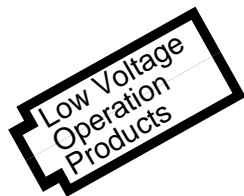


SVM7570C/M Series

Music Generator IC



- 4 Sound Sources
- 620 Words Melody ROM
- Max. of 15 Tunes

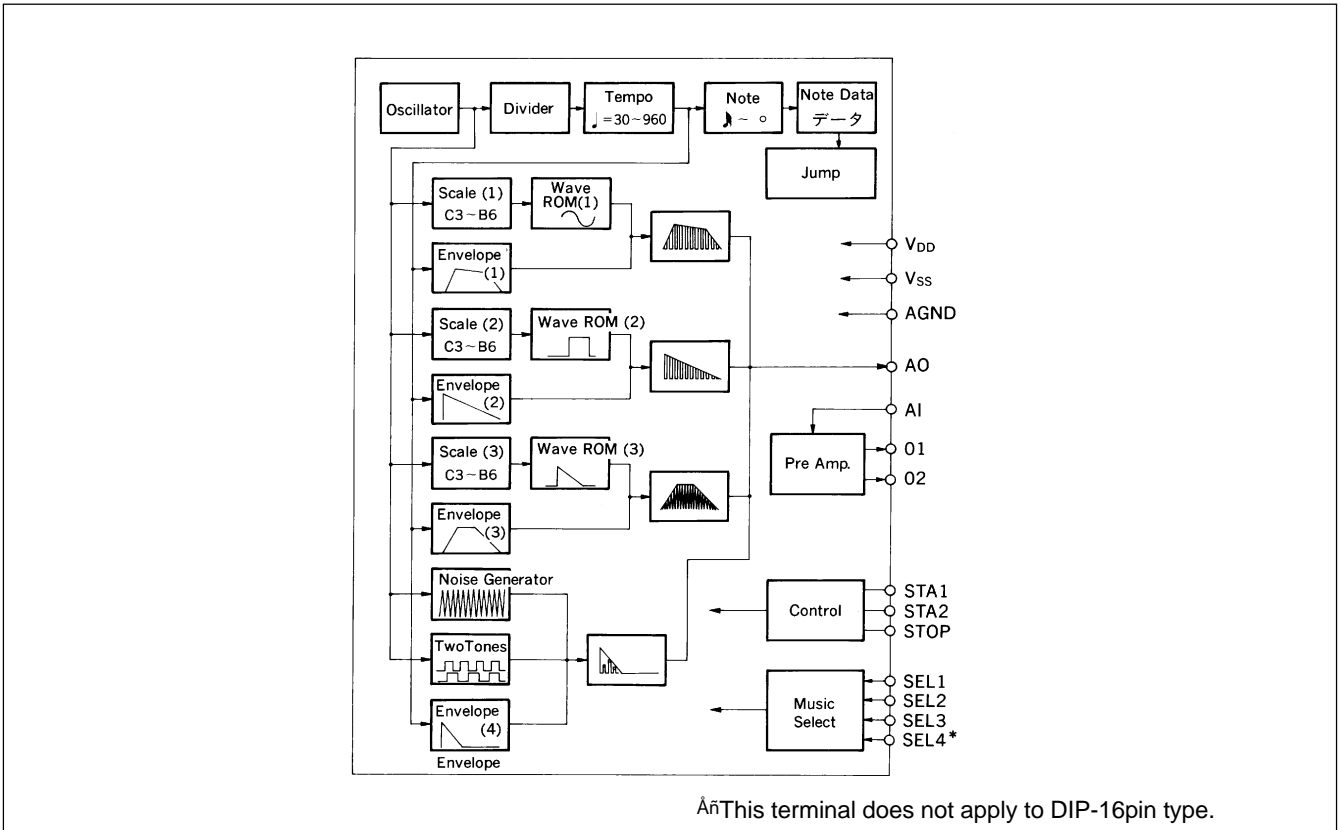
■ DESCRIPTION

SVM7570C/M Series CMOS high quality Melody IC's are able to play 3 different-tone-quality sounds and also rhythm sounds (percussion) such as drums, cymbals, etc. from the internal programmed ROM, memorizing the wave form, for instance, of instrument sound, melody, alarm sound or bells, and envelope. The ROM size storing music notes is 620 words, which memorize up to 15 tunes with 3 different-tone-quality sounds and rhythm sound. SVM7570C/M Series are suitable for high-grade telephone, high-grade clock, Music Box, Toys, Game Machines, etc.

