

TOSHIBA CMOS Digital Integrated Circuit Silicon Monolithic

TC74VHCT125AF, TC74VHCT125AFN, TC74VHCT125AFT, TC74VHCT125AFK TC74VHCT126AF, TC74VHCT126AFN, TC74VHCT126AFT, TC74VHCT126AFK

TC74VHCT125AF/AFN/AFT/AFK Quad Bus Buffer
TC74VHCT126AF/AFN/AFT/AFK Quad Bus Buffer

Note: xxxFN (JEDEC SOP) is not available in Japan.

The TC74VHCT125A/126A are high speed CMOS QUAD BUS BUFFERS fabricated with silicon gate C²MOS technology.

They achieve the high speed operation similar to equivalent Bipolar Shottky TTL while maintaining the CMOS low power dissipation.

The TC74VHCT125A requires the 3-state control input \bar{G} to be set high to place the output into the high impedance state, whereas the TC74VHCT126A requires the control input G to be set low to place the output into high impedance.

The input voltage are compatible with TTL output voltage.

This device may be used as a level converter for interfacing 3.3 V to 5 V system.

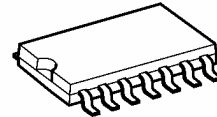
Input protection and output circuit ensure that 0 to 5.5 V can be applied to the input and output ^(Note) pins without regard to the supply voltage. There structure prevents device destruction due to mismatched supply and input/output voltages such as battery back up, hot board insertion, etc.

Note: $V_{CC} = 0 V$

Features

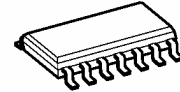
- High speed: $t_{pd} = 3.8 \text{ ns (typ.)}$ at $V_{CC} = 5 V$
- Low power dissipation: $I_{CC} = 4 \mu A \text{ (max)}$ at $T_a = 25^\circ C$
- Compatible with TTL outputs: $V_{IL} = 0.8 V \text{ (max)}$
 $V_{IH} = 2.0 V \text{ (min)}$
- Power down protection is provided on all inputs and outputs.
- Balanced propagation delays: $t_{pLH} \approx t_{pHL}$
- Low noise: $V_{OLP} = 0.8 V \text{ (max)}$
- Pin and function compatible with the 74 series (74AC/HC/F/ALS/LS etc.) 125/126 types.

TC74VHCT125AF, TC74VHCT126AF



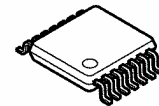
SOP14-P-300-1.27A

TC74VHCT125AFN, TC74VHCT126AFN



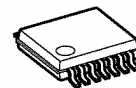
SOL14-P-150-1.27

TC74VHCT125AFT, TC74VHCT126AFT



TSSOP14-P-0044-0.65A

TC74VHCT125AFK, TC74VHCT126AFK

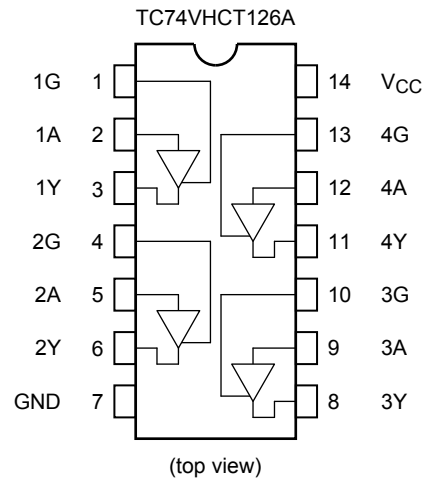
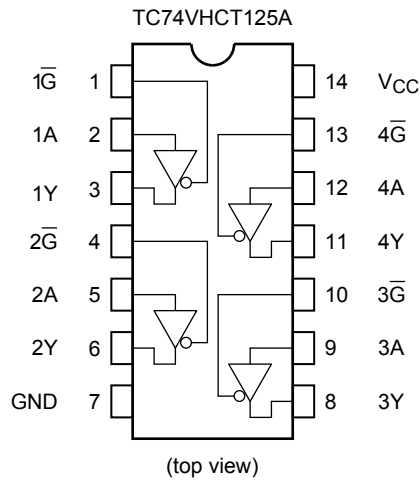


