

# Serial Signal Generator IC for SLA7042M and SLA7044M

## Absolute Maximum Ratings

(T<sub>a</sub>=25°C)

Parameter	Symbol	Ratings	Units
Supply voltage	V <sub>DD</sub>	-0.5 to 7	V
Input voltage	V <sub>I</sub>	-0.5 to V <sub>DD</sub> +0.5	V
Input current	I <sub>I</sub>	±10	mA
Output voltage	V <sub>O</sub>	-0.5 to V <sub>DD</sub> +0.5	V
Output current	I <sub>O</sub>	±15	mA
Power dissipation	P <sub>D</sub>	200	mW
Operating temperature	T <sub>OP</sub>	-20 to +85	°C
Storage temperature	T <sub>stg</sub>	-40 to +150	°C

## Electrical Characteristics

(T<sub>a</sub>=25°C)

Parameter	Symbol	Conditions	Ratings			Units
			min	typ	max	
DC characteristics	Supply voltage	V <sub>DD</sub>	4.5		5.5	V
	Supply current	I <sub>DD</sub> V <sub>DD</sub> =5.5V		0.35	0.45	mA
	Output voltage	V <sub>DD</sub> =5V, I <sub>O</sub> =±3mA	4.5		0.4	V
	Input current	I <sub>I</sub> V <sub>DD</sub> =5V, V <sub>I</sub> =0 or 5V			±1	μA
	Input voltage	V <sub>DD</sub> =5V	3.5		5	V
	Input hysteresis voltage	V <sub>H</sub> V <sub>DD</sub> =5V		1		V
	Input capacity	C <sub>I</sub> V <sub>DD</sub> =5V		5	10	pF
AC characteristics	Internal oscillation frequency	F V <sub>DD</sub> =5V		1.5		MHz
	Propagation delay time	T <sub>CS</sub> T <sub>CC</sub> See Fig. 1.	3.5	50	100	ns
	Output voltage	T <sub>r</sub> V <sub>DD</sub> =5V, C <sub>L</sub> =15pF		20		ns
	Rise and fall time	T <sub>f</sub> See Fig. 2.		20		
	CLOCK IN terminal	V <sub>CIH</sub> H level time, V <sub>DD</sub> =5V	4.5			μs
	Input clock time	V <sub>CIL</sub> L level time, V <sub>DD</sub> =5V	0.5			
	Reset setting time (A)	t <sub>sR</sub> Inter-clock				ns
	Stabilization time after reset (B)	t <sub>psR</sub> See Fig. 3.	100			
	Signal setting time (C)	t <sub>sS</sub> Inter-clock				ns
	Stabilization time after signal input (D)	t <sub>psS</sub> See Fig. 3.	100			

