



MT83 Mini 2D Imager, Integration Guide, V0.8

MT83 **(Mini 2D Imager)**

Integration Guide

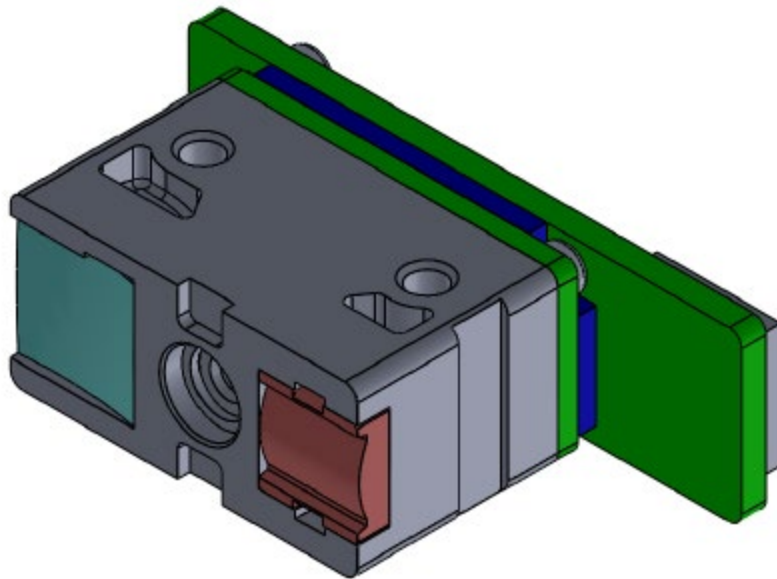




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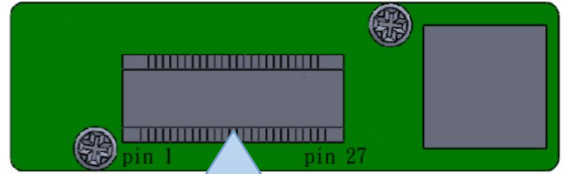
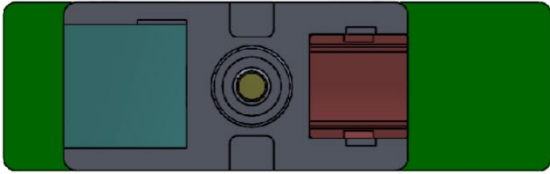
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1. Introduction

MARSON MT83 is a low power Image sensor with analog signal output. It can be integrated with user's own decoder board by sending related control signals. One white LED is embedded as light source for illumination and one red LED for aiming purpose.

2. Pin Assignment



Plug FPC cable this way

PINS	PIN NAME	I/O Type	Description	Operation
1	GND	---	Ground	---
2	NC	---	---	---
3	GND	---	Ground	---
4	NC	---	---	---
5	VCC_ILLUM	Input	Supply Power	Operating voltage: 3.3V±5% Max current: 300mA
6	VCC_ILLUM	Input	Supply Power	Operating voltage: 3.3V±5% Max current: 300mA
7	VDD_IO_HOST	Input	Supply Power	Operating voltage: 1.8V±5% Max current: 50mA
8	VCC	Input	Aim, Logic and Sensor Power	Operating voltage: 3.3V±5% Max current: 300mA
9	EXT_ILLUM_EN	Output	External Illumination LED Enable	Floating
10	NC	---	---	---
11	NC	---	---	---
12	NC	---	---	---
13	NC	---	---	---
14	NC	---	---	---
15	NC	---	---	---



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16	NC	---	---	---
17	NC	---	---	---
18	NC	---	---	---
19	SDA	I/O	I2C Data	High = 3.3V, Low = 0V
20	SCL	I/O	I2C Clock	High = 3.3V, Low = 0V
21	RCN	Output	MIPI Clock-	---
22	GND	---	Ground	---
23	RCP	Output	MIPI Clock+	---
24	GND	---	Ground	---
25	RDP0	Output	MIPI Data+ <0>	---
26	GND	---	Ground	---
27	RDN0	Output	MIPI Data- <0>	---

2.1 Illumination & Aimer Control

Slave address = **0x20**

Address	Register	Default Value	Description
0x0001	Illumination	0xA	Bit[7:4]:Reserved Bit[3:0] 0x0: OFF 0x1 : minimum brightness 0xA: maximum brightness
0x0002	Aimer	0x1	Bit[7:1]:Reserved Bit[0] 0x0 : OFF 0x1 : Aimer on

