



# LC897127K

## SCSI CD-ROM Decoder with On-Chip DVD Interface

### Overview

The LC897127K is a CD-ROM decoder that includes an on-chip DVD interface. Since the LC897127K also includes an on-chip SCSI interface, it can be used to implement a SCSI-compatible DVD-ROM drive simply by combining it with a DVD decoder. It can also operate as an independent SPC functional unit.

### Functions

- CD-ROM ECC function, subcode read function, SCSI I/F, CAV audio function, DVD I/F
- ATAPI-to-SCSI conversion function, DMA I/F-to-SCSI conversion function

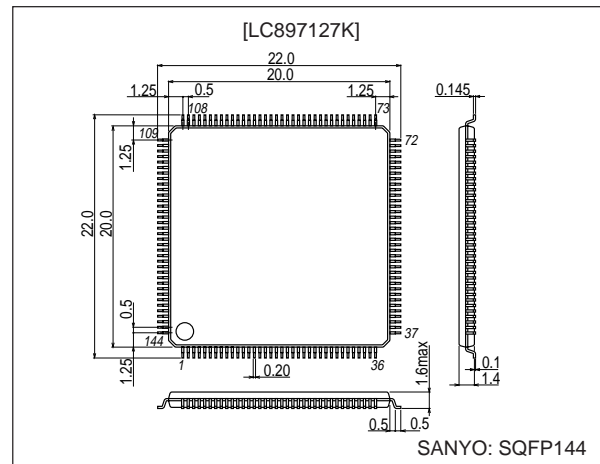
### Features

- Built-in SCSI I/F (Built-in register for SCAM selection)
- 20× speed and transfer speed of 10 Mbytes/s supported using EDO-DRAM (×16, 70 ns)
- 32× speed and transfer speed of 10 Mbytes/s supported using EDO-DRAM (16×, 50 ns)
- Up to 4 Mbits of buffer RAM connectable
- CD main channel and C2 flag areas in buffer RAM can be freely set by user
- Built-in batch transfer function (function for sending CD main channel, C2 flag, etc. at one time)
- Built-in multi block transfer function (function for sending several blocks at one time)
- Built-in subcode buffering function and CD text support
- Built-in CAV audio function
- 20 Mbytes/s transfer supported
- Built-in DVD I/F
- Built-in ATAPI I/F-to-SCSI conversion function
- Built-in DMA I/F-to-SCSI conversion function

### Package Dimensions

unit: mm

#### 3214-SQFP144



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## Specifications

### Absolute Maximum Ratings at $V_{SS} = 0\text{ V}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{DD\text{ max}}$	$T_a = 25^\circ\text{C}$	-0.3 to +7.0	V
Input/output voltage	$V_{I/O}$	$T_a = 25^\circ\text{C}$	-0.3 to $V_{DD} + 0.3$	V
Allowable power dissipation	$P_d\text{ max}$	$T_a \leq 70^\circ\text{C}$	550	mW
Operating temperature	$T_{opr}$		-30 to +70	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +125	$^\circ\text{C}$
Soldering temperature (pin part only)		10s	260	$^\circ\text{C}$

### Allowable Operating Ranges at $T_a = -30\text{ to }+70^\circ\text{C}$ , $V_{SS} = 0\text{ V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply voltage	$V_{DD}$		4.5	5.0	5.25	V
Input voltage range	$V_{IN}$		0		$V_{DD}$	V

### DC Characteristics at $T_a = -30\text{ to }+70^\circ\text{C}$ , $V_{SS} = 0\text{ V}$ , $V_{DD} = 4.5\text{ to }5.5\text{ V}$

