74LVC1G74
Single D-Type Positive Edge-Triggered Flip-Flop with Clear and Preset

GENERAL DESCRIPTION

The 74LVC1G74 is a single D-Type positive edge-triggered flip-flop with clear and preset functions. This device can operate in the supply voltage range from 1.65V to 5.5V. No matter what the levels of the other inputs are, the preset ($\overline{PRE}$) input or clear ($\overline{CLR}$) input can be pulled low to set or reset the outputs. When the preset input and clear input are held high, data at the D input that suffices for setup time purposes is moved to the Q output on the low-to-high clock transition. After the hold time interval, data at the D input can be changed without any influence on output levels. Clock triggering appears at a voltage level which is uncorrelated with the rise time of the clock pulse.

This device is highly suitable for partial power-down applications by using power-off leakage current (I_{OFF}) circuit.

APPLICATIONS

Telecommunication Facilities

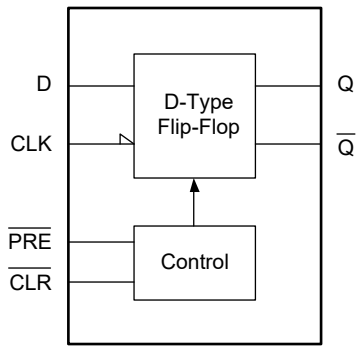
Servers and I/O Expanders

Network Switches

Motor Drivers

LED Displays

LOGIC DIAGRAM



FEATURES

- **Wide Supply Voltage Range: 1.65V to 5.5V**
- **Inputs Accept Voltages Higher than the Supply Voltage**
- **+32mA/-32mA Output Current**
- **Outputs in High-Impedance State when V_{CC} = 0V**
- **-40℃ to +125℃ Operating Temperature Range**
- **Available in Green VSSOP-8, XTDFN-1.4×1-8L and MSOP-8(S) Packages**

FUNCTION TABLE

INPUTS				OUTPUTS	
$\overline{PRE}$	$\overline{CLR}$	CLK	D	Q	$\overline{Q}$
L	H	*X*	*X*	H	L
H	L	*X*	*X*	L	H
L	L	*X*	*X*	H (1)	H (1)
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	L	*X*	Q_0	$\overline{Q}_0$

H = High Voltage Level

L = Low Voltage Level

Z = High-Impedance State

↑ = Low-to-High Clock Transition

X = Don't Care

NOTE:

1. The configuration is unstable that it cannot continue to exist when $\overline{PRE}$ or $\overline{CLR}$ returns to inactive (high) level.

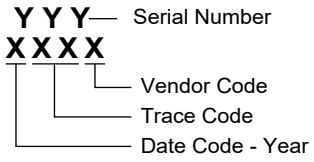
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
74LVC1G74	VSSOP-8	-40℃ to +125℃	74LVC1G74XVS8G/TR	084 XXXX	Tape and Reel, 3000
	XTDFN-1.4×1-8L	-40℃ to +125℃	74LVC1G74XXDO8G/TR	00X	Tape and Reel, 5000
	MSOP-8(S)	-40℃ to +125℃	74LVC1G74XSMS8G/TR	0GB XSMS8 XXXXX	Tape and Reel, 4000

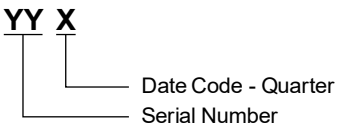
MARKING INFORMATION

NOTE: XXXX = Date Code, Trace Code and Vendor Code. X = Date Code.

VSSOP-8

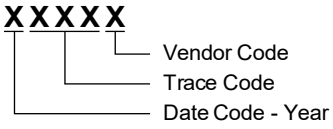


XTDFN-1.4×1-8L



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

MSOP-8(S)



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 Range, V_{CC} ..... -0.5V to 6.5V
Input Voltage Range, V_I (2) ..... -0.5V to 6.5V
Output Voltage Range, V_O (2)
High-State or Low-State..... -0.5V to MIN(6.5V, V_{CC} + 0.5V)
High-Impedance or Power-Off State ..... -0.5V to 6.5V
Input Clamp Current, I_{IK} (V_I < 0V) .....-50mA
Output Clamp Current, I_{OK} (V_O < 0V) .....-50mA
Continuous Output Current, I_O .....±50mA
Continuous Current through V_{CC} or GND.....±100mA
Junction Temperature (3).....+150℃
Storage Temperature Range .....-65℃ to +150℃
Lead Temperature (Soldering, 10s).....+260℃
ESD Susceptibility
HBM.....4000V
CDM 1000V

