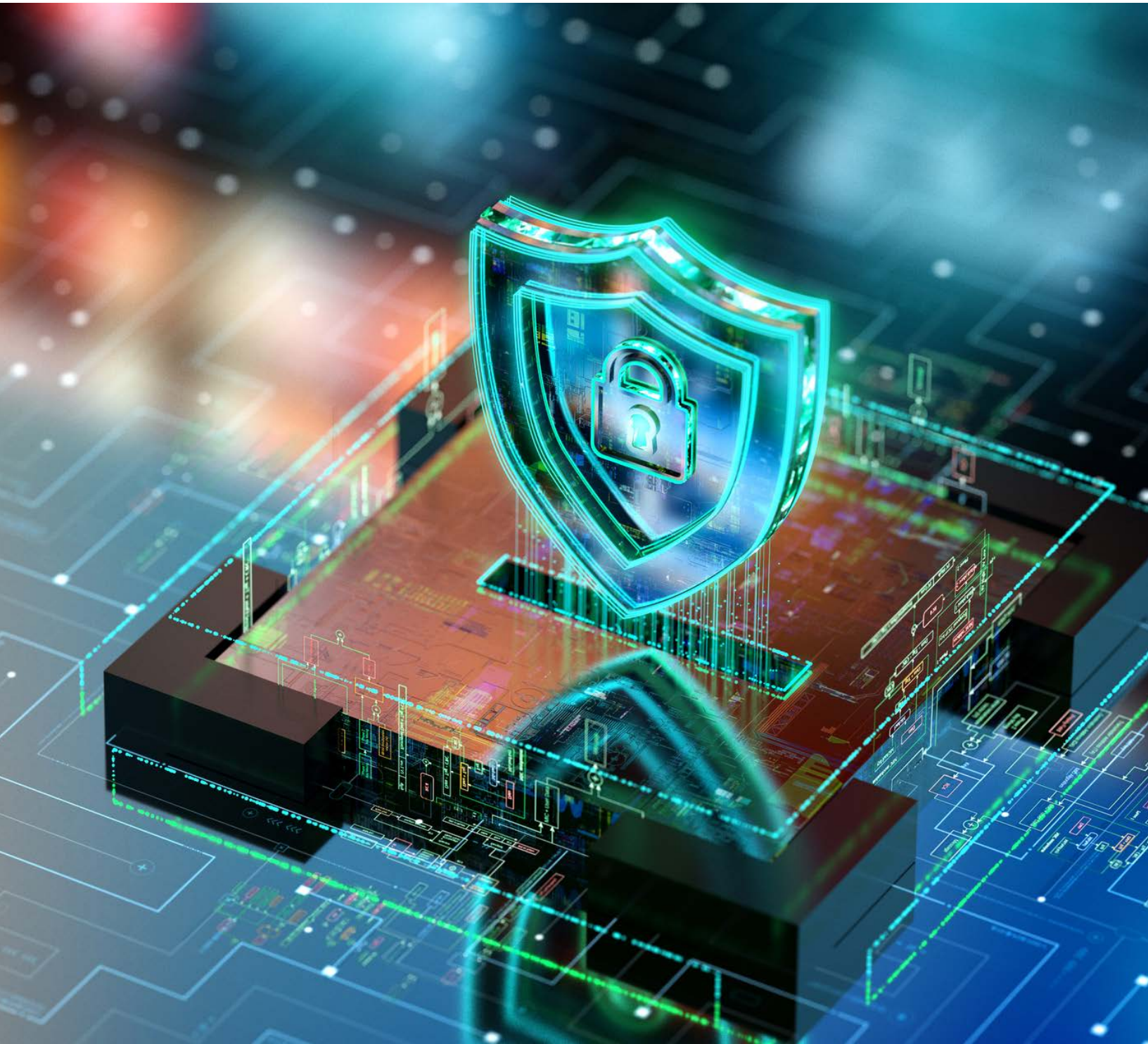


# Circuit Protection Products



Industry leading SurgeSwitch® and TVS Diode solutions to safeguard data interfaces from ESD and surge transients



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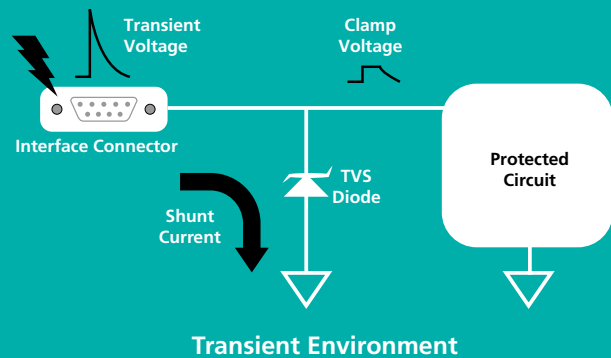
# TVS Solutions

For more than 50 years, Semtech's Protection Products Group has been on the forefront of developing cutting-edge circuit protection solutions to safeguard the various circuit buses, ports, connectors, and interfaces found in consumer products and electronic systems. Semtech's proprietary TVS technologies lead the industry in protecting high-speed data circuits against ESD, electromagnetic interference, cable discharge, lightning, and power surges. These innovative devices help ensure electronics do not fail in the presence of highly destructive overvoltage threats.

## WHAT IS ESD?



ESD is a natural phenomenon that occurs all-around us. ESD events occur when electrons—due to friction or induction—are redistributed on a material surface in such a way to create a charge imbalance and thus an electric field. When an electric field is sufficiently strong, the static charges seek equilibrium across the potential difference, and a violent electrical zap known as an electrostatic discharge can occur. These common electrical shocks occur with such frequency that most of the time they may not even be perceptible to humans, but they can mean disaster for microelectronic-based electronics. An ESD strike and resulting failure to the electronic product may lead to lost time to market, revenue and a loss of reputation in the market for a product supplier.



## THE NEED FOR ROBUST ESD PROTECTION

The world is more connected than ever. From smartphones to tablets to smart vehicles these devices give us constant access to real-time information and live communication. As our world becomes more connected, microelectronic chips are also becoming faster and more advanced. As this trend continues, the chips enabling these smaller, thinner and faster microelectronics must likewise scale to smaller geometries. As a result, these devices exhibit an increased sensitivity to real world ESD and transient voltage threats.

Increased device vulnerability to ESD threats, coupled with the trend in chip miniaturization, has compounded the challenge of designing adequate circuit-level ESD protection. With the increased ESD sensitivity of digital ICs, the need to protect systems with more robust off-chip/system-level TVS is more critical today than ever.

# TVS Application Matrix

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Semtech's protection products meet the industry's most rigid immunity standards, including:

- IEC 61000-4-2 (ESD)
- IEC 61000-4-4 (EFT)
- IEC 61000-4-5 (lightning)
- Telcordia GR-1089
- ITU K.20, K.21

## FEATURES

- Sub-5V solutions: 2.5V – 3.3V
- Ultra-low capacitance devices: <0.5pF
- Extremely low clamping voltage
- ESD protection with EMI/RFI filtering
- Single-line and multi-line protection
- Small package solutions, including Semtech's own leadless package
- High volume manufacturing
- RoHS/WEEE Compliant

## APPLICATIONS

- Portable electronics
- Ethernet
- Set top box
- HDTV/monitor interfaces
- Telecom/datacom interfaces
- Servers/desktop
- Notebooks/tablets
- Automotive interfaces (AEC-Q100 qualified)
- Wearables
- Internet of Things (IoT) nodes



# TVS Solutions

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Semtech has a rich and diverse portfolio of TVS protection devices. It is helpful to think of these devices as categorized into five basic subgroups

## **μClamp® Family (MicroClamp®)**

- General purpose ESD protection
- Single-line and multi-line devices
- Used in broad markets, but more commonly in portable and handheld applications

## **RClamp® Family (RailClamp®)**

- Low capacitance ESD and transient voltage protection
- Protection for high-speed lines
- Surge and ESD level protection

Multi-market adoption: used in high-speed data lines

## **PClamp® Family (PowerClamp™)**

- Higher surge immunity for VBUS and DC lines
- High-surge protection (>100A 8x20μs surge events)
- Generally intended for VBUS and DC line applications

## **TClamp® Family (TransClamp®)**

- High-surge, low capacitance protection
- Single-line and multi-line devices
- Targeted at telecom and some industrial applications

