SPE6V8UH

Ultra Low Capacitance 4 -Line ESD Protection Array

DESCRIPTION

The SPE6V8UH is 4-channel very low capacitance ESD transient voltage suppressor which provides a very high level of protection for sensitive electronic components that may be subjected to electrostatic discharge. It is particularly well-suited to protect systems with high speed communication lines from ESD, EFT, and lighting.

The SPE6V8UH is consists of eight low capacitance steering diodes and a TVS diode in a MSOP-10L package. Each channel of SPE6V8UH could safely dissipate ESD strikes of ±15kV air discharge as well as ±8kV contact discharge, meeting the requirement of the IEC 61000-4-2 international standard. Using the MIL-STD-883 (Method 3015) specification for Human Body Model (HBM) ESD, the device provides protection for contact discharges to greater than ±15kV.

APPLICATIONS

- Cellular Handsets and Accessories
- Cordless Phone
- PDA
- Notebooks and Handhelds
- Portable Instrumentation
- Digital Cameras
- MP3 Player High Definition Multi-Media Interface Protection
- USB 2.0 Power and Data Line
- Monitors and Notebook Computers
- HDSL, IDSL Secondary IC Side Protection
- 10/100/1000 Ethernet

FEATURES

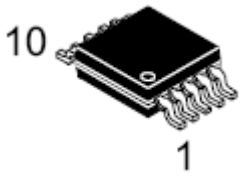
- Transient protection for data lines to

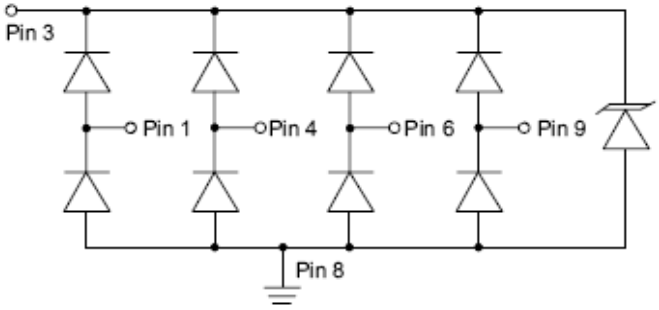
  IEC 61000-4-2 (ESD)
  ±15kV (air)
  ±8kV (contact)

  IEC 61000-4-4 (EFT)
  40A (5/50ns)

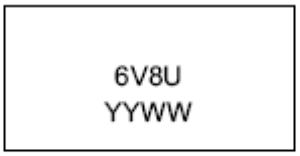
- Protects five bidirectional I/O lines
- Working voltage: 5V
- Low leakage current
- Low operating and clamping voltages
- Low capacitance: 0.35 pF typical

PIN CONFIGURATION (MSOP-10L)





PART MARKING



6V8U=Specific Device Code
YYWW=Date Code(y=year,w=week)

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ORDERING INFORMATION

Part Number	Package	Part Marking
SPE6V8UHMS10RGB	MSOP-10L	6V8U YYWW

※ SPE6V8UHMS10RGB : Tape Reel ; Pb – Free ; Halogen - Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Peak Pulse Power (tp = 8/20 μs)	Ppk	180	W
Maximum Peak Pulse Current (tp = 8/20 μs)	Ipp	7	A
ESD per ICE 61000 – 4 – 2 (Air)	Vpp	±15	KV
ESD per ICE 61000 – 4 – 2 (Contact)	Vpp	±8	KV
Operating Junction Temperature	T_J	-55 ~ 150	℃
Storage Temperature Range	T_{STG}	-55 ~ 150	℃
Lead Soldering Temperature	T_L	260 (10sec)	℃

ELECTRICAL CHARACTERISTICS

(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Reverse Stand – Off Voltage	V_{RWM}				5	V
Forward Voltage @ IF	V_F	I_F = 10mA	0.4	0.8	1.5	V
Reverse Breakdown Voltage	V_{BR}	It = 1mA	6.0	7.0		V
Reverse Leakage Current	I_R	V_{RWM} = 5V , T=25℃		0.01	1	μA
Clamping Voltage	V_C	Ipp = 1A , tp = 8/20 μs			12	V
Junction Capacitance	Cj	V_R = 0V, f = 1MHz Any I/O pin to Ground		0.7	1.0	pF
		V_R = 0V, f = 1MHz Between I/O pins		0.35		

