

# UD info Corp.

Industrial USB FLASH DISK

UFD-04AF Series

Product DataSheet

**UD info CORP.**

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## Revision History

Revision	Draft Date	History	Author
1.0	2014/5/23	New release	Migo Huang
1.1	2014/1/8	Modify Part number decoding	Migo Huang



## 1. TERMINOLOGY

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UDinfo industrial USB disk is a solid-state design with USB 2.0 compatible device, which is ideally used as reliable data storage for rugged and embedded application. All components are assembled with industrial grade material that works well even under extreme shock and vibration environment. Thus providing an excellent solution for mobile applications with space limitations. It is fully compatible with all consumer and industrial applications designed for data storage, allowing simple use for the end user.

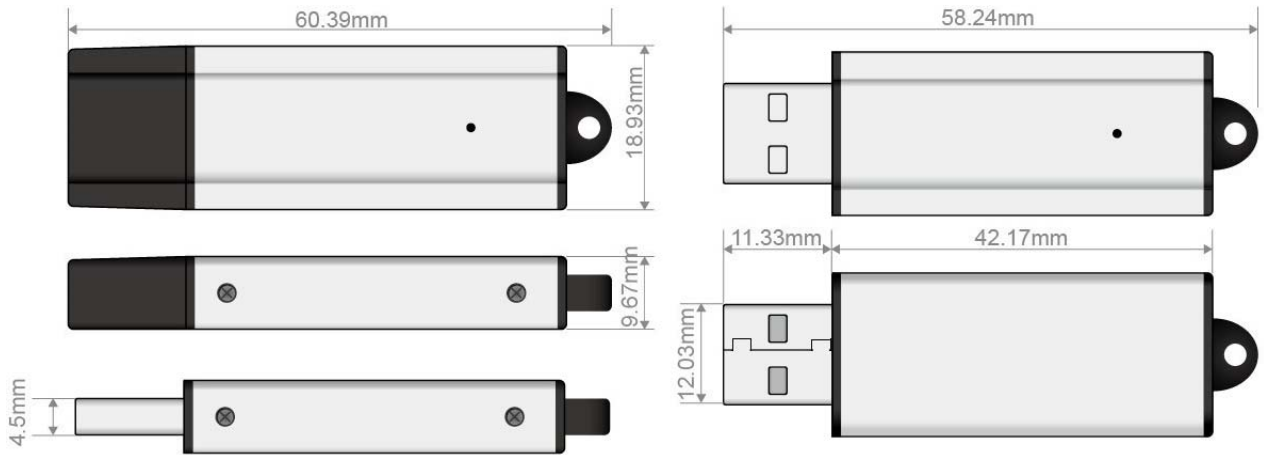
## 2. FEATURES

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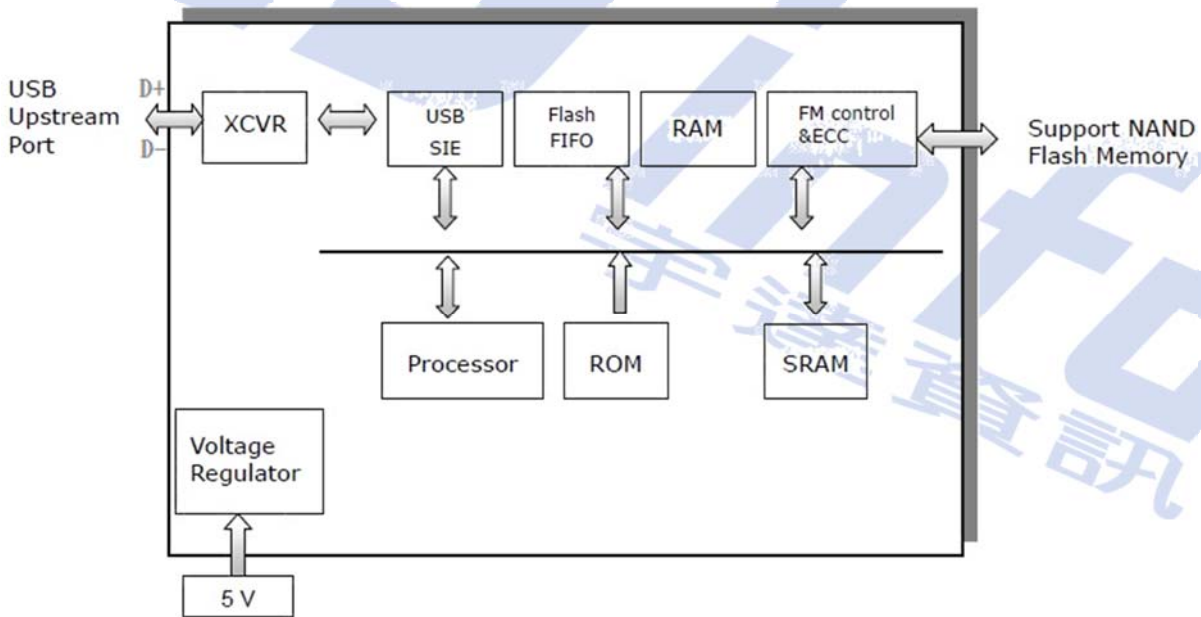
- **Compliant with USB specification 2.0**
- **No external power or battery needed**
- **LED indicates the usage status of USB Flash Disk**
- **Support low power mode**
- **Works with default driver under the environments of Windows Series, Mac 9.2, Mac OS X. ,Linux**
- **Support smart application**
  - Support partition management and lock disk function
  - Support password protection for access security

