

Serial Signal Generator IC for SLA7042M and SLA7044M

Absolute Maximum Ratings

(T_a=25°C)

Parameter	Symbol	Ratings	Units
Supply voltage	V _{DD}	-0.5 to 7	V
Input voltage	V _I	-0.5 to V _{DD} +0.5	V
Input current	I _I	±10	mA
Output voltage	V _O	-0.5 to V _{DD} +0.5	V
Output current	I _O	±15	mA
Power dissipation	P _D	200	mW
Operating temperature	T _{OP}	-20 to +85	°C
Storage temperature	T _{stg}	-40 to +150	°C

Electrical Characteristics

(T_a=25°C)

Parameter	Symbol	Conditions	Ratings			Units	
			min	typ	max		
DC characteristics	Supply voltage	V _{DD}	4.5		5.5	V	
	Supply current	I _{DD}		0.35	0.45	mA	
	Output voltage	V _{OH}	V _{DD} =5V, I _O =±3mA	4.5			V
		V _{OL}				0.4	
	Input current	I _I	V _{DD} =5V, V _I =0 or 5V			±1	μA
	Input voltage	V _{IH}	V _{DD} =5V	3.5		5	V
		V _{IL}		-0.3		1.5	
Input hysteresis voltage	V _H	V _{DD} =5V		1		V	
Input capacity	C _I	V _{DD} =5V		5	10	pF	
AC characteristics	Internal oscillation frequency	F		1.5		MHz	
	Propagation delay time	T _{CS}	See Fig. 1.		50	100	ns
		T _{CC}			430	550	
	Output voltage	T _r	V _{DD} =5V, C _L =15pF See Fig. 2.		20		ns
		T _f			20		
	CLOCK IN terminal	V _{CIH}	H level time, V _{DD} =5V	4.5			μs
	Input clock time	V _{CIL}	L level time, V _{DD} =5V	0.5			
	Reset setting time (A)	t _{sR}	Inter-clock				ns
	Stabilization time after reset (B)	t _{psR}	See Fig. 3.	100			
	Signal setting time (C)	t _{sS}	Inter-clock				ns
Stabilization time after signal input (D)	t _{psS}	See Fig. 3.		100			

Fig. 1

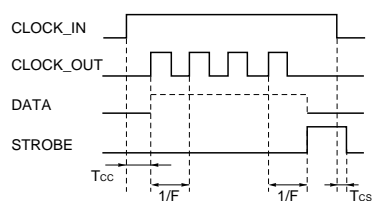


Fig.2

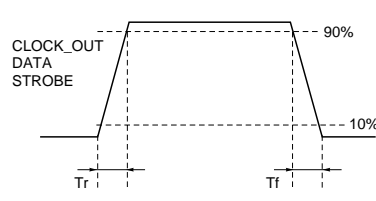
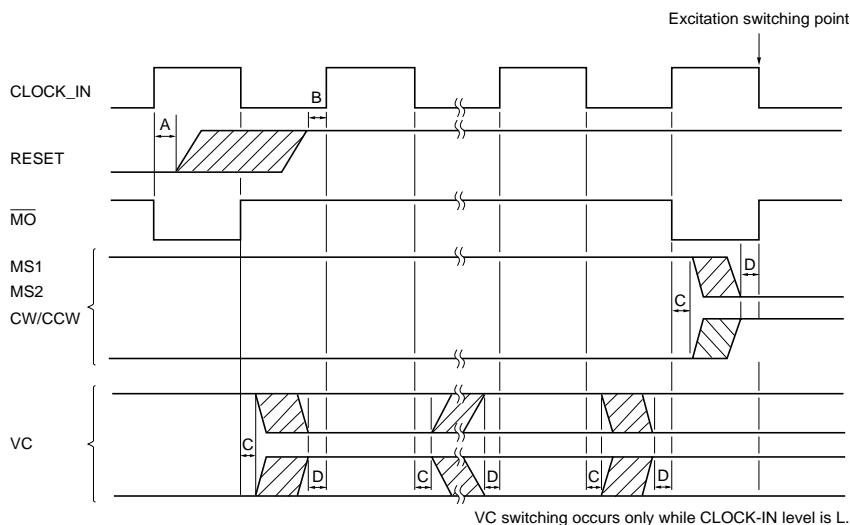


