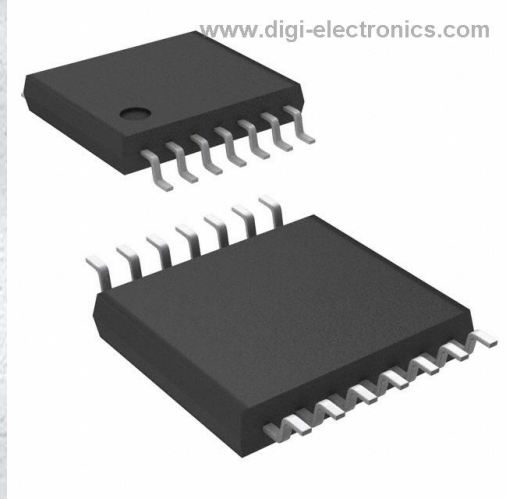
AS339GTR-G1 Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	AS339GTR-G1-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	AS339GTR-G1
Description	IC COMPARATOR 4 GEN PUR 14TSSOP
Detailed Description	Comparator General Purpose Open-Collector 14-TSSOP

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
AS339GTR-G1	Diodes Incorporated
Series:	Product Status:
-	Active
Type:	Number of Elements:
General Purpose	4
Output Type:	Voltage - Supply, Single/Dual (±):
Open-Collector	2V ~ 36V, ±1V ~ 18V
Voltage - Input Offset (Max):	Current - Input Bias (Max):
5mV @ 5V	0.25µA @ 5V
Current - Output (Typ):	Current - Quiescent (Max):
16mA @ 5V	2mA
CMRR, PSRR (Typ):	Propagation Delay (Max):
-	-
Hysteresis:	Operating Temperature:
-	-40°C ~ 85°C
Package / Case:	Mounting Type:
14-TSSOP (0.173", 4.40mm Width)	Surface Mount
Supplier Device Package:	Base Product Number:
14-TSSOP	AS339

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	3 (168 Hours)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8542.39.0001	

AS339/339A

LOW POWER LOW OFFSET VOLTAGE QUAD COMPARATORS

Description

The AS339/339A consist of four independent precision voltage comparators with a typical offset voltage of 2.0mV and high gain. They 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 AS339/339A series are compatible with industry standard 339. The AS339A has more stringent input offset voltage than the AS339.

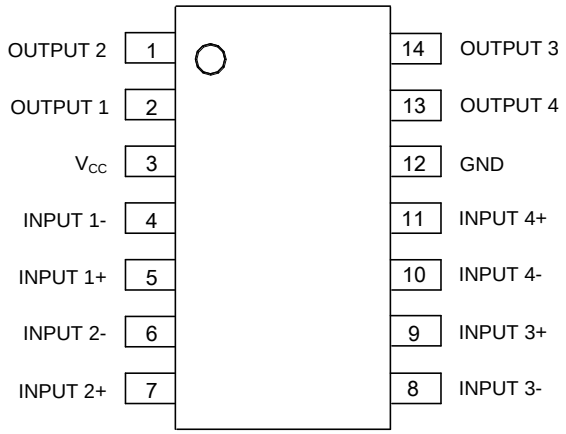
The AS339 is available in SO-14 and TSSOP-14 packages, and the AS339A is available in SO-14 package.

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 Range Equals to the Power Supply Voltage
- Low Output Saturation Voltage: 200mV at 4mA
- Open Collector Output
- Lead-Free Packages: SO-14, TSSOP-14
  - **Totally Lead-Free; RoHS Compliant (Notes 1 & 2)**
- Lead-Free Packages, Available in “Green” Molding Compound: SO-14, TSSOP-14
  - **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
  - **Halogen and Antimony Free. “Green” Device (Note 3)**

Pin Assignments

(Top View)



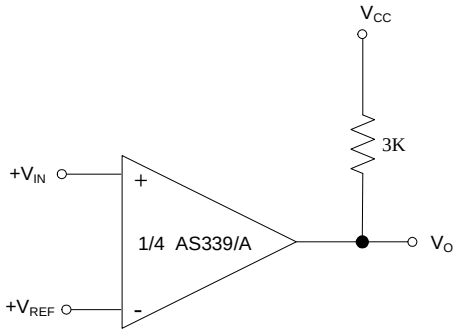
SO-14 / TSSOP-14

Applications

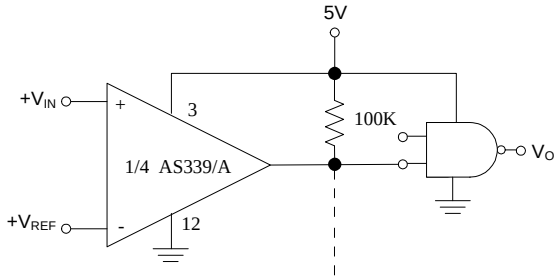
- Battery Charger
- Cordless Telephone
- Switching Power Supply
- DC-DC Module
- PC Motherboard
- Communication Equipment

