



IT8209R

Extended PCI Arbiter and Clock Buffer

Preliminary Specification V0.3



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Revision History

Section	Revision	Page No.
6	- The MAX. value of V_{IL} in section 6 DC Characteristics was revised to "$V_{CC} \times 0.3$". - The MAX. value of V_{IH} has been removed.	11

Contents

1. Features	1
2. General Description	3
3. Block Diagram	5
4. Pin Configuration	7
5. IT8209R Pin Descriptions	9
6. DC Characteristics (VCC, AVCC = 3.3V±0.3V. Ta=0°C to 70°C).....	11
7. AC Characteristics	13
8. Package Information	15
9. Ordering Information	17

Figures

Figure 2-1. Arbitration Scheme of IT8209R	3
Figure 3-1. Extended PCI Arbiter Scheme.....	5
Figure 3-2. Clock Buffer Scheme.....	5
Figure 7-1. PCI Request Delay Timing	13
Figure 7-2. PCI Grant Delay Timing	13
Figure 7-3. PCI Grant Separation Timing	13
Figure 7-4. PCI Clock Acquisition Timing	14

Tables

Table 4-1. Pins Listed in Numeric Order	7
Table 5-1. Pin Descriptions of Extended PCI Arbiter	9
Table 5-2. Pin Descriptions of Clock Buffer	9
Table 5-3. Pin Descriptions of Power/Ground Signals.....	9
Table 7-1. PCI Request Delay Timing Table	13
Table 7-2. PCI Grant Delay Timing Table	13
Table 7-3. PCI Grant Separation Timing Table	13
Table 7-4. PCI Clock Acquisition Timing Table	14



1. Features

- **Extended PCI Arbiter**
 - Utilizes 1 set of SYSGNT# and SYSREQ# to support 3 PCI Masters
- **Input PCI Clock**
 - Supports input clock frequency from 25MHz to 66MHz
- **Clock Buffer**
 - Provides 4 zero delay clock sources
 - Supports output clock frequency from 25MHz to 66MHz
- **28-pin SSOP**

2. General Description

The IT8209R incorporates an extended PCI arbiter and a clock buffer.

The extended PCI arbiter utilizes one set of SYSGNT# and SYSREQ# to support 3 PCI Masters, so that two more PCI Masters can be supported for the system. PCISTOP# input signal is useful to facilitate the fairness arbitration. The algorithm of this arbiter uses a rotation arbitration priority that is illustrated in Figure 2-1.

The clock buffer provides 4 zero delay and low jitter clock sources. PCICLK1 is the clock input of the clock buffer, and PCICLKOUT is the clock output fed back internally to the input of the built-in PLL to reduce the clock skew. If zero clock skew is required, PCICLKOUT and PCICLK1 to PCICLK4 must be equally loaded.

When PCICLK1 input becomes inactive, the IT8209R will enter power down mode. In power down mode, all clock outputs are low and other control outputs are deasserted.

The IT8209R is available in 28-pin SSOP package.