Parameter	Symbol	Conditions	Applicable pins	Ratings			Unit
				min	typ	max	
Input high-level voltage	$V_{IH1}$	TTL levels	(1)	2.2			V
Input low-level voltage	$V_{IL1}$					0.8	V
Input high-level voltage	$V_{IH2}$	TTL levels	(9)	2.2	—	—	V
Input low-level voltage	$V_{IL2}$	with pull-up resistor		—	—	0.8	V
Input high-level voltage	$V_{IH3}$	TTL levels	(2)	2.2	—	—	V
Input low-level voltage	$V_{IL3}$	Schmitt		—	—	0.8	V
Input high-level voltage	$V_{IH3}$	TTL levels	(11)	2.2	—	—	V
Input low-level voltage	$V_{IL3}$	Schmitt with pull-down resistor		—	—	0.8	V
Input high-level voltage	$V_{IH4}$	TTL levels	(12)	2.2	—	—	V
Input low-level voltage	$V_{IL4}$	Schmitt with pull-up resistor		—	—	0.8	V
Input high-level voltage	$V_{IH4}$	CMOS levels	(3)	$0.8 V_{DD}$	—	—	V
Input low-level voltage	$V_{IL4}$	Schmitt		—	—	$0.2 V_{DD}$	V
Input high-level voltage	$V_{IH5}$		(4), (8), (10)	2.0		—	V
Input low-level voltage	$V_{IL5}$						0.8
Output high-level voltage	$V_{OH1}$	$I_{OH1} = -12\text{ mA}$	(6)	$V_{DD} - 2.1$	—	—	V
Output low-level voltage	$V_{OL1}$	$I_{OL1} = 12\text{ mA}$		—	—	0.4	V
Output high-level voltage	$V_{OH2}$	$I_{OH2} = -8\text{ mA}$	(7), (11)	2.4		—	V
Output low-level voltage	$V_{OL2}$	$I_{OL2} = 8\text{ mA}$				0.4	V
Output high-level voltage	$V_{OH2}$	$I_{OH2} = -2\text{ mA}$	(9), (5)	2.4		—	V
Output low-level voltage	$V_{OL2}$	$I_{OL2} = 2\text{ mA}$				0.4	V
Output low-level voltage	$V_{OL4}$	$I_{OL4} = 48\text{ mA}$	(10)			0.4	V
Input leakage current	$I_{IL}$	$V_I = V_{SS}, V_{DD}$	All input pins	-25		+25	$\mu\text{A}$
Pull-up resistance	$R_{UP}$		(5), (9)	60	120	240	$\text{k}\Omega$
Pull-down resistance	$R_{DOWN}$		(11)	60	120	240	$\text{k}\Omega$

Applicable pin sets are as follows.

INPUT (1) TEST0 to TEST4, CSCTRL, SUA0 to SUA6, C2PO, SDATA, BCK, LRCK, SCOR, WFCK, SBS0, MCK2SEL

(2) RESET

(3)  $\overline{\text{CS}}$ ,  $\overline{\text{RD}}$ ,  $\overline{\text{WR}}$

(4) SCSISEL, XTALSEL

OUTPUT (5) INT0, INT1, SWAIT

(6) MCK

(7) EXCK, DSDATA, DLRCK, DBCK, RAS0, CAS0, CAS1, OE, UWE, LWE, RA0 to RA8, HDBDIR

INOUT (8) ACK, ATN

(9) D0 to D7, IO0 to IO15

(10) DB0 to DB7, DBP, BSY, I/O, MSG, SEL, RST, REQ, C/D

(11) DRESP, DREQ, HDB0 to HDB7

(12) IOP0 to IOP7 (No pull-up resistor used when these pins are used as pins HDB0 to HDB7)

Note: Pins XTAL0, XTALCK0, XTAL1, XTALCK1, and X1EN are not included in DC characteristics.

**SCSI Pin Input Characteristics**

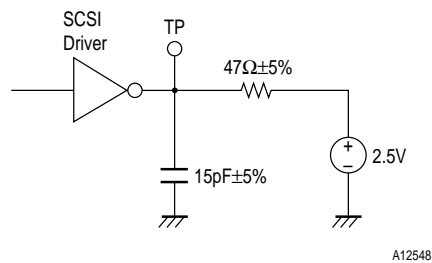
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input threshold voltage	$V_{th1}$	$V_{DD} = 4.50$ to $5.50$ V		1.60	2.00	V
	$V_{t-1}$		0.80	1.10		V
Hysteresis width	$\Delta V_{th1}$	$V_{DD} = 5.0$ V	0.41	0.5		V

**Active Low Output Characteristics**

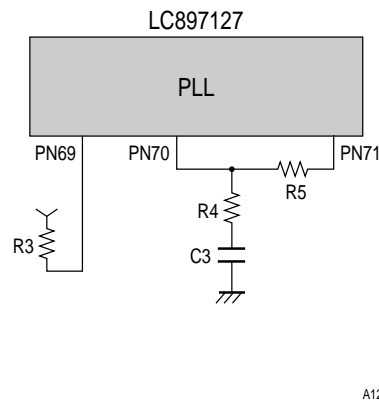
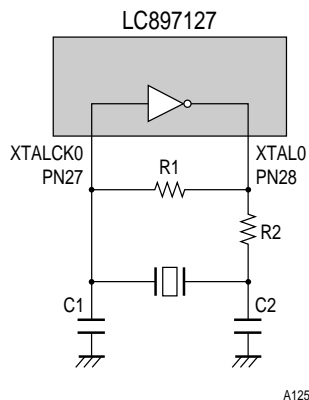
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output high-level voltage	$V_{OH}$		2.5			V
Output low-level voltage	$V_{OL}$				0.4	V