Fig. 3 Timing conditions



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

Internal Block Diagram

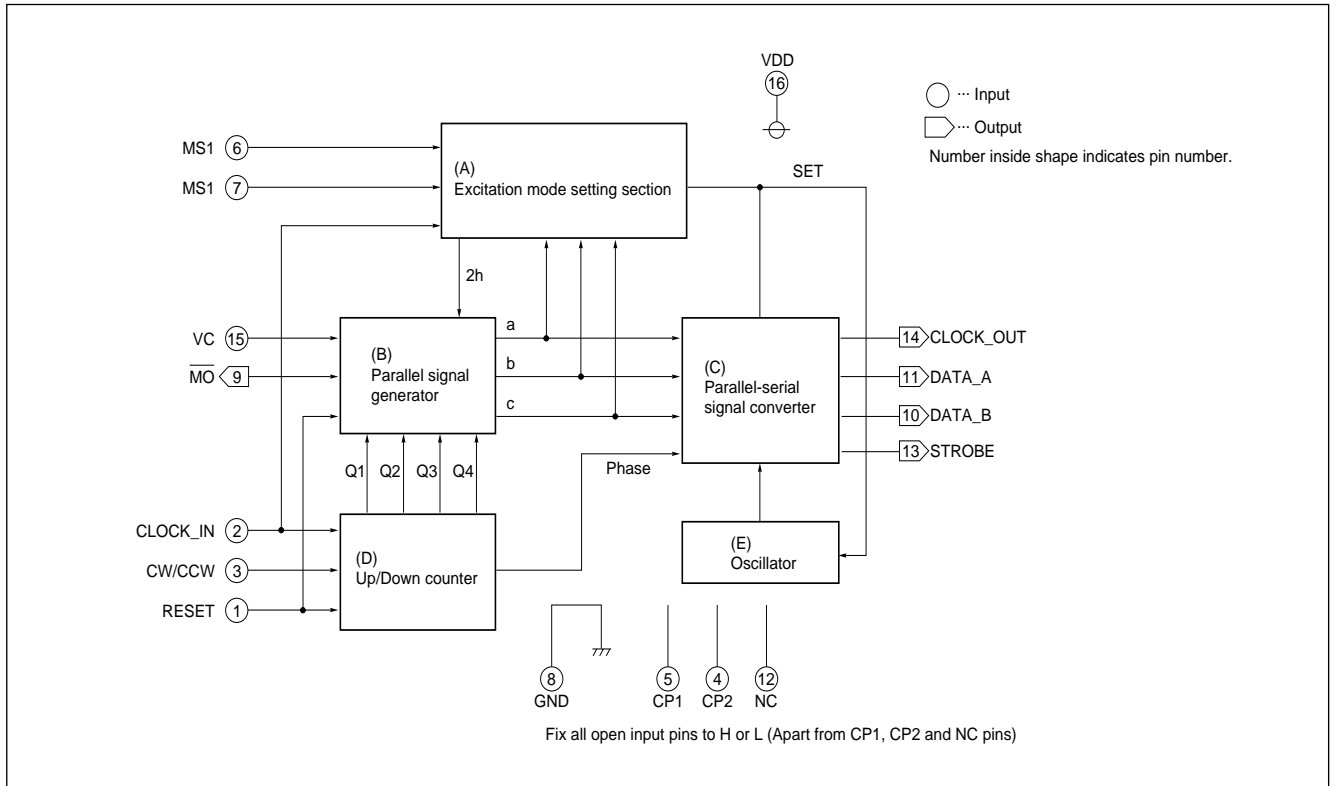
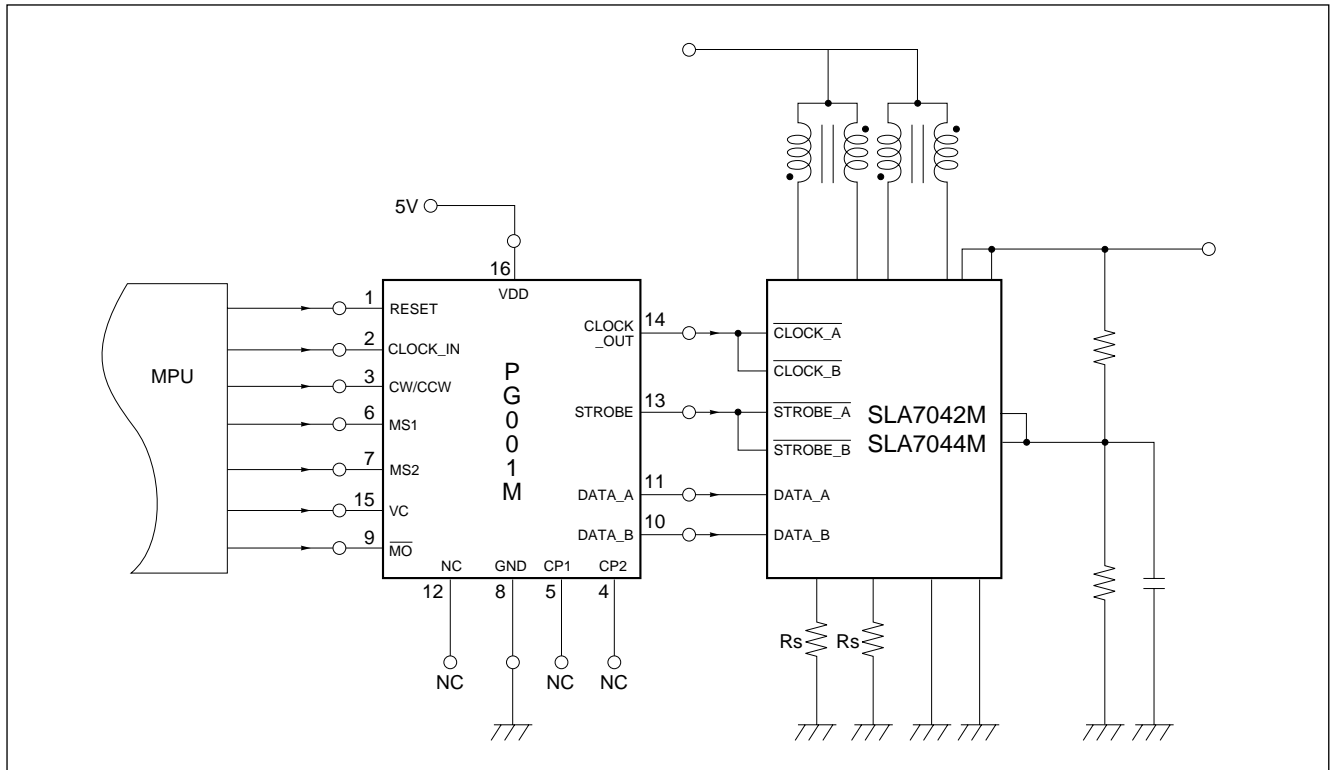
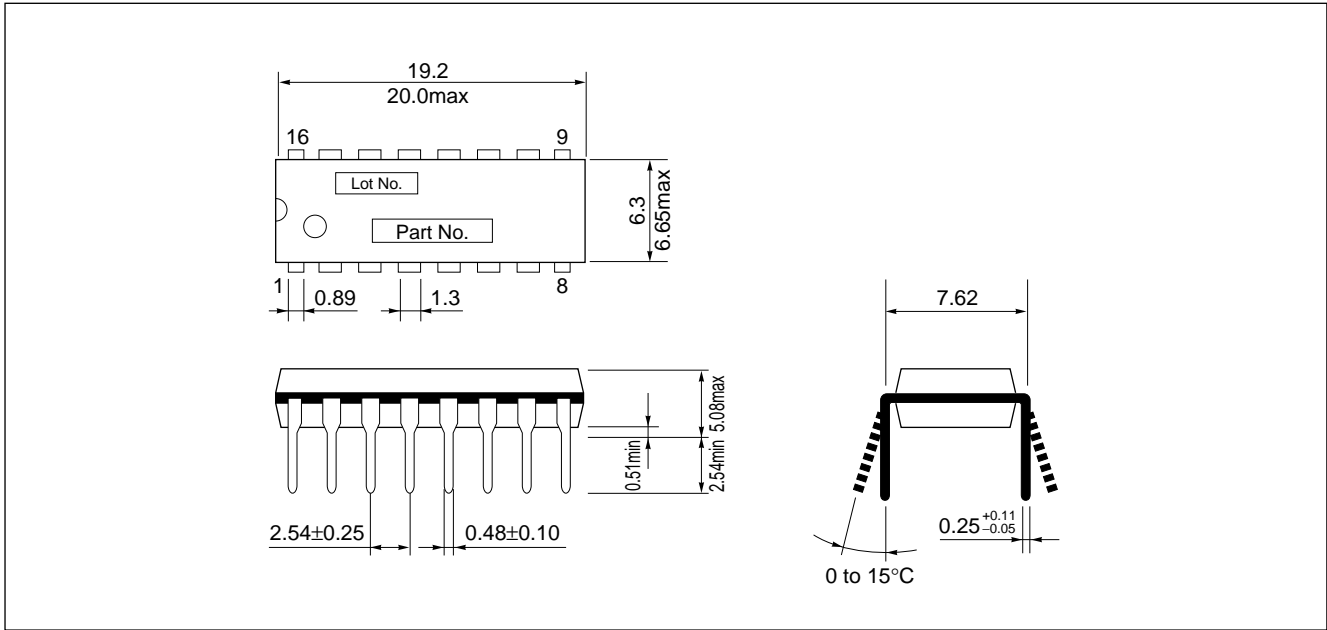