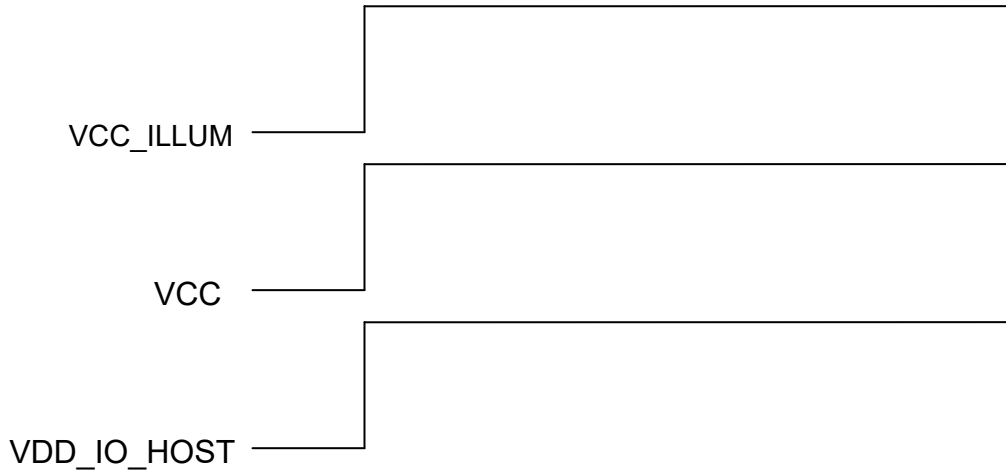
SCCB single read from random location



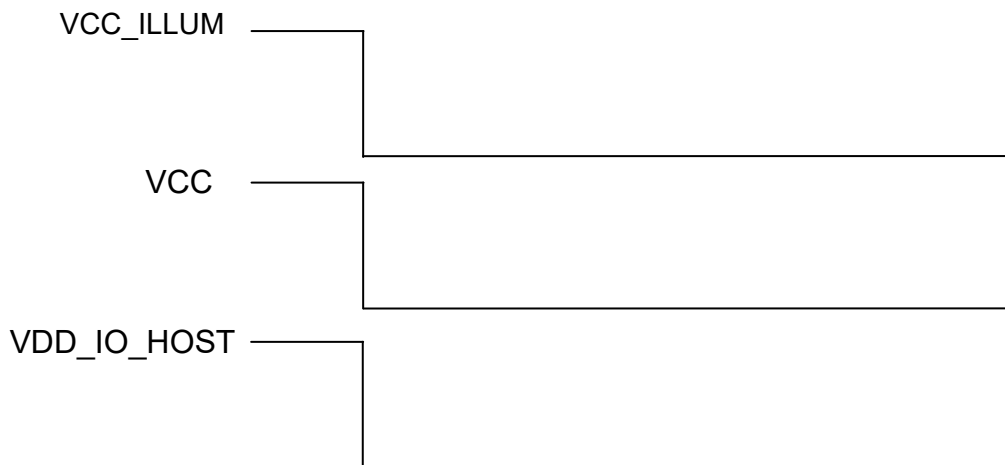
SCCB single write to random location



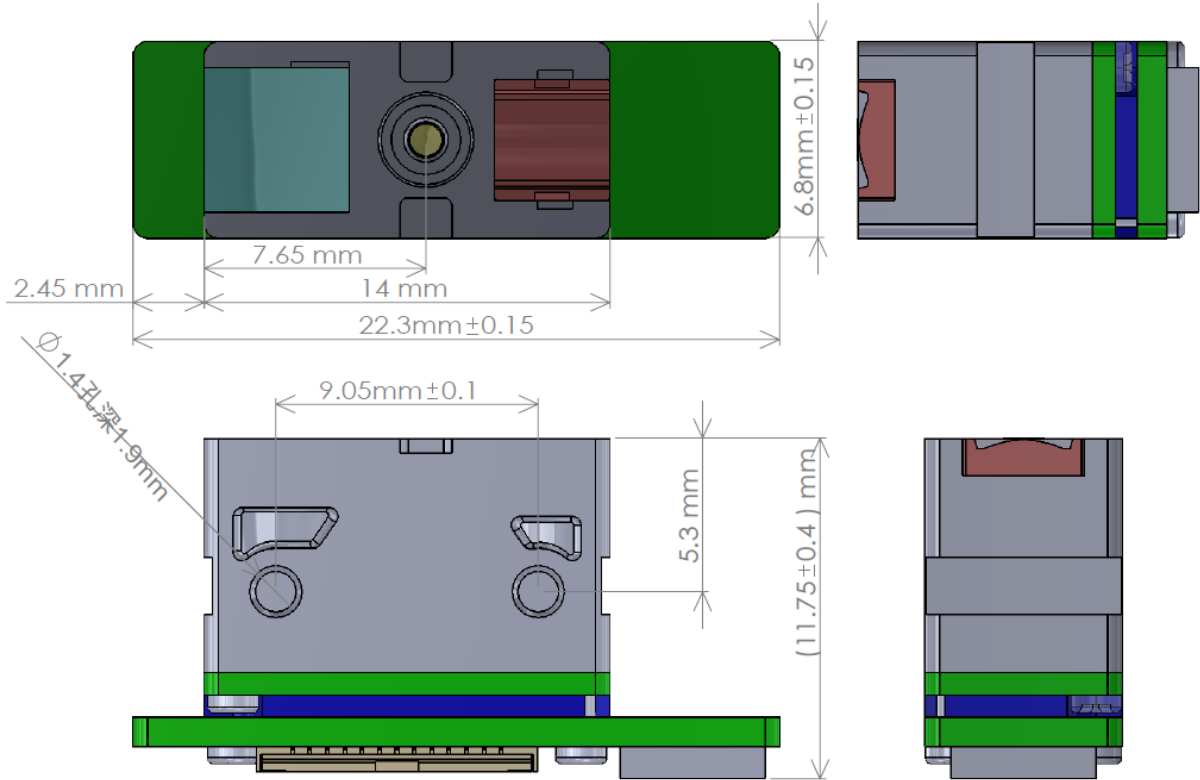
2.2 Power-up Sequence



2.3 Power-down Sequence



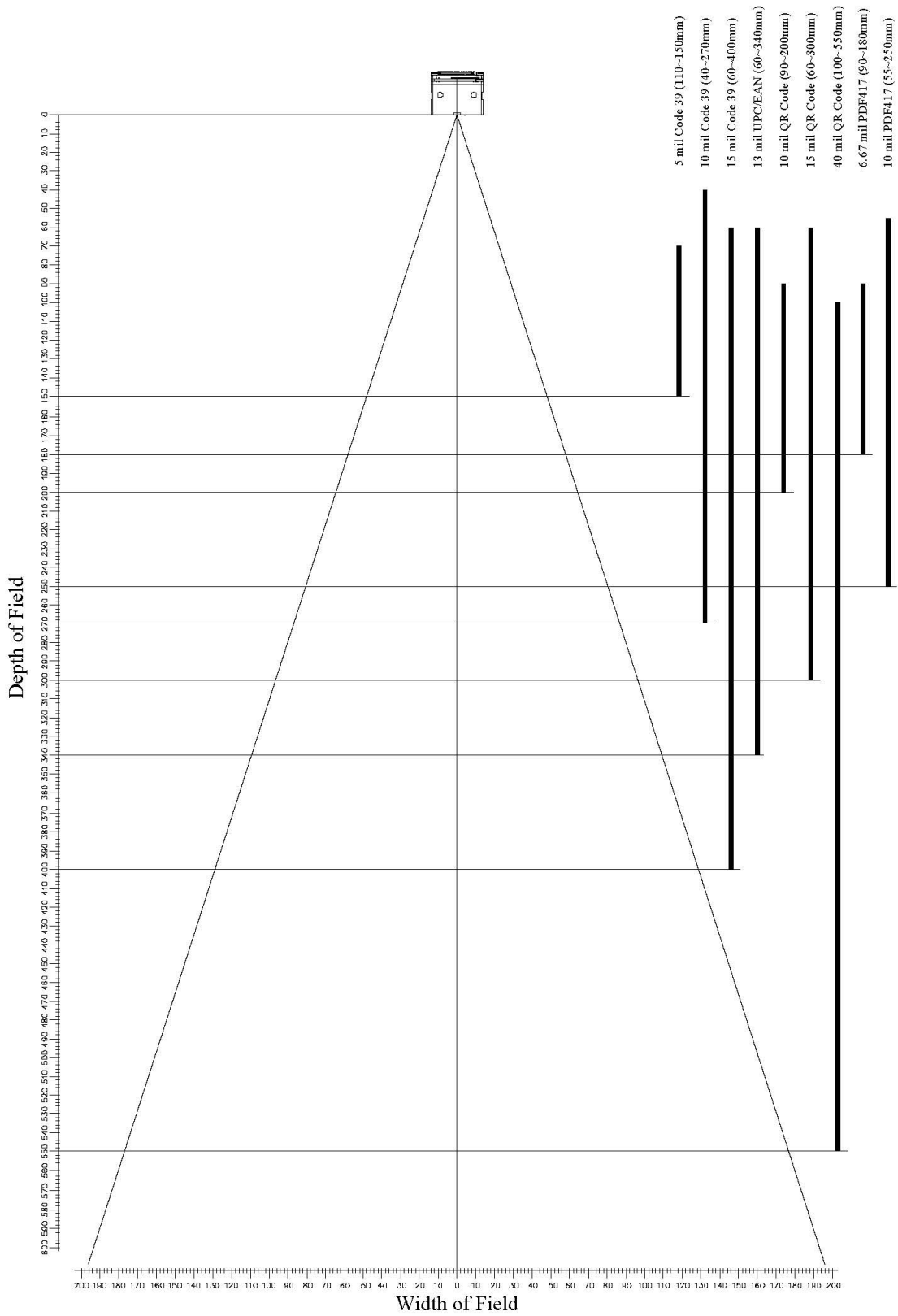
3. Dimension



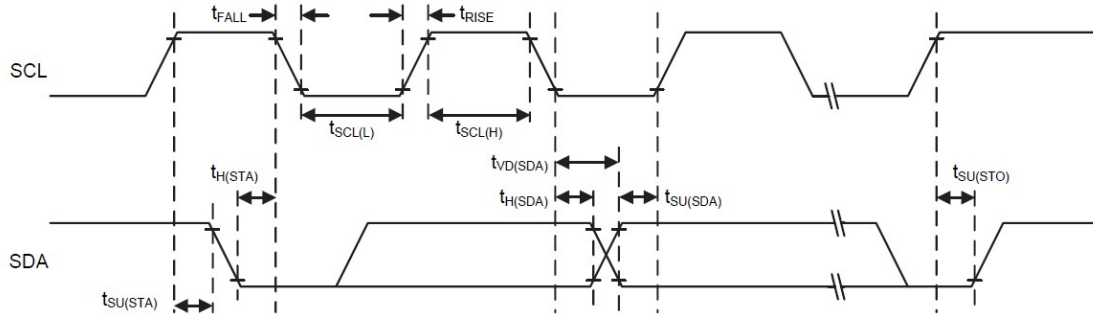
4. Technical Specification

Optic & Performance	
Light Source	White LED
Aimer	Red LED
Sensor	Image Sensor
Resolution	5mil/ 0.125mm
Scan Angle	Pitch: 60°, Skew: 30°, Roll: 360°
Print Contrast Ratio	30%
Width of Field	110mm (13mil Code39)
Depth Of Field (Environment: >500 lux)	5 mil Code39: 110 ~ 150mm
	10 mil Code39: 40 ~ 270mm
	15 mil Code39: 60 ~ 400mm
	13 mil UPC/ EAN: 60 ~ 340mm