Fig. 1

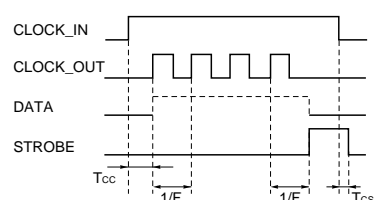


Fig.2

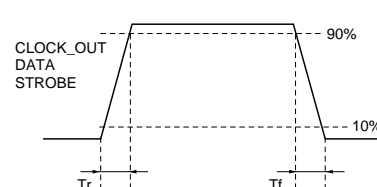
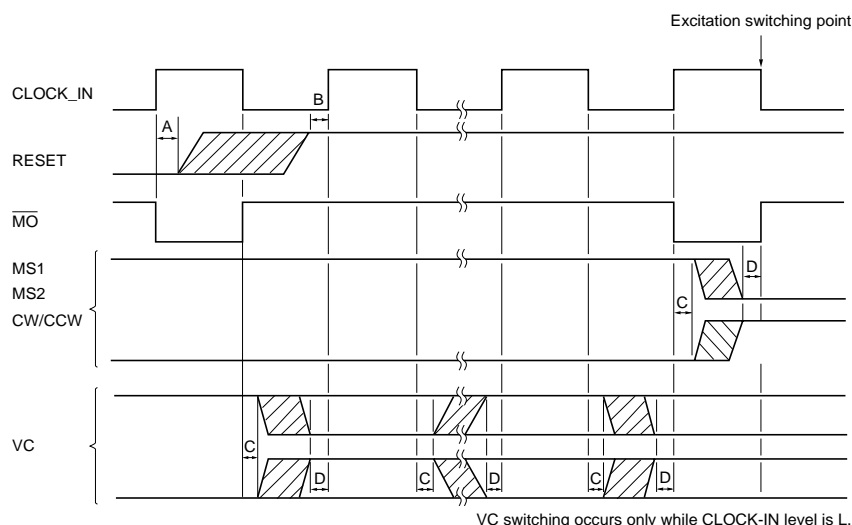
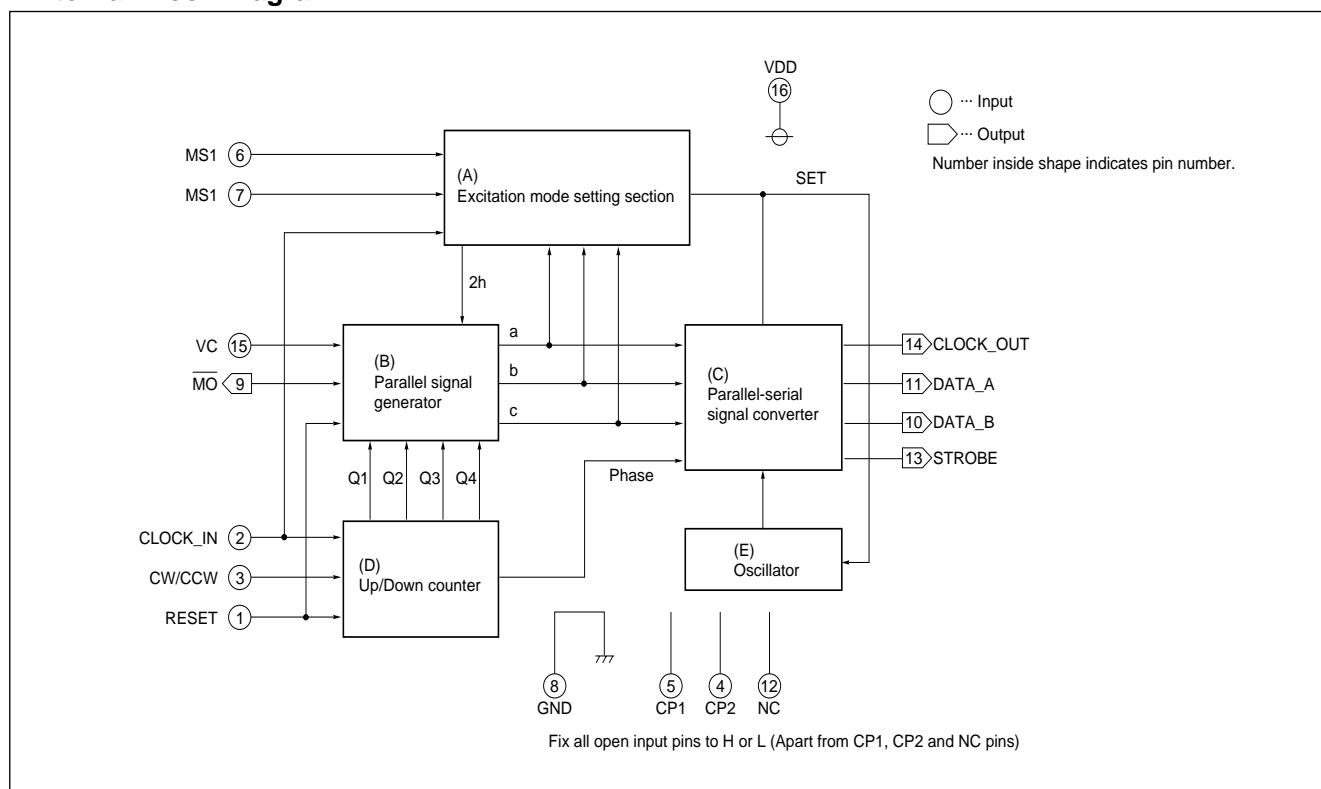