VSSOP14-P-0030-0.50

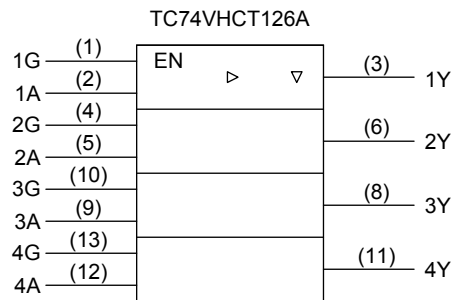
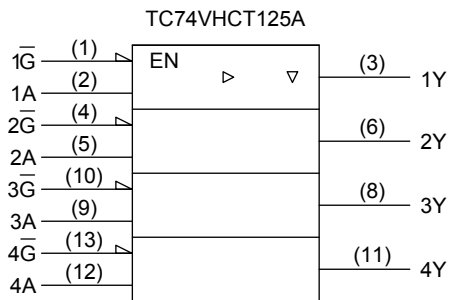
Weight

SOP14-P-300-1.27A	: 0.18 g (typ.)
SOL14-P-150-1.27	: 0.12 g (typ.)
TSSOP14-P-0044-0.65A	: 0.06 g (typ.)
VSSOP14-P-0030-0.50	: 0.02 g (typ.)

Pin Assignment



IEC Logic Symbol



Truth Table

TC74VHCT125A

Inputs		Output
\bar{G}	A	Y
H	X	Z
L	L	L
L	H	H

X: Don't care

Z: High impedance

TC74VHCT126A

Inputs		Output
G	A	Y
L	X	Z
H	L	L
H	H	H

X: Don't care

Z: High impedance

Absolute Maximum Ratings (Note 1)

Characteristics	Symbol	Rating	Unit
Supply voltage range	V_{CC}	-0.5 to 7.0	V
DC input voltage	V_{IN}	-0.5 to 7.0	V
DC output voltage	V_{OUT}	-0.5 to 7.0 (Note 2)	V
		-0.5 to $V_{CC} + 0.5$ (Note 3)	
Input diode current	I_{IK}	-20	mA
Output diode current	I_{OK}	± 20 (Note 4)	mA
DC output current	I_{OUT}	± 25	mA
DC V_{CC} /ground current	I_{CC}	± 50	mA
Power dissipation	P_D	180	mW
Storage temperature	T_{stg}	-65 to 150	$^{\circ}C$

Note 1: Exceeding any of the absolute maximum ratings, even briefly, lead to deterioration in IC performance or even destruction.

Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 2: Output in off-state

Note 3: High or low state. I_{OUT} absolute maximum rating must be observed.

Note 4: $V_{OUT} < GND$, $V_{OUT} > V_{CC}$

Operating Ranges (Note 1)

Characteristics	Symbol	Rating	Unit
Supply voltage	V_{CC}	4.5 to 5.5	V
Input voltage	V_{IN}	0 to 5.5	V
Output voltage	V_{OUT}	0 to 5.5 (Note 2)	V
		0 to V_{CC} (Note 3)	
Operating temperature	T_{opr}	-40 to 85	$^{\circ}C$
Input rise and fall time	dt/dv	0 to 20	ns/V

Note 1: The operating ranges must be maintained to ensure the normal operation of the device. Unused inputs must be tied to either V_{CC} or GND .

Note 2: Output in off-state

Note 3: High or low state

Electrical Characteristics

DC Characteristics

Characteristics	Symbol	Test Condition	V _{CC} (V)	Ta = 25°C			Ta = -40 to 85°C		Unit	
				Min	Typ.	Max	Min	Max		
High-level input voltage	V _{IH}	—	4.5 to 5.5	2.0	—	—	2.0	—	V	
Low-level input voltage	V _{IL}	—	4.5 to 5.5	—	—	0.8	—	0.8	V	
High-level output voltage	V _{OH}	V _{IN} = V _{IH} or V _{IL}	I _{OH} = -50 μA	4.5	4.40	4.50	—	4.40	—	V
			I _{OH} = -8 mA	4.5	3.94	—	—	3.80	—	
Low-level output voltage	V _{OL}	V _{IN} = V _{IH} or V _{IL}	I _{OL} = 50 μA	4.5	—	0.0	0.1	—	0.1	V
			I _{OL} = 8 mA	4.5	—	—	0.36	—	0.44	
Input leakage current	I _{IN}	V _{IN} = 5.5 V or GND	0 to 5.5	—	—	±0.1	—	±1.0	μA	
3-state output off-state current	I _{OZ}	V _{IN} = V _{IH} or V _{IL} V _{OUT} = V _{CC} or GND	5.5	—	—	±0.25	—	±2.50	μA	
Quiescent supply current	I _{CC}	V _{IN} = V _{CC} or GND	5.5	—	—	4.0	—	40.0	μA	
	I _{CC(T)}	Per input: V _{IN} = 3.4 V Other input: V _{CC} or GND	5.5	—	—	1.35	—	1.50	mA	
Output leakage current	I _{OPD}	V _{OUT} = 5.5 V	0	—	—	0.5	—	5.0	μA	

