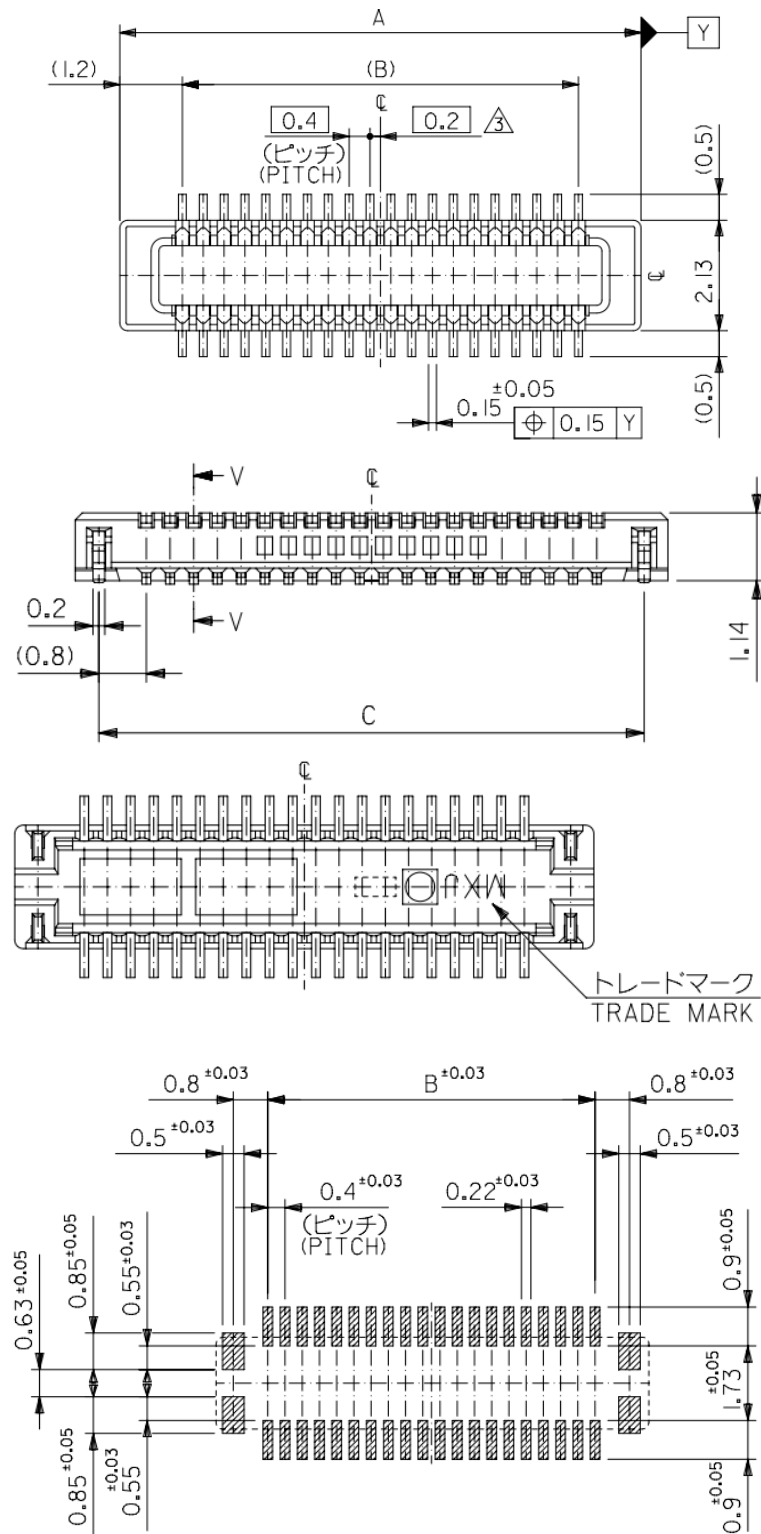
Back view



Side view

2-2-3 FPC header

For more information, see Molex 55909-3474_datasheet.pdf.

