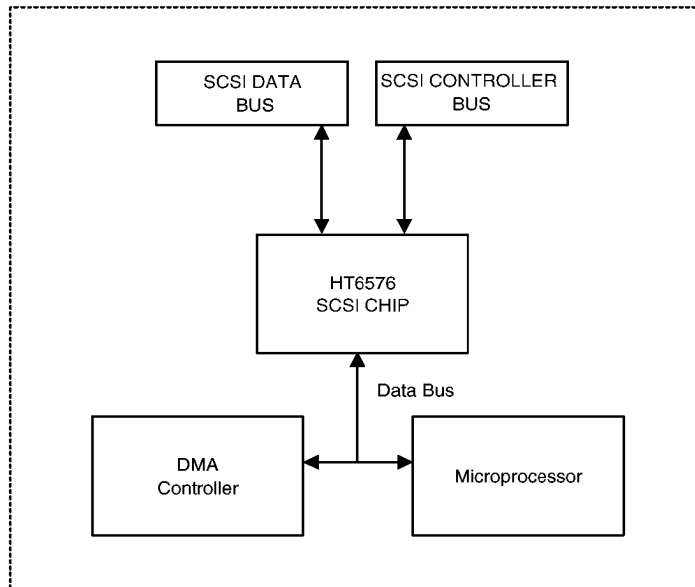
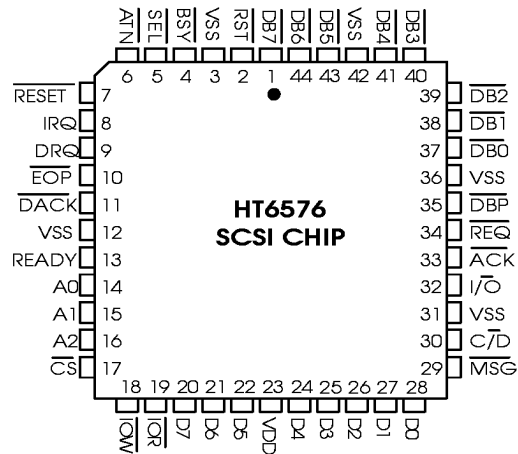


Features

- Support the ANSI X3.131-1986 standard
- Asynchronous transfer rate to 5 Mbyte/sec
- Support initiator and target mode
- 0.8um CMOS process
- On chip 48mA single-ended drivers and receivers
- Non internal clock needed
- 44pins PLCC package

Block Diagram

Pin Diagram



Pin Description

Host Interface Signal

Pin No	Pin Name	I/O	Description
14~16	A0~A2	I	Address Lines
17	$\overline{CS}$	I	Chip Select, active low
11	$\overline{DACK}$	I	DMA Acknowledge, active low
9	DRQ	O	DMA Request
24~28, 20~22	D0~D7	I/O	Data Lines
10	$\overline{EOP}$	I	End of Process, active low
19	$\overline{IOR}$	I	I/O Read, active low
18	$\overline{IOW}$	I	I/O Write, active low
8	IRQ	O	Interrupt Request
13	READY	O	Ready
7	$\overline{RESET}$	I	Reset, active low

SCSI Interface Signals

Pin No	Pin Name	I/O	Description
33	$\overline{\text{ACK}}$	I/O	Acknowledge, active low
6	$\overline{\text{ATN}}$	I/O	Attention, active low
4	$\overline{\text{BSY}}$	I/O	Busy, active low
30	$\text{C}/\overline{\text{D}}$	I/O	Control/Data, active low
32	$\text{I}/\overline{\text{O}}$	I/O	Input/Output, active low
29	$\overline{\text{MSG}}$	I/O	Message, active low
34	$\overline{\text{REQ}}$	I/O	Request, active low
2	$\overline{\text{RST}}$	I/O	Reset, active low
37~41, 43, 44, 1	$\overline{\text{DB0}}\text{--}\overline{\text{DB7}}$	I/O	SCSI Data Bus, active low
35	$\overline{\text{DBP}}$	I/O	SCSI Parity Bit, active low
5	$\overline{\text{SEL}}$	I/O	Select, active low

VSS

3, 12, 31, 36, 42

VDD

23

Registers
Address 0

Current SCSI data register(READ ONLY)

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-----	-----	-----	-----	-----	-----	-----	-----

The SCSI bus parity is checked at the beginning of the read cycle.

