

# SCI7680M Series

## Semicustom System Power Supply Array

- System power supply circuit
- Low voltage with the low current consumption

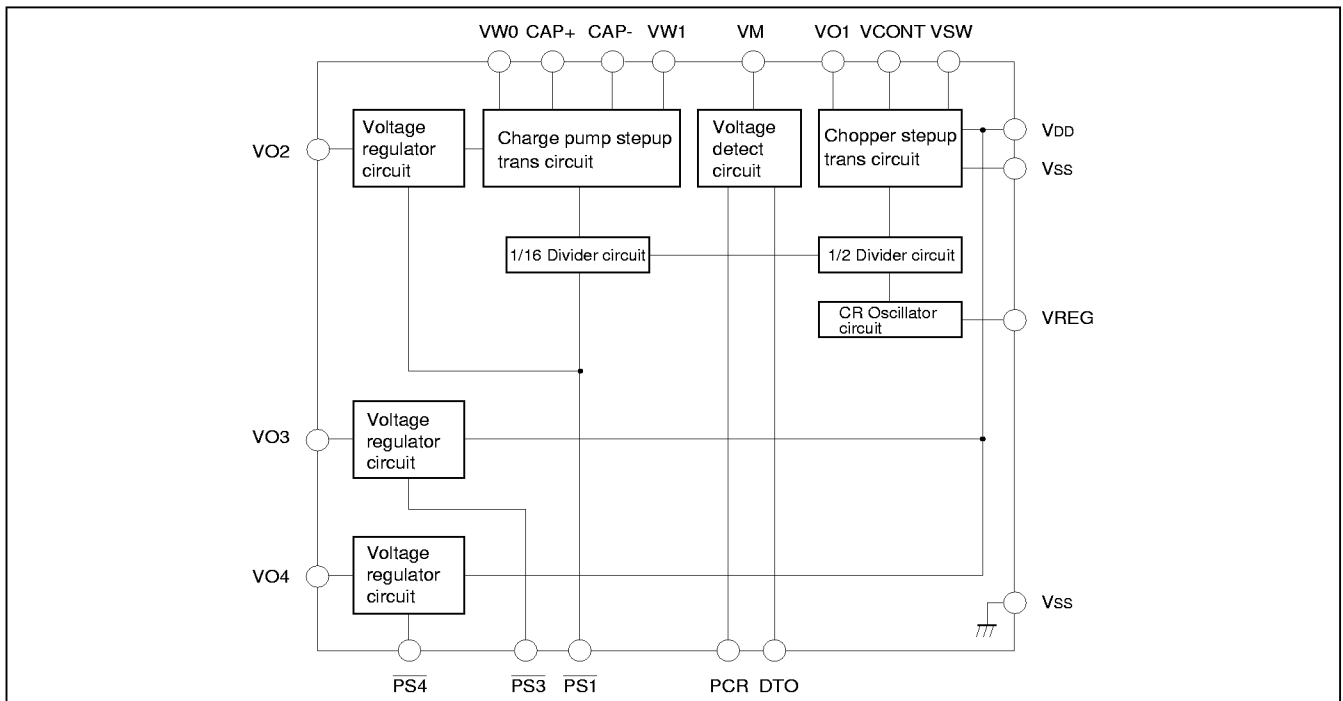
### DESCRIPTION

The SCI7680 system power supply IC has been developed based on the low-voltage and low-power CMOS silicon gate process, and it has the chopper stepup converter of low power consumption, two-time stepup transformer DC-to-DC converter using charge pump, power ON clear function, and voltage regulation function on a single chip. Its circuit consists of the reference voltage source, op amp, voltage stepup clock generator circuit (CR oscillator circuit), and current switching transistors. The output voltage and detect voltage are internally fixed. As the SCI7680 series can operate at the low voltage with the low current consumption, it is appropriate to the power supply of a portable PC equipment requiring the highest efficiency. The output voltage of the chopper stepup transformer circuit can be set to have the negative temperature gradient characteristics. It is appropriate to the power supply of PC equipment having an LCD panel.

