

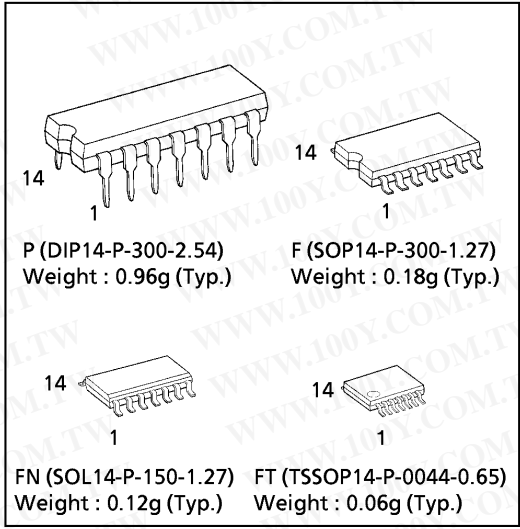
TC4066BP, TC4066BF, TC4066BFN, TC4066BFT

(Note) The JEDEC SOP (FN) is not available in Japan.

TC4066B QUAD BILATERAL SWITCH

TC4066B contains four independent circuits of bidirectional switches. When control input CONT is set to "H" level, the impedance between input and output of the switch becomes low and when it is set to "L" level, the impedance becomes high. This can be applied for switching of analog signals and digital signals.

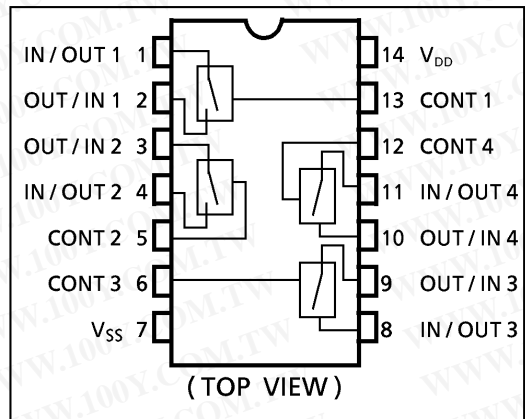
- ON-resistance, Ron
 250Ω (TYP.) $V_{DD} - V_{SS} = 5V$
 110Ω (TYP.) $V_{DD} - V_{SS} = 10V$
 70Ω (TYP.) $V_{DD} - V_{SS} = 15V$
- OFF-resistance, Roff
 R_{off} (TYP.) $> 10^9\Omega$



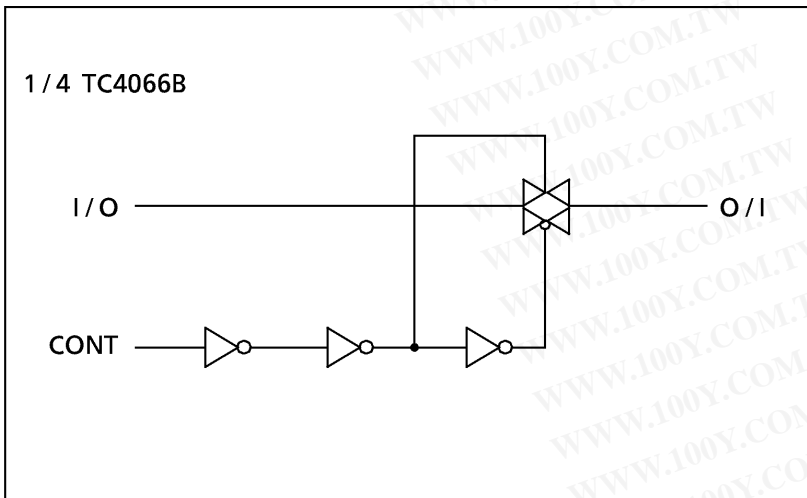
MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Supply Voltage	V_{DD}	$V_{SS} - 0.5 \sim V_{SS} + 20$	V
Control Input Voltage	V_{CIN}	$V_{SS} - 0.5 \sim V_{DD} + 0.5$	V
Switch I/O Voltage	$V_{I/O}$	$V_{SS} - 0.5 \sim V_{DD} + 0.5$	V
Potential difference across I/O during ON	$I_{I/O}$	± 0.5	V
Control Input Current	I_{CIN}	± 10	mA
Power Dissipation	P_D	300 (DIP) / 180 (SOIC)	mW
Operating Temperature Range	T_{opr}	$-40 \sim 85$	$^{\circ}C$
Storage Temperature Range	T_{stg}	$-65 \sim 150$	$^{\circ}C$

