

### GENERAL DESCRIPTION

The 74HC164 is an 8-bit serial-in and parallel-out shift register which can accept a wide supply voltage range from 2.0V to 5.5V.

This device provides gated serial inputs (DSA and DSB) and parallel data outputs (Q0 to Q7). DSA and DSB support serial data entry, where either input can allow data to enter through another input as an active high input. CP is a clock input. When the device is on low-to-high clock transition of the CP, data can be shifted.  $\overline{MR}$  is the master reset input that is separated from the other inputs. When  $\overline{MR}$  is held low, it can make the register clear and all outputs must be low level. The clamp diodes of inputs allow the use of current limiting resistors to connect inputs to the voltage exceeding supply voltage.

### FEATURES

- **Wide Operating Voltage Range: 2.0V to 5.5V**
- **+5.2mA/-5.2mA Output Current**
- **CMOS Low Power Consumption**
- **Gated Serial Data Inputs**
- **Asynchronous Master Reset Input**
- **-40°C to +125°C Operating Temperature Range**
- **Available in Green SOIC-14 and TSSOP-14 Packages**

### APPLICATIONS

Servers and I/O Expanders  
LED Displays

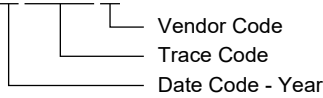
**PACKAGE/ORDERING INFORMATION**

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
74HC164	SOIC-14	-40°C to +125°C	74HC164XS14G/TR	74HC164XS14 XXXXX	Tape and Reel, 2500
	TSSOP-14	-40°C to +125°C	74HC164XTS14G/TR	74HC164 XTS14 XXXXX	Tape and Reel, 4000

**MARKING INFORMATION**

NOTE: XXXXX = Date Code, Trace Code and Vendor Code.

**XXXXX**



Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

**ABSOLUTE MAXIMUM RATINGS <sup>(1)</sup>**

Supply Voltage, $V_{CC}$ .....	-0.5V to 7.0V
Input Voltage Range, $V_I$ <sup>(2)</sup> ....	-0.5V to MIN(7.0V, $V_{CC} + 0.5V$ )
Output Voltage Range, $V_O$ <sup>(2)</sup> .....	-0.5V to MIN(7.0V, $V_{CC} + 0.5V$ )
Input Clamp Current, $I_{IK}$ ( $V_I < -0.5V$ or $V_I > V_{CC} + 0.5V$ ) .....	$\pm 20mA$
Output Clamp Current, $I_{OK}$ ( $V_O < -0.5V$ or $V_O > V_{CC} + 0.5V$ ) .....	$\pm 20mA$
Continuous Output Current, $I_O$ ( $-0.5V < V_O < V_{CC} + 0.5V$ ) .....	$\pm 25mA$
Continuous Current through $V_{CC}$ or GND.....	$\pm 50mA$
Junction Temperature <sup>(3)</sup> .....	+150°C
Storage Temperature Range .....	-65°C to +150°C
Lead Temperature (Soldering, 10s).....	+260°C
ESD Susceptibility	
HBM.....	6000V
CDM .....	1000V

**RECOMMENDED OPERATING CONDITIONS**

Supply Voltage, $V_{CC}$ .....	2.0V to 5.5V
Input Voltage, $V_I$ .....	0V to $V_{CC}$
Output Voltage, $V_O$ .....	0V to $V_{CC}$
Output Current, $I_O$ .....	$\pm 5.2mA$
Input Transition Rise or Fall Rate, $\Delta t/\Delta V$	
$V_{CC} = 2.0V$ .....	625ns/V (MAX)
$V_{CC} = 4.5V$ .....	139ns/V (MAX)
$V_{CC} = 5.5V$ .....	83ns/V (MAX)
Operating Temperature Range.....	-40°C to +125°C

**OVERSTRESS CAUTION**

1. Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.
2. The input and output voltage ratings may be exceeded if the input and output clamp current ratings are observed.
3. The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction temperatures which are detrimental to reliability.

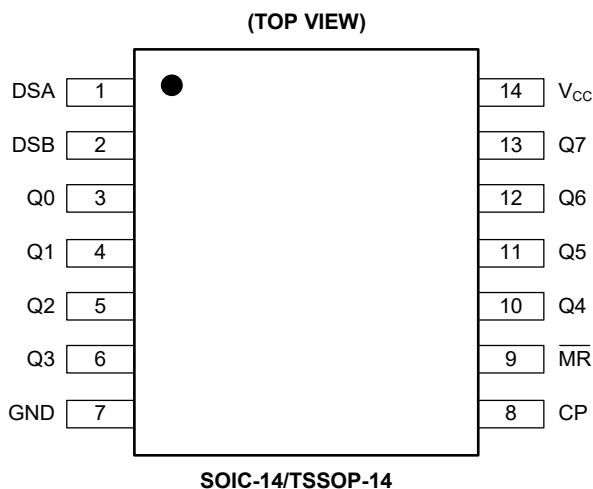
**ESD SENSITIVITY CAUTION**

This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because even small parametric changes could cause the device not to meet the published specifications.

