

IS917

USB3.0 Flash Disk Controller

Datasheet

Version. 0.91



Copyright © 2013 Innostor Technology Corporation.
All rights reserved.

Innstor Technology Corporation

IS917 USB3.0 Flash Disk Controller

© Copyright Innstor Technology Corporation

All Rights Reserved.

No part of this document may be reproduced or transmitted in any form or by any means. All information contained in this document is subject to change without notice. The products described in this document are not intended for use implantation or other life supports application where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Innstor Technology Corporation product specification or warranties. Nothing in this document shall operate as an express or implied license or environments, and is presented as an illustration. The results obtained in other operating environments may vary.

THE INFORMATION CONTAINED IN THIS DOCUMENT IS PROVIDED ON AN "AS IS" BASE. In no event will Innstor be liable for damages arising directly or indirectly from any use of the information contained in this document.

Innstor Technology Corporation
2F, No.8, Lane 32, Xianzheng 5th St.,
Jhubei City, Hsinchu County 302, Taiwan

Innostor Technology Corporation

IS917 USB3.0 Flash Disk Controller

Table of Contents :

1. DESCRIPTION	4
2. FEATURES	5
3. PIN ASSIGNMENT	6
3.1 QFN-48 Pin Assignment	6
3.2 Pin Descriptions	7
4. SYSTEM APPLICATION CONFIGURATIONS	9
4.1 QFN-48 configuration examples.....	9
5. ELECTRICAL CHARACTERISTICS	10
5.1 Absolute Maximum Ratings	10
5.2 Operating Conditions.....	10
5.3 DC Characteristics.....	11
6. PACKAGE INFORMATION	13
6.1 QFN-48 package outline dimension	13
7. Block Diagram	14

Innostor Technology Corporation

IS917 USB3.0 Flash Disk Controller

Revision History

No	Date	History
V.0.90	2013/05/28	Initial version
V.0.91	2013/06/20	Added Block Diagram