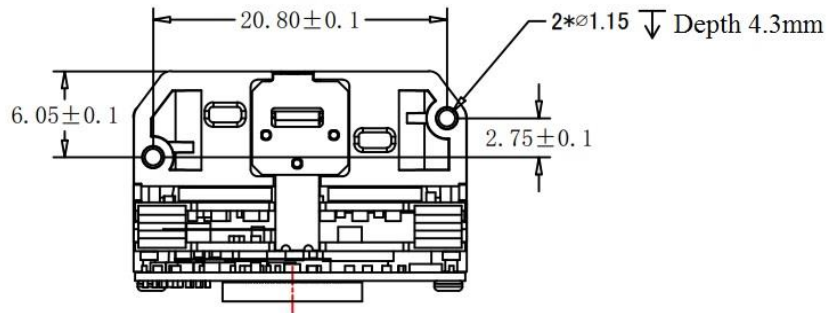


参考基板レイアウト (マウント面)
P.C.BOARD PATTERN DIMENSION.
(REFERENCE)
(MOUNTING AREA)

2-3 Screw specification

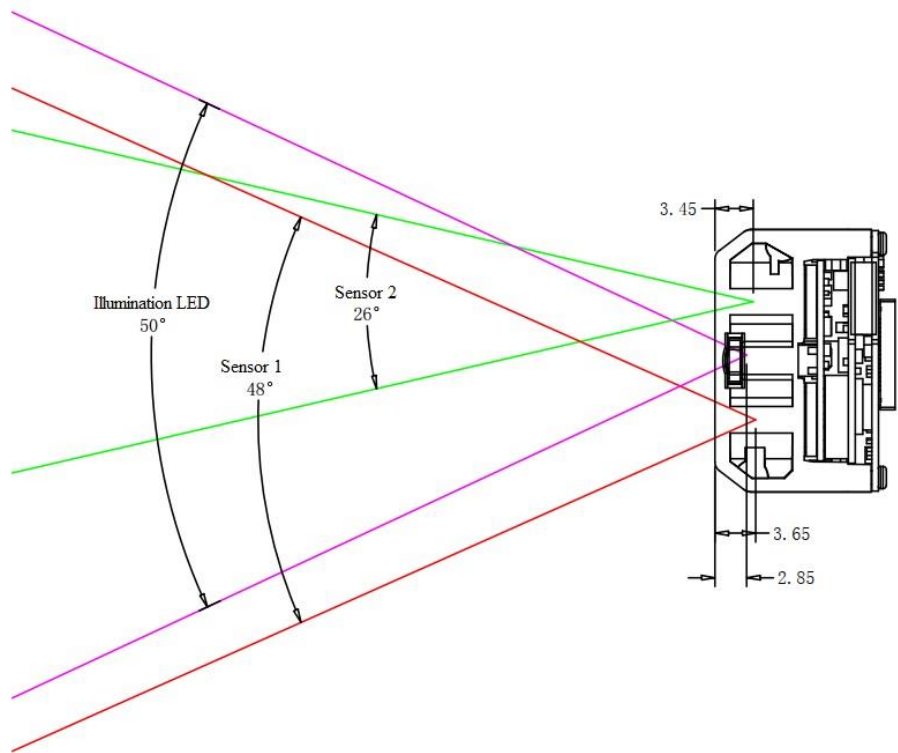
2 tapping screws with a diameter of 1.4 mm (maximum depth of 4.3 mm) are recommended for securing the engine.

When fixing the engine, full consideration should be given to protecting the engine from any external force during impact and vibration.

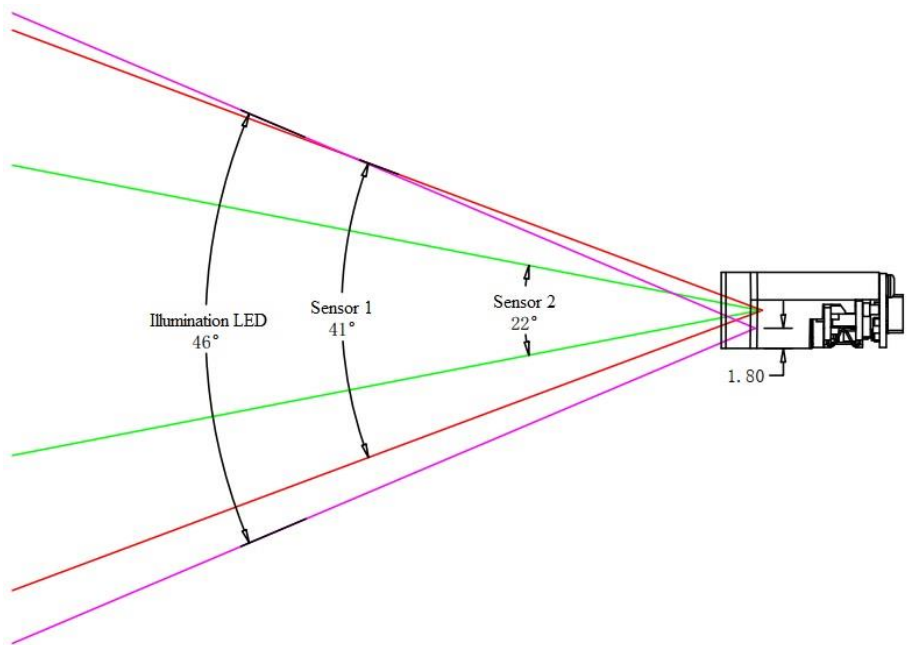


2-4 Field of View

The engine's field of view (horizontal and vertical) is shown below.



