

# TD62803P

## TD62803P STEPPING MOTOR CONTROLLER/DRIVER

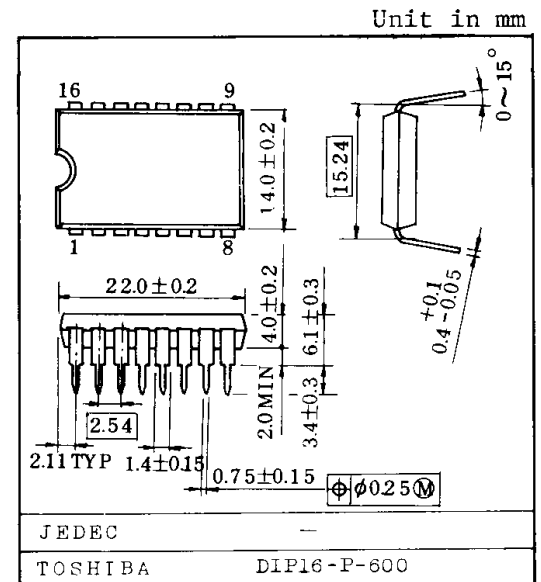
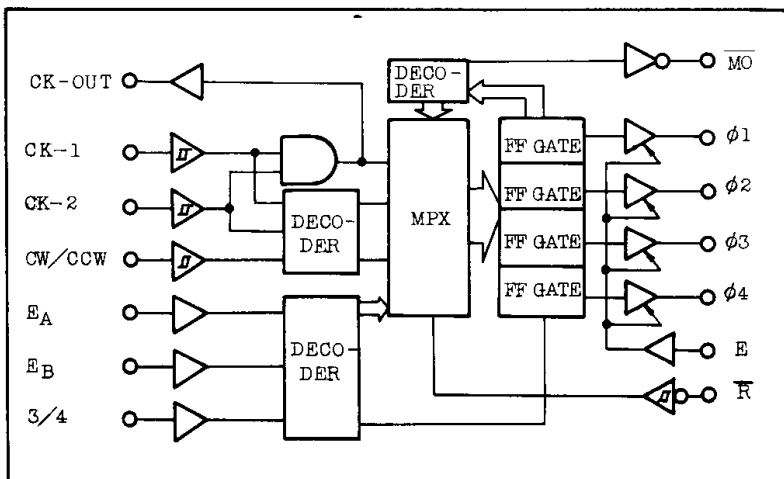
### Features

- High-Voltage, High-Current Outputs  
 $V_{CE(SUS)\phi} = 28V(\text{MIN})$ ,  $I_{OUT\phi} = 400\text{mA}(\text{MAX})$
- 1,2, 1-2 Phase Excitation Mode Capable
- 3 Inputs Direction Control .. CK-1, CK-2 CW/CCW
- Output Enable Function ... E
- Initialized Status .....  $\overline{MO}$  (Monitor out)
- Schmitt Trigger Inputs .... CK-1, CK-2, CW/CCW,  $\overline{R}$
- Standard Supply Voltage

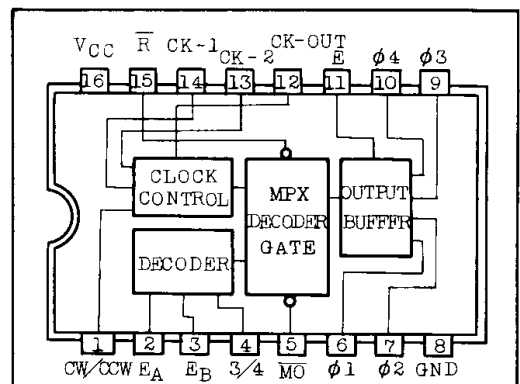
### MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	$V_{CC}$	-0.3 ~ +7.0	V
Output Sustaining Voltage	$V_{CE(SUS)\phi}$	-0.3 ~ +28	V
Output Current	$I_{OUT\phi}$	400	mA
Current	$\overline{MO}, CK\text{-}OUT$	10	mA
Input Voltage	$V_{IN}$	-0.3 ~ $V_{CC}+0.3$	V
Input Current	$I_{IN}$	±1	mA
Power Dissipation	PD	2.7	W
Operating Temperature	$T_{opr}$	-30 ~ +85	°C
Storage Temperature	$T_{stg}$	-55 ~ +150	°C