1. Description

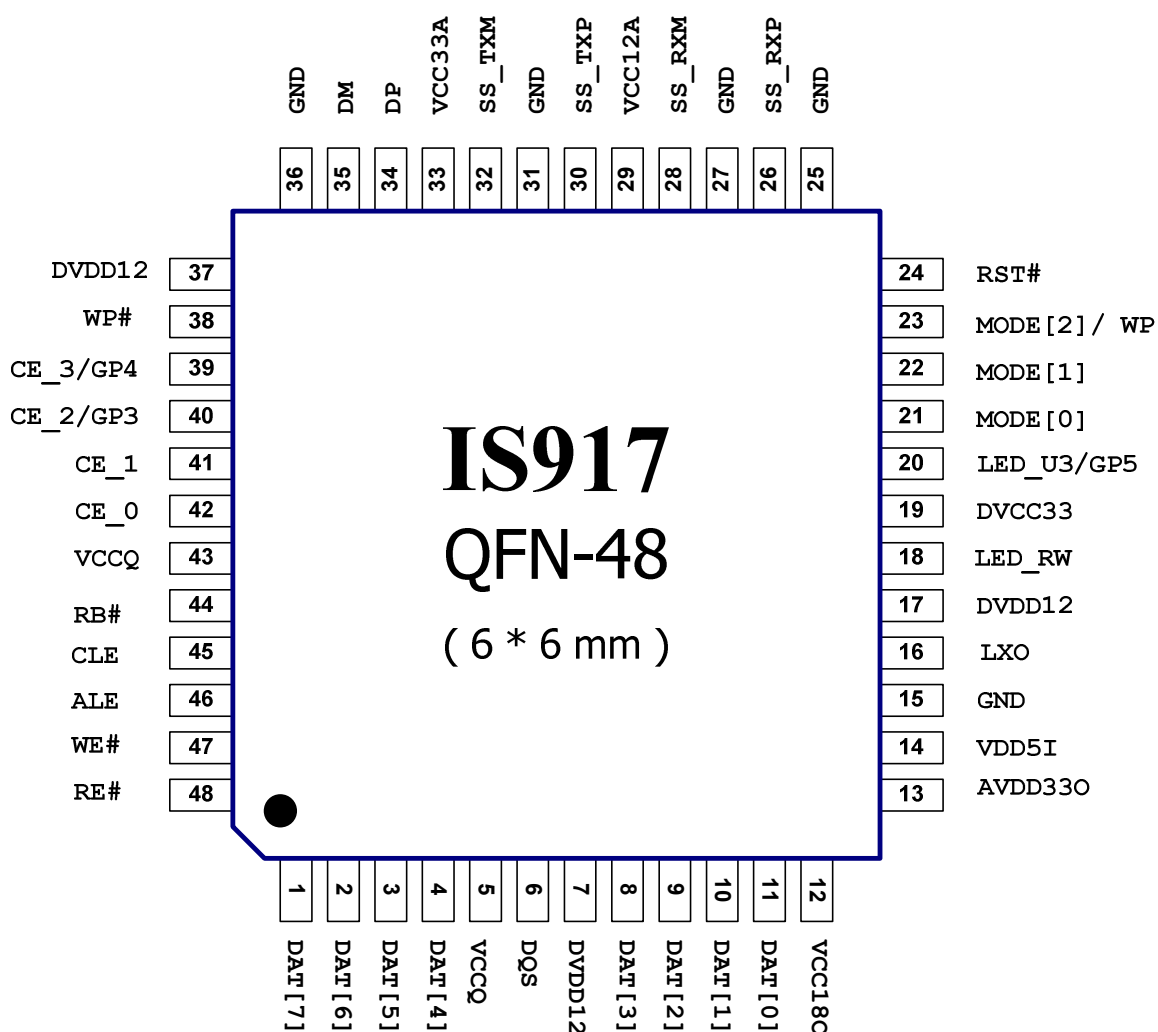
IS917 is the latest USB-3.0 interface Nand Flash Controller. With flexible firmware code supporting, IS917 can support various flash technology including 8k / 16k page TLC / MLC / SLC by different 2xnm / 2ynm / 1xnm / 1ynm process for major flash vendors.

2. Features

- ◆ One Channel data bus by small footprint package
- ◆ Up to 8 CEs supported(Die form)
- ◆ ECC protect up to 70 bit (configurable) by 1K bytes
- ◆ 2xnm, 2ynm, 1xnm, 1ynm : SLC / MLC / TLC types NAND Flash supported
- ◆ ONFI 2.1 spec. interface supported
- ◆ Toggle DDR interface supported
- ◆ Compliant with USB 3.0 spec. version 1.0
- ◆ Compliant with USB 2.0 spec. backward compatible with USB1.1
- ◆ Compliant with USB Mass Storage Class spec. version 1.0
- ◆ High performance 8051 with hardware acceleration DMA
- ◆ F/W off-load engine embedded
- ◆ 1.2V low power consumption design
- ◆ LED indicator to show link status and r/w traffic
- ◆ Customized VID/ PID with serial number
- ◆ Built-in LDO regulator
- ◆ 25Mhz Crystal