Output data register(WRITE ONLY)

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-----	-----	-----	-----	-----	-----	-----	-----

Address 1: Initiator command register

WRITE

7	6	5	4	3	2	1	0
ASSERT $\overline{\text{RST}}$	TRI-STATE	RESERVED	ASSERT $\overline{\text{ACK}}$	ASSERT $\overline{\text{BSY}}$	ASSERT $\overline{\text{SEL}}$	ASSERT $\overline{\text{ATN}}$	ASSERT DATA

- BIT 7: ASSERT $\overline{\text{RST}}$
WHEN SET, THE $\overline{\text{RST}}$ SIGNAL IS ASSERTED ON THE SCSI BUS
- BIT 6: TRI-STATE (TEST MODE)
- BIT 5: RESERVED (0)
- BIT 4: ASSERT $\overline{\text{ACK}}$
WHEN SET, THE $\overline{\text{ACK}}$ SIGNAL IS ASSERTED ON THE SCSI BUS
- BIT 3: ASSERT $\overline{\text{BSY}}$
WHEN SET, THE $\overline{\text{BSY}}$ SIGNAL IS ASSERTED ON THE SCSI BUS
- BIT 2: ASSERT $\overline{\text{SEL}}$
WHEN SET, THE $\overline{\text{SEL}}$ SIGNAL IS ASSERTED ON THE SCSI BUS
- BIT 1: ASSERT $\overline{\text{ATN}}$
WHEN SET, THE $\overline{\text{ATN}}$ SIGNAL IS ASSERTED ON THE SCSI BUS
- BIT 0: ASSERT DATA
WHEN SET, This bit allows the contents of the output data register to be enabled as chip outputs on SCSI signal DB0-DB7

READ

7	6	5	4	3	2	1	0
RET	ARBIT PROGRESS	LOST ARBIT	ACK	BSY	SEL	ATN	ASSERT DATA

Address 2: Mode register

READ/WRITE

7	6	5	4	3	2	1	0
LOCK DMA	TARGET MODE	ENABLE PARITY	ENABLE PARITY	ENABLE EOP	MONITOR CHECK BUSY	DMA IRQ MODE	ARBIT

- BIT 7: BLOCK MODE DMA
- BIT 6: TARGET MODE
When set, the chip operates as an SCSI bus target device.
- BIT 5: ENABLE PARITY CHECKING
When set, data received on the SCSI data bus is checked for odd parity.

- **BIT 4: ENABLE PARITY INTERRUPT**
When set, this bit causes the IRQ signal to be asserted if a parity error is detected.
- **BIT 3: ENABLE EOP INTERRUPT**
When set, this bit causes the IRQ signal to be asserted if $\overline{\text{EOP}}$ is received from the DMA controller.
- **BIT 2: MONITOR BUSY**
When set, this bit causes the IRQ signal asserted when $\overline{\text{BSY}}$ changes to the inactive state for at least a bus settle delay.
- **BIT 1: DMA MODE**
- **BIT 0: Arbitrate**
When set, this bit starts the arbitration process.

Address 3: Target command register

7	6	5	4	3	2	1	0
LAST BYTE	X	X	X	ASSERT $\overline{\text{REQ}}$	ASSERT $\overline{\text{MSG}}$	ASSERT $\text{C}/\overline{\text{D}}$	ASSERT $\text{I}/\overline{\text{O}}$
R				R/W	R/W	R/W	R/W

- **BIT 7: LAST BYTE SEND (READ ONLY)**
- **BIT 3: ASSERT $\overline{\text{REQ}}$**
WHEN SET, THE $\overline{\text{REQ}}$ SIGNAL IS ASSERTED ON THE SCSI BUS (IN TARGET MODE)
- **BIT 2: ASSERT $\overline{\text{MSG}}$**
WHEN SET, THE $\overline{\text{MSG}}$ SIGNAL IS ASSERTED ON THE SCSI BUS (IN TARGET MODE)
- **BIT 1: ASSERT $\text{C}/\overline{\text{D}}$**
WHEN SET, THE $\text{C}/\overline{\text{D}}$ SIGNAL IS ASSERTED ON THE SCSI BUS (IN TARGET MODE)
- **BIT 0: ASSERT $\text{I}/\overline{\text{O}}$**
WHEN SET, THE $\text{I}/\overline{\text{O}}$ SIGNAL IS ASSERTED ON THE SCSI BUS (IN TAGRTE MODE)

