

## 1.Description

The UMW 74LVC1G19 is a high-performance non-inverting 1-to-2 demultiplexer. With the Select input [S] at Low, data at A is passed to Y0 and Y1 is set to high impedance. With the Select input [S] at High, data at A is passed to Y1 and Y0 is set to high impedance. The device operates over the voltage range from 1.65V to 5.5V. This device has been optimized for on-board buffering applications and offers mixed (1.65V, 2.3V, 3.0V and 5.5V) voltage capability by providing over voltage tolerance (OVT) circuitry on I/O pins.

## 2.Features

- Designed for 1.65V to 5.5V VCC Operation
- High-Speed Propagation Delay tPD  
2.9nS (Typ)@3.3V, Load 50pF
- Power Down Impedance Outputs in High-Z
- Output Drive Capability 32mA
- These Devices are Pb-Free and are RoHS Compliant
- Packages are SC70-6, SOT23-6 or small DFN6
- MSL3(SC70-6, SOT23-6, DFN6)

## 3.Pinning information

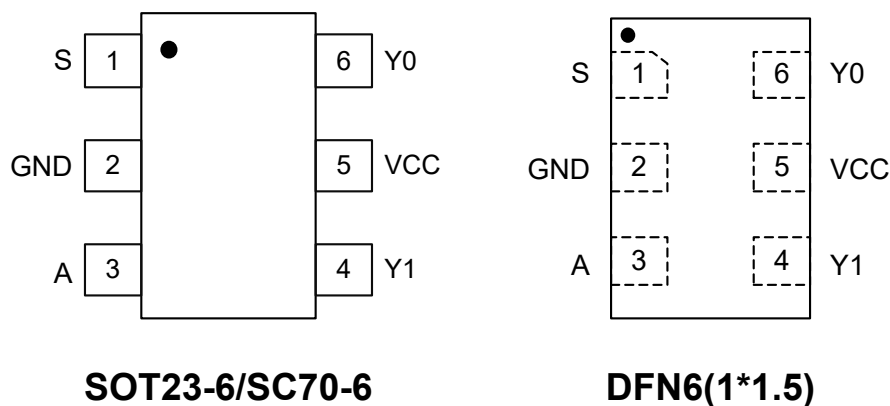


Figure1. Top View

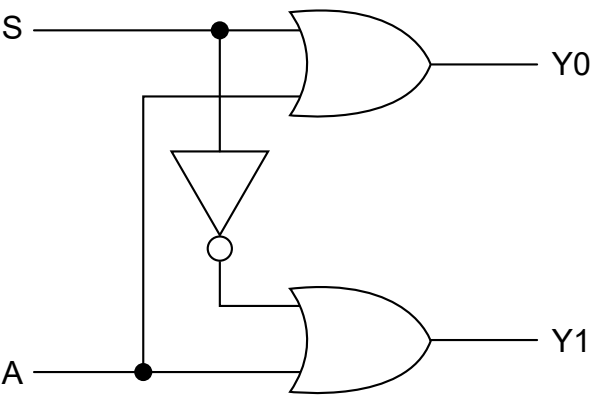


4.Pin Function

| Pin No. | Pin Name | Function             |
|---------|----------|----------------------|
| 1       | S        | Demultiplexer Select |
| 2       | GND      | Ground               |
| 3       | A        | Data input           |
| 4       | Y1       | Output 2             |
| 5       | VCC      | Power                |
| 6       | Y0       | Output 1             |



5.Block Diagram



Function Table

| Input |   | Output |    |
|-------|---|--------|----|
| S     | A | Y0     | Y1 |
| L     | L | L      | H  |
| L     | H | H      | H  |
| H     | L | H      | L  |
| H     | H | H      | H  |



