四通道、低电容ESD保护二极管阵列

UESD6V8V4A SC70-6/SC88/SOT363
UESD6V8V4B SC89-6/SOT563/SOT666
UESD6V8V4C TSOP-6/SOT23-6

描述

UESD6V8V4X系列浪涌额定二极管阵列专为高速数据接口的防护设计，其核心功能是保护连接在数据及传输线路上的敏感元件，使其免受静电放电（ESD）引发的过压损坏。

该器件采用的独特设计，将浪涌额定值、低电容转向二极管和一个TVS二极管集成在一个封装中。在瞬态条件下，转向二极管会将瞬态电压导向电源线的正极或接地端。内部 TVS二极管可防止电源线上出现过压，从而保护所有下游元件。

UESD6V8V4X 的低电容阵列配置允许用户保护四条高速数据或传输线路。低电感结构最大程度地减少了大浪涌电流时的过冲电压。该器件针对便携式电子设备的ESD保护进行了优化，可满足IEC 61000-4-2标准的第4级抗扰度要求：±15kV 空气间隙放电和 ±8kV 接触放电。

应用

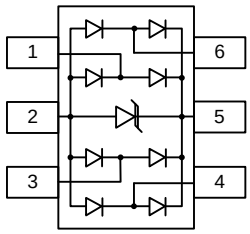
- USB 2.0
- USB OTG
- 显示器和平板
- 显示器数字视频接口（DVI）
- 高清多媒体接口（HDMI）
- SIM 端口
- IEEE 1394 火线端口

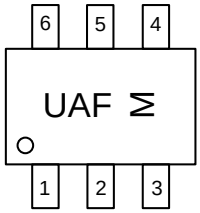
特性

- 高速数据线瞬态保护，符合IEC 61000-4-2标准：
  ±15kV（空气间隙放电）
  ±8kV（接触放电）
- 带内部 TVS 二极管的浪涌额定二极管阵列
- 最多可保护四条I/O线和电源线
- 适用于高速接口的低电容特性
- 低漏电流和钳位电压
- 低工作电压：5.0V
- 固态硅雪崩技术

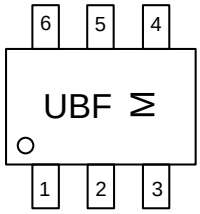
引脚配置

顶部视图

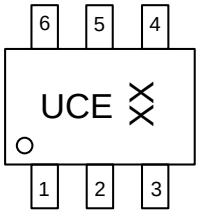




M: Month Code
UESD6V8V4A
SC70-6/SC88/SOT363



M: Month Code
UESD6V8V4B
SC89-6/SOT563/SOT666



XX: Week Code
UESD6V8V4C
TSOP-6/SOT23-6

Ordering Information

Part Number	Working Voltage	Packaging Type	Channel	Marking Code	Shipping Qty
UESD6V8V4A	5.0V	SC70-6/SC88/SOT363	4	UAF	3000pcs/7Inch Tape & Reel
UESD6V8V4B		SC89-6/SOT563/SOT666		UBF	
UESD6V8V4C		TSOP-6/SOT23-6		UCE	

Absolute Maximum Ratings

Rating	Symbol	Value	Unit
Peak Pulse Power (t_P=8/20μs)	P_{pk}	150	Watts
Peak Pulse Current (t_P=8/20μs)	I_{PP}	6	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	15 8	kV
Operating Temperature	T_J	-55 to +125	℃
Storage Temperature	T_{STG}	-55 to +150	℃

