

**SANYO**

No. ※4854A

**LC89517K****Built-in Subcode Interface CD-ROM/CD-I  
Error Correction LSI****Preliminary****Overview**

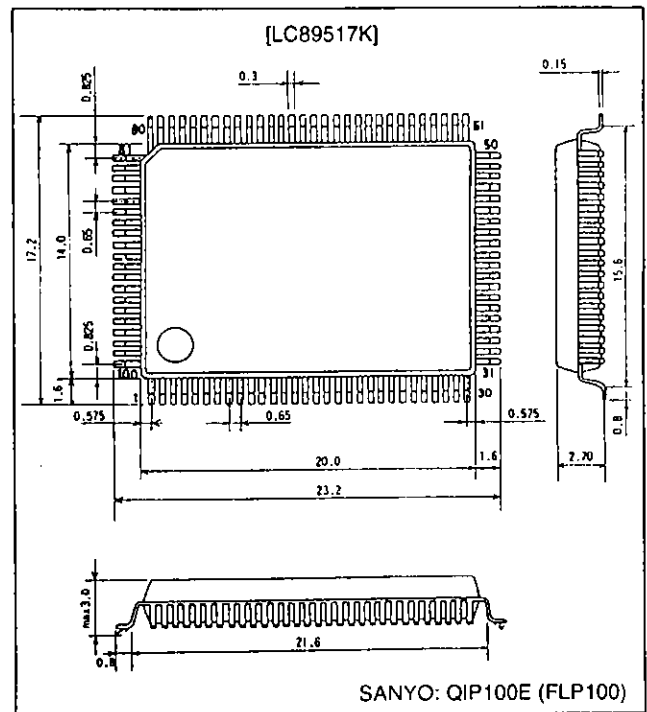
The LC89517K is a CD-ROM/CD-I error correction LSI that integrates the functions provided by the improved version of the LC89515 and a sub-code function in a single chip. The improved version of the LC89515 additionally supports double speed operation.

**Features**

- Support for double speed operation (selectable by setting an internal register) at an operating frequency of 16.9344 MHz
- Built-in 12-byte FIFO for transfers from the system microcontroller to the host computer
- Built-in 12-byte FIFO for transfers from the host computer to the system microcontroller
- Direct connection to the LC8955 (an ADPCM decoder LSI) and the LC8953 (a 68000 CPU peripheral interface LSI)
- Sub-code data can be written to buffer RAM simply by connecting the CD DSP sub-code pin. This allows the system microcontroller to read the sub-code values.
- The system microcontroller can access buffer RAM through the LC89517K.
- Pseudo-SRAM support (An interface circuit is built in.)

**Package Dimensions**

unit: mm

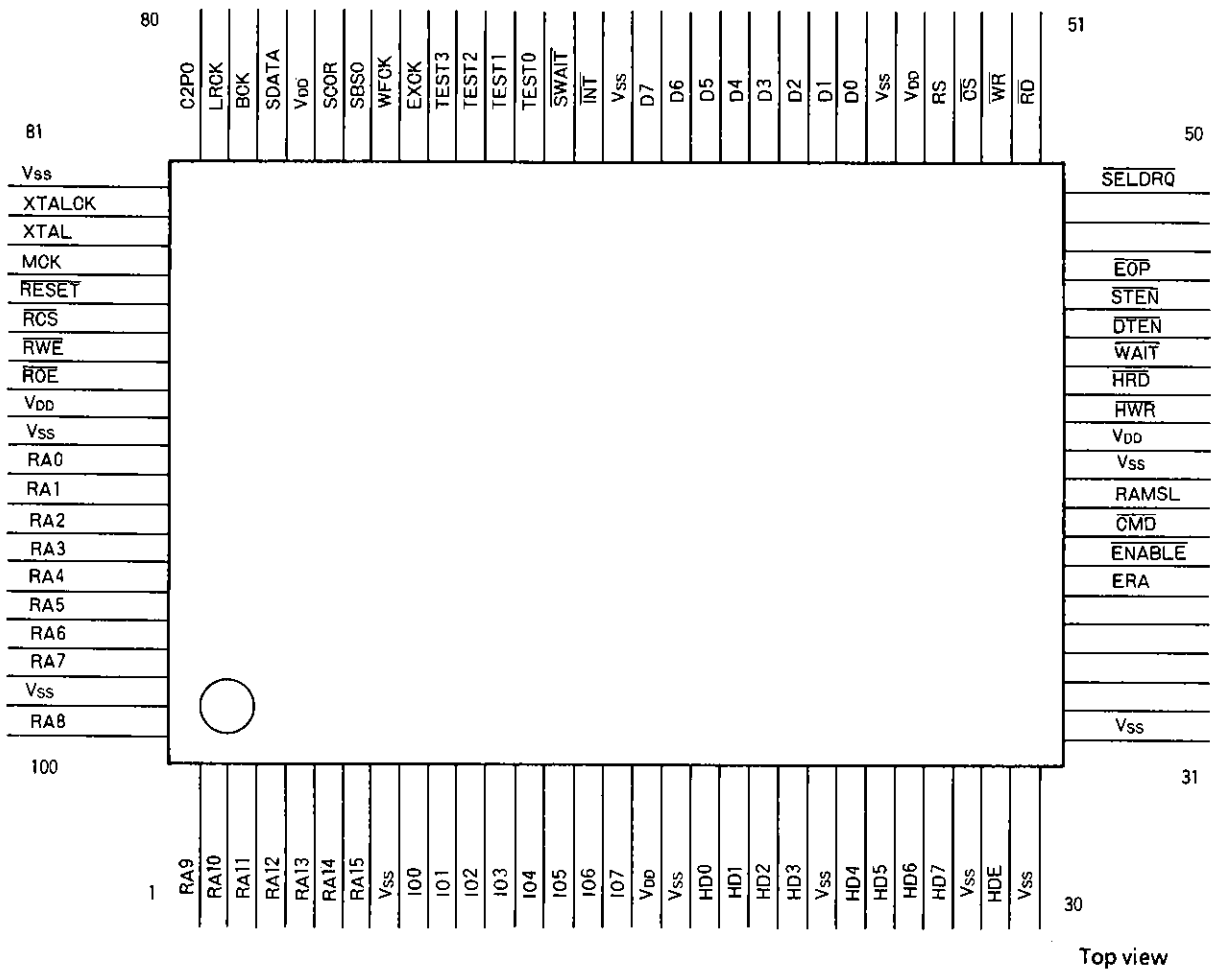
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Pin Assignment