Note: Only applies to the active-low output pins  $\overline{DB0}$  to  $\overline{DB7}$ ,  $\overline{REQ}$ , and  $\overline{DBPB}$

**Rise Time Test Circuit**



**Recommended Oscillator and PLL Circuits**



$R1 = 120$  k $\Omega$ ,  $R2 = 47$   $\Omega$ ,  $C1 = 30$  pF

Crystal element oscillator frequency XTALCK0 = 16.9344 MHz

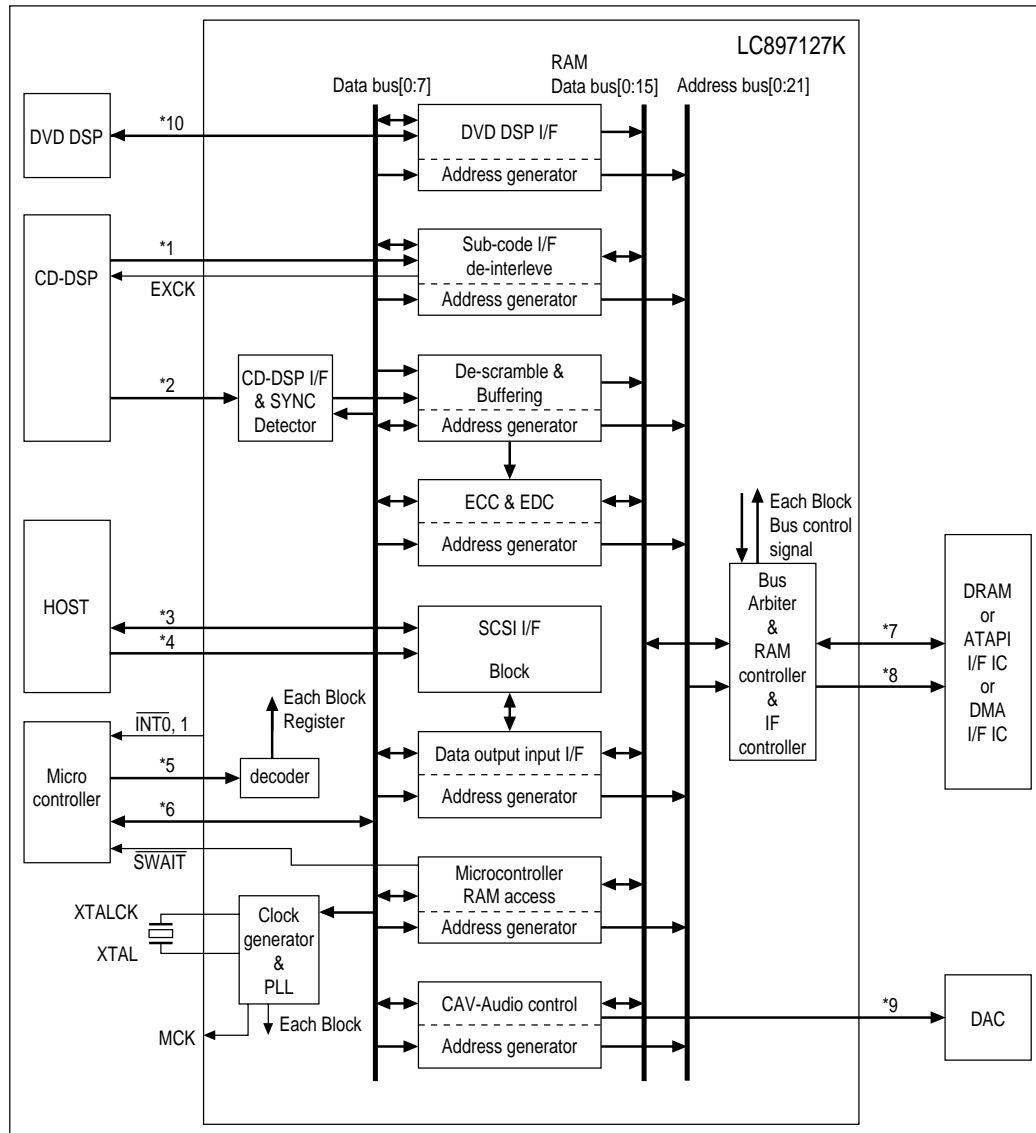
$R3 = 7.5$  k $\Omega$ ,  $R4 = 200$   $\Omega$ ,  $R5 = 10$  k $\Omega$ ,  $C3 = 0.1$   $\mu$ F

Note: The values listed above for R3, R4, R5, and C3 also apply when the XTALKC0 frequency is 33.8688 MHz.