PIN ASSIGNMENT



LOGIC DIAGRAM



TRUTH TABLE

CONTROL	Impedance Between IN / OUT - OUT / IN *
H	$0.5 \sim 5 \times 10^2\Omega$
L	$> 10^9\Omega$

* See Static Electrical Characteristics

RECOMMENDED OPERATING CONDITIONS ($V_{SS} = 0V$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
DC Supply Voltage	V_{DD}		3	—	18	V
Input Voltage	V_{DD} / V_{OUT}		0	—	V_{DD}	

STATIC ELECTRICAL CHARACTERISTICS (In case not specifically appointed, $V_{SS} = 0V$)

CHARACTERISTIC	SYM-BOL	TEST CONDITION	V_{DD} (V)	-40°C		25°C			85°C		UNIT	
				MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.		
Control Input High Voltage	V_{IH}	$ I_{IS} < 10\mu A$	5	3.5	—	3.5	2.75	—	3.5	—	V	
			10	7.0	—	7.0	5.50	—	7.0	—		
			15	11.0	—	11.0	8.25	—	11.0	—		
Control Input Low Voltage	V_{IL}	$ I_{IS} < 10\mu A$	5	—	1.5	—	2.25	1.5	—	1.5	V	
			10	—	3.0	—	4.50	3.0	—	3.0		
			15	—	4.0	—	6.75	4.0	—	4.0		
On-State Resistance	R_{ON}	$0 \leq V_{IS} \leq V_{DD}$ $R_L = 10k\Omega$	5	—	800	—	290	950	—	1200	Ω	
			10	—	210	—	120	250	—	300		
			15	—	140	—	85	160	—	200		
Δ On-State Resistance (Between Any 2 Switches)	$R_{ON\Delta}$		5	—	—	—	10	—	—	—	Ω	
			10	—	—	—	6	—	—	—		
			15	—	—	—	4	—	—	—		
Input / Output Leakage Current	I_{OFF}	$V_{IN} = 18V, V_{OUT} = 0V$ $V_{IN} = 0V, V_{OUT} = 18V$	18	—	± 100	—	± 0.1	± 100	—	± 1000	nA	
			18	—	± 100	—	± 0.1	± 100	—	± 1000		
Quiescent Supply Current	I_{DD}	$V_{IN} = V_{SS}, V_{DD} *$	5	—	0.25	—	0.001	0.25	—	7.5	μA	
			10	—	0.50	—	0.001	0.50	—	15.0		
			15	—	1.00	—	0.002	1.00	—	30.0		
Input Current	"H" Level	I_{IH}	$V_{IH} = 18V$	18	—	0.1	—	10^{-5}	0.1	—	1.0	μA
	"L" Level	I_{IL}	$V_{IL} = 0V$	18	—	-0.1	—	-10^{-5}	-0.1	—	-1.0	

* All valid input combinations.

勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

DYNAMIC ELECTRICAL CHARACTERISTICS (Ta = 25°C, Vss = 0V, CL = 50pF)

CHARACTERISTIC	SYMBOL	TEST CONDITION	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
			V _{SS} (V)	V _{DD} (V)				
Phase Difference between Input to Output	φ I-O	CL = 50pF	0	5	—	15	40	
			0	10	—	8	20	
			0	15	—	5	15	
Propagation Delay Time (CONTROL - OUT)	t _{pZL} t _{pZH}	RL = 1kΩ CL = 50pF	0	5	—	55	120	ns
			0	10	—	25	40	
			0	15	—	20	30	
Propagation Delay Time (CONTROL - OUT)	t _{pLZ} t _{pHZ}	RL = 1kΩ CL = 50pF	0	5	—	45	80	
			0	10	—	30	70	
			0	15	—	25	60	
Max. Control Input Repetition Rate	f _{MAX} (C)	RL = 1kΩ CL = 50pF	0	5	—	10	—	MHz
			0	10	—	12	—	
			0	15	—	12	—	
-3dB Cutoff Frequency	f _{MAX} (I-O)	RL = 1kΩ CL = 15pF (* 1)	-5	5	—	30	—	
Total Harmonic Distortion	—	RL = 10kΩ f = 1kHz (* 2)	-5	5	—	0.03	—	%
-50dB Feed through Frequency	—	RL = 1kΩ (* 3)	-5	5	—	600	—	kHz
-50dB Crosstalk Frequency	—	RL = 1kΩ (* 4)	-5	5	—	1	—	MHz
Crosstalk (CONTROL - OUT)	—	R _{IN} = 1kΩ R _{OUT} = 10kΩ CL = 15pF	0	5	—	200	—	mV
			0	10	—	400	—	
			0	15	—	600	—	
Input Capacitance	C _{IN}	Control Input			—	5	7.5	pF
		Switch I/O			—	10	—	
Feed through Capacitance	C _{IN-OUT}				—	0.5	—	

