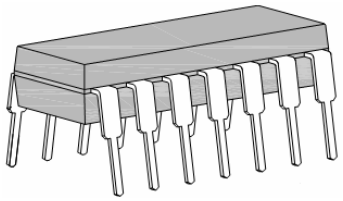
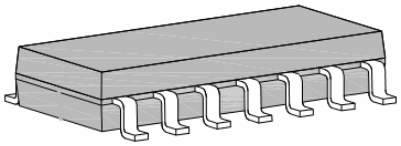
Low Power Low Offset Voltage Quad Comparator

General Description

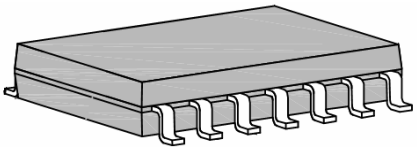
- The LM339/339A series consist of four independent precision voltage comparators with a typical offset voltage of 2.0mV and high gain.
- The LM339/339A series are specifically designed to operate from a single power supply over wide range of voltages. Operation from split power supply is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage.
- The LM339/339A series are compatible with industry standard 339.
- The LM339/339A series are available in standard packages of DIP-14, SOP-14N and TSSOP-14.



DIP-14



SOP-14N



TSSOP-14

Features

- Wide supply voltage range -Single supply: 2.0V to 36V
  -Dual supplies: ±1.0V to ±18V
- Low supply current drain: 0.9mA
- Low input bias current: 25nA (typical)
- Low input offset current: ±5.0nA (typical)
- Low input offset voltage: 2.0mV (typical)
- Input common mode voltage range includes ground
- Differential input voltage equals to the power supply voltage
- Low output saturation voltage: 200mV at 4mA
- Open collector output
- RoHS compliant and halogen free

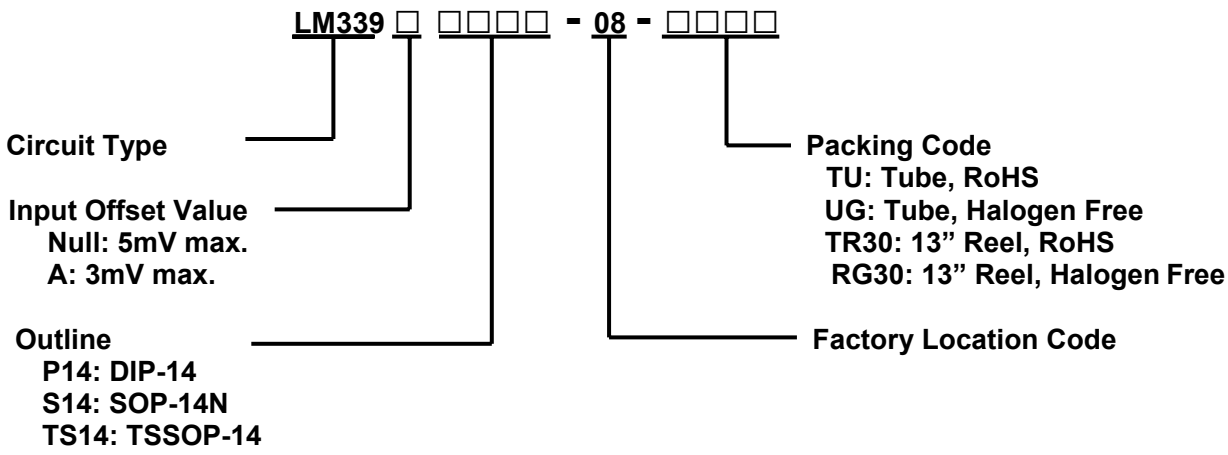
RoHS Compliant

HALOGEN FREE

Applications

- Battery Charger
- Cordless Telephone
- Switching Power Supply
- DC-DC Module
- PC Motherboard
- Communication Equipment