Applications must be designed so that the analog  $V_{DD}$  and  $V_{SS}$  power supply system is completely independent of the logic system power supply and is not affected by the logic system power supply in any way.

Since the exact values of these components will vary depending on characteristics of the printed circuit board used and other factors, consult the manufacturer of the crystal element when designing the oscillator circuit.

Block Diagram



A12551

- \*1. WFCK, SBSO, SCOR
- \*2. BCK, SDATA, LRCK, C2PO
- \*3.  $\overline{DB0}$  to  $\overline{DB7}$ ,  $\overline{DBP}$ ,  $\overline{BSY}$ ,  $\overline{MSG}$ ,  $\overline{SEL}$ ,  $\overline{RST}$ ,  $\overline{REQ}$ , I/O, C/D
- \*4.  $\overline{ACK}$ ,  $\overline{ATN}$
- \*5.  $\overline{RD}$ ,  $\overline{WR}$ ,  $\overline{SUA0}$  to  $\overline{SUA6}$ ,  $\overline{CS}$ ,  $\overline{CSCTRL}$
- \*6. D0 to D7
- \*7. IO0 to IO15 (Data bus for both ATAPI and DMA interfaces)
- \*8. RA0 to RA10, RAS1, RAS0, OE, UWE, LWE  
 ATAPI interface: SBSO (DMARQ),  $\overline{DBCK}$  (DMACK),  $\overline{DLRCK}$  (DIOR), DSDATA (DIOW)  
 DMA interface: EXCK (DMARQ), C2PO (DMACK), SDATA (DIOR), BCK (DIOW)
- \*9.  $\overline{DBCK}$ ,  $\overline{DLRCK}$ , DSDATA
- \*10.  $\overline{HDB7}$  to  $\overline{HDB0}$ ,  $\overline{DRESP}$ ,  $\overline{DREQ}$   
 See the circuit examples for details on ATAPI and DMA interface IC connection.

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### LC897127K Pin Functions

When the DVD Interface is Used

Type					
I	INPUT	B	BIDIRECTION	NC	NOT CONNECT
O	OUTPUT	P	POWER		

Pin No.	Pin	Type	Function
1	V <sub>SS0</sub>	P	
2	IO2	B	Buffer RAM data I/O. These pins have built-in pull-up resistors.
3	IO1	B	
4	IO0	B	
5	MCK2SEL	I	
6	C2PO	I	CD DSP interface
7	SDATA	I	
8	BCK	I	
9	LRCK	I	
10	EXCK	O	Subcode I/O
11	WFCK	I	
12	SBSO	I	Subcode I/O
13	SCOR	I	
14	DSDATA	O	D/A converter outputs
15	DLRCK	O	
16	DBCK	O	
17	MCK	O	XTALCLK0 1/1, 1/2, and stop output
18	V <sub>DD</sub>	P	
19	V <sub>SS0</sub>	P	
20	RESET	I	IC reset. The IC is reset on a low-level input.
21	CSCTRL	I	Microcontroller CS low/high
22	TEST3	I	Test pins. These pins must be connected to V <sub>SS0</sub> in normal operation.
23	TEST0	I	
24	TEST1	I	
25	TEST2	I	
26	V <sub>SS0</sub>	P	
27	XTALCK0	I	Crystal oscillator circuit input
28	XTAL0	O	Crystal oscillator circuit output
29	TEST4	I	Test pin. This pin must be connected to V <sub>SS0</sub> in normal operation.
30	DRESP	B	DVD ECC data latching. A pull-down resistor is built in.
31	HDBDIR	O	DVD data bus direction output. A pull-down resistor is built in.
32	DREQ	B	DVD ECC data request. A pull-down resistor is built in.
33	V <sub>SS0</sub>	P	
34	HDB7	I	DVD data input
35	HDB6	I	
36	V <sub>SS0</sub>	P	
37	V <sub>DD</sub>	P	
38	HDB5	I	DVD data input
39	HDB4	I	
40	HDB3	I	
41	HDB2	I	
42	HDB1	I	
43	HDB0	I	
44	V <sub>SS0</sub>	P	
45	RD	I	Microcontroller data read signal input
46	WR	I	Microcontroller data write signal input
47	CS	I	Register chip select input from the microcontroller
48	SUA0	I	Microcontroller register selection signals
49	SUA1	I	
50	SUA2	I	
51	SUA3	I	
52	SUA4	I	
53	SUA5	I	