AC Characteristics (input: t_r = t_f = 3 ns)

Characteristics	Symbol	Test Condition	V _{CC} (V)	C _L (pF)	Ta = 25°C			Ta = -40 to 85°C		Unit
					Min	Typ.	Max	Min	Max	
Propagation delay time	t _{pLH}	—	5.0 ± 0.5	15	—	3.8	5.5	1.0	6.5	ns
	t _{pHL}			50	—	5.3	7.5	1.0	8.5	
Output enable time	t _{pZL}	R _L = 1 kΩ	5.0 ± 0.5	15	—	3.6	5.1	1.0	6.0	ns
	t _{pZH}			50	—	5.1	7.1	1.0	8.0	
Output disable time	t _{pLZ}	R _L = 1 kΩ	5.0 ± 0.5	50	—	6.1	8.8	1.0	10.0	ns
	t _{pHZ}									
Output to output skew	t _{osLH}	(Note 1)	5.0 ± 0.5	50	—	—	1.0	—	1.0	ns
	t _{osHL}									
Input capacitance	C _{IN}	—	—	—	—	4	10	—	10	pF
Output capacitance	C _{OUT}	—	—	—	—	6	—	—	—	pF
Power dissipation capacitance	C _{PD} (Note 2)	TC74VHCT125A	—	—	—	14	—	—	—	pF
		TC74VHCT126A	—	—	—	15	—	—	—	

Note 1: Parameter guaranteed by design.

$$t_{osLH} = |t_{pLHm} - t_{pLHn}|, t_{osHL} = |t_{pHLm} - t_{pHLn}|$$

Note 2: C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation:

$$I_{CC(opr)} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}/4 \text{ (per gate)}$$

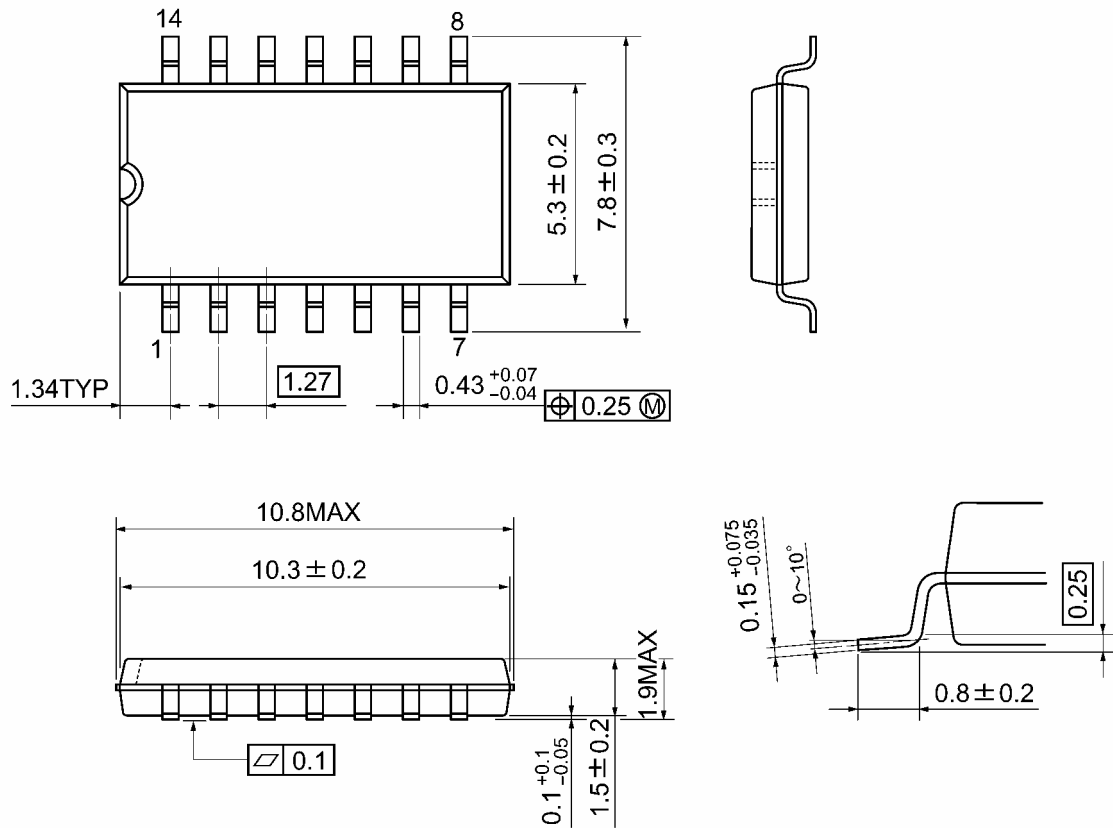
Noise Characteristics (input: $t_r = t_f = 3 \text{ ns}$)

