

ILIM2V Controller

Datasheet

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Document Revision History

Version	Data	Author	Description
1.00	2012/4/13	Jay	First Release version
1.01	2012/05/18	Jay	Modified typing error. Modified pin configuration
1.02	2012/8/27	Jay Lee	Modified Naming
1.03	2012/10/15	Roy Lo	1, Package Pin name 2, Power On Timing
1.04	2013/6/11	Alan Liu	Modified DC Characteristics
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1.07	2014/01/10	Alan Liu	Modified LDO & VDD33 capacitor value.

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1 Description

ILIM2V is a 32-bit microcontroller that can work together with ILITek capacitive touch panel IC through SPI interfaces. ILIM2V can be designed with multiple ILI2152/ILI2301s series in cascade mode for 10.1” to 32” applications.

2 Feature

- 32-bit microcontroller
- Support 4-wire high-speed SPI interface.
- Support 2-wire high-speed I²C interface.
- Support USB 1.1 interface.
- 48 pin LQFP package.

3 Block Diagram

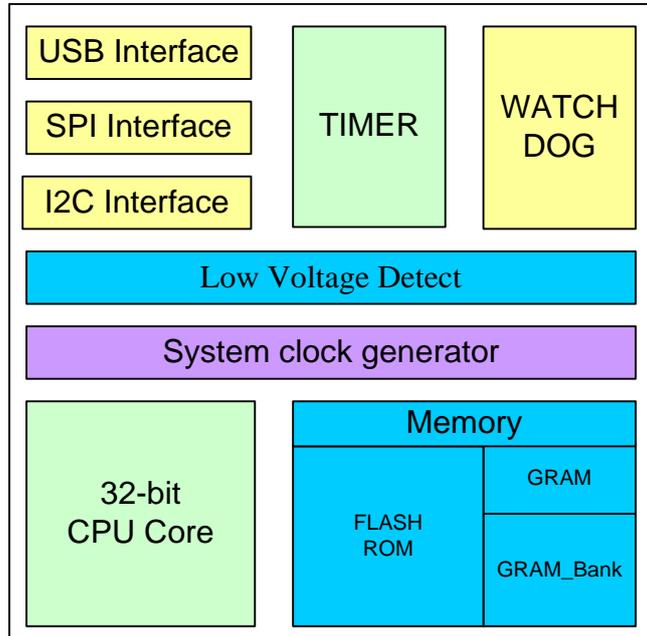


Figure 3-1: ILIM2V Block Diagram

4 Pin Configuration

4.1 ILIM2V (LQFP48)

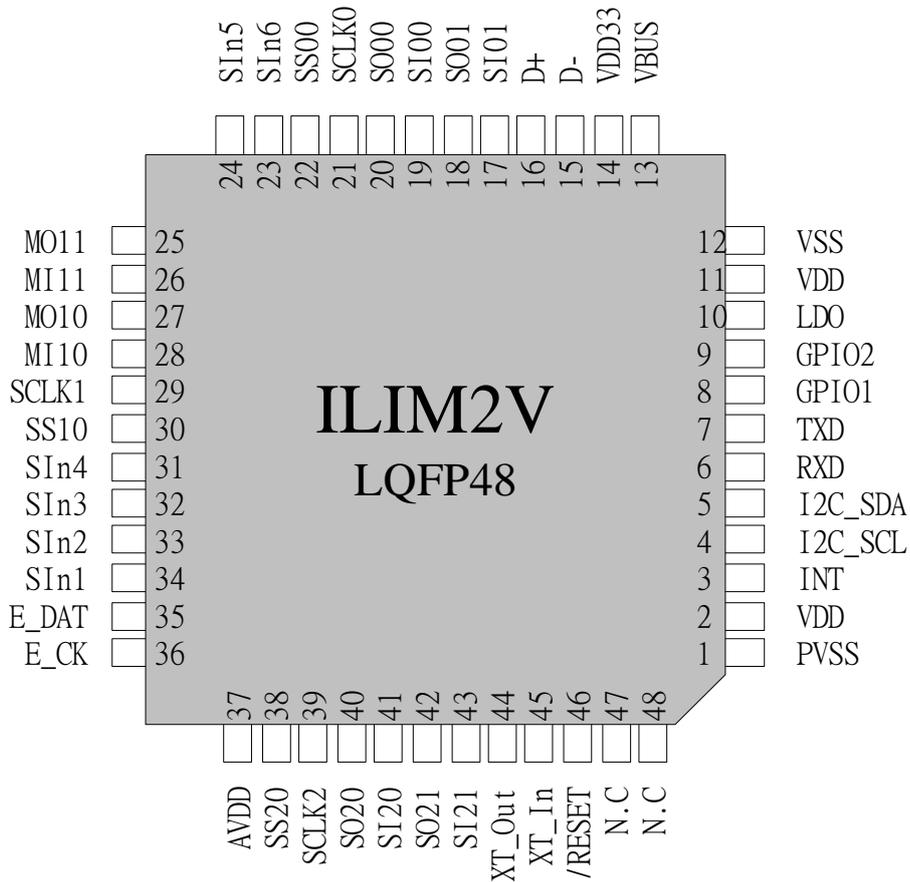


Figure 4-1: ILIM2V (LQFP48) Package Diagram

Table 4-1: ILIM2V Pin Assignments

Pin No.	Name	Type	Description
1	PVSS	I/O (D)	PLL Ground.
2	VDD	VDD (P)	Power Input
3	INT	I/O (D)	Interrupt pin for touch activities reports
4	I2C_SCL	I/O (D)	I2C clock pin
5	I2C_SDA	I/O (D)	I2C data input/output pin
6	RX	I/O (D)	RS232 debug port
7	TX	I/O (D)	RS232 debug port
8	GPIO1	I/O (D)	Digital GPIO pin
9	GPIO2	I/O (D)	Digital GPIO pin
10	LDO	VDD (P)	Connect a capacitor to GND. Typical 4.7uF.
11	VDD	VDD (P)	Power Input
12	VSS	GND	GND
13	VBUS	VDD (P)	USB Power Input
14	VDD33	VDD (P)	Connect a capacitor to GND. Typical 2.2uF.
15	D-	I/O (D)	USB D- data pin
16	D+	I/O (D)	USB D+ data pin
17	SI01	I/O (D)	SPI channel 01 data input