	10 mil QR Code: 90 ~ 200mm
	15 mil QR Code: 60 ~ 300mm
	40 mil QR Code: 100 ~ 550mm
	6.67 mil PDF417: 90 ~ 180mm
	10 mil PDF417: 55 ~ 250mm
Physical Characteristics	
Dimension	(W)22.3 x (L)11.75 x (H)6.8 mm
Weight	2g
Color	Black
Material	PC
Connector	25pin ZIF (pitch=0.3mm)
Electrical	
Operation Voltage	3.3VDC±5%
Working Current	Typ: 160mA Max: 180 mA
Standby Current	Typ: 50 mA Max: 80 mA
Connectivity	
Interface	MIPI
User Environment	
Operating Temperature	-20°C ~ 60°C
Storage Temperature	-30°C ~ 70°C
Humidity	0%~95%RH (Non-condensing)
Drop Durability	1.5M
Ambient Light	100,000 Lux(Fluorescent Light)

5. Scanning Range



6. Serial Bus Timing



Symbol	Parameter	Standard mode	
		Min	Max
f_{SCL}	SCL Clock Frequency	—	100
$t_{SCL(H)}$	SCL Clock High Time	4.5	—
$t_{SCL(L)}$	SCL Clock Low Time	4.5	—
t_{FALL}	SCL and SDA Fall Time	—	1.3
t_{RISE}	SCL and SDA Rise Time	—	1.3
$t_{SU(SDA)}$	SDA Data Setup Time	500	—
$t_{H(SDA)}$	SDA data hold time (Note 5)	0	—
	SDA data hold time (Note 6)	100	—
$t_{VD(SDA)}$	SDA data valid time	—	1.6
$t_{SU(STA)}$	START Condition Setup Time	500	—
$t_{H(STA)}$	START Condition Hold Time	0	—
$t_{SU(STO)}$	STOP Condition Setup Time	500	—

7. Mechanical Integration

Mounting the MT83

First of all, the MT83 should be fixed with two self-forming screws on the host PCBA. To secure MT83 the maximum thread depth is 2.0 mm and operator must use safe ESD practices when handling and mounting the MT83.