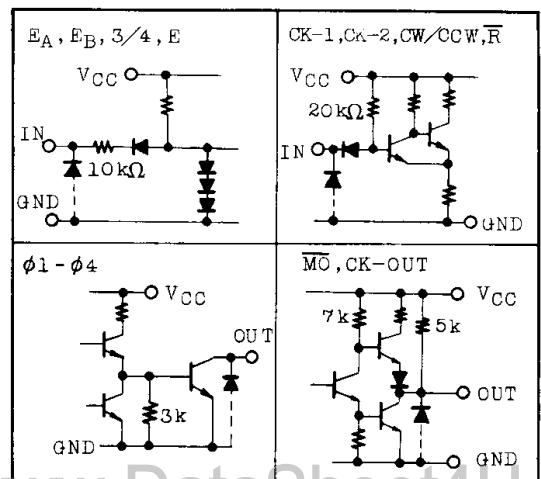
### BLOCK DIAGRAM



### PIN CONNECTION (TOP VIEW)



### SCHEMATICS OF INPUTS AND OUTPUTS



TOSHIBA CORPORATION

# TD62803P

## RECOMMENDED OPERATING CONDITIONS (Ta=-30 ~ +85°C)

CHARACTERISTIC	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Supply Voltage	V <sub>CC</sub>		4.5	5.0	5.5	V
Output Sustaining Voltage	V <sub>CE(SUS)</sub>		0		26	V
"L" Level Output Current $\phi_n$	I <sub>OUT<math>\phi</math></sub>				400	mA
		Test Mode			250	
Output Current Mo, CK-OUT	"H" Level	I <sub>OH</sub>			-0.4	mA
	"L" Level	I <sub>OL</sub>			8	
Input Voltage	V <sub>IN</sub>		0		V <sub>CC</sub>	V
Clock Frequency	f <sub>CK</sub>		0		100	kHz
Power Dissipation	P <sub>D</sub>				1.0	W

## ELECTRICAL CHARACTERISTICS (Ta=25°C)

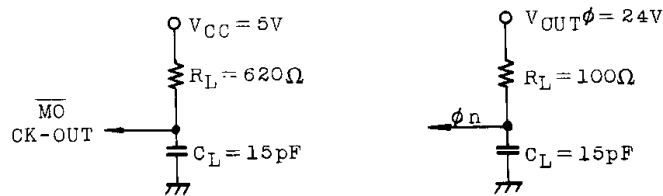
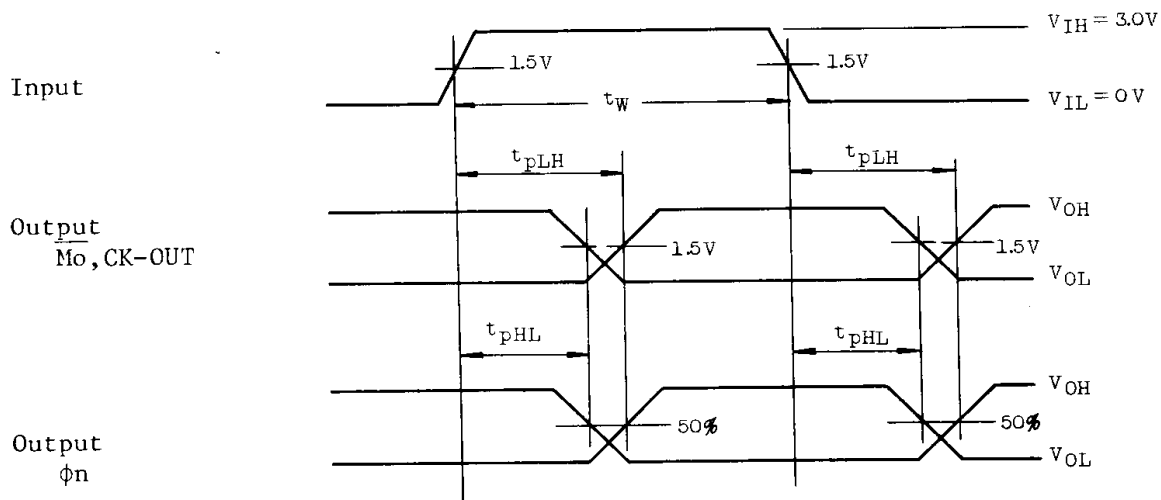
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
"H" Level Input Voltage	V <sub>IH</sub>		2.0			V
"L" Level Input Voltage	V <sub>IL</sub>				0.8	V
"H" Level Output Current $\phi_n$	I <sub>OH<math>\phi</math></sub>	V <sub>CC</sub> =5.5V, V <sub>OUT</sub> =26V			100	$\mu$ A
"H" Level Output Voltage Mo, CK-OUT	V <sub>OH</sub>	V <sub>CC</sub> =4.5V, I <sub>OH</sub> =-0.4mA	2.4			V
		V <sub>CC</sub> =5.0V, I <sub>OH</sub> =-10 $\mu$ A	4.0			
"L" Level Output Voltage	Mo, CK-OUT	V <sub>OL</sub>			0.4	V
	$\phi_n$	V <sub>OUT<math>\phi</math></sub>	V <sub>CC</sub> =4.5V, I <sub>OUT</sub> =400mA		1.1	
			V <sub>CC</sub> =4.5V, I <sub>OUT</sub> =200mA		0.6	
"H" Level Input Current	I <sub>IH</sub>	V <sub>CC</sub> =5.5V, V <sub>IH</sub> =5.5V			10	$\mu$ A
"L" Level Input Current	I <sub>IL</sub>	V <sub>CC</sub> =5.5V, V <sub>IL</sub> =0.4V			-0.4	mA
Hysteresis	$\Delta$ V <sub>T</sub>		200			mV
Supply Current	I <sub>CC</sub>				100	mA