Address 4: Current SCSI Bus Register

READ

7	6	5	4	3	2	1	0
RST	BSY	REQ	MSG	$\overline{\text{C}}/\text{D}$	$\overline{\text{I}}/\text{O}$	SEL	DBP

WRITE -SELECT ENABLE REGISTER

7	6	5	4	3	2	1	0
SID7	SID6	SID5	SID4	SID3	SID2	SID1	SID0

Address 5: Bus And Status
READ

7	6	5	4	3	2	1	0
END DMA	DMA REQUEST	PARITY ERROR	IRQ	PHASE MATCH	BUS ERROR	ATN	ACK

WRITE **–START DMA SEND**

7	6	5	4	3	2	1	0
X	X	X	X	X	X	X	X

Address 6: Input Data
READ

7	6	5	4	3	2	1	0
LDB7	LDB6	LDB5	LDB4	LDB3	LDB2	LDB1	LDB0

LATCH SCSI DATA. The register represent the complement of the active low SCSI data bus.

WRITE **–START DMA TARGET RECEIVE**

7	6	5	4	3	2	1	0
X	X	X	X	X	X	X	X

Address 7:
READ **–RESET PARITY/INTERRUPT**

7	6	5	4	3	2	1	0
X	X	X	X	X	X	X	X

WRITE **–START DMA INITIATOR RECEIVE**

7	6	5	4	3	2	1	0
X	X	X	X	X	X	X	X

Interrupts

SELECTION/RESELECTION

- $\overline{\text{SEL}}$ = ACTIVE LOW
- $\overline{\text{BSY}}$ IS FALSE FOR AT LEAST 400NS
- HT6576 DEVICE ID (SELECT REGISTER) is active on the SCSI bus will generate IRQ.

END OF PROCESS (EOP) INTERRUPT

- $\overline{\text{EOP}}$ = ACTIVE LOW
- $\overline{\text{DACK}}$ = ACTIVE LOW
- $\overline{\text{IOR}}$ OR $\overline{\text{IOW}}$ = ACTIVE LOW
- DMA MODE
- ENABLE EOP IRQ $\Rightarrow$ GENERATE EOP IRQ

SCSI BUS $\overline{\text{RST}}$ /IRQ

When An SCSI $\overline{\text{RST}}$ active low, the IRQ is generated.

PARITY ERROR IRQ

An IRQ is generated for a received parity error if enable parity checking bit and the enable parity interrupt bit are set.

BUS PHASE MISMATCH IRQ

If the DMA MODE bit is active and a phase mismatch occurs when $\overline{\text{REQ}}$ from false to true, an interrupt is generated

LOSS OF BSY/IRQ

- MONITOR $\overline{\text{BSY}}$ bit= 1
- $\overline{\text{BSY}}$ = ACTIVE LOW FOR 400ns WILL GENERATE IRQ

Electrical Characteristics

D.C. Characteristics

Absolute Maximum Ratings

(Ta=25°C)

Symbol	Parameter	Min.	Max.	Unit
Tstg	Storage Temperature	-55	150	°C
V _{DD}	Supply Voltage	-0.5	7.0	V
V _{IN}	Input Voltage	V _{SS} -0.5	V _{DD} +0.5	V
ESD	Electrostatic Discharge	-5000	5000	V

Operating Conditions

(Ta=25°C)

Symbol	Parameter	Min.	Max.	Unit
V _{DD}	Supply Voltage	4.75	5.25	V
I _{DD}	Supply Current	—	20	mA
Ta	Operating Free-Air	0	70	°C

SCSI Signals

(Ta=25°C)

Symbol	Characteristic	Condition	Min.	Max.	Unit
V _{IH}	Input High Voltage	—	2.0	V _{DD} +0.5	V
V _{IL}	Input Low Voltage	—	V _{SS} -0.5	0.8	V
V _{OL}	Output Low Voltage	I _{OL} =48mA	V _{SS}	0.5	V
V _{HYS}	Hysteresis	—	200	450	mV
I _{OL}	Output Low Current	V _{OL} =0.5	48	—	mA
I _{IH}	Input High Leakage	V _{IH} = 5.25V	—	50	μA
I _{IL}	Input Low Leakage	V _{IL} =V _{SS}	—	-50	μA

Microprocessor Data Bus D0-D7

(Ta=25°C)