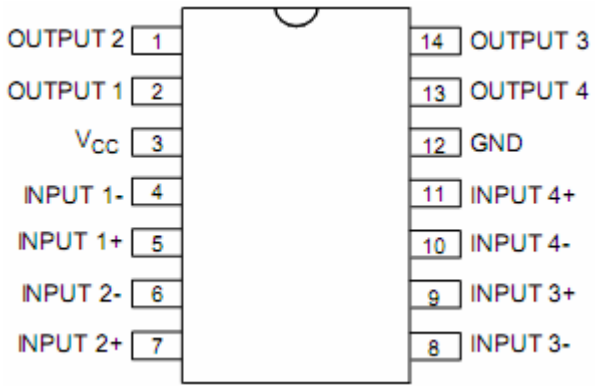
Ordering Information



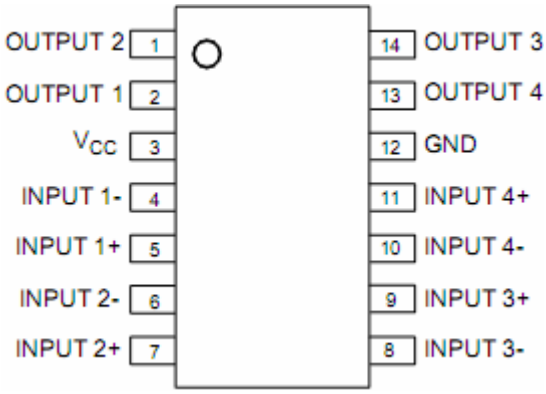
Marking Information

Outline	Temperature Range	PN	Marking Code	Packing Type
SOP-14N	-40 to 85°C	LM339S14-08-TU	AS339M-E1	Tube
		LM339S14-08-UG	AS339M-G1	
		LM339AS14-08-TU	AS339AM-E1	
		LM339AS14-08-UG	AS339AM-G1	
		LM339S14-08-TR30	AS339M-E1	Tape & Reel
		LM339S14-08-RG30	AS339M-G1	
		LM339AS14-08- TR30	AS339AM-E1	
		LM339AS14-08- RG30	AS339AM-G1	
TSSOP-14	-40 to 85°C	LM339TS14-08-TU	EGS339	Tube
		LM339TS14-08-UG	GGS339	
		LM339TS14-08-TR30	EGS339	Tape & Reel
		LM339TS14-08-RG30	GGS339	
DIP-14	-40 to 85°C	LM339P14-08-TU	AS339P-E1	Tube
		LM339P14-08-UG	AS339P-G1	

Pin Configuration

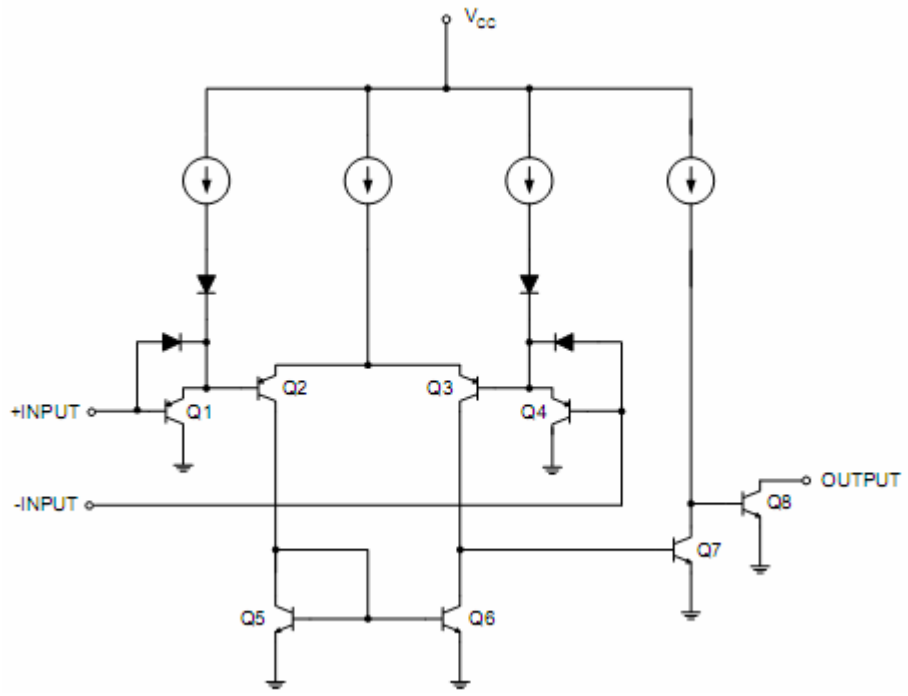


DIP-14



SOP-14N & TSSOP-14

Block Diagram (Each Comparator)



Absolute Maximum Ratings (Note 1)

Symbol	Description		Ratings	Unit
V_{CC}	Supply Voltage		40	V
V_{ID}	Differential Input Voltage		40	V
V_{IN}	Input Voltage		-0.3 to 40	V
I_{IN}	Input Current (V_{IN}<-0.3V) (Note 2)		50	mA
	Output Short-Circuit to Ground		Continuous	
P_D	Power Dissipation (T_A=25°C)	DIP-14	1050	mW
		SOP-14N	890	
		TSSOP-14	790	
T_J	Operating Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-65 ~ +150	°C
T_{LEAD}	Lead Temperature (Soldering, 10 sec.)		260	°C

Note: 1. Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “Recommended Operating Conditions” is not implied. Exposure to “Absolute Maximum Ratings” for extended period may affect device
reliability.