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated’s definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

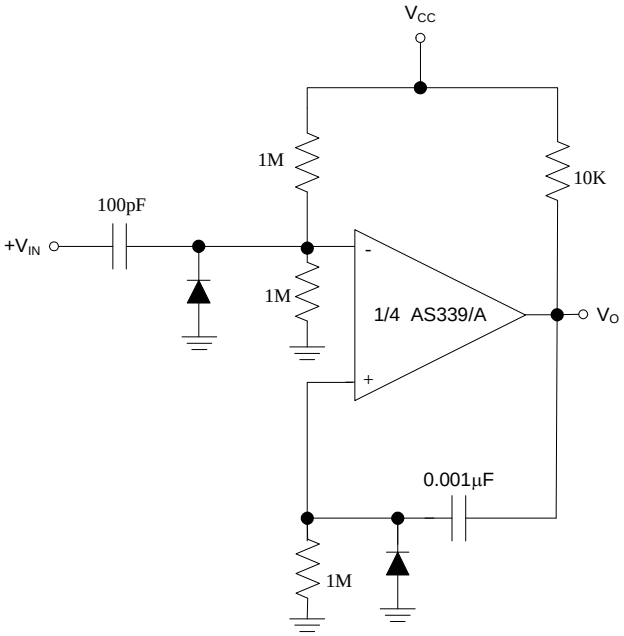
Typical Applications Circuit



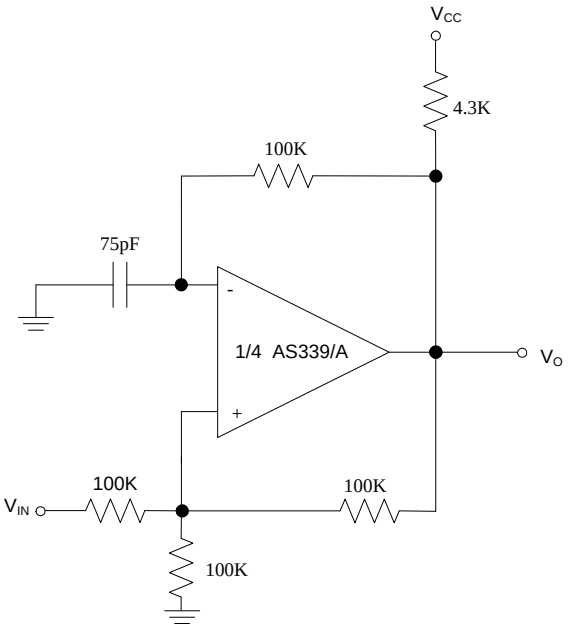
Basic Comparator



Driving CMOS

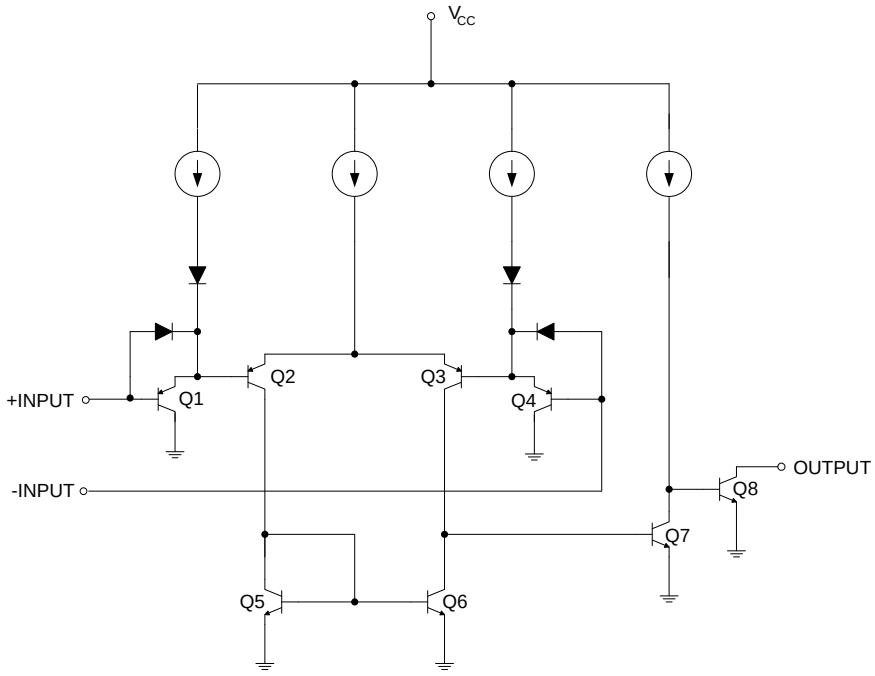


One Shot Multivibrator



Squarewave Oscillator

Functional Block Diagram



Absolute Maximum Ratings (Note 4)

Symbol	Parameter	Rating		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 5)	50		mA
—	Output Short-Circuit to Ground	Continuous		—
P_D	Power Dissipation (T_A = +25°C)	SO-14	890	mW
		TSSOP-14	790	
T_J	Operating Junction Temperature	+150		°C
T_{STG}	Storage Temperature Range	-65 to +150		°C
T_{LEAD}	Lead Temperature (Soldering, 10 Seconds)	+260		°C

Notes: 4. 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 periods may affect device reliability.

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

Electrical Characteristics (Limits in standard typeface are for T_A = +25°C, **bold** typeface applies over T_A = -40°C to +85°C (Note 6), V_{CC} = 5V, GND = 0V, unless otherwise specified.)

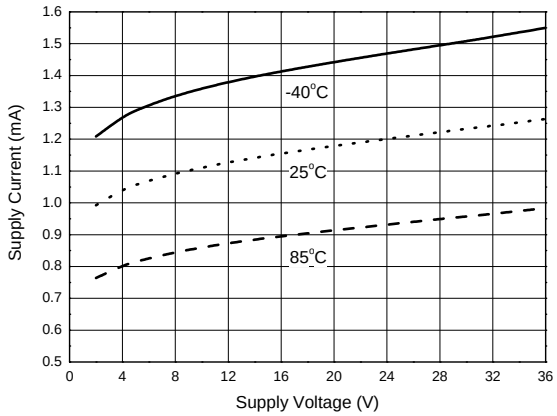
Parameter	Conditions		Min	Typ	Max	Unit
