



LEOPARD IMAGING INC

Rev 1.1

# LI-TX1-KIT-IMX274M12-T

## Data Sheet

### Key Features

- Compatible with Nvidia Jetson TX1
- MIPI interface
- Support up to three IMX274 cameras
- Sony Diagonal 7.20 mm (Type 1/2.5) CMOS Image Sensor IMX274
- Active pixels: 3864H x 2196V
- Length of the I-PEX cable: 300mm
- Support M12 lens
- Provide customization services
- Weight: 70 g
- Part#: **LI-TX1-KIT-IMX274M12-T**



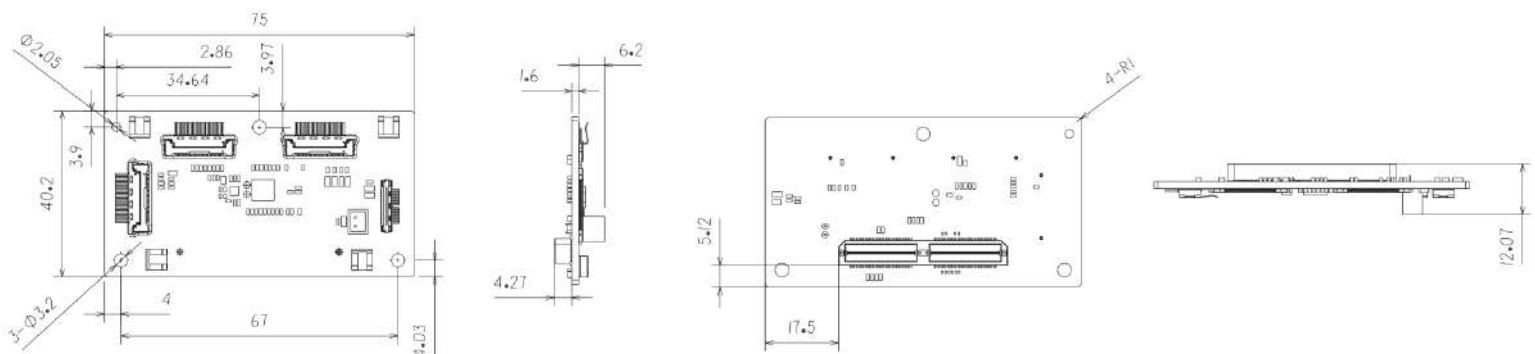
### BOM

#	Items	QTY
1	LI-JTX1-MIPI-ADPT	1
2	LI-IMX274-MIPI-M12	3
3	FAW-1233-03 cable	3

### Lens Spec

- Model: YC-172
- Focal length: 4.0 mm
- Aperture, F/#: 1.8
- Built in 650nm IR cut filter
- FOV (D/H/V): 112° / 96° / 51°
- TV Distortion: < 20%
- Mount: M12 x P0.5

