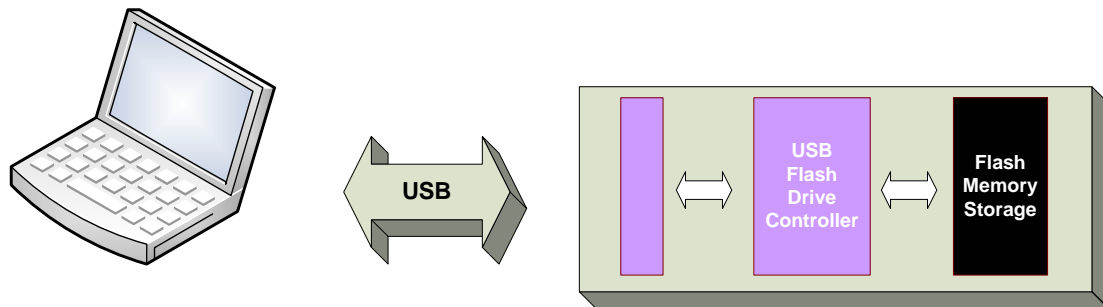


Description:

TPD20XXX (i-Drive) Flash Drive is construct by using NAND Flash type memory into a elite, portable and one of most commend use digital storage device.

Features:

- Capacity: 128MB / 256MB / 512MB / 1GB
- Form Factor: 57mm x 18mm x 9mm
- USB 2.0 / 1.1 Compatible
- IBM PC or Compatible PC or Notebook with USB interface
- True Plug and Play
- Maximum Data Transfer Rate: Read:8MB/sec,Write:5MB/sec
- Support Windows ME, 2000, XP, MAC 9.2, OS X, Only win 98 driver need
- Multiple FIFO implementation for concurrent bus operation
- Runs at 30MHz, built-in 480MHz PLL
- Embedded with data error correction
- Low power consumption
- Power by host side USB port, no external programming voltage required
- Support AutoRun feature.
AutoRun feature can be supported on Windows ME, Windows 2000, Windows XP and Windows 98 system.
- Support smart application – iRun handy tool
Support password protection for access security
Support partition and lock disk function.
Support software write protection function

Concept, Pin descriptions and Spec:**Pin description**

Pin #	Pin Name	Function
1	VCC	Power input
2	USB-	USB differential signal
3	USB+	The pairs are used to transmit Data/Address/Command
4	VSS	Ground

SPEC:

Capacity	128MB/256MB/512MB/1GB
Hardware	IBM PC or Compatible PC or Notebook with USB interface
Operation System	Win XP, Win 2K, Win ME, and MAC OS 9.0 and up
Drivers	Only Win 98 needs the driver
Power	USB bus-power no external power required
Interface	USB 2.0 interface
Data retention	Over 10 years
Maximum read rate	8 MB/ second
Maximum write rate	5 MB/ second
Dimension / Weight	L x W x H 57 x 18 x 9 mm / 8.5g

Electronic Characteristic:**Absolute Maximum Ratings:**

SYMBOL	PARAMETER	RATING	UNITS
V _{CC}	Power Supply	-0.3 to V _{CC} +0.3	V
V _{IN}	Input Voltage	-0.3 to 3.3	V
V _{OUT}	Output Voltage	-0.3 to V _{CC} +0.3	V
T _{STG}	Storage Temperature	-40 to 150	°C

Recommend operating Condition:

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS
V _{CC}	Power Supply	3.0	3.3	3.6	V
V _{IN}	Input Voltage	0	3.3	5.2	V
T _{OPR}	Operating Temperature	-40		115	°C

General DC Characteristic:

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
I _{IN}	Input current	No pull-up or pull-down	-10	±1	10	μA
I _{OZ}	Tri-state leakage current		-10	±1	10	μA
C _{IN}	Input capacitance	Pad Limit		2.8		pF
C _{OUT}	Output capacitance	Pad Limit		2.8		pF
C _{BID}	Bi-directional buffer capacitance	Pad Limit		2.8		pF

Electrical Characteristic of 3.3V I/O Cells:

SYMBOL	PARAMETER	CONDITIONS	Limits			UNIT
			MIN	TYP	MAX	
V _{CC}	Power supply	3.3V I/O	3.0	3.3	3.6	V
V _{il}	Input low voltage	LVTTTL			0.8	V
V _{ih}	Input high voltage		2.0			V
V _{ol}	Output low voltage	I _{ol} = 2~16mA			0.4	V
V _{oh}	Output high voltage	I _{oh} = 2~16mA	2.4			V
R _{pu}	Input pull-up resistance	PU=high, PD=low	40	75	190	KΩ
R _{pd}	Input pull-down resistance	PU=low, PD=high	40	75	190	KΩ
I _{in}	Input leakage current	V _{in} = V _{CC} or 0	-10	±1	10	μA
I _{oz}	Tri-state output leakage current		-10	±1	10	μA

USB Transceiver Characteristic:

Electrical Characteristic

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
AVCC	Analog supply current		3.0	3.3	3.6	V
VCC	Digital supply current		2.25	2.5	2.75	V
I _{CC}	Operating supply current	High speed operating at 480 MHz			73	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: Digital Pin

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Input levels						
V _{IL}	Low-level input voltage				0.8	V
V _{IH}	High-level input voltage		2.0			V
Output levels						
V _{OL}	Low-level output voltage				0.2	V
V _{OH}	High-level output voltage		VCC-0.2			V

AVCC = 3.0V ~ 3.6V; VCC = 2.25V ~ 2.75V; TEMP = 0 ~ 100 °C

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

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

AVCC = 3.0V ~ 3.6V; VCC = 2.25V ~ 2.75V; TEMP = 0 ~ 100 °C

Dynamic characteristic : Analog I/O pins (DP/DM)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Driver Characteristics						
High-Speed Mode						
t_{HSR}	High-speed differential rise time		500			ps
t_{HSF}	High-speed differential fall time		500			ps
Full-Speed Mode						
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
Low-Speed Mode						
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