Input Offset Voltage	V_O = 1.4V, R_S = 0Ω, V_{CC} from 5V to 30V	AS339	—	2	5	mV
			—	—	**7**	
		AS339A	—	2	3	
			—	—	**5**	
Input Bias Current	I_{IN}+ or I_{IN}- with output in Linear Range, V_{CM} = 0V		—	25	250	nA
			—	—	**400**	
Input Offset Current	I_{IN}+ - I_{IN}-, V_{CM} = 0V		—	5.0	50	nA
			—	—	**200**	
Input Common Mode Voltage Range (Note 7)	V_{CC} = 30V		0	—	V_{CC}-1.5	V
Supply Current	R_L = ∞	V_{CC} = 5V	—	0.9	2.0	mA
			—	—	**3.0**	
		V_{CC} = 30V	—	1.2	2.5	
			—	—	**3.5**	
Voltage Gain	R_L ≥ 15kΩ, V_{CC} = 15V, V_O = 1V to 11V		50	200	—	V/mV
Large Signal Response Time	V_{IN} = TTL Logic Swing, V_{REF} = 1.4V V_{RL} = 5V, R_L = 5.1kΩ		—	200	—	ns
Response Time	V_{RL} = 5V, R_L = 5.1kΩ		—	1.3	—	µs
Output Sink Current	V_{IN}- = 1V, V_{IN}+ = 0, V_O = 1.5V		6.0	16	—	mA
Output Leakage Current	V_{IN}- = 0V, V_{IN}+ = 1V, V_O = 5V		—	0.1	—	nA
	V_{IN}- = 0V, V_{IN}+ = 1V, V_O = 30V		—	—	**1**	µA
Saturation Voltage	V_{IN}- = 1V, V_{IN}+ = 0, I_{SINK} ≤ 4mA		—	200	400	mV
			—	—	**500**	
Thermal Resistance (Junction to Case)	SO-14		—	15	—	°C/W
	TSSOP-14		—	6	—	
Thermal Resistance (Junction to Ambient)	SO-14		—	89	—	
	TSSOP-14		—	125	—	

Notes: 6. Limits over the full temperature are guaranteed by design, but not tested in production.

