LI-OV2685-MIPI-FF
SPECIFICATION

Rev 1.0
Leopard Imaging Inc.

Contents

Version History

Version	Description	Release Date
1.0	First Release	10. Nov. 2015

Key Information

Module Part#		LI-OV2685-MIPI-FF
Module Size		100 mm (L) x 6.5 mm (W) x 4.9 mm(H)
Sensor Type		OV2685
Array Size		1616 x 1216
Power Supply	core	1.7 ~ 1.9V
	analog	2.6 ~ 3.0V
	I/O	1.7 ~ 3.0V
Lens		1/5"
Focus(F.NO)		2.8
View Angle		65°
Focal Length		2.66 mm
Object distance		60cm-infinity
Sensitivity		7 ke⁻/Lux-sec
Pixel size		1.75 um x 1.75 um
IR Cutter		650 nm
Sensor Temperature Range	Operating	-30 ℃ to +85 ℃
	Stable Image	0 ℃ to +50 ℃
Output Formats		10-bit RGB RAW, 8-bit YUV
Support Images Sizes		UXGA (1600 x 1200); 1600 HD+ (1600 x 900); SXGA (1280 x 960); 720P (1280 x 720); and more
Dynamic Range		66dB @ 8x gain
Max S/N ratio		36 dB
IC Package		53-pin CSP5
Power Requirement	Active	259 mW
	XSHUTND	< 1 uA
Scan mode		progressive
Shutter		Rolling shutter
Dark Current		6.5 e⁻/sec @ 50 ˚C junction temp
Package Dimensions		4454 um x 4014 um
Interface		MIPI

Pin Assignment

No.	Name	Pin type	Description
1	SDA	I/O	SCCB data
2	SCL	Input	SCCB input clock
3	DOVDD1.8V/2.8V	Power	Power for I/O circuit
4	MCP	Output	MIPI clock positive output
5	MCN	Output	MIPI clock negative output
6	GND	Ground	
7	MDP1	Output	MIPI data positive output
8	MDN1	Output	MIPI data negative output
9	GND	Ground	
10	MDP2	Output	MIPI data positive output
11	MDN2	Output	MIPI data negative output
12	GND	Ground	
13	MDP3 (NC)	Output	MIPI data positive output
14	MDN3 (NC)	Output	MIPI data negative output
15	GND	Ground	
16	MDP4 (NC)	Output	MIPI data positive output
17	MDN4 (NC)	Output	MIPI data negative output
18	DVDD1.8V	Power	Power for digital core
19	XCLK	Input	System input clock
20	PWDN (NC)	Input	Power down (active high with internal pull-down resistor)
21	RESET	Input	Reset (active low with internal pull-up resistor)
22	AVDD2.8	Power	Analog power
23	NC		
24	GND	Ground	

Electrical Characteristics

1. Absolute Maximum Ratings

parameter		absolute maximum rating[a]
ambient storage temperature		-40°C to +125°C
supply voltage (with respect to ground)	V_{DD-A}	4.5V
	V_{DD-D}	3V
	V_{DD-IO}	4.5V
electro-static discharge (ESD)	human body model	2000V
	machine model	200V
all input/output voltages (with respect to ground)		-0.3V to V_{DD-IO} + 1V
I/O current on any input or output pin		± 200 mA
peak solder temperature (10 second dwell time)		245°C

a. exceeding the absolute maximum ratings shown above invalidates all AC and DC electrical specifications and may result in permanent damage to the device. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.

2. Functional temperature

parameter	range
operating temperature[a]	-30°C to +85°C junction temperature
stable image temperature[b]	0°C to +50°C junction temperature

a. sensor functions but image quality may be noticeably different at temperatures outside of stable image range

