

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA8410P, TA8410K, TA8410AK

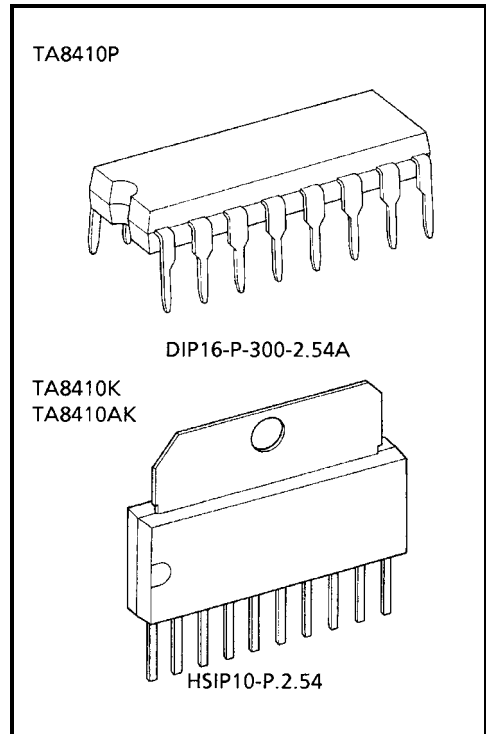
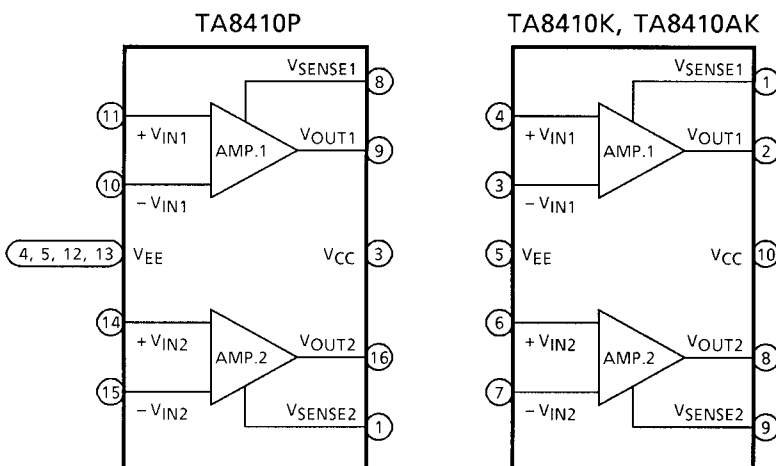
## DUAL POWER OPERATIONAL AMPLIFIER

The TA8410 series are a dual power operational amplifier. It is intended for use especially DC MOTOR positioning system applications such as Arm Driver (for Audiodisk Players), head or voice coil motor drivers (for Floppy and Hard Disk Drivers) and any other power driver applications.

### FEATURES

- Built-in over current protector
- Few external parts required
- Output current up to 600 mA (AVE)
- Package TA8410P : DIP16  
TA8410K / AK : HSIP 10

### BLOCK DIAGRAM



Weight  
 DIP16-P-300-2.54A : 1.0 g (Typ.)  
 HSIP10-P-2.54 : 3.0 g (Typ.)

## PIN FUNCTION

PIN No.	SYMBOL	FUNCTIONAL DESCRIPTION
1 (9)	V <sub>SENSE2</sub>	Amp.2 output current sensing terminal.
2 (-)	NC	Non connection
3 (10)	V <sub>CC</sub>	Positive-side voltage supply terminal.
4 (5)	V <sub>EE</sub>	Negative-side voltage supply terminal.
5 (-)	V <sub>EE</sub>	
6 (-)	NC	Non connection
7 (-)	NC	Non connection
8 (1)	V <sub>SENSE1</sub>	Amp.1 output current sensing terminal.
9 (2)	V <sub>OUT1</sub>	Amp.1 output terminal.
10 (3)	-V <sub>IN1</sub>	Amp.1 input terminal (-)
11 (4)	+V <sub>IN1</sub>	Amp.1 input terminal (+)
12 (-)	V <sub>EE</sub>	Negative-side voltage supply terminal.
13 (-)	V <sub>EE</sub>	
14 (6)	+V <sub>IN2</sub>	Amp.2 input terminal (+)
15 (7)	-V <sub>IN2</sub>	Amp.2 input terminal (-)
16 (8)	V <sub>OUT2</sub>	Amp.2 output terminal.