## 6. Absolute Maximum Ratings

| Parameter                                            |                      | Symbol    | Value                  | Units |
|------------------------------------------------------|----------------------|-----------|------------------------|-------|
| DC Supply Voltage                                    |                      | $V_{CC}$  | -0.5 to 7              | V     |
| DC Input Voltage                                     |                      | $V_I$     | $-0.5 \leq V_I \leq 7$ | V     |
| DC Output Voltage Output in Higher or Low State      |                      | $V_O$     | -0.5 to 0.5            | V     |
| DC Input Diode Current $V_I < GND$                   |                      | $I_{IK}$  | -50                    | mA    |
| DC Output Diode Current $V_O < GND, V_O > V_{CC}$    |                      | $I_{OK}$  | $\pm 50$               | mA    |
| DC Output Sink Current                               |                      | $I_O$     | $\pm 50$               | mA    |
| DC Supply Current per Supply Pin                     |                      | $I_{CC}$  | $\pm 100$              | mA    |
| Storage Temperature Range                            |                      | $T_{STG}$ | -65 to 150             | °C    |
| Lead Temperature, 1 mm from Case for 10 Seconds      |                      | $T_L$     | 260                    | °C    |
| Max Junction Temperature                             |                      | $T_J$     | 150                    | °C    |
| ESD Classification                                   | Human Body Model     | $V_{ESD}$ | $\pm 4000$             | V     |
|                                                      | Charged Device Model |           | $\pm 1000$             | V     |
| Max Latch up Current Above $V_{CC}$ and GND at 125°C |                      | $I_{LU}$  | $\pm 100$              | mA    |



## 7. Thermal Characteristics

| Ratings                                                      | Package       | Symbol          | Value | Units |
|--------------------------------------------------------------|---------------|-----------------|-------|-------|
| Thermal Characteristics, Thermal Resistance, Junction-to-Air | SC70-6        | $R_{\theta JA}$ | 280   | °C/W  |
|                                                              | SOT23-6       |                 | 180   |       |
|                                                              | DFN6(1.0x1.5) |                 | 440   |       |
| Power Dissipation in Still Air at 85°C                       | SC70-6        | $P_D$           | 230   | mW    |
|                                                              | SOT23-6       |                 | 360   |       |
|                                                              | DFN6(1.0x1.5) |                 | 150   |       |

## 8. Recommended Operating Conditions

| Parameter                             |                              | Symbol                          | Min  | Max | Unit |
|---------------------------------------|------------------------------|---------------------------------|------|-----|------|
| DC Supply Voltage Operating           |                              | V <sub>CC</sub>                 | 1.65 | 5.5 | V    |
| Date Retention                        |                              |                                 | 1.5  | 5.5 | V    |
| DC Input Voltage                      |                              | V <sub>IN</sub>                 | 0    | 5.5 | V    |
| DC Output Voltage (High or Low State) |                              | V <sub>OUT</sub>                | 0    | 5.5 | V    |
| Operating Temperature Range           |                              | T <sub>A</sub>                  | -40  | 85  | °C   |
| Input Rise and Fall Time              | V <sub>CC</sub> =2.5V ± 0.2V | t <sub>r</sub> , t <sub>f</sub> | 0    | 20  | ns/V |
|                                       | V <sub>CC</sub> =3V ± 0.3V   |                                 | 0    | 10  | ns/V |
|                                       | V <sub>CC</sub> =5V ± 0.5V   |                                 | 0    | 5   | ns/V |

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied.



