



LEOPARD IMAGING INC

# LI-IMX274-MIPI-CS

## Data Sheet

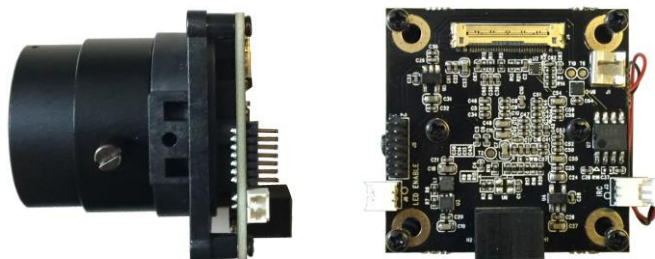
### Key Features

- Sony Diagonal 7.20 mm (Type 1/2.5) CMOS Image Sensor IMX274
- Active pixels: 3864H x 2196V
- Pixel size: 1.62  $\mu\text{m}$  x 1.62  $\mu\text{m}$
- Color sensor
- Interface: MIPI output
- Support CS lens
- Module Size: 38mmx38mm
- Weight: 54 g
- Part#: **LI-IMX274-MIPI-CS**

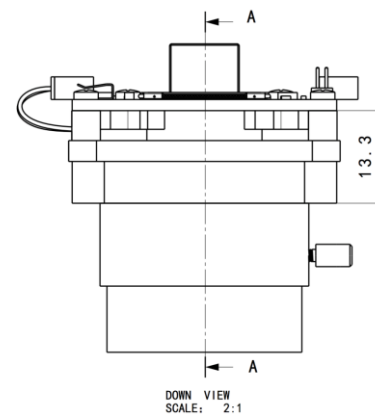
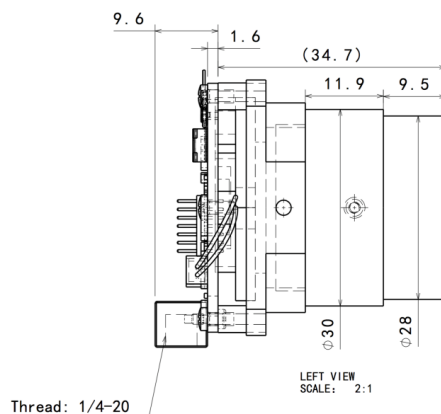
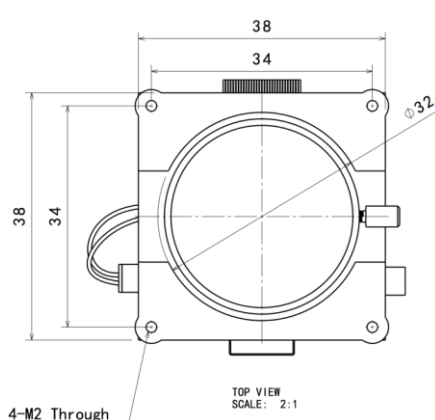


### Lens Spec

- Model: ES0522F.IR
- Focal length: 5.0 mm
- Aperture, F/#: 2.2
- Built in 650nm IR cut filter
- FOV (D/H/V): 87 °/ 76 °/43 °
- TV Distortion: < -8%
- Mount Type: CS



### Dimensions



Leopard Imaging Inc.