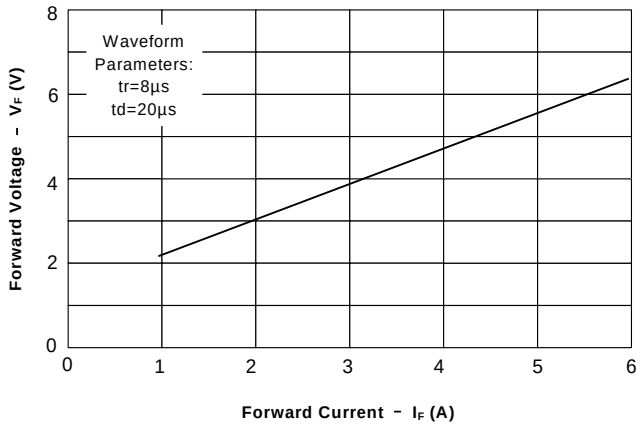
Electrical Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Stand-Off Voltage	V_{RWM}				5.0	V
Reverse Breakdown Voltage	V_{BR}	I_T=1mA, Pin 5 to 2	6.0			V
Reverse Leakage Current	I_R	V_{RWM}=5V, T=25 ℃ Pin 5 to 2			2	μA
Clamping Voltage	V_C	I_{PP}=1A, 8/20μs Any Pin to Pin 2			15	V
Clamping Voltage	V_C	I_{PP}=6A, 8/20μs Any Pin to Pin 2			25	V
Junction Capacitance	C_j	V_R=0V, f=1MHz Any I/O Pin to Pin 2 (Note 1)			2	pF
		V_R=0V, f=1MHz Between I/O Pins (Note 1)			1	pF