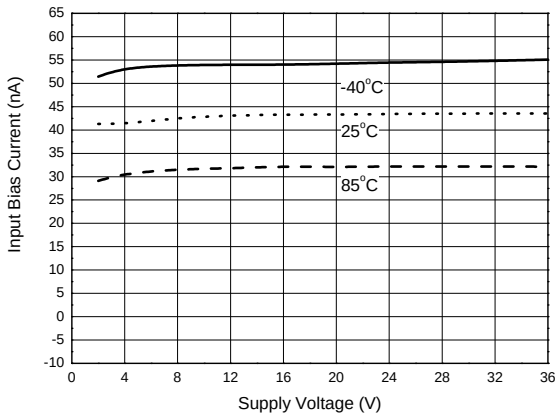
7. The input common-mode voltage of either input signal voltage should not be allowed to go negatively by more than 0.3V (at +25°C). The upper end of the common-mode voltage range is V_{CC} -1.5V (at +25°C), but either or both inputs can go to +36V without damages, independent of the magnitude of the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

Performance Characteristics

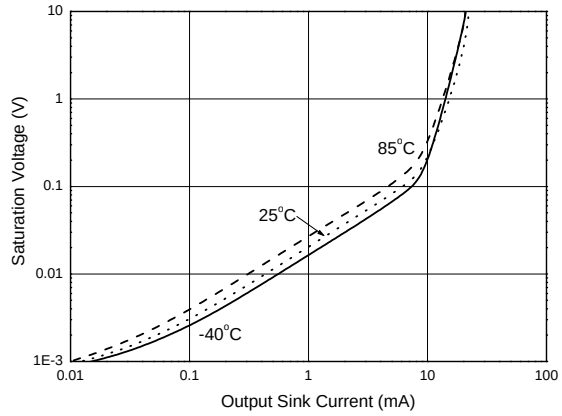
Supply Voltage vs. Supply Current



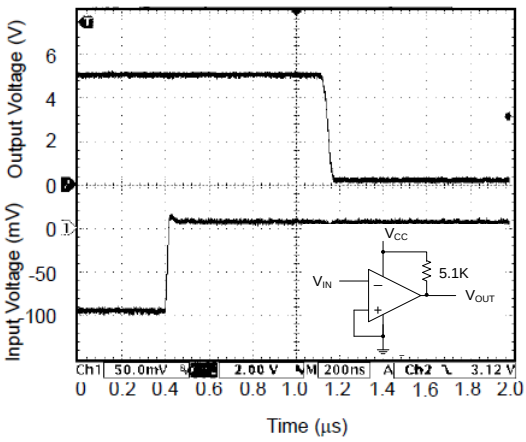
Supply Voltage vs. Input Bias Current



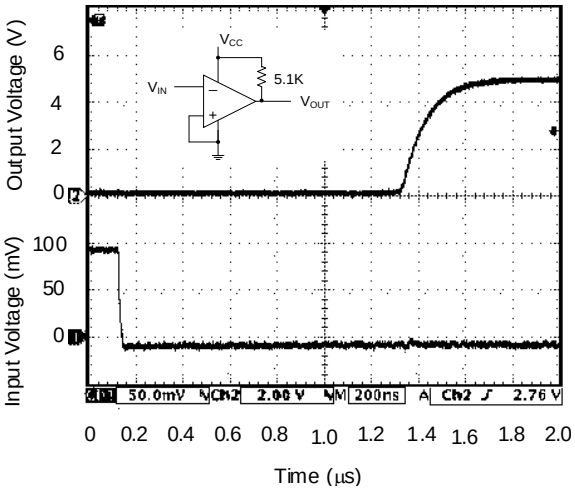
Output Sink Current vs. Saturation Voltage



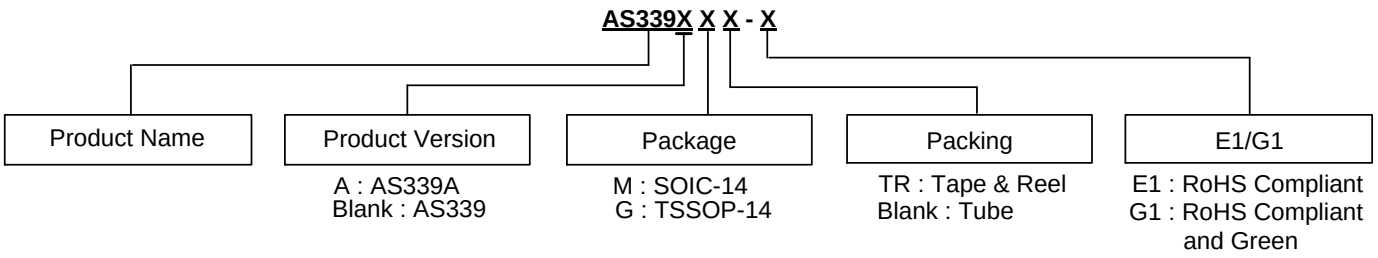
Response Time for 5mV Input Overdrive - Negative Transition