( ): TA8410K, TA8410AK

## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	TA8410P	+9	V
	TA8410K		
	TA8410AK	+15	
Output Current	I <sub>O(AVE)</sub>	0.6	A
Power Dissipation	TA8410P	1.4 (Note 1)	W
	TA8410K	1.4 (Note 2)	
	TA8410AK	12.5 (Note 3)	
Operating Temperature	T <sub>opr</sub>	-30~75	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

Note 1: No heat sink

Note 2: 60 × 30 × 1.6 mm PCB mounting occupied copper area in excess of 50%.

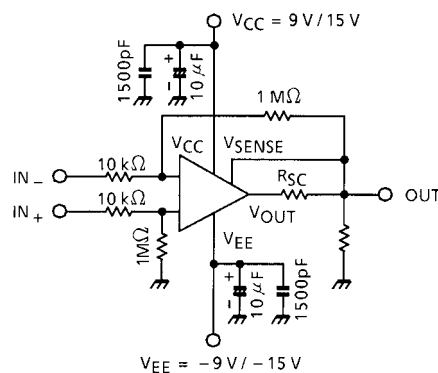
Note 3: T<sub>c</sub> = 25°C

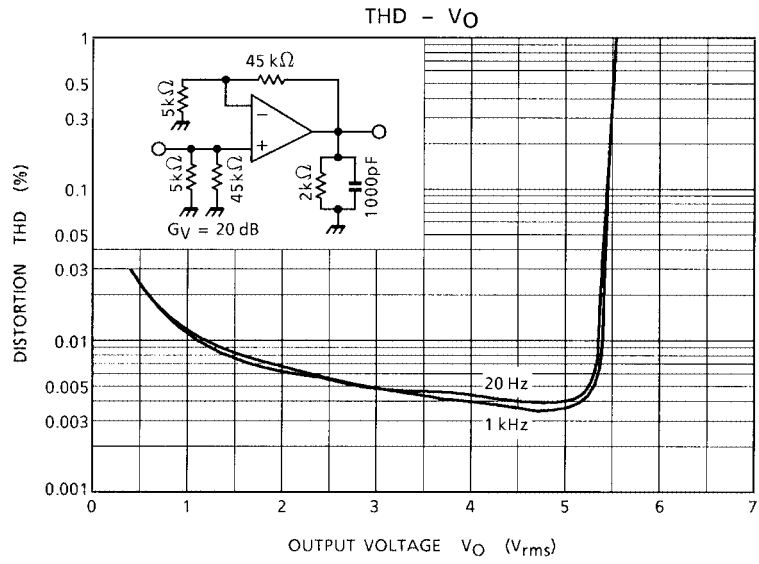
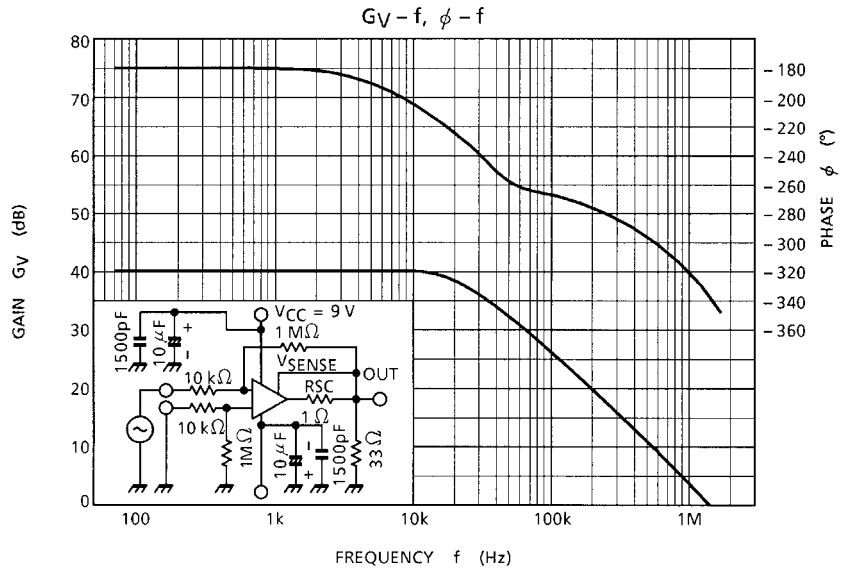
## ELECTRICAL CHARACTERISTICS