b. image quality remains stable throughout this temperature range

3. DC Characteristics (-30° C < T_J < 85° C)

symbol	parameter	min	typ	max	unit
supply					
V_{DD-A}	supply voltage (analog)	2.6	2.8	3.0	V
V_{DD-IO}	supply voltage (digital I/O)	1.7	1.8	3.0	V
V_{DD-D}	supply voltage (digital core for 2-lane MIPI up to 576 Mbps/lane)	1.7	1.8	1.9	V
DOVDD = 1.8V, AVDD = 2.8V, external DVDD = 1.8V					
I_{DD-A}	active (operating) current full size @ 30fps, YUV		22	30	mA
I_{DD-IO}			1.8	3	mA
I_{DD-D}			100	130	mA
I_{DD-A}	active (operating) current full size @ 15fps, YUV		21	28	mA
I_{DD-IO}			1.8	3	mA
I_{DD-D}			60	83	mA
standby current					
$I_{DD-SCCB}$	standby current[a]		50	100	µA
$I_{DD-XSHUTDOWN}$[b]			<1	<1	µA
digital inputs (typical conditions: AVDD = 2.8V, DVDD = 1.8V, DOVDD = 1.8V)					
V_{IL}	input voltage LOW			0.54	V
V_{IH}	input voltage HIGH	1.26			V
C_{IN}	input capacitor			10	pF
digital outputs (standard loading 25 pF)					
V_{OH}	output voltage HIGH	1.62			V
V_{OL}	output voltage LOW			0.18	V
serial interface inputs					
V_{IL}[c]	SIOC and SIOD	-0.5	0	0.54	V
V_{IH}	SIOC and SIOD	1.28	1.8	3.0	V

a. standby current is measured at room temperature

b. it is necessary to cut off external DVDD outside the sensor to eliminate leakage current

c. based on DOVDD = 1.8V

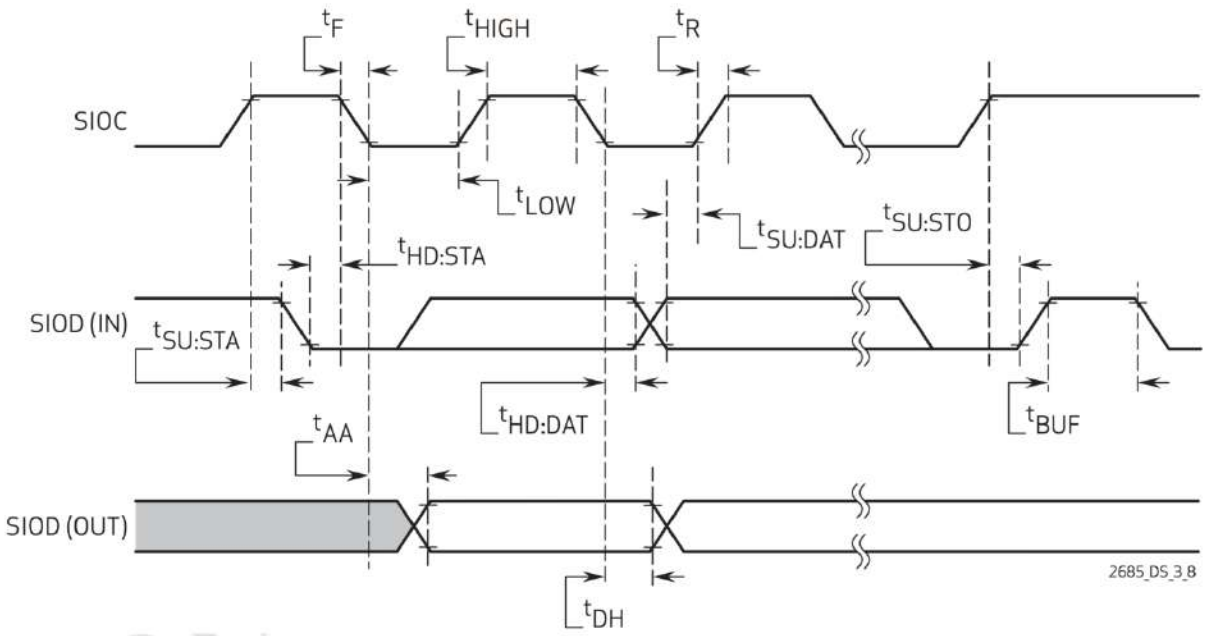
4. Timing Characteristics

symbol	parameter	min	typ	max	unit
oscillator and clock input					
f_{OSC}	frequency (XVCLK)	6	24	27	MHz
t_r, t_f	clock input rise/fall time			5 (10[a])	ns

