

GENERAL DESCRIPTION

The 74HC165 is an 8-bit parallel-load shift register with a wide operating voltage range of 2.0V to 5.5V. When the shift/load input is LOW, eight parallel data inputs (A-H) are enabled and allowed to enter each stage. Data is shifted to a serial output when the device is clocked. The device also provides a complementary serial output.

When the shift/load input is HIGH and the clock inhibit input is LOW, the clock transition can be completed by a LOW-to-HIGH transition of the clock input. Due to the interchangeable function of the clock input and the clock inhibit input, the clock transition also can be completed by a low level of the clock input and a LOW-to-HIGH transition of the clock inhibit input. When the shift/load input remains HIGH, parallel load is inhibited. When the shift/load input remains LOW, parallel inputs enter the register, independent of other inputs.

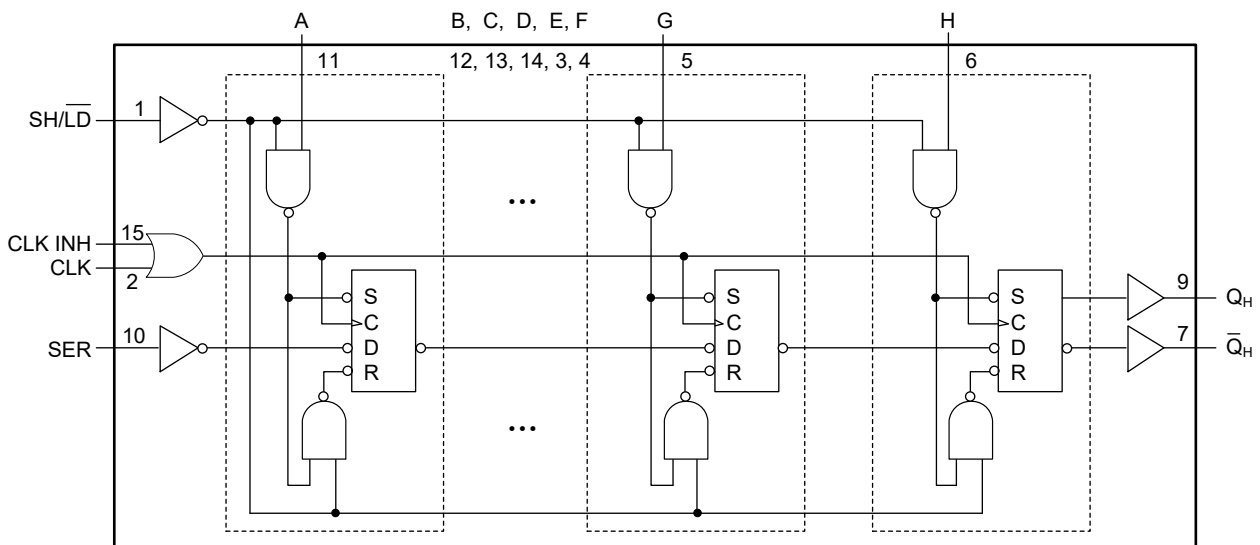
FEATURES

- **Wide Supply Voltage Range: 2.0V to 5.5V**
- **+5.2mA/-5.2mA Output Current**
- **Synchronous Serial Input**
- **CMOS Low Power Dissipation**
- **Data Transformation of Parallel-to-Serial**
- **-40°C to +125°C Operating Temperature Range**
- **Available in Green SOIC-16 and TSSOP-16 Packages**

APPLICATIONS

- Programmable Logic Controller
- System of Video Display
- Output Expander and Keyboard Appliance

LOGIC DIAGRAM



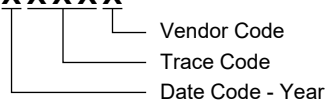
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
74HC165	SOIC-16	-40°C to +125°C	74HC165XS16G/TR	74HC165XS16 XXXXX	Tape and Reel, 2500
	TSSOP-16	-40°C to +125°C	74HC165XTS16G/TR	74HC165 XTS16 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 ⁽¹⁾