## 9.DC Electrical Characteristics

| Parameter                 | Condition                       | Symbol    | $V_{CC}(V)$  | $T_A=25^{\circ}C$ |           |              | $-40^{\circ}C \leq T_A \leq 85^{\circ}C$ |              | Units   |
|---------------------------|---------------------------------|-----------|--------------|-------------------|-----------|--------------|------------------------------------------|--------------|---------|
|                           |                                 |           |              | Min               | Typ       | Max          | Min                                      | Max          |         |
| High-Level Input Voltage  |                                 | $V_{IH}$  | 1.65 to 1.95 | $0.75V_{CC}$      |           |              | $0.75V_{CC}$                             |              | V       |
|                           |                                 |           | 2.3 to 5.5   | $0.7V_{CC}$       |           |              | $0.7V_{CC}$                              |              |         |
| Low-Level Input Voltage   |                                 | $V_{IL}$  | 1.65 to 1.95 |                   |           | $0.25V_{CC}$ |                                          | $0.25V_{CC}$ |         |
|                           |                                 |           | 2.3 to 5.5   |                   |           | $0.3V_{CC}$  |                                          | $0.3V_{CC}$  |         |
| High-Level Output Voltage | $I_{OH}=-100\mu A$              | $V_{OH}$  | 1.65 to 5.5  | $V_{CC}-0.1$      | $V_{CC}$  |              | $V_{CC}-0.1$                             |              | V       |
|                           | $I_{OH}=-3mA$                   |           | 1.65         | 1.29              | 1.52      |              | 1.29                                     |              |         |
|                           | $I_{OH}=-8mA$                   |           | 2.3          | 1.9               | 2.1       |              | 1.9                                      |              |         |
|                           | $I_{OH}=-12mA$                  |           | 2.7          | 2.2               | 2.4       |              | 2.2                                      |              |         |
|                           | $I_{OH}=-16mA$                  |           | 3            | 2.4               | 2.7       |              | 2.4                                      |              |         |
|                           | $I_{OH}=-24mA$                  |           | 3            | 2.3               | 2.5       |              | 2.3                                      |              |         |
|                           | $I_{OH}=-32mA$                  |           | 4.5          | 3.8               | 4         |              | 3.8                                      |              |         |
| Low-Level Output Voltage  | $I_{OH}=100\mu A$               | $V_{OL}$  | 1.65 to 5.5  |                   | 0.0       | 0.1          |                                          | 0.1          | V       |
|                           | $I_{OL}=3mA$                    |           | 1.65         |                   | 0.08      | 0.24         |                                          | 0.24         |         |
|                           | $I_{OL}=8mA$                    |           | 2.3          |                   | 0.2       | 0.3          |                                          | 0.3          |         |
|                           | $I_{OL}=12mA$                   |           | 2.7          |                   | 0.22      | 0.4          |                                          | 0.4          |         |
|                           | $I_{OL}=16mA$                   |           | 3            |                   | 0.28      | 0.4          |                                          | 0.4          |         |
|                           | $I_{OL}=24mA$                   |           | 3            |                   | 0.38      | 0.55         |                                          | 0.55         |         |
|                           | $I_{OL}=32mA$                   |           | 4.5          |                   | 0.42      | 0.55         |                                          | 0.55         |         |
| Input Leakage Current     | $V_{IN}=5.5V$ or GND            | $I_{IN}$  | 0 to 5.5     |                   | $\pm 0.1$ |              |                                          | $\pm 1$      | $\mu A$ |
| Power Off Leakage Current | $V_{IN}=5.5V$ or $V_{OUT}=5.5V$ | $I_{OFF}$ | 0            |                   |           | 1            |                                          | 10           |         |
| Quiescent Supply Current  | $V_{IN}=5.5V$ or GND            | $I_{CC}$  | 5.5          |                   |           | 1            |                                          | 10           |         |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.



## 10.AC Electrical Characteristics

$t_r = t_f = 5\text{ns}$ ;

| Parameter                             | Condition                              | Symbol             | $V_{CC}(V)$   | $T_A=25^\circ\text{C}$ |     |      | $-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$ |     | Units |
|---------------------------------------|----------------------------------------|--------------------|---------------|------------------------|-----|------|----------------------------------------------------|-----|-------|
|                                       |                                        |                    |               | Min                    | Typ | Max  | Min                                                | Max |       |
| Propagation Delay<br>(Figure 3 and 4) | $R_L=1\text{M}\Omega, C_L=15\text{pF}$ | $t_{PLH}, t_{PHL}$ | 1.65          | 2                      | 5.3 | 11.4 | 2                                                  | 12  | ns    |
|                                       |                                        |                    | 1.8           | 2                      | 4.4 | 9.5  | 2                                                  | 10  |       |
|                                       | $R_L=1\text{M}\Omega, C_L=15\text{pF}$ |                    | $2.5 \pm 0.2$ | 0.2                    | 3.5 | 6.5  | 0.8                                                | 7   |       |
|                                       | $R_L=1\text{M}\Omega, C_L=15\text{pF}$ |                    | $3.3 \pm 0.3$ | 0.8                    | 2.1 | 4.5  | 0.5                                                | 4.7 |       |
|                                       | $R_L=500\Omega, C_L=50\text{pF}$       |                    |               | 1.2                    | 2.9 | 5.5  | 1.5                                                | 5.2 |       |
|                                       | $R_L=1\text{M}\Omega, C_L=15\text{pF}$ |                    | $5.0 \pm 0.5$ | 0.5                    | 1.8 | 3.9  | 0.5                                                | 4.1 |       |
|                                       | $R_L=500\Omega, C_L=50\text{pF}$       |                    |               | 0.8                    | 2.4 | 4.3  | 0.8                                                | 4.5 |       |

## 11.Capacitance Characteristics

| Parameter                                    | Symbol   | Condition                                             | Typ  | Units |
|----------------------------------------------|----------|-------------------------------------------------------|------|-------|
| Input Capacitance                            | $C_{IN}$ | $V_{CC}=5.5\text{V}, V_I=0\text{V or } V_{CC}$        | >2.5 | pF    |
| Power Dissipation Capacitance <sup>(2)</sup> | $C_{PD}$ | 10MHz, $V_{CC}=3.3\text{V}, V_I=0\text{V or } V_{CC}$ | 9    | pF    |
|                                              |          | 10MHz, $V_{CC}=5.5\text{V}, V_I=0\text{V or } V_{CC}$ | 11   | pF    |

Notes2:

$C_{PD}$  is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.