3. Pin Assignment

3.1 QFN-48 Pin Assignment



Innoster Technology Corporation

IS917 USB3.0 Flash Disk Controller

3.2 Pin Descriptions

Pin Name	Pin #	Pull up/Down	Attribute	Description
DAT[7]	1	Down	I/O	Flash data bit [7]
DAT[6]	2	Down	I/O	Flash data bit [6]
DAT[5]	3	Down	I/O	Flash data bit [5]
DAT[4]	4	Down	I/O	Flash data bit [4]
VCCQ	5		PWR	3.3V/1.8V IO Power input
DQS	6	Down	I/O	Flash DQS
DVDD12	7		PWR	1.2V Core power input
DAT[3]	8	Down	I/O	Flash data bit [3]
DAT[2]	9	Down	I/O	Flash data bit [2]
DAT[1]	10	Down	I/O	Flash data bit [1]
DAT[0]	11	Down	I/O	Flash data bit [0]
VCC18O	12		PWR	Regulator 1.8V output
AVDD33O	13		PWR	Regulator 3.3V output
VDD5I	14		PWR	Regulator 5V input
GND	15		GND	GND
LXO	16		PWR	LXO
DVDD12	17		PWR	1.2V Core power input
LED_RW	18		I/O	R/W Access LED
DVCC33	19		PWR	3.3V IO Power input
LED_U3			I/O	USB Mode LED
MODE[0]	20	Down	I	Test mode pin, tie to GND
MODE[1]	22	Down	I	Test mode pin, tie to GND
MODE[2]	23	Down	I	Test mode pin, tie to GND
RST#	24	Up	I	Reset
GND	25		GND	GND
SS_RXP	26		I/O	USB 3.0 differential receive pin positive