18	SO01	I/O (D)	SPI channel 01 data output
19	SI00	I/O (D)	SPI channel 00 data input
20	SO00	I/O (D)	SPI channel 00 data output
21	SCLK0	I/O (D)	SPI channel 0 Clock
22	SS00	I/O (D)	SPI channel 00 Chip select
23	Sin6	I(D)	For ILI2152/ILI2301S Chip Connector
24	SIn5	I(D)	For ILI2152/ILI2301S Chip Connector
25	MO11	I/O (D)	SPI channel 11 data output
26	MI11	I/O (D)	SPI channel 11 data input
27	MO10	I/O (D)	SPI channel 10 data output
28	MI10	I/O (D)	SPI channel 10 data input
29	SCLK1	I/O (D)	SPI channel 1 Clock
30	SS10	I/O (D)	SPI channel 10 Chip select
31	SIn4	I(D)	For ILI2152/ILI2301S Chip Connector
32	Sin3	I(D)	For ILI2152/ILI2301S Chip Connector
33	Sin2	I(D)	For ILI2152/ILI2301S Chip Connector
34	Sin1	I(D)	For ILI2152/ILI2301S Chip Connector

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35	E_DAT	I/O (D)	Emulation data port
36	E_CK	I/O (D)	Emulation clock port
37	AVDD	VDD (P)	Analog Power Input for internal PLL
38	SS20	I/O (D)	SPI channel 20 Chip select
39	SCLK2	I/O (D)	SPI channel 2 Clock
40	SO20	I/O (D)	SPI channel 20 data output
41	SI20	I/O (D)	SPI channel 20 data input
42	SO21	I/O (D)	SPI channel 21 data output
43	SI21	I/O (D)	SPI channel 21 data input
44	XT_Out	CLK	External crystal clock output
45	XT_In	CLK	External crystal clock input
46	$\overline{\text{Reset}}$	I/O (D)	Reset pin (active low)
47	N.C	--	Not Connect
48	N.C	--	Not Connect

Table 4-2: Type Define

Symbol	Description
(D)	Digital pad
(P)	Power pad
CLK	Clock
IO	input / output pad
VDD	supply voltage
GND	ground

5 Electrical Characteristics

5.1 Absolute Maximum Ratings

The absolute maximum rating is listed on following table. When ILIM2V is used out of the absolute maximum ratings, the ILIM2V may be permanently damaged. These are stress ratings only. Functional operation of this device at these or under any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability of the device.