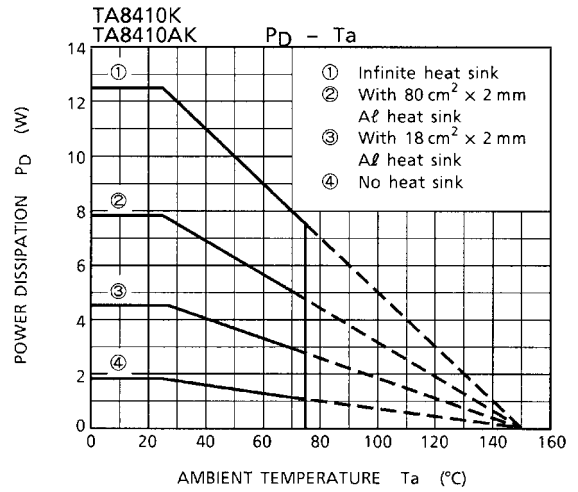
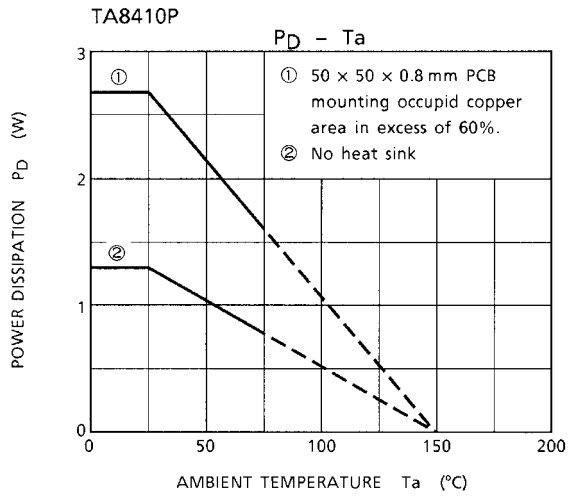
Unless otherwise specified,  $T_a = 25^\circ\text{C}$ , (TA8410P / K,  $V_{CC} = 9\text{ V}$ ,  $V_{EE} = -9\text{ V}$ )  
 (TA8410AK,  $V_{CC} = 15\text{ V}$ ,  $V_{EE} = -15\text{ V}$ )

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT	
Quiescent Current		$I_{CC}$	—	—	—	7	18	mA	
Input Off Set Current		$I_{IO}$	—	—	—	0	100	nA	
Input Bias Current		$I_I$	—	—	—	100	700	nA	
Input Off Set Voltage		$V_{IO}$	—	—	—	0	6	mV	
Output Voltage Swing	TA8410P TA8410K	Upper	$V_{OH-1}$	—	$R_L = \infty$	7.4	7.6	—	V
			$V_{OH-2}$	—	$I_O = 0.6\text{ A}$	5.5	6.2	—	
		Lower	$V_{OL-1}$	—	$R_L = \infty$	7.4	7.7	—	
			$V_{OL-2}$	—	$I_O = 0.6\text{ A}$	5.6	6.2	—	
	TA8410K	Upper	$V_{OH-1}$	—	$R_L = \infty$	13.0	13.6	—	
			$V_{OH-2}$	—	$I_O = 0.6\text{ A}$	11.0	11.6	—	
		Lower	$V_{OL-1}$	—	$R_L = \infty$	13.0	13.6	—	
			$V_{OL-2}$	—	$I_O = 0.6\text{ A}$	11.0	11.7	—	
Open Loop Gain		$G_{VO}$	—	—	—	100	—	dB	
Input Common Mode Voltage Range	TA8410P TA8410K	CMR	—	$G_V = 40\text{ dB}$	$\pm 8.0$	$\pm 8.3$	—	V	
	TA8410AK	CMR	—	$G_V = 40\text{ dB}$	14.0	$\pm 14.3$	—		
Common Mode Rejection Ratio		CMRR	—	—	70	82	—	dB	
Supply Voltage Rejection Ratio		SVRR	—	—	76	90	—	dB	
Unity Gain Cross Frequency		$f_T$	—	Open loop	—	1.0	—	MHz	
Slew Rate		SR	—	$R_L = 33\ \Omega$	—	0.5	—	V / $\mu\text{s}$	
Short Circuit Current		$I_{SC}$	—	$R_{SC} = 1.0\ \Omega$	—	0.6	—	A	
Cross Talk		$C_T$	—	$R_L = 33\ \Omega$ , $V_{OUT} = 1\text{ V}_{p-p}$	—	60	—	dB	