## SWITCHING CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Propagation Delay Time, Low-to-High Level	CK- $\phi_n$	t <sub>pLH</sub> V <sub>CC</sub> =5.0V R <sub>L</sub> -CK-OUT, Mo=620 $\Omega$ R <sub>L</sub> - $\phi_1 \sim \phi_4$ =100 $\Omega$ C <sub>L</sub> -All Outputs=15pF V <sub>OUT<math>\phi</math></sub> =24V		2.0		$\mu$ S
	CK-CK-OUT			1.0		
	CK-Mo			2.8		
	E- $\phi_n$			1.0		
	R- $\phi_n$			2.0		

SWITCHING CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Propagation Delay Time High-to-Low Level	CK-φn	t <sub>pHL</sub>	V <sub>CC</sub> =5.0V R <sub>L</sub> -CK-OUT, $\overline{M}o=620\Omega$ R <sub>L</sub> -φ <sub>1</sub> ~φ <sub>4</sub> =100Ω C <sub>L</sub> -All Outputs = 15pF V <sub>OUTφ</sub> =24V		1.4		μS
	CK-CK-OUT				0.7		
	CK- $\overline{M}o$				2.1		
	E-φn				1.2		
	$\overline{R}$ -φn				1.0		
	$\overline{R}$ - $\overline{M}o$				2.0		
Maximum Clock Frequency	f <sub>max</sub>			250		kHz	
Set Up Time CK, CW/CCW	t <sub>set-up</sub>			0.1		μS	
Hold Time CK, CW/CCW	t <sub>hold</sub>			0.1			
Minimum Clock Pulse Width	t <sub>w</sub> (CK)			1.0			
Minimum Reset Pulse Width	t <sub>w</sub> ( $\overline{R}$ )			1.0			