Symbol	Characteristic	Condition	Min.	Max.	Unit
V _{IH}	Input High Voltage	—	2.0	V _{DD} +0.5	V
V _{IL}	Input Low Voltage	—	V _{SS} -0.5	0.8	V
V _{OH}	Output High Voltage	I _{OH} =-4.0mA	2.4	V _{DD}	V
V _{OL}	Output Low Voltage	I _{OL} =8.0mA	V _{SS}	0.4	V
I _{OH}	Output High Current	V _{OH} =V _{DD} -0.5V	-4.0	—	mA
I _{OL}	Output Low Current	V _{OL} =0.4V	8.0	—	mA
I _{IH}	Input High Leakage	V _{IH} =5.25V	—	10	μA
I _{IL}	Input Low Leakage	V _{IL} =V _{SS}	—	-10	μA
I _{TL}	Tri-State Leakage	—	-10	10	μA

A0~A2, $\overline{\text{CS}}$, $\overline{\text{EOP}}$, $\overline{\text{IOR}}$, $\overline{\text{IOW}}$, $\overline{\text{RESET}}$

(Ta=25°C)

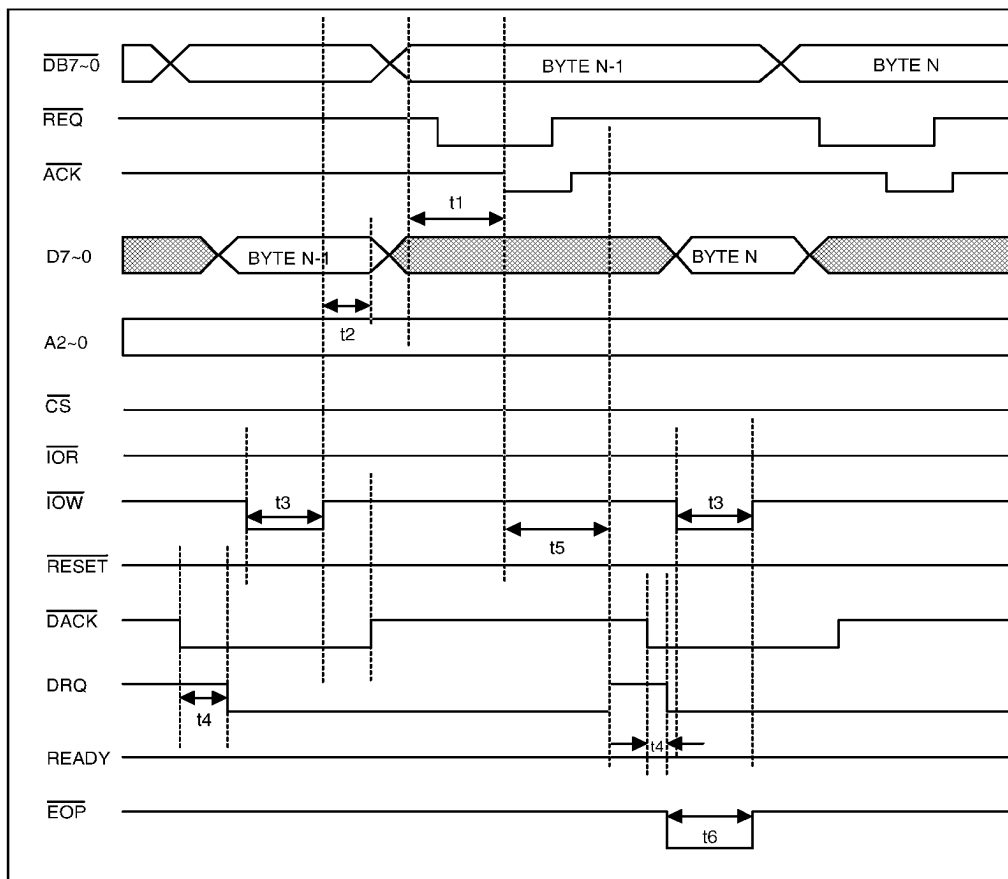
Symbol	Characteristic	Condition	Min.	Max.	Unit
V _{IH}	Input High Voltage	—	2.0	V _{DD} +0.5	V
V _{IL}	Input Low Voltage	—	V _{SS} -0.5	0.8	V
I _{IH}	Input High Leakage	V _{IH} =5.25V	10	—	μA
I _{IL}	Input Low Leakage	V _{IL} =V _{SS}	-10	—	μA