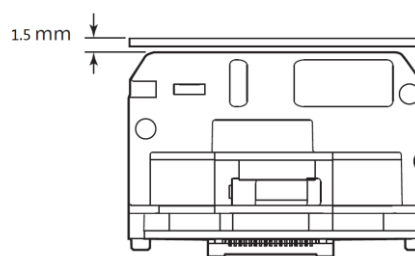
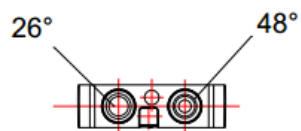
Horizontal



Vertical

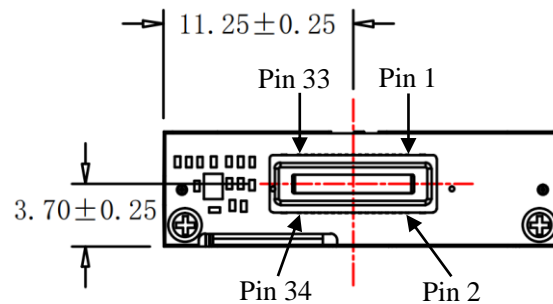
2-5 Scan window positioning

The window should be mounted as close as possible to the front of the engine (parallel, no tilt). Since unwanted reflections can occur at either surface and the window thickness can vary, the distance from the front of the engine to the far side of the glass should not exceed 1.5 mm.



3 Electrical characteristics

3-1 Pin assignment



Pin	Signal	I/O	Description
1	Ground	Power	Power and signal ground.
2	Ground	Power	Power and signal ground.
3	VIN_3V3_LED	Power	Power supply input for the LED Illumination and LED aimer. 3.3V, $I_{LED} > 1A$.
4	CIS-1 MD0n	Output	CIS1 MIPI data lane 0.
5	VIN_3V3_LED	Power	Power supply input for the LED Illumination and LED aimer. 3.3V, $I_{LED} > 1A$.
6	CIS-1 MD0p	Output	CIS1 MIPI data lane 0.
7	N/C	-	Reserved for future use.
8	Ground	Power	Power and signal ground.
9	I ² C_SCL	Input/Output	Image scanning Engine follows I ² C slave protocols with respect to this signal, 3.3V
10	CIS-1 MD1n	Output	CIS1 MIPI data lane 1
11	Ground	Power	Power and signal ground.
12	CIS-1 MD1p	Output	CIS1 MIPI data lane 1
13	I ² C_SDA	Input/Output	Image scanning Engine follows I ² C slave protocols with respect to this signal, 3.3V
14	Ground	Power	Power and signal ground.
15	N/C	-	Reserved for future use.
16	CIS-1 MCn	Output	CIS1 MIPI clock
17	ENG_RESET	Input	Asynchronous reset for the scan engine microcontroller, 3.3V
18	N/C	-	Reserved for future use.
19	PWR_ENA	Input	Active high (3.3V) = scan engine in Active mode. Active low (longer than 10 milliseconds) = scan engine in Sleep mode and resets all registers of the image sensor.
20	CIS-1 MCP	Output	CIS1 MIPI clock
21	ENG_EXPO	Output	Auxiliary lighting control (1.8V)
22	Ground	Power	Power and signal ground.
23	ILL_ON	Input	External lighting control signals (3.3V)
24	CIS-2 MD0n	Output	CIS2 MIPI data lane 0
25	AIM_ON	Input	External aiming control signals (3.3V)
26	CIS-2 MD0p	Output	CIS2 MIPI data lane 0
27	N/C	-	-
28	Ground	Power	Power and signal ground.
29	VIN_3V3_IMGR	Power	Power supply input for the scan engine microcontroller. 3.3V, $I_{IMG} > 0.4A$;
30	CIS-2 MCn	Output	CIS2 MIPI clock
31	VIN_3V3_IMGR	Power	Power supply input for the scan engine microcontroller. 3.3V, $I_{IMG} > 0.4A$;

32	CIS-2 MCp	Output	CIS2 MIPI clock
33	Ground	Power	Power and signal ground.
34	Ground	Power	Power and signal ground.

3-2 DC characteristic

3-2-1 Operating Voltage

Item	Description	Min	Typ	Max
VIN_3V3_IMGR	Imager sensor power supply	3.0V	3.3V	3.6V
VIN_3V3_LED	LED Illumination and LED aimer power supply	3.0V	3.3V	3.6V

Note: Exposure to absolute maximum rated conditions for extended periods may affect device reliability. Ensure that the engine is properly connected before powering on the engine. Poor power connection, live connection, instantaneous high pulse, etc., may damage the electronic components of the engine, causing the engine to not work.