LOAD CIRCUIT

# TD62803P

## PIN NAMES AND FUNCTIONS

PIN NO.	SYMBOL	NAME	FUNCTION
1	CW/CCW	Clock Wise/Counter Clock Wise	Direction Control Input      Function Table A
2	EA	Excitation A	Phase Excitation Mode Input      Function Table B
3	EB	Excitation B	
4	3/4	3 Phases/4 Phases	
5	$\overline{Mo}$	Monitor Out	Initial Status Output $\overline{Mo}$ ="L" at Initial State
6	$\phi_1$	$\phi_1$ Out	$\phi_1$ Output
7	$\phi_2$	$\phi_2$ Out	$\phi_2$ Output
8	GND	GND	GND
9	$\phi_3$	$\phi_3$ Out	$\phi_3$ Output
10	$\phi_4$	$\phi_4$ Out	$\phi_4$ Output
11	E	Output Enable	Outputs are Enable at E="H"
12	CK-OUT	Clock-Out	Clock Output
13	CK1	Clock In-1	Clock Input 1      Function Table A
14	CK2	Clock In-2	Clock Input 2
15	$\overline{R}$	Reset	Reset Input
16	VCC	VCC	VCC

FUNCTION TABLE A

CK1	CK2	CW/CCW	FUNCTION
	H	L	CW
	L	L	Inhibit
H		L	CCW
L		L	Inhibit
	H	H	CCW
	L	H	Inhibit
H		H	CW
L		H	Inhibit

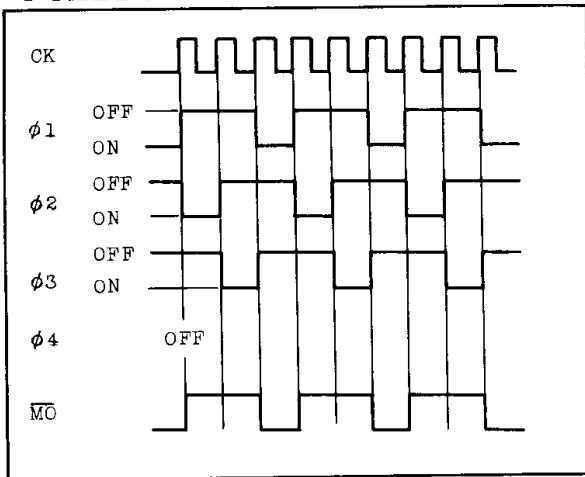
FUNCTION TABLE B

EA	EB	3/4	FUNCTION	
L	L	L	4 Phases      1 Phase Excitation	
H	L	L		2 Phase Excitation
L	H	L		1-2 Phase Excitation
H	H	L	Test Mode $\phi_1 \sim \phi_4$ ON	
L	L	H	3 Phases      1 Phase Excitation	
H	L	H		2 Phase Excitation
L	H	H		1-2 Phase Excitation
H	H	H	Test Mode $\phi_1 \sim \phi_4$ ON	

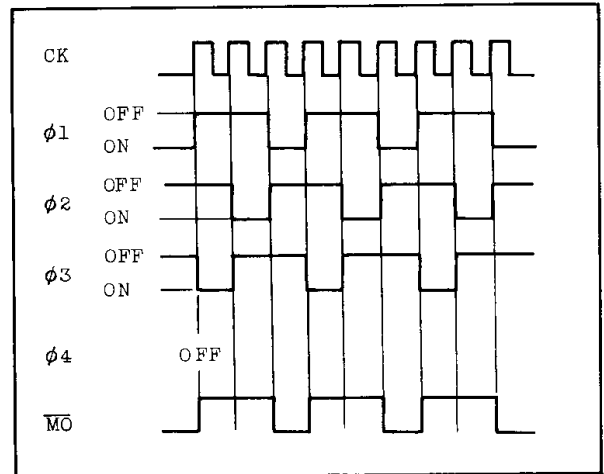
NOTE) Conversion of Phase Excitation Mode must be made after the Reset Mode is established.