RECOMMENDED OPERATING CONDITIONS

Supply Voltage Range, V_{CC} ..... 1.65V to 5.5V
Input Voltage Range, V_I (4) ..... 0V to 5.5V
Output Voltage Range, V_O
High-State or Low-State .....0V to V_{CC}
High-Impedance or Power-Off State..... 0V to 5.5V
Output Current, I_O..... ±32mA
Input Transition Rise or Fall Rate, Δt/ΔV
V_{CC} = 1.8V ± 0.15V, 2.5V ± 0.2V ..... 20ns/V (MAX)
V_{CC} = 3.3V ± 0.3V..... 10ns/V (MAX)
V_{CC} = 5.0V ± 0.5V..... 5ns/V (MAX)
Operating Temperature Range..... -40℃ to +125℃

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.

4. Unused input pins must be held at V_{CC} or GND to guarantee the device in normal operation.

ESD SENSITIVITY CAUTION

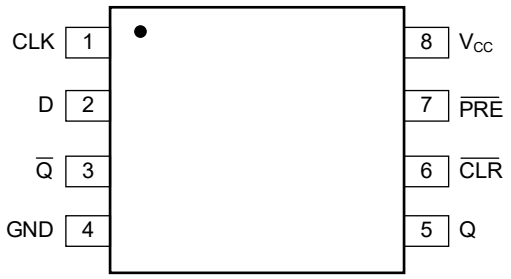
This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance 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.

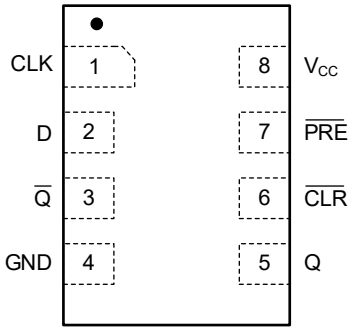
PIN CONFIGURATIONS

(TOP VIEW)



VSSOP-8/MSOP-8(S)

(TOP VIEW)



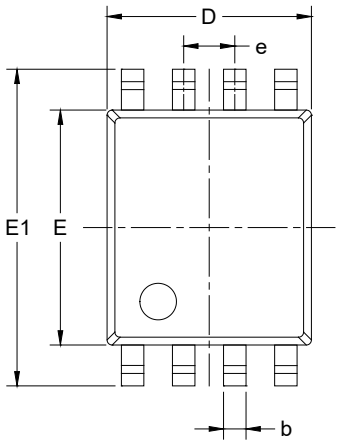
XTDFN-1.4×1-8L

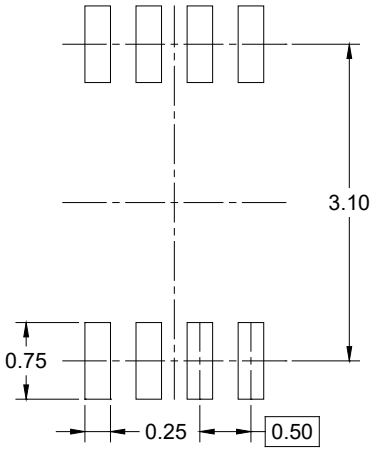
PIN DESCRIPTION

PIN	NAME	FUNCTION
1	CLK	Clock Input (Low-to-High Clock Transition, Edge-Triggered).
2	D	Data Input.
3	$\overline{Q}$	Complementary Output.
4	GND	Ground.
5	Q	Output.
6	$\overline{CLR}$	Clear Input (Active-Low).
7	$\overline{PRE}$	Preset Input (Active-Low).
8	V_{CC}	Supply Voltage.

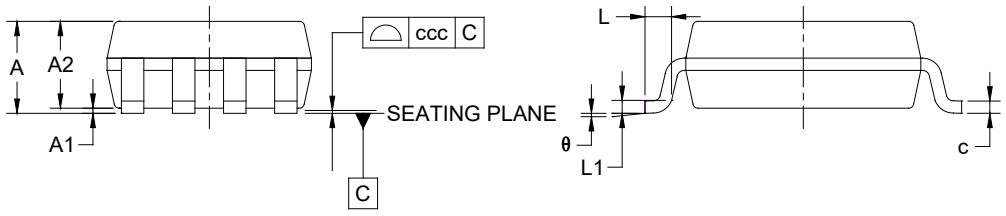
PACKAGE OUTLINE DIMENSIONS

VSSOP-8





RECOMMENDED LAND PATTERN (Unit: mm)