Diagram of Standard External Circuit

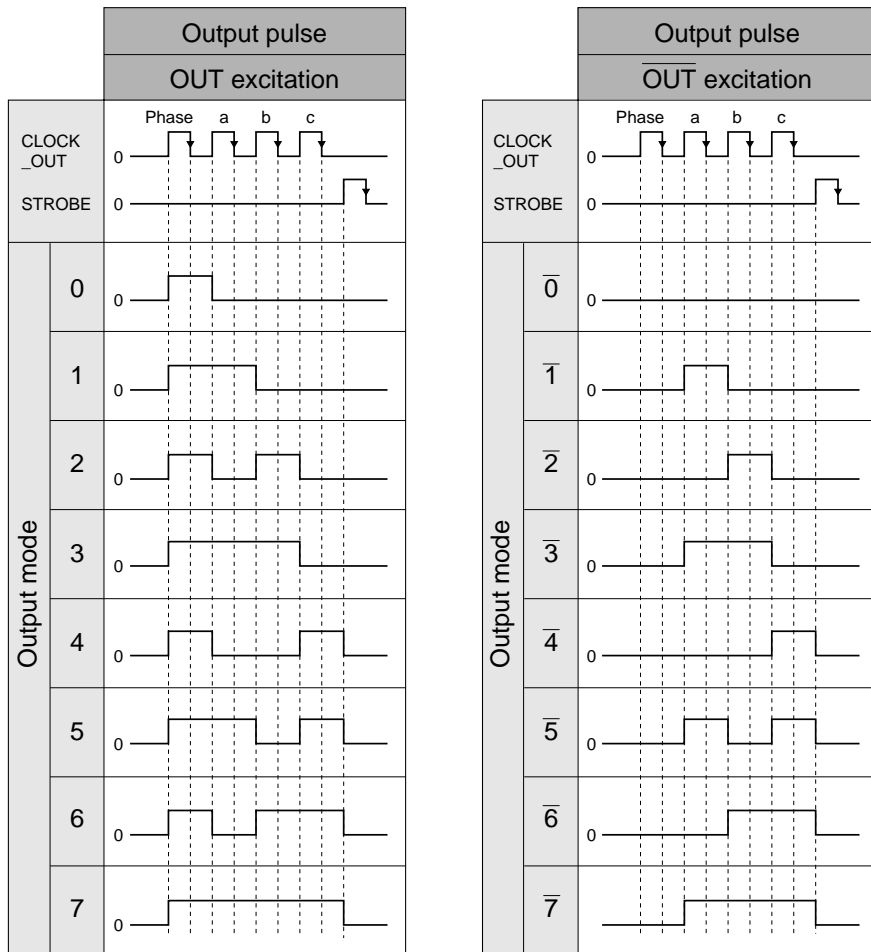


External Dimensions

(Unit: mm)