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Pin No.	Pin	Type	Function
54	V <sub>DD</sub>	P	
55	V <sub>SS0</sub>	P	
56	SUA6	I	Microcontroller register selection signals
57	D0	B	Microcontroller data signals
58	D1	B	
59	D2	B	
60	D3	B	
61	D4	B	
62	D5	B	
63	V <sub>SS0</sub>	P	
64	D6	B	Microcontroller data signals
65	D7	B	
66	$\overline{\text{INT0}}$	O	Interrupt request signal output to the microcontroller (ECC side. Set by setting a register value.)
67	$\overline{\text{INT1}}$	O	Interrupt request signal output to the microcontroller (SCSI side. Set by setting a register value.)
68	$\overline{\text{SWAIT}}$	O	Wait signal output to the microcontroller
69	X1EN	I	Used by the PLL. This pin must be connected to V <sub>DD</sub> through a resistor.
70	XTALCK1	I	Used by the PLL.
71	XTAL1	O	Used by the PLL.
72	V <sub>SS0</sub>	P	Analog V <sub>SS</sub>
73	V <sub>DD</sub>	P	Analog V <sub>DD</sub>
74		NC	
75	I/O	B	SCSI interface
76	$\overline{\text{REQ}}$	B	
77	V <sub>SS1</sub>	P	
78	C/D	B	SCSI interface
79	$\overline{\text{SEL}}$	B	
80		NC	
81	V <sub>DD</sub>	P	
82	V <sub>SS1</sub>	P	
83	$\overline{\text{MSG}}$	B	SCSI interface
84	$\overline{\text{RST}}$	B	
85	V <sub>SS1</sub>	P	
86	$\overline{\text{ACK}}$	B	SCSI interface
87	$\overline{\text{BSY}}$	B	
88	V <sub>SS1</sub>	P	
89	$\overline{\text{ATN}}$	B	SCSI interface
90	V <sub>DD</sub>	P	
91	V <sub>SS1</sub>	P	
92		NC	
93	$\overline{\text{DBP}}$	B	SCSI interface
94	V <sub>DD</sub>	P	
95	$\overline{\text{DB7}}$	B	SCSI interface
96	$\overline{\text{DB6}}$	B	
97	V <sub>SS1</sub>	P	
98	$\overline{\text{DB5}}$	B	SCSI interface
99	$\overline{\text{DB4}}$	B	
100	V <sub>DD</sub>	P	
101	$\overline{\text{DB3}}$	B	SCSI interface
102	$\overline{\text{DB2}}$	B	
103	V <sub>SS1</sub>	P	
104	$\overline{\text{DB1}}$	B	SCSI interface
105	$\overline{\text{DB0}}$	B	
106	SCSISEL	I	SCSI pin layout selection. (This pin must be connected to V <sub>SS0</sub> .)
107	XTALSEL	I	PLL XATL oscillator selection

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Pin No.	Pin	Type	Function
108	V <sub>SS1</sub>	P	
109	V <sub>DD</sub>	P	
110	V <sub>SS0</sub>	P	
111	$\overline{\text{RAS0}}$	O	Buffer RAM RAS signal output 0
112	DVDSEL	P	V <sub>SS0</sub> selects the DVD interface and V <sub>DD</sub> selects the I/O port function.
113	$\overline{\text{CAS0}}$	O	Buffer RAM CAS signal output 0 (Normally fixed at 0 (low).)
114	$\overline{\text{CAS1}}$	O	Buffer RAM CAS signal output 1
115	$\overline{\text{OE}}$	O	Buffer RAM output enable
116	$\overline{\text{UWE(RA9)}}$	O	Buffer RAM upper write enable (RA9 when 8M or more DRAM is used.)
117	$\overline{\text{LWE}}$	O	Buffer RAM lower write enable
118	V <sub>SS0</sub>	P	
119	RA0	O	Buffer RAM address signal outputs
120	RA1	O	
121	RA2	O	
122	RA3	O	
123	RA4	O	
124	RA5	O	
125	RA6	O	
126	V <sub>DD</sub>	P	
127	V <sub>SS0</sub>	P	
128	RA7	O	Buffer RAM address signal outputs
129	RA8	O	
130	IO15	B	Buffer RAM data I/O. These pins have built-in pull-up resistors.
131	IO14	B	
132	IO13	B	
133	IO12	B	
134	IO11	B	
135	IO10	B	
136	IO9	B	
137	IO8	B	
138	V <sub>SS0</sub>	P	
139	IO7	B	Buffer RAM data I/O. These pins have built-in pull-up resistors.
140	IO6	B	
141	IO5	B	
142	IO4	B	
143	IO3	B	
144	V <sub>DD</sub>	P	

- Unused ("NC") pins must be left open.
- Pins whose name is under a bar operate with inverted (negative) logic.
- V<sub>SS0</sub> is the logic system ground and V<sub>SS1</sub> is the SCSI interface driver ground.
- If DRAM is used, applications must adopt measures to prevent undershoot and other DRAM problems. Such measures include inserting resistors in the RAS and CAS lines and inserting capacitors between V<sub>SS</sub> pins. See the article on Designing with the Latest Microcontrollers and Memory in special issue number 25 of Transistor Technology for details on these measures.
- Since this device includes buffers that sink a current of 48 mA, applications must take adequate noise prevention measures.