Characteristics	Symbol	Test Condition	V _{CC} (V)	Ta = 25°C		Unit
				Typ.	Limit	
Quiet output maximum dynamic V _{OL}	V _{OLP}	C _L = 50 pF	5.0	0.5	0.8	V
Quiet output minimum dynamic V _{OL}	V _{OLV}	C _L = 50 pF	5.0	-0.5	-0.8	V
Minimum high level dynamic input voltage	V _{IHD}	C _L = 50 pF	5.0	—	2.0	V
Maximum low level dynamic input voltage	V _{ILD}	C _L = 50 pF	5.0	—	0.8	V

Package Dimensions

SOP14-P-300-1.27A

Unit: mm

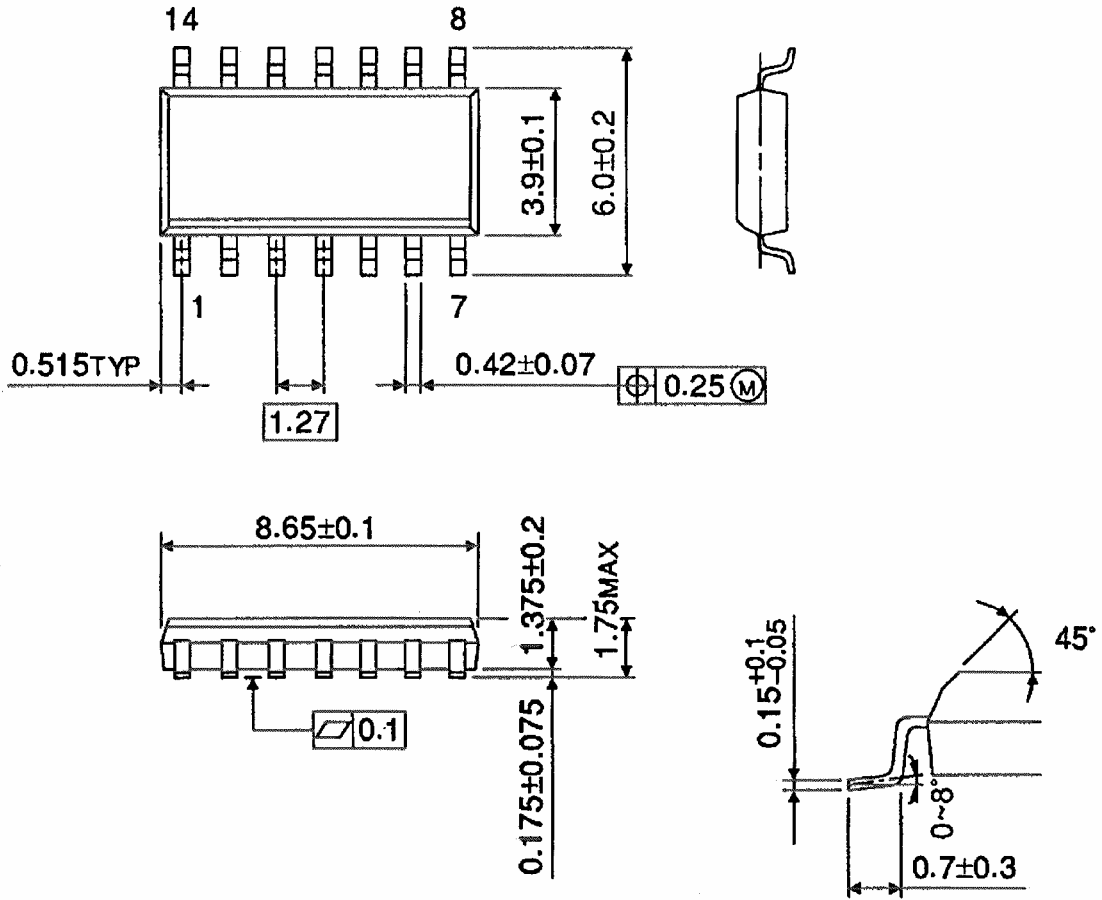


Weight: 0.18 g (typ.)

Package Dimensions (Note)

SOL14-P-150-1.27

Unit : mm



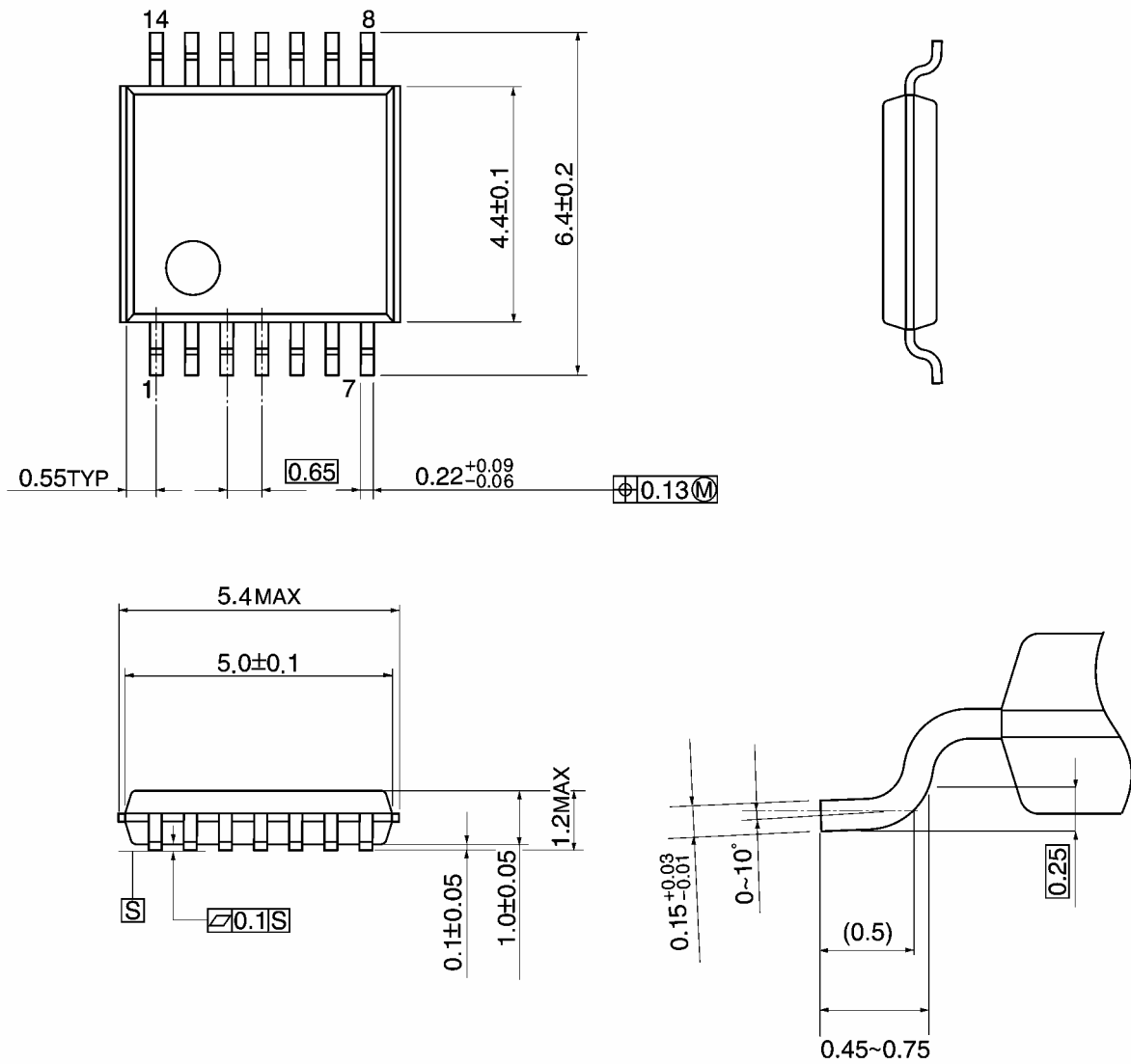
Note: This package is not available in Japan.