a. if using internal PLL

5. SCCB timing

a. SCCB interface timing



b. SCCB interface timing Specification[ab]

symbol	parameter	min	typ	max	unit
f_{SIOC}	clock frequency			400	kHz
t_{LOW}	clock low period	1.3			μs
t_{HIGH}	clock high period	0.6			μs
t_{AA}	SIOC low to data out valid	0.1		0.9	μs
t_{BUF}	bus free time before new start	1.3			μs
$t_{HD:STA}$	start condition hold time	0.6			μs
$t_{SU:STA}$	start condition setup time	0.6			μs
$t_{HD:DAT}$	data in hold time	0			μs
$t_{SU:DAT}$	data in setup time	0.1			μs
$t_{SU:STO}$	stop condition setup time	0.6			μs
t_R, t_F	SCCB rise/fall times			0.3	μs
t_{DH}	data out hold time	0.05			μs

a. SCCB timing is based on 400kHz mode

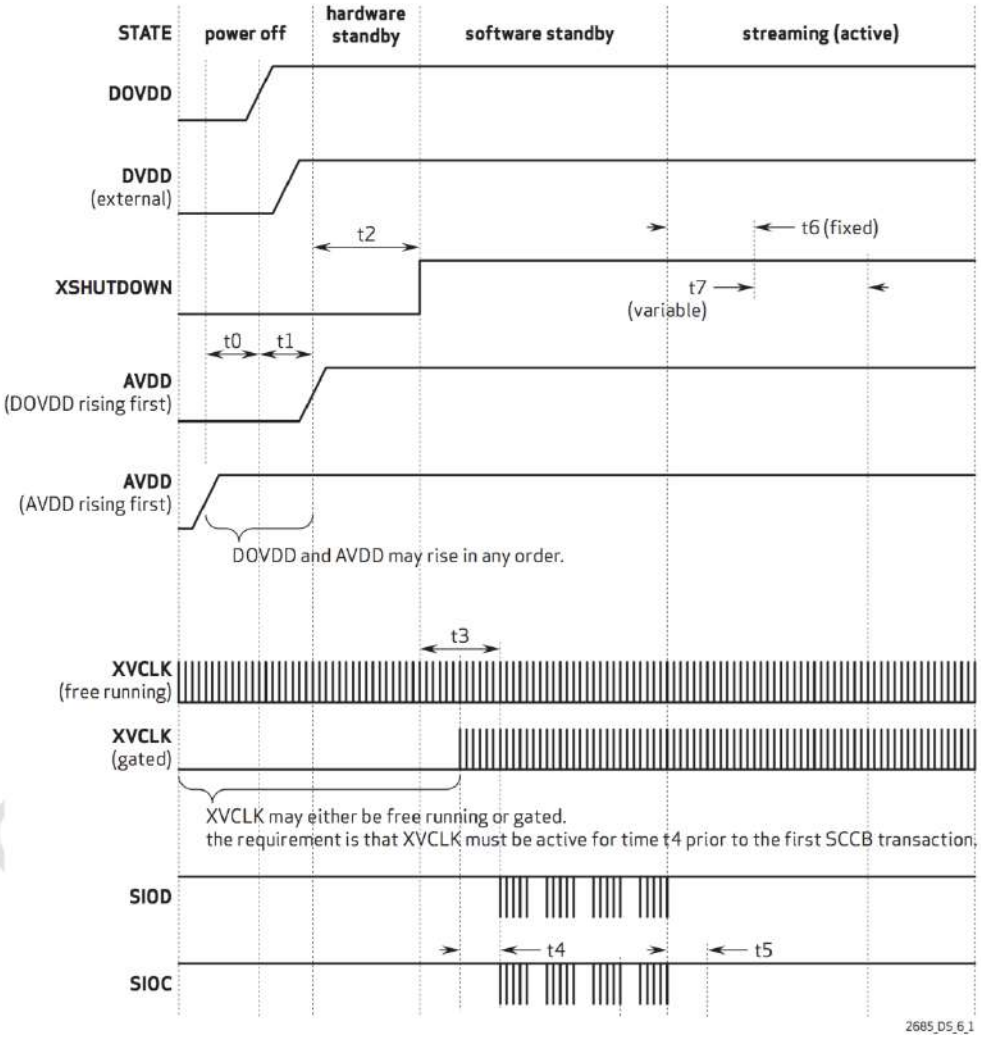
b. timing measurement shown at the beginning of the rising edge and/or of the falling edge signifies 30%, timing measurement shown in the middle of the rising/falling edge signifies 50%, timing measurement shown at the beginning of the rising edge and/or of the falling edge signifies 70%