Response Time for 5mV Input Overdrive - Positive Transition



Ordering Information

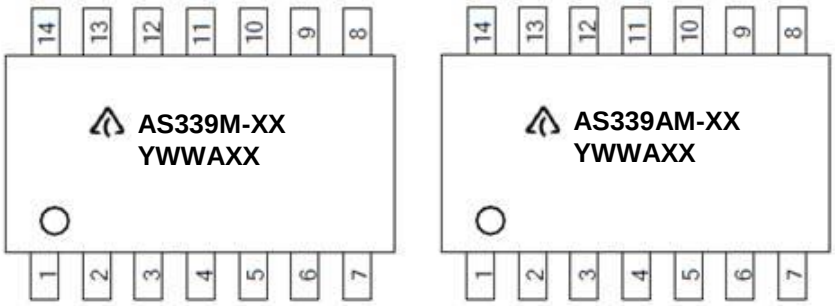


	Part Number	Package (Note 9)	RoHS Compliant Lead Free / Green	Marking ID	Packing	Quantity	Status (Note 8)	Alternative
Lead-Free	AS339M-E1	SO-14	Lead Free	AS339M-E1	Tube	NA	End of Life	AS339MTR-G1
Lead-Free	AS339MTR-E1	SO-14	Lead Free	AS339M-E1	Tape & Reel	2500	NRND	AS339MTR-G1
Lead-Free	AS339AM-E1	SO-14	Lead Free	AS339AM-E1	Tube	NA	End of Life	AS339AMTR-G1
Lead-Free	AS339AMTR-E1	SO-14	Lead Free	AS339AM-E1	Tape & Reel	2500	NRND	AS339AMTR-G1
Lead-Free Green	AS339M-G1	SO-14	Green	AS339M-G1	Tube	NA	End of Life	AS339MTR-G1
Lead-Free Green	AS339MTR-G1	SO-14	Green	AS339M-G1	Tape & Reel	2500	In Production	—
Lead-Free Green	AS339AM-G1	SO-14	Green	AS339AM-G1	Tube	NA	End of Life	AS339AMTR-G1
Lead-Free Green	AS339AMTR-G1	SO-14	Green	AS339AM-G1	Tape & Reel	2500	In Production	—
Lead-Free	AS339GTR-E1	TSSOP-14	Lead Free	EGS339	Tape & Reel	2500	NRND	AS339GTR-G1
Lead-Free Green	AS339GTR-G1	TSSOP-14	Green	GGS339	Tape & Reel	2500	In Production	—

Notes: 8. All variants in Tube packing with package SO-14 are End of Life.
All variants with package DIP-14 are End of Life without replacements.
NRND: Not Recommended for New Design.
9. For packaging details, go to our website at: https://www.diodes.com/design/support/packaging/diodes-packaging/.

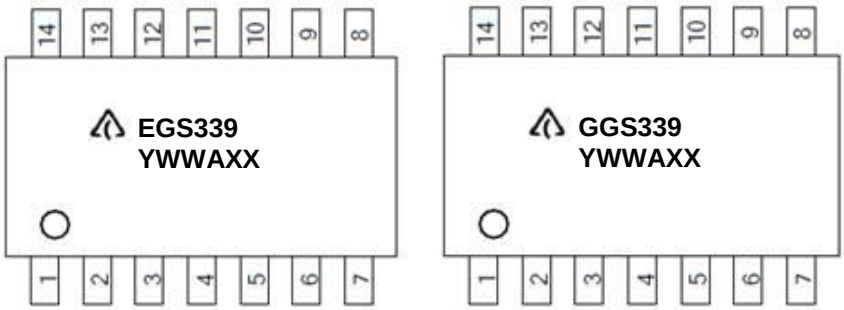
Marking information

(1) SO-14



First Line: Logo and Marking ID
(See Ordering Information)
Second Line: Date Code
Y: Year
WW: Work Week of Molding
A: Assembly House Code
XX: 7th and 8th Digits of Batch Number

