TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA7259P,TA7259P(LB),TA7259F

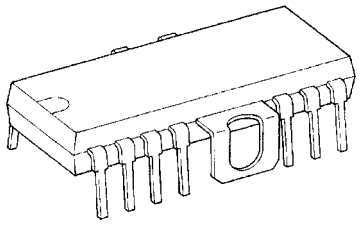
DC MOTOR DRIVER IC

The TA7259P is a 3−phase Bi−directional motor driver IC.
It designed for use VTR tape deck, floppy disk and record player motor drivers.
It contains output power drivers, position sensing circuits, control amplifier and CW / CCW control circuit.

FEATURES

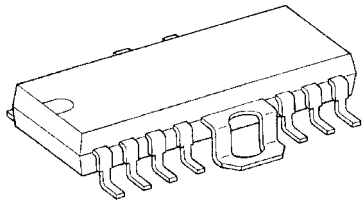
- 3−phase Bi−directional driver and output current up to ±1.2 A.
- Few external parts required.
- Wide operating supply voltage range: $V_{CC\ (opr.)}$ MIN. = 7 V
- Forward and reverse rotation is controlled simply by means of a CW / CCW control signal fed into FRS.
- High sensitivity of position sensing amplifier.
  (V_H = 10 mV (Typ.), recommend to use TOSHIBA Ga−As hall sensor "THS" series.
- Surge protect diode connected for all input terminals.
  (Position sensing, control, CW / CCW control inputs.)
- DIP−14F power package.

TA7259P



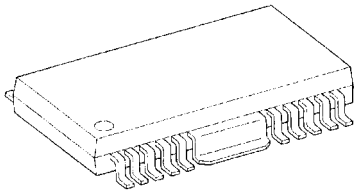
HDIP14-P-500-2.54A

TA7259P (LB)



HSOP14-P-2.54

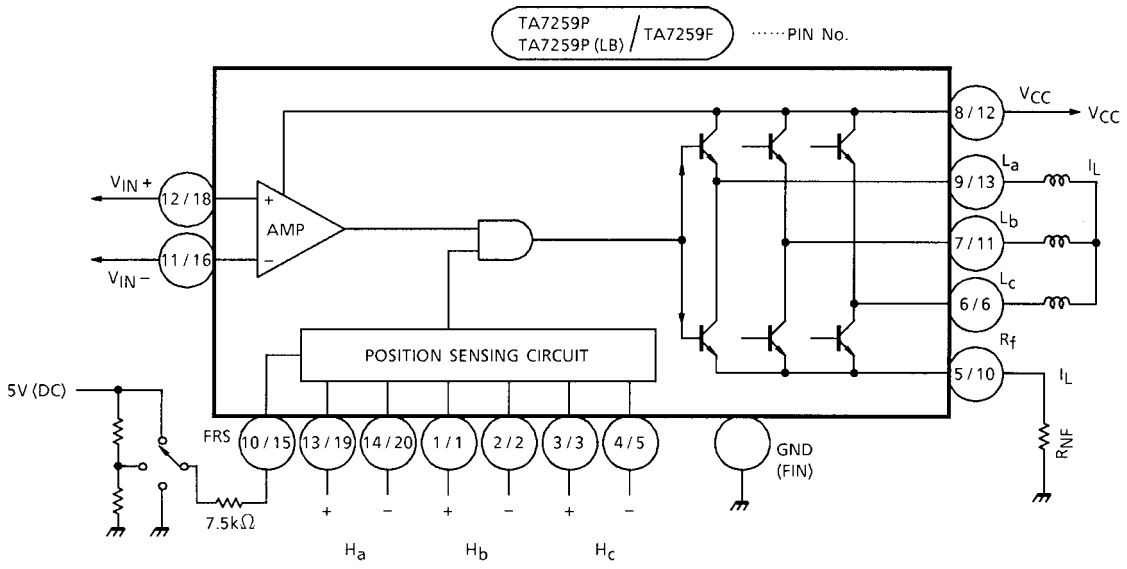
TA7259F



HSOP20-P-450-1.00

Weight
HDIP14−P−500−2.54A : 3.00 g (Typ.)
HSOP14−P−2.54 : 3.00 g (Typ.)
HSOP20−P−450−1.00 : 0.79 g (Typ.)