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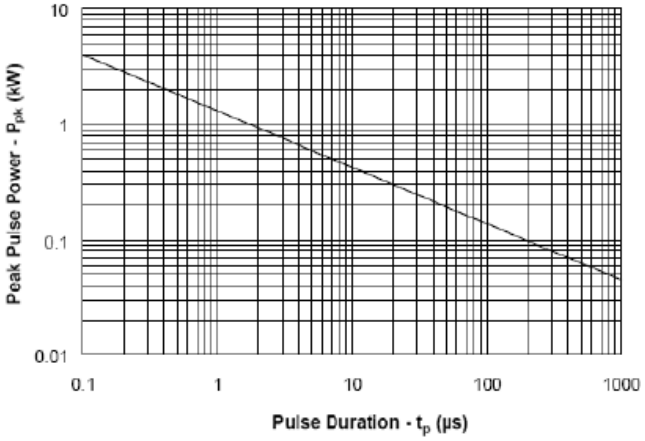
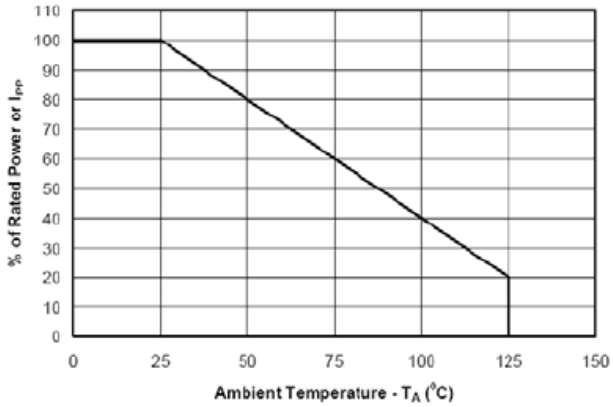
TYPICAL CHARACTERISTICS

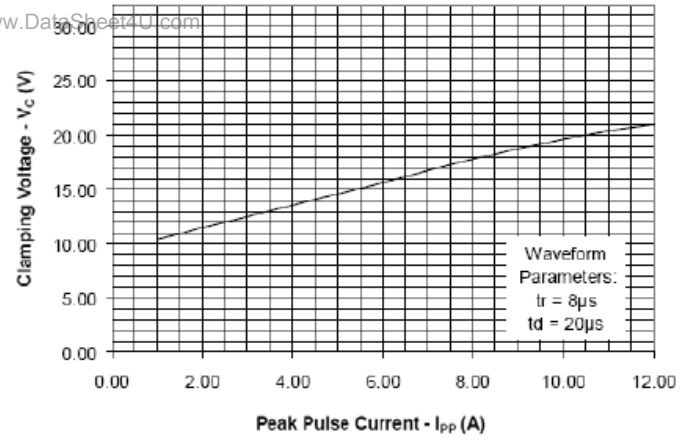
Non-Repetitive Peak Pulse Power vs. Pulse Time