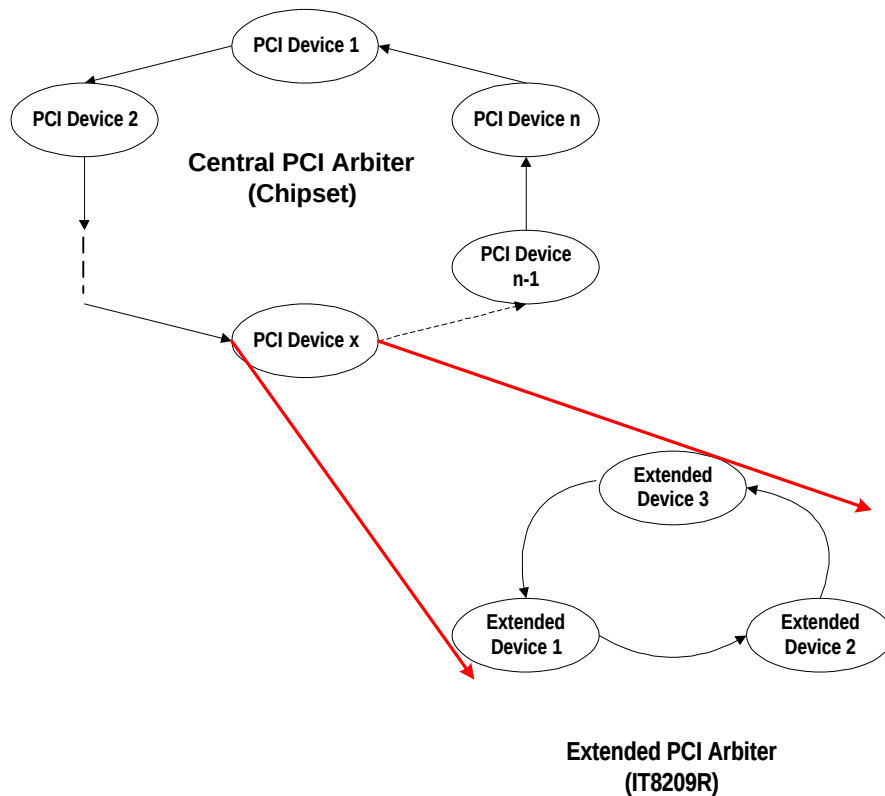


Figure 2-1. Arbitration Scheme of IT8209R

3. Block Diagram

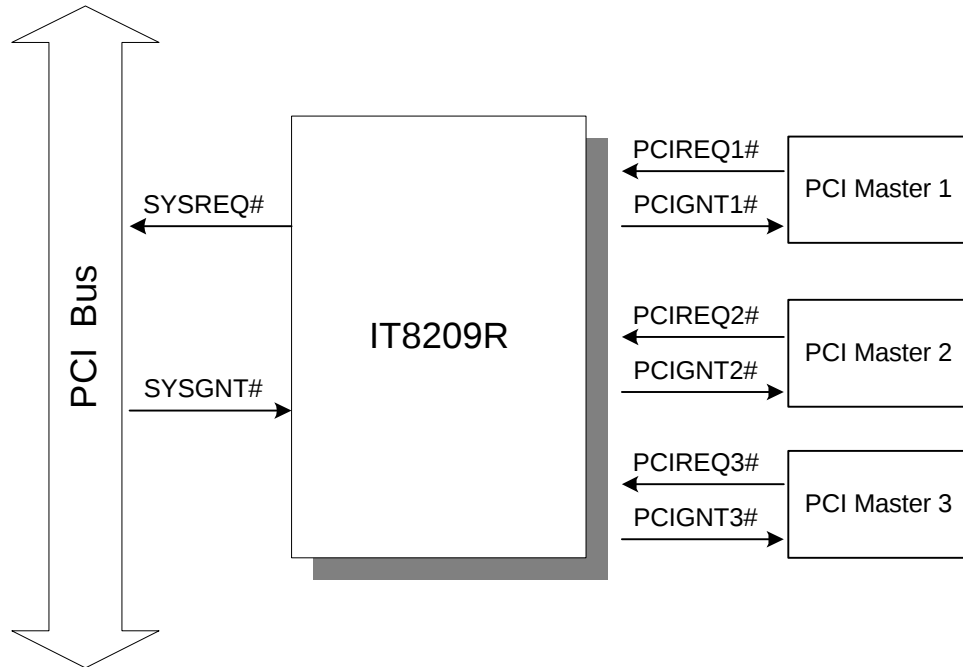


Figure 3-1. Extended PCI Arbiter Scheme

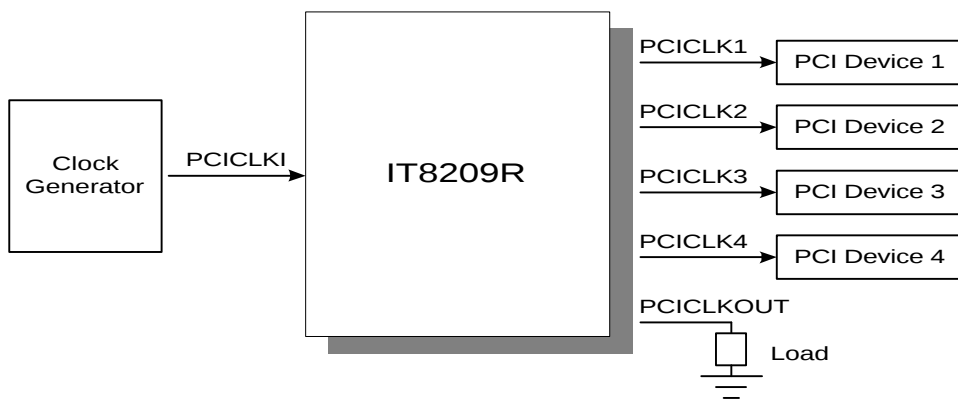
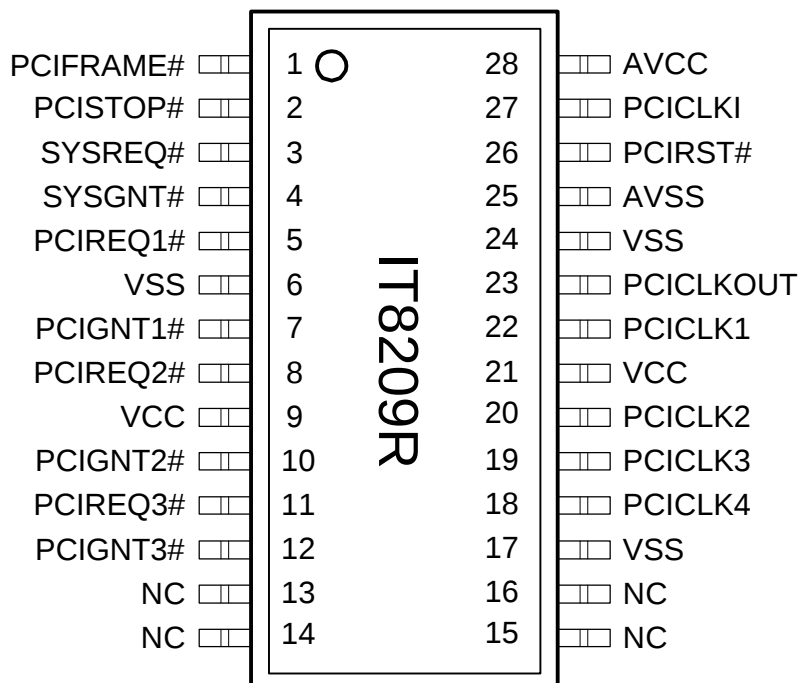


Figure 3-2. Clock Buffer Scheme

4. Pin Configuration



Pin	Signal	Pin	Signal
1	PCIFRAME#	15	NC
2	PCISTOP#	16	NC
3	SYSREQ#	17	VSS
4	SYSGNT#	18	PCICLK4
5	PCIREQ1#	19	PCICLK3
6	VSS	20	PCICLK2
7	PCIGNT1#	21	VCC
8	PCIREQ2#	22	PCICLK1
9	VCC	23	PCICLKOUT
10	PCIGNT2#	24	VSS
11	PCIREQ3#	25	AVSS
12	PCIGNT3#	26	PCIRST#
13	NC	27	PCICLK1
14	NC	28	AVCC

Table 4-1. Pins Listed in Numeric Order



5. IT8209R Pin Descriptions

Table 5-1. Pin Descriptions of Extended PCI Arbiter

Signal	Pin(s) No.	Attribute	Description
Extended PCI Arbiter Signals (3.3V CMOS I/F, 5V tolerant)			
PCIFRAME#	1	PIU	PCI Bus FRAME# Signal The pin can be connected to PCI Bus FRAME# signal or not connected to any signals.
PCISTOP#	2	PIU	PCI Bus STOP# Signal
SYSREQ#	3	O12	PCI Bus Request