■ FEATURES

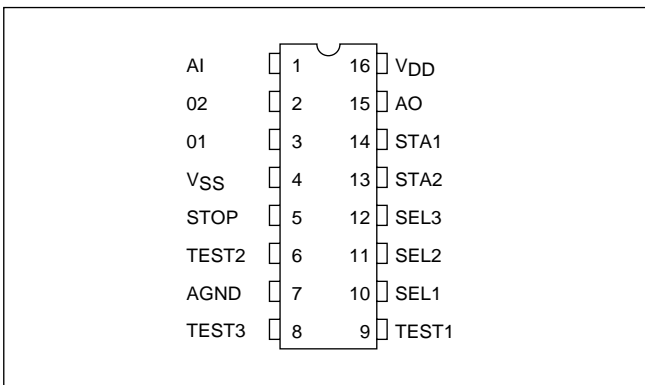
- Melody ROM size 620-word
- Maximum number of tunes 15-tune (mask selectable serial selection or binary selection)
- Natural grave sound playable by 3-diferent-tone-quality sound and rhythm sounds.
- Wave form and envelope selectable by wave form Mask ROM.
- Play start mode DC trigger input
- Play mode (level hold play and 2 kinds of one shot play, total of 3 kinds) selectable by play start input pin "STA1" and "STA2".
- Force to stop the play and No play during stop playing input pin "STOP"=H (mask selectable)
- Dinamic speaker (8Ω) drivable with external transistors.
- Oscillator CR oscillation(C, R built-in)
Ceramic oscillation (ceramic oscillator, C_G, C_D, R_F external)
- Operating voltage 3.0V (2.4 to 3.5V)/5.0V (3.0 to 5.5V)
- Package DIP-16pin (plastic)/DIP-24pin(plastic)/SOP1-24pin(plastic)

■ BLOCK DIAGRAM

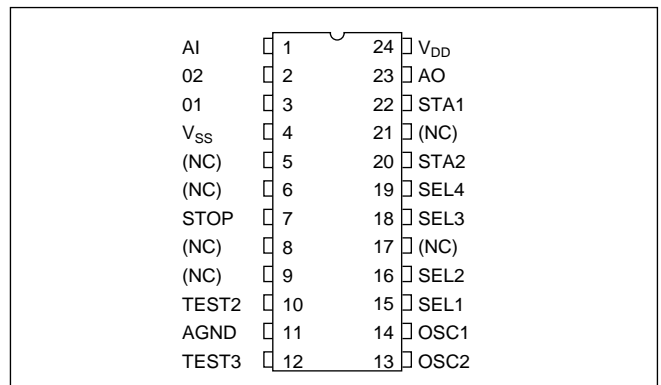


■ PIN CONFIGURATION

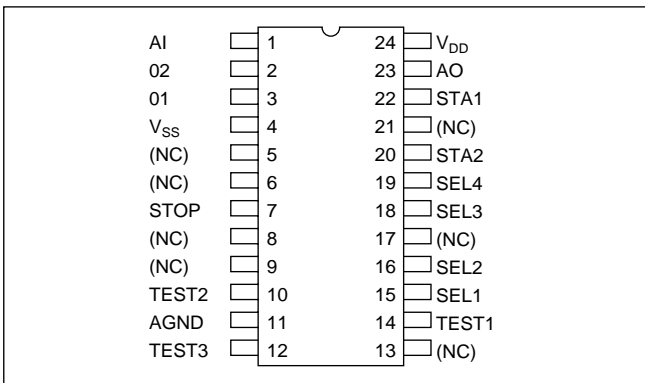
● DIP-16pin (CR Oscillator)



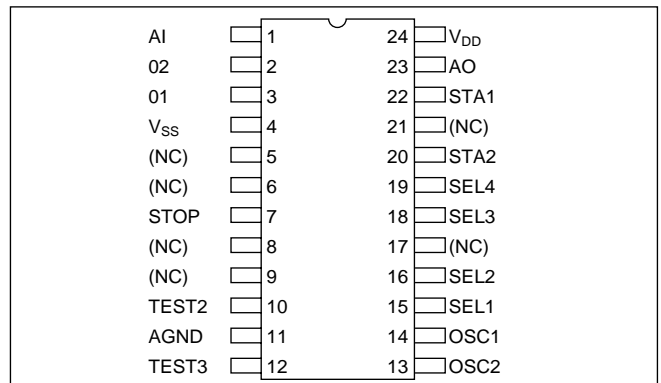
● DIP-24pin (Ceramic Oscillator)