BLOCK DIAGRAM



PIN FUNCTION

PIN No.		SYMBOL	FUNCTION DESCRIPTION
P TYPE	F TYPE		
1	1	H_b +	b−phase Hall Amp. positive input terminal
2	2	H_b −	b−phase Hall Amp. negative input terminal
3	3	H_c +	c−phase Hall Amp. positive input terminal
4	5	H −	c−phase Hall Amp. negative input terminal
5	10	R_F	Output current detection terminal
6	6	L_c	c−phase drive output terminal
7	11	L_b	b−phase drive output terminal
8	12	V_{CC}	Power supply input terminal
9	13	L_a	a−phase drive output terminal
10	15	FRS	Forward / Reverse / Stop switch terminal
11	16	V_{IN} −	Control Amp, negative input terminal
12	18	V_{IN} +	Control Amp, positive input terminal
13	19	H_a +	a−phase Hall Amp. positive input terminal
14	20	H_a −	a−phase Hall Amp. negative input terminal
Fin	Fin	GND	GND Terminal

FUNCTION

FRS (10 PIN)	POSITION SENSING INPUT			COIL OUTPUT		
	H_a	H_b	H_c	L_a	L_b	L_c
L	1	0	1	H	L	M
	1	0	0	H	M	L
	1	1	0	M	H	L
	0	1	0	L	H	M
	0	1	1	L	M	H
	0	0	1	M	L	H
H	1	0	1	L	H	M
	1	0	0	L	M	H
	1	1	0	M	L	H
	0	1	0	H	L	M
	0	1	1	H	M	L
	0	0	1	M	H	L
M	1	0	1	High Impedance		
	1	0	0			
	1	1	0			
	0	1	0			
	0	1	1			
	0	0	1			

MAXIMUM RATINGS (Ta = 25°C)

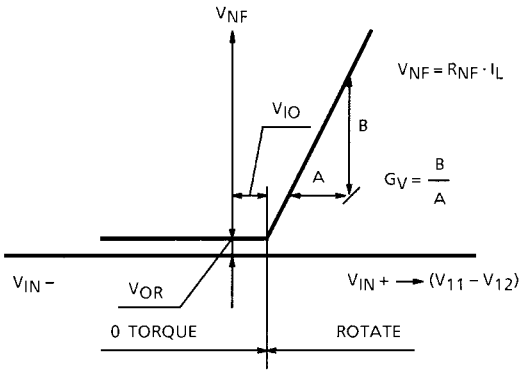
CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	26	V
Output Current		I_O	1.2	A
Power Dissipation (Note)	TA7259P	P_D	2.3	W
	TA7259P (LB)		2.3	
	TA7259F		1.0	
Operating Temperature		Topr	−30~75	°C
Storage Temperature		T_{stg}	−55~150	°C

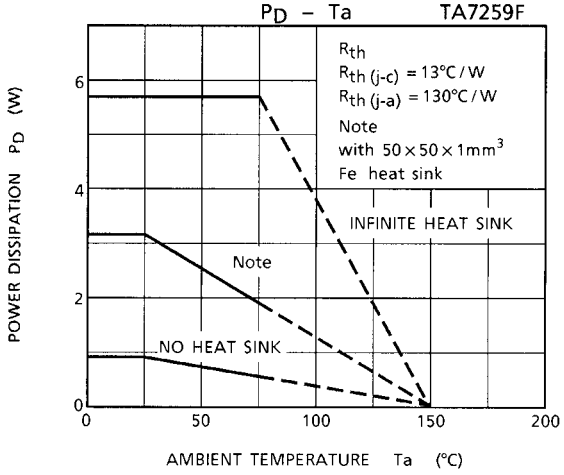
Note: No heat sink.