### FEATURES

- Direct RAM data display
- Low-voltage system operation ... +0.9 V Min.
- Low power consumption
- Built-in, two-time stepup DC-DC converter function with charge pump
- Built-in voltage detect circuit
- Built-in voltage regulator circuit
- Built-in complete CR oscillator circuit
- Built-in temperature gradients
- Built-in power off function
- Built-in power-on clear function
- Package ..... SC7680M $\star$ : SSOP1-20pin (plastic)  
SC7680MA $\star$ : SOP1-24pin (plastic)

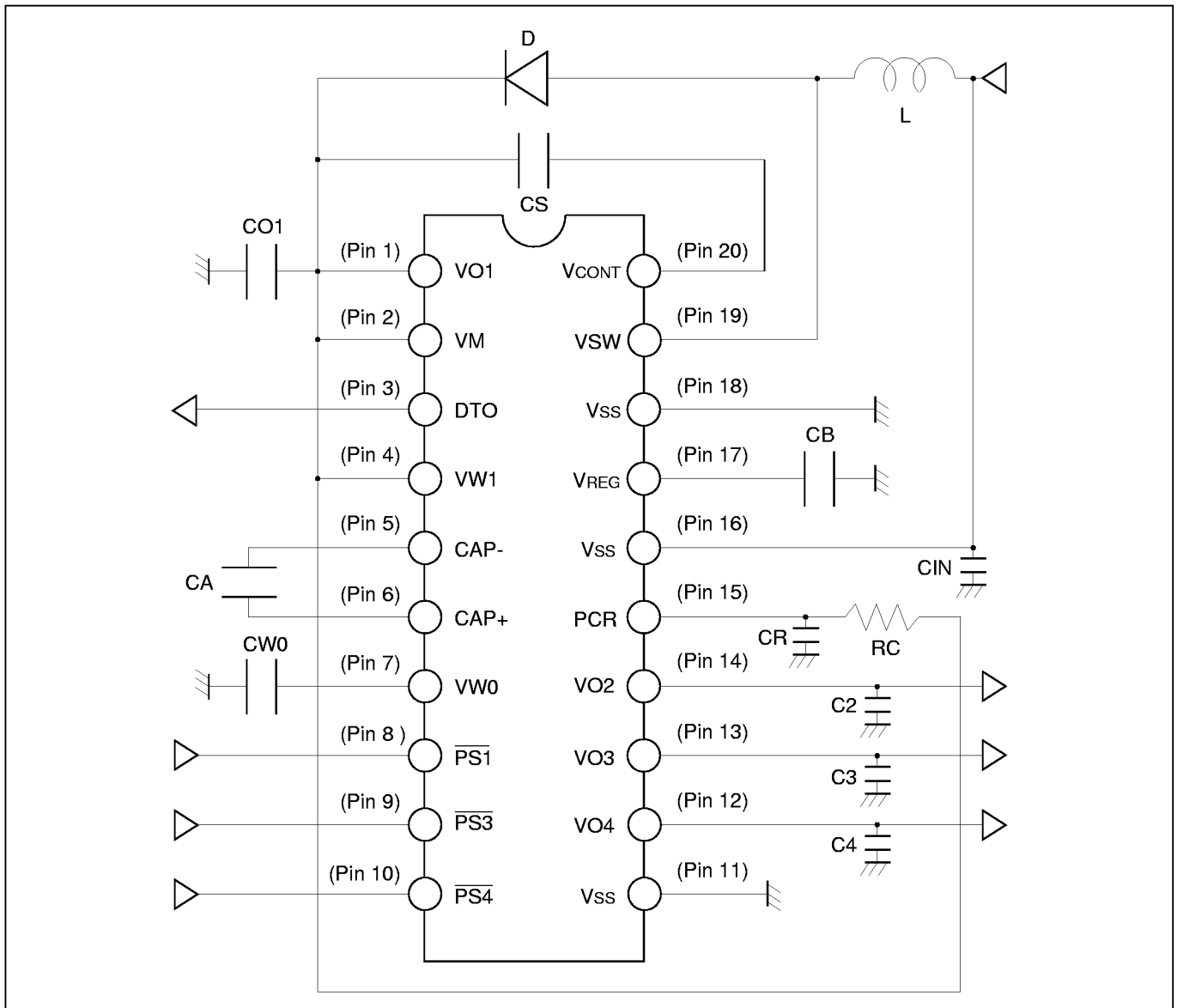
### BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Supply voltage	VDD	-0.3 to +7.0	V
	VM	-0.3 to +7.0	V
	VWI	-0.3 to +3.5	V
Input terminal voltages (PS1, PS3, PS4)	VI	-0.3 to V01+0.3	V
Output voltages (V01, VW0, V02, V03, V04)	VO	-0.3 to +7.0	V
Allowable loss	Pd	99	mW
Operating temperature	Topr	-20 to +70°C	°C
Storage temperature	Tstg	-65 to +150°C	°C

