

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

## USBLC6-2SC6-MS

Product specification

## Description

The USBLC6-2SC6-MS are monolithic application specific devices dedicated to ESD protection of high speed interfaces, such as USB 2.0, Ethernet links and video lines. The very low line capacitance secures a high level of signal integrity without compromising in protecting sensitive chips against the most stringently characterized ESD strikes.

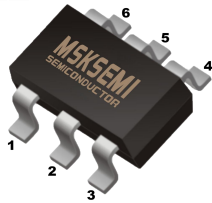
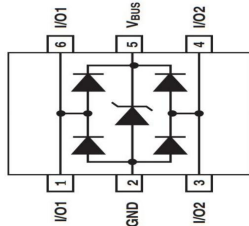

## Features and benefits

- ESD Protect for 2 high-speed I/O channels
- Provide ESD protection for each channel to IEC 61000-4-2(ESD)  $\pm 30\text{kV}$ (air),  $\pm 30\text{kV}$ (contact)
- Low Working Voltage: 5.0V
- Low Capacitance: 0.8pF (I/O-GND)
- Low Clamping Voltage
- Response time is typically  $< 1\text{ ns}$
- Array of surge rated diodes with internal equivalent TVS diodes
- Small package saves board space
- RoHS compliant

## Application information

- Video Graphics Cards
- USB2.0 Power and Data lines protection
- 10/100/1000 Ethernet
- Notebooks and PC Computers
- IEEE 1394 Firewire Ports
- Portable electronics
- SIM ports

## Reference News

| SOT23-6   | Graphic symbol  | Marking   |
|---|---|---|
|  |  |  |

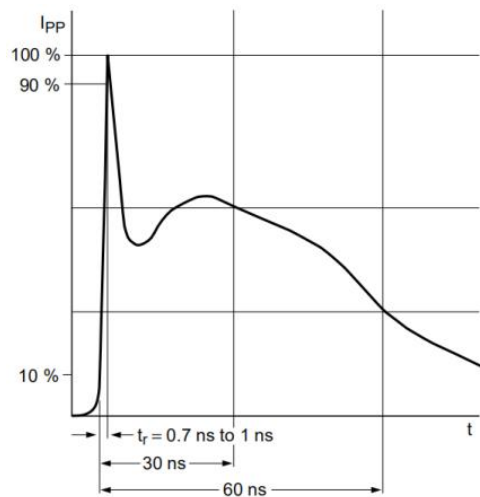
**Maximum Ratings** ( $T_{OP} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| Parameter  | Symbol    | Value       | Unit               |
|--|-----------|-------------|--------------------|
| Peak Pulse Power ( $T_p = 8/20\mu\text{s}$ )         | $P_{PPM}$ | 78          | W                  |
| Rated Peak Pulse Current ( $T_p = 8/20\mu\text{s}$ ) | $I_{PPM}$ | 6           | A                  |
| ESD voltage IEC 61000-4-2 (air discharge)            | $V_{ESD}$ | 30          | kV                 |
| ESD voltage IEC 61000-4-2 (contact discharge)        | $V_{ESD}$ | 30          | kV                 |
| Maximum lead temperature for soldering during 10s    | $T_L$     | 260         | $^{\circ}\text{C}$ |
| Storage Temperature Range                            | $T_{stg}$ | -55 to +150 | $^{\circ}\text{C}$ |
| Operating Temperature Range                          | $T_{OP}$  | -40 to +125 | $^{\circ}\text{C}$ |