● DIP-24pin/DIP1-24pin (CR Oscillator)



● SOP1-24pin (Ceramic Oscillator)



■ PIN DESCRIPTION

Name	Pin No.		I/O	Function
	DIP-16pin	DIP-24pin SOP1-24pin		
AI	1	1	I	Built-in amplifier input
O2	2	2	O	Built-in amplifier output, composing a low frequency linear amplifier with external circuit
O1	3	3	O	
V _{SS}	4	4	-	Power terminal(0V)
STOP	5	7	I	Play stop input. Play stops when it turns on.
TEST2	6	10	I	Test input. Should be open or connected to V _{SS} for normal use.
AGND	7	11	O	Analog circuit grounding output. Capacitance connection allows its level stable
TEST3	8	12	I	Test input. Should be open or connected to V _{SS} for normal use.
OSC2	-	13	I	For ceramic oscillation, ceramic oscillator(CS), gate capacitor(C _G), drain capacitor(C _D)and feedback resistor(R _f)will be connected between terminals to compose of an oscillator circuit.
OSC1	-	14	O	
TEST1	9	14	I	Test input. Should be open for normal use(CR Oscillation only).
SEL1	10	15	I	Binary selection: Selects a tune with SEL2, SEL3 and SEL4. Serial selection: Selects up to 15 tunes sequentially.
SEL2	11	16	I	Binary selection: Selects a tune with SEL1, SEL3 and SEL4. Serial selection: Will not be used, so should be open or connected to V _{SS} for normal use.
SEL3	12	18	I	Binary selection: Selects a tune with SEL1, SEL2 and SEL4. Serial selection: It will not be used, so should be open or connected to V _{SS} for normal use.
SEL4*	-	19	I	Binary selection: Selects a tune with SEL1, SEL2 and SEL3. Serial selection: Will not be used, so should be open or connected to V _{SS} for normal use.
STA2	13	20	I	Play start and play mode selection with STA1.
STA1	14	22	I	Play start and play mode selection with STA2.
AO	15	23	O	Outputs not-amplified acoustic signals and is connected to the built-in amplifier through a volume control and coupling capacitor.
V _{DD}	16	24	-	Power terminal (+)
(NC)	-	5, 6, 8, 9, 17, 21	-	Not connected. Should be open for normal use.

*) At DIP-16pin package device, selectable tunes by binary selection are up to 8, because SEL4 can not use.

■ ABSOLUTE MAXIMUM RATINGS

(V_{SS}=0V)

Ratings	Symbol	Value	Unit
Power supply	V _{DD}	-0.3 to 7.0	V
Input/output voltage	V _{I/O}	-0.2 to V _{DD} +0.2	V
Operating temperature	T _{opr}	-20 to 65	°C
Storage temperature	T _{stg}	-55 to 125	°C
Soldering temperature and time	T _{sol}	260°C, 10s (at lead)	-

■ ELECTRICAL CHARACTERISTICS

● DC Characteristics

○ 3.0V mode

(V_{SS}=0V, T_a=-20 to 65°C)