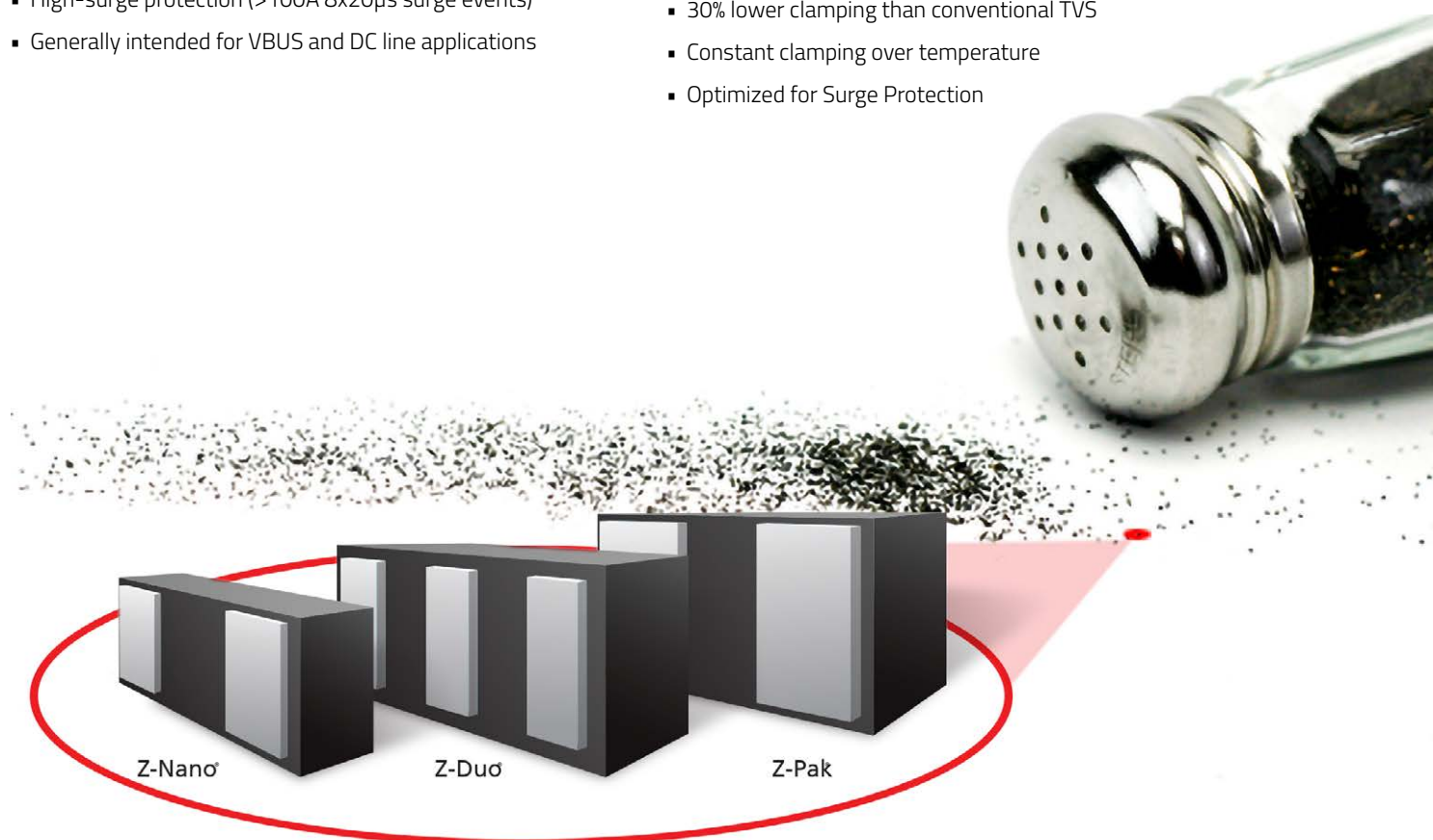
## **EClamp® Family (EMIClamp®)**

- ESD protection in combination with filter devices
- TVS with integrated passive components, used for EMI filtering applications

EClamp family also features TVS and termination passives for data interfaces

## **SurgeSwitch or Transient Diverting Suppressor (TDS)**

- Protection for power and low-speed data lines (small footprint)
- 30% lower clamping than conventional TVS
- Constant clamping over temperature
- Optimized for Surge Protection



# SurgeSwitch

The SurgeSwitch product line provides highly efficient protection against electrical overstress (EOS) and electrostatic discharge (ESD) events. These devices have superior clamping and stability over-temperature when compared to standard transient voltage suppression TVS devices.

Unlike TVS diodes, SurgeSwitch devices do not use a conventional PN junction for the breakdown mechanism. Instead, these devices employ a surge-rated FET with a driving circuit as the primary surge current shunting element, effectively working as voltage-controlled switches. A precisely tuned trigger circuit activates the shunt FET when an EOS event is detected. During an EOS event, transient voltage increases beyond the rated breakdown voltage of the device. The FET, in turn, switches on and safely diverts transient current to the ground to safeguard the integrated circuit. The operation of the SurgeSwitch is shown in Figure 1.

## FEATURES

- Clamping voltage is nearly constant due to the extremely low On-Resistance of the FET
- Lower clamping voltage at maximum peak pulse current makes SurgeSwitch a suitable solution for protecting today's sensitive ICs
- Clamping voltage remains stable over the operating temperature range
- Clamping voltage of SurgeSwitch is typically 30% less than the clamping voltage seen with conventional TVS ESD protection devices

## APPLICATIONS

- USB Type-C
- Sensor
- Industrial IO-Link
- 4-20mA Current Loop
- PLC/DCS IO Module
- HVAC/24VAC Circuit
- Power Over Ethernet

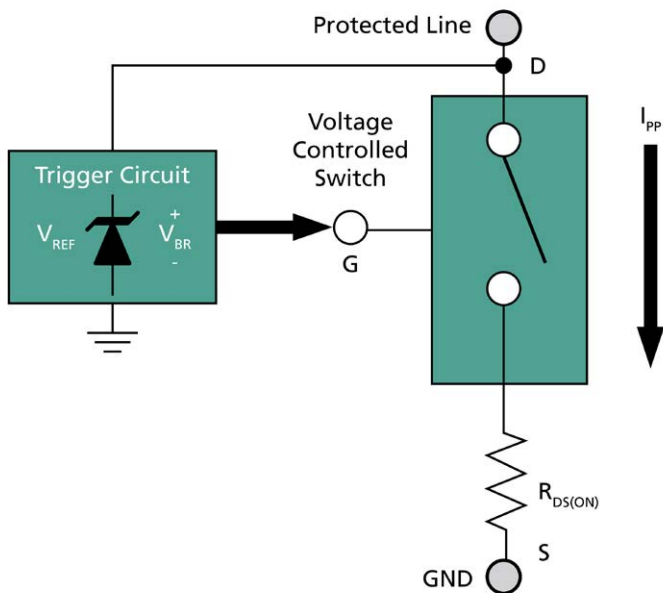














Figure 1. Operation of SurgeSwitch

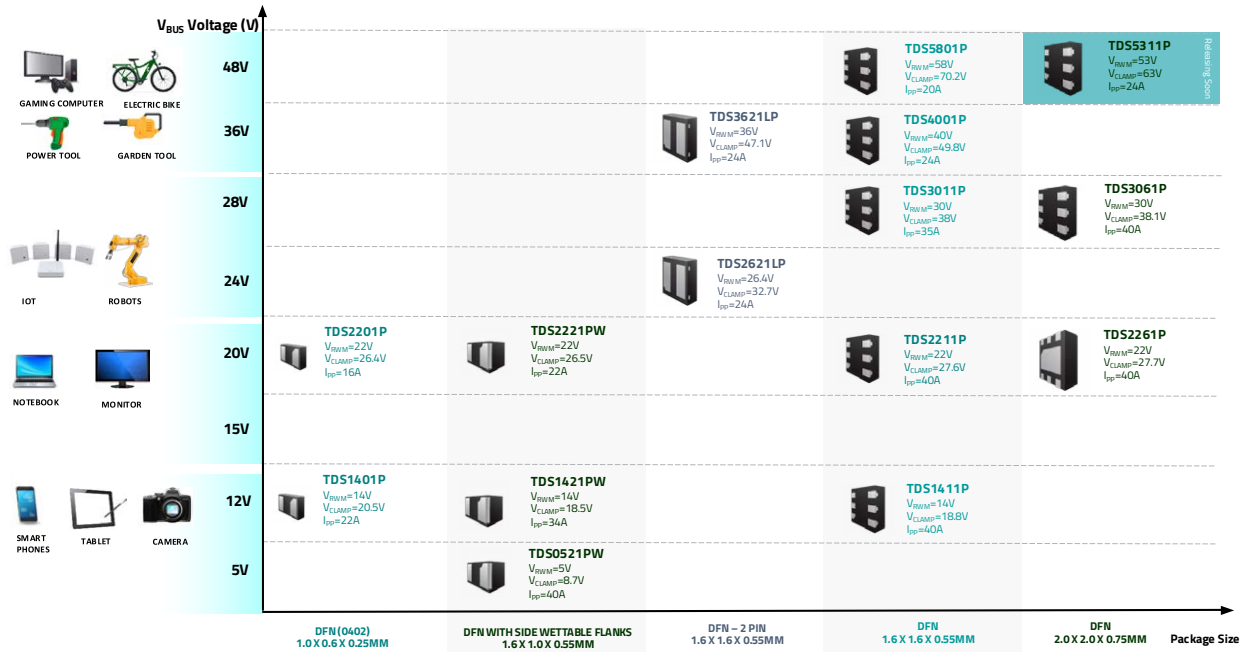
# SurgeSwitch® Product Details

Semtech's SurgeSwitch devices are offered in several voltage options to address the needs of the consumer, industrial and telecom applications. Each device is housed in a small 1.6mm x 1.6mm package. The SurgeSwitch portfolio, provide surge immunity up to level 1 of the IEC61000-4-5 standard. These devices also provide ESD immunity above level 4 of the IEC61000-4-2 ESD Immunity standard.