## LC897127K

### LC897127K Pin Functions

When ATAPI to SCSI Conversion is Used

Type					
I	INPUT	B	BIDIRECTION	NC	NOT CONNECT
O	OUTPUT	P	POWER		

Pin No.	Pin	Type	Function
1	V <sub>SS0</sub>	P	
2	IO2	B	ATAPI data I/O. These pins have built-in pull-up resistors.
3	IO1	B	
4	IO0	B	
5	MCK2SEL	I	
6	V <sub>SS0</sub>	P	
7	V <sub>SS0</sub>	P	
8	V <sub>SS0</sub>	P	
9	V <sub>DD</sub>	P	
10		NC	
11	V <sub>DD</sub>	P	
12	DMARQ	I	ATAPI interface
13	V <sub>DD</sub>	P	
14	DIOW	O	ATAPI interface
15	DIOR	O	
16	DMACK	O	
17	MCK	O	XTALCLK0 1/1, 1/2, and stop output
18	V <sub>DD</sub>	P	
19	V <sub>SS0</sub>	P	
20	$\overline{\text{RESET}}$	I	IC reset. The IC is reset on a low-level input.
21	CSCTRL	I	Microcontroller CS low/high
22	TEST3	I	Test pins. These pins must be connected to V <sub>SS0</sub> in normal operation.
23	TEST0	I	
24	TEST1	I	
25	TEST2	I	
26	V <sub>SS0</sub>	P	
27	XTALCK0	I	Crystal oscillator circuit input
28	XTAL0	O	Crystal oscillator circuit output
29	TEST4	I	Test pin. This pin must be connected to V <sub>SS0</sub> in normal operation.
30	V <sub>SS0</sub>	P	
31	V <sub>SS0</sub>	P	
32	V <sub>SS0</sub>	P	
33	V <sub>SS0</sub>	P	
34	IOP7	I	General-purpose inputs
35	IOP6	I	These pins have built-in pull-up resistors.
36	V <sub>SS0</sub>	P	
37	V <sub>DD</sub>	P	
38	IOP5	I	General-purpose inputs These pins have built-in pull-up resistors.
39	IOP4	I	
40	IOP3	I	
41	IOP2	I	
42	IOP1	I	
43	IOP0	I	
44	V <sub>SS0</sub>	P	
45	$\overline{\text{RD}}$	I	Microcontroller data read signal input
46	$\overline{\text{WR}}$	I	Microcontroller data write signal input
47	$\overline{\text{CS}}$	I	Register chip select input from the microcontroller
48	SUA0	I	Microcontroller register selection signals
49	SUA1	I	
50	SUA2	I	
51	SUA3	I	
52	SUA4	I	
53	SUA5	I	

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Pin No.	Pin	Type	Function
54	V <sub>DD</sub>	P	
55	V <sub>SS0</sub>	P	
56	SUA6	I	Microcontroller register selection signals
57	D0	B	Microcontroller data signals
58	D1	B	
59	D2	B	
60	D3	B	
61	D4	B	
62	D5	B	
63	V <sub>SS0</sub>	P	
64	D6	B	Microcontroller data signals
65	D7	B	
66	$\overline{\text{INT0}}$	O	Interrupt request signal output to the microcontroller (ECC side. Set by setting a register value.)
67	$\overline{\text{INT1}}$	O	Interrupt request signal output to the microcontroller (SCSI side. Set by setting a register value.)
68	$\overline{\text{SWAIT}}$	O	Wait signal output to the microcontroller
69	X1EN	I	Used by the PLL. This pin must be connected to V <sub>DD</sub> through a resistor.
70	XTALCK1	I	Used by the PLL.
71	XTAL1	O	Used by the PLL.
72	V <sub>SS0</sub>	P	Analog V <sub>SS</sub>
73	V <sub>DD</sub>	P	Analog V <sub>DD</sub>
74		NC	
75	I/O	B	SCSI interface
76	$\overline{\text{REQ}}$	B	
77	V <sub>SS1</sub>	P	
78	C/D	B	SCSI interface
79	$\overline{\text{SEL}}$	B	
80		NC	
81	V <sub>DD</sub>	P	
82	V <sub>SS1</sub>	P	
83	$\overline{\text{MSG}}$	B	SCSI interface
84	$\overline{\text{RST}}$	B	
85	V <sub>SS1</sub>	P	
86	$\overline{\text{ACK}}$	B	SCSI interface
87	$\overline{\text{BSY}}$	B	
88	V <sub>SS1</sub>	P	
89	$\overline{\text{ATN}}$	B	SCSI interface
90	V <sub>DD</sub>	P	
91	V <sub>SS1</sub>	P	
92		NC	
93	$\overline{\text{DBP}}$	B	SCSI interface
94	V <sub>DD</sub>	P	
95	$\overline{\text{DB7}}$	B	SCSI interface
96	$\overline{\text{DB6}}$	B	
97	V <sub>SS1</sub>	P	
98	$\overline{\text{DB5}}$	B	SCSI interface
99	$\overline{\text{DB4}}$	B	
100	V <sub>DD</sub>	P	
101	$\overline{\text{DB3}}$	B	SCSI interface
102	$\overline{\text{DB2}}$	B	
103	V <sub>SS1</sub>	P	
104	$\overline{\text{DB1}}$	B	SCSI interface
105	$\overline{\text{DB0}}$	B	
106	SCSISEL	I	SCSI pin layout selection. (This pin must be connected to V <sub>SS0</sub> .)
107	XTALSEL	I	PLL XATL oscillator selection