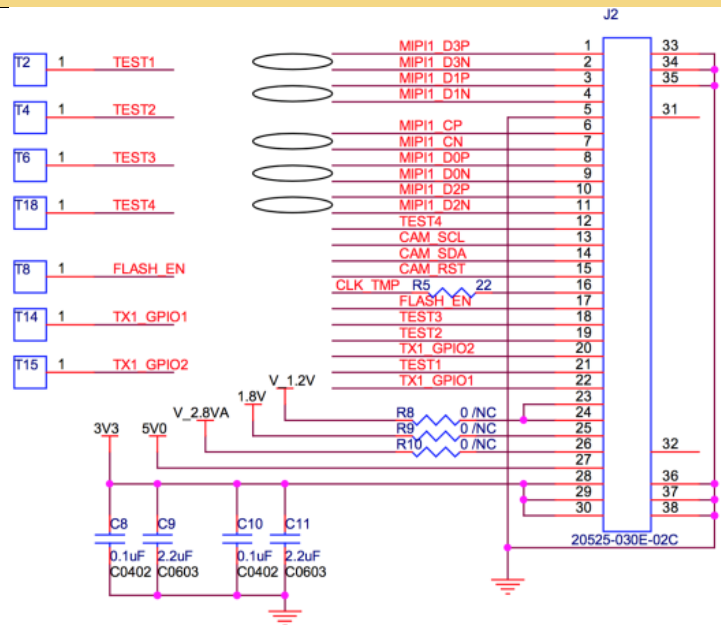
1130 Cadillac Ct., Milpitas, CA 95035, USA  
Phone: +1-408-263-0988  
Fax: +1-408-217-1960  
Email: sales@leopardimaging.com  
Website: www.leopardimaging.com  
www.leopard-security.com

## Interfaces

### Interfaces

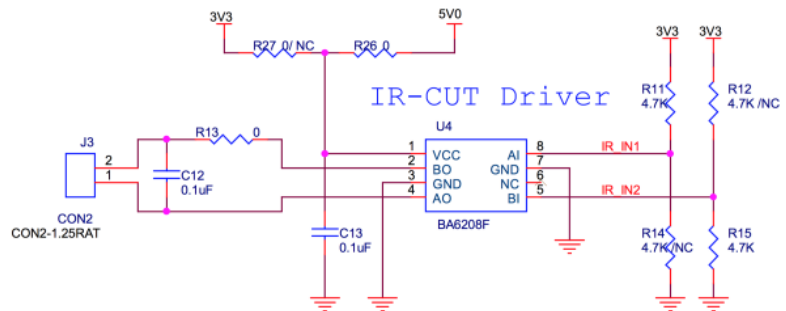
#### Interface J2:

- Part#: 20525-030E-02C
- Number of Positions: 30
- Pitch: 0.4mm
- Mating I-PEX cable: LI-FAW-1233-T1 (200mm)



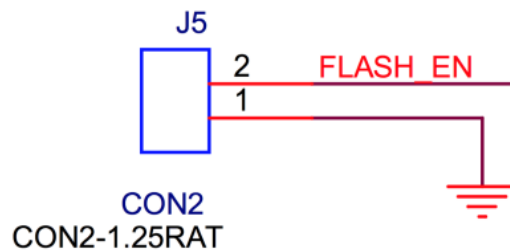
#### Interface J3:

- Part#: 1734829-2
- Number of Positions: 2
- Pitch: 1.25mm



#### Interface J5:

- Part#: 1734829-2
- Number of Positions: 2
- Pitch: 1.25mm



Leopard Imaging Inc.

1130 Cadillac Ct., Milpitas, CA 95035, USA

Phone: +1-408-263-0988

Fax: +1-408-217-1960

Email: sales@leopardimaging.com

Website: www.leopardimaging.com

www.leopard-security.com

## Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage (Analog)	$V_{ADD}^{*1}$	-0.3 to +3.3	V
Supply voltage (Digital 1)	$V_{DDD1}^{*2}$	-0.5 to +2.0	V
Supply voltage (Digital 2)	$V_{DDD2}^{*3}$	-0.5 to +3.3	V
Input voltage (Digital)	$V_I$	-0.3 to $V_{DDD2} + 0.3$	V
Output voltage (Digital)	$V_O$	-0.3 to $V_{DDD2} + 0.3$	V
Guaranteed operating temperature	$T_{OPR}$	-30 to +75	°C
Storage guarantee temperature	$T_{STG}$	-30 to +80	°C
Performance guarantee temperature	$T_{SPEC}$	-10 to +60	°C

