

4-bit Single Chip Microcomputer

Preliminary



- 4-bit E0C63000 Core CPU
- Built-in LCD Driver
- High Speed Instruction Cycle (2-6CPI)
- Built-in Multiply-divide Circuit
- Built-in R/F Converter

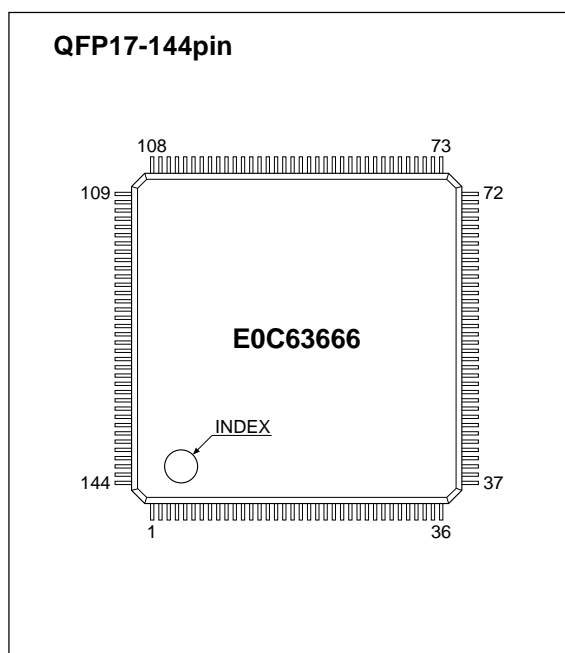
■ DESCRIPTION

The E0C63666 is a CMOS 4-bit microcomputer composed of a CMOS 4-bit core CPU, ROM, RAM, LCD driver, serial interface, multiply-divide circuit, R/F converter and counters. The E0C63666 features high-speed and ultra low current consumption, this makes it suitable for battery driven portable equipment such as clocks.

■ FEATURES

- CMOS LSI 4-bit parallel processing E0C63000 core CPU
- OSC1 oscillation circuit 32.768kHz (Typ.) crystal oscillation circuit
- OSC3 oscillation circuit 4MHz (Max.) ceramic or 1.4MHz (Typ.) CR oscillation circuit (*1)
- Instruction set Basic instruction : 46 types (411 instructions with all)
Addressing mode : 8 types
- Instruction execution time During operation at 32.768kHz : 61μsec 122μsec 183μsec
During operation at 4MHz : 0.5μsec 1μsec 1.5μsec
- ROM capacity Code ROM : 16,384 words × 13 bits
Data ROM : 4,096 words × 4 bits
- RAM capacity Data memory : 5,120 words × 4 bits
Display memory: 128 words × 4 bits
- Input port 8 bits (Pull-down resistors may be supplemented *1)
- Output port 8 bits (It is possible to switch the 2 bits to special output *2)
- I/O port 8 bits (It is possible to switch the 4 bits to serial I/F input/output *2)
- Serial interface 1 port (8-bit clock synchronous system)
- LCD driver 64 segments × 4, 5 or 8 commons (*2)
- Time base counter Clock timer
Stopwatch timer (1/1000 sec, with direct key input function)
- Programmable timer 8 bits × 3 ch. or 16 bits × 1 ch. + 8 bits × 1 ch. (*2)
- Watchdog timer Built-in
- Sound generator With envelope and 1-shot output functions
- R/F converter 2 ch., CR oscillation type, 20-bit counter
- Multiply-divide circuit 8-bit accumulator × 1 ch.
Multiplication : 8 bits × 8 bits → 16-bit product
Division : 16 bits ÷ 8 bits → 8-bit quotient and 8-bit remainder
- Analog comparator 1 ch.
- Supply voltage detection (SVD) circuit .. 4 criteria voltages are selectable from 8 types (1.85 to 2.90V *1)
(External voltage detection is possible *1)
- Interrupts External interrupt : Input port interrupt 1 system
Internal interrupt : Clock timer interrupt 4 systems
: Stopwatch timer interrupt 2 systems
: Programmable timer interrupt 2 systems
: Serial interface interrupt 1 system
: R/F converter interrupt 1 system