Output Mode Vs Output Pulse



Input and Output Function Correlation Table

Input				Output				
Mode	CLOCK_IN	CW/CCW	RESET	MO	CLOCK_OUT	STROBE	DATA-A	DATA-B
CW		L	H				CW	CW
		L	H				CW	CW
CCW		H	H				CCW	CCW
		H	H				CCW	CCW
RESET		x	L				Output Mode 4 or 7	Input Mode 4 or 7
		x	L				Output Mode	Output Mode

x: Don't care

*: 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

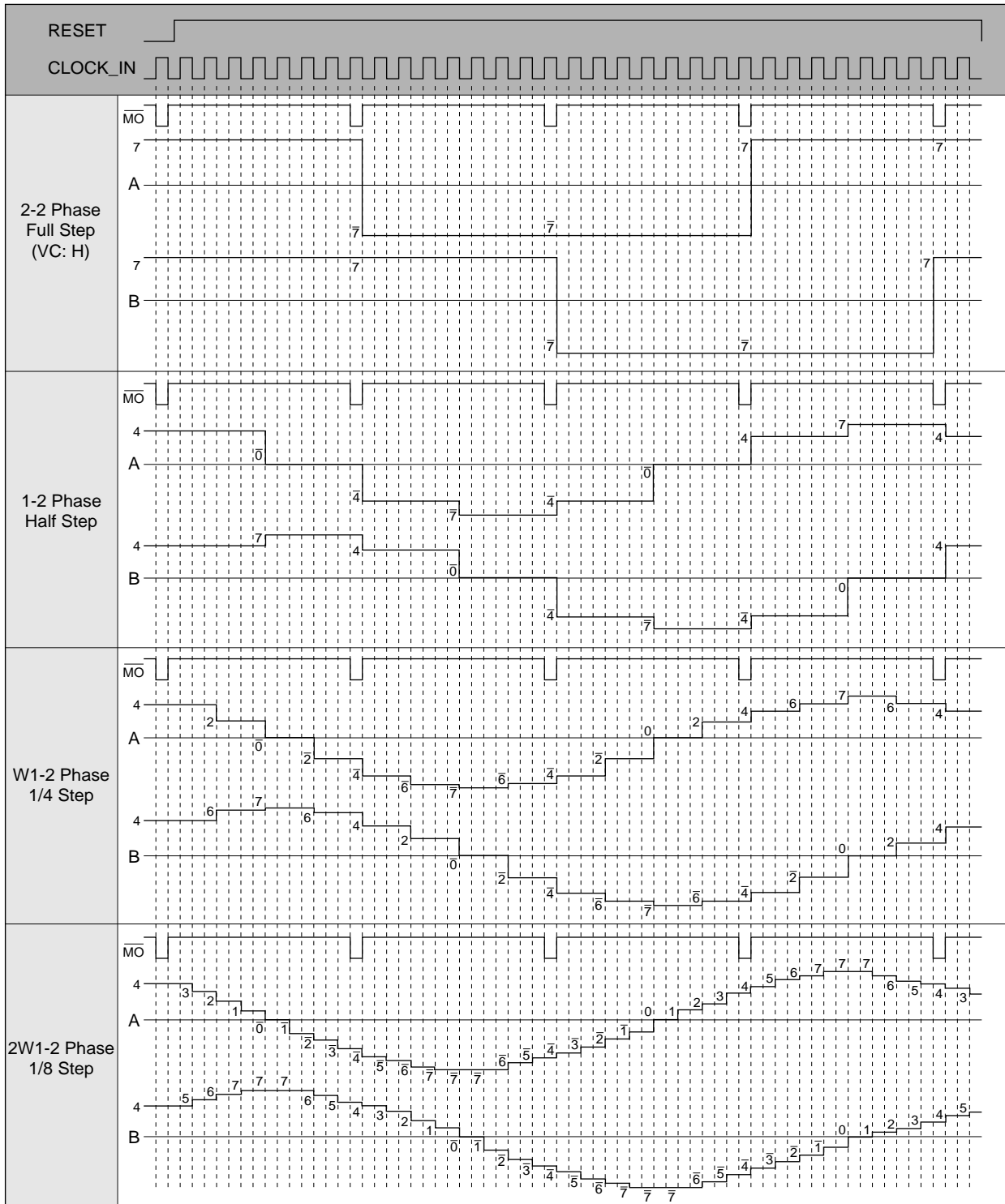
Excitation method	Input			Output current mode of SLA7042M/7044M								Torque vector
	Excitation mode selection			0	1	2	3	4	5	6	7	
	VC	MS1	MS2	0%	20%	40%	55.5%	71.4%	83%	91%	100%	
2-2 Phase Full Step	H	L	L	-	-	-	-	-	-	-	○	141%
	L	L	L	-	-	-	-	○	-	-	-	100%
1-2 Phase Half Step	x	H	L	○	-	-	-	○	-	-	○	100%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

