

S1C33209

32-bit Single Chip Microcomputer

- 32-bit S1C33000 RISC Core
- Multiply Accumulation
- Built-in 8K-byte RAM
- 10-bit ADC
- 4-ch. SIO
- High-speed DMA, Intelligent DMA

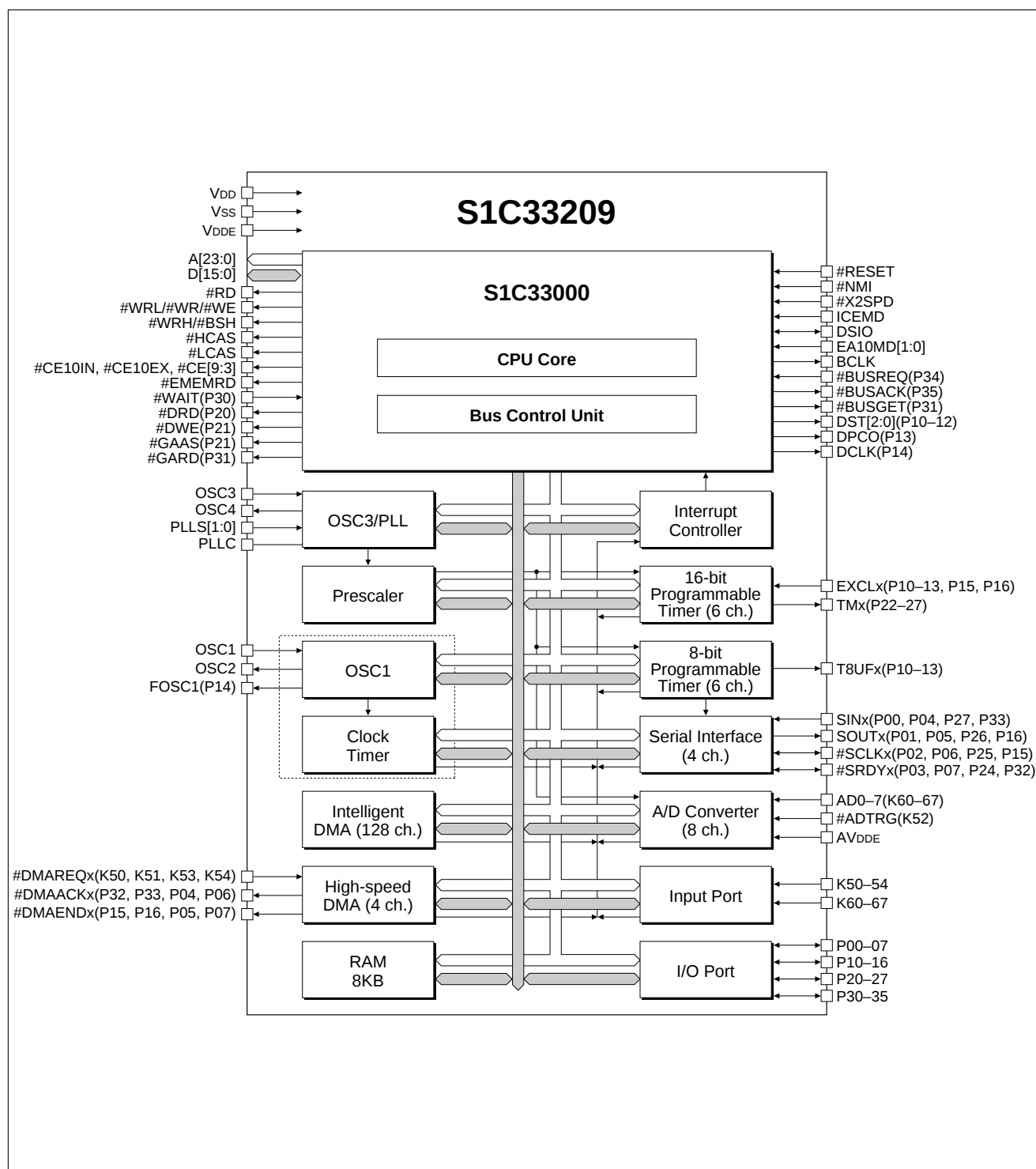
■ DESCRIPTION

The S1C33209 is a CMOS 32-bit microcomputer composed of a CMOS 32-bit RISC core, 8K-byte RAM, 4-channel SIO, A/D converter, timers, PLL and other circuits. The S1C33209 features high-speed operation and low current consumption. It is suitable for various portable equipment and multimedia control systems. The S1C33209 also provides a DSP function using the internal MAC (multiplication and accumulation) operation function with the A/D converter, this makes it possible to achieve speech recognition and voice synthesis systems.

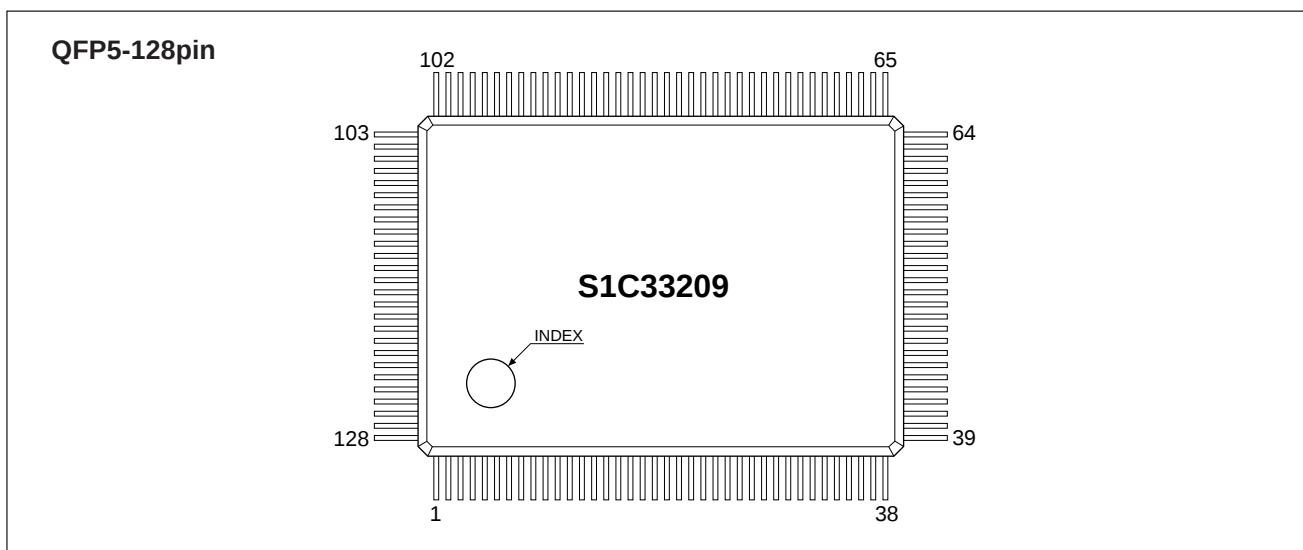
■ FEATURES

- CMOS LSI 32-bit parallel processing S1C33000 RISC core
- Main clock 60MHz (Max., up to 15MHz external clock input)
- Sub clock 32.768kHz (Typ., crystal)
- Instruction set 16-bit fixed length, 105 instructions
(MAC instruction is included, 2 cycles)
- Internal RAM size 8,192 bytes
- Clock timer 1 channel
- Programmable timer 8 bits × 6 channels and 16 bits × 6 channels
- Watchdog timer Realized with a 16-bit programmable timer
- Serial interface 4 channels
Clock synchronization type and asynchronization type are selectable. Usable as an infrared ray (IrDA) interface.
- 10-bit A/D converter Successive approximation type, 8 input channels
- High-speed DMA 4 channels
- Intelligent DMA 128 channels
- I/O port Input port : 13 bits
I/O port : 29 bits
- Interrupt controller External interrupts : 10 types
Internal interrupts : 29 types
- External bus interface 24-bit address bus, 16-bit data bus, 7 chip enable pins
DRAM and burst ROM may be connected directly.
- Shipping form QFP5-128pin/QFP15-128pin
- Supply voltage Core voltage : 1.8 to 3.6V
I/O voltage : 1.8 to 5.5V
- Current consumption SLEEP state : 10μA (3.3V, 32.768kHz, clock timer run state, Typ.)
: 2.5μA (2.0V, 32.768kHz, clock timer run state, Typ.)
RUN state : 65mA (3.3V, 50MHz Typ.)