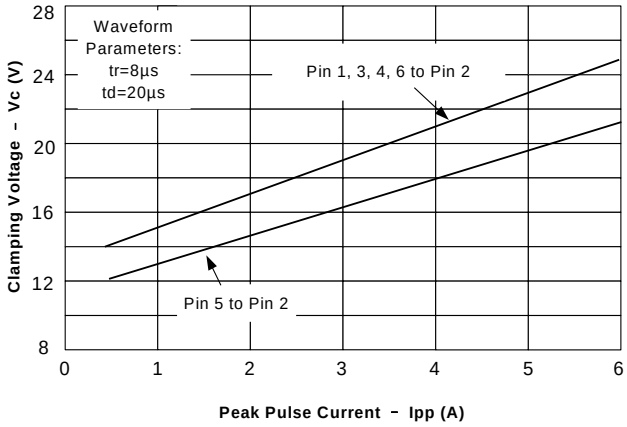
Note 1: I/O pins are pin 1, 3, 4, and 6

Typical Operating Characteristics

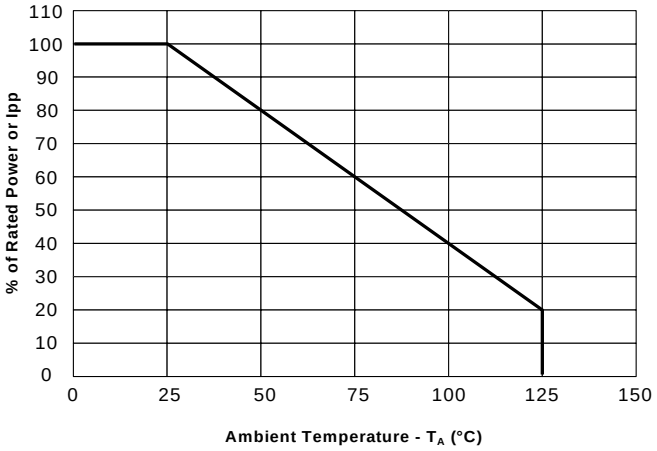
Forward Voltage vs. Forward Current



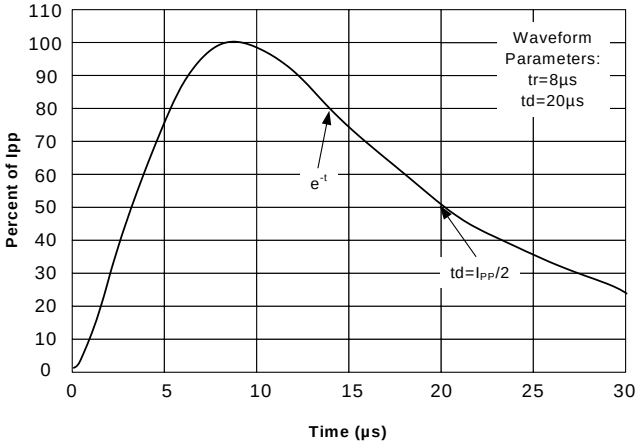
Clamping Voltage vs. Peak Pulse Current



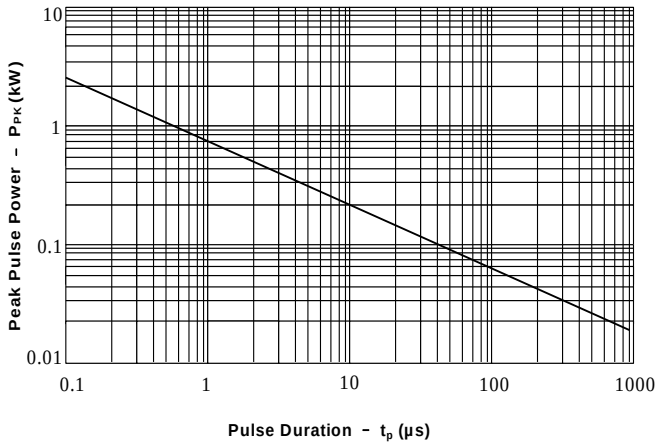
Power Derating Curve



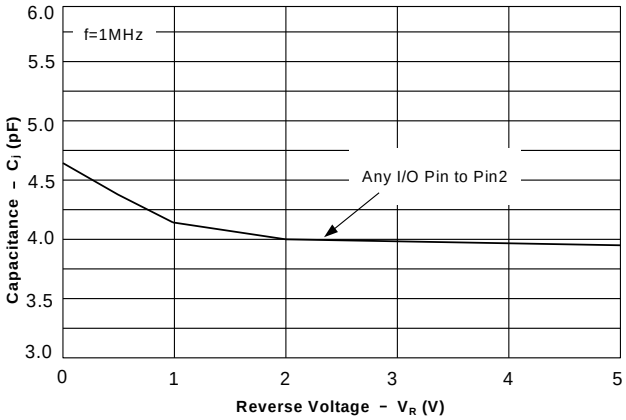
Pulse Waveform



Non-Repetitive Peak Pulse Power vs. Pulse Time



Junction Capacitance vs. Reverse Voltage



Application Information

Device Connection Options for Protection of Four High-Speed Data Lines

This device is designed to protect data lines by clamping them to a fixed reference. When the voltage on the protected line exceeds the reference voltage the steering diodes are forward biased, conducting the transient current away from the sensitive circuitry. Data lines are connected at pins 1, 3, 4 and 6. Pin 2 should be connected directly to a ground plane. The path length is kept as short as possible to minimize parasitic inductance. The positive reference is connected at pin 5. The options for connecting the positive reference are as follows:

1. To protect data lines and the power line, connect pin 5 directly to the positive supply rail (VCC). In this configuration the data lines are referenced to the supply voltage. The internal TVS diode prevents over-voltage on the supply rail. See Figure 1.
2. In applications where the supply rail does not exit the system, the internal TVS may be used as the reference. In this case, pin 5 is not connected. The steering diodes will begin to conduct when the voltage on the protected line exceeds the working voltage of the TVS (plus one diode drop).
3. In applications where complete supply isolation is desired, the internal TVS is again used as the reference and VCC is connected to one of the I/O inputs. An example of this configuration is the protection of a SIM port. The Clock, Reset, I/O, and VCC lines are connected at pins 1, 3, 4, and 6. Pin 2 is connected to ground and pin 5 is not connected. See Figure 2.