## 12. Test Waveform

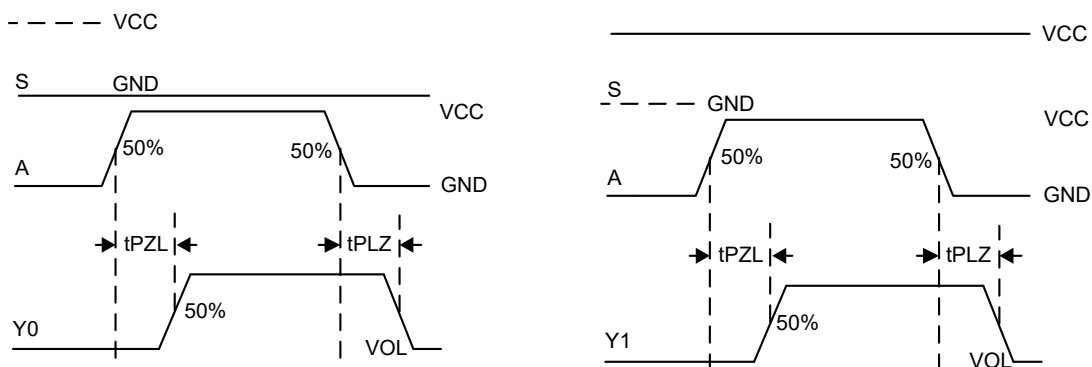


Figure3. Switching Waveforms

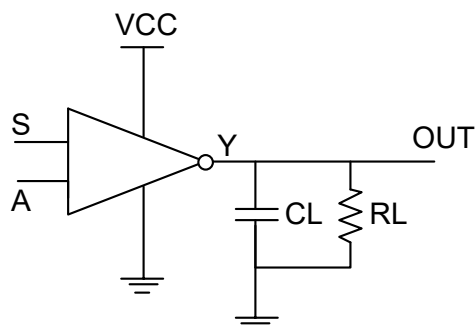
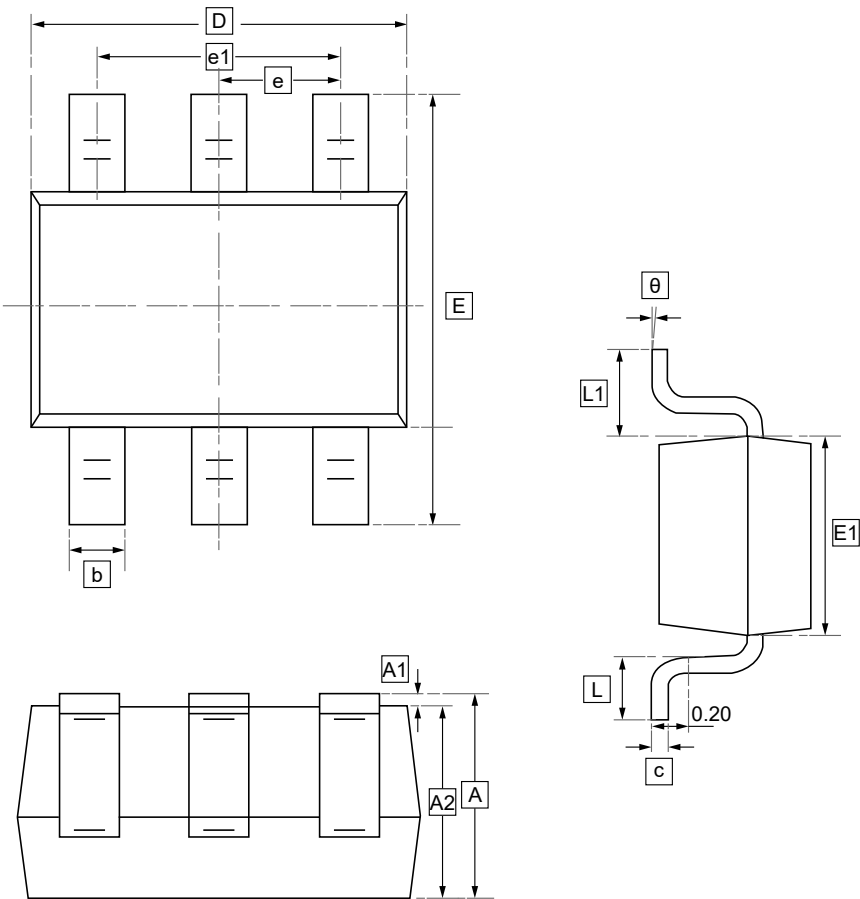


