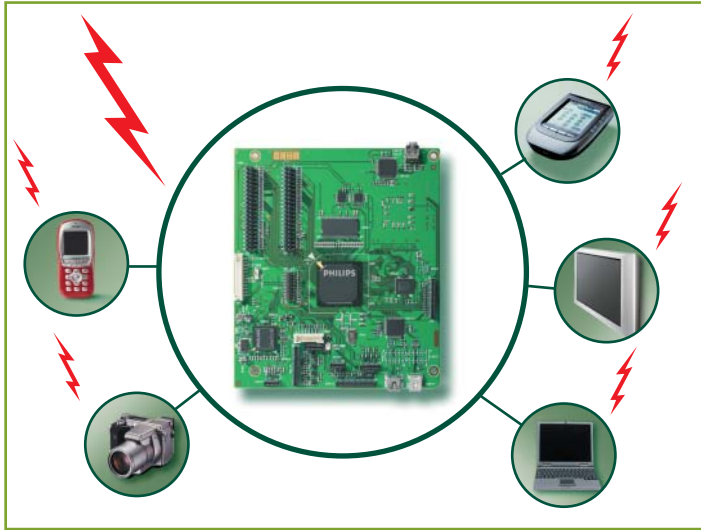


New ESD protection diodes

Driving the evolution of discrete solutions, Philips' new PESD diodes excel in the diode arena. Delivering a superior size / performance ratio these innovative ESD protection diodes provide designers of space-constrained applications with an excellent protection option for electrical equipment both at the system and component level.



Key features

- Excellent ESD clamping behavior
- Low leakage current (~ 50 nA)
- Low device capacitance (~ 10 pF)
- Up to 30 kV ESD protection
- IEC61000-4-2, level 4 compatible (8 kV contact / 15 kV air discharge)
- Superior size / performance ratio
- Space-saving, ultra-small SMD plastic packages

Key benefits

- Sensitive applications are protected from the destructive effects of Electro Static Discharge (ESD) according to international industrial standards
- Highly reliable protection devices featuring excellent ESD protection performance
- Ultra-small SMD plastic packages delivering PCB space savings

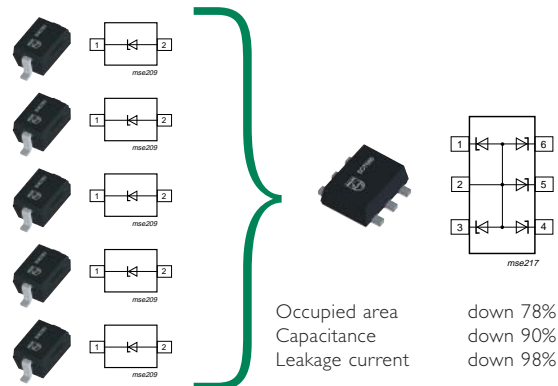
Safeguarding circuits everywhere



Rated up to 15 kV, Philips' new ESD protection diode series is more than a match for high-energy Electro Static Discharge (ESD) pulses, which are a major cause of damage or malfunction in electronic equipment. With extremely fast response time and excellent clamping behavior in ultra-small plastic packages, the PESD series offers designers of space-constrained applications an ideal solution at both system and component level. Performing to international industrial standards, the optimized diode structure ensures low clamping voltages and ultra-low reverse leakage currents, making them ideal for effective ESD protection of today's sensitive electronics.

Often, as application size decreases the effects of ESD pulses become even more destructive. Susceptibility to damage increases in space-critical designs such as mobile devices, which utilize smaller semiconductors containing denser and more complex circuitry. Benefiting from small package dimensions and the integration of several protection diodes per device, the new PESD series is well suited to these small-scale applications – ranging from cellular phones to notebook PCs and portable DVD players.