Top view

## Pin Functions

Type: I: Input pin, O: Output pin, B: Bidirectional pin, P: Power supply pin, NC: Unconnected pin

Pin No.	Pin	Type	Function
1	RA9	O	Data buffer RAM address signal outputs
2	RA10	O	
3	RA11	O	
4	RA12	O	
5	RA13	O	
6	RA14	O	
7	RA15	O	
8	V <sub>SS</sub>	P	
9	IO0	B	Data buffer RAM data signals
10	IO1	B	These pins have built-in pull-up resistors.
11	IO2	B	
12	IO3	B	
13	IO4	B	
14	IO5	B	
15	IO6	B	Data buffer RAM data signals
16	IO7	B	These pins have built-in pull-up resistors.
17	V <sub>DD</sub>	P	
18	V <sub>SS</sub>	P	
19	HD0	B	Host data signals These pins have built-in pull-up resistors.
20	HD1	B	
21	HD2	B	
22	HD3	B	
23	V <sub>SS</sub>	P	
24	HD4	B	Host data signals These pins have built-in pull-up resistors
25	HD5	B	
26	HD6	B	
27	HD7	B	
28	V <sub>SS</sub>	P	
29	HDE	O	Host erasure flag output (Connect to V <sub>DD</sub> if unused.)
30	V <sub>SS</sub>	P	
31	V <sub>SS</sub>	P	
32		NC	
33		NC	
34		NC	
35		NC	
36	ERA	B	Data buffer RAM erasure flag signal (Connect to V <sub>SS</sub> if unused.)
37	ENABLE	I	Chip select signal input (from host computer)
38	CMD	I	Host command/data selection signal
39	RAMSL	I	DRAM/SRAM switch
40	V <sub>SS</sub>	P	
41	V <sub>DD</sub>	P	
42	HWR	I	Host data write signal input
43	HRD	I	Host data read signal input
44	WAIT	O	Wait signal output (to host). This pin can be switched to function as the DRQ signal.
45	DTEN	O	Data enable signal output
46	STEN	O	Status enable signal output
47	EOP	O	End of process signal output. Used during DMA transfers.
48		NC	
49		NC	
50	SELDRQ	I	Selects the mode for data transfers to the host.