Protection of Four Data Lines and Power Supply Line

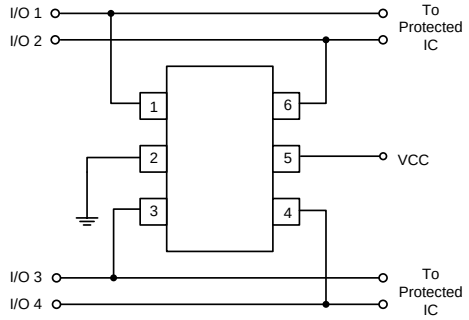


Figure 1

Protection of Four Data Lines Using Internal TVS Diode as Reference

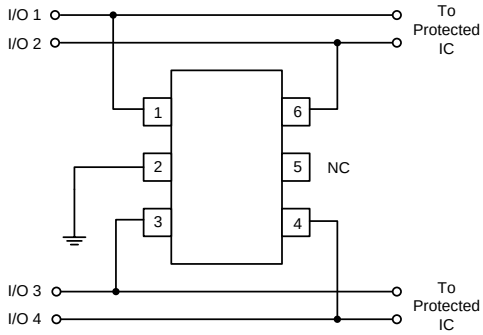


Figure 2

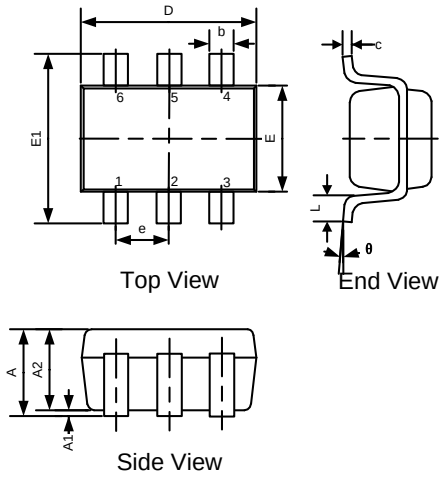
Matte Tin Lead Finish

Matte tin has become the industry standard lead-free replacement for SnPb lead finishes. A matte tin finish is composed of 100% tin solder with large grains. Since the solder volume on the leads is small compared to the solder paste volume that is placed on the land pattern of the PCB, the reflow profile will be determined by the requirements of the solder paste. Therefore, these devices are compatible with both lead-free and SnPb assembly techniques. In addition, unlike other lead-free compositions, matte tin does not have any added alloys that can cause degradation of the solder joint.

Package Information

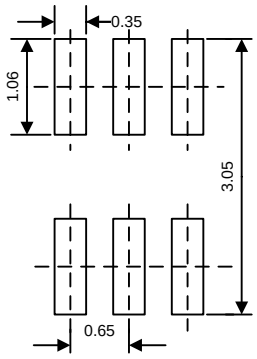
UESD6V8V4A SC70-6/SC88/SOT363

Outline Drawing



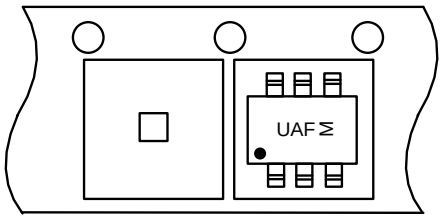
DIMENSIONS						
Symbol	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	0.90	-	1.10	0.035	-	0.043
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	0.90	-	1.00	0.035	-	0.039
b	0.10	0.25	0.35	0.004	0.010	0.014
c	0.08	0.11	0.22	0.003	0.004	0.009
D	1.80	2.15	2.20	0.071	0.085	0.087
E	1.15	1.30	1.35	0.045	0.051	0.053
E1	2.00	-	2.45	0.079	-	0.096
e	0.65BSC			0.026BSC		
L	0.25	-	0.46	0.010	-	0.018
θ	0 °	-	8 °	0 °	-	8 °

Land Pattern



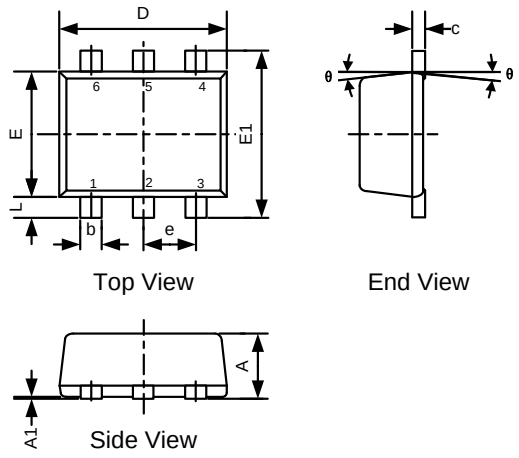
NOTES:
1. Compound dimension: 2.15×1.30;
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