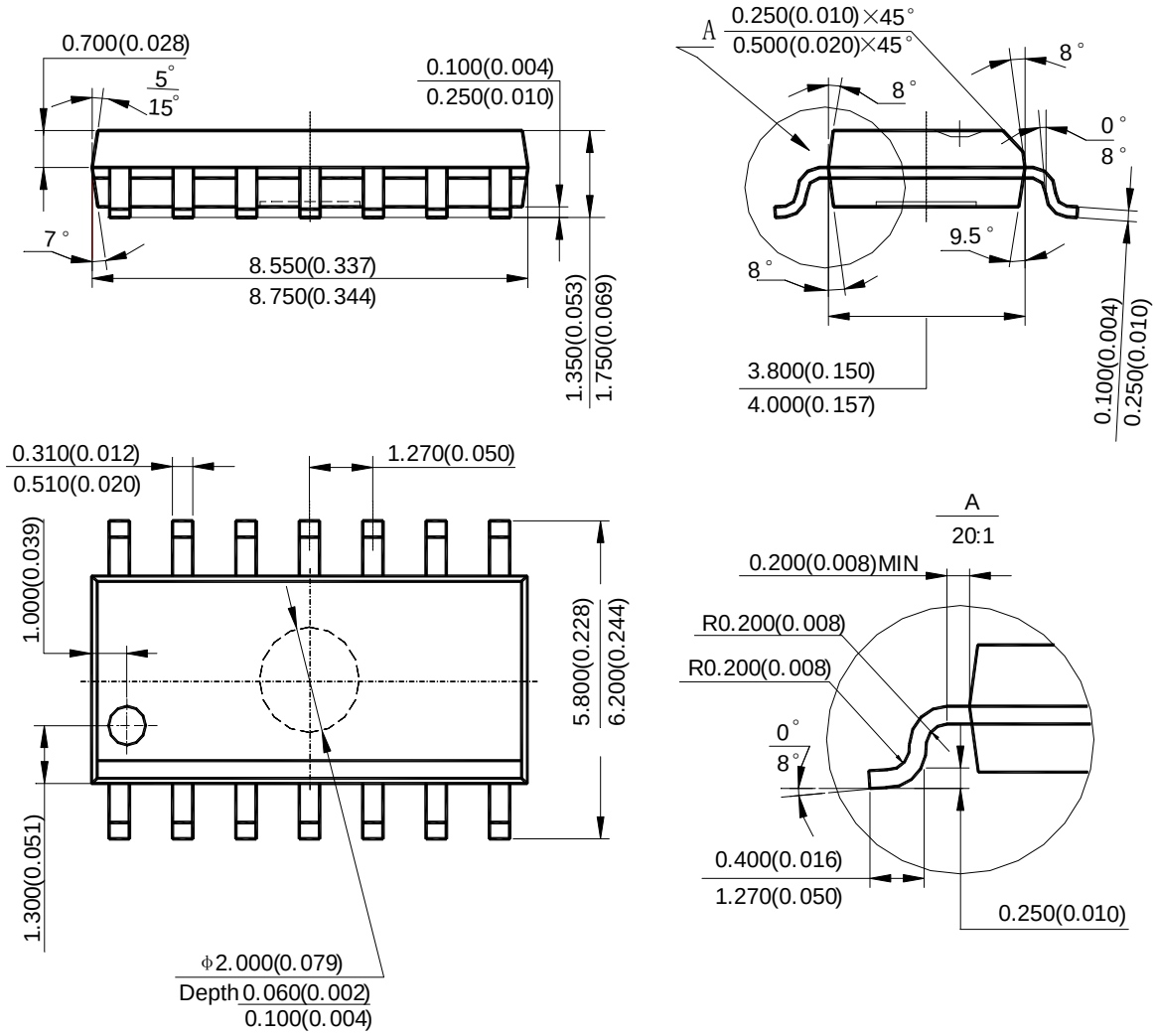
(2) TSSOP14



First Line: Logo and Marking ID
(See Ordering Information)
Second Line: Date Code
Y: Year
WW: Work Week of Molding
A: Assembly House Code
XX: 7th and 8th Digits of Batch Number

Package Outline Dimensions (All dimensions in mm(inch).)