2. This input current will only exist when the voltage at any of the input leads is driven negative. It is due to the collector-base junction of the input PNP transistors becoming forward biased and thereby acting as input diode clamps. In addition to this diode action, there is also lateral NPN parasitic transistor action on the IC chip. This transistor action can cause the output voltages of the comparators to go to the V+ voltage level (or to ground for a large overdrive) for the time duration that an input is driven negative. This is not destructive and normal output states will re-establish when the input voltage, which was negative, again returns to a value greater than -0.3 V_{DC} (at 25°C).

Recommended Operating Conditions

Symbol	Description	Min.	Max.	Unit
V_{CC}	Supply Voltage	2	36	V
T_A	Operating Temperature Range	-40	85	°C

Electrical Characteristics

T_A=25°C, V_{CC}=5V, GND=0V, Unless otherwise specified -40°C≤T_A≤85°C(Note 3)

Description		Min.	Typ.	Max.	Unit	Conditions	
Input Offset Voltage	LM339	-	2	5	mV		V_O=1.4V, R_S=0Ω, V_{CC}=5V to 30V
		-	-	7		-40°C≤T_A≤85°C	
	LM339A	-	2	3			
		-	-	5		-40°C≤T_A≤85°C	
Input Bias Current		-	25	250	nA		I_{IN}+ or I_{IN}- with output in linear range, V_{CM}=0V
		-	-	400		-40°C≤T_A≤85°C	
Input Offset Current		-	5	50	nA		V_{CM}=0V
		-	-	200		-40°C≤T_A≤85°C	
Input Common Mode Voltage Range (Note 4)		0	-	V_{CC}-1.5	V	V_{CC}=30V	
Supply Current		-	0.9	2	mA		V_{CC}=5V, R_L=∞
		-	-	3		-40°C≤T_A≤85°C	
		-	1.2	2.5			V_{CC}=30V R_L=∞
		-	-	3.5		-40°C≤T_A≤85°C	
Voltage Gain		50	200	-	V/mV	V_{CC}=15V, R_L≥15KΩ, V_O=1V to 11V	
Large Signal Response Time		-	200	-	ns	V_{IN}=TTL, Logic Swing, V_{REF}=1.4V, V_{RL}=5V, R_L=5.1K	
Response Time		-	1.3	-	μs	V_{RL}=5V, R_L=5.1K	
Output Sink Current		6	16		mA	V_{IN}+=0V, V_{IN}-=1V, V_O=1.5V	
Output Leakage Current		-	0.1	-	nA	V_{IN}+=1V, V_{IN}-=0V, V_O=5V	
		-	-	1	μA	V_{IN}+=1V, V_{IN}-=0V, V_O=30V, -40°C≤T_A≤85°C	
Saturation Voltage		-	200	400	mV		V_{IN}+=0V,V_{IN}-=-1V, I_{SINK}≤4mA
		-	-	500		-40°C≤T_A≤85°C	

Note: 3. Limits over the full temperature are guaranteed by design, but not tested in production.

4. The input common-mode voltage of either input signal voltage should not be allowed to go negatively by more than 0.3V (at 25°C). The upper end of the common-mode voltage range is V_{CC}-1.5V (at 25°C), but either or both inputs can go to +36V without damages, independent of the magnitude of the V_{CC}.