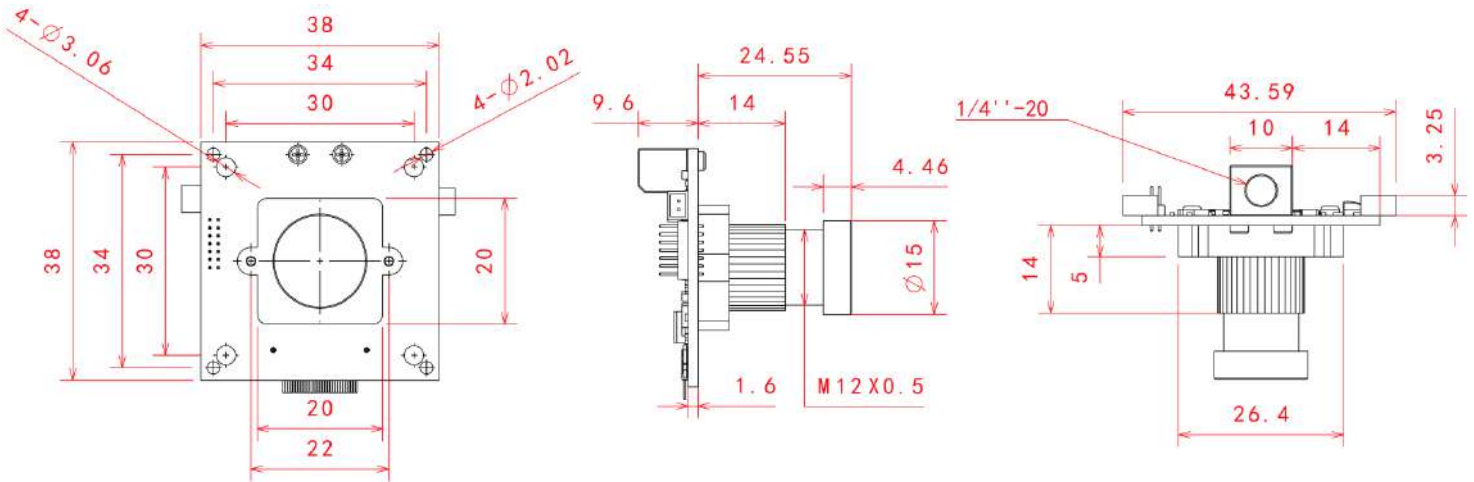
### Dimensions (LI-JTX1-MIPI-ADPT)



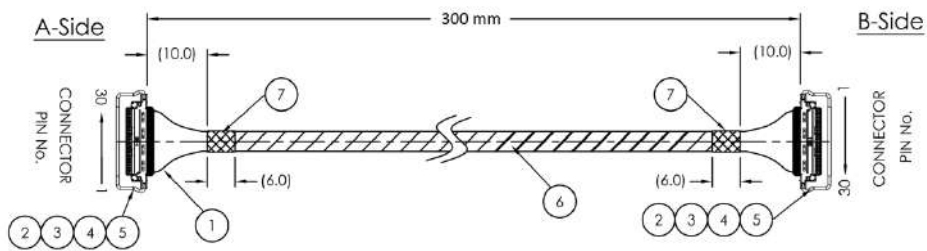
Leopard Imaging Inc.

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

## Dimensions (LI-IMX274-MIPI-M12)



## Dimensions (FAW-1233-03)



## Work on Nvidia Jetson TX1



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

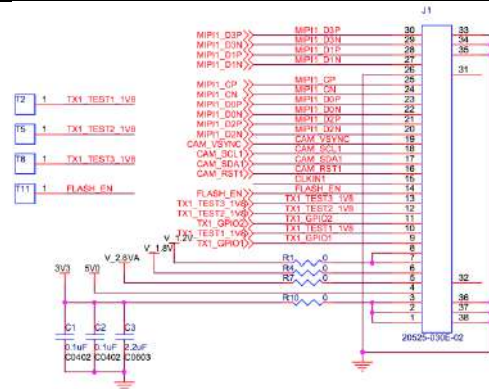
# LI-JTX1-MIPI-ADPT



## Interfaces

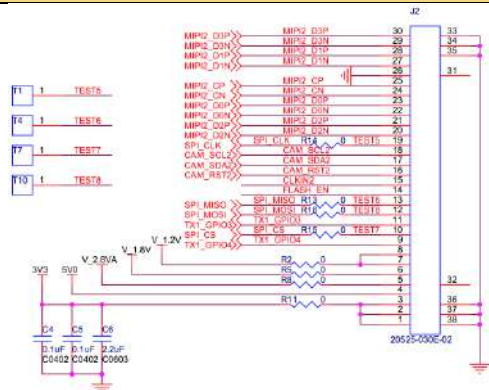
### Interface J1

- Part#: 20525-030E-02C
- Number of Positions: 30
- Pitch: 0.4mm
- Mating I-PEX cable: FAW-1233-03 (300mm)