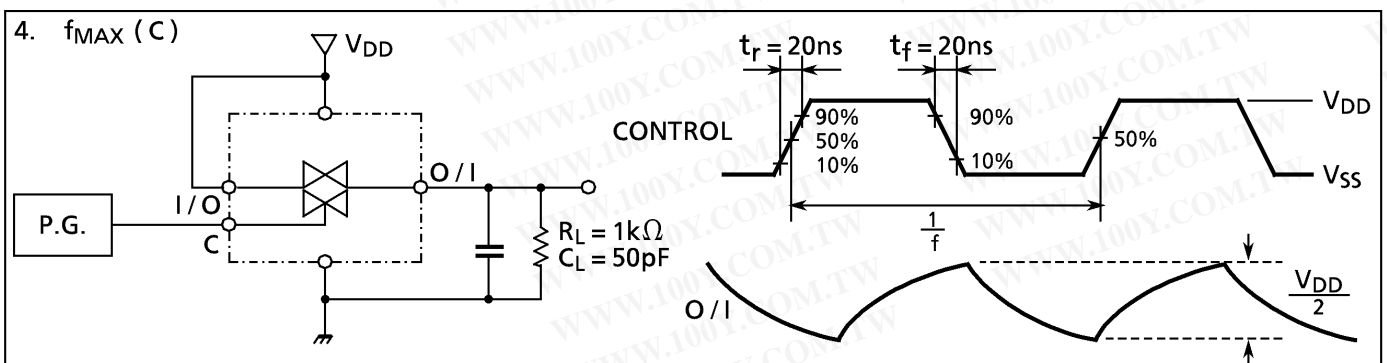
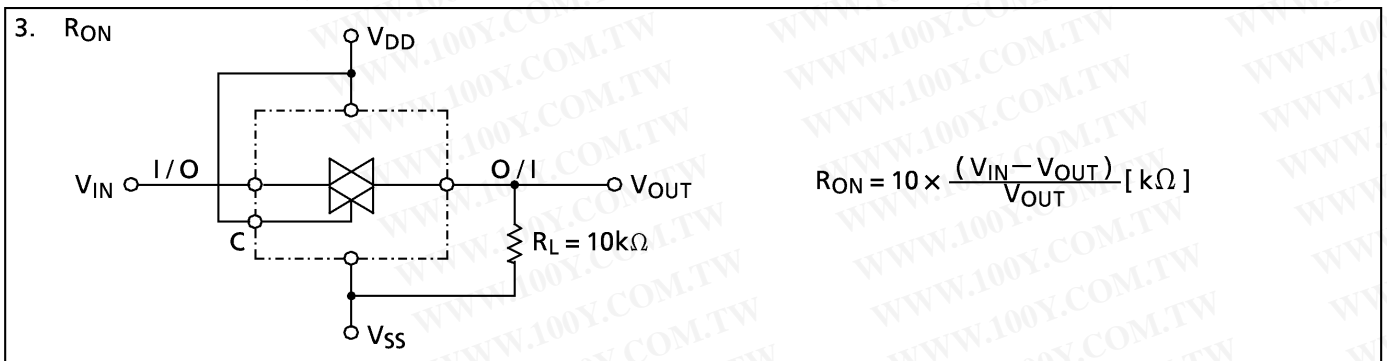
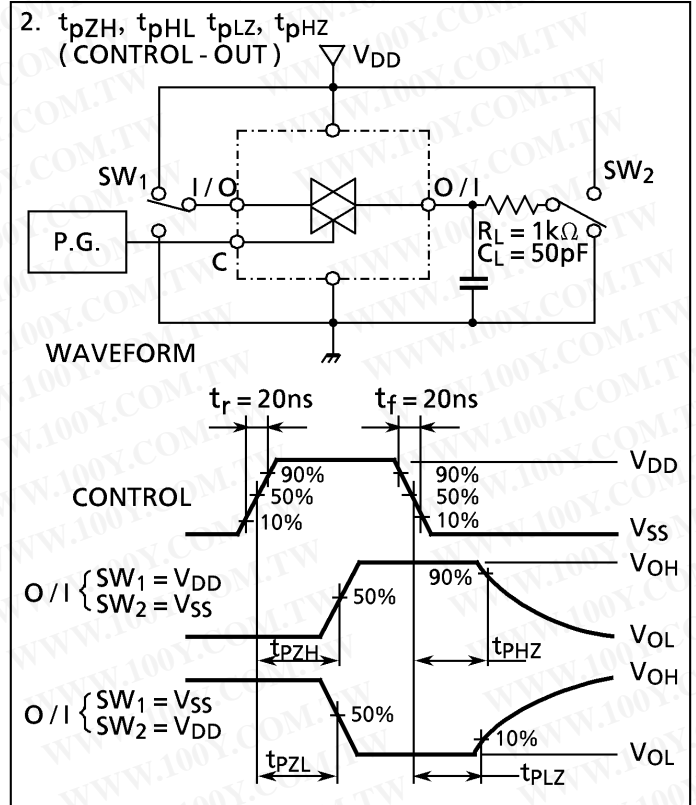
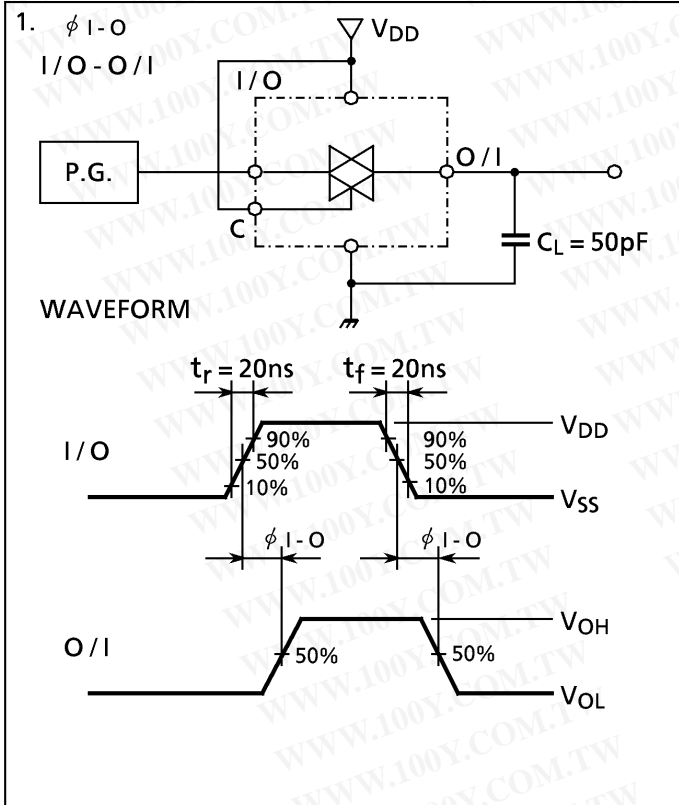
* 1 Sine wave of ±2.5p.p shall be used for V_{is} and the frequency $20 \log_{10} \frac{V_{os}}{V_{is}} = -3\text{dB}$ Shall be f_{MAX}.