DRQ, IRQ, READY,

Symbol	Characteristic	Condition	Min.	Max.	Unit
V _{OH}	Output High Voltage	I _{OH} =-4.0mA	2.4	V _{DD}	V
V _{OL}	Output Low Voltage	I _{OL} =8.0mA	V _{SS}	0.4	V
I _{OH}	Output High Current	V _{OH} =V _{DD} -0.5V	-4.0	—	mA
I _{OL}	Output Low Current	V _{OL} =0.4V	8.0	—	mA

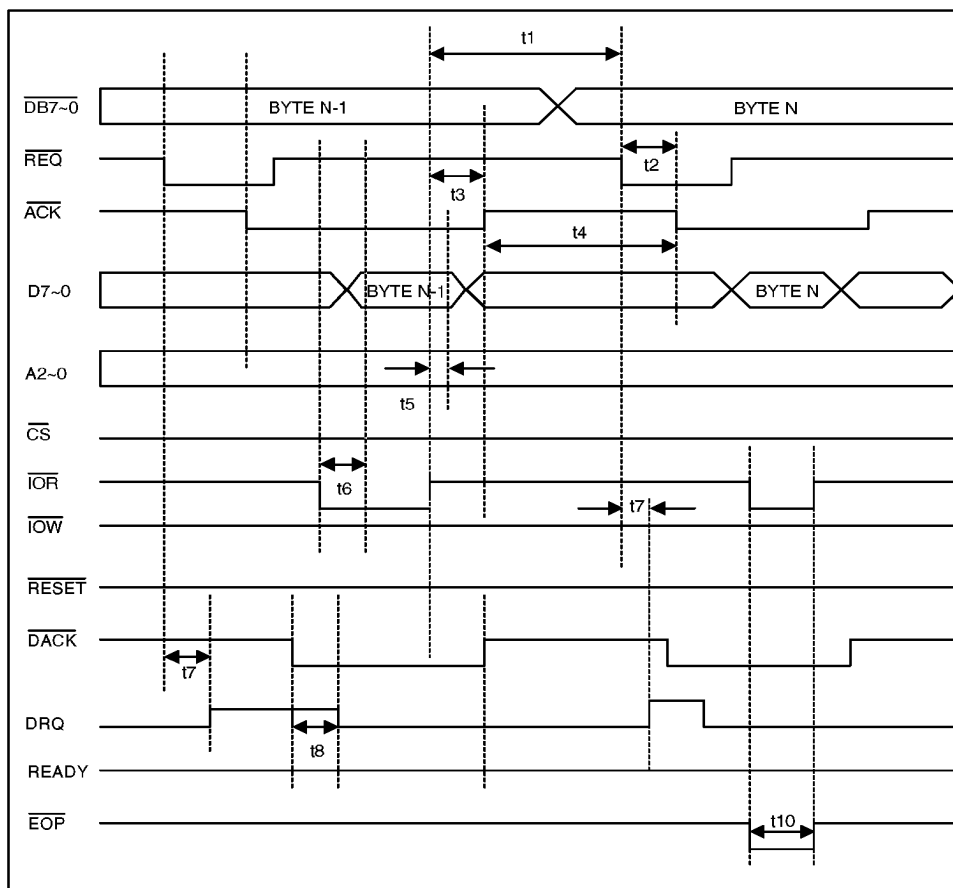
Timing Diagram

Initiator Send



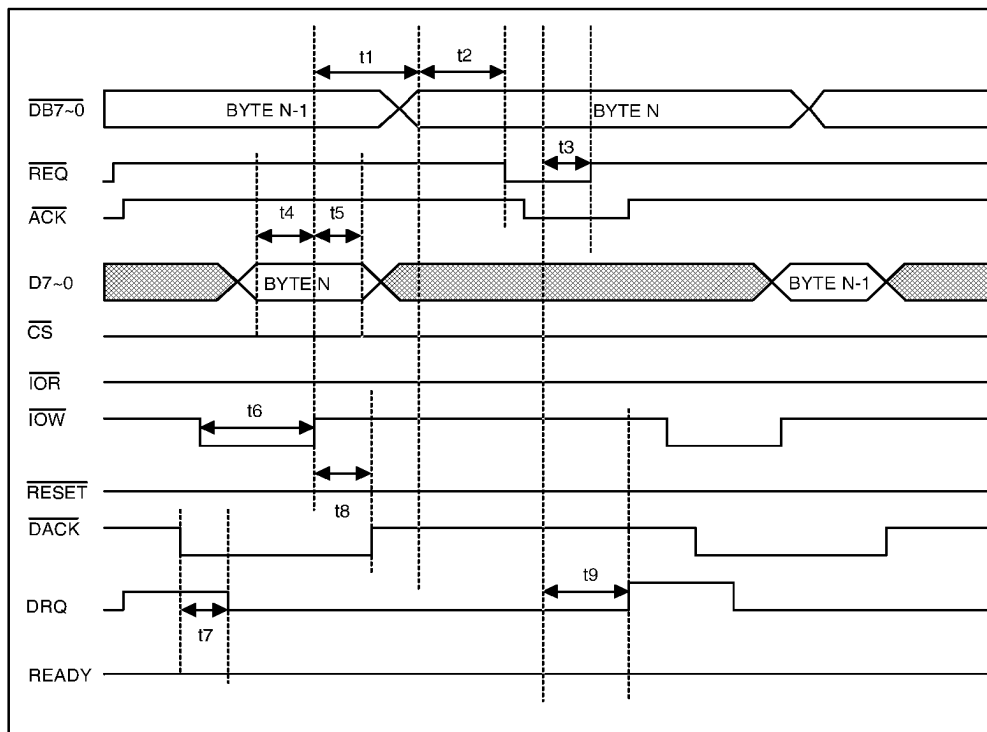
Name	Description	Min.	Max.	Unit
t1	SCSI Data setup time to $\overline{ACK}$ active	40	—	ns
t2	Data Bus held time from $\overline{IOW}$ inactive	10	—	ns
t3	$\overline{IOW}$ active time	30	—	ns