## Recommended Operating Conditions

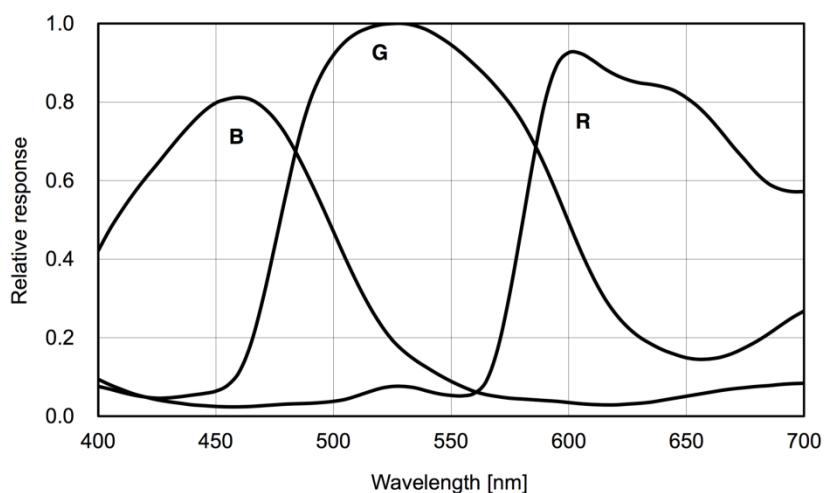
Item	Symbol	Rating	Unit
Supply voltage (Analog)	$V_{ADD}^{*1}$	$2.8 \pm 0.1$	V
Supply voltage (Digital 1)	$V_{DDD1}^{*2}$	$1.2 \pm 0.1$	V
Supply voltage (Digital 2)	$V_{DDD2}^{*3}$	$1.8 \pm 0.1$	V
Input voltage (Digital)	$V_I$	-0.1 to $V_{DDD2} + 0.1$	V

\*1  $V_{ADD}$ :  $V_{DDSUB}$ ,  $V_{DDHCM}$ ,  $V_{DDHPX}$ ,  $V_{DDHDA}$ ,  $V_{DDHCP}$  (2.8 V power supply)

\*2  $V_{DDD1}$ :  $V_{DDLSC1}$  to 2,  $V_{DDLPA}$ ,  $V_{DDLPL1}$ ,  $V_{DDLPL2}$  to 3,  $V_{DDLIF}$  (1.2 V power supply)

\*3  $V_{DDD2}$ :  $V_{DDMIO}$ ,  $V_{DDMIF}$  (1.8 V power supply)

## Spectral Sensitivity Characteristics



Leopard Imaging Inc.

1130 Cadillac Ct., Milpitas, CA 95035, USA  
Phone: +1-408-263-0988  
Fax: +1-408-217-1960  
Email: sales@leopardimaging.com  
Website: www.leopardimaging.com  
www.leopard-security.com

## DC Characteristics

### Current Consumption and Gain Vatriable Range

( $V_{ADD} = 2.9\text{ V}$ ,  $V_{DDD1} = 1.3\text{ V}$ ,  $V_{DDD2} = 1.9\text{ V}$ ,  $T_j = 60\text{ }^{\circ}\text{C}$ , Reference Gain (0 dB)

All pixel scan mode (MODE0), 29.97 frame/s)

Item	Symbol	Min.	Typ.	Max	Unit	Remarks
Current consumption (Analog)	$I_{ADD}$	—	—	62	mA	
Current consumption (Digital 1)	$I_{DDD1}$	—	—	190	mA	
Current consumption (Digital 2)	$I_{DDD2}$	—	—	1	mA	
Standby current (Analog)	$I_{ADDSTB}$	—	—	35	$\mu\text{A}$	In the dark
Standby current (Digital 1)	$I_{DDD1STB}$	—	—	13	mA	In the dark
Standby current (Digital 2)	$I_{DDD2STB}$	—	—	20	$\mu\text{A}$	In the dark
PGA gain variable range	PGAG	0	—	27	dB	