Supply Voltage, V_{CC}	-0.5V to 7.0V
Input Voltage Range, V_I ⁽²⁾	-0.5V to MIN(7.0V, $V_{CC} + 0.5V$)
Output Voltage Range, V_O ⁽²⁾	-0.5V to MIN(7.0V, $V_{CC} + 0.5V$)
Input Clamp Current, I_{IK} ($V_I < 0V$ or $V_I > V_{CC}$)	$\pm 20mA$ (MAX)
Output Clamp Current, I_{OK} ($V_O < 0V$ or $V_O > V_{CC}$)	$\pm 20mA$ (MAX)
Continuous Output Current, I_O ($V_O = 0V$ to V_{CC})	$\pm 25mA$ (MAX)
Continuous Current through V_{CC} or GND, I_O	$\pm 50mA$ (MAX)
Junction Temperature ⁽³⁾	+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}
Input Transition Rise or Fall Rate, $\Delta t/\Delta V$	
$V_{CC} = 2.0V$	1000ns/V (MAX)
$V_{CC} = 4.5V$	500ns/V (MAX)
$V_{CC} = 5.5V$	400ns/V (MAX)
Operating Temperature Range.....	-40°C to +125°C

OVERSTRESS CAUTION

- 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.
- The input and output voltage ratings may be exceeded if the input and output clamp current ratings are observed.
- The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction temperatures which are detrimental to reliability.

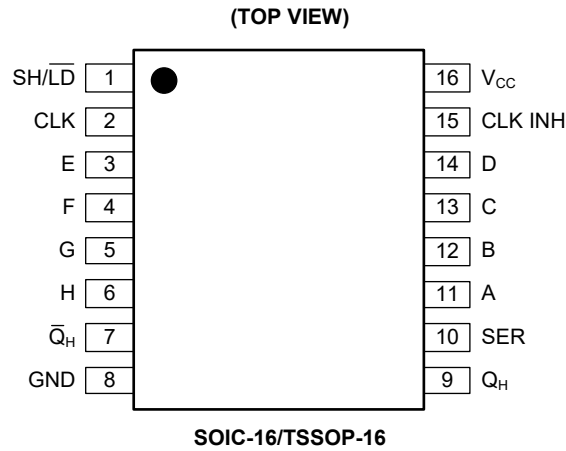
ESD SENSITIVITY CAUTION

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

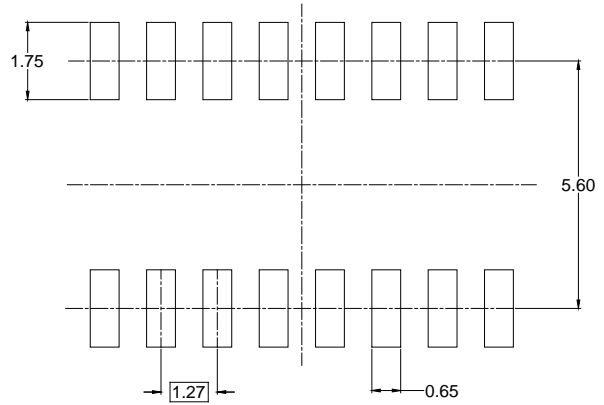
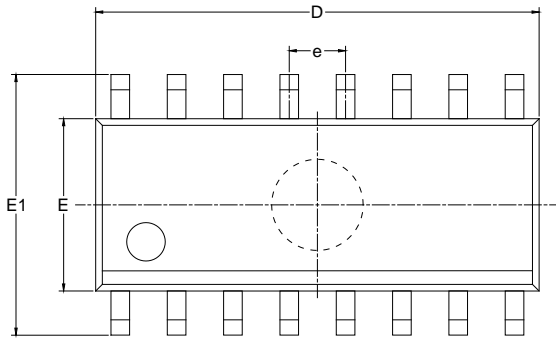