Fig. 3 Timing conditions

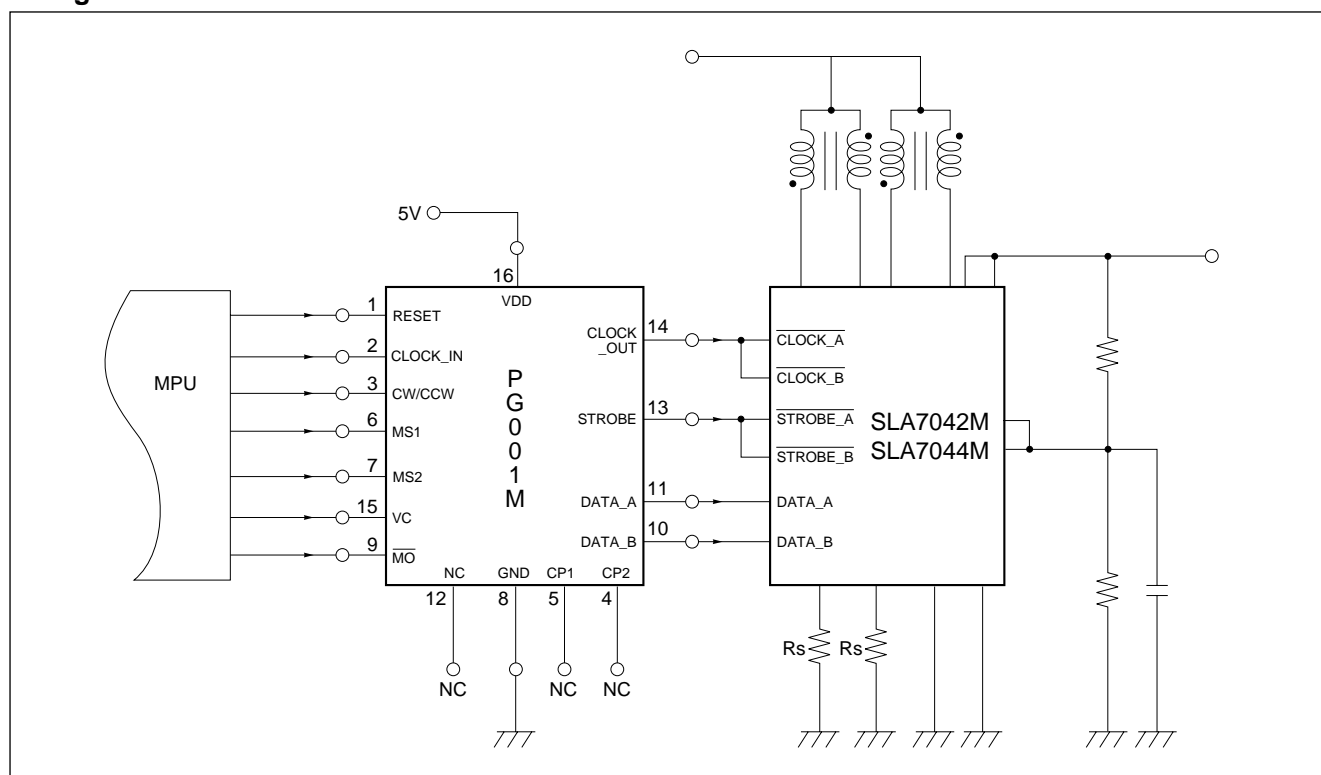


VC switching occurs only while CLOCK-IN level is L.