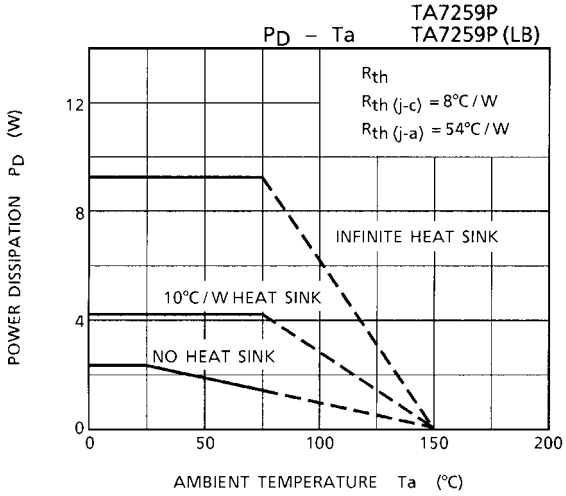
ELECTRICAL CHARACTERISTICS (Unless otherwise specified, V_{CC} = 12 V, Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIR−CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Quiescent Current		I_{CC1}	—	FRS open	2	4	7	mA
		I_{CC2}		FRS = 5 V	2	5	9	
		I_{CC3}		V_{CC} = 22 V, FRS = GND	2	5	9	
Input Offset Voltage		V_{IO}	—	—	—	40	—	mV
Residual Output Voltage		V_{OR}	—	V_{IN} − = V_{IN} + = 7 V	—	0	10	mV
Voltage Gain		G_V	—	R_{NF} = 2.2 Ω	—	15.0	—	—
Saturation Voltage	Upper	V_{SAT1}	—	I_L = 400 mA	—	1.0	1.5	V
	Lower	V_{SAT2}	—		—	0.4	1.0	
Cut−off Current	Upper	I_{OC1}	—	V_C = 20 V	—	—	20	μA
	Lower	I_{OC2}	—		—	—	20	
Position sensing Input Sensitivity		V_H	—	—	—	10	—	mA
Maximum Position Sensing Input Voltage		V_H MAX.	—	—	—	—	400	mV_{p-p}
Input Operating Voltage	Position	CMR_H	—	—	2.0	—	V_{CC} − 2.5	V
	Control	CMR_C	—	—	2.0	—	V_{CC} − 2.5	
Rotation Control Input Voltage	CW	V_F	—		—	0	0.4	V
	STOP	V_S	—	—	2.5	3.0	3.5	
	CCW	V_R	—	—	4.5	5.0	5.8	