Weight: 0.12 g (typ.)

Package Dimensions

TSSOP14-P-0044-0.65A

Unit: mm

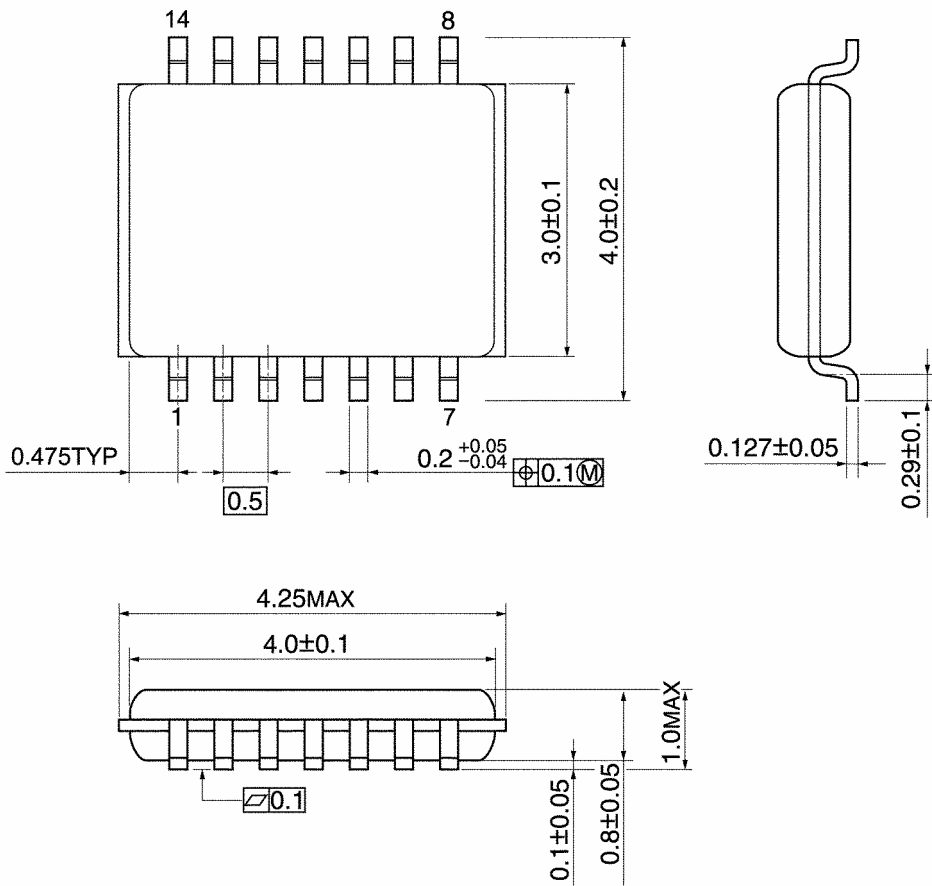


Weight: 0.06 g (typ.)

Package Dimensions

VSSOP14-P-0030-0.50

Unit: mm



Weight: 0.02 g (typ.)

RESTRICTIONS ON PRODUCT USE

20070701-EN GENERAL

- The information contained herein is subject to change without notice.
- 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 shall not be used or embedded to any downstream products of which manufacture, use and/or sale are prohibited under any applicable laws and regulations.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patents or other rights of TOSHIBA or the third parties.
- Please contact your sales representative for product-by-product details in this document regarding RoHS compatibility. Please use these products in this document in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances. Toshiba assumes no liability for damage or losses occurring as a result of noncompliance with applicable laws and regulations.



Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331