Typical Characteristics Curves

Fig.1- Supply Voltage vs. Supply Current

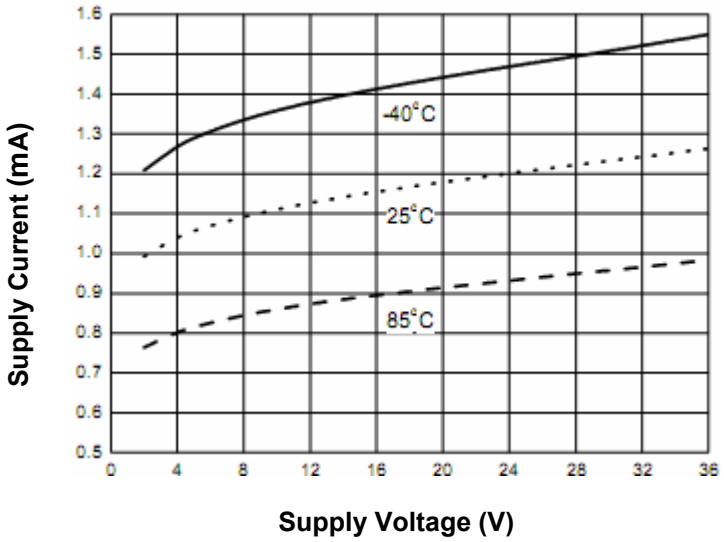


Fig.2- Supply Voltage vs. Input Bias Current

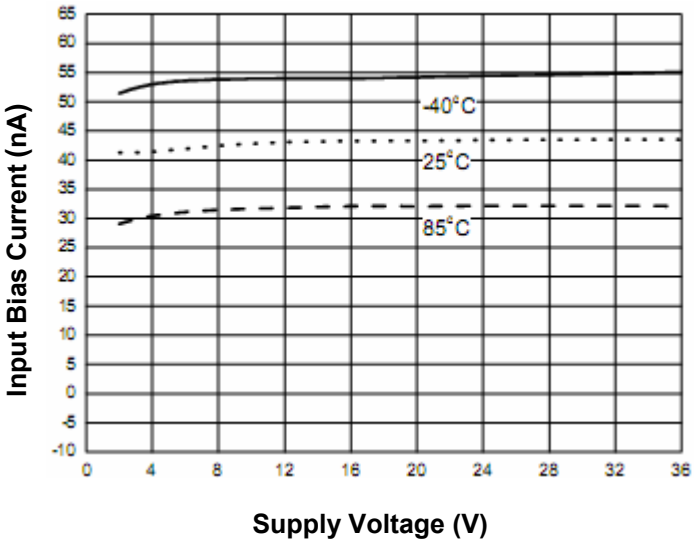


Fig.3- Output Sink Current vs. Saturation Voltage

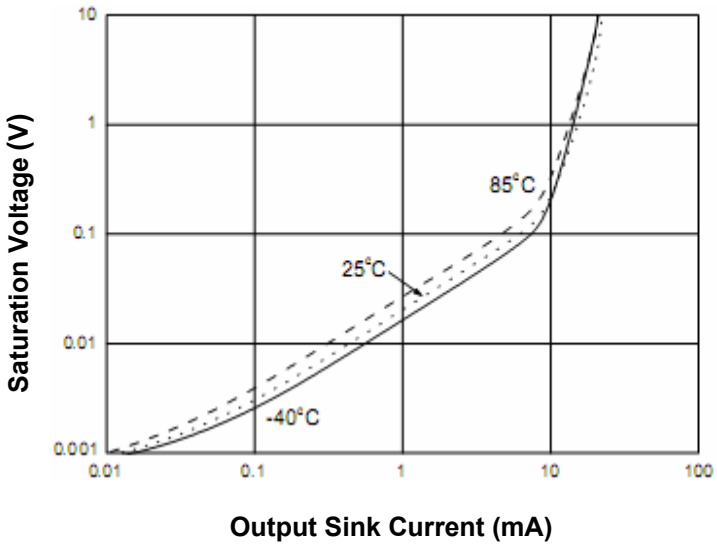


Fig.4- Response Time for 5mV Input Overdrive - Negative Transition

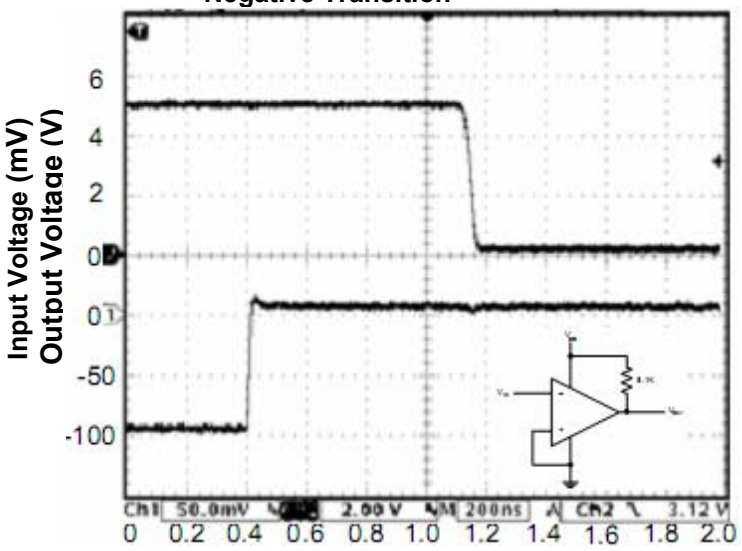
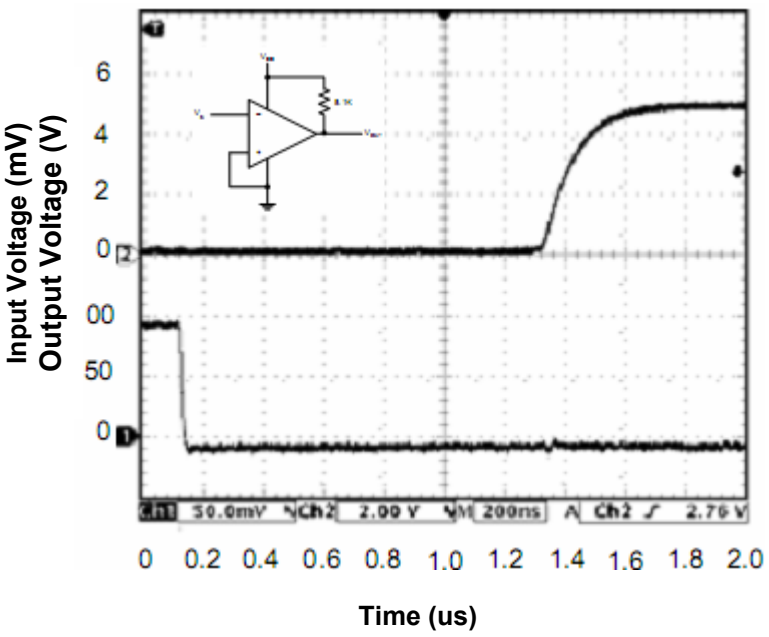