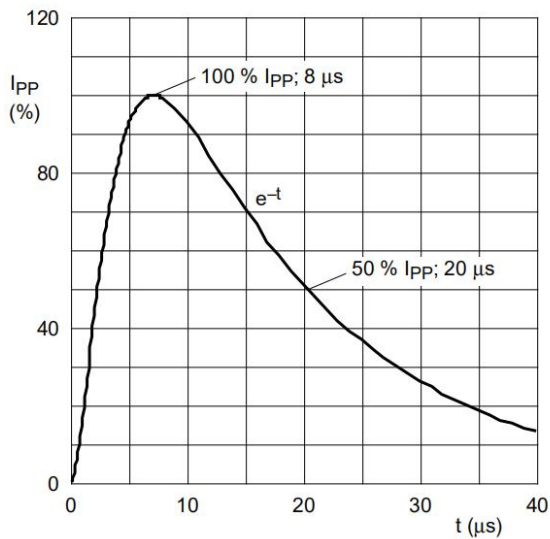
**Electrical Characteristics** ( $T_{OP} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| Parameter                        | Symbol    | Min | Typ  | Max  | Unit | Condition  |
|----------------------------------|-----------|-----|------|------|------|--|
| Reverse Working Voltage          | $V_{RWM}$ | --  | --   | 5.0  | V    |  |
| Breakdown Voltage                | $V_{BR}$  | 6.5 | --   | 9.0  | V    | $I_r = 1\text{mA}$                               |
| Leakage Current $I_{Leak}$       | $I_r$     | --  | --   | 100  | nA   | $V_{RWM} = 5\text{V}$                            |
| Clamping Voltage( $I/O$ -GND)    | $V_C$     | --  | 11.0 | 13.0 | V    | $I_{PP} = 6\text{A}$ , $T_p = 8/20\mu\text{s}$   |
| Clamping Voltage( $V_{DD}$ -GND) | $V_C$     | --  | 11.0 | 13.0 | V    | $I_{PP} = 8\text{A}$ , $T_p = 8/20\mu\text{s}$   |
| Junction Capacitance             | $C_j$     | --  | 0.4  | 0.5  | pF   | $V_R = 0\text{V}$ , $f = 1\text{MHz}$ I/O to I/O |
| Junction Capacitance             | $C_j$     | --  | 0.8  | 1.0  | pF   | $V_R = 0\text{V}$ , $f = 1\text{MHz}$ I/O to GND |

TypicalCharacteristics

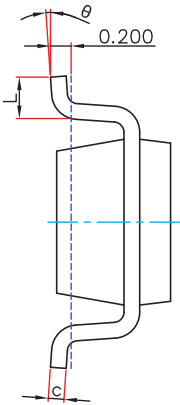
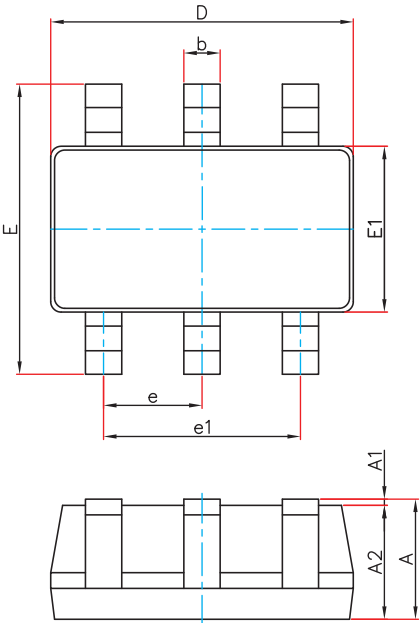


IEC61000-4-2 Waveform



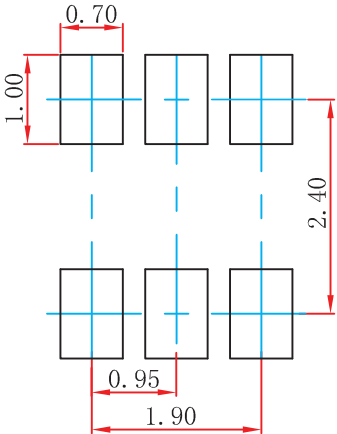
IEC 61000-4-5 Waveform( 8/20 $\mu$ s pulse)

SOT-23-6 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 1.050                     | 1.150 | 0.041                | 0.045 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 2.820                     | 3.020 | 0.111                | 0.119 |
| E1     | 1.500                     | 1.700 | 0.059                | 0.067 |
| E      | 2.650                     | 2.950 | 0.104                | 0.116 |
| e      | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.300                     | 0.600 | 0.012                | 0.024 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

SOT-23-6 Suggested Pad Layout



Note:  
1.Controlling dimension:in millimeters.  
2.General tolerance:± 0.05mm.  
3.The pad layout is for reference purposes only.

REEL SPECIFICATION

| P/N            | PKG      | QTY  |
|----------------|----------|------|
| USBLC6-2SC6-MS | SOT-23-6 | 3000 |

### Attention

■ Any and all MSKSEMI Semiconductor products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your MSKSEMI Semiconductor representative nearest you before using any MSKSEMI Semiconductor products described or contained herein in such applications.

■ MSKSEMI Semiconductor assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specification of any and all MSKSEMI Semiconductor products described or contained herein.

■ Specifications of any and all MSKSEMI Semiconductor products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

■ MSKSEMI Semiconductor strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.

■ In the event that any or all MSKSEMI Semiconductor products (including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.

■ No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of MSKSEMI Semiconductor.

■ Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. MSKSEMI Semiconductor believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringement of intellectual property rights or other rights of third parties.

■ Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the MSKSEMI Semiconductor product that you intend to use.