The thickness of PCBA: 0.8 mm.

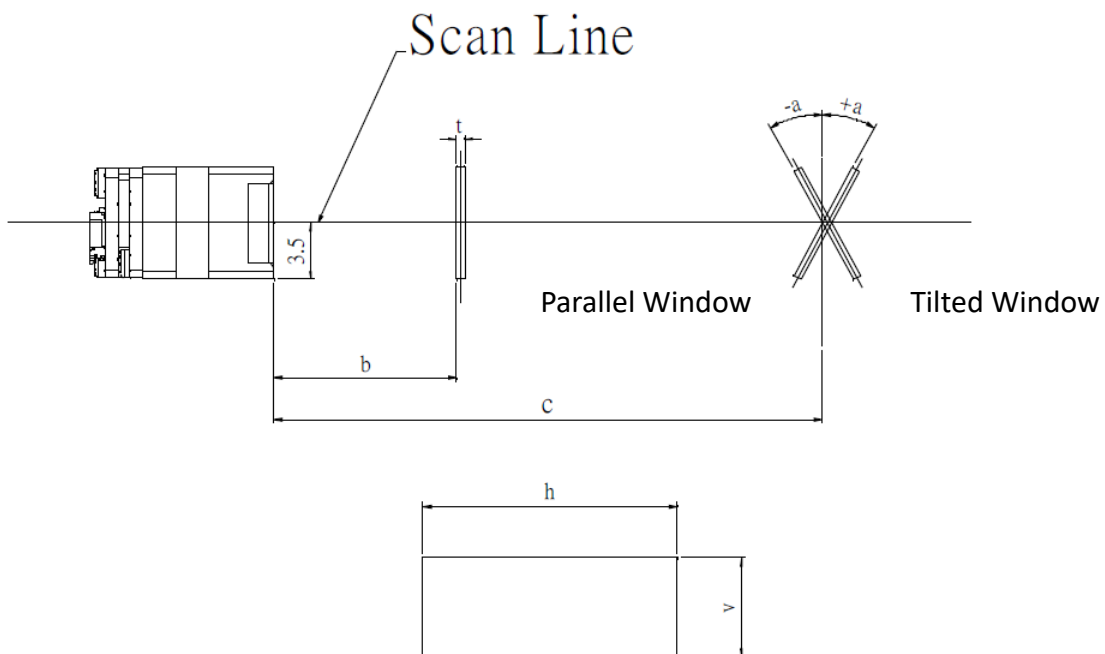
The size of screw hole: 1.4mm dia.

The size of screw: T1.7mm X 2.5 mm L

The torque of screwdriver: $\leq 1\text{kg}\cdot\text{cm}$ (0.86 lb-in)

8. Window Placement

The external transparent window is recommended to be AR-coated which provides 5% maximum reflectivity from 400 to 1000 nanometers at nominal window tilt angle. There are two types of window placement can be implemented while a parallel window must be close to MT83 within a distance under 0.5 mm.



Window Specifications for MT83 Integration					
Distance	Tilt Angle(a)		Minimum Window Size		
			Horizontal (h)	Vertical (v)	Thickness (t)
< 0.5mm (b)	0°	0°	14 mm	7mm	< 1 mm
10 mm (c)	+20°~	-20°~	28 mm	15 mm	
20 mm (c)	+17°~	-17°~	36 mm	24 mm	
30 mm (c)	+15°~	-15°~	50 mm	32 mm	

9. Version History

Rev.	Date	Description	Issued	Checked
0.1	2019.02.15	Initial Draft Release	Kenji	Andy
0.2	2019.05.08	Updated Pin Assignment Added Chapter 2.1	Shaw	Kenji & Hus
0.3	2019.07.26	Updated Slave Address in Chapter 2.1	Shaw	Kenji & Hus
0.4	2019.09.06	Updated D.O.F specification & Connector	Shaw	Kenji & Hus
0.5	2019.11.22	Added Chapter 6 (Serial Bus Timing)	Shaw	Kenji
0.6	2020.06.09	Updated D.O.F	Shaw	Kenji
0.7	2020.06.24	Updated Dimension	Shaw	Alice
0.8	2022.02.11	Updated VCC_ILLUM, VDD_IO_HOST, EXT_ILLUM_EN, VCC Added Power-up/down Sequence	Shaw	Kenji

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