Fig.5- Response Time for 5mV Input Overdrive - Positive Transition



Typical Applications

Fig.6- Basic Comparator

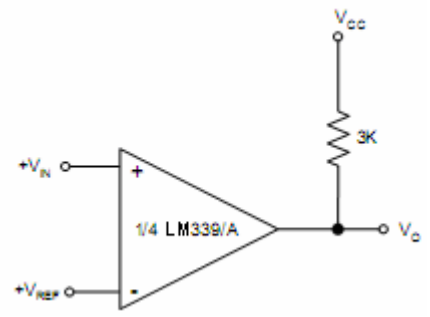


Fig.7- Driving CMOS

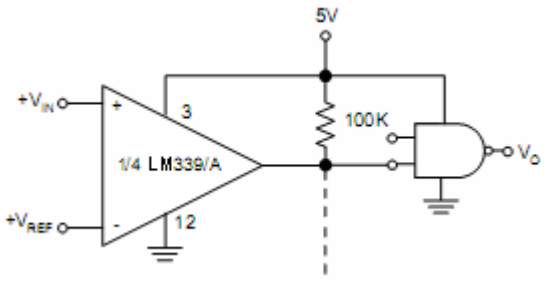


Fig.8- One Shot Multi-vibrator

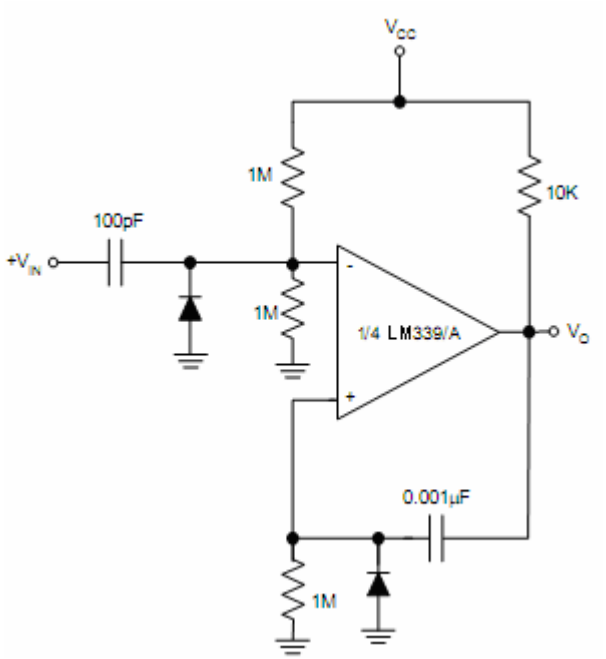
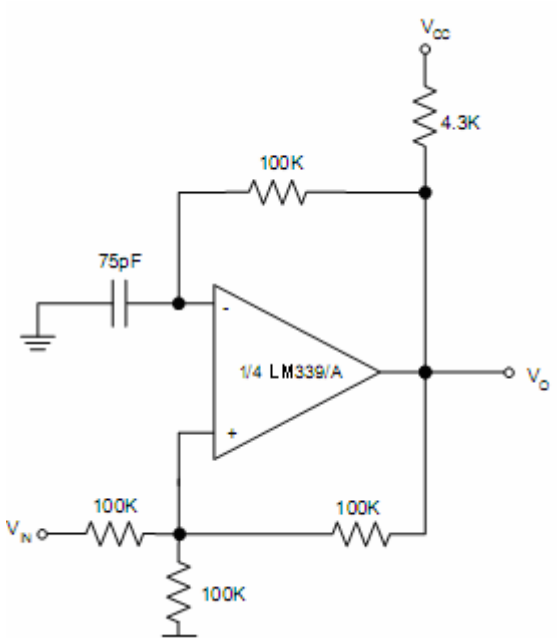
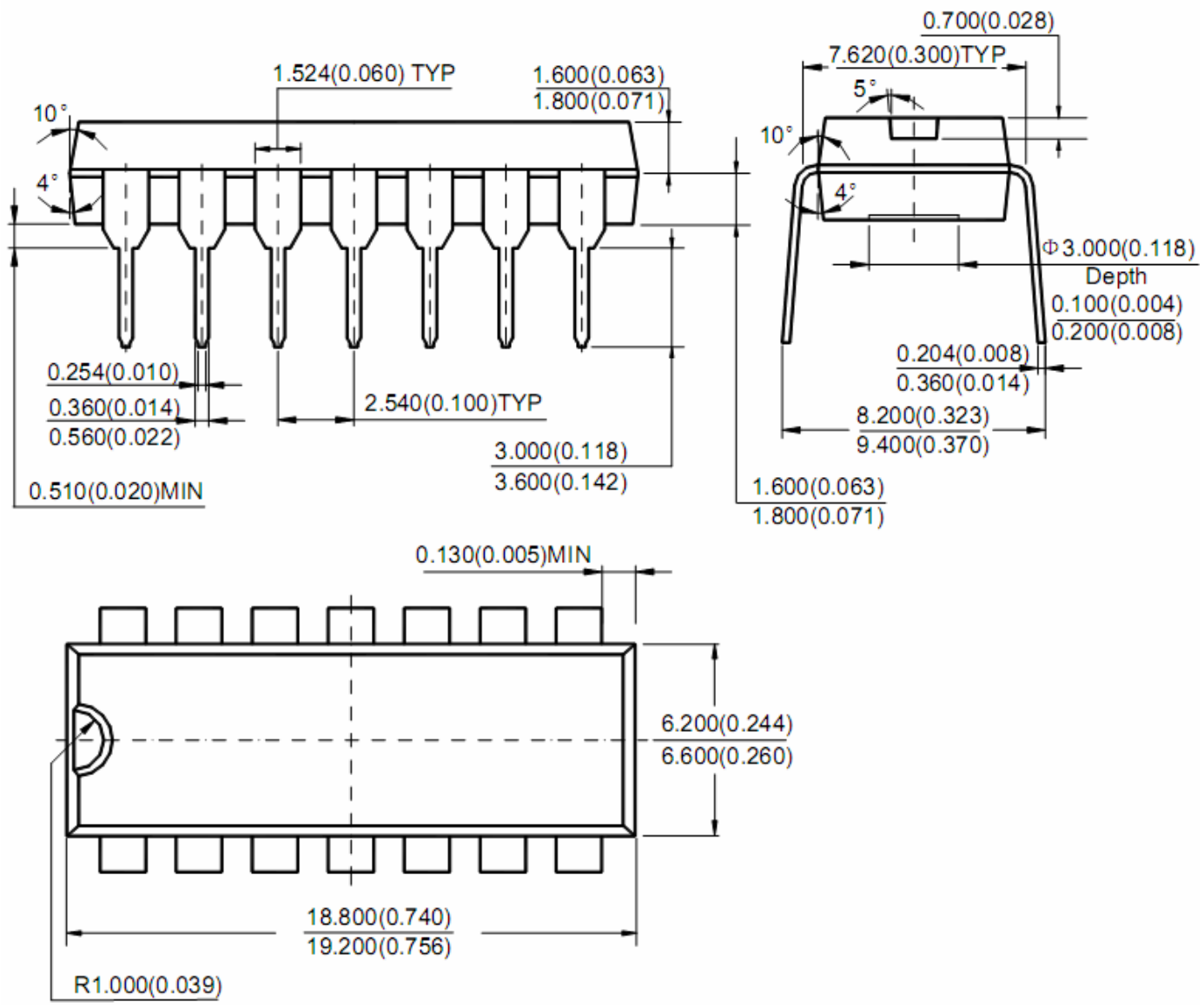