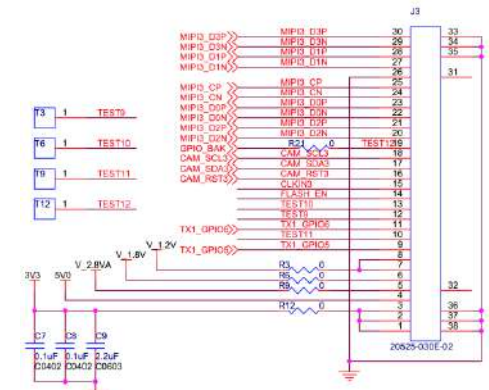
### Interface J2

- Part#: 20525-030E-02C
- Number of Positions: 30
- Pitch: 0.4mm
- Mating I-PEX cable: FAW-1233-03 (300mm)



### Interface J3

- Part#: 20525-030E-02C
- Number of Positions: 30
- Pitch: 0.4mm
- Mating I-PEX cable: FAW-1233-03 (300mm)



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

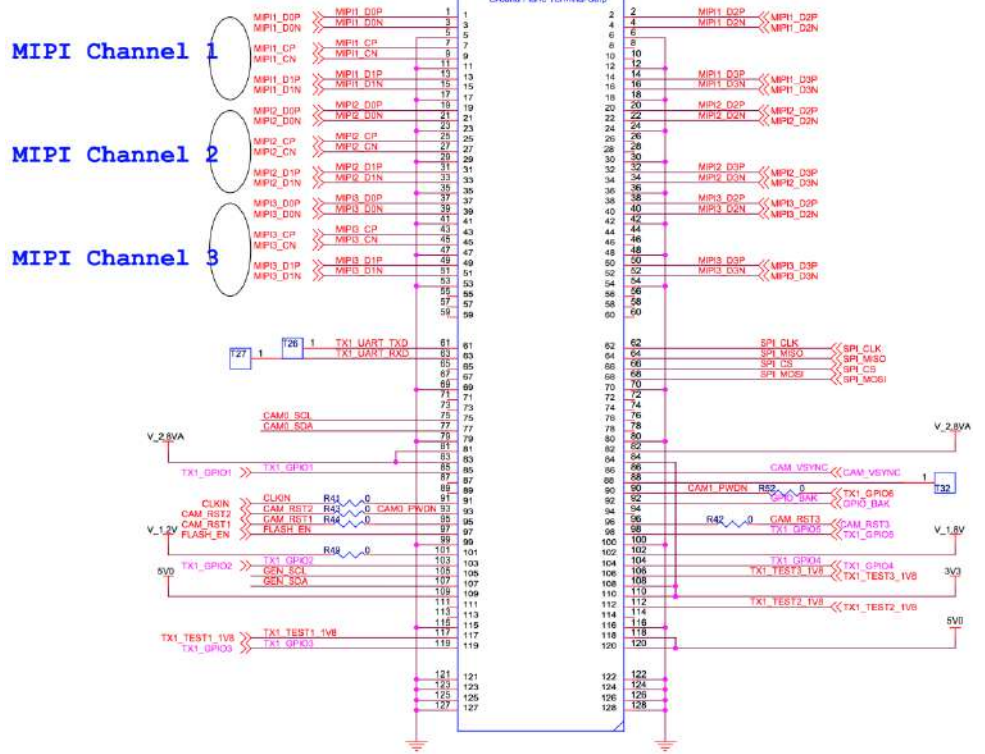


Leopard Imaging Inc.

# Interface J10

- Part#: QTH-060-01-L-D-A
- Number of Positions: 120
- Number of Rows: 2
- Pitch: 0.5 mm