Semtech's SurgeSwitch Portfolio for USB-PD							
Part Number	VRWM	Surge Rating (8/20µs)	Clamping Voltage (8/20µs)	VBR (Min)	ESD Rating Contact/Air	Package	Package Size (mm)
 <a href="#">TDS0521PW</a>	5V	40A	8.7V	6.9V	±30/±30	DFN1610-2	1.6 x 1.0 x 0.55
 <a href="#">TDS1421PW</a>	14V	34A	18.5V	16V	±25/±30	DFN1610-2	1.6 x 1.0 x 0.55
 <a href="#">TDS1411P</a>	14V	40A	18.8V	17V	±30/±30	DFN1616-6	1.6 x 1.6 x 0.55
 <a href="#">TDS2201P</a>	22V	16A	26.4V	25V	±8/±30	DFN1006-2	1.0 x 0.6 x 0.25
 <a href="#">TDS2221PW</a>	22V	22A	26.5V	23V	±25/±30	DFN1610-2	1.6 x 1.0 x 0.55
 <a href="#">TDS2211P</a>	22V	40A	27.6V	25V	±30/±30	DFN1610-6	1.6 x 1.6 x 0.55
 <a href="#">TDS2261P</a>	22V	40A	27.7V	25V	±20/±30	DFN2020-6	2.0 x 2.0 x 0.75
 <a href="#">TDS3011P</a>	30V	35A	38V	34V	±30/±30	DFN1610-6	1.6 x 1.6 x 0.55
 <a href="#">TDS3061P</a>	30V	40A	38.1V	34V	±30/±30	DFN2020-6	2.0 x 2.0 x 0.75
 <a href="#">TDS3311P</a>	33V	35A	40.5V	36V	±30/±30	DFN1610-6	1.6 x 1.6 x 0.55
 <a href="#">TDS4001P</a>	40V	24A	49.8V	46V	±20/±30	DFN1610-6	1.6 x 1.6 x 0.55
 <a href="#">TDS5801P</a>	58V	20A	70.2V	68V	±15/±20	DFN1610-6	1.6 x 1.6 x 0.55

# SurgeSwitch® Product Details

## SEMTECH'S SURGESWITCH PORTFOLIO FOR USB-PD



### PACKAGE OPTIONS

- 0402 (1.0x0.6mm): Ultra-compact mobile designs
- DFN w/ Wettable Flanks: Automated visual inspection
- Standard DFN: Size/performance balance
- High-Power DFN (2.0x2.0mm): Maximum surge endurance

### TESTED AND QUALIFIED

- SurgeSwitch devices meet global EMC standards:
- EC 61000-4-2: ±30kV ESD
  - IEC 61000-4-4: EFT protection
  - IEC 61000-4-5: Surge protection
  - Extended temperature range & long-term reliability

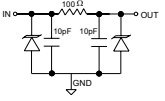
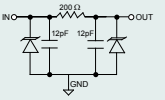
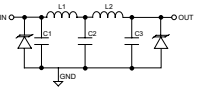

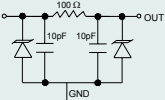
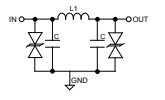
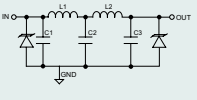
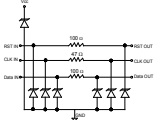
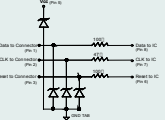
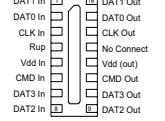
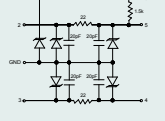
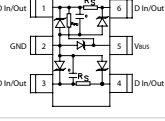
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<a href="#">EClamp2374KQ</a>				•											
<a href="#">EClamp2374K</a>															
<a href="#">EClamp2376K</a>															
<a href="#">EClamp2378K</a>															
<a href="#">EClamp2384K</a>															
<a href="#">EClamp2386K</a>															
<a href="#">EClamp2388K</a>															
<a href="#">EClamp2394P</a>															
<a href="#">EClamp2396P</a>															
<a href="#">EClamp2398P</a>															
<a href="#">EClamp2410P</a>															
<a href="#">EClamp2422N</a>															
<a href="#">EClamp2454P</a>															
<a href="#">EClamp2456P</a>															
<a href="#">EClamp2458P</a>															
<a href="#">EClamp2455K</a>															
<a href="#">EClamp2455P</a>															
<a href="#">EClamp2465T</a>															
<a href="#">EClamp2515K</a>															
<a href="#">EClamp2522P</a>															
<a href="#">STF203-15</a>															
<a href="#">STF203-22</a>															
<a href="#">STF203-33</a>															
TransClamp® – High-Power Surge TVS															
<a href="#">TClamp0602N</a>	•	•		•											
<a href="#">TClamp1202P</a>															
<a href="#">TClamp1272S</a>		•													
<a href="#">TClamp2472S</a>		•													
<a href="#">TClamp2482S</a>		•													
<a href="#">TClamp2502N</a>				•											•
<a href="#">TClamp2512N</a>				•											
<a href="#">TClamp3302N</a>		•		•											•
<a href="#">TClamp3312N</a>				•											
<a href="#">LC01-6</a>	•														
<a href="#">LC03-3.3</a>	•			•											
<a href="#">LC03-6</a>	•	•		•											
<a href="#">LC04-6</a>	•	•													
<a href="#">LC05-6</a>	•														
<a href="#">LC04-12</a>	•	•													
RailClamp® – Low Capacitance TVS															
<a href="#">RClamp0502A</a>				•			•	•							•
<a href="#">RClamp0582BQ</a>				•				•							•
<a href="#">RClamp0582N</a>				•			•	•							•
<a href="#">RClamp0504FA</a>				•			•	•	•						•
<a href="#">RClamp0504N</a>	•	•		•			•	•	•						•

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<a href="#">RClamp0506T</a>															•
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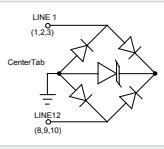
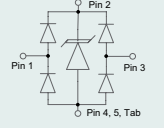
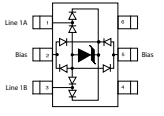
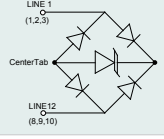
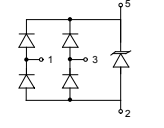
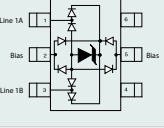
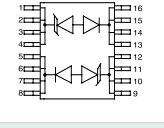
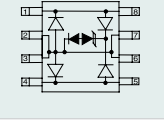
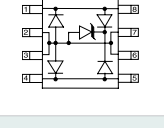
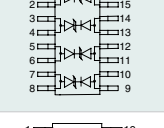
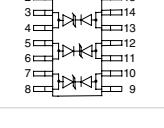
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<a href="#">RClamp7528T</a>								•	•	•		•			•	
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<a href="#">SR3.3</a>								•							•	
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<a href="#">SRV05-4</a>			•		•			•	•	•					•	
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<a href="#">µClamp0501H</a>								•						•	•	
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<a href="#">µClamp3061P</a>														•		
<a href="#">µClamp3661P</a>														•		
<a href="#">µClamp4061P</a>														•		
<a href="#">µClamp6061P</a>														•		
<a href="#">µClamp0504T</a>														•	•	
<a href="#">µClamp0505T</a>														•	•	
<a href="#">µClamp0506T</a>														•	•	

PART NUMBER	T-Carrier	xDSL	Antenna	(Automotive/AEC-Q100)	Ethernet 1000/100/10	Industrial Sensing	Serial/Parallel Ports	LVDS	OTG/3.0/2.0/USB1.1	Multimedia Memory Port	Audio	Color LCD Display	VBUS/DC line	Keypad	HDMI/DisplayPort	Analog Video
<a href="#">µClamp0508T</a>								•			•			•		
<a href="#">µClamp0504A</a>								•						•		
<a href="#">µClamp0505A</a>								•			•			•		
<a href="#">µClamp0511P</a>								•						•	•	
<a href="#">µClamp0511T</a>									•		•		•	•	•	
<a href="#">µClamp0524P</a>								•						•	•	
<a href="#">µClamp0541Z</a>											•		•	•		
<a href="#">µClamp1201H</a>								•						•	•	
<a href="#">µClamp1201P</a>								•						•	•	
<a href="#">µClamp1211P</a>														•	•	
<a href="#">µClamp1211T</a>											•		•	•	•	
<a href="#">µClamp1211Z</a>														•	•	
<a href="#">µClamp2401T</a>								•						•	•	
<a href="#">µClamp2501T</a>														•	•	
<a href="#">µClamp2511T</a>											•			•	•	
<a href="#">µClamp2501ZA</a>															•	
<a href="#">µClamp2804L</a>																
<a href="#">µClamp3301P</a>								•						•	•	
<a href="#">µClamp3304A</a>								•						•	•	
<a href="#">µClamp3305P</a>								•						•	•	
<a href="#">µClamp3306P</a>								•						•	•	
<a href="#">µClamp3311P</a>														•	•	
<a href="#">µClamp3311PQ</a>				•	•									•	•	
<a href="#">µClamp3311T</a>											•			•	•	
<a href="#">µClamp3321ZA</a>											•		•	•	•	
<a href="#">µClamp3324P</a>								•						•	•	
<a href="#">µClamp3381P</a>									•							
<a href="#">µClamp3603T</a>				•										•	•	
<a href="#">µClamp5011ZA</a>											•		•	•	•	
<a href="#">SM712</a>								•								
<b>LCDA/SLVU Families – TVS Arrays</b>																
<a href="#">LCDA12C-1</a>			•					•								
<a href="#">LCDA15C-1</a>																
<a href="#">LCDA24C-1</a>																
<a href="#">SLVU2.8Q</a>								•								•
<a href="#">SLVU2.8-4</a>								•								
<a href="#">SLVU2.8-8</a>								•								
<b>PowerClamp™ High-surge TVS Diode</b>																
<a href="#">PClamp0501P</a>											•			•		
<a href="#">PClamp0801P</a>														•		•
<a href="#">PClamp1011P</a>											•			•		
<a href="#">PClamp1021P</a>											•			•		
<a href="#">PClamp1211P</a>											•			•		
<a href="#">PClamp1221P</a>											•			•		
<a href="#">PClamp2011P</a>											•			•		