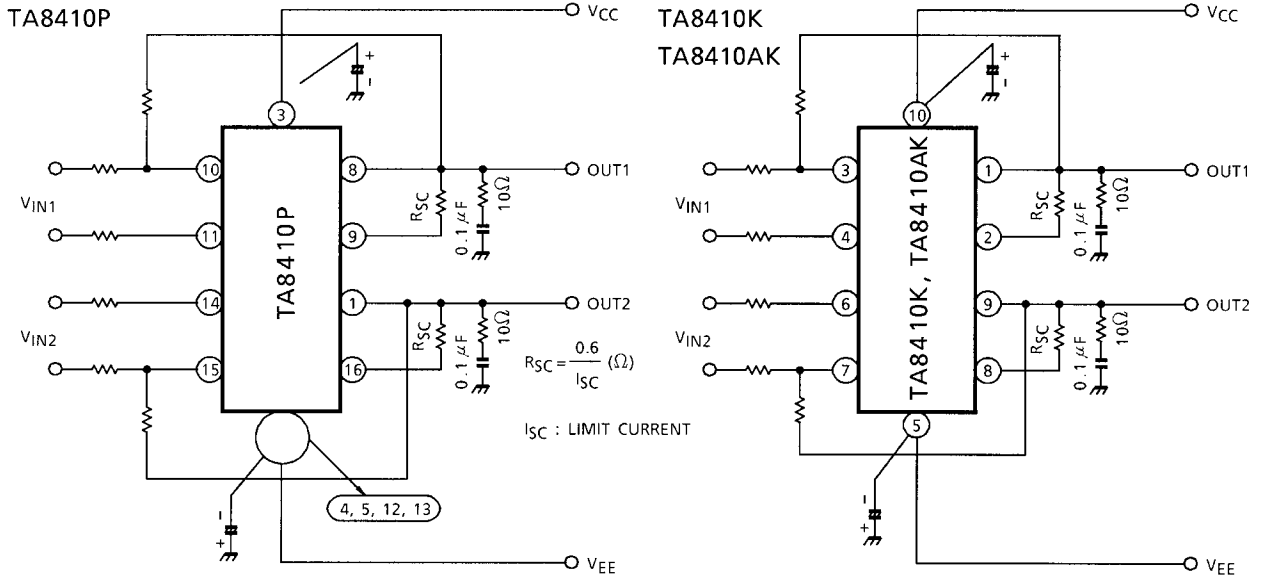
## TEST CIRCUIT



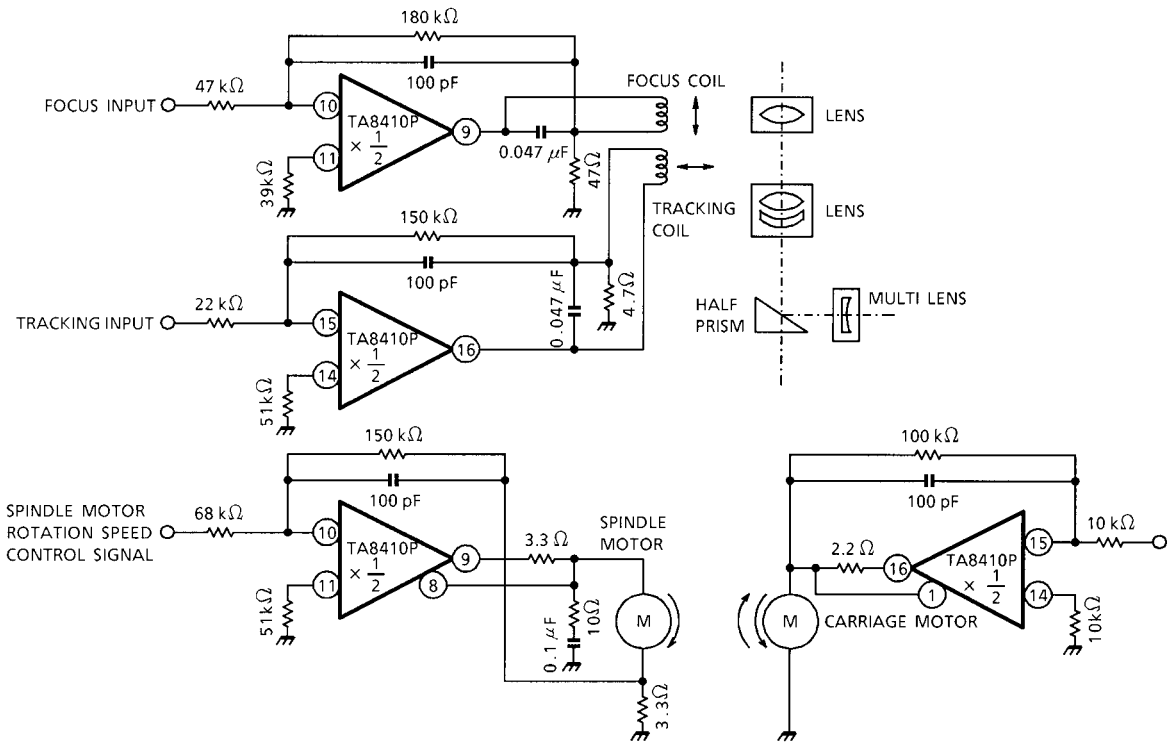




**APPLICATION CIRCUIT 1**



**APPLICATION 2 (Drive circuit for CD player motors)**

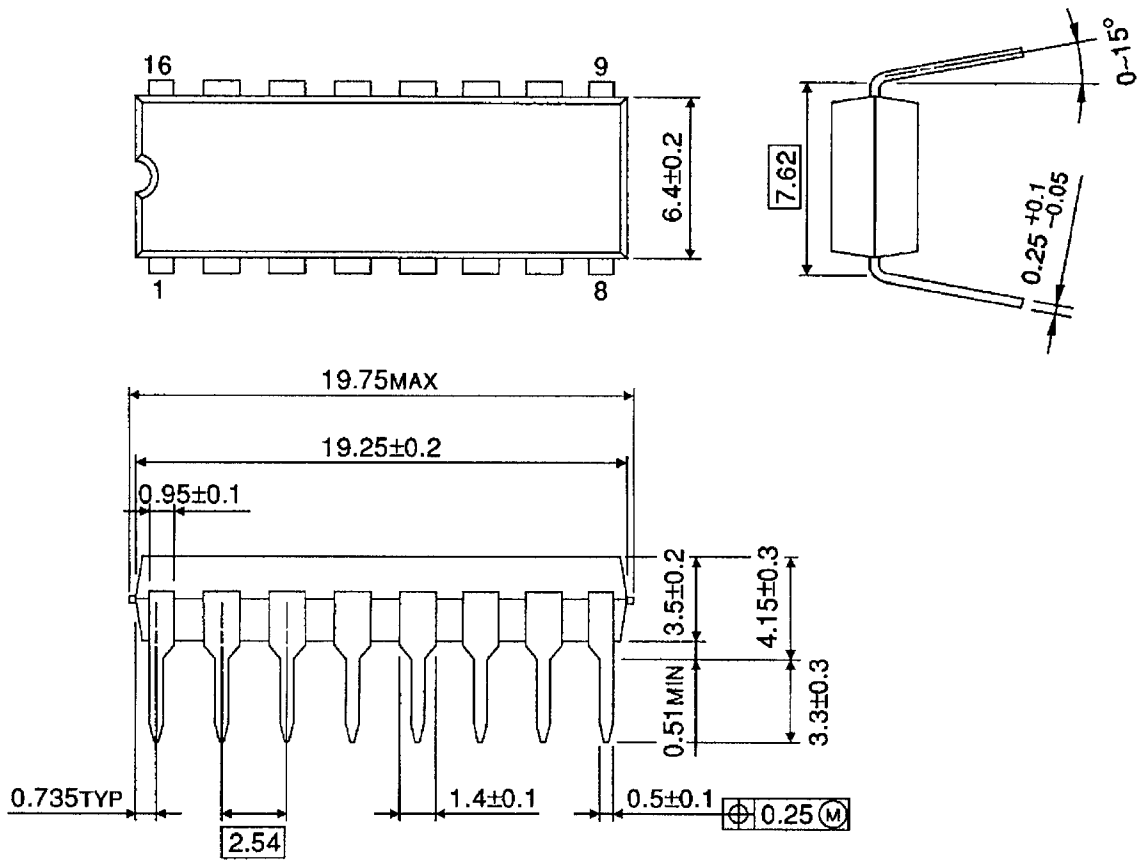