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit		
Power supply	V _{DD}	-	2.4	3.0	3.5	V		
High level input voltage	V _{IH}	-	V _{DD} -0.1	-	V _{DD}	V		
Low level input voltage	V _{IL}	-	0	-	0.1	V		
High level input current ①	I _{IH1}	TEST2, TEST3, STOP V _{DD} =3.0V, V _{TIH} =V _{DD}	10	35	105	μA		
High level input current ②	I _{IH2}	SEL1, V _{DD} =3.0V, V _{IH2} =V _{DD}	serial selection		10	35	105	μA
			binary selection	standby	-	-	0.2	
		during play		10	35	105		
High level input current ③	I _{IH3}	SEL2—SEL4, binary selection only, V _{DD} =3.0V, V _{IH3} =V _{DD}	standby		-	-	0.2	μA
			during play		10	35	105	
High level input current ④	I _{IH4}	STA1, STA2, V _{DD} =3.0V, V _{IH4} =V _{DD}	3	10	30	μA		
High level input current ⑤	I _{IH5}	AI, V _{DD} =3.0V, V _{IH5} =V _{DD}	standby		20	70	210	μA
			during play		-	-	0.2	
Low level input current ①	I _{HL1}	SEL1—SEL4, STOP, TEST2, TEST3 V _{DD} =3.0V, V _{HL1} =V _{SS}	-	-	0.2	μA		
Low level input current ②	I _{HL2}	STA1, STA2, V _{DD} =3.0V, V _{IL2} =0.4V	0.8	2.5	8.0	μA		
High level output current ①	I _{O1H}	O1, standby, V _{DD} =V _{O1H} =3.0V	-	-	0.2	μA		
High level output current ②	I _{O2H}	O2, during play, V _{DD} =1.2V, V _{O2H} =0.7V	2.0	6.0	16.0	mA		
High level output current ③	I _{O3H}	AO, V _{O3H} =1.5V, at maximum output	40	120	400	μA		
Low level output current ①	I _{O1L}	O1, during play, V _{DD} =1.2V, V _{O1L} =0.5V	2.0	6.0	16.0	mA		
Low level output current ②	I _{O2L}	O2, standby, V _{DD} =3.0V, V _{O2L} =V _{SS}	-	-	0.2	μA		
Low level output current ③	I _{O3L}	AO, V _{O3L} =1.5V, at maximum output	40	120	400	μA		
Average current drain during standby	I _{SB}	no load, V _{DD} =3.0V	-	0.2	10.0	μA		
Average current drain during play	I _{OP}	STA1, STA2=V _{DD} , V _{DD} =3.0V, no load	-	3.0	9.0	mA		

○ 5.0V mode

(V_{SS}=0V, T_a=-20 to 65°C)

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit		
Power supply	V _{DD}	-	4.5	5.0	5.5	V		
High level input voltage	V _{IH}	-	V _{DD} -0.3	-	V _{DD}	V		
Low level input voltage	V _{IL}	-	0	-	0.3	V		
High level input current ①	I _{IH1}	TEST2, TEST3, V _{DD} =5.0V, V _{TIH} =V _{DD}	30	100	300	μA		
High level input current ②	I _{IH2}	SEL1, V _{DD} =5.0V, V _{IH2} =V _{DD}	serial selection		7.0	25	70	μA
			binary selection	standby	-	-	0.2	
		during play		7.0	25	70		
High level input current ③	I _{IH3}	SEL2—SEL4, binary selection only, V _{DD} =5.0V, V _{IH3} =V _{DD}	standby		-	-	0.2	μA
			during play		7.0	25	70	

High level input current ④	I _{IH4}	STA1, STA2, V _{DD} =5.0V, V _{IH4} =V _{DD}	1.5	5.0	15	μA	
High level input current ⑤	I _{IH5}	AI, V _{DD} =5.0V, V _{IH5} =V _{DD}	standby	60	200	600	μA
			during play	-	-	0.2	
High level input current ⑥	I _{IH6}	STOP, V _{DD} =5.0V, V _{IH6} =V _{DD}	7.0	25	70	μA	
Low level input current ①	I _{HI1}	SEL1~SEL4, STOP, TEST2, TEST3, V _{DD} =5.0V, V _{HI1} =V _{SS}	-	-	0.2	μA	
Low level input current ②	I _{HI2}	STA1, STA2, V _{DD} =5.0V, V _{IL2} =0.4V	1.5	5.0	15	μA	
High level output current ①	I _{OHI1}	O1, standby, V _{DD} =V _{OHI1} =5.0V	-	-	0.2	μA	
High level output current ②	I _{OHI2}	O2, during play, V _{DD} =4.5V, V _{OHI2} =0.7V	0.8	2.8	6.0	mA	
High level output current ③	I _{OHI3}	AO, V _{OH} =2.5V, at maximum output	60	200	600	μA	
Low level output current ①	I _{OHI1}	O1, during play, V _{DD} =4.5V, V _{OLI1} =3.8	0.8	2.8	6.0	mA	
Low level output current ②	I _{OHI2}	O2, standby, V _{DD} =5.0V, V _{OLI2} =V _{SS}	-	-	0.2	μA	
Low level output current ③	I _{OHI3}	AO, V _{OL} =2.5V, at maximum, output	60	200	600	μA	
Average current drain during standby	I _{SB}	all pins open no load V _{DD} =5.0V	-	0.2	10	μA	
Average current drain during play	I _{OP}	STA1, STA2=V _{DD} , no load V _{DD} =5.0V	-	6.0	12	mA	