## Vertical Mating connector of Jetson TX1 J22



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

# LI-IMX274-MIPI-M12



<b>Camera Spec</b>	
Image Sensor	Sony Diagonal 7.20 mm (Type 1/2.5) CMOS Image Sensor IMX274
Optical format	1/2.5"
Number of active pixels	3864 (H) x 2196 (V)
Pixel size	1.62um (H) x 1.62um (V)
Color or Mono	Color
Interface	MIPI interface
Lens mount	M12
Weight	14 g
<b>Interfaces</b>	
<b>Interface J2:</b> <ul style="list-style-type: none"> <li>Part#: 20525-030E-02C</li> <li>Number of Positions: 30</li> <li>Pitch: 0.4mm</li> <li>Mating I-PEX cable: FAW-1233-03 (300mm)</li> </ul>	
<b>Interface J3:</b> <ul style="list-style-type: none"> <li>Part#: 1734829-2</li> <li>Number of Positions: 2</li> <li>Pitch: 1.25mm</li> </ul>	
<b>Interface J5:</b> <ul style="list-style-type: none"> <li>Part#: 1734829-2</li> <li>Number of Positions: 2</li> <li>Pitch: 1.25mm</li> </ul>	



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

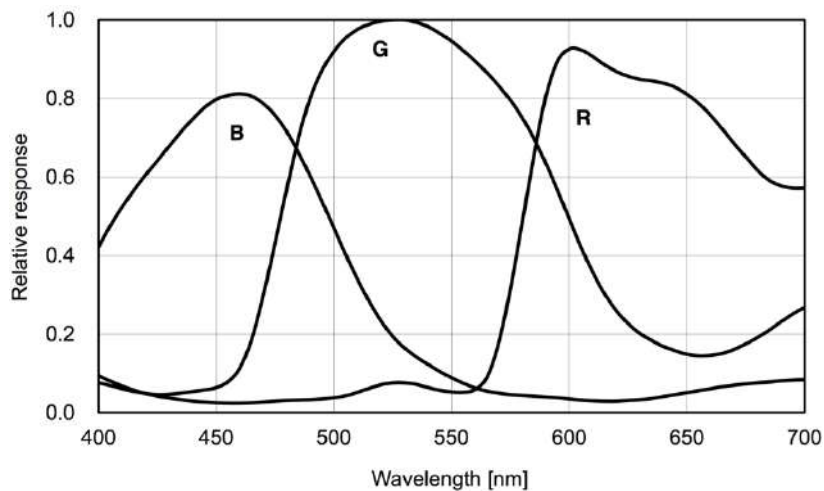
Item	Symbol	Rating	Unit
Supply voltage (Analog)	$V_{ADD}^{*1}$	$2.8 \pm 0.1$	V
Supply voltage (Digital 1)	$V_{DDD1}^{*2}$	$1.2 \pm 0.1$	V
Supply voltage (Digital 2)	$V_{DDD2}^{*3}$	$1.8 \pm 0.1$	V
Input voltage (Digital)	$V_I$	-0.1 to $V_{DDD2} + 0.1$	V

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

\*2  $V_{DDD1}$ :  $V_{DDL CN}$ ,  $V_{DDL SC1}$  to 2,  $V_{DDL PA}$ ,  $V_{DDL PL1}$ ,  $V_{DDL PL2}$  to 3,  $V_{DDL IF}$  (1.2 V power supply)