## EMIClamp® – ESD + EMI Protection Device

Part Number	Description	Device Schematic	V <sub>RWM</sub> (Max) (V)	V <sub>BR</sub> (Min) (V)	C (pF) @ 0V = V <sub>R</sub>	@ (C (pF) 2.5V = V <sub>R</sub>	R (ohm)	L (nH)	(C Max (pF) @ L-G 0V = V <sub>R</sub>	I <sub>r</sub> Max (μA) V <sub>RWM</sub> @	Package	Size (mm)
<a href="#">EClamp2374K</a> <a href="#">EClamp2376K</a> <a href="#">EClamp2378K</a>	line ESD/EMI-8,6,4 protection for color LCD interfaces		5	6	10	-	100	-	24	-	SLP1713P8 SLP2513P12 SLP3313P16	0.5 x 1.3 x 1.7 0.5 x 1.3 x 2.5 0.5 x 1.3 x 3.3
<a href="#">EClamp2384K</a> <a href="#">EClamp2386K</a> <a href="#">EClamp2388K</a>	line ESD/EMI-8,6,4 protection for color ,LCD interfaces 400μm lead pitch		5	6	-	12	200	-	-	-	SLP1713P8 SLP2513P12 SLP3313P16	0.5 x 1.3 x 1.7 0.5 x 1.3 x 2.5 0.5 x 1.3 x 3.3
<a href="#">EClamp2394P</a> <a href="#">EClamp2396P</a> <a href="#">EClamp2398P</a>	line ESD/EMI-8,6,4 protection for color LCD interfaces		5	6	-	12	-	19	-	-	SLP2116P8 SLP3016P12 SLP4016P16	0.58 x 1.6 x 2.1 0.58 x 1.6 x 3.0 0.58 x 1.6 x 4.0
 <a href="#">EClamp2374KQ</a>	line ESD/EMI TVS for-4 color LCD display		5	6	20	-	100	n/a	24	0.50	SLP1713P	0.5 x 1.3 x 1.7
<a href="#">EClamp2422N</a>	line ESD/EMI 2 protection for audio interfaces		5	6	100	-	-	2	-	-	SLP1510N6	0.58 x 1.0 x 1.45
<a href="#">EClamp2454P</a> <a href="#">EClamp2456P</a> <a href="#">EClamp2458P</a>	line ESD/EMI-8,6,4 protection for color LCD interfaces		5	6	-	12	-	28	-	-	SLP2116P8 SLP3016P12 SLP4016P16	0.58 x 1.6 x 2.1 0.58 x 1.6 x 3.0 0.58 x 1.6 x 4.0
<a href="#">EClamp2455K</a> <a href="#">EClamp2455P</a>	line ESD/EMI-4 protection for ,SIM cards (400μm lead pitch='K') (500μm lead pitch='P')		5	6	20	-	100 47	-	24	0.5	SLP1713P8 SLP2116P8	0.5 x 1.3 x 1.7 0.58 x 1.6 x 2.1
<a href="#">EClamp2465T</a>	line ESD/EMI-4 protection for SIM card		5	6	10	-	100	-	12	0.5	SLP1713P8T	0.4 x 1.3 x 1.7
<a href="#">EClamp2515K</a>	ESD protection for T-Flash/MicroSD interfaces		5	6	22	-	45	-	-	-	SLP3313P16	0.5 x 1.3 x 3.3
<a href="#">EClamp2522P</a>	USB upstream port filter & TVS for EMI filtering and ESD protection		5.5	6	20	-	22	-	45	1	SLP1616P6	0.58 x 1.6 x 1.6
<a href="#">15-STF203</a> <a href="#">22-STF203</a> <a href="#">33-STF203</a>	USB upstream port filter & TVS for EMI filtering and ESD protection		5,25	6	47	-	15 22 33	-	-	5	6L 70-SC	1.1 x 2.1 x 2.1 1.1 x 2.1 x 2.1 1.1 x 2.1 x 2.1

## TransClamp® – High-Power Surge TVS


Part Number	Description	Device Schematic	V <sub>RWM</sub> Max (V)	V <sub>DR</sub> Min (V)	C, Max (pF) L-L @ V <sub>k</sub> = 0V	Peak Power (W) (8/20µs)	Peak Power (W) (10/1000µs)	I <sub>PP</sub> (A) @ (10/1000µs)	I <sub>PP</sub> (A) @ (8/20µs)	I <sub>r</sub> Max (µA) @ V <sub>RWM</sub>	Package	Size (mm)
<a href="#">TClamp0602N</a> <a href="#">TClamp2502N</a> <a href="#">TClamp3302N</a>	2-line, low cap TVS for Ethernet and telecom interfaces		6 2.5 3.3	6.8 – –	12	2,500 – –	–	–	95	5 0.5 1	SLP2626P10	2.6 x 2.6 x 0.6 2.6 x 2.6 x 0.6 2.6 x 2.6 x 0.6
<a href="#">TClamp1202P</a>	Low cap TVS for RS-485 interfaces		12	13.3	12	–	300	12	100	0.1	SLP2020P5	2.0 x 2.0 x 0.6
<a href="#">TClamp1272S</a>	Low cap TVS for xDSL interfaces		12	13.5	5	600	–	–	20	0.1	S0T-23 6L	3.1 x 2.8 x 1.45
<a href="#">TClamp2512N</a> <a href="#">TClamp3312N</a>	2-line, low cap TVS for Ethernet and telecom interfaces		2.5V 3.3V	2.7V 3.5V	8	–	–	–	120	0.1	SLP2626P10	2.6 x 2.6 x 0.6 2.6 x 2.6 x 0.6
<a href="#">TClamp2472S</a>	Low cap TVS for xDSL interfaces		24	27	2	–	–	–	–	0.1	S0T-23 6L	3.1 x 2.8 x 1.45
<a href="#">TClamp2482S</a>	Low cap TVS for xDSL interfaces		24	27	2	150	–	–	20	0.1	S0T-23 6L	3.1 x 2.8 x 1.45
<a href="#">LC01-6</a>	Low cap TVS for high-speed telecommunication systems		6	8	–	–	1,500	100	–	25	S0-16W	10.3 x 10.3 x 2.65
<a href="#">LC03-3.3</a>	2-line, low cap 3.3V TVS for high-speed interfaces		3.3	–	12	1,800	–	–	100	1	S0-8	5.0 x 6.0 x 1.75
<a href="#">LC03-6</a>	2-line, low cap TVS for high-speed data interfaces		6	6.8	12	2,000	–	–	100	25	S0-8	5.0 x 6.0 x 1.75
<a href="#">LC04-6</a> <a href="#">LC05-6</a>	Dual, low cap TVS array for telecom linecard applications, protects 2 tip and ring line pairs		6	6.8	15	– 2,000	1,000 –	70 –	200 100	15	S0-16	10.0 x 6.0 x 1.75 10.0 x 6.0 x 1.75
<a href="#">LC04-12</a>	Dual, low cap TVS array for telecom linecard applications, protects 2 tip and ring line pairs		12	13.3	15	600	600	25	100	2	S0-16	10.0 x 6.0 x 1.75

## RailClamp® – Low Capacitance TVS

Part Number	Description	Device Schematic	V <sub>RWM</sub> Max (V)	V <sub>BR</sub> Min (V)	C <sub>L-L</sub> Max (pF) @ V <sub>R</sub> = 0V	Peak Power (W) (8/20μs)	I <sub>PP</sub> (A) @ (8/20μs)	I <sub>R</sub> Max (μA) @ V <sub>RWM</sub>	Package	Size (mm)
<a href="#">RClamp0502A</a>	2-line, ultra-low cap TVS array		5	6	0.7	50	3	1	SC-89	1.7 x 1.7 x 0.6
<a href="#">RClamp0502BA</a> <a href="#">RClamp1502B</a> <a href="#">RClamp2402B</a>	2-line protection, ultra-low cap TVS for ESD/CDE protection		5 15 24	6 16.7 26.7	0.9	125 200 200	5 5 4	1	SC-75	1.7 x 1.75 x 0.9 1.7 x 1.75 x 0.9 1.7 x 1.75 x 0.9
<a href="#">RClamp2451ZA</a>	24V, 1-line ESD protection		24	25.5	0.45	60	3	0.05	SLP0603P2X3	0.6 x 0.3 x 0.25
<a href="#">RClamp0504FA</a> <a href="#">RClamp0504S</a> <a href="#">RClamp0504N</a>	4-line protection, low cap TVS array		5	6	1.5 1.5 5*	150 150 300	6 6 12	3 3 5	SC-70 6L SOT-23 6L SLP2020P6	2.1 x 2.1 x 1.1 3.1 x 2.8 x 1.45 2.0 x 2.0 x 0.6
<a href="#">RClamp0504PA</a>	4-line protection, low cap TVS array		5	6	1	150	6	3	SLP1616P6	1.6 x 1.6 x 0.58
<a href="#">RClamp0506T</a>	6-line protection, ultra-low cap TVS for high-speed applications		5	6.5	0.4	75	5	0.1	SLP3313P6T	3.3 x 1.3 x 0.4
 <a href="#">RClamp0592PWQ</a>	5V, 2-line surge and ESD protection for high-speed applications		5	6.5	1.2	60	10	0.1	DFN1006N3T	1.0 x 0.6 x 0.55
<a href="#">RClamp0521PA</a> <a href="#">RClamp0821P</a> <a href="#">RClamp1521P</a>	Ultra-low cap, 1-line ESD protection		5 8 15	6 10 16.7	0.5	100 100 120	4	1	SLP1006P2	1.0 x 0.6 x 0.5 1.0 x 0.6 x 0.5 1.0 x 0.6 x 0.5
<a href="#">RClamp0521Z</a>	Ultra small, 1-line ESD protection		5	6	0.5	100	4	0.1	SLP0603P2X3A	0.6 x 0.3 x 0.25
<a href="#">RClamp3552T</a>	2-line, low voltage, ESD protection		3.5	-	0.4	60	4	0.3	SLP0603P2X3	0.6 x 0.3 x 0.25
<a href="#">RClamp0522P</a>	Protect 2 lines for high-speed applications		5	6	0.4	150	5	1	SLP1610P4	1.6 x 1.0 x 0.58
 <a href="#">RClamp0524PQ</a> <a href="#">RClamp0524PA</a>	Protect 4 lines for high-speed applications		5	6 6.5	0.4	150 75	5	1 0.1	SLP2510P8	2.5 x 1.0 x 0.58 2.5 x 1.0 x 0.58
 <a href="#">RClamp0531TQ</a>	1-line protection, ultra-low cap TVS for automotive applications		5	6	0.8	80	4	0.1	SLP1006P2T	1.0 x 0.6 x 0.4