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Pin No.	Pin	Type	Function
108	V <sub>SS1</sub>	P	
109	V <sub>DD</sub>	P	
110	V <sub>SS0</sub>	P	
111		NC	
112	V <sub>DD</sub>	P	
113		NC	
114		NC	
115		NC	
116		NC	
117		NC	
118	V <sub>SS0</sub>	P	
119		NC	
120		NC	
121		NC	
122		NC	
123		NC	
124		NC	
125		NC	
126	V <sub>DD</sub>	P	
127	V <sub>SS0</sub>	P	
128		NC	
129		NC	
130	IO15	B	ATAPI data I/O These pins have built-in pull-up resistors.
131	IO14	B	
132	IO13	B	
133	IO12	B	
134	IO11	B	
135	IO10	B	
136	IO9	B	
137	IO8	B	
138	V <sub>SS0</sub>	P	
139	IO7	B	ATAPI data I/O These pins have built-in pull-up resistors.
140	IO6	B	
141	IO5	B	
142	IO4	B	
143	IO3	B	
144	V <sub>DD</sub>	P	

- Unused ("NC") pins must be left open.
- Pins whose name is under a bar operate with inverted (negative) logic.
- V<sub>SS0</sub> is the logic system ground and V<sub>SS1</sub> is the SCSI interface driver ground.
- Since this device includes buffers that sink a current of 48 mA, applications must take adequate noise prevention measures.

## LC897127K

### LC897127K Pin Functions

When DMA Interface to SCSI Conversion is Used

Type					
I	INPUT	B	BIDIRECTION	NC	NOT CONNECT
O	OUTPUT	P	POWER		

Pin No.	Pin	Type	Function
1	V <sub>SS0</sub>	P	
2	IO2	B	DAM interface data I/O. These pins have built-in pull-up resistors.
3	IO1	B	
4	IO0	B	
5	MCK2SEL	I	
6	DMACK	I	DMA interface functions
7	DIOR	I	
8	DIOW	I	
9	V <sub>DD</sub>	P	
10	DMARQ	O	DMA interface functions
11	V <sub>DD</sub>	P	
12	V <sub>DD</sub>	P	
13	V <sub>DD</sub>	P	
14		NC	
15		NC	
16		NC	
17	MCK	O	XTALCLK0 1/1, 1/2, and stop output
18	V <sub>DD</sub>	P	
19	V <sub>SS0</sub>	P	
20	$\overline{\text{RESET}}$	I	IC reset. The IC is reset on a low-level input.
21	CCTRL	I	Microcontroller CS low/high
22	TEST3	I	Test pins. These pins must be connected to V <sub>SS0</sub> in normal operation.
23	TEST0	I	
24	TEST1	I	
25	TEST2	I	
26	V <sub>SS0</sub>	P	
27	XTALCK0	I	Crystal oscillator circuit input
28	XTAL0	O	Crystal oscillator circuit output
29	TEST4	I	Test pin. This pin must be connected to V <sub>SS0</sub> in normal operation.
30	V <sub>SS0</sub>	P	
31	V <sub>SS0</sub>	P	
32	V <sub>SS0</sub>	P	
33	V <sub>SS0</sub>	P	
34	IOP7	I	General-purpose inputs
35	IOP6	I	These pins have built-in pull-up resistors.
36	V <sub>SS0</sub>	P	
37	V <sub>DD</sub>	P	
38	IOP5	I	General-purpose inputs These pins have built-in pull-up resistors.
39	IOP4	I	
40	IOP3	I	
41	IOP2	I	
42	IOP1	I	
43	IOP0	I	
44	V <sub>SS0</sub>	P	
45	$\overline{\text{RD}}$	I	Microcontroller data read signal input
46	$\overline{\text{WR}}$	I	Microcontroller data write signal input
47	$\overline{\text{CS}}$	I	Register chip select input from the microcontroller
48	SUA0	I	Microcontroller register selection signals
49	SUA1	I	
50	SUA2	I	
51	SUA3	I	
52	SUA4	I	
53	SUA5	I	

Continued on next page.