## Internal Block Diagram

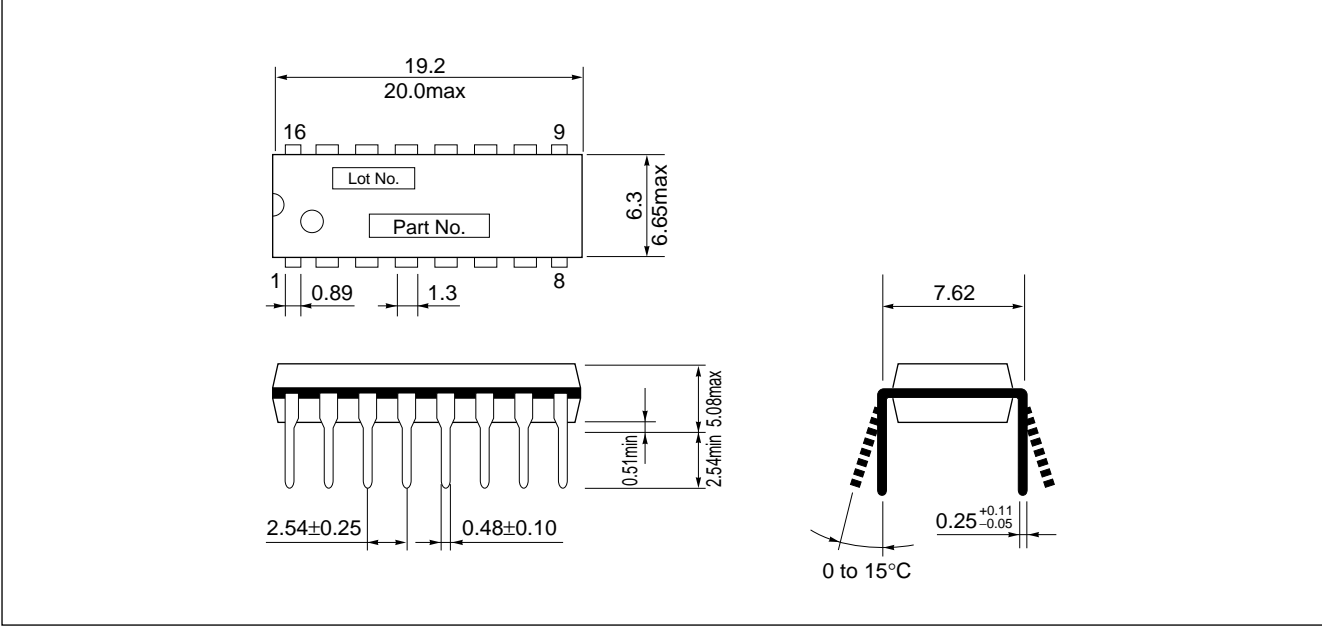


## Diagram of Standard External Circuit

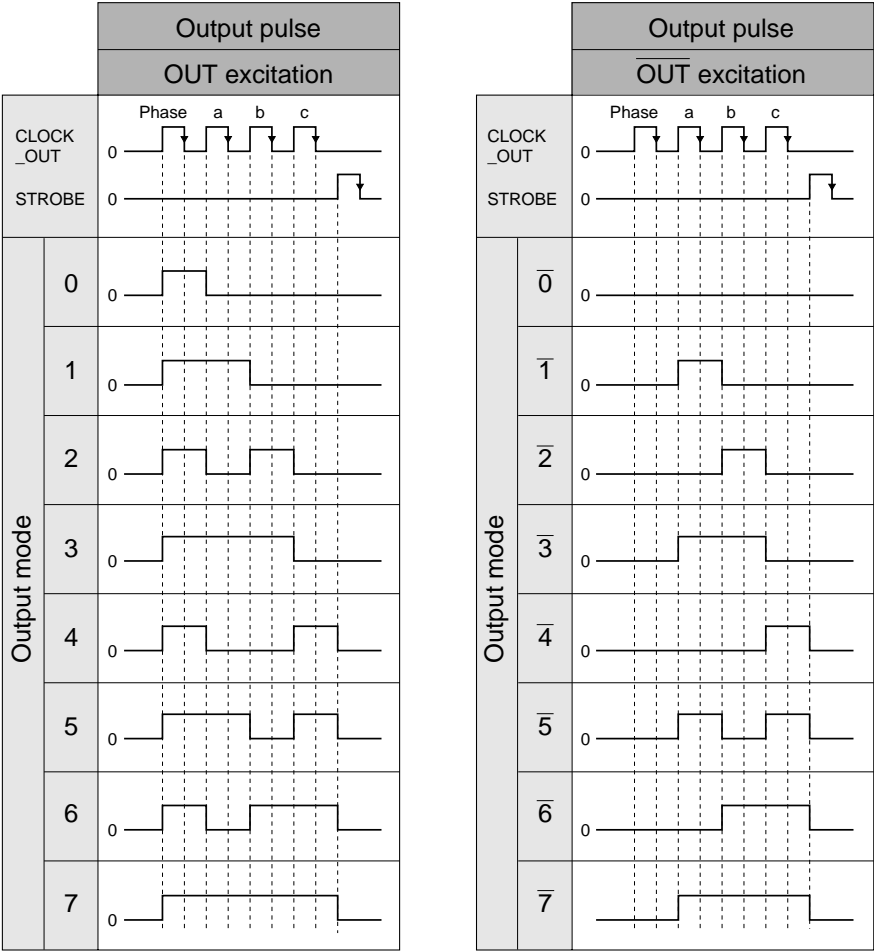


External Dimensions

(Unit: mm)



Output Mode Vs Output Pulse



### Input and Output Function Correlation Table

Input				Output				
Mode	CLOCK_IN	CW /CCW	RESET	$\overline{MO}$	CLOCK_OUT	STROBE	DATA -A	DATA -B
CW		L	H				CW	CW
		L	H					
CCW		H	H				CCW	CCW
		H	H					
RESET		×	L				Output Mode 4 or 7 Output Mode	Input Mode 4 or 7 Output Mode
		×	L					

×: Don't care

\*:  $\overline{MO}$  outputs L level while CLOCK\_IN is H level when output mode is 4:4 (7:7), 4:4 (7:7), 4:4 (7:7), or 4:4 (7:7). Modes in brackets ( ) are for 2-2 phase VC: H.