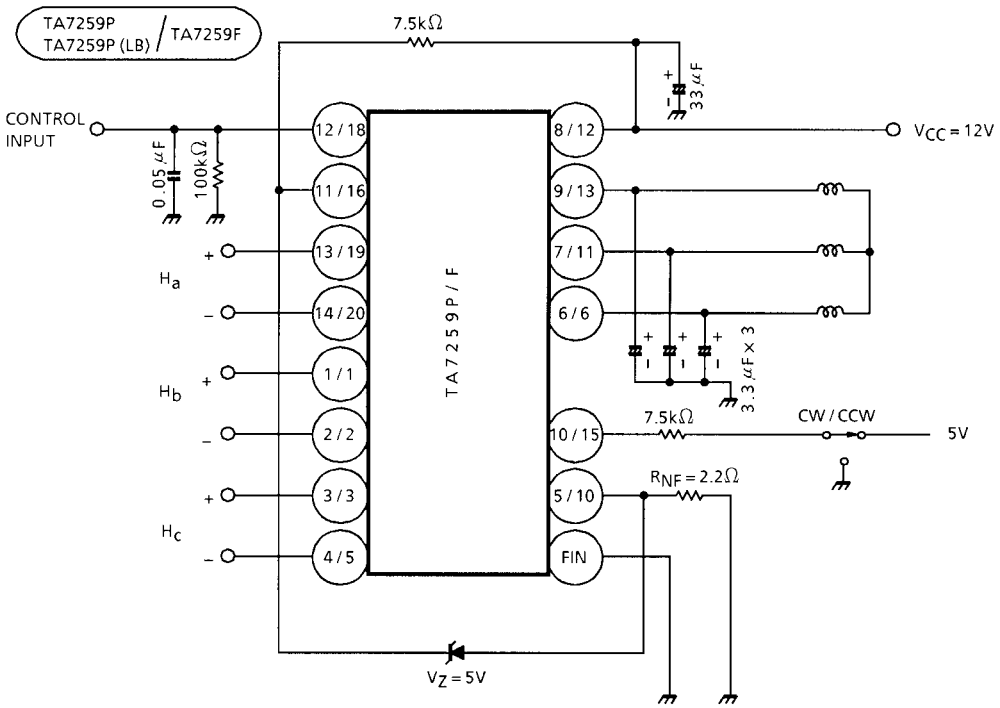
INPUT vs OUTPUT







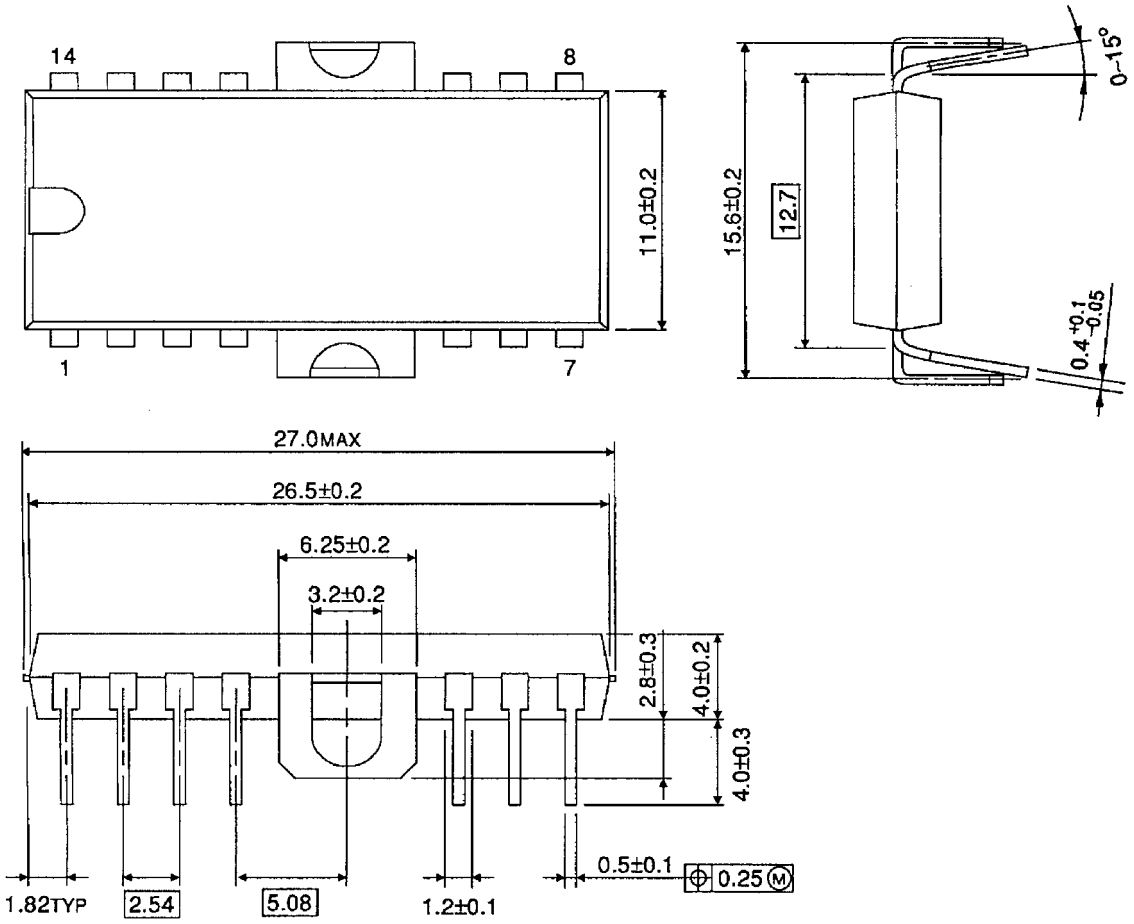
APPLICATION CIRCUIT



Note: Utmost care is necessary in the design of the output line, V_{CC} and GND line since IC may