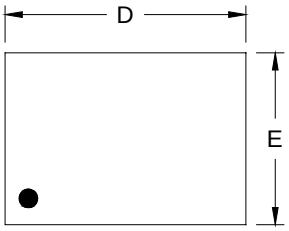


Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	-	-	1.000
A1	0.000	-	0.150
A2	0.600		0.850
b	0.170	-	0.270
c	0.080		0.230
D	1.900	-	2.100
E	2.200	-	2.400
E1	3.000	-	3.200
e	0.500 BSC		
L	0.150	-	0.400
L1	0.120 BSC		
θ	0°	-	8°
ccc	0.100		

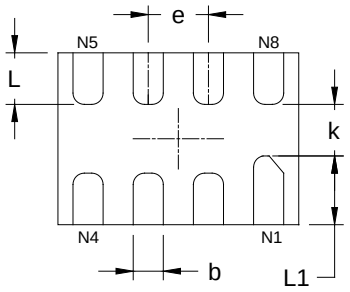
NOTES:
1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-187 CA.

PACKAGE OUTLINE DIMENSIONS

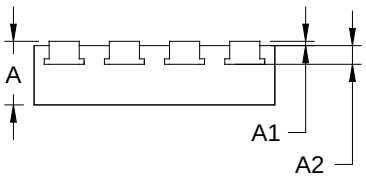
XTDFN-1.4×1-8L



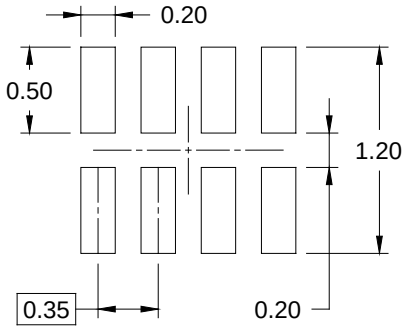
TOP VIEW



BOTTOM VIEW



SIDE VIEW



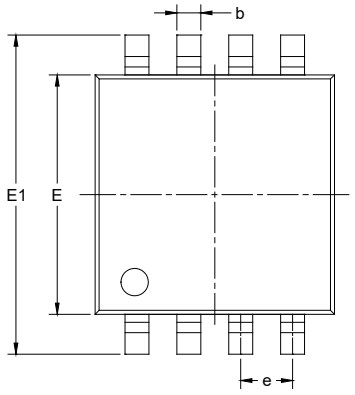
RECOMMENDED LAND PATTERN (Unit: mm)

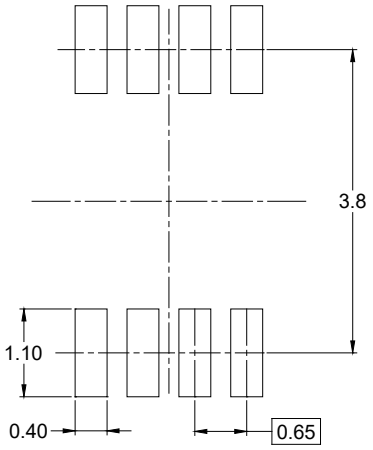
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.340	0.400	0.013	0.016
A1	0.000	0.050	0.000	0.002
A2	0.110 REF		0.004 REF	
D	1.350	1.450	0.053	0.057
E	0.950	1.050	0.037	0.041
k	0.200 MIN		0.008 MIN	
b	0.150	0.200	0.006	0.008
e	0.350 TYP		0.014 TYP	
L	0.250	0.350	0.010	0.014
L1	0.350	0.450	0.014	0.018

NOTE: This drawing is subject to change without notice.

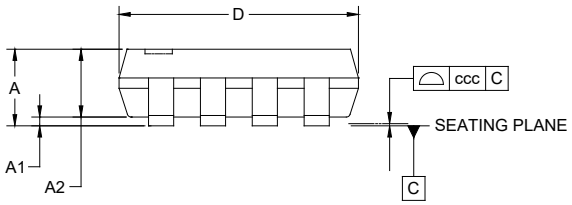
PACKAGE OUTLINE DIMENSIONS

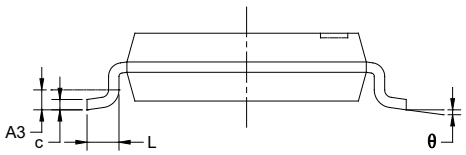
MSOP-8(S)