Figure4. Test Circuit





13.1 SC70-6 Package Outline Dimensions



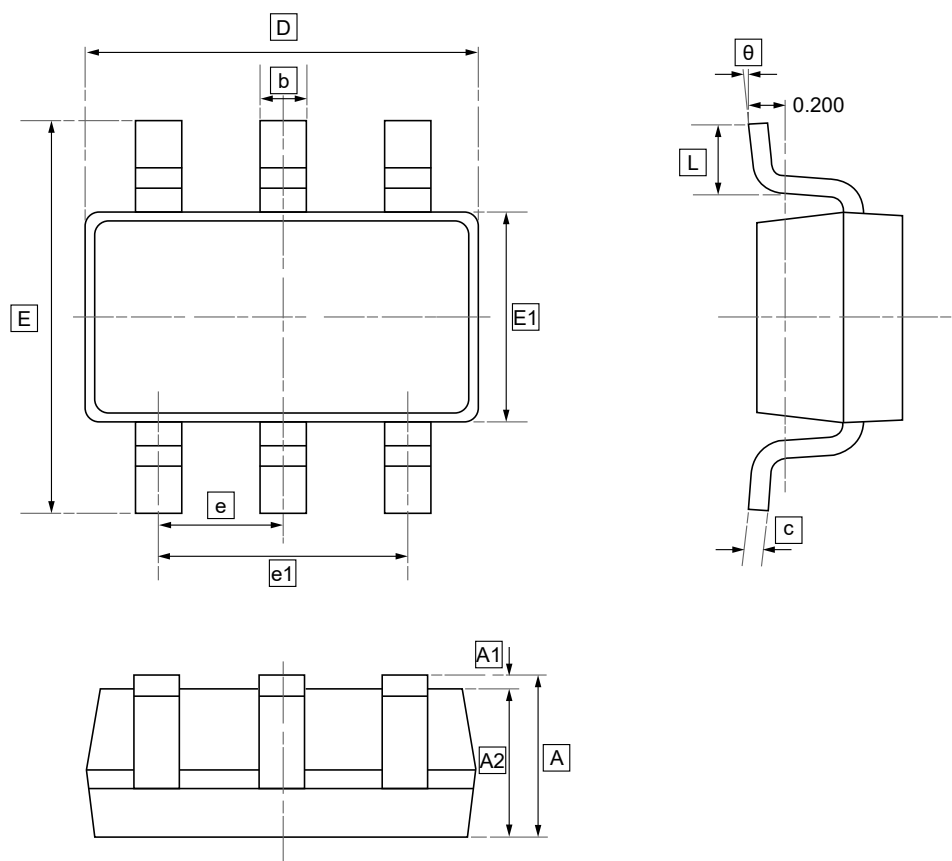
DIMENSIONS (mm are the original dimensions)

| Symbol | A    | A1   | A2   | b    | c    | D    | E    | E1   | e    | e1  | L    | L1    |
|--------|------|------|------|------|------|------|------|------|------|-----|------|-------|
| Min    | 0.90 | 0.00 | 0.90 | 0.15 | 0.08 | 2.05 | 2.15 | 1.15 | 0.65 | 1.2 | 0.26 | 0.525 |
| Max    | 1.10 | 0.10 | 1.00 | 0.35 | 0.15 | 2.25 | 2.45 | 1.35 | TYP. | 1.4 | 0.46 | REF.  |