### Excitation Selection Table

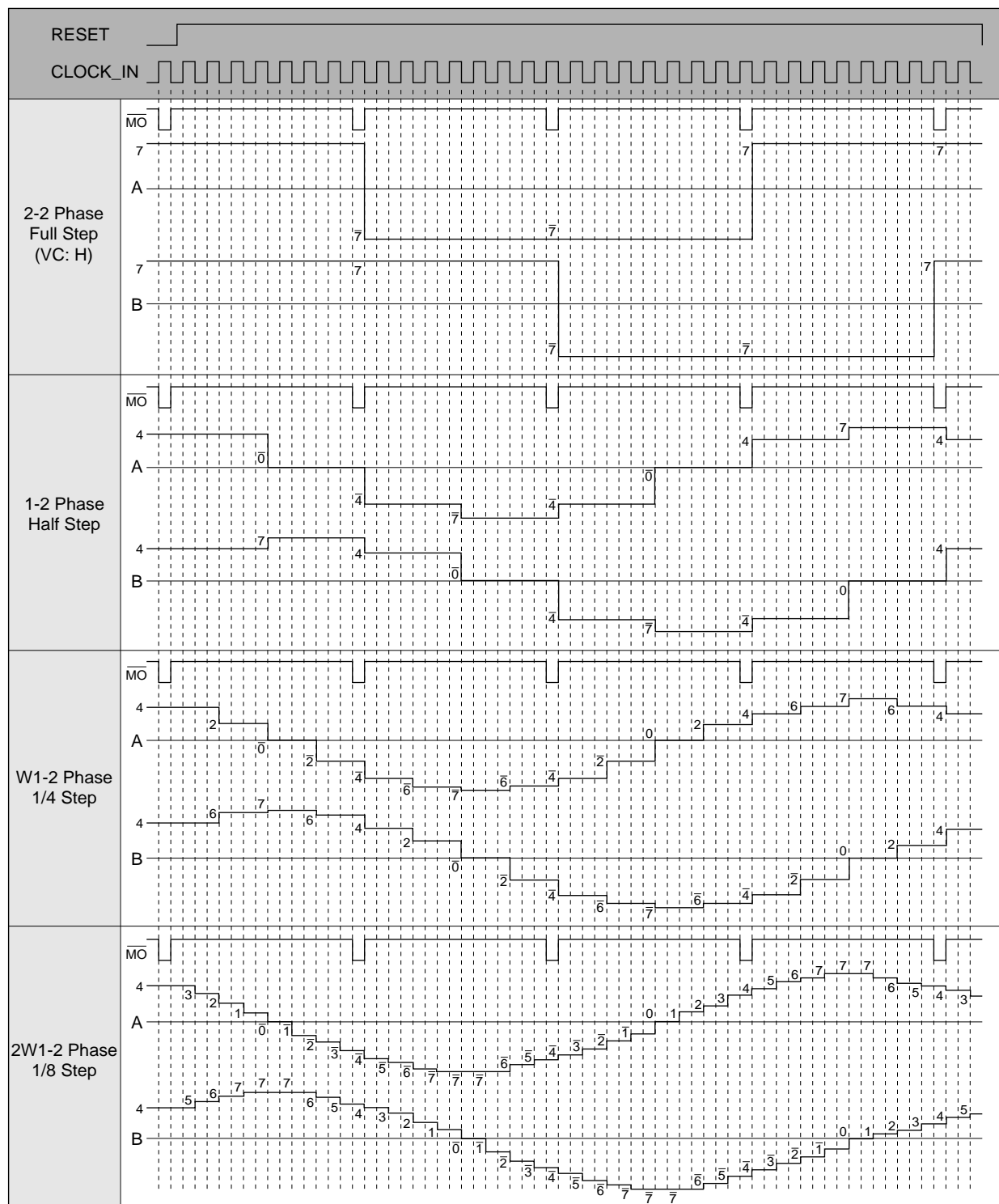
Excitation method	Input			Output current mode of SLA7042M/7044M									
	Excitation mode selection			0	1	2	3	4	5	6	7	Torque vector	
	VC	MS1	MS2	0%	20%	40%	55.5%	71.4%	83%	91%	100%		
2-2 Phase Full Step	H	L	L	—	—	—	—	—	—	—	○	141%	
	L	L	L	—	—	—	—	○	—	—	—	100%	
1-2 Phase Half Step	×	H	L	○	—	—	—	○	—	—	○	100%	
W1-2 Phase 1/4 Step	×	L	H	○	—	○	—	○	—	○	○	100%	
2W1-2 Phase 1/8 Step	×	H	H	○	○	○	○	○	○	○	○	100%	