■ OSCILLATION AND TEMPERATURE CHARACTERISTICS

●5.2.1 CR Oscillation

○3.0V model (CR oscillation)

(V_{SS}=0V, Ta=-20 to 65°C)

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Oscillation frequency variation	f _{OSC1}	V _{DD} =3.0V, Ta=25°C, adjusted by the fuse method	-20	262.144 (kHz)	+20	%
Oscillation frequency temperature deviation	f _{OSC2}	V _{DD} =3.0V, adjusted by the fuse method	-25	f _{OSC} (25°C)	+25	%
Oscillation selfstart voltage	V _{STA}	-	-	-	2.4	V
Oscillation start time	t _{OSC}	-	-	-	10	ms
Oscillation stop voltage	V _{STP}	-	-	-	2.4	V
Oscillation frequency voltage deviation	εf	$\epsilon f = \frac{f_{osc}(3.5V) - f_{osc}(2.5V)}{f_{osc}(3.5V)}$	-	-	5	%

○5.0V model (CR oscillation)

(V_{SS}=0V, Ta=-20 to 65°C)

Characteristics	Symbol	Conditions	Min.	Typ.	Max.	Unit
Oscillation frequency variation	f _{OSC1}	V _{DD} =5.0V, Ta=25°C, adjusted by the fuse method	-20	262.144 (kHz)	+20	%
Oscillation frequency temperature deviation	f _{OSC2}	V _{DD} =5.0V, adjusted by the fuse method	-25	f _{OSC} (25°C)	+25	%
Oscillation selfstart voltage	V _{STA}	-	-	-	3.0	V
Oscillation start time	t _{OSC}	-	-	-	10	ms
Oscillation stop voltage	V _{STP}	-	-	-	3.0	V
Oscillation frequency voltage deviation	εf	$\epsilon f = \frac{f_{osc}(5.5V) - f_{osc}(4.5V)}{f_{osc}(5.5V)}$	-	-	5	%

○3.0V model (Ceramic oscillation)

(CSB262D is used, V_{SS}=0V, Ta=-20 to 65°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Oscillation frequency variation	f _{OSC1}	V _{DD} =5V, Ta=25°C	-0.5	-	+0.5	%
Oscillation frequency temperature deviation	f _{OSC2}		-0.5	f _{osc} (25°C)	+0.5	%
Oscillation selfstart voltage	V _{STA}	-	-	-	2.4	V
Oscillation stop voltage	V _{STP}	-	-	-	2.4	V
Oscillation frequency voltage deviation	εf	$\epsilon f = \frac{f_{osc(3.5V)} - f_{osc(2.5V)}}{f_{osc(3.5V)}}$	-	-	500	PPM

○5.0V model (Ceramic oscillation)

(CSB262D is used, V_{SS}=0V, Ta=-20 to 65°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Oscillation frequency variation	f _{OSC1}	V _{DD} =5.0V, Ta=25°C	-0.5	-	+0.5	%
Oscillation frequency temperature deviation	f _{OSC2}		-0.5	f _{osc} (25°C)	+0.5	%
Oscillation selfstart voltage	V _{STA}	-	-	-	3.0	V
Oscillation stop voltage	V _{STP}	-	-	-	3.0	V
Oscillation frequency voltage deviation	εf	$\epsilon f = \frac{f_{osc(5.5V)} - f_{osc(4.5V)}}{f_{osc(5.5V)}}$	-	-	500	PPM