\* Line-to-ground capacitance (max) value

## RailClamp® – Low Capacitance TVS (Continued)

Part Number	Description	Device Schematic	$V_{RWM}$ Max (V)	$V_{BR}$ Min (V)	$C_i$ Max (pF) L-L @ $V_R = 0V$	Peak Power (W) (8/20 $\mu$ s)	$I_{PP}$ (A) @ (8/20 $\mu$ s)	$I_R$ Max ( $\mu$ A) @ $V_{RWM}$	Package	Size (mm)
<a href="#">RClamp0534N</a>	4-line protection, low cap TVS for high-speed applications		5	6	3	500	25	0.5	SLP3020N10	3.0 x 2.0 x 0.6
<a href="#">RClamp0542T</a>	Protect 2 lines for high-speed applications		5	6.5	0.4	75	5	0.05	SLP1610P4T	1.6 x 1.0 x 0.4
<a href="#">RClamp0544T</a>	Protect 4 lines for high-speed applications		5	6.5	0.4	75	5	0.1	SLP2010P8T	2.0 x 1.0 x 0.4
<a href="#">RClamp0551P</a>	Ultra-low cap, 1-line ESD protection		5	6	0.5	60	3	0.1	SLP1006P2	1.0 x 0.6 x 0.5
<a href="#">RClamp0552T</a>	Ultra-low cap, 2-line ESD protection		5	6.5	0.4	60	3	0.02	SLP1006N3T	1.0 x 0.6 x 0.4
<a href="#">RClamp0564P</a>	4-line, low-capacitance protection for high-speed interfaces		5	6.5	0.20	-	3	50	SGP2010N5	2.0 x 1.0 x 0.5
<a href="#">RClamp7534P</a>	4-line, low-capacitance protection for high-speed interfaces		5	6.5	0.22	-	4	100	SGP2010N5	2.0 x 1.0 x 0.5
<a href="#">RClamp0554S</a>	4 line protection, low cap TVS for high-surge applications		5	6	5*	375	25	0.5	SOT-23 6L	3.1 x 2.8 x 1.45
<a href="#">RClamp0582B</a>	2-line protection, ultra-low cap TVS for high-speed applications		5	6	0.8	300	15	0.1	SC-75	1.7 x 1.75 x 0.9
 <a href="#">RClamp0582BQ</a>	2 line protection, ultra-low cap TVS for automotive applications		5	6	0.8	300	15	0.1	SC-75	1.7 x 1.75 x 0.9
<a href="#">RClamp0582N</a>	2 data, 1 power line protection, ultra-low cap TVS for automotive applications		6.5	7	0.5	125	5	0.1	SLP1210N6	1.2 x 1.0 x 0.58
<a href="#">RClamp0584J</a>	4-line protection, ultra-low cap for high-speed applications		5	6.5	0.4	75	5	0.1	SLP2710P8	2.7 x 1.0 x 0.5

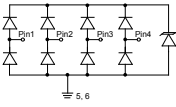
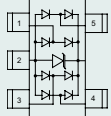
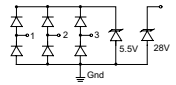
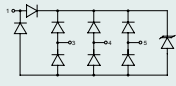
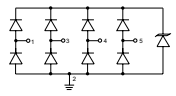
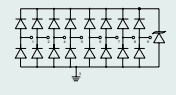
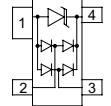
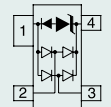
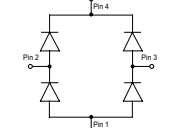
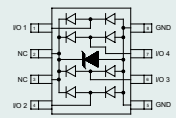
\* Line-to-ground capacitance (max) value

## RailClamp® – Low Capacitance TVS (Continued)

Part Number	Description	Device Schematic	V <sub>RWM</sub> Max (V)	V <sub>BR</sub> Min (V)	C <sub>i</sub> Max (pF) L-L @ V <sub>R</sub> = 0V	Peak Power (W) (8/20µs)	I <sub>PP</sub> (A) @ (8/20µs)	I <sub>R</sub> Max (µA) @ V <sub>RWM</sub>	Package	Size (mm)
<a href="#">RClamp0854P</a>	3 data line protection and 1 power line for USB charger and USB OTG		5.5	6.5	0.5	100	3	1	SLP1616P6	1.6 x 1.6 x 0.58
<a href="#">RClamp1654P</a>	3 data line protection and 1 power line for USB charger and USB OTG		5.5	6.5	0.5	100	3	1	SLP1616P6	1.6 x 1.6 x 0.58
<a href="#">RClamp2502L</a>	2.5V, flow-through TVS for gigabit and fast Ethernet protection		2.5	-	5	800	40	1	SO-8	5.0 x 6.0 x 1.75
<a href="#">RClamp2504N</a> <a href="#">RClamp3304NA</a>	4-line protection, low cap TVS array for Ethernet and telecom interfaces		2.5 3.3	-	5*	450	25	5	SLP2626P10	2.6 x 2.6 x 0.6 2.6 x 2.6 x 0.6
<a href="#">RClamp2504P</a> <a href="#">RClamp3304P</a>	4-line ultra-low cap TVS array		2.5 3.3	-	0.8*	80	5	0.5	SLP1616P6	1.6 x 1.6 x 0.58 1.6 x 1.6 x 0.58
 <a href="#">RClamp2574NQ</a> <a href="#">RClamp3374N</a>	4-line protection, high power TVS for Ethernet interfaces		2.5 3.3	-	5*	1,000	40	0.5	SLP3020N10	3.0 x 2.0 x 0.6 3.0 x 2.0 x 0.6
<a href="#">RClamp3321P</a>	3.3V, 1-line ESD protection		3.3	5.5	0.35	25	3	0.05	SLP1006P2	1.0 x 0.6 x 0.5
<a href="#">RClamp3324P</a>	3.3V, 4-line surge and ESD protection		3.3	-	0.4	-	4.5	0.05	SGP2510P8	2.5 x 1.0 x 0.6
<a href="#">RClamp3328P</a>	3.3V, 8-line surge and ESD protection		3.3	-	0.4	75	5	0.1	SGP3810N9	3.8 x 1.0 x 0.5
<a href="#">RClamp3331ZA</a>	3.3V, 1-line ESD protection		3.3	5.5	0.45	30	4	0.05	SLP0603P2X3	0.6 x 0.3 x 0.25
<a href="#">RClamp3346P</a>	3.3V, 6-line ESD protection for high-speed applications		3.3	-	0.4	-	4.5	0.05	SGP2708N7	2.7 x 0.8 x 0.5

\* Line-to-ground capacitance (max) value

## RailClamp® – Low Capacitance TVS (Continued)

Part Number	Description	Device Schematic	V <sub>RWM</sub> Max (V)	V <sub>BR</sub> Min (V)	C <sub>i</sub> Max (pF) L-L @ V <sub>R</sub> = 0V	Peak Power (W) (8/20μs)	I <sub>PP</sub> (A) @ (8/20μs)	I <sub>R</sub> Max (μA) @ V <sub>RWM</sub>	Package	Size (mm)
<a href="#">RClamp3324T</a>	3.3V, flow-through TVS for USB 3.0 interfaces		3.3	-	0.4	75	5	0.1	SLP1710P4T	1.7 x 1.0 x 0.4
<a href="#">RClamp3354S</a>	4-line, 3.3V TVS for GbE interfaces		3.3	-	5*	400	25	0.5	SOT-23	3.1 x 2.8 x 1.45
<a href="#">RClamp3654PA</a>	3 data line protection and 1 power line for USB charger and USB OTG		5.5	6.5	0.5	100	3	1	SLP1616P6	1.6 x 1.6 x 0.58
<a href="#">RClamp7522T</a>	2-line protection, ultra-low cap TVS for high-speed applications		5	6.5	0.4	100	4	0.1	SLP1007N5T	1.0 x 0.7 x 0.4
<a href="#">RClamp7524T</a>	4-line protection, ultra-low cap TVS for high-speed applications		5	6.5	0.4	75	5	0.1	SLP1308N5T	1.3 x 0.8 x 0.4
<a href="#">RClamp7528T</a> <a href="#">RClamp7538P</a>	8-line protection, ultra-low cap TVS for high-speed applications		5	6.5	0.4	75	5	0.1	SLP2611N9T SLP3810N9	2.6 x 1.1 x 0.4 3.8 x 1.0 x 0.5
<a href="#">SR05</a> <a href="#">SR12</a>	2-line, low cap TVS diode array		5 12	6 13.3	10*	500 550	25 16	5 1	SOT-143	3.04 x 2.64 x 1.22 3.04 x 2.64 x 1.22
<a href="#">SR2.8</a> <a href="#">SR3.3</a>	2-line, low cap TVS diode array		2.8 3.3	-	10*	200 150	14 10	1 1	SOT-143	3.04 x 2.64 x 1.22 3.04 x 2.64 x 1.22
<a href="#">SR70</a>	2-line, low cap TVS diode array		70	85	10*	-	24	5	SOT-143	3.04 x 2.64 x 1.22
<a href="#">SRDA3.3-4</a>	4-line, low capacitance TVS diode array		3.3	-	15*	500	25	1	SO-8	5.0 x 6.0 x 1.75