### Supply Voltage and I/O Voltage

Item		Pins	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	Analog	V <sub>DD</sub> SUB, V <sub>DD</sub> HCM, V <sub>DD</sub> HPX, V <sub>DD</sub> HDA, V <sub>DD</sub> HCP	V <sub>ADD</sub>	2.70	2.80	2.90	V
	Digital 1	V <sub>DD</sub> LCN, V <sub>DD</sub> LSC1 to 2, V <sub>DD</sub> LPL1, V <sub>DD</sub> LPA, V <sub>DD</sub> LPL2 to 3, V <sub>DD</sub> LIF	V <sub>DDD1</sub>	1.10	1.20	1.30	V
	Digital 2	V <sub>DD</sub> MIO, V <sub>DD</sub> MIF	V <sub>DDD2</sub>	1.70	1.80	1.90	V
Digital input voltage		SDA, SCL	V <sub>IH1</sub>	0.7 × V <sub>DDD2</sub>	—	1.9	V
			V <sub>IL1</sub>	−0.3	—	0.3 × V <sub>DDD2</sub>	V
		XCLR, INCK	V <sub>IH2</sub>	0.65 × V <sub>DDD2</sub>	—	V <sub>DDD2</sub> + 0.3	V
			V <sub>IL2</sub>	−0.3	—	0.35 × V <sub>DDD2</sub>	V
Digital output voltage		XHS, XVS	V <sub>HVOUT</sub>	—	V <sub>DDD2</sub>	—	V

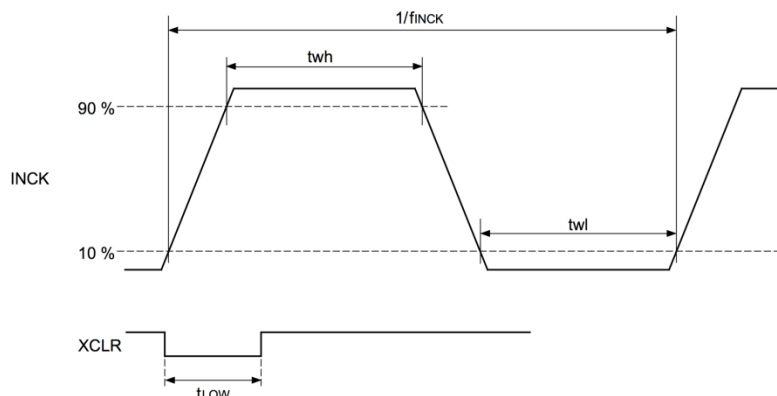


Leopard Imaging Inc.

1130 Cadillac Ct., Milpitas, CA 95035, USA  
 Phone: +1-408-263-0988  
 Fax: +1-408-217-1960  
 Email: sales@leopardimaging.com  
 Website: www.leopardimaging.com  
 www.leopard-security.com