6. Format and frame rate

format	resolution	max frame rate	methodology	MIPI total bit rate	
				RAW 10	YUV
UXGA	1600x1200	30 fps	full resolution	660 Mbps	1056 Mbps
1600 HD+	1600x900	30 fps	full resolution (16:9) crop	660 Mbps	1056 Mbps
SXGA	1280x960	30 fps	cropped 4:3	660 Mbps	1056 Mbps
720p	1280x720	60 fps	cropped 16:9	660 Mbps	1056 Mbps
quarter size	800x600	60 fps	2x2 binning/skip	660 Mbps	1056 Mbps
VGA	640x480	60 fps	crop + 2x2 binning/skip	660 Mbps	1056 Mbps

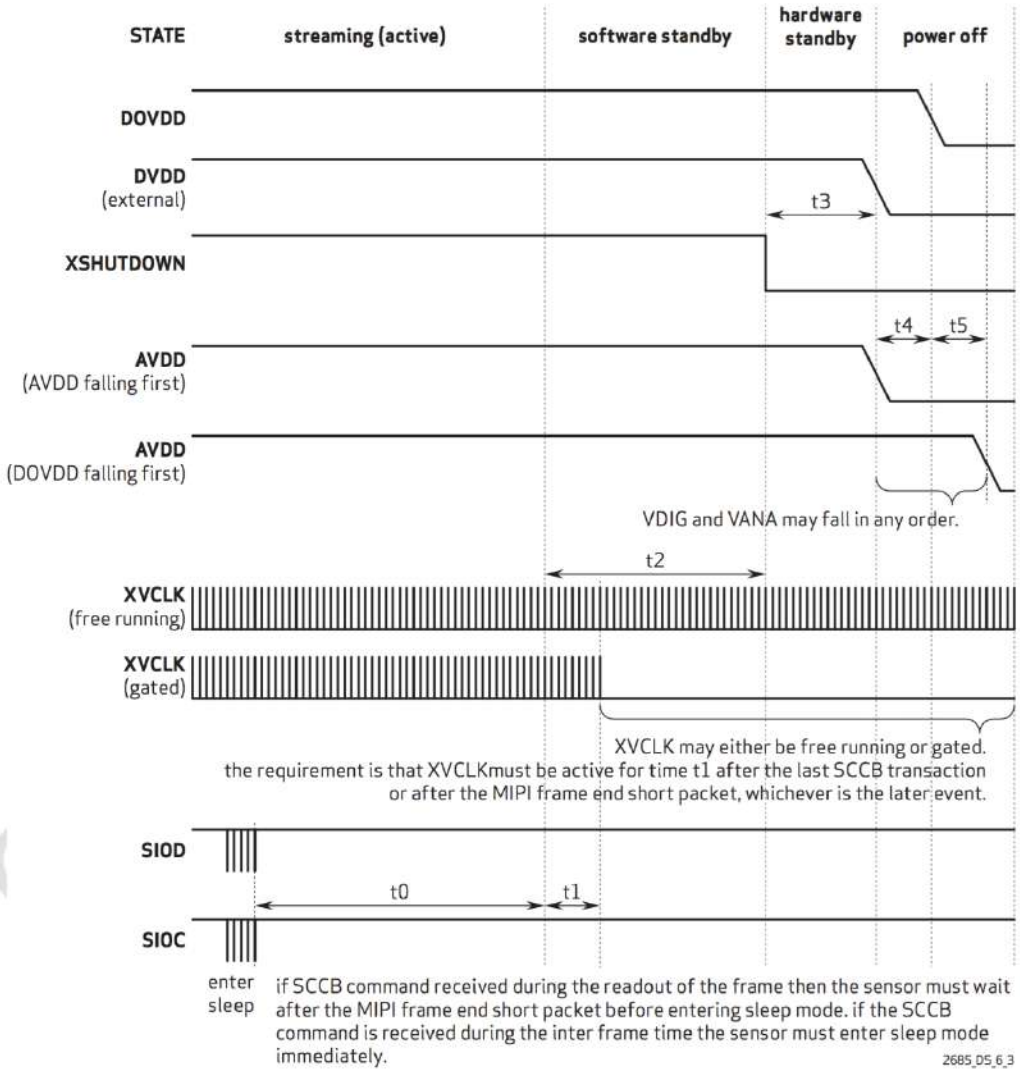
7. Power Up Sequence

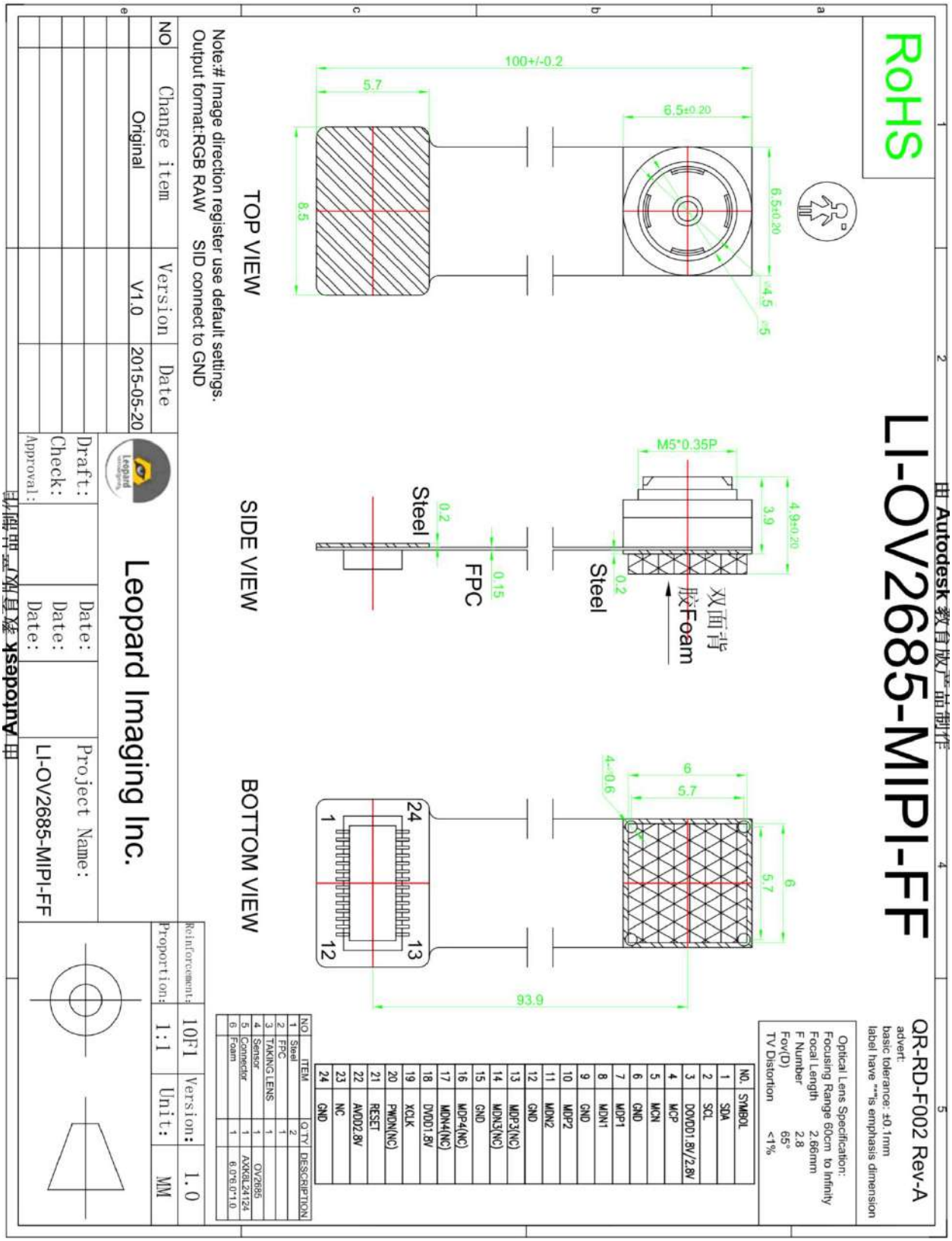
constraint	label	min	max	unit
AVDD rising – DOVDD rising	t0	AVDD and DOVDD may rise in any order. rising separation can vary from 0 ns to infinity.		ns
DOVDD rising – AVDD rising	t1			ns
AVDD rising – XSHUTDOWN rising	t2	0.0		ns
XSHUTDOWN rising – first SCCB transaction	t3	8192		XVCLK cycles
minimum number of XVCLK cycles prior to the first SCCB transaction	t4	8192		XVCLK cycles
PLL start up/lock time	t5		0.2	ms
entering streaming mode – first frame start sequence (fixed part)	t6		10	ms
entering streaming mode – first frame start sequence (variable part)	t7	delay is the integration time value		lines