* 2 V_{is} shall be sine wave of ±2.5Vp.p

* 3 Sine wave of ±2.5Vp.p shall be used for V_{is} and the frequency of $20 \log_{10} \frac{V_{OUT}}{V_{is}} = -50\text{dB}$ shall be feed-through.

* 4 Sine wave of ±2.5Vp.p shall be used for V_{is} and the frequency of $20 \log_{10} \frac{V_{OUT}}{V_{is}} = -50\text{dB}$ shall be crosstalk.

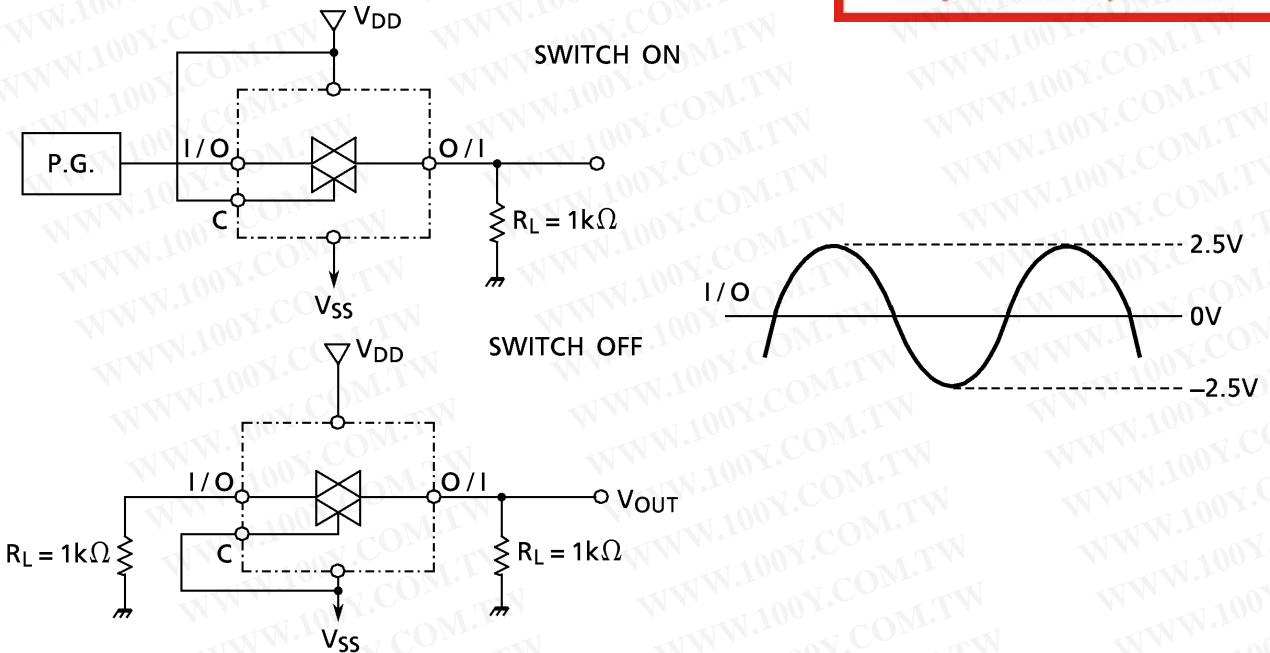
CIRCUIT FOR MEASUREMENT OF ELECTRICAL CHARACTERISTICS



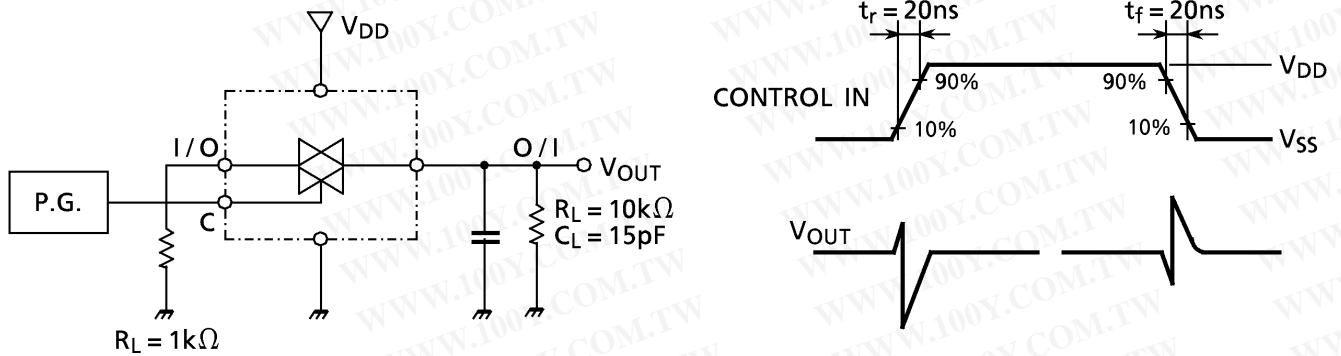
勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