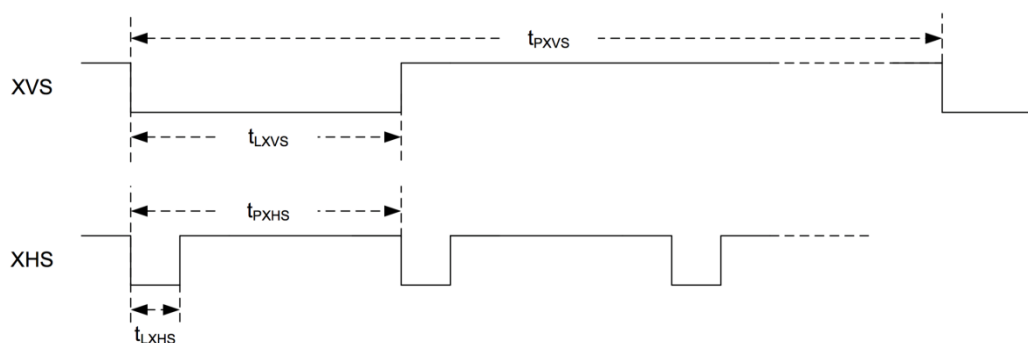
## AC Characteristics

### INCK, XCLR



Item	Symbol	Min.	Typ.	Max.	Unit
INCK clock frequency	$f_{INCK}$	6	—	27	MHz
INCK Low level pulse width	$t_{wl}$	5	—	—	ns
INCK High level pulse width	$t_{wh}$	5	—	—	ns
Clock duty	—	40	50	60	%
XCLR Low level pulse width	$t_{LOW}$	100	—	—	ns

### XHS, XVS (Output)



Item	Symbol	Min.	Typ.	Max.	Unit	Remarks
XHS Low level pulse width	$t_{LXHS}$		222		ns	16 clk@72MHz
XHS pulse period	$t_{PXHS}$		$HMAX^{*1}$		clk@72MHz	
XVS Low level pulse width	$t_{LXVS}$		$t_{PXHS}$		clk@72MHz	
XVS pulse period	$t_{PXVS}$		$HMAX^{*1} \times VMAX^{*2}$		clk@72MHz	

\*1 The value set as HMAX (address 30F6h, bit [7:0] and address 30F7h, bit [7:0])

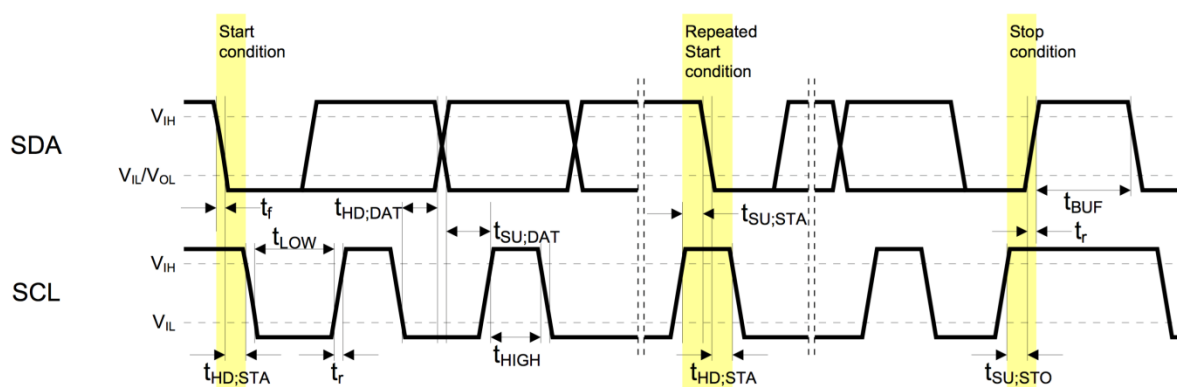
\*2 The value set as VMAX (address 30F8h, bit [7:0], address 30F9h, bit [7:0] and address 30FAh, bit [3:0]).



Leopard Imaging Inc.

1130 Cadillac Ct., Milpitas, CA 95035, USA  
 Phone: +1-408-263-0988  
 Fax: +1-408-217-1960  
 Email: sales@leopardimaging.com  
 Website: www.leopardimaging.com  
 www.leopard-security.com

## I<sup>2</sup>C Communication



## I<sup>2</sup>C Specification

Item	Symbol	Min.	Typ.	Max.	Unit	Remarks
Low level input voltage	$V_{IL}$	-0.3	—	$0.3 \times V_{DD2}$	V	
High level input voltage	$V_{IH}$	$0.7 \times V_{DD2}$	—	1.9	V	
Low level output voltage	$V_{OL}$	0	—	$0.2 \times V_{DD2}$	V	$V_{DD2} < 2\text{ V}$ , Sink 3 mA
Output fall time	$t_{of}$	—	—	250	ns	Load 10 pF to 400 pF, $0.7 \times V_{DD2}$ to $0.3 \times V_{DD2}$
Input current (SCL, SDA, XCLR, INCK)	$I_i$	-10	—	10	$\mu\text{A}$	$0.1 \times V_{DD2}$ to $0.9 \times V_{DD2}$
Input capacitance of SCL / SDA	$C_i$	—	—	10	pF	