### Output Mode Sequence

Excitation method	CW/CCW	CLOCK	RESET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
		MO	L	H	H	H	H	H	H	H	L	H	H	H	H	H	H	L	H	H	H	H	H	H	H	L	H	H	H	H	H	H	L		
2-2 Phase Full Step (1) (VC: H)	CW	DATA_A	7	=	=	=	=	=	=	=	7	=	=	=	=	=	=	7	=	=	=	=	=	=	=	7	=	=	=	=	=	=	=	7	
		DATA_B	7	=	=	=	=	=	=	=	7	=	=	=	=	=	=	7	=	=	=	=	=	=	=	7	=	=	=	=	=	=	=	7	
	CCW	DATA_A	7	=	=	=	=	=	=	=	7	=	=	=	=	=	=	7	=	=	=	=	=	=	=	7	=	=	=	=	=	=	=	7	
		DATA_B	7	=	=	=	=	=	=	=	7	=	=	=	=	=	=	7	=	=	=	=	=	=	=	7	=	=	=	=	=	=	=	7	
2-2 Phase Full Step (2) (VC: L)	CW	DATA_A	4	=	=	=	=	=	=	4	=	=	=	=	=	=	4	=	=	=	=	=	=	=	=	4	=	=	=	=	=	=	=	4	
		DATA_B	4	=	=	=	=	=	=	4	=	=	=	=	=	=	4	=	=	=	=	=	=	=	=	4	=	=	=	=	=	=	=	4	
	CCW	DATA_A	4	=	=	=	=	=	=	4	=	=	=	=	=	=	4	=	=	=	=	=	=	=	=	4	=	=	=	=	=	=	=	4	
		DATA_B	4	=	=	=	=	=	=	4	=	=	=	=	=	=	4	=	=	=	=	=	=	=	=	4	=	=	=	=	=	=	=	4	
1-2 Phase Half Step	CW	DATA_A	4	=	=	=	0	=	=	=	4	=	=	=	7	=	=	=	4	=	=	=	0	=	=	=	4	=	=	=	7	=	=	=	4
		DATA_B	4	=	=	=	7	=	=	=	4	=	=	=	0	=	=	=	4	=	=	=	7	=	=	=	4	=	=	=	0	=	=	=	4
	CCW	DATA_A	4	=	=	=	7	=	=	=	4	=	=	=	0	=	=	=	4	=	=	=	7	=	=	=	4	=	=	=	0	=	=	=	4
		DATA_B	4	=	=	=	0	=	=	=	4	=	=	=	7	=	=	=	4	=	=	=	0	=	=	=	4	=	=	=	7	=	=	=	4
W1-2 Phase 1/4 Step	CW	DATA_A	4	=	2	=	0	=	2	=	4	=	6	=	7	=	6	=	4	=	2	=	0	=	2	=	4	=	6	=	7	=	6	=	4
		DATA_B	4	=	6	=	7	=	6	=	4	=	2	=	0	=	2	=	4	=	6	=	7	=	6	=	4	=	2	=	0	=	2	=	4
	CCW	DATA_A	4	=	6	=	7	=	6	=	4	=	2	=	0	=	2	=	4	=	6	=	7	=	6	=	4	=	2	=	0	=	2	=	4
		DATA_B	4	=	2	=	0	=	2	=	4	=	6	=	7	=	6	=	4	=	2	=	0	=	2	=	4	=	6	=	7	=	6	=	4
2W1-2 Phase 1/8 Step	CW	DATA_A	4	3	2	1	0	1	2	3	4	5	6	7	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	7	6	5	4		
		DATA_B	4	5	6	7	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	7	6	5	4	3	2	1	0	1	2	3	4		
	CCW	DATA_A	4	5	6	7	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	7	6	5	4	3	2	1	0	1	2	3	4		
		DATA_B	4	3	2	1	0	1	2	3	4	5	6	7	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	7	6	5	4		

= : No output

# **Output Timing Chart (CW) ... Excitation Current of SLA7042M/7044M**



# **Output Timing Chart (CCW) ... Excitation Current of SLA7042M/7044M**