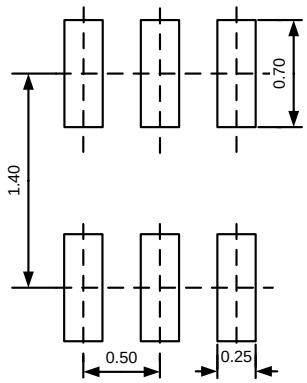
UESD6V8V4B SC89-6/SOT563/SOT666

Outline Drawing



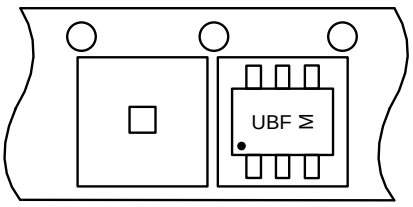
DIMENSIONS						
Symbol	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	0.525	0.60	0.62	0.021	0.023	0.024
A1	0.00	-	0.05	0.000	-	0.002
b	0.15	-	0.30	0.006	-	0.012
c	0.09	-	0.18	0.004	-	0.007
D	1.50	1.60	1.70	0.059	0.063	0.067
E	1.10	1.20	1.30	0.043	0.047	0.051
E1	1.50	1.60	1.70	0.059	0.063	0.067
e	0.50TYP			0.020TYP		
L	0.10	0.20	0.30	0.004	0.008	0.012
θ	7°REF			7°REF		

Land Pattern



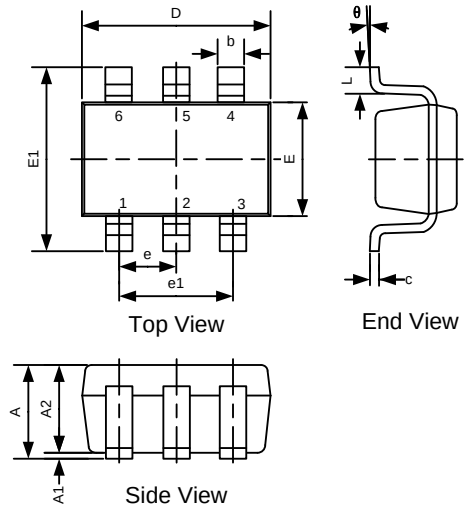
NOTES:
1. Compound dimension: 1.60×1.20;
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



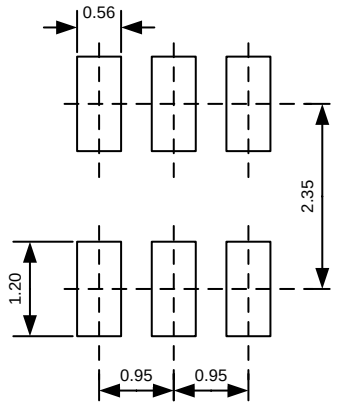
UESD6V8V4C TSOP-6/SOT23-6

Outline Drawing



Symbol	DIMENSIONS					
	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	1.013	1.15	1.40	0.040	0.045	0.055
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	1.00	1.10	1.30	0.039	0.043	0.051
b	0.30	-	0.50	0.012	-	0.020
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.82	-	3.10	0.111	-	0.122
E	1.50	1.60	1.70	0.059	0.063	0.067
E1	2.60	2.80	3.00	0.102	0.110	0.118
e	0.95REF			0.037REF		
e1	1.90REF			0.075REF		
L	0.30	-	0.60	0.012	-	0.024
θ	0 °	-	8 °	0 °	-	8 °

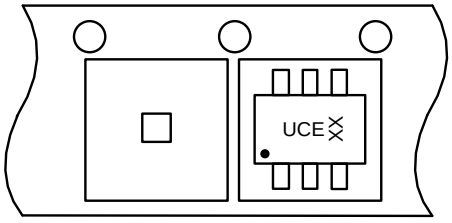
Land Pattern



NOTES:

1. Compound dimension: 2.92×1.60 ;
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



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