**3. DIMENSIONS**



unit : mm

**4. BLOCK DIAGRAM**



## 5. PIN ASSIGNMENTS



Pin Number	Pin Name	Function
1	VCC	Power
2	D-	The pairs are used to transmit Address, Data and Command.
3	D+	
4	VSS	Ground

## 6. SPECIFICATIONS



Host Interface	USB 2.0 Type A	
Storage Capacity	128MB-8GB	
Weight	18 g	
Data Retention	10 years	
MTBF	> 2,000,000 hours	
Erase Cycles	>100,000 times	
Media Transfer Rate	Read: 21 M Byte/sec Write: 20 M Byte /sec	
Power Supply	DC 5V ± 10% via the USB port	
Temperature Range	Standard Temperature	Operation: 0°C ~ +70°C Storage: -20°C ~ +80°C
	Wide Temperature	Operation: -40°C ~ +85°C Storage: -50°C ~ +95°C
Driver	Only in Win98/Win98SE need.	

## 7. ELCTRICAL CHARACTERISTICS



### ■ Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
$AV_{CC5V}$	5V Power Supply	-0.25 to $A_{CC}$ +0.25	V
$V_{CC}$	Power Supply	-0.3 to $V_{CC}$ +0.3	V
$V_{IN}$	Input Voltage	-0.3 to 3.6	V
$V_{OUT}$	Output Voltage	-0.3 to $V_{CC}$ +0.3	V
$T_{STG}$	Storage Temperature	-40 to 150	°C
$V_{CC3V}$	3.3V Power Supply	250	mA
$V_{18}$	1.8 Power Supply	250	mA

### ■ Recommended Operating Conditions

Symbol	Parameter	MIN	TYP	MAX	Unit
$A_{DD}$	5V Power Supply	4.75	5.0	5.26	V
$V_{CC}$	Power Supply	3.0	3.3	3.6	V
$V_{DD}$	Digital Supply	1.62	1.8	1.98	V
$V_{IN}$	Input Voltage	0	3.3	3.6	V
$T_{OPRS}$	Operating Standard Temperature	0		70	°C

### ■ USB Transceiver electrical characteristics

Symbol	Parameter	Condition	MIN	MAX	Unit
$AV_{CC}$	Analog supply Voltage		3.0	3.6	V
$V_{CC}$	Digital supply Voltage		1.62	1.98	V
$I_{CC}$	Operating supply current	High speed operating at 480 MHz		55	mA
$I_{CC(susp)}$	Suspend supply current	In suspend mode, current with 1.5kΩ pull-up resistor on pin RPU disconnected		120	μA

■ Static characteristic : Analog I/O pins (DP/DM)

Symbol	Parameter	Condition	MIN	TYP	MAX	Unit
USB2.0 Transceiver (HS)						
Input Levels (differential receiver)						
$V_{HSDIFF}$	High speed differential input sensitivity	$ V_{I(DP)} - V_{I(DM)} $ measured at the connection as application circuit	300			mV
$V_{HSCM}$	High speed data signaling common mode voltage range		-50		500	mV
$V_{HSSQ}$	High speed squelch detection threshold	Squelch detected			100	mV
		No squelch detected	150			mV
$V_{HSDSC}$	High speed disconnection detection threshold	Disconnection detected	625			mV
		Disconnection not detected			525	mV
Output Levels						
$V_{HSOI}$	High speed idle level output voltage(differential)		-10		10	mV
$V_{HSOL}$	High speed low level output voltage(differential)		-10		10	mV
$V_{HSOH}$	High speed high level output voltage(differential)		-360		400	mV
$V_{CHIRPJ}$	Chirp-J output voltage(differential)		700		1100	mV
$V_{CHIRPK}$	Chirp-K output voltage(differential)		-900		-500	mV