RECOMMENDED LAND PATTERN (Unit: mm)



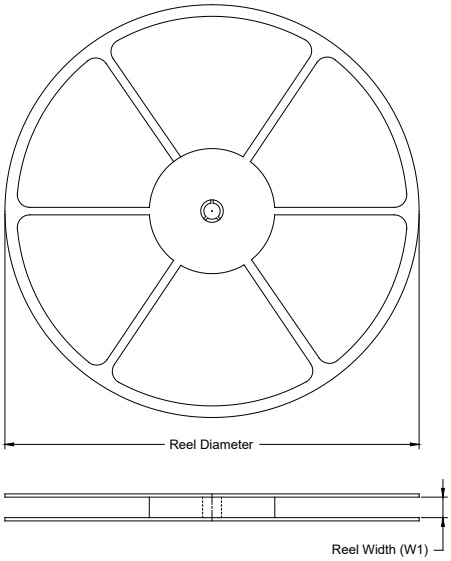


Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	-	-	1.350
A1	0.000	-	0.150
A2	0.850 REF		
A3	0.250 REF		
b	0.150	-	0.380
c	0.080	-	0.180
D	2.750	-	3.150
E	2.600	-	3.100
E1	3.750	-	4.250
e	0.650 BSC		
L	0.200	-	0.600
θ	0°	-	8°
ccc	0.100		

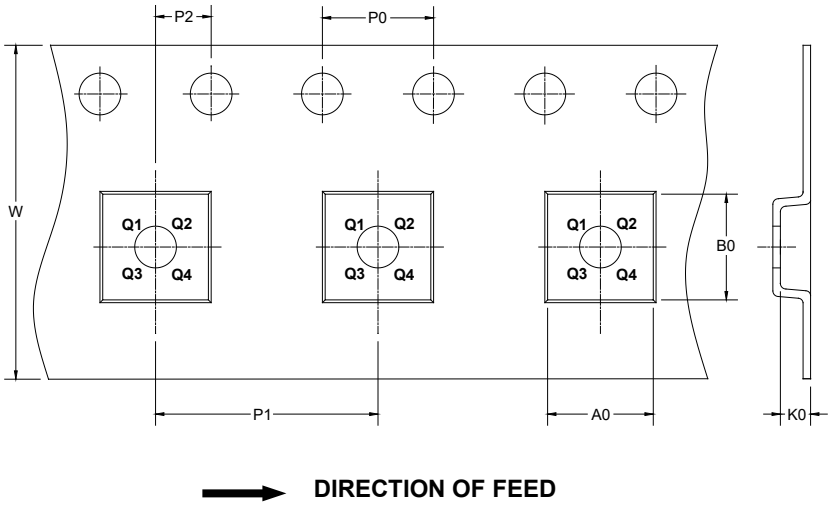
NOTES:
1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-187.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



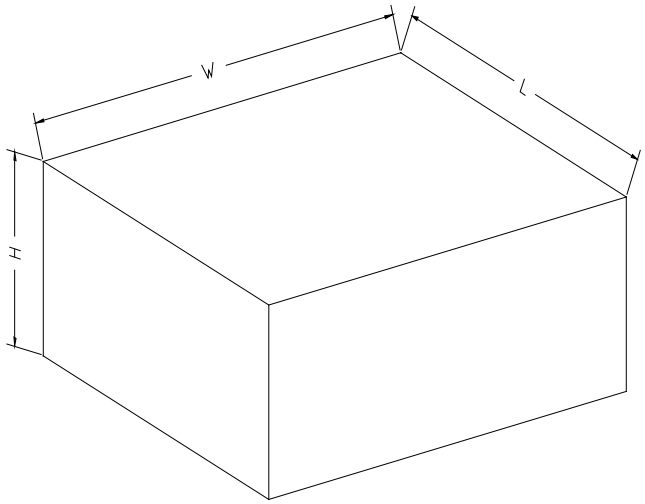
NOTE: The picture is only for reference. Please make the object as the standard.

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
VSSOP-8	7″	9.5	2.25	3.35	1.05	4.0	4.0	2.0	8.0	Q3
XTDFN-1.4×1-8L	7"	9.5	1.15	1.60	0.50	4.0	4.0	2.0	8.0	Q1
MSOP-8(S)	13"	12.4	3.25	4.30	1.50	4.0	4.0	2.0	12.0	Q3

DD0001

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
7″ (Option)	368	227	224	8
7″	442	410	224	18
13″	386	280	370	5

DD0002