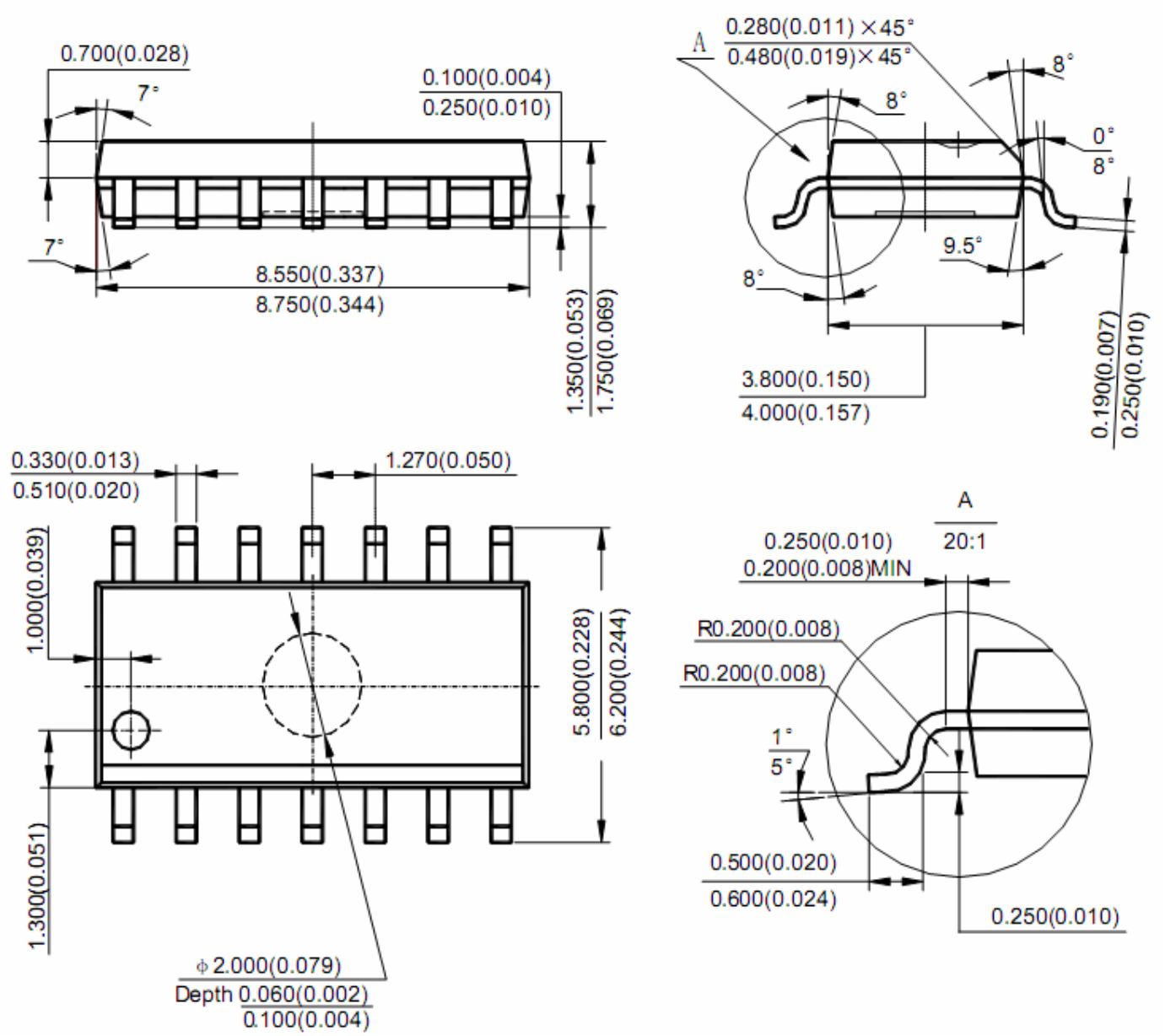
Fig.9- Square-wave Oscillator