Note: Utmost care is necessary in the design of the output line, V<sub>CC</sub> and V<sub>EE</sub> line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

## PACKAGE DIMENSIONS

DIP16-P-300-2.54A

Unit: mm

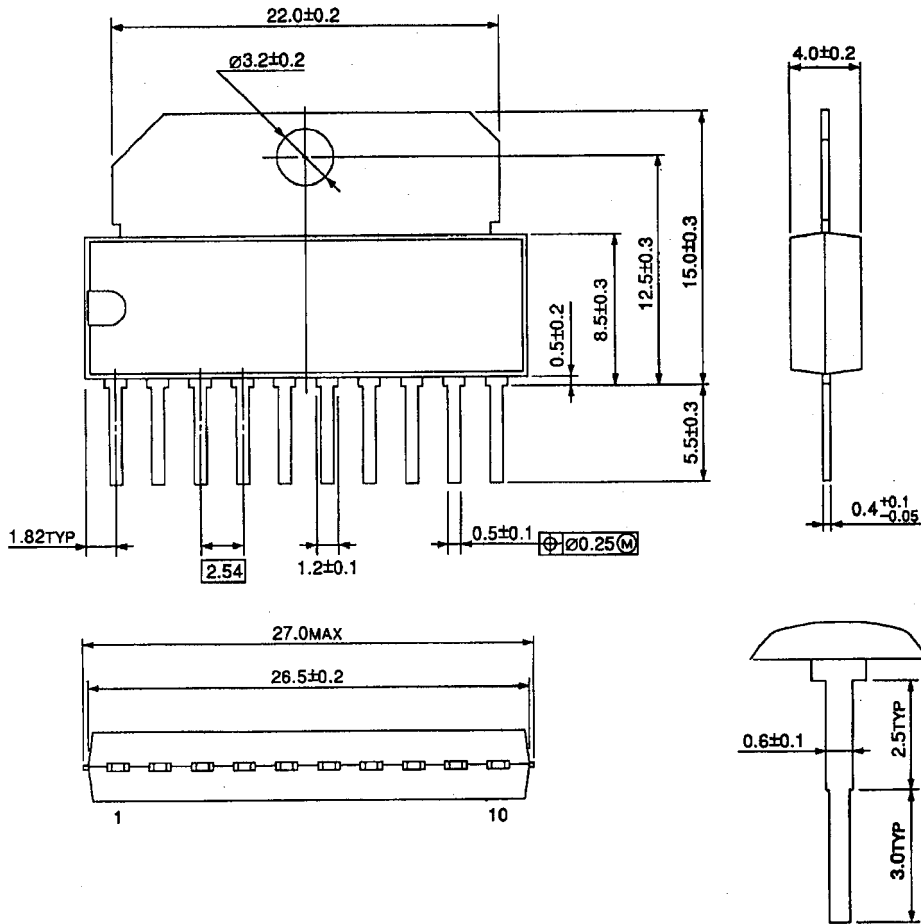


Weight: 1.0 g (Typ.)

## PACKAGE DIMENSIONS

HSIP10-P-2.54

Unit: mm



Weight: 3.0 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.

This datasheet has been download from:

[www.datasheetcatalog.com](http://www.datasheetcatalog.com)

Datasheets for electronics components.