■ MODEL CLASSIFICATION

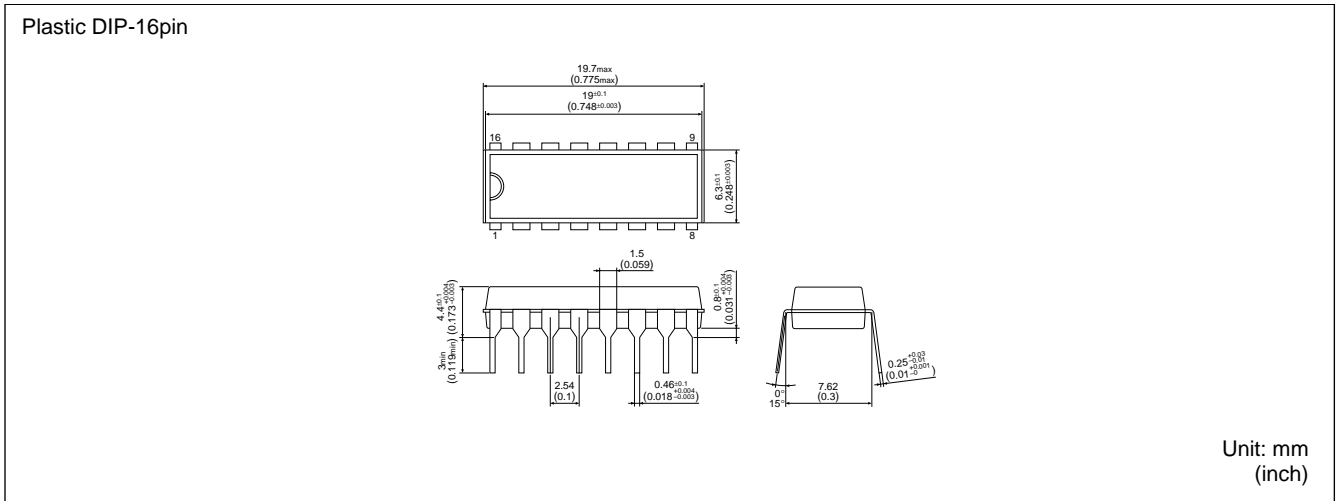
●Product name

Model	Package
SVM7571C**	DIP-16pin
SVM7570C**	DIP-24pin
SVM7570M**	SOP-24pin

●Power supply (identified by subcode)

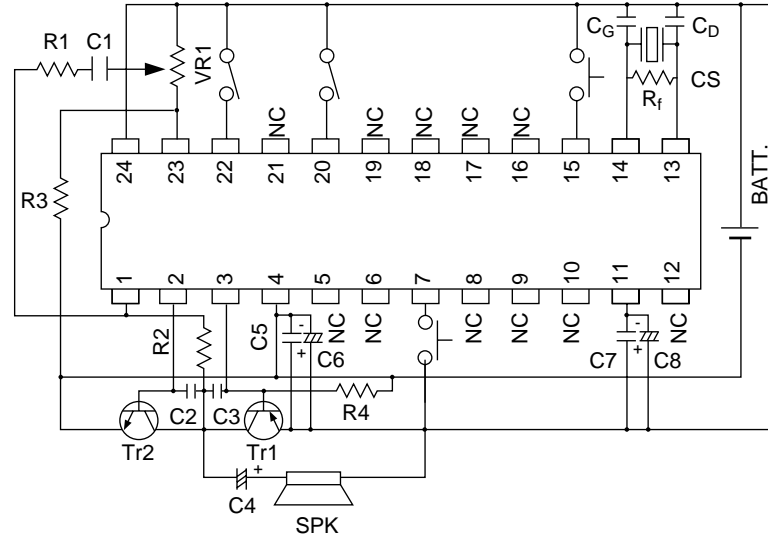
Power supply	3.0V model	5.0V model
Subcode	1A, 1B, 1C...	5A, 5B, 5C...

■ PACKAGE DIMENSIONS



●Ceramic Oscillation

Serial selection and DC trigger input (DIP-24pin/SOP1-24pin)



■ RECOMMENDED STANDARD FOR EXTERNAL COMPONENTS

Symbol	Recommended-value	Unit
SPK	dynamic speaker (8Ω)	-
Tr1	PNP transistor, DC $h_{FE}=160$ (approx.), equivalent to 2SA683	-
Tr2	NPN transistor, DC $h_{FE}=160$ (approx.), equivalent to 2SC1383	-
R1	(50~)150	kΩ
R2	510	kΩ
R3	500	kΩ
R3	2	MΩ
VR1	500	kΩ
C1	0.1	μF
C2	(0.01~)0.047	μF
C3	(0.01~)0.047	μF
C4	(100~)200	μF
C5	0.1	μF
C6	47	μF
C7	0.1	μF
C8	47	μF
CS	262KHz(Ceramic oscillation, RD is not needed)	-
Rf	1(feedback resistance)	MΩ
CG	330(Gate capacity)	pF
CD	330(Drain capacity)	pF

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Electric Device Information of EPSON WWW server

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