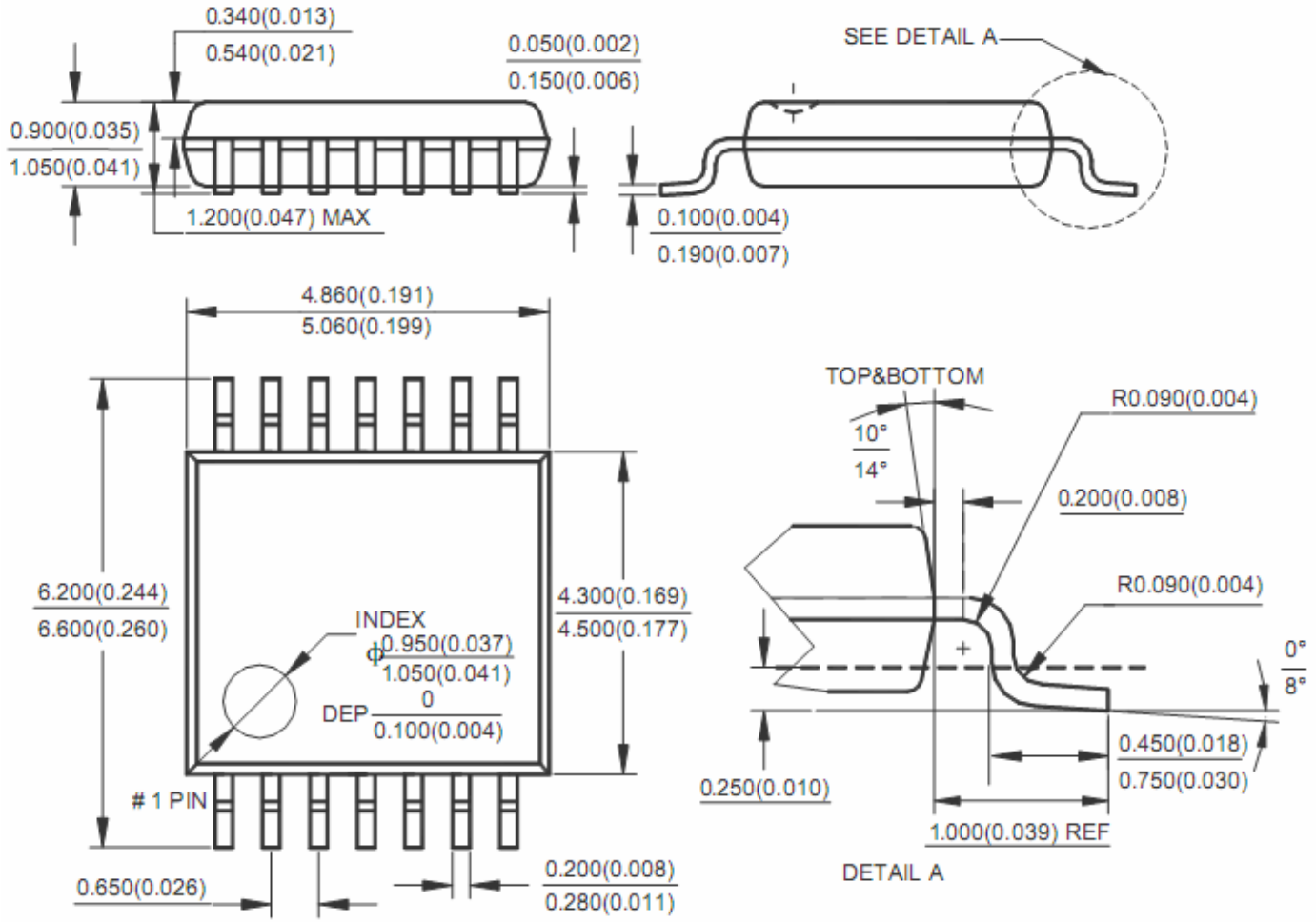
Dimensions in mm(inch)