■ BASIC EXTERNAL CONNECTION DIAGRAM



■ PIN DESCRIPTION

Pin No.	Pin name	Function
1	VO1	Inductance stepup trans output voltage terminal
2	VM	Input terminal for voltage detection
3	DTO	Output terminal for voltage detection (CMOS output) If the CMOS output voltage entered in the VM terminal is higher than the detect voltage, the VM level signal is output. If it is less than the detect voltage, the Vss level signal is output.
4	VWI	Capacitor stepup trans input voltage terminal
5	CAP-	Negative terminal of capacitor stepup transformer
6	CAP+	Positive terminal of capacitor stepup transformer
7	VWO	Capacitor stepup trans output voltage terminal
8	PS1	Power save signal input terminal (1) If the VDD (V01) level is set, the capacitor stepup transformer circuit starts to operate and the regulated voltage is output to the V02 terminal. If the Vss level is set, the capacitor stepup trans circuit stops to operate, the output transistor connected to the V02 terminal is turned off, and the signal at V02 terminal is set to Vss level.
9	PS3	Power save signal input terminal (3) If the V01 level is set, the regulated voltage is output to the V03 terminal. When the Vss level is set, the output transistor connected to the V03 terminal is turned off and the signal at V03 terminal is set to Vss level.
10	PS4	Power save signal input terminal (4) If the V01 level is set, the regulated voltage is output to the V04 terminal. When the Vss level is set, the output transistor connected to the V04 terminal is turned off and the signal at V04 terminal is set to Vss level.
11	Vss	Power terminal (negative, connected to the logic side)
12	VO4	Output terminal of regulated power supply (4) Receives the voltage supplied to the VDD terminal and outputs the regulated voltage.
13	VO3	Output terminal of regulated power supply (3) Receives the voltage supplied to the VDD terminal and outputs the regulated voltage.
14	VO2	Output terminal of regulated power supply (2) Receives the voltage supplied to the VDD terminal and outputs the regulated voltage.
15	PCR	Power-on clear terminal
16	VDD	Power terminal (positive)
17	VREG	Regulated power terminal for oscillation
18	Vss	Power terminal (negative, connected to the switching transistor of inductance stepup trans)
19	VSW	External inductance drive terminal Drives the external inductance circuit using the built-in, N-channel MOS transistor.
20	VCONT	Comparator input terminal If a capacitor for response compensation is inserted between the VCONT and V01 terminals, the ripple voltage of the increased output voltage can be reduced.

■ OPTION LIST

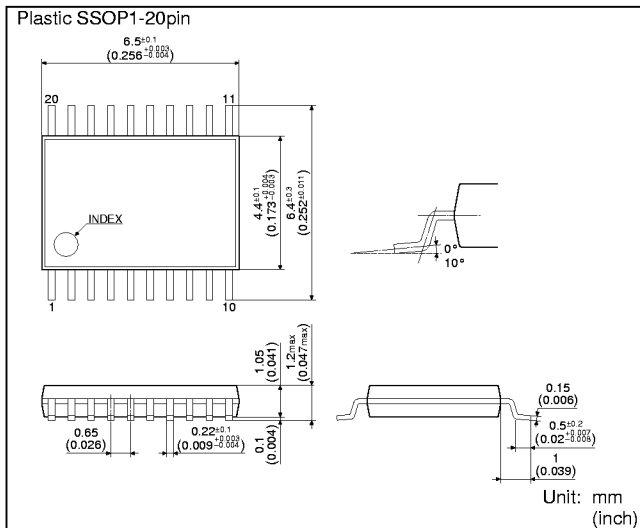
For each function block, any of the shown values can be selected (mask option).

Table 1 SC17680 Option List

(The values are Typ.)

1	Switching regulator (inductance pressure rise)	VO1 (V)	2.00	2.10	2.20	2.30	2.40	2.50
			2.60	2.70	2.80	2.90	3.00	3.10
			3.20	3.30	3.40	3.50		
	Voltage - temperature characteristics	(mV/°C)		Kt	-2	-4	-6	-8
2	DC/DC converter (charge pump type) (Double pressure rise)	VWO	Provided	None				
3	Voltage detector	DTO (V)	1.55	1.60	1.65	1.70	1.75	1.80
			1.85	1.90	1.95	2.05	2.15	2.25
			2.35	2.45	2.55	2.65	2.75	2.85
	Output method		CMOS output	Nch open drain	Pch open drain			
4	Stabilized power supply (2)	VO2 (V)	3.00					
5	Stabilized power supply (3)	VO3 (V)	1.05	1.10	1.15	1.20	1.30	1.40
			1.50	1.60	1.70	1.80	1.90	2.00
			2.10	2.20	2.30	2.40	2.50	2.60
			2.70	2.80	2.90	3.00		
6	Stabilized power supply (4)	VO4 (V)	1.05	1.10	1.15	1.20	1.30	1.40
			1.50	1.60	1.70	1.80	1.90	2.00
			2.10	2.20	2.30	2.40	2.50	2.60
			2.70	2.80	2.90	3.00		

■ PACKAGE DIMENSIONS



■ PIN CONFIGURATION