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Resistance						
R <sub>DRV</sub>	Driver output impedance	Equivalent resistance used as internal chip only	3	6	9	Ω
		Overall resistance including external resistor	40.5	45	49.5	Ω
Termination						
V <sub>TERM</sub>	Termination voltage for pull-up resistor on pin RPU		3.0		3.6	V
USB1.1 Transceiver(FS/LS)						
Input Levels(differential receiver)						
V <sub>DI</sub>	Differential input sensitivity	$ V_{I(DP)} - V_{I(DM)} $	0.2			V
V <sub>CM</sub>	Differential common mode voltage		0.8		2.5	V
Input Levels(single-ended receivers)						
V <sub>SE</sub>	Single ended receiver threshold		0.8		2.0	V
Output levels						
V <sub>OL</sub>	Low-level output voltage		0		0.3	V
V <sub>OH</sub>	High-level output voltage		2.8		3.6	V

$AV_{CC} = 3.0V \sim 3.6V$  ;  $V_{CC} = 1.62V \sim 1.98V$  ; Temp =  $0^{\circ}C \sim 70^{\circ}C$

## Dynamic characteristic

Symbol	Parameter	Condition	MIN	TYP	MAX	Unit
<b>Driver Characteristics</b>						
<b>High-Speed Mode</b>						
$t_{HSR}$	High-speed differential rise time		500			ps
$t_{HSF}$	High-speed differential fall time		500			ps
<b>Full-Speed Mode</b>						
$t_{FR}$	Rise time	CL=50pF ; 10 to 90 % of $ V_{OH}-V_{OL} $	4		20	ns
$t_{FF}$	Fall time	CL=50pF ; 90 to 10 % of $ V_{OH}-V_{OL} $	4		20	ns
$t_{FRMA}$	Differential rise/fall time matching ( $t_{FR} / t_{FF}$ )	Excluding the first transition from idle mode	90		110	%
$V_{CRS}$	Output signal crossover voltage	Excluding the first transition from idle mode	1.3		2.0	V
<b>Low-Speed Mode</b>						
$t_{LR}$	Rise time	CL=200pF -600pF 10 to 90% of $ V_{OH}-V_{OL} $	75		300	ns
$t_{LF}$	Fall time	CL=200pF -600pF 90 to 10% of $ V_{OH}-V_{OL} $	75		300	ns
$t_{LRMA}$	Differential rise/fall time matching ( $t_{LR} / t_{LF}$ )	Excluding the first transition from idle mode	80		125	%
$V_{CRS}$	Output signal crossover voltage	Excluding the first transition from idle mode	1.3		2.0	V
$V_{OH}$	High-level output voltage		2.8		3.6	V

## 8. BARCODE DESCRIPTION



U F D 0 4 A F 0 0 8 G B P I R

09101005SSA

Part Number

Manufacturing

Data: YYMMDD

Manufacturers of the controller

Flash Type:

Flash Pcs:

## 9. PARTNUMBER DECODER



UFD-04AFX<sup>8</sup>X<sup>9</sup>X<sup>10</sup>X<sup>11</sup>X<sup>12</sup> X<sup>13</sup> X<sup>14</sup> X<sup>15</sup>

X <sup>1</sup> X <sup>2</sup> X <sup>3</sup>	X <sup>4</sup> X <sup>5</sup>	X <sup>6</sup> X <sup>7</sup>	X <sup>8</sup> X <sup>9</sup> X <sup>10</sup> X <sup>11</sup> X <sup>12</sup>	X <sup>13</sup>	X <sup>14</sup>	X <sup>15</sup>
UFD	04	AF	128MB 256MB 512MB 001GB 002GB 004GB 008GB	P	C I	F R

X<sup>14</sup> C: Standard (0°C ~ +70°C) I: Industrial (-40°C ~ +85°C)

X<sup>15</sup> F: Fixed mode R: Removable mode