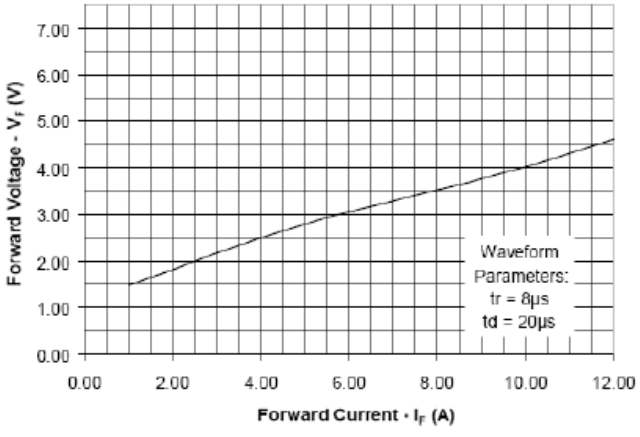
Power Derating Curve



Clamping Voltage vs. Peak Pulse Current



Forward Voltage vs. Forward Current



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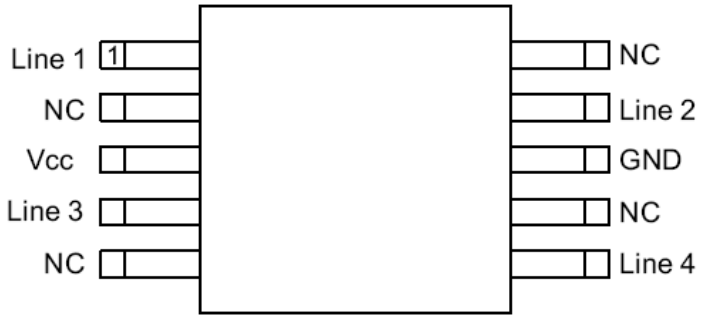
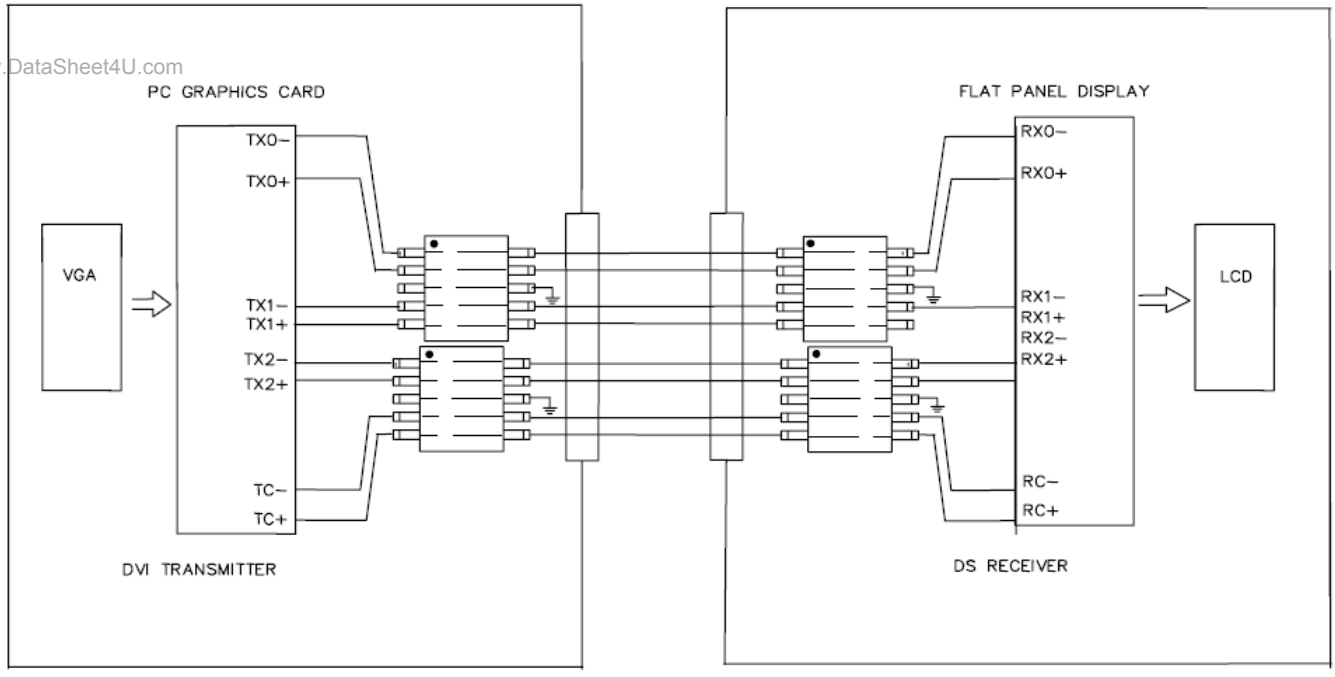
SCHEMATIC & PIN CONFIGURATION