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

## Spectral Sensitivity Characteristics



## DC Characteristics

### Current Consumption and Gain Variable 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	

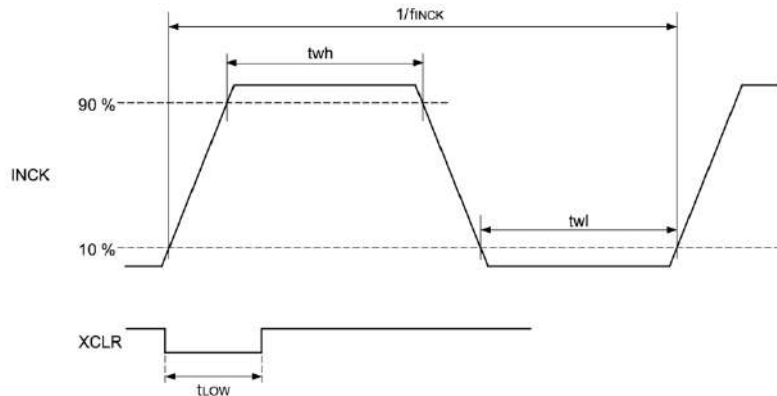
### Supply Voltage and I/O Voltage

Item	Pins	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	Analog $V_{DDSUB}$ , $V_{DDHCM}$ , $V_{DDHPX}$ , $V_{DDHDA}$ , $V_{DDHCP}$	$V_{ADD}$	2.70	2.80	2.90	V
	Digital 1 $V_{DDL CN}$ , $V_{DDLSC1}$ to 2, $V_{DDLPL1}$ , $V_{DDLPA}$ , $V_{DDLPL2}$ to 3, $V_{DDLIF}$	$V_{DDD1}$	1.10	1.20	1.30	V
	Digital 2 $V_{DDMIO}$ , $V_{DDMIF}$	$V_{DDD2}$	1.70	1.80	1.90	V
Digital input voltage	SDA, SCL	$V_{IH1}$	$0.7 \times V_{DDD2}$	—	1.9	V
		$V_{IL1}$	-0.3	—	$0.3 \times V_{DDD2}$	V
	XCLR, INCK	$V_{IH2}$	$0.65 \times V_{DDD2}$	—	$V_{DDD2} + 0.3$	V
		$V_{IL2}$	-0.3	—	$0.35 \times V_{DDD2}$	V
Digital output voltage	XHS, XVS	$V_{HVOUT}$	—	$V_{DDD2}$	—	V



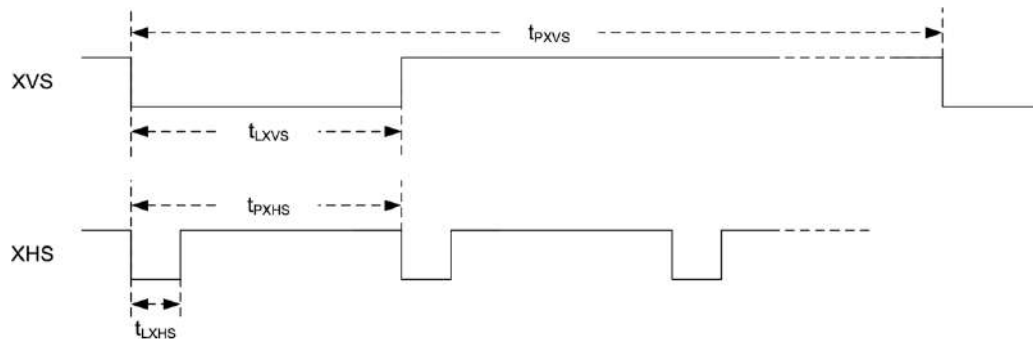
## AC Characteristics

### 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	

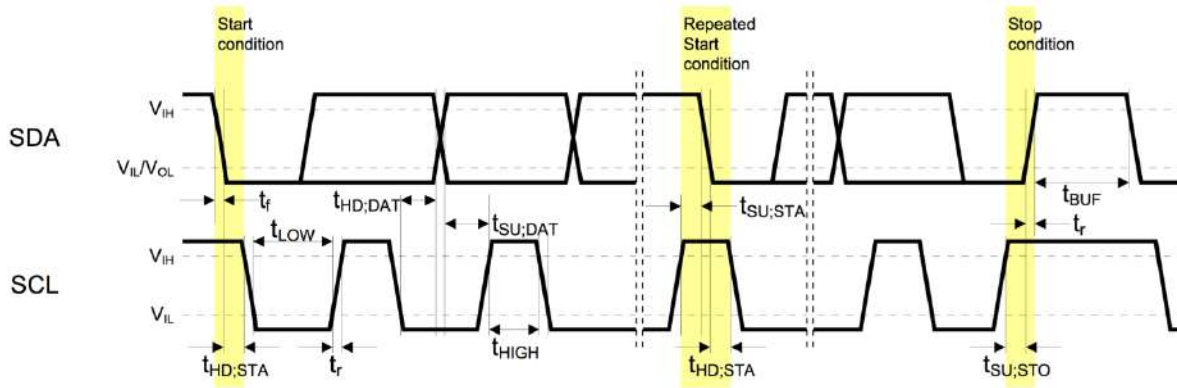
\*1 The value set as HMAX (address 30F6h, bit [7:0] and address 30F7h, bit [7:0])