t4	$\overline{DACK}$ active, to $\overline{DRQ}$ inactive	—	20	ns
t5	$\overline{ACK}$ active to next $\overline{DRQ}$ active	—	45	ns
t6	$\overline{EOP}$ active time	30	—	ns

Initiator Receive



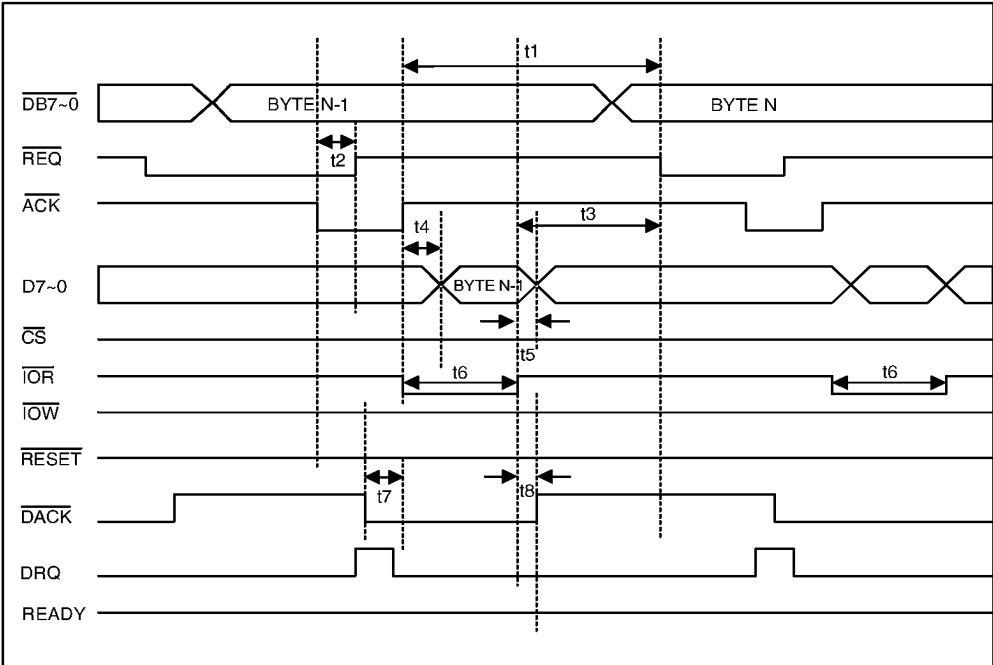
Name	Description	Min.	Max.	Unit
t1	IOR inactive to next REQ active	50	—	ns
t2	REQ active to ACK active	50	—	ns
t3	IOR inactive to ACK inactive	10	—	ns
t4	ACK inactive time	50	—	ns
t5	Data Bus hold time from IOR inactive	10	—	ns
t6	Data Bus valid time from IOR active	—	20	ns
t7	REQ active to DRQ active	—	25	ns
t8	DACK active to DRQ inactive	—	20	ns
t9	DACK inactive to next DRQ active	20	—	ns
t10	EOP active time	30	—	ns