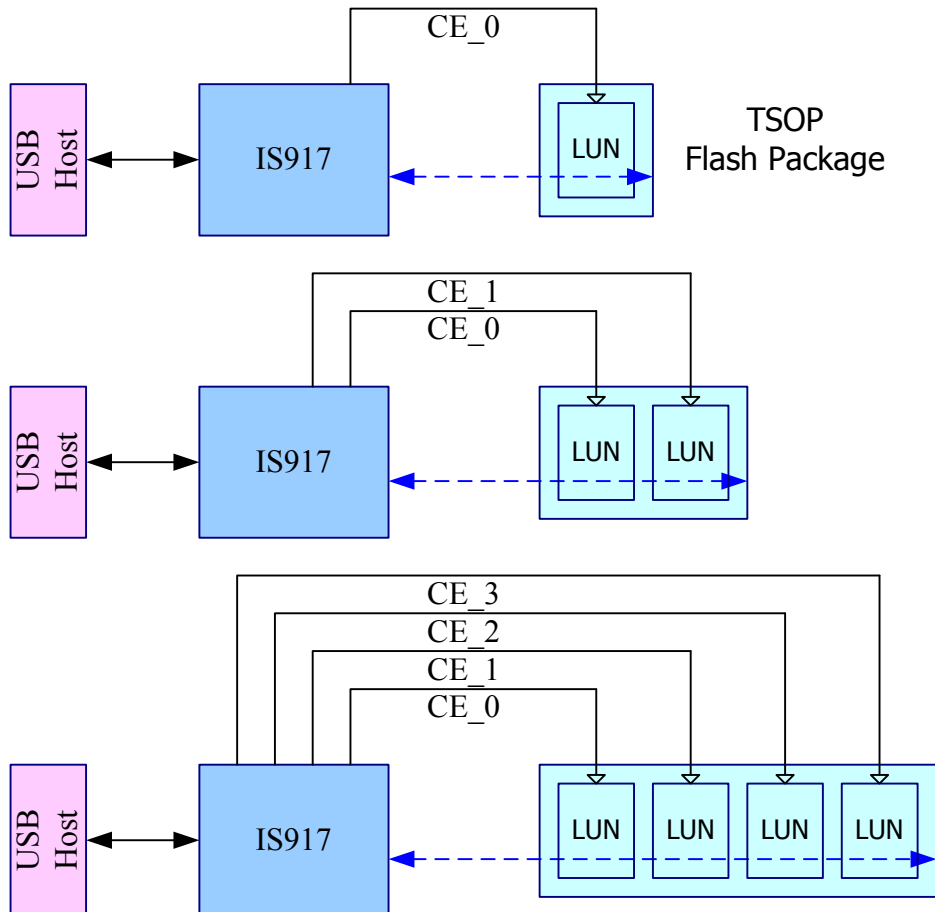
Innostor Technology Corporation

IS917 USB3.0 Flash Disk Controller

GND	27			GND
SS_RXM	28		I/O	USB 3.0 differential receive pin negative
VCC12A	29		PWR	1.2V analog power input
SS_TXP	30		I/O	USB 3.0 differential transmit pin positive
GND	31			GND
SS_TXM	32		I/O	USB 3.0 differential transmit pin negative
VCC33A	33		PWR	3.3V analog power input
DP	34		I/O	USB 2.0 differential pin plus
DM	35		I/O	USB 2.0 differential pin minus
GND	36			GND
DVDD12	37			1.2 core power input
WP#	38		O	Flash write protection
CE_3	39		O	Flash chip enable 3
CE_2	40		O	Flash chip enable 2
CE_1	41		O	Flash chip enable 1
CE_0	42		O	Flash chip enable 0
VCCQ	43			3.3/1.8V IO power
RB#	44	Up	I	Flash Ready / Busy Status
CLE	45		O	Flash Channel Command latch
ALE	46		O	Flash Channel Address latch
WE#	47		O	Flash Channel WE#
RE#	48		O	Flash Channel RE#

4. System Application Configurations

4.1 QFN-48 configuration examples



5. Electrical Characteristics

5.1 Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T _{storage}	-40	150	C
5.0V supply power	V _{in50}	-0.3	5.5	V
3.3V supply power	V _{in33}	-0.3	3.63	V
1.2V supply power	V _{in12}	-0.3	1.32	V
1.8V supply power	V _{in18}	-0.3	1.98	V

5.2 Operating Conditions

Parameter	Symbol	Min.	Max.	Unit
Operating Temperature	T _{operating}	0	70	C
USB VBUS	VBUS	4.5	5.5	V
Regulator 5V IN	V5IN	4.5	5.5	V
Regulator 3.3V IN	V33I	3.0	3.6	V
Analog 3.3V power	VCC33A	3.15	3.45	V
Analog 1.2V power	VCC12A	1.14	1.26	V
Digital 3.3V power	DVDD33	2.97	3.63	V
Digital 1.2V power	DVDD12	1.08	1.32	V

5.3 DC Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
USB bus power	VBUS_cur			310	mA
Analog 3.3V power U3	V33A_cur_u3		TBD		mA
Analog 1.2V power U3	V12A_cur_u3		TBD		mA
Analog 3.3V power U2	V33A_cur_u3		TBD		mA
Analog 1.2V power U2	V12A_cur_u3		TBD		mA
Analog 3.3V Suspend	V33A_cur_sus		TBD		mA
Analog 1.2V Suspend	V12A_cur_sus		TBD		mA
Digital 3.3V power	DVDD33_cur		TBD		mA
Digital 1.2V power	DVDD12_cur		TBD		mA

DC Characteristics of 3.3V IO

Parameter	Symbol	Min.	Typ.	Max.	Unit
Digital 3.3V power	DVCC33/VCCQ	2.97	3.3	3.63	V
Input low voltage	Vil	-0.3		0.8	V
Input high voltage	Vih	2.0		DVCC33+0.3	V
Output low voltage	Vol			0.4	V
Output high voltage	Voh	2.4			V
Pull-up resistance	Rpu	59	78	123	KΩ
Pull-down resistance	Rpd	49	72	150	KΩ

DC Characteristics of 1.8V IO

Parameter	Symbol	Min.	Typ.	Max.	Unit
Digital 3.3V power	VCCQ	1.62	1.8	1.98	V

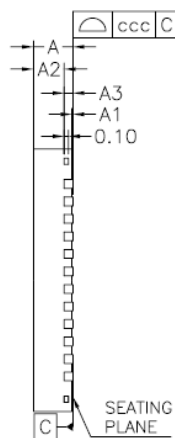
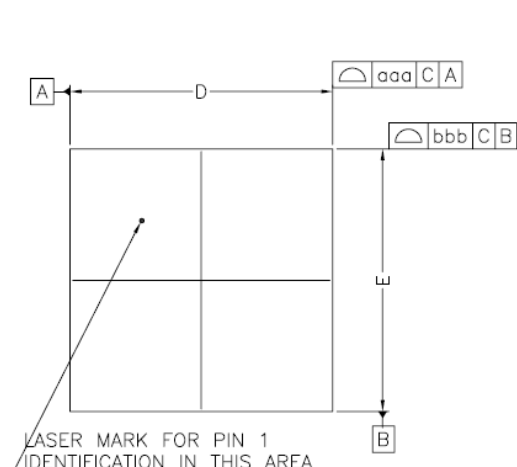
Innostor Technology Corporation