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Continued from preceding page.

Pin No.	Pin	Type	Function
54	V <sub>DD</sub>	P	
55	V <sub>SS0</sub>	P	
56	SUA6	I	Microcontroller register selection signals
57	D0	B	Microcontroller data signals
58	D1	B	
59	D2	B	
60	D3	B	
61	D4	B	
62	D5	B	
63	V <sub>SS0</sub>	P	
64	D6	B	Microcontroller data signals
65	D7	B	
66	$\overline{\text{INT0}}$	O	Interrupt request signal output to the microcontroller (ECC side. Set by setting a register value.)
67	$\overline{\text{INT1}}$	O	Interrupt request signal output to the microcontroller (SCSI side. Set by setting a register value.)
68	$\overline{\text{SWAIT}}$	O	Wait signal output to the microcontroller
69	X1EN	I	Used by the PLL. This pin must be connected to V <sub>DD</sub> through a resistor.
70	XTALCK1	I	Used by the PLL.
71	XTAL1	O	Used by the PLL.
72	V <sub>SS0</sub>	P	Analog V <sub>SS</sub>
73	V <sub>DD</sub>	P	Analog V <sub>DD</sub>
74		NC	
75	I/O	B	SCSI interface
76	$\overline{\text{REQ}}$	B	
77	V <sub>SS1</sub>	P	
78	C/D	B	SCSI interface
79	$\overline{\text{SEL}}$	B	
80		NC	
81	V <sub>DD</sub>	P	
82	V <sub>SS1</sub>	P	
83	$\overline{\text{MSG}}$	B	SCSI interface
84	$\overline{\text{RST}}$	B	
85	V <sub>SS1</sub>	P	
86	$\overline{\text{ACK}}$	B	SCSI interface
87	$\overline{\text{BSY}}$	B	
88	V <sub>SS1</sub>	P	
89	$\overline{\text{ATN}}$	B	SCSI interface
90	V <sub>DD</sub>	P	
91	V <sub>SS1</sub>	P	
92		NC	
93	$\overline{\text{DBP}}$	B	SCSI interface
94	V <sub>DD</sub>	P	
95	$\overline{\text{DB7}}$	B	SCSI interface
96	$\overline{\text{DB6}}$	B	
97	V <sub>SS1</sub>	P	
98	$\overline{\text{DB5}}$	B	SCSI interface
99	$\overline{\text{DB4}}$	B	
100	V <sub>DD</sub>	P	
101	$\overline{\text{DB3}}$	B	SCSI interface
102	$\overline{\text{DB2}}$	B	
103	V <sub>SS1</sub>	P	
104	$\overline{\text{DB1}}$	B	SCSI interface
105	$\overline{\text{DB0}}$	B	
106	SCSISEL	I	SCSI pin layout selection. (This pin must be connected to V <sub>SS0</sub> .)
107	XTALSEL	I	PLL XATL oscillator selection

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Continued from preceding page.

Pin No.	Pin	Type	Function
108	V <sub>SS1</sub>	P	
109	V <sub>DD</sub>	P	
110	V <sub>SS0</sub>	P	
111		NC	
112	V <sub>DD</sub>	P	
113		NC	
114		NC	
115		NC	
116		NC	
117		NC	
118	V <sub>SS0</sub>	P	
119		NC	
120		NC	
121		NC	
122		NC	
123		NC	
124		NC	
125		NC	
126	V <sub>DD</sub>	P	
127	V <sub>SS0</sub>	P	
128		NC	
129		NC	
130	IO15	B	DMA interface data I/O. These pins have built-in pull-up resistors.
131	IO14	B	
132	IO13	B	
133	IO12	B	
134	IO11	B	
135	IO10	B	
136	IO9	B	
137	IO8	B	
138	V <sub>SS0</sub>	P	
139	IO7	B	ATAPI data I/O. These pins have built-in pull-up resistors.
140	IO6	B	
141	IO5	B	
142	IO4	B	
143	IO3	B	
144	V <sub>DD</sub>	P	

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