Target Send (Non-block mode)



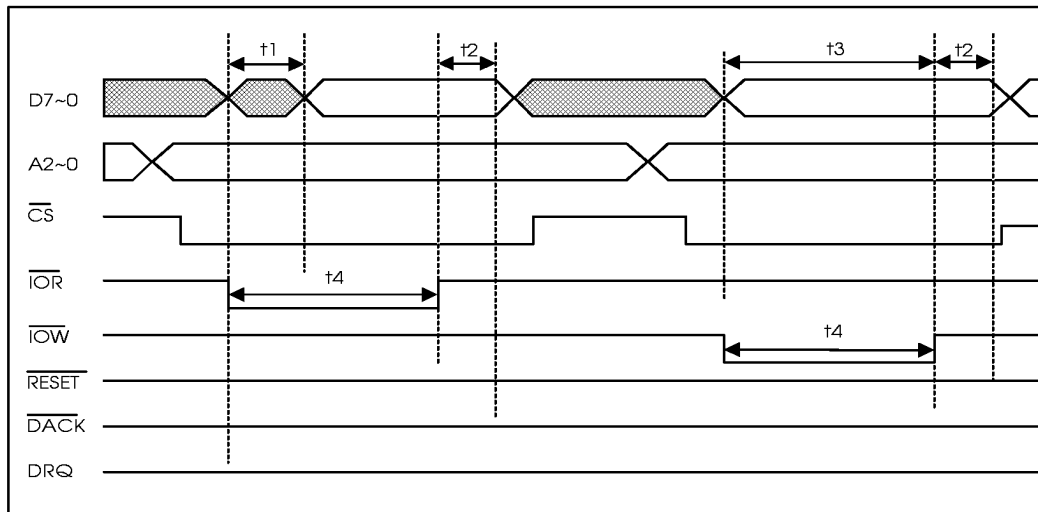
Name	Description	Min.	Max.	Unit
t1	SCSI data hold time from $\overline{IOW}$ inactive	—	30	ns
t2	SCSI data setup time to $\overline{REQ}$ active	40	—	ns
t3	$\overline{ACK}$ active to $\overline{REQ}$ inactive	—	30	ns
t4	Data Bus setup time to $\overline{IOW}$ inactive	10	—	ns
t5	Data Bus hold time from $\overline{IOW}$ inactive	10	—	ns
t6	$\overline{IOW}$ active time	30	—	ns
t7	$\overline{DACK}$ active to $\overline{DRQ}$ inactive	—	20	ns
t8	$\overline{IOW}$ inactive to $\overline{DACK}$ inactive	0	—	ns
t9	$\overline{ACK}$ active to next $\overline{DRQ}$ active	—	45	ns

Target Receive (Non-block mode)



Name	Description	Min.	Max.	Unit
t1	$\overline{\text{ACK}}$ inactive to next $\overline{\text{REQ}}$ active	50	—	ns
t2	$\overline{\text{ACK}}$ active to $\overline{\text{REQ}}$ inactive	—	30	ns
t3	$\overline{\text{IOR}}$ inactive to next $\overline{\text{REQ}}$ active	50	—	ns
t4	Data Bus setup time to $\overline{\text{IOR}}$ active	—	20	ns
t5	Data Bus hold time from $\overline{\text{IOR}}$ inactive	10	—	ns
t6	$\overline{\text{IOR}}$ active time	30	—	ns
t7	$\overline{\text{DACK}}$ active to $\overline{\text{DRQ}}$ inactive	—	20	ns
t8	$\overline{\text{IOR}}$ inactive to $\overline{\text{DACK}}$ inactive	0	—	ns

PIO Timing



Name	Description	Min.	Max.	Unit
t1	Data valid time from $\overline{IOR}$ active	—	20	ns
t2	Data hold time from $\overline{IOR}$ inactive	10	—	ns
t3	Data setup time to $\overline{IOW}$ inactive	10	—	ns
t4	$\overline{IOR}$ or $\overline{IOW}$ active time	30	—	ns