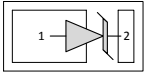
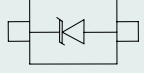

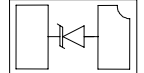
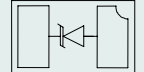
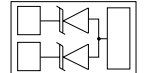
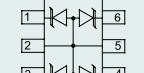
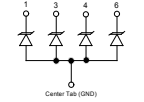
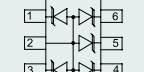
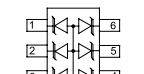
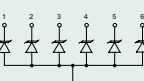
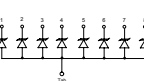
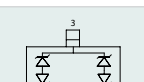

\* Line-to-ground capacitance (max) value

## RailClamp® – Low Capacitance TVS (Continued)

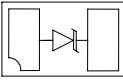


Part Number	Description	Device Schematic	V <sub>RWM</sub> Max (V)	V <sub>BR</sub> Min (V)	C <sub>i</sub> Max (pF) L-L @ V <sub>R</sub> = 0V	Peak Power (W) (8/20μs)	I <sub>PP</sub> (A) @ (8/20μs)	I <sub>R</sub> Max (μA) @ V <sub>RWM</sub>	Package	Size (mm)
<a href="#">SRDA5-4</a> <a href="#">SRDA12-4</a>	4-line, low capacitance TVS diode array		5 12	6 13.3	15*	500	25 20	10 1	SO-8	5.0 x 6.0 x 1.75 5.0 x 6.0 x 1.75
<a href="#">SRV05-4</a>	4-line, low capacitance TVS diode array		5	6	5*	300	12	5	SOT-23 6L	3.1 x 2.8 x 1.45
<a href="#">RClamp0821ZA</a> <a href="#">RClamp5031ZA</a>	Ultra small low capacitance 1 line ESD protection		8 5	10 6.5	0.5 0.45	-	4	0.1 0.05	SLP0603P2X3F	0.6 x 0.3 x 0.25 0.6 x 0.3 x 0.25
<a href="#">RClamp3521ZA</a>	1-line, low cap 3.5V TVS for high-speed interfaces		3.5	5.5	0.55	30	6	0.05	SLP0603P2X3F	0.6 x 0.3 x 0.25
<a href="#">RClamp3351ZA</a> <a href="#">RClamp3371ZC</a> <a href="#">RClamp3391ZC</a>	Ultra low cap TVS for high-speed interfaces		3.3	5.5	0.6 0.25 0.2	65 65 45	10 9 7	0.05	SLP0603P2X3F SLP0603P2X3J SLP0603P2X3J	0.6 x 0.3 x 0.25 0.6 x 0.3 x 0.25 0.6 x 0.3 x 0.25
 <a href="#">RClamp0551PQ</a>	Low capacitance 1 line protection of automotive interfaces		5	6	0.5	45	3	0.1	SLP1006P2	1.0 x 0.6 x 0.5
 <a href="#">RClamp0561PQ</a> <a href="#">RClamp1561PQ</a>	Low capacitance 1 line protection of automotive interfaces		5.5 15	6.5 16.5	0.18 0.3	40 70	2	0.05	SLP1006P2	1.0 x 0.6 x 0.5 1.0 x 0.6 x 0.5
 <a href="#">RClamp3331PQ</a>	Low capacitance ESD and EOS protection		3.3	6	0.38	30	10	0.05	SLP1006P2	1.0 x 0.6 x 0.5
 <a href="#">RClamp0582NQ</a>	Low capacitance 2 line ESD and EOS protection		6.5	7	0.5	125	5	0.1	SLP1210N6	1.2 x 1.0 x 0.58
<a href="#">RClamp0521ZA</a>	Ultra small, 1-line ESD protection		5	6.5	-	-	2	0.1	SLP0603P2X3	0.6 x 0.3 x 0.25

\* Line-to-ground capacitance (max) value


## MicroClamp® - TVS Arrays

Part Number	Description	Device Schematic	V <sub>RWM</sub> Max (V)	V <sub>BR</sub> Min (V)	C <sub>i</sub> Max (pF) L-G @ V <sub>R</sub> = 0V	Peak Power (W) (8/20μs)	I <sub>PP</sub> (A) @ (8/20μs)	I <sub>q</sub> Max (μA) @ V <sub>RWM</sub>	Package	Size (mm)
<a href="#">μClampxx61P</a>	High power, 1-line ESD and surge protection		5-40	-	220 to 125	1,200 to 1,500	80-5	0.2	SLP1608P2	1.6 x 0.8 x 0.5
<a href="#">μClamp0501H</a> <a href="#">μClamp1201H</a>	1-line ESD protection		5 12	6 13.3	160 60	240 200	16 8	5 1	SOD-523	1.7 x 0.9 x 0.7 1.7 x 0.9 x 0.7
 <a href="#">μClamp0301PQ</a> <a href="#">μClamp0501P</a> <a href="#">μClamp1201P</a>	1-line ESD protection		3 5 12	- 6 13.3	30 160 60	40 200 200	5 16 8	0.5 5 1	SLP1006P2	1.0 x 0.6 x 0.5 1.0 x 0.6 x 0.5 1.0 x 0.6 x 0.5
<a href="#">μClamp0501T</a> <a href="#">μClamp2401T</a>	1-line ESD protection		5 24	6 27	10 50	25 150	2 3	0.25	SLP1006P2T	1.0 x 0.6 x 0.4 1.0 x 0.6 x 0.4
<a href="#">μClamp0502P</a> <a href="#">μClamp0502T</a>	2-line ESD protection		5	6	10	25	2	0.25	SLP1006P3 SLP1006P3T	1.0 x 0.6 x 0.5 1.0 x 0.6 x 0.5
<a href="#">μClamp0504A</a> <a href="#">μClamp3304A</a>	4-line ESD protection array		5 3.3	6 -	75 30	100 40	7 5	1 0.5	SC-89	1.7 x 1.7 x 0.6 1.7 x 1.7 x 0.6
<a href="#">μClamp0504T</a> <a href="#">μClamp0505T</a> <a href="#">μClamp0506T</a>	4, 5, 6-line ESD protection		5	6	10	25	2	0.25	SLP1313P6T	1.3 x 1.3 x 0.4 1.3 x 1.3 x 0.4 1.3 x 1.3 x 0.4
<a href="#">μClamp0505A</a>	5-line ESD protection array		5	6	75	100	7	1	SC-89	1.7 x 1.7 x 0.6
<a href="#">μClamp0506A</a>	5-line ESD protection array		5	6	40	100	7	1	SC-89	1.7 x 1.7 x 0.6
<a href="#">μClamp0506P</a>	6-line ESD protection array		5	6	75	100	7	1	SLP1616P6	1.6 x 1.6 x 0.58
<a href="#">μClamp0508T</a>	8-line ESD protection		5	6	10	25	2	0.25	SLP1713P8T	1.7 x 1.3 x 0.4
<a href="#">SM712</a>	300W asymmetrical 2-line 7V/12V protection in SOT23-3		7,12	7.5 13.3	75	550-700	21	0.2	JEDEC SOT-23	3.04 x 2.64 x 1.2
<a href="#">μClamp2501ZA</a>	1 line 2.5V TVS diode		2.5	3	4.5	65	8	0.05	SLP0603P2X3F	0.6 x 0.3 x 0.25