8. Power Down Sequence

constraint	label	min	max	unit
enter software standby SCCB command device in software standby mode	t0	when a frame of MIPI data is output, wait for the MIPI end code before entering the software for standby; otherwise, enter the software standby mode immediately		
minimum of XVCLK cycles after the last SCCB transaction or MIPI frame end	t1	512		XVCLK cycles
last SCCB transaction or MIPI frame end, XSHUTDOWN falling	t2	512		XVCLK cycles
XSHUTDOWN falling - AVDD falling	t3	0.0		ns
AVDD falling - DOVDD falling	t4	AVDD and DOVDD may fall in any order, the falling separation can vary from 0 ns to infinity		ns
DOVDD falling - AVDD falling	t5			ns




RoHS
LI-OV2685-MIPI-FF
QR-RD-F002 Rev-A
advert:
basic tolerance: ±0.1mm
label have "*"is emphasis dimension
Optical Lens Specification:
Focusing Range 60cm to Infinity
Focal Length 2.66mm
F Number 2.8
Fov(D) 65°
TV Distortion <1%
NO. SYMBOL
1 SDA
2 SCL
3 DOVDD1.8V/2.8V
4 MCP
5 MCN
6 GND
7 MDP1
8 MDN1
9 GND
10 MDP2
11 MDN2
12 GND
13 MDP3(NC)
14 MDN3(NC)
15 GND
16 MDP4(NC)
17 MDN4(NC)
18 DVDD1.8V
19 XCLK
20 PWDN(NC)
21 RESET
22 AVDD2.8V
23 NC
24 GND
NO ITEM Q'TY DESCRIPTION
1 Steel 2
2 FPC 1
3 TAKING LENS 1
4 Sensor 1 OV2685
5 Connector 1 AXK6L24124
6 Foam 1 6.0*6.0*1.0
TOP VIEW
SIDE VIEW
BOTTOM VIEW
Note:# Image direction register use default settings.
Output format:RGB RAW SID connect to GND
100+/-0.2
5.7
6.5±0.20
6.5±0.20
8.5
4.5
5
M5*0.35P
4.9±0.20
3.9
0.2
Steel
双面背胶Foam
0.15
FPC
0.2
Steel
6
5.7
4-0.6
6
5.7
24
1
13
12
93.9
NO Change item Version Date
Original V1.0 2015-05-20
Draft: Date:
Check: Date:
Approval: Date:
Leopard Imaging Inc.
Project Name:
LI-OV2685-MIPI-FF
Reinforcement
Proportion 1:1
10F1
Version: 1.0
Unit: MM
由Autodesk教育版产品制作
由Autodesk Student版本创建