3 PHASES METHOD

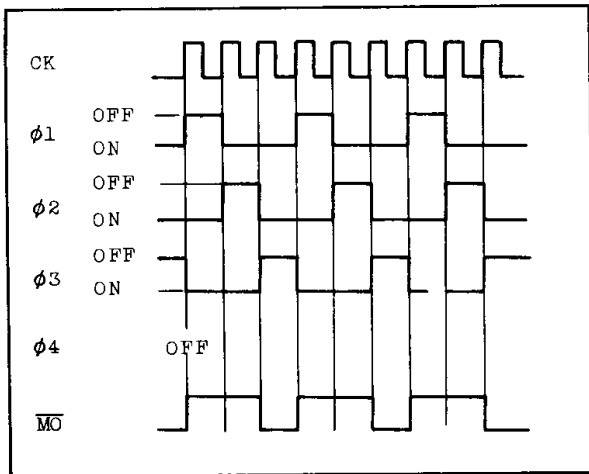
1 PHASE EXCITATION CW



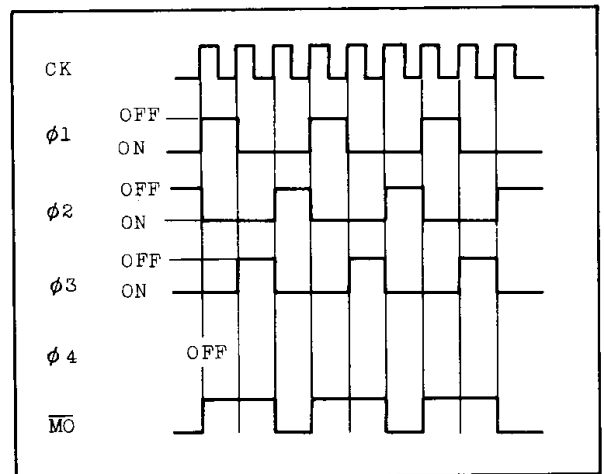
1 PHASE EXCITATION CCW



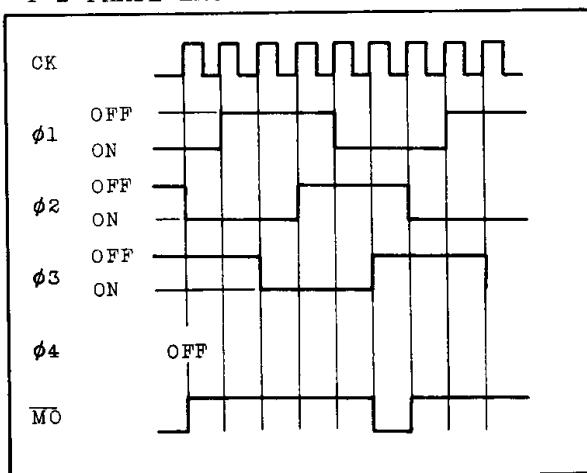
2 PHASE EXCITATION CW



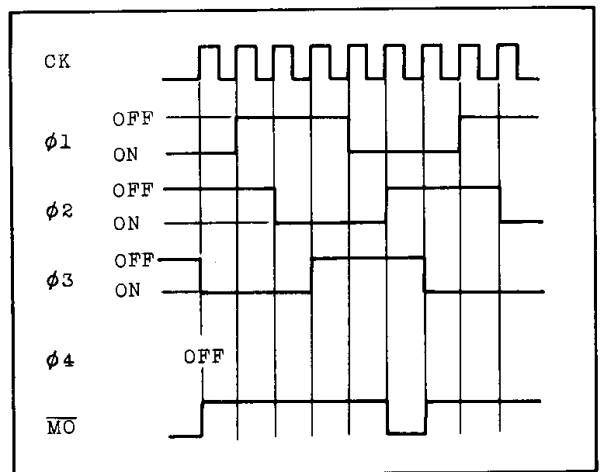
2 PHASE EXCITATION CCW



1-2 PHASE EXCITATION CW



1-2 PHASE EXCITATION CCW

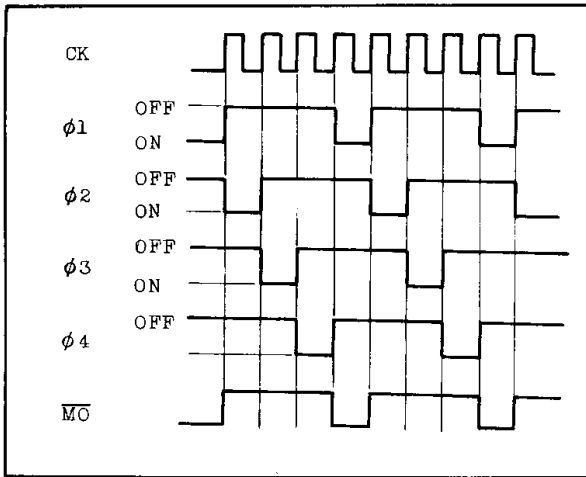