PIN DESCRIPTION

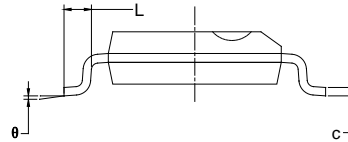
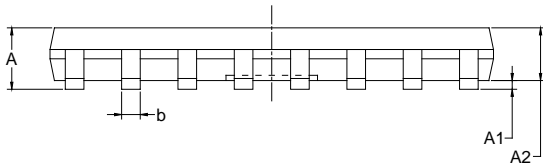
PIN	NAME	FUNCTION
1	SH/ $\overline{\text{LD}}$	Shift/Load Input. Data is shifted at high level and data is loaded from parallel inputs at low level.
2	CLK	Clock Input (LOW-to-HIGH Clock Transition, Edge-Triggered).
3, 4, 5, 6	E, F, G, H	Parallel Inputs.
7	$\overline{\text{QH}}$	Complementary Serial Output.
8	GND	Ground.
9	QH	Serial Output.
10	SER	Serial Input.
11, 12, 13, 14	A, B, C, D	Parallel Inputs.
15	CLK INH	Clock Inhibit Input (Active LOW). There is no change in output at high level.
16	V_{CC}	Supply Voltage.

PACKAGE OUTLINE DIMENSIONS

SOIC-16



RECOMMENDED LAND PATTERN (Unit: mm)



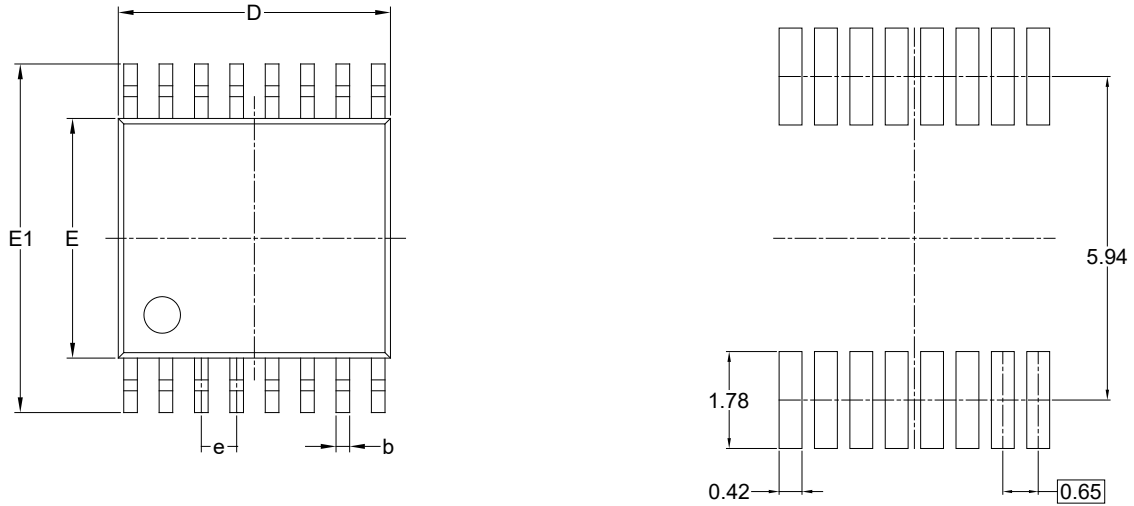
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	9.800	10.200	0.386	0.402
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.27 BSC		0.050 BSC	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

NOTES:

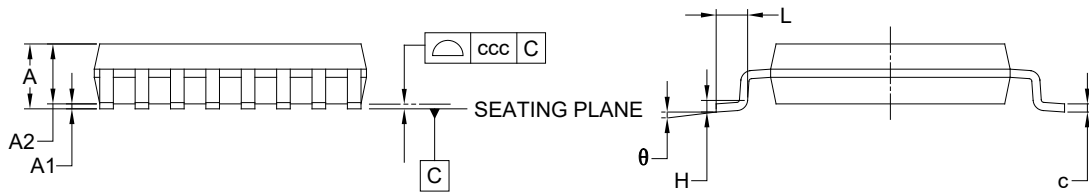
1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.

PACKAGE OUTLINE DIMENSIONS

TSSOP-16



RECOMMENDED LAND PATTERN (Unit: mm)



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		
θ	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-16	13"	16.4	6.50	10.30	2.10	4.0	8.0	2.0	16.0	Q1
TSSOP-16	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