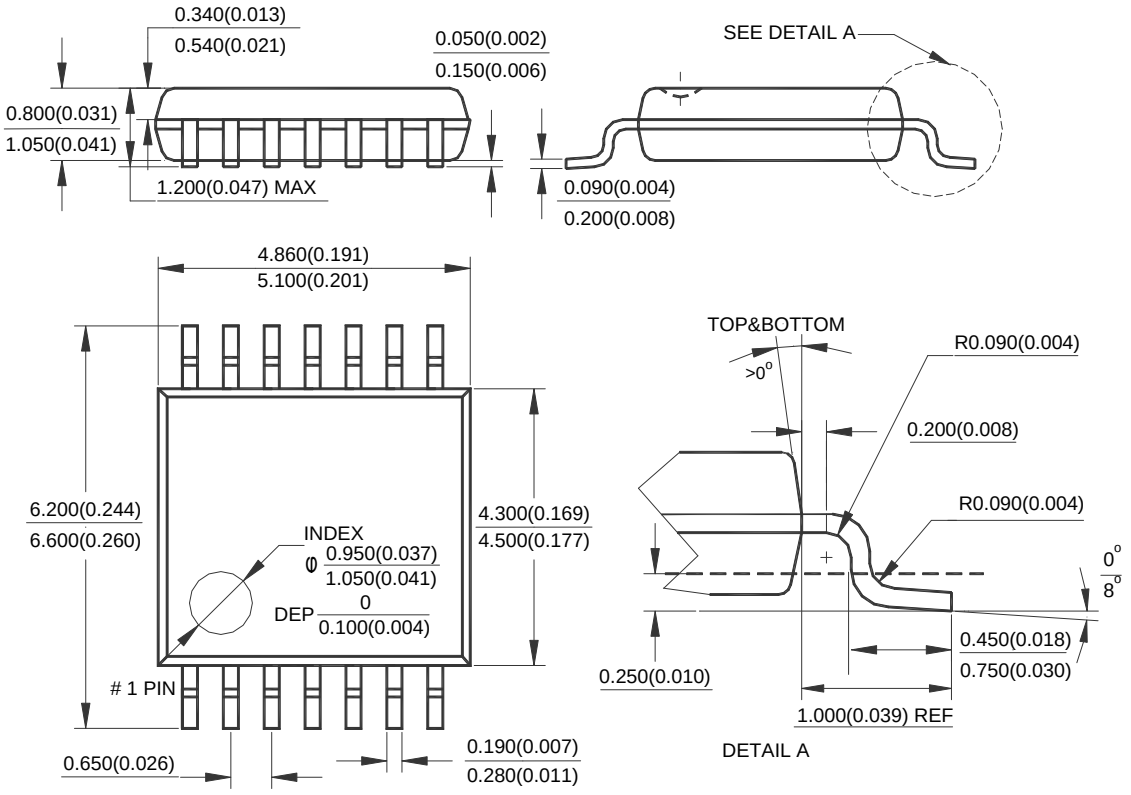
(1) Package Type: SO-14



Note: Eject hole, oriented hole and mold mark is optional.

Package Outline Dimensions (Cont. All dimensions in mm(inch).)

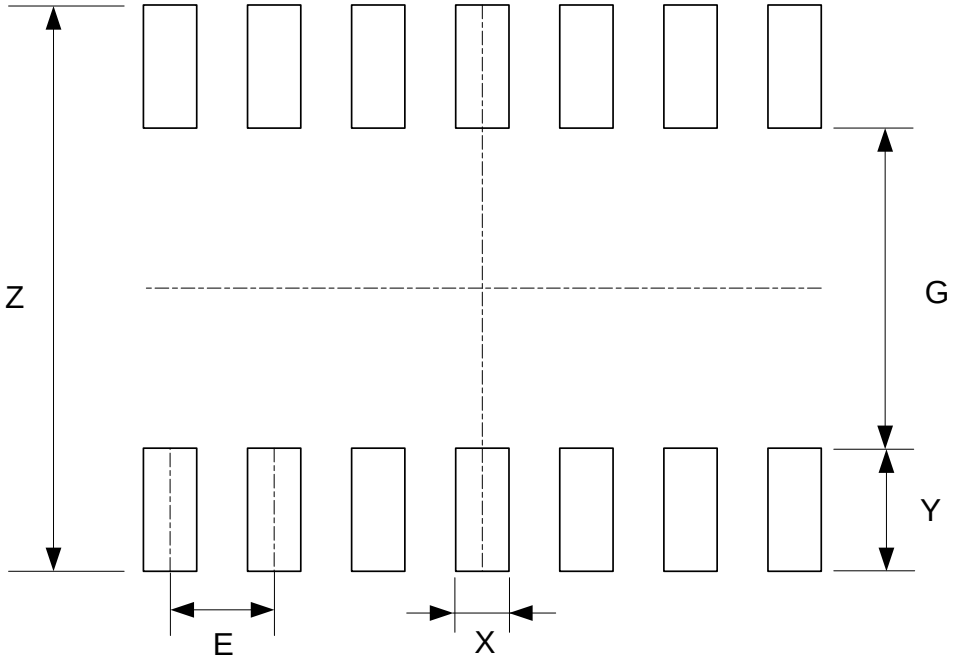
(2) Package Type: TSSOP-14



Note: Eject hole, oriented hole and mold mark is optional.