SYSGNT#	4	PIU	PCI Bus Grant
PCIREQ1#	5	PIU	Request Signal from Extended PCI Master 1
PCIGNT1#	7	O12	Grant Signal to Extended PCI Master 1
PCIREQ2#	8	PIU	Request Signal from Extended PCI Master 2
PCIGNT2#	10	O12	Grant Signal to Extended PCI Master 2
PCIREQ3#	11	PIU	Request Signal from Extended PCI Master 3
PCIGNT3#	12	O12	Grant Signal to Extended PCI Master 3
PCIRST#	26	IK	PCI Bus RST# Signal

Table 5-2. Pin Descriptions of Clock Buffer

Signal	Pin(s) No.	Attribute	Description
Clock Buffer Signals (3.3V CMOS I/F)			
PCICLK4	18	O12	PCICLK Output 4
PCICLK3	19	O12	PCICLK Output 3
PCICLK2	20	O12	PCICLK Output 2
PCICLK1	22	O12	PCICLK Output 1
PCICLKOUT	23	O12	PCICLK Output (for internal feedback)
PCICLK1	27	I	PCICLK Input

Table 5-3. Pin Descriptions of Power/Ground Signals

Signal	Pin(s) No.	Attribute	Description
Power Ground Signals			
VSS	6, 17, 24	I	Ground
VCC	9, 21	I	Power Supply of 3.3V
AVSS	25	I	Analog Ground for analog PLL
AVCC	28	I	Analog VCC for analog PLL

Notes: IO cell types are described as below:

I: Input PAD.