be destroyed due to short−circuit between outputs, air contamination fault, or fault by improper grounding.

PACKAGE DIMENSIONS

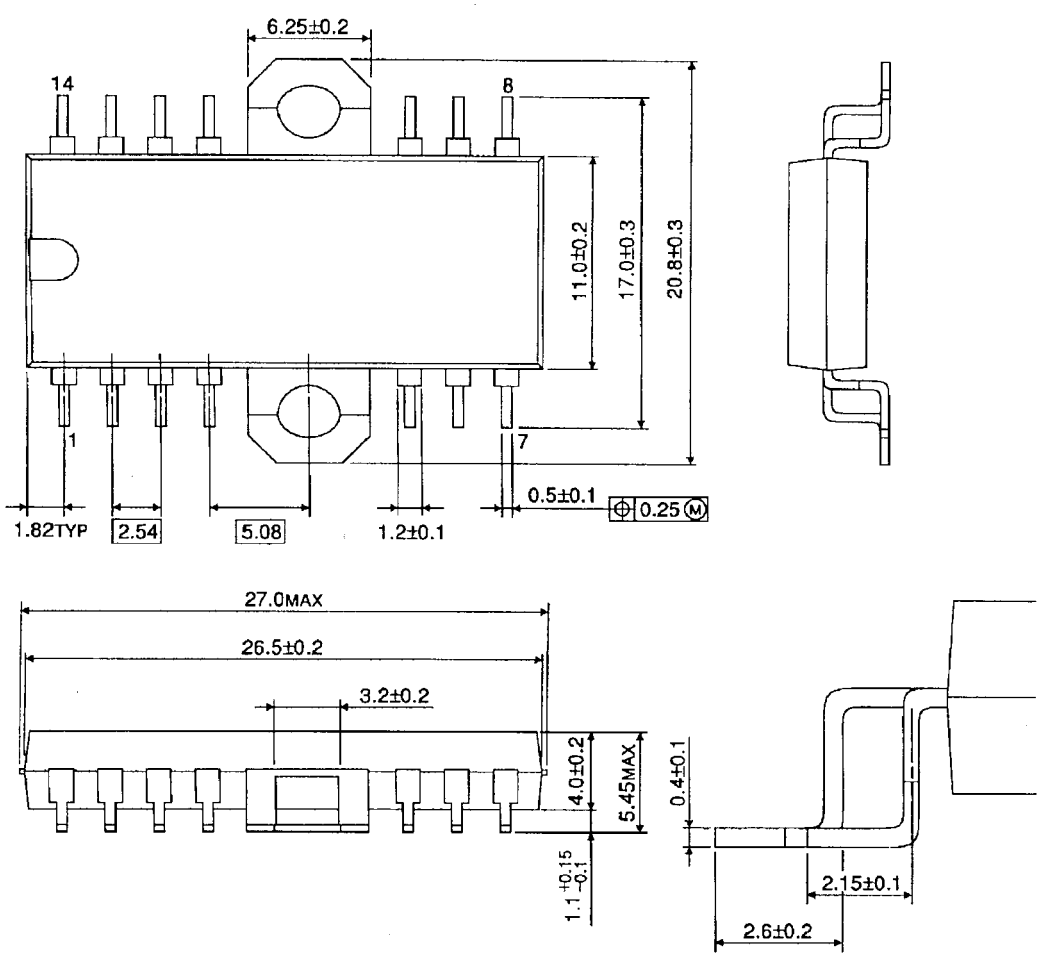
HDIP14−P−500−2.54A Unit: mm



Weight: 3.00 g (Typ.)