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





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



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

Item	Symbol	Min.	Typ.	Max.	Unit	Remarks
Low level input voltage	V <sub>IL</sub>	-0.3	—	0.3 × V <sub>DD2</sub>	V	
High level input voltage	V <sub>IH</sub>	0.7 × V <sub>DD2</sub>	—	1.9	V	
Low level output voltage	V <sub>OL</sub>	0	—	0.2 × V <sub>DD2</sub>	V	V <sub>DD2</sub> < 2 V, Sink 3 mA
Output fall time	tof	—	—	250	ns	Load 10 pF to 400 pF, 0.7 × V <sub>DD2</sub> to 0.3 × V <sub>DD2</sub>
Input current (SCL, SDA, XCLR, INCK)	li	-10	—	10	μA	0.1 × V <sub>DD2</sub> to 0.9 × V <sub>DD2</sub>
Input capacitance of SCL / SDA	Ci	—	—	10	pF	

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

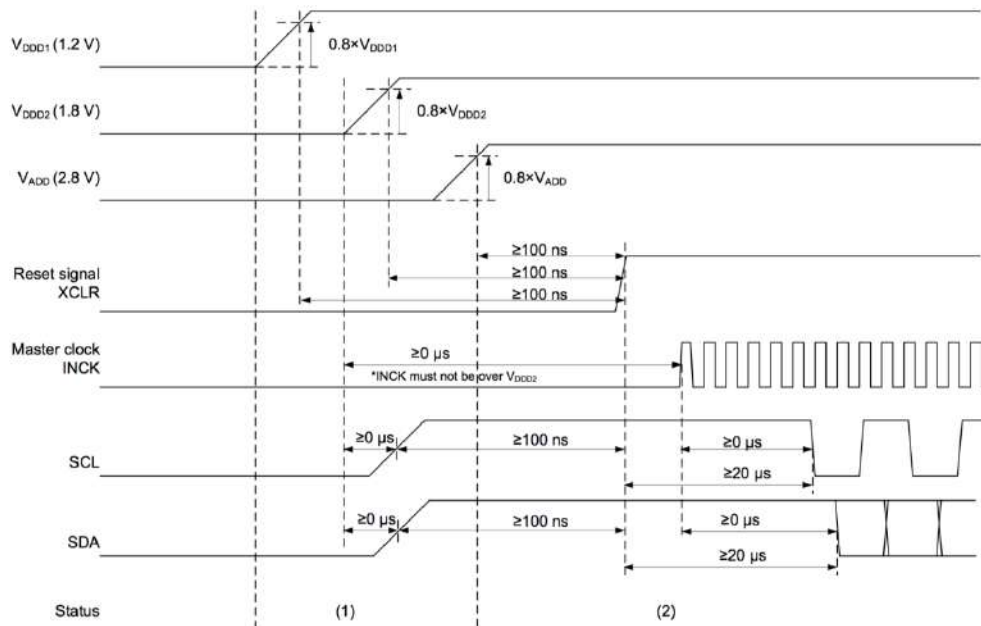
Item	Symbol	Min.	Typ.	Max.	Unit
SCL clock frequency	f <sub>SCL</sub>	0	—	400	kHz
Hold time (Start Condition)	t <sub>HD,STA</sub>	0.6	—	—	μs
Low period of the SCL clock	t <sub>LOW</sub>	1.3	—	—	μs
High period of the SCL clock	t <sub>HIGH</sub>	0.6	—	—	μs
Set-up time (Repeated Start Condition)	t <sub>SU,STA</sub>	0.6	—	—	μs
Data hold time	t <sub>HD,DAT</sub>	0	—	0.9	μs
Data set-up time	t <sub>SU,DAT</sub>	100	—	—	ns
Rise time of both SDA and SCL signals	t <sub>r</sub>	—	—	300	ns
Fall time of both SDA and SCL signals	t <sub>f</sub>	—	—	300	ns
Set-up time (Stop Condition)	t <sub>SU,STO</sub>	0.6	—	—	μs
Bus free time between a STOP and START Condition	t <sub>BUF</sub>	1.3	—	—	μs