Suggested Pad Layout

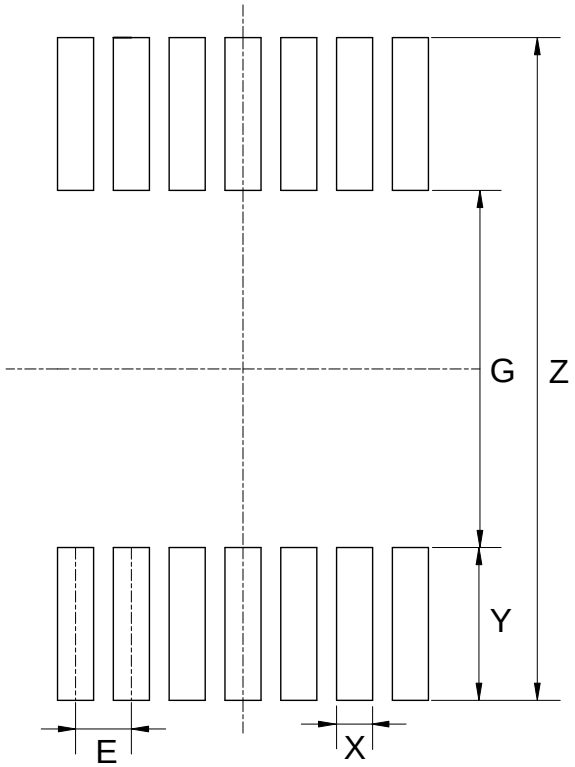
(1) Package Type: SO-14



Dimensions	Z (mm)/(inch)	G (mm)/(inch)	X (mm)/(inch)	Y (mm)/(inch)	E (mm)/(inch)
Value	6.900/0.272	3.900/0.154	0.650/0.026	1.500/0.059	1.270/0.050

Suggested Pad Layout (Cont.)

(2) Package Type: TSSOP-14



Dimensions	Z (mm)/(inch)	G (mm)/(inch)	X (mm)/(inch)	Y (mm)/(inch)	E (mm)/(inch)
Value	7.720/0.304	4.160/0.164	0.420/0.017	1.780/0.070	0.650/0.026

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2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

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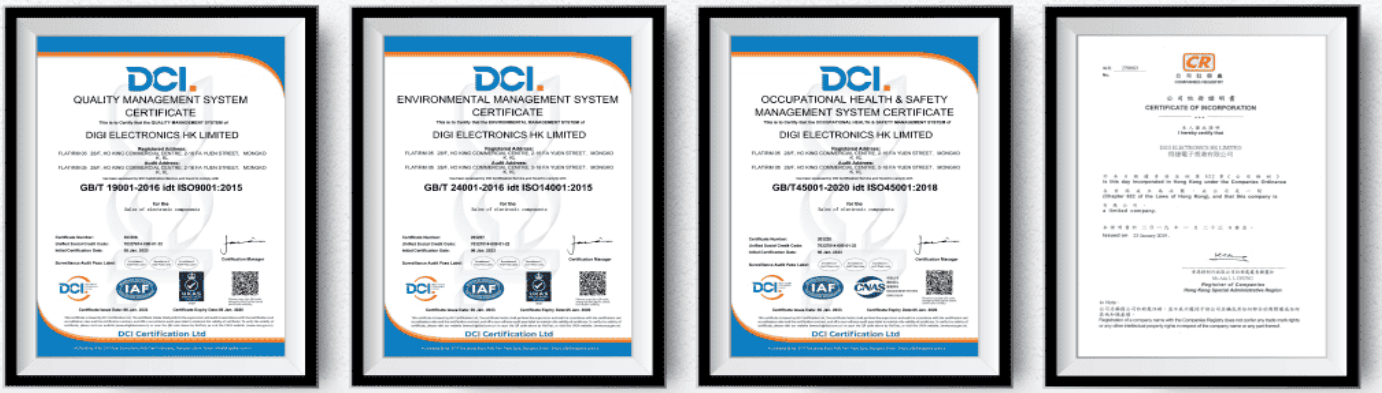

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