PACKAGE DIMENSIONS

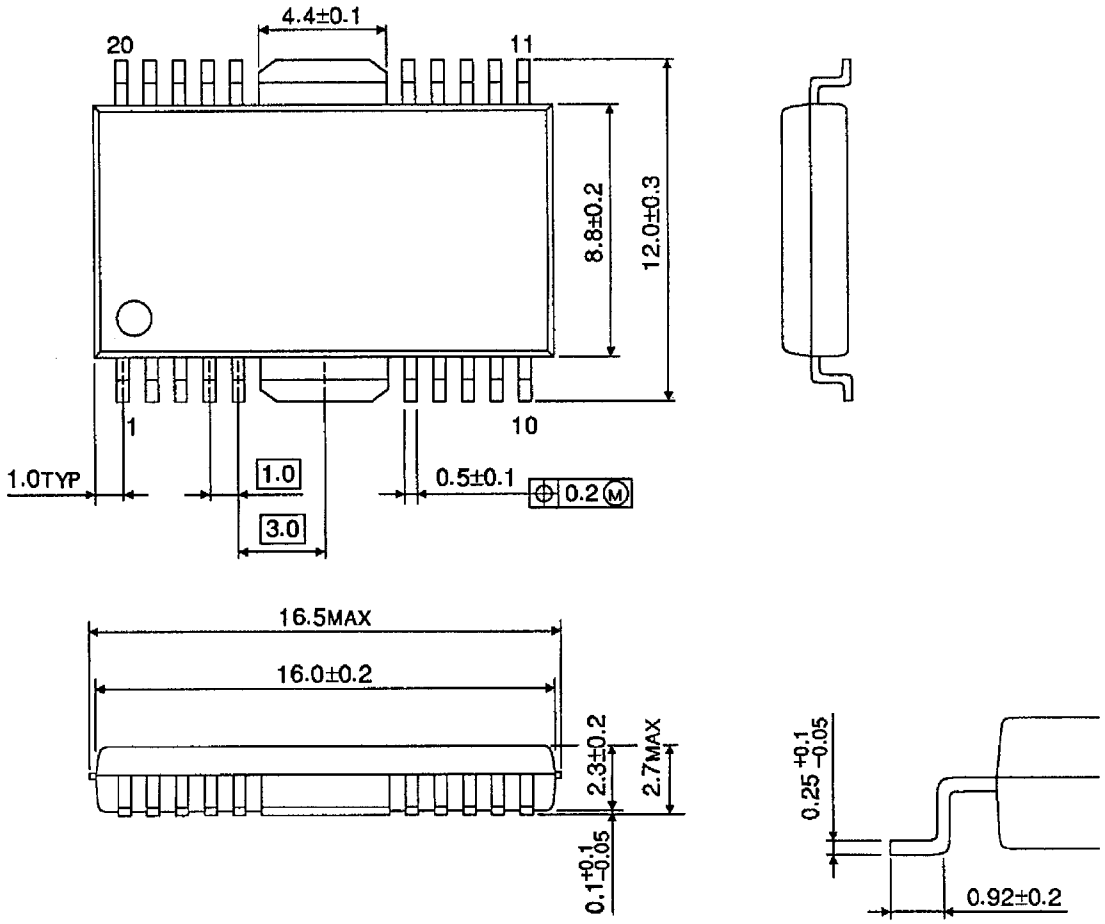
HSOP14-P-2.54 Unit : mm



Weight: 3.00 g (Typ.)

PACKAGE DIMENSIONS

HSOP20−P−450−1.00 Unit: mm



Weight: 0.79 g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
  In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the “Handling Guide for Semiconductor Devices,” or “TOSHIBA Semiconductor Reliability Handbook” etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury (“Unintended Usage”). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer’s own risk.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.