IK: Schmitt Trigger Input PAD.

PIU: PCI Bus Specified Input PAD (integrated a 75K ohms pull-up resistor).

O12: 12mA Output PAD.



DC Characteristics

6. DC Characteristics (VCC, AVCC = 3.3V±0.3V. Ta=0°C to 70°C)

Absolute Maximum Ratings*

Applied Voltage of VCC, AVCC -0.3V to +4.6V
 Input Voltage of 3.3V Interface -0.3V to VCC+0.3V
 Input Voltage of 5V tolerant Interface ... -0.3V to 5.25V
 Tcase 0°C to +70°C
 Storage Temperature -40°C to +125°C

*Comments

Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to this device. These are stress ratings only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied, and exposure to absolute maximum rating conditions for extended periods may affect device reliability.

DC Electrical Characteristics (Ta = 0°C to 70°C)

Symbol	Parameter	Min.	Typ.	Max.	Conditions
V _{IL}	Input Low Voltage	- 0.3V		VCC x 0.3	VCC=3.0 ~ 3.6V
V _{IH}	Input High Voltage	VCC x 0.7			VCC=3.0 ~ 3.6V
V _{OL}	Output Low Voltage			0.5	I _{OL} = -12mA
V _{OH}	Output High Voltage	2.4			I _{OH} = 12mA
I _{IL}	Input Low Current	-1μA		1μA	V _{IL} = V _{SS} no pull-up or pull-down
I _{IH}	Input High Current	-1μA		1μA	V _{IH} = VCC no pull-up or pull-down
I _{OZ}	Tri-state Leakage Current	-10μA		10μA	
C _{in}	Input Capacitance		3pF		
C _{out}	Output Capacitance		3pF		
C _{bld}	Bi-directional Buffer		3pF		
R _i	Input Pull-Up Resistance	40KΩ	75KΩ	170KΩ	V _{IL} =0V

7. AC Characteristics

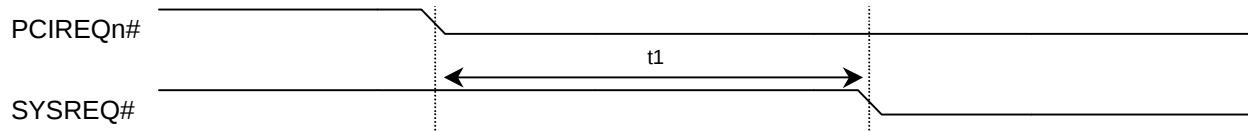


Figure 7-1. PCI Request Delay Timing

Table 7-1. PCI Request Delay Timing Table

Symbol	Parameter	Min.	Typ.	Max.	Unit
t_1	PCIREQn# (n=1, 2, 3) to SYSREQ# asserted	0	-	7	ns

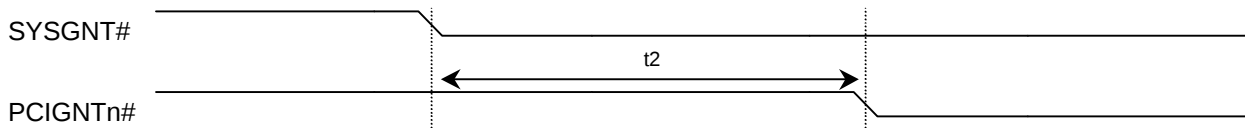


Figure 7-2. PCI Grant Delay Timing

Table 7-2. PCI Grant Delay Timing Table

Symbol	Parameter	Min.	Typ.	Max.	Unit
t_2	SYSGNT# to PCIGNTn# (n=1, 2, 3) asserted	0	-	8.5	ns

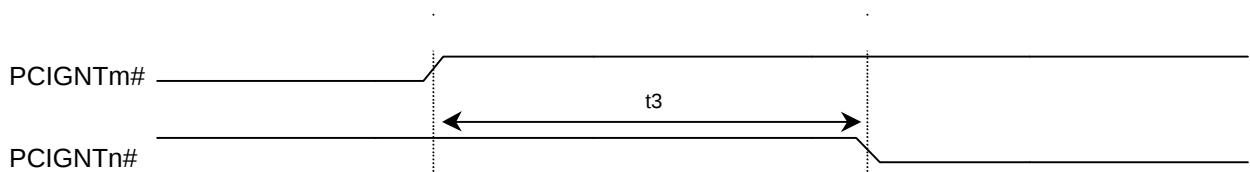


Figure 7-3. PCI Grant Separation Timing

Table 7-3. PCI Grant Separation Timing Table

Symbol	Parameter	Min.	Typ.	Max.	Unit
t_3	PCIGNTm# (m=1, 2, 3) deasserted to PCIGNTn# (n=1, 2, 3) asserted (n != m)	1	-	-	Clock Period