PIN CONFIGURATION



No.	Pin name	No.	Pin name	No.	Pin name	No.	Pin name	No.	Pin name
1	N.C.	30	OSC4	59	SEG53	88	K13	117	SEG7
2	COM0	31	Vss	60	SEG54	89	P00	118	SEG8
3	COM1	32	TEST	61	SEG55	90	P01	119	SEG9
4	COM2	33	RESET	62	SEG56	91	P02	120	SEG10
5	COM3	34	N.C.	63	SEG57	92	P03	121	SEG11
6	CA	35	N.C.	64	SEG58	93	P10	122	SEG12
7	CB	36	N.C.	65	SEG59	94	P11	123	SEG13
8	Vc1	37	N.C.	66	SEG60	95	P12	124	SEG14
9	Vc2	38	SEG32	67	SEG61	96	P13	125	SEG15
10	Vc3	39	SEG33	68	SEG62	97	R00	126	SEG16
11	CMPP0	40	SEG34	69	SEG63	98	R01	127	SEG17
12	CMPM0	41	SEG35	70	N.C.	99	R02	128	SEG18
13	SVD	42	SEG36	71	N.C.	100	R03	129	SEG19
14	VSSA	43	SEG37	72	N.C.	101	R10	130	SEG20
15	RFOUT	44	SEG38	73	N.C.	102	R11	131	SEG21
16	RFIN	45	SEG39	74	N.C.	103	R12	132	SEG22
17	REF	46	SEG40	75	N.C.	104	R13	133	SEG23
18	SEN0	47	SEG41	76	COM4	105	BZ	134	SEG24
19	SEN1	48	SEG42	77	COM5	106	BZ	135	SEG25
20	VDDA	49	SEG43	78	COM6	107	Vss	136	SEG26
21	CC	50	SEG44	79	COM7	108	N.C.	137	SEG27
22	CD	51	SEG45	80	VDD	109	N.C.	138	SEG28
23	Vd2	52	SEG46	81	K00	110	SEG0	139	SEG29
24	VDD	53	SEG47	82	K01	111	SEG1	140	SEG30
25	VoSC	54	SEG48	83	K02	112	SEG2	141	SEG31
26	OSC1	55	SEG49	84	K03	113	SEG3	142	N.C.
27	OSC2	56	SEG50	85	K10	114	SEG4	143	N.C.
28	Vd1	57	SEG51	86	K11	115	SEG5	144	N.C.
29	OSC3	58	SEG52	87	K12	116	SEG6	—	—

N.C.: No Connection

PIN DESCRIPTION

Pin name	Pin No.	I/O	Function
VDD	80	—	Power (+) supply pin
VSS	31, 107	—	Power (–) supply pin
VDDA	20	—	Analog system power (+) supply pin (=VDD)
VSSA	14	—	Analog system power (–) supply (=Vss)
Vd1	28	—	Internal logic system regulated voltage output pin
Vd2	23	—	1/2VDD voltage halver output pin
VoSC	25	—	Oscillation system regulated voltage output pin
Vc1–Vc3	8–9	—	LCD system power supply pin
CA, CB	6, 7	—	LCD system voltage booster capacitor connecting pin
CC, CD	21, 22	—	Voltage halver capacitor connecting pin
OSC1	26	I	Crystal oscillation input pin
OSC2	27	O	Crystal oscillation output pin
OSC3	29	I	Ceramic or CR oscillation input pin (selected by mask option)
OSC4	30	O	Ceramic or CR oscillation output pin (selected by mask option)
K00–K03	81–84	I	Input port pins
K10–K13	85–88	I	Input port pins
P00	89	I/O	I/O port or serial I/F data input pin (selected by software)
P01	90	I/O	I/O port or serial I/F data output pin (selected by software)
P02	91	I/O	I/O port or serial I/F clock I/O pin (selected by software)
P03	92	I/O	I/O port or serial I/F ready signal output pin (selected by software)
P10–P13	93–96	I/O	I/O port pins
R00	97	O	Output port pin
R01	98	O	Output port pin
R02	99	O	Output port of TOUT output pin (selected by software)
R03	100	O	Output port or FOUT output pin (selected by software)
R10–R13	101–104	O	Output port pins
COM0–COM7	2–5, 76–79	O	LCD common output pin (1/4, 1/5 or 1/8 duty is selectable by software)
SEG0–SEG63	110–141, 38–69	O	LCD segment output pin
SEN0	18	O	R/F converter sensor 0 CR oscillation output pin
SEN1	19	O	R/F converter sensor 1 CR oscillation output pin
REF	17	O	R/F converter reference resistor CR oscillation output pin
RFIN	16	I	R/F converter CR oscillation input pin
RFOUT	15	O	R/F converter oscillation frequency output pin
CMPP0	11	I	Analog comparator non-inverted input pin
CMPM0	12	I	Analog comparator inverted input pin
BZ	105	O	Sound output pin
BZ	106	O	Sound inverted output pin
SVD	13	I	SVD external voltage input pin
RESET	33	I	Initial reset input pin
TEST	32	I	Testing input pin

NOTICE:

No part of this material may be reproduced or duplicated in any form or by any means without the written permission of Seiko Epson. Seiko Epson reserves the right to make changes to this material without notice. Seiko Epson does not assume any liability of any kind arising out of any inaccuracies contained in this material or due to its application or use in any product or circuit and, further, there is no representation that this material is applicable to products requiring high level reliability, such as, medical products. Moreover, no license to any intellectual property rights is granted by implication or otherwise, and there is no representation or warranty that anything made in accordance with this material will be free from any patent or copyright infringement of a third party. This material or portions thereof may contain technology or the subject relating to strategic products under the control of the Foreign Exchange and Foreign Trade Law of Japan and may require an export license from the Ministry of International Trade and Industry or other approval from another government agency.

© Seiko Epson Corporation 2000 All right reserved.

SEIKO EPSON CORPORATION

ELECTRONIC DEVICES MARKETING DIVISION

IC Marketing & Engineering Group

ED International Marketing Department Europe & U.S.A.

421-8, Hino, Hino-shi, Tokyo 191-8501, JAPAN
Phone : 042-587-5812 FAX : 042-587-5564

ED International Marketing Department Asia

421-8, Hino, Hino-shi, Tokyo 191-8501, JAPAN
Phone : 042-587-5814 FAX : 042-587-5110

■ EPSON Electronic Devices Website

<http://www.epson.co.jp/device/>