DIP-14


0.700(0.028)
7°
0.100(0.004)
0.250(0.010)
7°
8.550(0.337)
8.750(0.344)
1.350(0.053)
1.750(0.069)
A
0.280(0.011)×45°
0.480(0.019)×45°
8°
8°
0°
8°
9.5°
8°
3.800(0.150)
4.000(0.157)
0.190(0.007)
0.250(0.010)
0.330(0.013)
0.510(0.020)
1.270(0.050)
1.000(0.039)
5.800(0.228)
6.200(0.244)
1.300(0.051)
Φ2.000(0.079)
Depth 0.060(0.002)
0.100(0.004)
A
20:1
0.250(0.010)
0.200(0.008)MIN
R0.200(0.008)
R0.200(0.008)
1°
5°
0.500(0.020)
0.600(0.024)
0.250(0.010)

SOP-14N


0.340(0.013)
0.540(0.021)
0.050(0.002)
0.150(0.006)
SEE DETAIL A
0.900(0.035)
1.050(0.041)
1.200(0.047) MAX
0.100(0.004)
0.190(0.007)
4.860(0.191)
5.060(0.199)
TOP&BOTTOM
R0.090(0.004)
10°
14°
0.200(0.008)
6.200(0.244)
6.600(0.260)
INDEX
Φ0.950(0.037)
1.050(0.041)
DEP 0
0.100(0.004)
4.300(0.169)
4.500(0.177)
R0.090(0.004)
0°
8°
# 1 PIN
0.450(0.018)
0.750(0.030)
0.250(0.010)
1.000(0.039) REF
DETAIL A
0.650(0.026)
0.200(0.008)
0.280(0.011)

TSSOP-14

How to contact us:

US HEADQUARTERS

28040 WEST HARRISON PARKAWAY, VALENCIA, CA 91355-4162
Tel: (800) TAITRON (800) 824-8766 (661) 257-6060
Fax: (800) TAITFAX (800) 824-8329 (661) 257-6415
Email: taitron@taitroncomponents.com
Http://www.taitroncomponents.com

TAITRON COMPONETS MEXICO, S.A .DE C.V.

BOULEVARD CENTRAL 5000 INTERIOR 5 PARQUE INDUSTRIAL ATITALAQUIA, HIDALGO C.P. 42970 MEXICO
Tel: +52-55-5560-1519
Fax: +52-55-5560-2190

TAITRON COMPONETS INCORPORATED E REPRESENTAÇÕES DO BRASIL LTDA

RUA DOMINGOS DE MORAIS, 2777, 2.ANDAR, SALA 24 SAÚDE - SÃO PAULO-SP 04035-001 BRAZIL
Tel: +55-11-5574-7949
Fax: +55-11-5572-0052

TAITRON COMPONETS INCORPORATED, SHANGHAI REPRESENTATIVE OFFICE

METROBANK PLAZA, 1160 WEST YAN' AN ROAD, SUITE 1503, SHANGHAI, 200052, CHINA
Tel: +86-21-5424-9942
Fax: +86-21-5424-9931