## I<sup>2</sup>C AC Characteristics

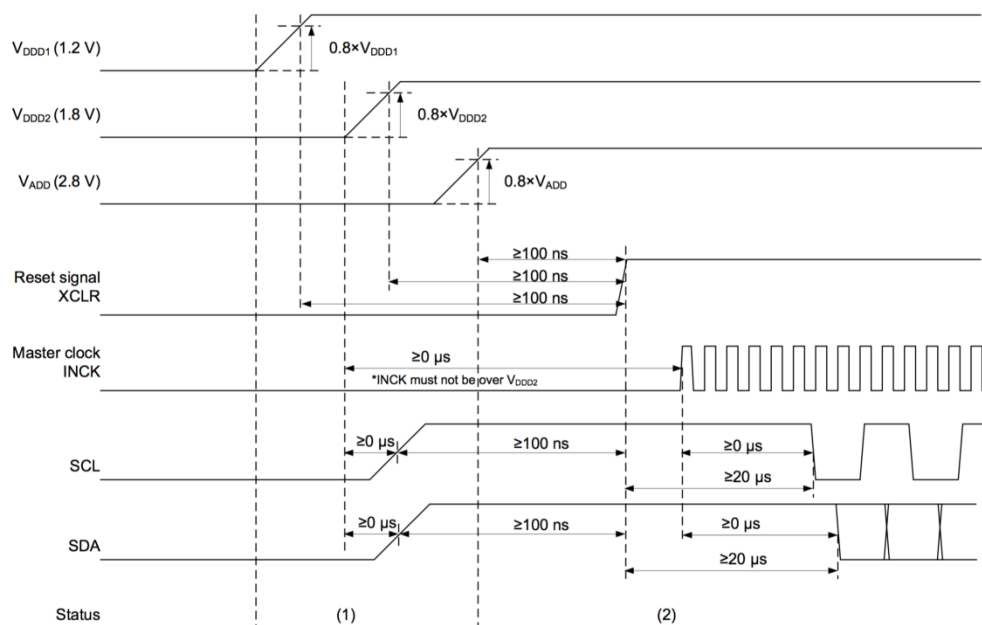
Item	Symbol	Min.	Typ.	Max.	Unit
SCL clock frequency	$f_{SCL}$	0	—	400	kHz
Hold time (Start Condition)	$t_{HD;STA}$	0.6	—	—	$\mu\text{s}$
Low period of the SCL clock	$t_{LOW}$	1.3	—	—	$\mu\text{s}$
High period of the SCL clock	$t_{HIGH}$	0.6	—	—	$\mu\text{s}$
Set-up time (Repeated Start Condition)	$t_{SU;STA}$	0.6	—	—	$\mu\text{s}$
Data hold time	$t_{HD;DAT}$	0	—	0.9	$\mu\text{s}$
Data set-up time	$t_{SU;DAT}$	100	—	—	ns
Rise time of both SDA and SCL signals	$t_r$	—	—	300	ns
Fall time of both SDA and SCL signals	$t_f$	—	—	300	ns
Set-up time (Stop Condition)	$t_{SU;STO}$	0.6	—	—	$\mu\text{s}$
Bus free time between a STOP and START Condition	$t_{BUF}$	1.3	—	—	$\mu\text{s}$



Leopard Imaging Inc.