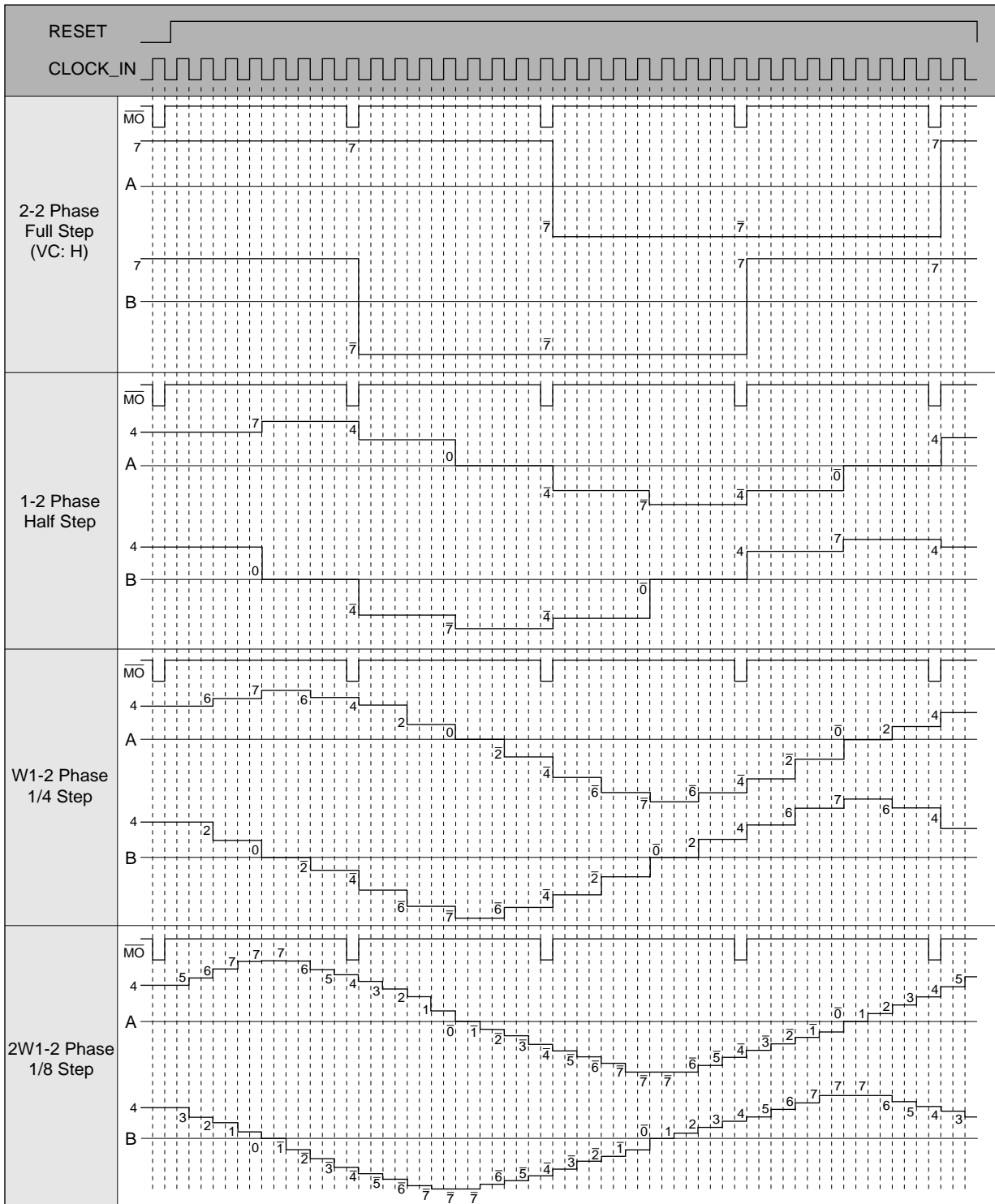
= : No output

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



For 2-2 phase VC : L, output mode is 7→4.

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



For 2-2 phase VC:L, output mode is 7→4.