CIRCUIT FOR MEASUREMENT OF ELECTRICAL CHARACTERISTICS

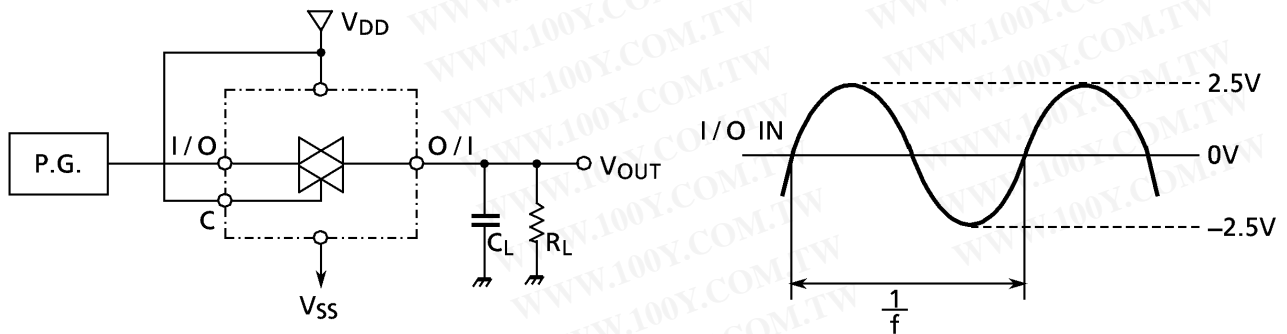
5. CROSSTALK BETWEEN ANY TWO SWITCHES



6. CROSSTALK, CONTROL TO INPUT