1130 Cadillac Ct., Milpitas, CA 95035, USA  
 Phone: +1-408-263-0988  
 Fax: +1-408-217-1960  
 Email: sales@leopardimaging.com  
 Website: www.leopardimaging.com  
 www.leopard-security.com

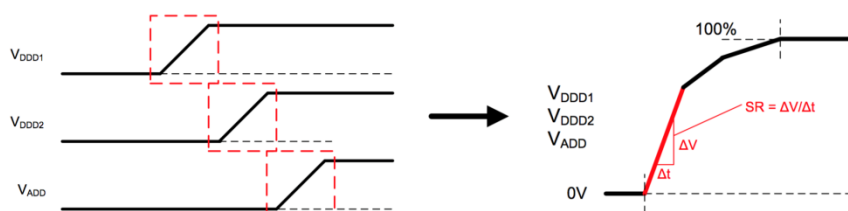
## Power-on Sequence



Period name	Remarks
(1) Power stabilization period	All input signals are set to Low level. There are no constraints of the power-on sequence with $V_{ADD}$ , $V_{DD1}$ , and $V_{DD2}$ .
(2) Register communication period for standby cancel	Wait 100 ns after the last power supply in $V_{ADD}$ , $V_{DD1}$ and $V_{DD2}$ . Then set XCLR to "H" and start the standby cancel sequence.

## Slew Rate Limitation of Power-on Sequence

Conform to the slew rate limitation shown below when power supply change 0 V to each voltage (0 % to 100 %) in power-on sequence.



Item	Symbol	Power supply	Min.	Max.	Unit	Remarks
Slew rate	SR	$V_{DD1}$ (1.2 V)	—	25	mV/us	
		$V_{DD2}$ (1.8 V)	—	25	mV/us	
		$V_{ADD}$ (2.8 V)	—	25	mV/us	

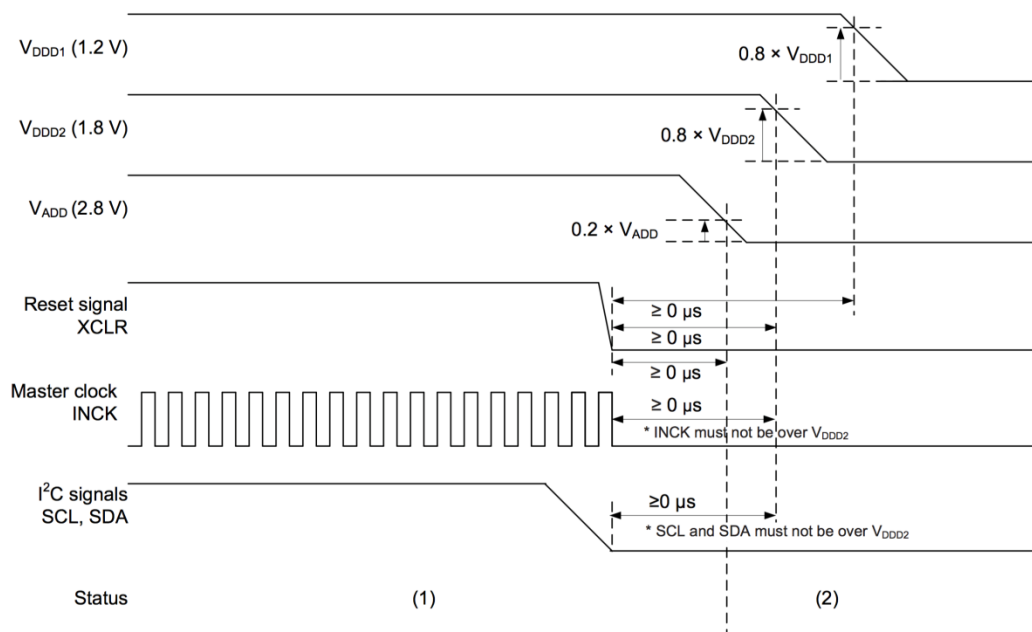


Leopard Imaging Inc.