# TD62803P

## 4 PHASES METHOD

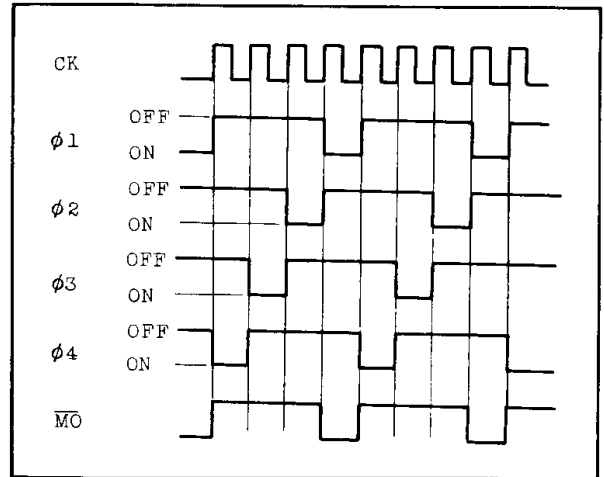
1 PHASE EXCITATION

CW



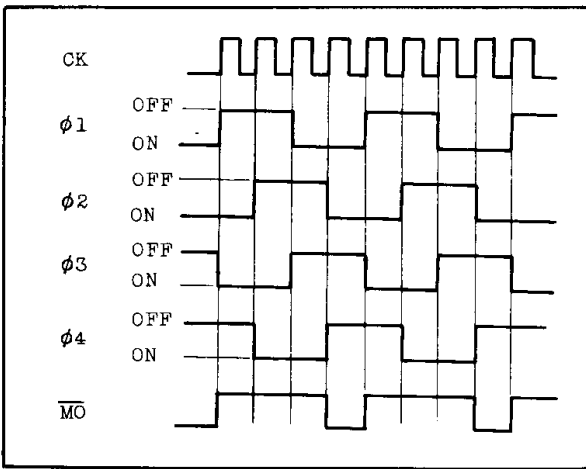
1 PHASE EXCITATION

CCW



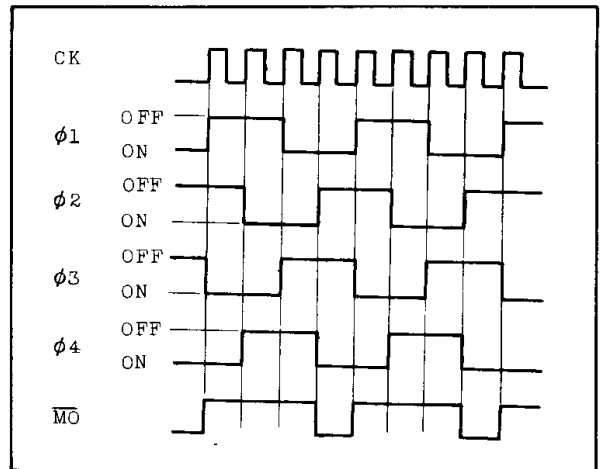
2 PHASE EXCITATION

CW



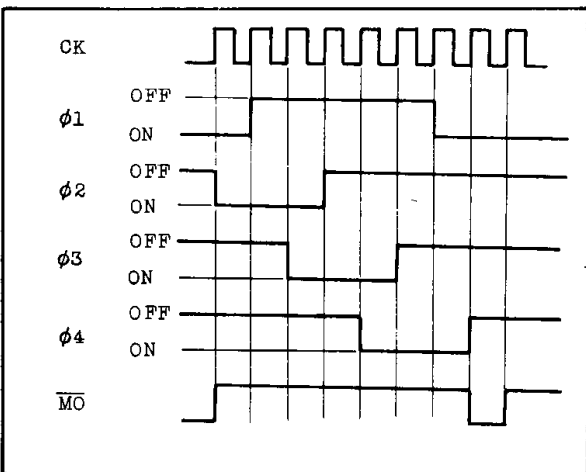
2 PHASE EXCITATION

CCW



1-2 PHASE EXCITATION

CW



1-2 PHASE EXCITATION

CCW