Table 5-1: Absolute Maximum Ratings

Item	Symbol	Min	Max	Unit
USB 5V input power supply voltage	VBUS	-0.3	6.0	V
Digital input power supply voltage	VDD	-0.3	6.0	V
Analog input power supply voltage	AVDD	-0.3	6.0	V
Operating temperature	T _{opr}	-20	+85	°C
Storage temperature	T _{stg}	-55	+125	°C

5.2 DC Characteristics

Table 5-2: Input Power Supply and LDO

(GND = 0V, T_{opr} = 25°C)

Item	Symbol	Min	Typ.	Max	Unit	Condition
USB 5V input power supply voltage	VBUS	4.75	5	5.25	V	@ USB
Digital input power supply voltage	VDD	2.7 4.75	5	5.5 5.25	V	@ I ² C @ USB
Analog input power supply voltage	AVDD	2.7 4.75	5	5.5 5.25	V	@ I ² C @ USB
3.3V LDO output voltage	VDD33	-10%	3.3	+10%	V	
1.8V LDO output voltage	LDO	-10%	1.8	+10%	V	

Table 5-3: DC Characteristics

(V_{DD} = 3.3, GND = 0V, T_{opr} = 25°C)

Item	Symbol	Min	Typ.	Max	Unit	Condition
Power Ground	VSS	-0.3			V	
Operation current	I _{op}	-20%	55	+20%	mA	VDD=5.5V@72MHz
Standby current (Sleep Mode)	I _{ST}	-20%	12	+20%	μA	
Input Low Voltage	V _{IL1}	-0.5		0.3 VDD	V	
Input High Voltage	V _{IH1}	0.65 VDD		VDD +0.5	V	
Hysteresis voltage	V _{HY}		0.2V _{DD}		V	
Input Low Voltage, XT_In	V _{IL2}	0		0.6	V	VDD=3.3V
Input High Voltage, XT_In	V _{IH2}	2.6		VDD+0.2	V	VDD=3.3V
Negative going threshold, /Reset	V _{ILS}	-0.5		0.2VDD	V	
Positive going threshold, /Reset	V _{IHS}	0.6V _{DD}		VDD+0.5	V	
Output Low Voltage	V _{OH}	0.7V _{DD}			V	VDD =3.3V, I _{OH} = 8mA
Output High Voltage	V _{OL}			0.3VDD	V	VDD =3.3V, I _{OL} = 10mA

Table 5-4: USB DC Characteristics

Item	Symbol	Min	Typ.	Max	Unit	Condition
Input Low	V_{IL}			0.8	V	
Input High (driven)	V_{IH}	2.0			V	
Differential input sensitivity	V_{DI}	0.2			V	(D+) – (D-)
Differential common-mode range	V_{CM}	0.8		2.5	V	Includes V_{DI} range
Single-ended receiver threshold	V_{SE}	0.8		2.0	V	
Receiver hysteresis	V_{RH}		200		mV	
Output low (driven)	V_{OL}	0		0.3		
Output high (driven)	V_{OH}	2.8		3.6		
Output signal cross voltage	V_{CRS}	1.3		2.0		
Pull-up resistor	R_{PU}	1.425		1.575		
Pull-down resistor	R_{PD}	14.25		15.75		
Termination Voltage for upstream port pull up (RPU)	V_{TRM}	3.0		3.6		

Item	Symbol	Min	Typ.	Max	Unit	Condition
Input clock frequency	f_{XIN}	-1%	12	+1%	MHz	External crystal

5.3 Power on Timing

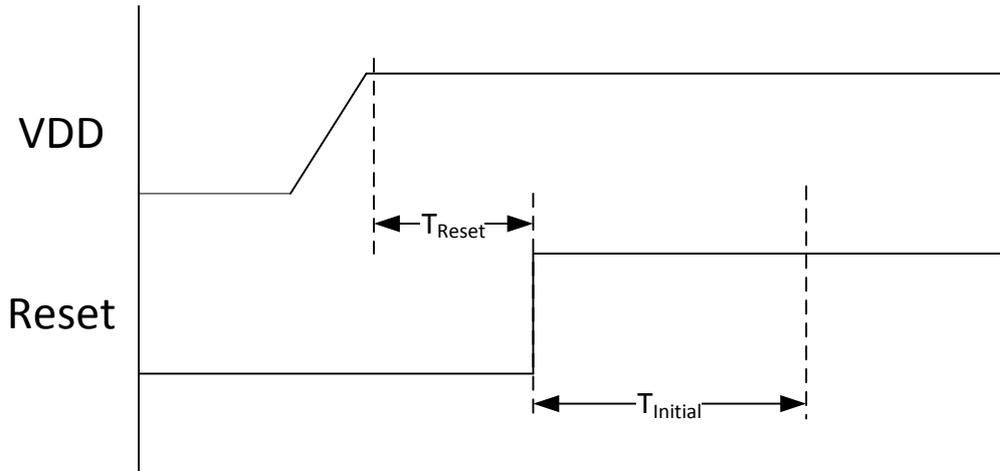


Table 5-4: Power On Timing

(VDD = 3.3, GND = 0V, $T_{opr} = 25^{\circ}\text{C}$)