■ BLOCK DIAGRAM



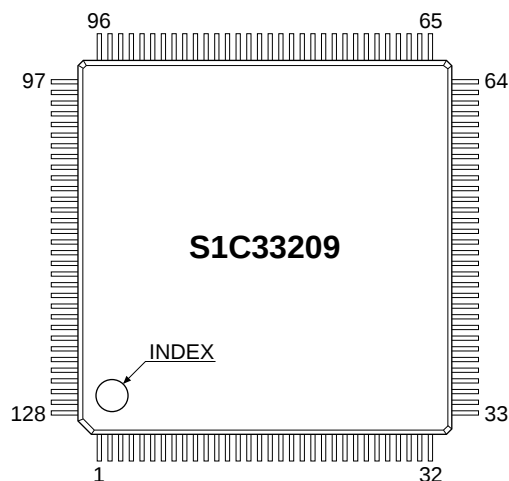
■ PIN LAYOUT



No.	Pin name	No.	Pin name	No.	Pin name	No.	Pin name
1	P24/TM2/#SRDY2	33	K65/AD5	65	#RESET	97	A16
2	Vss	34	K50/#DMAREQ0	66	#NMI	98	ICEMD
3	P25/TM3/#SCLK2	35	K64/AD4	67	A0/#BSL	99	A17
4	P26/TM4/SOUT2	36	K63/AD3	68	A1	100	A18
5	P15/EXCL4/#DMAEND0/#SCLK3	37	K62/AD2	69	P34/#BUSREQ/#CE6	101	A19
6	P27/TM5/SIN2	38	AVDDE	70	Vss	102	P04/SIN1/#DMAACK2
7	BCLK	39	K61/AD1	71	A2	103	P05/SOUT1/#DMAEND2
8	P00/SIN0	40	K60/AD0	72	A3	104	P06/#SCLK1/DMAACK3
9	P01/SOUT0	41	D6	73	A4	105	Vss
10	D15	42	Vss	74	A5	106	PLLC
11	VDD	43	D5	75	A6	107	Vss
12	P03/#SRDY0	44	D4	76	#CE10IN	108	PLLS1
13	D14	45	D3	77	VDD	109	PLLS0
14	P31/#BUSGET/#GARD	46	D2	78	#EMEMRD	110	P07/#SRDY1/#DMAEND3
15	D13	47	D1	79	A7	111	#X2SPD
16	P32/#DMAACK0/#SRDY3	48	D0	80	#HCAS	112	EA10MD0
17	D12	49	P35/#BUSACK	81	A8	113	EA10MD1
18	P33/#DMAACK1/SIN3	50	VDDDE	82	#LCAS	114	VDD
19	D11	51	#CE9/#CE17/#CE17&18	83	A9	115	(No Connection)
20	K54/#DMAREQ3	52	OSC2	84	P16/EXCL5/#DMAEND1/SOUT3	116	OSC4
21	D10	53	#CE7/#RAS0/#CE13/#RAS2	85	A10	117	P20/#DRD
22	K53/#DMAREQ2	54	OSC1	86	A20	118	OSC3
23	D9	55	#CE6/#CE7&8	87	A11	119	P21/#DWE/#GAAS
24	K52/#ADTRG	56	#RD	88	A21	120	#CE3
25	Vss	57	Vss	89	A12	121	P22/TM0
26	K51/#DMAREQ1	58	#WRL/#WR/#WE	90	A22	122	P23/TM1
27	P02/#SCLK0	59	#WRH/#BSH	91	A13	123	DSIO
28	D8	60	#CE10EX/#CE9&10EX	92	A23	124	P10/EXCL0/T8UF0/DST0
29	D7	61	#CE8/#RAS1/#CE14/#RAS3	93	Vss	125	P11/EXCL1/T8UF1/DST1
30	VDDDE	62	#CE5/#CE15/#CE15&16	94	A14	126	P12/EXCL2/T8UF2/DST2
31	K67/AD7	63	#CE4/#CE11/#CE11&12	95	A15	127	P13/EXCL3/T8UF3/DPCO
32	K66/AD6	64	P30/#WAIT/#CE4&5	96	VDDDE	128	P14/FOSC1/DCLK