IS917 USB3.0 Flash Disk Controller

Input low voltage	Vil	-0.3		$0.35 \cdot V_{CCQ}$	V
Input high voltage	Vih	$0.65 \cdot V_{CCQ}$		$V_{CCQ} + 0.3$	V
Output low voltage	Vol			0.45	V
Output high voltage	Voh	$V_{CCQ} - 0.45$			V
Pull-up resistance	Rpu	112	176	320	K Ω
Pull-down resistance	Rpd	104	181	421	K Ω

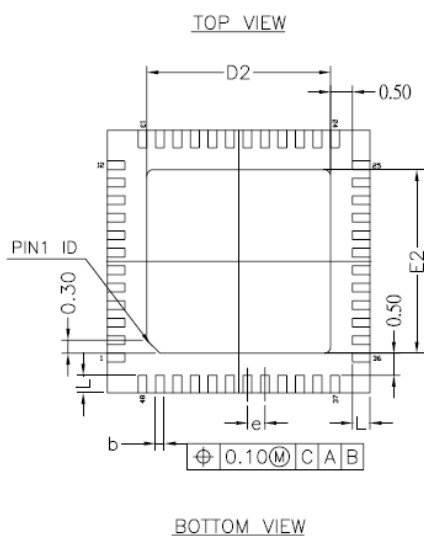
6. Package Information

6.1 QFN-48 package outline dimension



* CONTROLLING DIMENSION : MM

SYMBOL	MILLIMETER			INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.80	0.85	0.90	0.031	0.033	0.035
A1	0.00	0.035	0.05	0.000	0.001	0.002
A2	---	0.65	0.70	---	0.026	0.028
A3	0.203	REF.		0.008	REF.	
b	0.15	0.20	0.25	0.006	0.008	0.010
D	6.00	bsc		0.236	bsc	
D2	4.10	4.20	4.30	0.161	0.165	0.169
E	6.00	bsc		0.236	bsc	
E2	4.10	4.20	4.30	0.161	0.165	0.169
L	0.35	0.40	0.45	0.014	0.016	0.018
e	0.40	bsc		0.016	bsc	
TOLERANCES OF FORM AND POSITION						
aaa	0.10			0.004		
bbb	0.10			0.004		
ccc	0.08			0.003		



NOTES :

- 1.ALL DIMENSIONS ARE IN MILLIMETERS.
- 2.DIE THICKNESS ALLOWABLE IS 0.305 mm MAXIMUM(0.012 INCHES MAXIMUM)
- 3.DIMENSIONING & TOLERANCES CONFORM TO ASME Y14.5M. -1994.
- 4.THE PIN #1 IDENTIFIER MUST BE PLACED ON THE TOP SURFACE OF THE PACKAGE BY USING INDENTATION MARK OR OTHER FEATURE OF PACKAGE BODY.
- 5.EXACT SHAPE AND SIZE OF THIS FEATURE IS OPTIONAL.
- 6.PACKAGE WARPAGE MAX 0.08 mm.
- 7.APPLIED FOR EXPOSED PAD AND TERMINALS. EXCLUDE EMBEDDING PART OF EXPOSED PAD FROM MEASURING.
- 8.APPLIED ONLY TO TERMINALS.

TITLE		SCALE	PROJ.	DATE
PACKAGE OUTLINE				
48L SAWN QFN				
6.0x6.0x0.9 mm				
UNIT		TOLERANCE		REFERENCE DOCUMENT
		DIMENSION	ANGLE	
INCH / MM				

7. Block Diagram