3-2-2 Power supply noise

VIN_3V3_IMGR: $V_{pp} < 100\text{mV}$

VIN_3V3_LED: $V_{pp} < 200\text{mV}$

It is recommended to use a low noise power supply so that the engine can be used for maximum performance. High noise power supply will reduce engine scanning performance.

3-2-3 Operating Currents

Item	Description	Min	Typ	Max
$I_{InRush}(VIN_3V3_IMGR)$	Inrush current of Imager Sensor	-	-	725mA
$I_{InRush}(VIN_3V3_LED)$	Inrush current of LED Illumination and LED aimer	-	-	925mA
$I_{Standby}(VIN_3V3_IMGR)$	Standby current of Imager Sensor	25mA	27mA	30mA
$I_{Standby}(VIN_3V3_LED)$	Standby current of LED Illumination and LED aimer	-	353 μ A	690 μ A
$I_{Normal}(VIN_3V3_IMGR)$	Normal working current of Imager Sensor	54mA	84mA	130mA
$I_{Normal}(VIN_3V3_LED)$	Normal working current of LED Illumination and LED aimer	-	388mA	650mA

Note: Inrush is defined as the highest possible charge transferred to the power pins of the engine when PWR_EN signal is High. Higher short current spikes occur when power is applied to the power pins of the engine. These spikes are related to the presence of capacitors at the input of power rails of the engine:

VIN_3V3_IMGR: 20 μ F

VIN_3V3_LED: 22 μ F

The value of these spikes may vary with current capabilities of a power supply and resistance of the power path. Circuitry may be added to limit the rate of charge transfer and keep the peak current down during start-up.

3-2-4 Input/output voltage requirements

The input voltage requirements of the control signal are as follows:

PWR_ENA、ENG_RESET、 ILL_ON、AIM_ON	Min	Typ	Max
V _{IL} - Input Low Voltage	-	-	VIN_3V3_IMGR×0.3
V _{IH} - Input High Voltage	VIN_3V3_IMGR×0.7	-	-

I2C bus signal input/output voltage requirements are as follows:

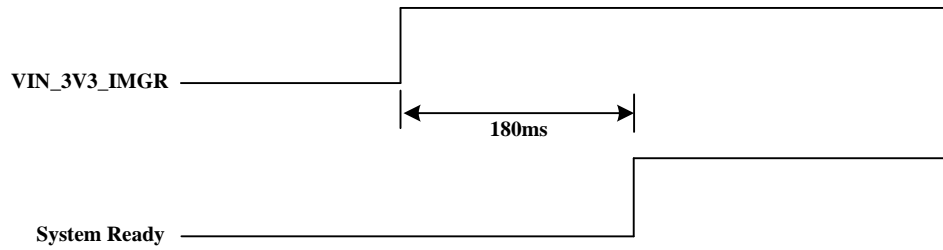
I2C_SCL、I2C_SDA	Min	Typ	Max
F _{SCL} - SCL Clock Frequency	0	-	400KHz
V _{IL} - Input Low Voltage	-	-	VIN_3V3_IMGR×0.3
V _{IH} - Input High Voltage	VIN_3V3_IMGR×0.7	-	-
V _{OL} - Output Low Voltage	-	-	VIN_3V3_IMGR×0.3
V _{OH} - Output High Voltage	VIN_3V3_IMGR×0.7	-	-

3-3 Timing

3-3-1 Imager Start-Up Timing

When the engine is connected to the host hardware, the host controls engine startup and scanning through the driver.

The following figure shows how long it takes for the engine to start up after the host has supplied power to the engine.



4 API

For more API information, see [Mindeo Software Decoder SDK API User Manual.pdf](#).

For more information, please visit: www.mindeo.cn

MINDEO

Shenzhen MinDe Electronics Technology Ltd.

Add:5th Floor, Section 1,25th Block, No.5, Kezhi Xi Road,

Keji Yuan, Nanshan District, Shenzhen, P.R.China

Tel : +86(0)755 8614 1288