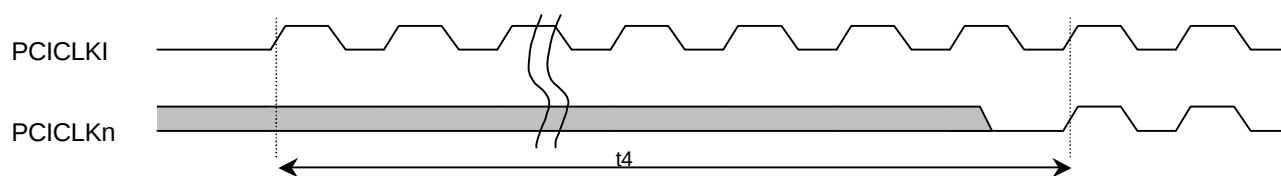


Figure 7-4. PCI Clock Acquisition Timing

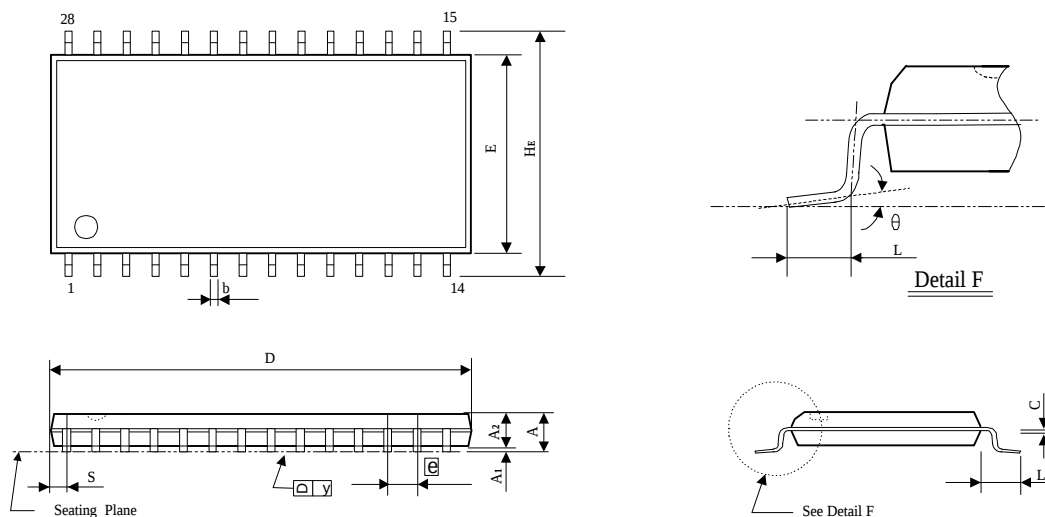
Table 7-4. PCI Clock Acquisition Timing Table

Symbol	Parameter	Min.	Typ.	Max.	Unit
t_4	PCICLK_I stable to PCICLK_n (n=1, 2, 3, 4, out) stable	-	-	60	us

8. Package Information

SSOP28L Outline Dimensions

unit: inches/mm



Symbol	Dimension in inches			Dimension in mm		
	Min	Nom	Max	Min	Nom	Max
A	0.053	0.064	0.069	1.35	1.63	1.75
A ₁	0.004	0.006	0.010	0.10	0.152	0.25
A ₂	-	-	0.059	-	-	1.50
b	0.008	0.010	0.012	0.203	0.254	0.305
C	0.007	-	0.010	0.178	-	0.250
D	0.386	0.390	0.394	9.80	9.91	10.00
E	0.150	0.154	0.157	3.80	3.91	4.00
$\square e$	0.025BSC			0.635BSC		
He	0.228	0.236	0.244	5.80	5.99	6.20
L	0.016	0.025	0.050	0.40	0.635	1.27
L ₁	0.041REF.			1.04REF.		
S	0.033REF.			0.838REF.		
y	-	-	0.004	-	-	0.10
θ	0°	-	8°	0°	-	8°



Ordering Information

9. Ordering Information

Part No.	Package
IT8209R	28 SSOP