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Pin No.	Pin	Type	Function
51	$\overline{RD}$	I	Microcontroller data read signal input
52	$\overline{WR}$	I	Microcontroller data write signal input
53	$\overline{CS}$	I	Chip select signal input (from microcontroller)
54	RS	I	Register selection signal
55	V <sub>DD</sub>	P	
56	V <sub>SS</sub>	P	
57	D0	B	Microcontroller data signals. These pins have built-in pull-up resistors.
58	D1	B	
59	D2	B	
60	D3	B	
61	D4	B	
62	D5	B	
63	D6	B	
64	D7	B	
65	V <sub>SS</sub>	P	
66	$\overline{INT}$	O	Interrupt request signal output (to the microcontroller) This pin is an open drain output with a built-in pull-up resistor.
67	SWAIT	O	System microcontroller wait signal
68	TEST0	I	Test inputs. These pins should be tied low during normal operation.
69	TEST1	I	
70	TEST2	I	
71	TEST3	I	
72	EXCK	O	Sub-code I/O
73	WFCK	I	
74	SBSO	I	
75	SCOR	I	
76	V <sub>DD</sub>	P	
77	SDATA	I	Serial data input
78	BCK	I	Serial data input clock
79	LRCK	I	44.1 kHz strobe signal input
80	C2PO	I	C2 pointer input
81	V <sub>SS</sub>	P	
82	XTALCK	I	Crystal oscillator input
83	XTAL	O	Crystal oscillator output
84	MCK	O	Outputs the XTALCK input signal divided by 2.
85	$\overline{RESET}$	I	Chip select signal input
86	$\overline{RCS}$	O	RAM chip select
87	$\overline{RWE}$	O	RAM data write signal
88	$\overline{ROE}$	O	RAM data read signal
89	V <sub>DD</sub>	P	
90	V <sub>SS</sub>	P	
91	RA0	O	Data buffer RAM address signal outputs
92	RA1	O	
93	RA2	O	
94	RA3	O	
95	RA4	O	
96	RA5	O	
97	RA6	O	
98	RA7	O	
99	V <sub>SS</sub>	P	
100	RA8	O	Data buffer RAM address signal output

## 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
I/O voltage	$V_I, V_O$	$T_a = 25^\circ\text{C}$	-0.3 to $V_{DD} + 0.3$	V
Allowable power dissipation	$P_d\text{ max}$	$T_a \leq 70^\circ\text{C}$	350	mW
Operating temperature	$T_{opr}$		-30 to +70	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +125	$^\circ\text{C}$
Soldering temperature		10 seconds	260	$^\circ\text{C}$

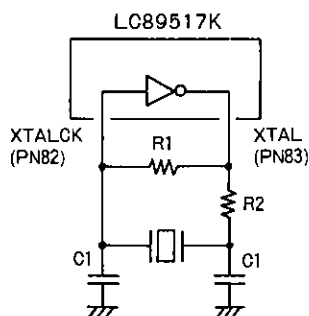
### Allowable Operating Ranges at $T_a = -30\text{ to }+70^\circ\text{C}$ , $V_{SS} = 0\text{ V}$

Parameter	Symbol	Conditions	min	typ	max	Unit
Supply voltage	$V_{DD}$		3.5	5.0	5.5	V
Input voltage range	$V_{IN}$		0		$V_{DD}$	V

### DC Characteristics at $T_a = -30\text{ to }+70^\circ\text{C}$ , $V_{SS} = 0\text{ V}$ , $V_{DD} = 3.5\text{ to }5.5\text{ V}$

Parameter	Symbol	Conditions	min	typ	max	Unit
Input high level voltage	$V_{IH1}$	All input pins other than (1) and XTALCK	2.2			V
Input low level voltage	$V_{IL1}$				0.8	V
Input high level voltage	$V_{IH2}$	RESET, all bus pins (HRD, HWR, ENABLE, CMD, RD, CS, WR, WFCK, SBSO, SCOR) (1)	2.5			V
Input low level voltage	$V_{IL2}$				0.6	V
Output high level voltage	$V_{OH1}$	$I_{OH1} = -2\text{ mA}$ : All output pins (including bus pins) other than (2) and XTALCK	2.4			V
Output low level voltage	$V_{OL1}$	$I_{OL1} = 2\text{ mA}$ : All output pins (including bus pins) other than (2) and XTALCK			0.4	V
Output low level voltage	$V_{OL2}$	$I_{OL2} = 2\text{ mA}$ : INT (open drain circuit with pull-up resistor) (2)			0.4	V
Output high level voltage	$V_{OH3}$	$I_{OH3} = -6\text{ mA}$ : HD0 to HD7	2.4			V
Output low level voltage	$V_{OL3}$	$I_{OL3} = 6\text{ mA}$ : HD0 to HD7			0.4	V
Input leakage current	$I_L$	$V_I = V_{SS}, V_{DD}$ : All input pins	-25		+25	$\mu\text{A}$
Pull-up resistance	$R_{UP}$	All bus pins, INT	10	20	40	$\text{k}\Omega$

### Sample Recommended Oscillator Circuit



$R1 = 120\text{ k}\Omega$   
 $R2 = 47\ \Omega$   
 $C1 = 30\text{ pF}$   
 Crystal oscillator frequency = 16.9344 MHz