## MicroClamp® - TVS Arrays (Continued)

Part Number	Description	Device Schematic	V <sub>RWM</sub> Max (V)	V <sub>BR</sub> Min (V)	C <sub>i</sub> Max (pF) L-G @ V <sub>R</sub> = 0V	Peak Power (W) (8/20μs)	I <sub>PP</sub> (A) @ (8/20μs)	I <sub>SP</sub> Max (μA) @ V <sub>RWM</sub>	Package	Size (mm)
<a href="#">μClamp0511P</a> <a href="#">μClamp1211P</a> <a href="#">μClamp3311P</a>	1-line ESD protection		5 12 3.3	6 13.3 -	75 25 15	170 200 90	12 7 5	1 1 0.5	SLP1006P2	1.0 x 0.6 x 0.5 1.0 x 0.6 x 0.5 1.0 x 0.6 x 0.5
<a href="#">μClamp0511T</a>	1-line ESD protection		5	6	7	-	2	0.05 (V <sub>R</sub> =3.3V)	SLP1006P2T	1.0 x 0.6 x 0.4
<a href="#">μClamp0541Z</a> <a href="#">μClamp1211Z</a>	Ultra small, 1 line ESD protection		5 12	6 14.2	9 25	25 175	2 7	0.05	SLP0603P2X3	0.6 x 0.3 x 0.25 0.6 x 0.3 x 0.25
<a href="#">μClamp0524P</a> <a href="#">μClamp3324P</a>	4-line, low voltage TVS for ESD protection		5 3.3	6 -	160 30	240 40	16 5	5 0.5	SLP2116P8	2.1 x 1.6 x 0.58 2.1 x 1.6 x 0.58
<a href="#">μClamp2501T</a>	1-line, 2.5V TVS for ESD protection		2.5	-	30	40	5	0.05	SLP1006P2T	1.0 x 0.6 x 0.4
<a href="#">μClamp2511T</a> <a href="#">μClamp3311T</a> <a href="#">μClamp1211T</a>	1-line ESD protection		2.5 3.3 12	- - 13.3	10 7 7	40 40 -	5 5 -	0.05	SLP1006P2T	1.0 x 0.6 x 0.4 1.0 x 0.6 x 0.4 1.0 x 0.6 x 0.4
<a href="#">μClamp3321ZA</a>	1-Line ESD protection		3.3 5	5.5 6.5	0.45 5	30	4 2.5	0.05 0.02	SLP0603P2X3	0.6 x 0.3 x 0.25
<a href="#">μClamp2804L</a>	4-line, 2.8V TVS array for Ethernet applications		2.8	-	-	100	10	0.05	SO-8	5.0 x 6.0 x 1.75
<a href="#">μClamp3301P</a>	1-line, low voltage ESD/CDE protection		3.3	-	30	40	5	0.5	SLP1006P2	1.0 x 0.6 x 0.5
<a href="#">μClamp3305P</a>	5-line, 3.3V TVS		3.3	-	25	40	5	0.5	SLP1616P6	1.6 x 1.6 x 0.58
<a href="#">μClamp3306P</a>	6-line, 3.3V TVS		3.3	-	25	40	5	0.5	SLP1616P6	1.6 x 1.6 x 0.58
 <a href="#">μClamp3311PQ</a>	1-line, low voltage TVS for automotive applications		3.3	-	15	90	5	0.5	SLP1006P2	1.0 x 0.6 x 0.5
<a href="#">μClamp3381P</a>	3.3V, 1-line ESD and surge protection		3.3	4.5	35	275	25	0.1	SGP1006N2	1.0 x 0.6 x 0.5
<a href="#">μClamp5011ZA</a>	1-line ESD protection		5	6.5	5	30	2.5	0.02	SLP0603P2X3	0.6 x 0.3 x 0.25
<a href="#">μClamp3612P</a>	1-line, 33V TVS for proximity switch input protection		33	36	25	170	-	1	SLP1006P2	1.0 x 0.6 x 0.5
<a href="#">μClamp3603T</a>	3-line, 36V TVS for proximity switch protection		36	-	50	-	-	1	SLP1710N6T	1.7 x 1.0 x 0.4

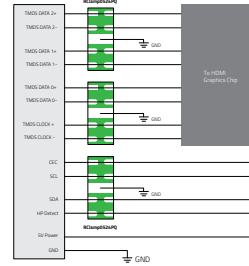
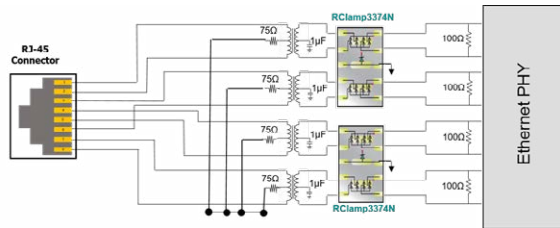
## LCDA/SLVU Families - TVS Arrays

Part Number	Description	Device Schematic	V <sub>RWM</sub> Max (V)	V <sub>BR</sub> Min (V)	C <sub>i</sub> Max (pF) L-G @ V <sub>R</sub> = 0V	Peak Power (W) (8/20μs)	I <sub>PP</sub> (A) @ (8/20μs)	I <sub>R</sub> Max (μA) @ V <sub>RWM</sub>	Package	Size (mm)
<a href="#">LCDA12C-1</a> <a href="#">LCDA15C-1</a> <a href="#">LCDA24C-1</a>	1-line, low cap TVS diode array		12 15 24	13.3 16.7 26.7	15 15 10	500	-	5 5 1	SOT-143	3.04 x 2.64 x 1.22 3.04 x 2.64 x 1.22 3.04 x 2.64 x 1.22
 <a href="#">SLVU2.8Q</a>	1-line, 2.8V TVS for automotive applications		2.8	-	100	400	24	0.25	SOT-23	3.1 x 2.8 x 1.45
<a href="#">SLVU2.8-4</a>	4-line, EPD TVS diode array for ESD and latch-up protection		2.8	-	-	400	24	1	SO-8	5.0 x 6.0 x 1.75
<a href="#">SLVU2.8-8</a>	8-line EPD TVS diode array for ESD and latch-up protection		2.8	-	-	600	30	1	SO-8	5.0 x 6.0 x 1.75

## PowerClamp™ High-surge TVS Diode

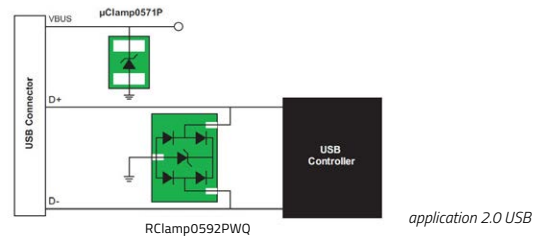
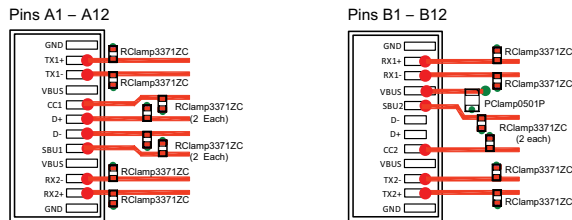
Part Number	Description	Device Schematic	V <sub>RWM</sub> Max (V)	V <sub>BR</sub> Min (V)	C <sub>i</sub> Max (pF) L-G @ V <sub>R</sub> = 0V	Peak Power (W) (8/20μs)	I <sub>PP</sub> (A) @ (8/20μs)	I <sub>R</sub> Max (μA) @ V <sub>RWM</sub>	Package	Size (mm)
<a href="#">PCLamp1211P</a>	Power MicroClamp 1-line high-surge TVS diode		13.5	14.5	2,500	5,000	180	0.35	SLP2018P6	2.0 x 1.8 x 0.57
<a href="#">PCLamp1011P</a> <a href="#">PCLamp2011P</a>	Power MicroClamp 1-line high-surge TVS diode		10 23	12.5 27	2,500 800	4,700 5,700	180 120	0.15	SLP2018P6	2.0 x 1.8 x 0.57 2.0 x 1.8 x 0.57
<a href="#">PCLamp0501P</a> <a href="#">PCLamp1021P</a> <a href="#">PCLamp1221P</a>	1-line surge protection		5 10 12	5 11 13	1,150 600 430	1,800 1,680 2,000	80	0.1	SGP1610N2-D	1.6 x 1.0 x 0.53 1.6 x 1.0 x 0.53 1.6 x 1.0 x 0.53
<a href="#">PCLamp0801P</a>	Power MicroClamp 1 line high-surge TVS diode		7.6	7.96	1,150	500	50	5	SGP1610N2-D	1.6 x 1.0 x 0.53

# Key Applications



Ethernet						
Part Number	Vrwm (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">RClamp3374N</a>	3.3	4	30kV±/30kV±	40	5	0.6 x 2.0 x 3.0
<a href="#">RClamp3354S</a>	3.3	4	30kV±/30kV±	25	5	1.45 x 2.8 x 3.1
<a href="#">RClamp0592PWQ</a>	5.0	2	30kV±/30kV±	10	1	0.55 x 0.6 x 1.0
<a href="#">RClamp0582BQ</a>	5.0	2	25kV±/30kV±	15	1.2	0.75 x 1.6 x 1.6

HDMI						
Part Number	Vrwm (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">RClamp0574P</a>	5.5	4	10kV±/15kV±	5	0.3	0.5 x 1.0 x 2.0
<a href="#">RClamp0524PQ</a>	5.0	4	15kV±/25kV±	5	1.5	0.58 x 1.0 x 2.5
<a href="#">RClamp0564P</a>	5.0	4	10kV±/15kV±	3	0.2	0.5 x 1.0 x 2.0
<a href="#">RClamp0524PA</a>	5.0	4	12kV±/17kV±	5	0.8	0.58 x 1.0 x 2.5
<a href="#">RClamp7524T</a>	5.0	4	25kV±/30kV±	5	0.6	0.4 x 0.8 x 1.3
<a href="#">RClamp7534P</a>	5.0	4	20kV±/25kV±	4	0.22	0.5 x 1.0 x 2.0



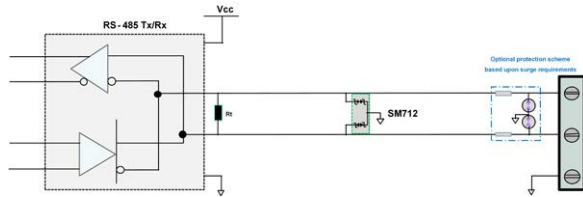
USB Type-C						
Part Number	Vrwm (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">RClamp0592PWQ</a>	5.0	2	30kV±/30kV±	10	1	0.55 x 0.6 x 1.0
<a href="#">RClamp33712C</a>	3.3	1	10kV±/17kV±	9	0.25	0.25 x 0.3 x 0.6
<a href="#">μClamp5011ZA</a>	5.0	1	15kV±/18kV±	2.5	5	0.25 x 0.3 x 0.6
<a href="#">μClamp2271P</a>	22	1	30kV±/30kV±	25	165	0.57 x 1.0 x 1.6