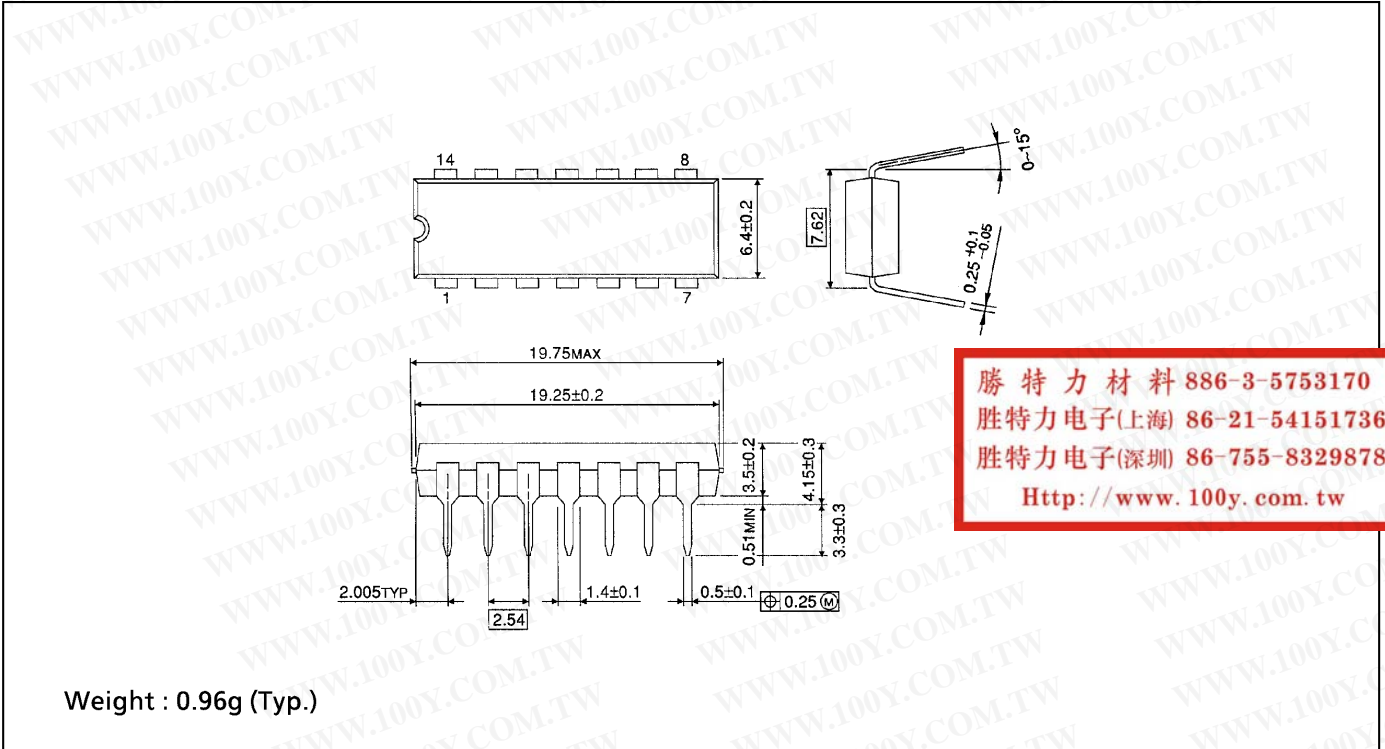


7. TOTAL HARMONIC DISTORTION, f_{MAX} (I-O), FEEDTHROUGH



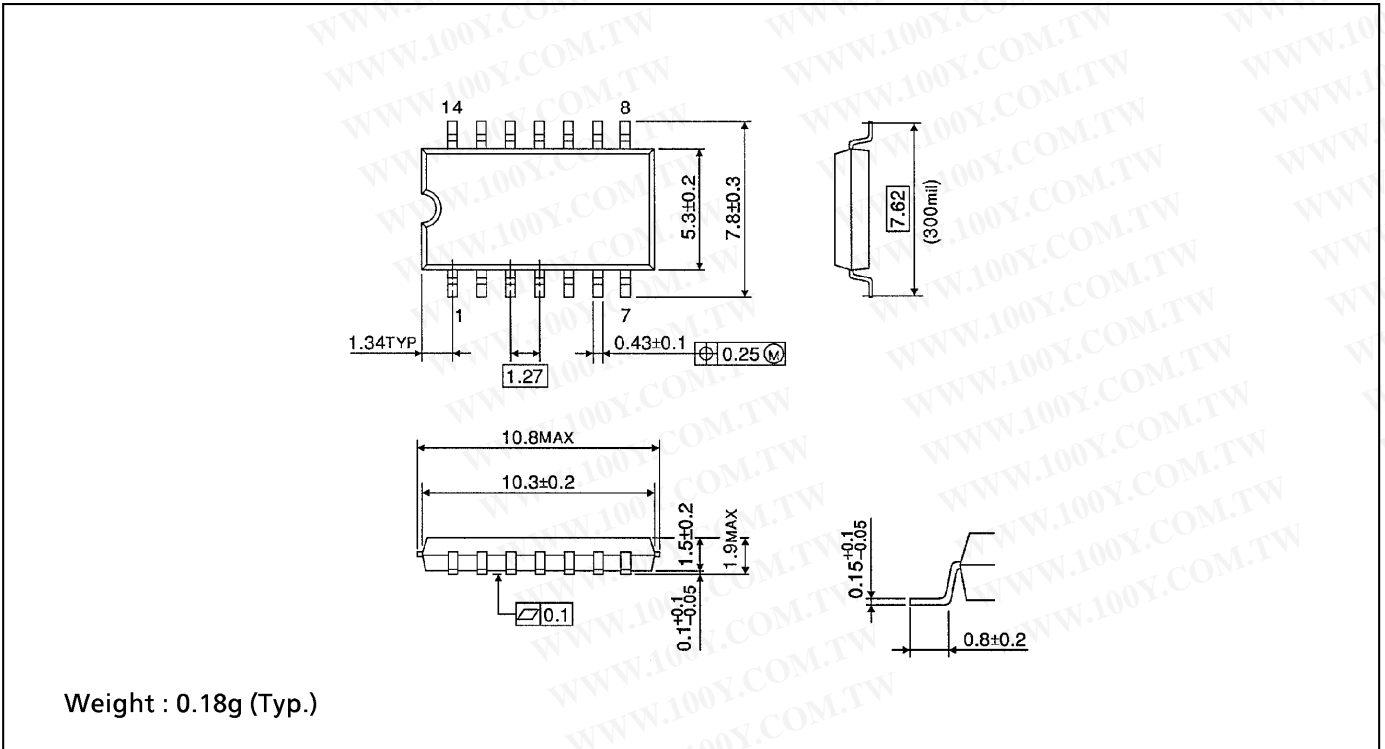
DIP 14PIN PACKAGE DIMENSIONS (DIP14-P-300-2.54)