S1C33209

QFP15-128pin



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1	P26/TM4/SOUT2	33	K63/AD3	65	A1	97	A18
2	P15/EXCL4/#DMAEND0/#SCLK3	34	K62/AD2	66	P34/#BUSREQ/#CE6	98	A19
3	P27/TM5/SIN2	35	AVDDE	67	Vss	99	P04/SIN1/#DMAACK2
4	BCLK	36	K61/AD1	68	A2	100	P05/SOUT1/#DMAEND2
5	P00/SIN0	37	K60/AD0	69	A3	101	P06/#SCLK1/DMAACK3
6	P01/SOUT0	38	D6	70	A4	102	Vss
7	D15	39	Vss	71	A5	103	PLL
8	VDD	40	D5	72	A6	104	Vss
9	P03/#SRDY0	41	D4	73	#CE10IN	105	PLLS1
10	D14	42	D3	74	VDD	106	PLLS0
11	P31/#BUSGET/#GARD	43	D2	75	#EMEMRD	107	P07/#SRDY1/#DMAEND3
12	D13	44	D1	76	A7	108	#X2SPD
13	P32/#DMAACK0/#SRDY3	45	D0	77	#HCAS	109	EA10MD0
14	D12	46	P35/#BUSACK	78	A8	110	EA10MD1
15	P33/#DMAACK1/SIN3	47	VDD	79	#LCAS	111	VDD
16	D11	48	#CE9/#CE17/#CE17&18	80	A9	112	(No Connection)
17	K54/#DMAREQ3	49	OSC2	81	P16/EXCL5/#DMAEND1/SOUT3	113	OSC4
18	D10	50	#CE7/#RAS0/#CE13/#RAS2	82	A10	114	P20/#DRD
19	K53/#DMAREQ2	51	OSC1	83	A20	115	OSC3
20	D9	52	#CE6/#CE7&8	84	A11	116	P21/#DWE/#GAAS
21	K52/#ADTRG	53	#RD	85	A21	117	#CE3
22	Vss	54	Vss	86	A12	118	P22/TM0
23	K51/#DMAREQ1	55	#WRL/#WR/#WE	87	A22	119	P23/TM1
24	P02/#SCLK0	56	#WRH/#BSH	88	A13	120	DSIO
25	D8	57	#CE10EX/#CE9&10EX	89	A23	121	P10/EXCL0/T8UF0/DST0
26	D7	58	#CE8/#RAS1/#CE14/#RAS3	90	Vss	122	P11/EXCL1/T8UF1/DST1
27	VDD	59	#CE5/#CE15/#CE15&16	91	A14	123	P12/EXCL2/T8UF2/DST2
28	K67/AD7	60	#CE4/#CE11/#CE11&12	92	A15	124	P13/EXCL3/T8UF3/DPCO
29	K66/AD6	61	P30/#WAIT/#CE4&5	93	VDD	125	P14/FOSC1/DCLK
30	K65/AD5	62	#RESET	94	A16	126	P24/TM2/#SRDY2
31	K50/#DMAREQ0	63	#NMI	95	ICEMD	127	Vss
32	K64/AD4	64	A0/#BSL	96	A17	128	P25/TM3/#SCLK2