2.0 USB						
Part Number	Vrwm (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">RClamp7522T</a>	5.0	3	15kV±/25kV±	4	0.4	0.4 x 0.7 x 1.0
<a href="#">RClamp0582B</a>	5.0	2	25kV±/30kV±	15	1.2	0.75 x 1.6 x 1.6
<a href="#">RClamp0592PWQ</a>	5.0	2	30kV±/30kV±	10	1	0.55 x 0.6 x 1.0
<a href="#">μClamp0571P</a>	5.0	1	30kV±/30kV±	80	675	0.57 x 1.0 x 1.6

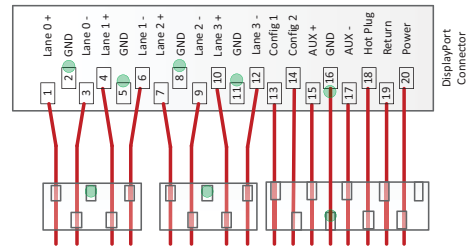


3 Thunderbolt						
Part Number	Vrwm (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">RClamp33912C</a>	3.3	1	8kV±/15kV±	7	0.2	0.25 x 0.3 x 0.6
<a href="#">RClamp10112C</a>	1.0	1	10kV±/15kV±	2.5	0.2	0.25 x 0.3 x 0.6

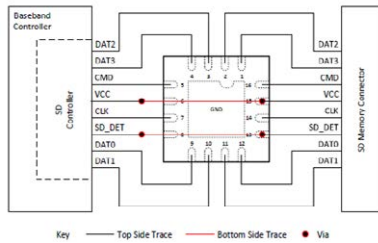
Audio Port/Side Keys Protection						
Part Number	Vrwm (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">μClamp3321ZA</a>	3.3	1	15kV±/17kV±	4	5	0.25 x 0.3 x 0.6
<a href="#">μClamp0541Z</a>	5.0	1	17kV±/17kV±	2	9	0.25 x 0.3 x 0.6
<a href="#">μClamp5011ZA</a>	5.0	1	15kV±/18kV±	2.5	5	0.25 x 0.3 x 0.6
<a href="#">μClamp1211Z</a>	12	1	30kV±/30kV±	7	25	0.25 x 0.3 x 0.6



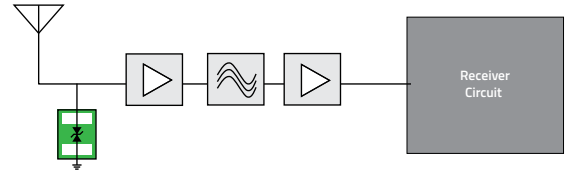
485-RS						
Part Number	V <sub>rw</sub> (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">SM712</a>	12 (2 or 1 to 3 Pin) 7 (2 or 1 to 3 Pin)	2	30kV±/30kV±	21 (3 to 2 or 1 Pin) 38 (2 or 1 to 3 Pin)	75	1.2 x 2.64 x 3.04



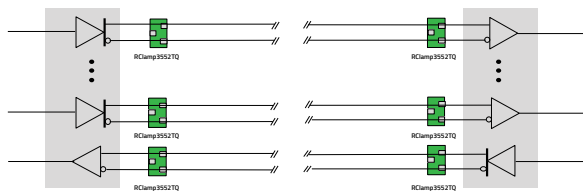
Display Port						
Part Number	V <sub>rw</sub> (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">RClamp0564P</a>	V <sub>RWM</sub> (V)	4	10kV±/15kV±	3	0.2	0.5 x 1.0 x 2.0
<a href="#">RClamp7534P</a>	5.0	4	20kV±/25kV±	4	0.22	0.5 x 1.0 x 2.0
<a href="#">RClamp7538P</a>	5.0	8	20kV±/25kV±	5	0.6	0.5 x 1.0 x 3.8



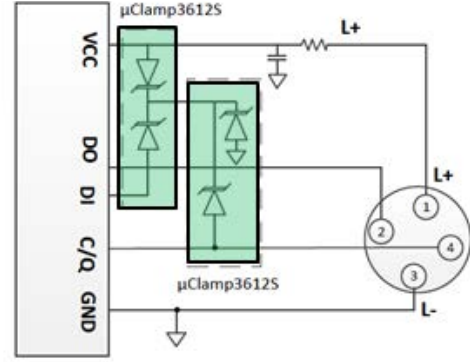
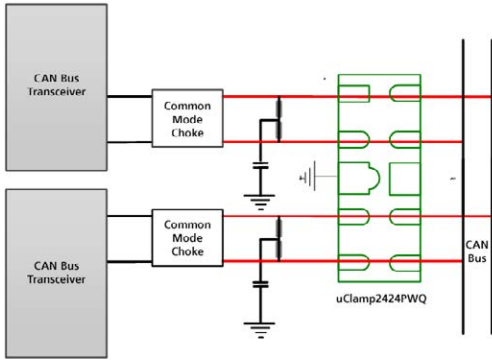
SD Card						
Part Number	V <sub>rw</sub> (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">RClamp3331ZA</a>	3.3	1	18kV±/20kV±	4	0.45	0.25 x 0.3 x 0.6
<a href="#">RClamp3351ZA</a>	3.3	1	22kV±/25kV±	10	0.6	0.25 x 0.3 x 0.6
<a href="#">PClamp0511ZV</a>	5.0	1	30kV±/30kV±	115	275	0.25 x 0.6 x 1.0



Antenna						
Part Number	V <sub>rw</sub> (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">RClamp3331PQ</a>	3.3	1	30kV±/30kV±	10	0.38	0.5 x 0.6 x 1.0
<a href="#">RClamp0521PA</a>	5.0	1	12kV±/15kV±	4	0.5	0.5 x 0.6 x 1.0
<a href="#">RClamp0531T</a>	5.0	1	12kV±/20kV±	4	0.8	0.4 x 0.6 x 1.0
<a href="#">RClamp2451ZA</a>	24	1	14kV±/18kV±	4	0.45	0.25 x 0.3 x 0.6
<a href="#">RClamp1521P</a>	15	1	8kV±/15kV±	4	0.5	0.5 x 0.6 x 1.0



Low Voltage Differential Signaling (LVDS)						
Part Number	V <sub>rw</sub> (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">RClamp3352TQ</a>	3.5	2	17kV±/20kV±	4	0.4	0.4 x 0.6 x 1.0
<a href="#">RClamp3331PQ</a>	3.3	1	30kV±/30kV±	10	0.38	0.5 x 0.6 x 1.0



### CAN Bus Protection

Part Number	V <sub>rw</sub> (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">μClamp2424PWQ</a>	24	2	30kV±/30kV±	5A	115	0.55 x 1.0 x 2.5



### USB VBUS

Part Number	V <sub>rw</sub> (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">PCLamp0501P</a>	5	1	30kV±/30kV±	120	1150	0.53 x 1.0 x 1.6
<a href="#">PCLamp1021P</a>	10	1	30kV±/30kV±	80	600	0.53 x 1.0 x 1.6
<a href="#">PCLamp1211P</a>	13.5	1	30kV±/30kV±	180	2500	0.57 x 1.8 x 2.0
<a href="#">PCLamp1221P</a>	12	1	30kV±/30kV±	80	530	0.53 x 1.0 x 1.6
<a href="#">PCLamp1011P</a>	10	1	30kV±/30kV±	180	2500	0.57 x 1.8 x 2.0
<a href="#">PCLamp2011P</a>	23	1	30kV±/30kV±	120	800	0.57 x 1.8 x 2.0

### IO-Link & Proximity Switch Protection

Part Number	V <sub>rw</sub> (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">SDC36C</a>	33	2	8kV±/15kV±	4	120	1.2 x 2.64 x 3.04
<a href="#">μClamp3603T</a>	36	3	15kV±/20kV±	16	120	0.4 x 1.0 x 1.7

### VBUS Protection

Part Number	V <sub>rw</sub> (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">μClamp0571P</a>	5	1	30kV±/30kV±	80	675	0.57 x 1.0 x 1.6
<a href="#">μClamp0871P</a>	8	1	30kV±/30kV±	65	475	0.57 x 1.0 x 1.6
<a href="#">μClamp1071P</a>	10	1	30kV±/30kV±	60	350	0.57 x 1.0 x 1.6
<a href="#">μClamp1271P</a>	12	1	30kV±/30kV±	45	275	0.57 x 1.0 x 1.6
<a href="#">μClamp1571P</a>	15	1	30kV±/30kV±	40	220	0.57 x 1.0 x 1.6
<a href="#">μClamp1871P</a>	18	1	30kV±/30kV±	35	225	0.57 x 1.0 x 1.6
<a href="#">μClamp2271P</a>	22	1	30kV±/30kV±	25	165	0.57 x 1.0 x 1.6
<a href="#">μClamp2671P</a>	26	1	30kV±/30kV±	23	155	0.57 x 1.0 x 1.6
<a href="#">μClamp3671P</a>	36	1	30kV±/30kV±	18	150	0.57 x 1.0 x 1.6

### Optical Modules Protection

Part Number	V <sub>rw</sub> (V)	Lines	ESD Rating (Air/Contact)	Surge (8x20us) (A)	Cap (pF)	Size (mm)
<a href="#">μClamp0511P</a>	5	1	8kV±/15kV±	12	75	0.5 x 0.6 x 1.0
<a href="#">μClamp3381P</a>	3.3	1	30kV±/30kV±	25	35	0.5 x 0.6 x 1.0
<a href="#">RClamp7524T</a>	5	4	25kV±/30kV±	5	0.6	0.4 x 0.8 x 1.3
<a href="#">RClamp0524T</a>	5	4	8kV±/15kV±	5	0.8	0.4 x 1.0 x 2.5



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