**DISCLAIMER**

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

## PIN CONFIGURATIONS

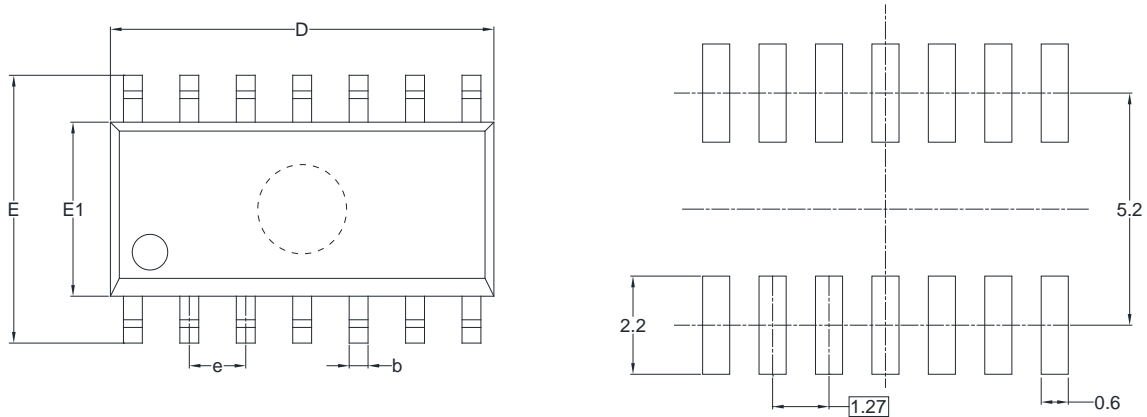


## PIN DESCRIPTION

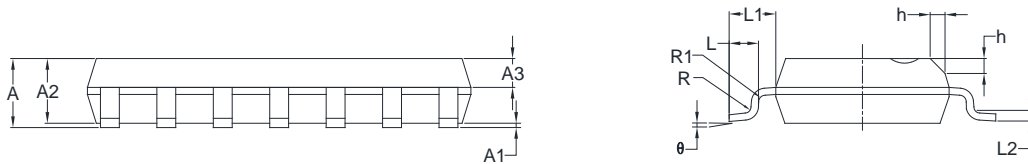
PIN	NAME	FUNCTION
1	DSA	Serial Data Input A.
2	DSB	Serial Data Input B.
3, 4, 5, 6, 10, 11, 12, 13	Q0, Q1, Q2, Q3, Q4, Q5, Q6, Q7	Parallel Data Outputs.
7	GND	Ground.
8	CP	Clock Input (Low-to-High Clock Transition, Edge-Triggered).
9	$\overline{\text{MR}}$	Master Reset Input (Active Low).
14	V <sub>CC</sub>	Supply Voltage.

PACKAGE OUTLINE DIMENSIONS

SOIC-14



RECOMMENDED LAND PATTERN (Unit: mm)



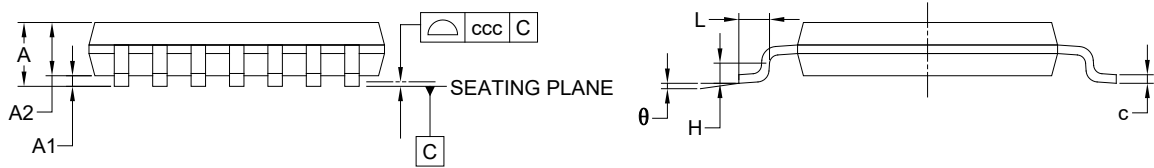
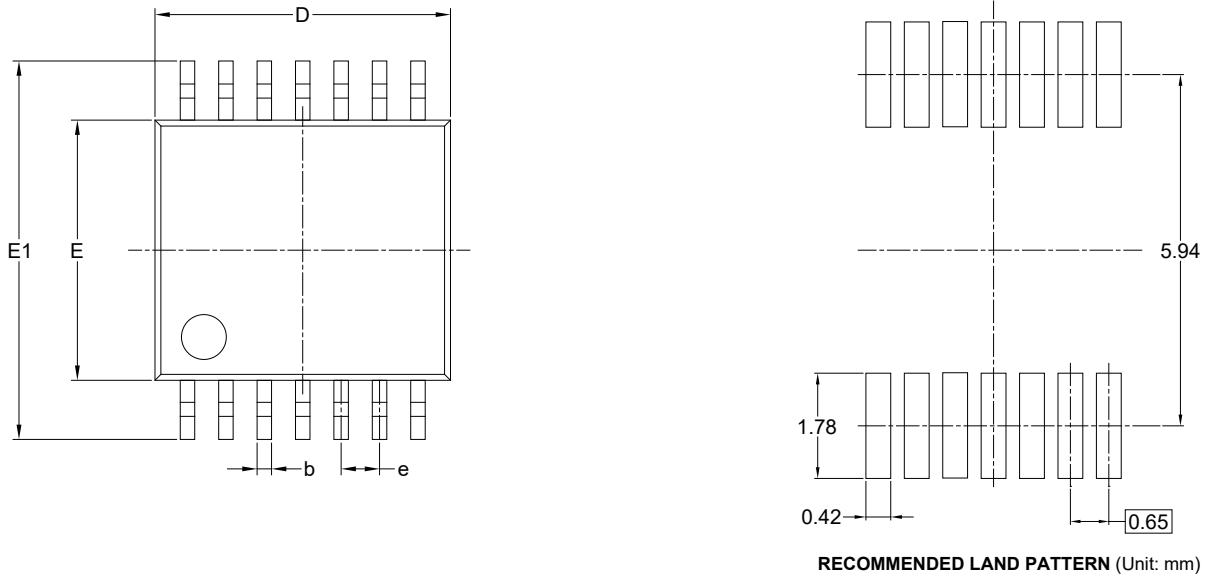
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	1.65	0.049	0.065
A3	0.55	0.75	0.022	0.030
b	0.36	0.49	0.014	0.019
D	8.53	8.73	0.336	0.344
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
L	0.45	0.80	0.018	0.032
L1	1.04 REF		0.040 REF	
L2	0.25 BSC		0.01 BSC	
R	0.07		0.003	
R1	0.07		0.003	
h	0.30	0.50	0.012	0.020
θ	0°	8°	0°	8°