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

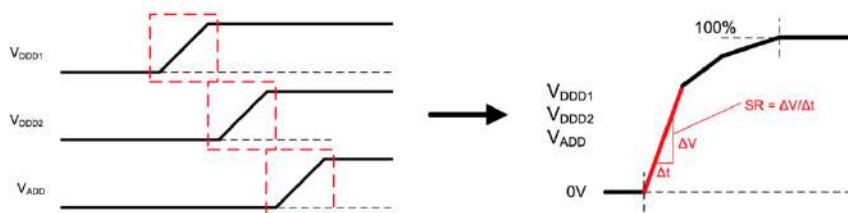
# Power-on Sequence



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 <sub>ADD</sub> , V <sub>DD1</sub> , and V <sub>DD2</sub> .
(2) Register communication period for standby cancel	Wait 100 ns after the last power supply in V <sub>ADD</sub> , V <sub>DD1</sub> and V <sub>DD2</sub> . 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.



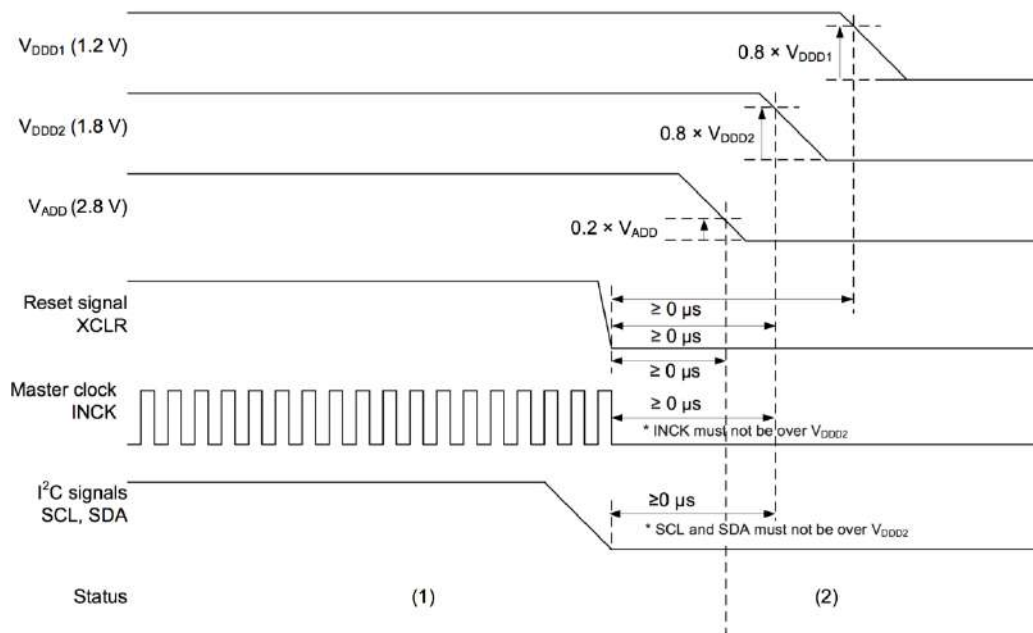
Item	Symbol	Power supply	Min.	Max.	Unit	Remarks
Slew rate	SR	V <sub>DD1</sub> (1.2 V)	—	25	mV/us	
		V <sub>DD2</sub> (1.8 V)	—	25	mV/us	
		V <sub>ADD</sub> (2.8 V)	—	25	mV/us	



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	Turn the power supplies off after all input signals are set to "Low" level except SCL and SDA. Set SCL and SDA to "Low" level at the same time with turning off the power supply of V <sub>DD2</sub> . There are no constraints of the power-off sequence with V <sub>DD</sub> , V <sub>DD1</sub> , and V <sub>DD2</sub> .



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



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.