Unit in mm



SOP 14PIN (200mil BODY) PACKAGE DIMENSIONS (SOP14-P-300-1.27)

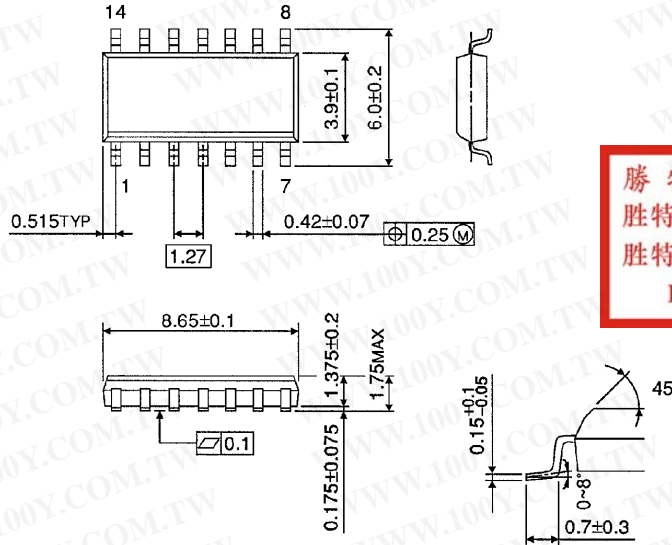
Unit in mm



SOP 14PIN (150mil BODY) PACKAGE DIMENSIONS (SOL14-P-150 -1.27)

Unit in mm

(Note) This package is not available in Japan.

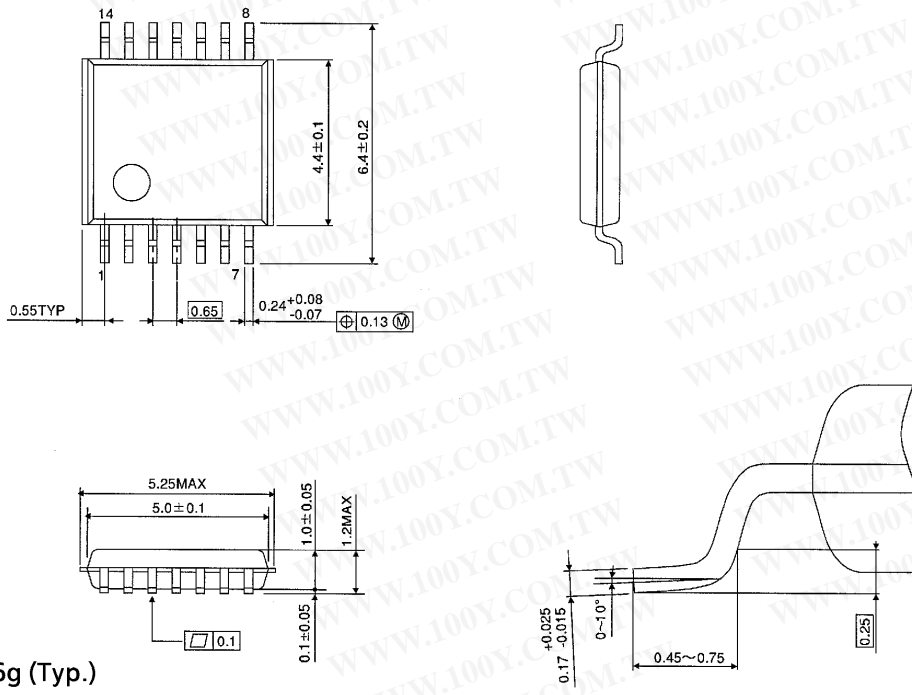


勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

Weight : 0.12g (Typ.)

TSSOP 14PIN (170mil BODY) PACKAGE DIMENSIONS (TSSOP14-P-0044-0.65)

Unit in mm



Weight : 0.06g (Typ.)

勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-54151736
勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

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.