Item	Min	Typ.	Max	Unit	Condition
T_{Reset}	50	-	-	uS	
$T_{initial}$	100	-	-	mS	

6 Package Information

6.1 LQFP48

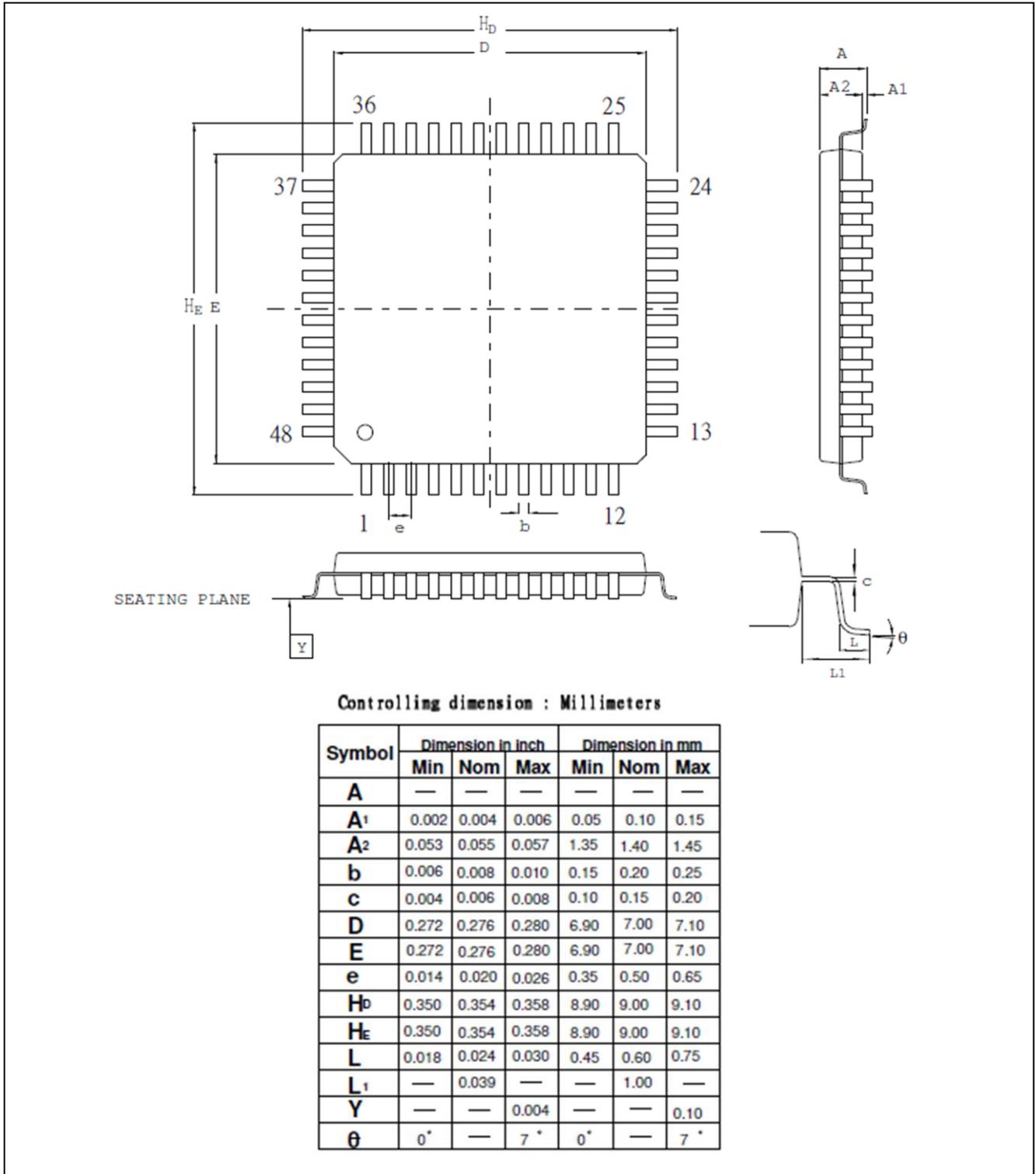


Figure 6-1: Package Information of LQFP48

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