| Symbol | θ  |
|--------|----|
| Min    | 0° |
| Max    | 8° |



13.2 SOT23-6 Package Outline Dimensions

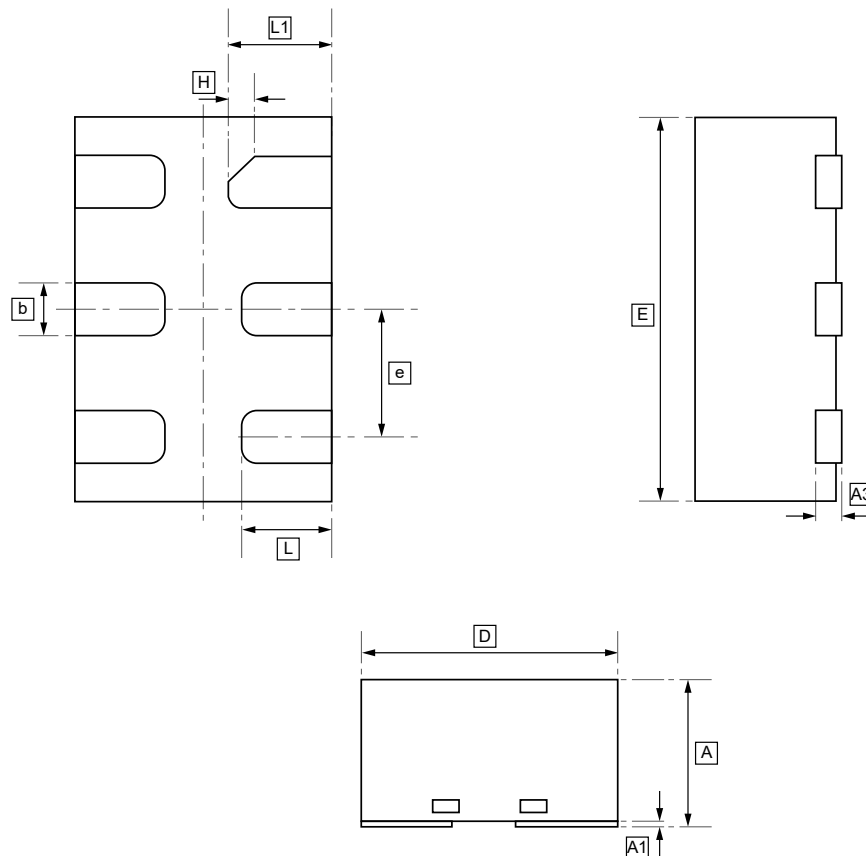


DIMENSIONS (mm are the original dimensions)

| Symbol | A     | A1    | A2    | b     | c     | D     | E1    | E     | e     | e1    | L     | θ  |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| Min    | 1.050 | 0.000 | 1.050 | 0.300 | 0.100 | 2.820 | 1.500 | 2.650 | 0.950 | 1.800 | 0.300 | 0° |
| Max    | 1.250 | 0.100 | 1.150 | 0.500 | 0.200 | 3.020 | 1.700 | 2.950 | BSC   | 2.000 | 0.600 | 8° |



### 13.3 DFN6(1\*1.5) Package Outline Dimensions

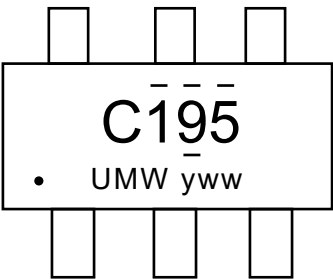


**DIMENSIONS (mm are the original dimensions)**

| Symbol | A    | A1   | A3   | b    | D    | E    | e    | H    | L    | L1   |
|--------|------|------|------|------|------|------|------|------|------|------|
| Min    | 0.50 | 0    | 0.10 | 0.15 | 0.90 | 1.40 | 0.40 | 0.10 | 0.30 | 0.35 |
| Max    | 0.60 | 0.05 | REF  | 0.25 | 1.10 | 1.60 | 0.60 | REF  | 0.40 | 0.45 |



14.Ordering information



yww: Batch Code

| Order Code          | Marking | Package | Base QTY | Delivery Mode |
|---------------------|---------|---------|----------|---------------|
| UMW SN74LVC1G19DBVR | C195    | SOT23-6 | 3000     | Tape and reel |
| UMW SN74LVC1G19DCKR | CYF     | SC70-6  | 3000     | Tape and reel |
| UMW SN74LVC1G19DRYR | CY      | DFN6    | 5000     | Tape and reel |



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