NOTES:

1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.

PACKAGE OUTLINE DIMENSIONS

TSSOP-14



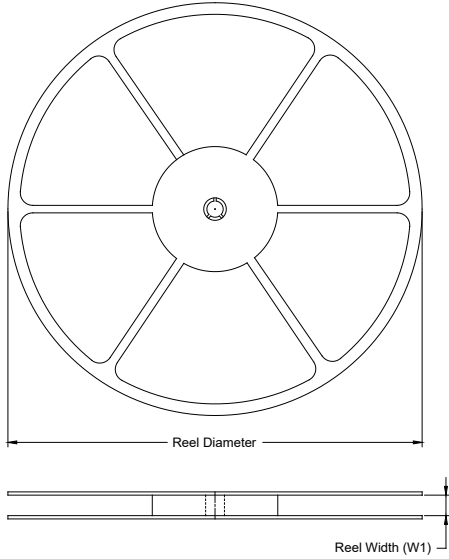
Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	-	-	1.200
A1	0.050	-	0.150
A2	0.800	-	1.050
b	0.190	-	0.300
c	0.090	-	0.200
D	4.860	-	5.100
E	4.300	-	4.500
E1	6.200	-	6.600
e	0.650 BSC		
L	0.450	-	0.750
H	0.250 TYP		
$\theta$	0°	-	8°
ccc	0.100		

NOTES:

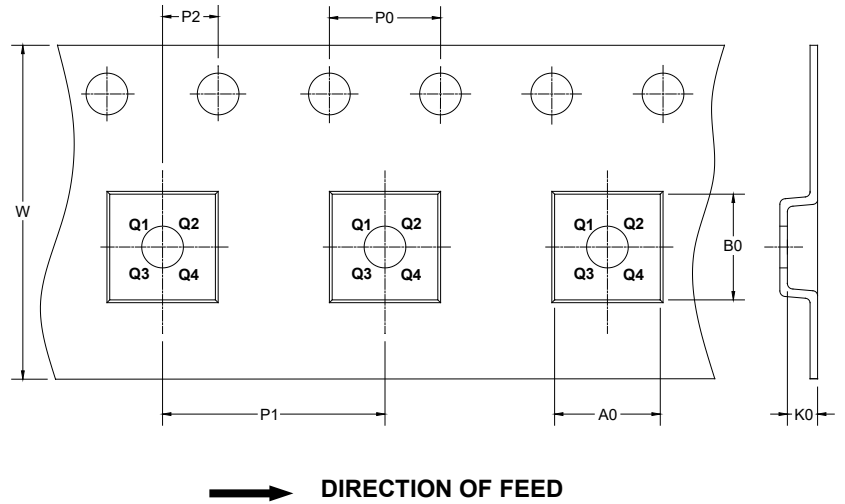
1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-153.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOIC-14	13"	16.4	6.60	9.30	2.10	4.0	8.0	2.0	16.0	Q1
TSSOP-14	13"	12.4	6.80	5.40	1.50	4.0	8.0	2.0	12.0	Q1

DD0001

# PACKAGE INFORMATION

## CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

## KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
13"	386	280	370	5

DD0002

单击下面可查看定价，库存，交付和生命周期等信息

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