APPLICATION INFORMATION

The HDMI Compliance Test Specification (CTS) requires sink (receiver) ports maintain a differential impedance of 100 Ohms +/- 15%. The measurement is taken using a Time Domain Reflect (TDR) method that utilizes a pulse with a rise time <= 200ps.ESD protection devices have an inherent junction capacitance. Even a small amount of added capacitance on an HDMI port will cause the impedance of the differential pair to drop. As such, some form of compensation to the layout will be required to bring the differential pairs back within the required 100Ohm +/-15% range. The higher the added capacitance, the more extreme the modifications will need to be. If the added capacitance is too high, compensation may not even be possible. The SPE6V8UH presents <1pF capacitance between the pairs while being rated to handle >8KV ESD contact discharges(>15KV air discharge) as outlined in IEC 61000-4-2.As such, it is possible to make minor adjustments to the board layout parameters to compensate for the added capacitance of the SPE6V8UH. As figure shows how to implement the SPE6V8UH in an HDMI application (transmitter and receiver).



HDMI Schematic

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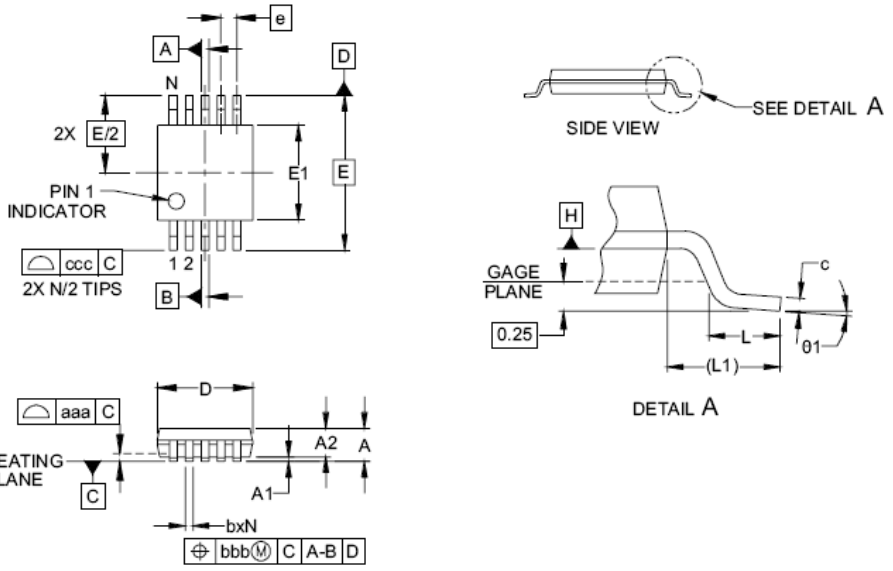
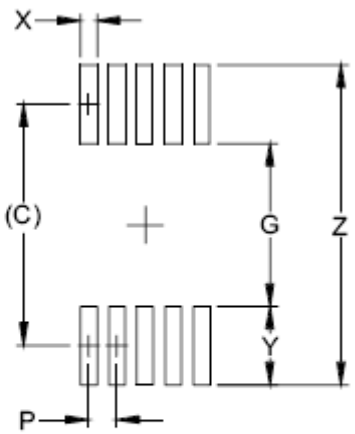
MSOP-10L PACKAGE OUTLINE



DIMENSIONS						
DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	-	-	.043	-	-	1.10
A1	.000	-	.006	0.00	-	0.15
A2	.030	-	.037	0.75	-	0.95
b	.007	-	.011	0.17	-	0.27
c	.003	-	.009	0.08	-	0.23
D	.114	.118	.122	2.90	3.00	3.10
E1	.114	.118	.122	2.90	3.00	3.10
E	.193 BSC			4.90 BSC		
e	.020 BSC			0.50 BSC		
L	.016	.024	.032	0.40	0.60	0.80
L1	(.037)			(.95)		
N	10			10		
θ1	0°	-	8°	0°	-	8°
aaa	.004			0.10		
bbb	.003			0.08		
ccc	.010			0.25		

NOTES:

1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. DATUMS -A- AND -B- TO BE DETERMINED AT DATUM PLANE -H-
3. DIMENSIONS "E1" AND "D" DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
4. REFERENCE JEDEC STD MO-187, VARIATION BA.



DIMENSIONS		
DIM	INCHES	MILLIMETERS
C	(.161)	(4.10)
G	.098	2.50
P	.020	0.50
X	.011	0.30
Y	.063	1.60
Z	.224	5.70

NOTES:

1. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY. CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.

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