1130 Cadillac Ct., Milpitas, CA 95035, USA  
 Phone: +1-408-263-0988  
 Fax: +1-408-217-1960  
 Email: sales@leopardimaging.com  
 Website: www.leopardimaging.com  
 www.leopard-security.com



## Power-off Sequence



Period name	Remarks
(1) Pixel output period	Pixel signal output period
(2) Power-off period	<p>Turn the power supplies off after all input signals are set to "Low" level except SCL and SDA.</p> <p>Set SCL and SDA to "Low" level at the same time with turning off the power supply of <math>V_{DD2}</math>.</p> <p>There are no constraints of the power-off sequence with <math>V_{ADD}</math>, <math>V_{DD1}</math>, and <math>V_{DD2}</math>.</p>



Leopard Imaging Inc.

1130 Cadillac Ct., Milpitas, CA 95035, USA  
 Phone: +1-408-263-0988  
 Fax: +1-408-217-1960  
 Email: sales@leopardimaging.com  
 Website: www.leopardimaging.com  
 www.leopard-security.com

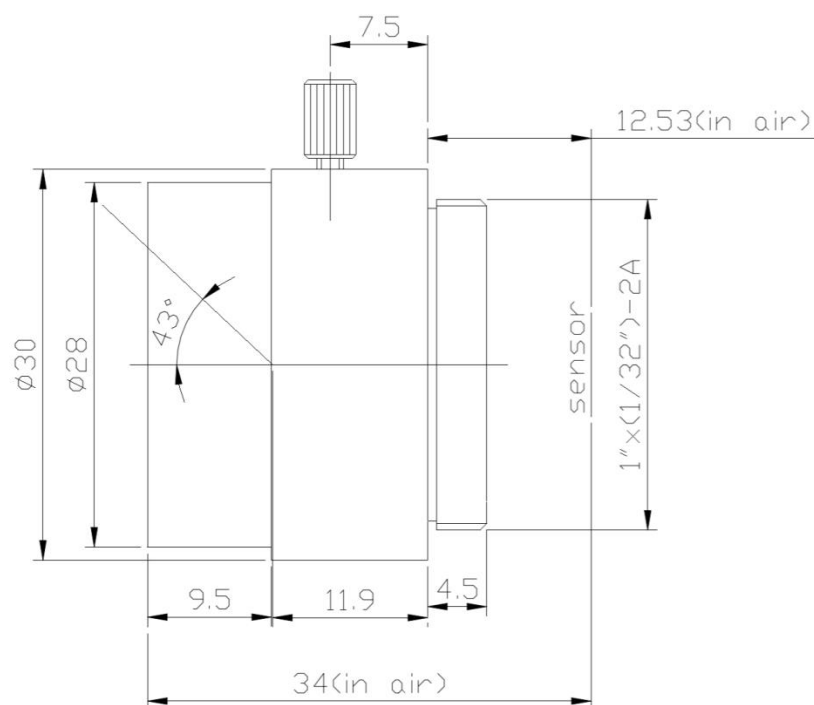


## 10 Megapixel IR Series

### ES0522F.IR



有效焦距	E.F.L.		5 mm
相对孔径	F No.		F2.2
接口类型	Mount Type		CS
水平视角	H.FOV	1/1.8"	72°
像面尺寸	Image Format (Max)		1/1.8"
光圈类型	Iris Type		Fixed
近 摄 距	M.O.D		0.3m
畸 变	TV Distortion	1/1.8"	-8%
操控方式	Control Type	变倍 Zoom	/
		聚焦 Focus	Manual
工作温度	Operating Temperature		-30°C ~ 70°C
镜头重量	Weight		39g
尺寸规格	Dimensions		



Leopard Imaging Inc.

1130 Cadillac Ct., Milpitas, CA 95035, USA  
 Phone: +1-408-263-0988  
 Fax: +1-408-217-1960  
 Email: sales@leopardimaging.com  
 Website: www.leopardimaging.com  
 www.leopard-security.com