Space saving through integration



5x BZX384-C6V8

Package	5x SOD323
Occupied area	21.84 mm ²
Capacitance	200 pF
Leakage current	2 μA

1x PESD5V0L5UV

Package	1x SOT666
Occupied area	4.81 mm ²
Capacitance	19 pF
Leakage current	25 nA

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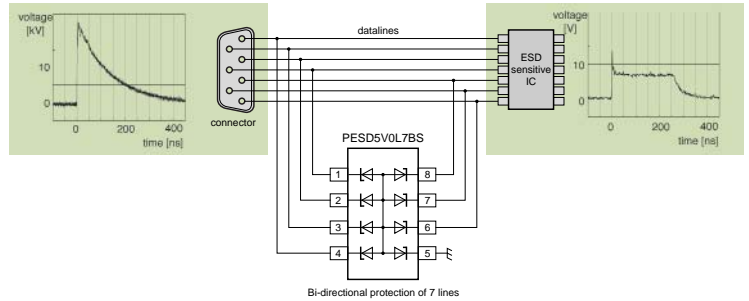
New ESD protection diodes

Safeguarding circuits everywhere



Superior performance for all applications

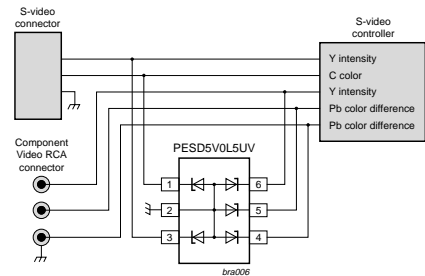
Specifically developed, tested and characterized for ESD protection, this new series is optimized to withstand ESD pulses up to 30 kV and to ensure very low clamping voltages. Where high-speed data / high-frequency applications are concerned, parasitic capacitance of protection devices can cause unwanted and detrimental attenuation of signals. To ensure this effect is kept to a minimum in your system, Philips' ESD protection diodes offer a low device capacitance down to 10 pF. And when power consumption is a key concern, such as in battery-driven appliances, the devices' ultra-low leakage current – down to 25 nA – helps reduce overall power consumption.



Bi-directional protection of 7 lines

Key applications

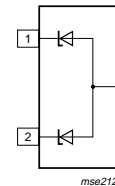
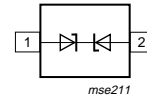
- Cellular handsets and accessories
- Portable equipment
- PCs, laptops and peripherals
- Communication systems
- Audio and video equipment



S-video controller input protection

Best-in-class protection from smallest footprint

The low-capacitance PESD3V3L2UM, PESD5V0L2UM and PESD5V0S1BL diodes offer uni-directional and bi-directional ESD protection for up to 2 lines and are the first ESD protection diodes to utilize the new leadless, ultra-small SOD882 and SOT883 surface mount packages. With a device footprint of only 1.0 x 0.6 x 0.5 mm, these miniature solutions offer manufacturers PCB space savings of 90% compared to the SOT23 (the traditional package for ESD protection diodes).



SOD882 / SOT883
1.0 x 0.6 x 0.5 mm³

ESD protection diode selection

Philips' new ESD protection diodes are available in an extensive selection of packages with a wide range of reverse standoff voltages (V_{RWM}) and a choice of uni-directional or bi-directional configurations, capable of protecting from a single line up to 18 lines per device.

ESD protection for 4 to 18 lines

Number of lines		I_{RM} max [μ A]	@ V_{RWM} [V]	C max [pF]	PPp *** max [W]	PZSM * max [W]	Configuration	Types	Package (not true to scale)	
Uni-directional	Bi-directional									
4	3	2	3	240		24		BZA456A	SOT457 (SC-74)	
4	3	0.7	4	200		24		BZA462A		
4	3	0.075	14	48		19.6		BZA418A		
4	3	0.1	15	48		19.6		BZA420A		
4	3	2	3	240		24		BZA856A	SOT353 (SC-88A)	
4	3	0.7	4	200		24		BZA862A		
4	3	0.2	4.3	180		24		BZA868A		
4	3	0.1	15	50		17		BZA820A		
4	3	1	3	125		16		BZA856AL		
4	3	0.5	4	105		15		BZA862AL		
4	3	0.1	4.3	90		14		BZA868AL		
4	3	0.3	3.3	28	30			PESD3V3L4UG		
4	3	0.025	5	19	30		PESD5V0L4UG			
4	3	1	3	125		16		BZA956A	SOT665	
4	3	0.5	4	105		15		BZA962A		
4	3	0.1	4.3	90		14		BZA968A		
4	3	0.3	3.3	28	30			PESD3V3L4UW		
4	3	0.025	5	19	30			PESD5V0L4UW		
	4	0.1	5	75		20		BZA408B		SOT457 (SC-74)
	4	0.1	5	75		20		BZA408B		
	4	0.1	5	75		20		BZA408B		
5	4	0.3	3.3	28	25			PESD3V3L5UY	SOT363 (SC-88)	
5	4	0.025	5	19	25			PESD5V0L5UY		
5	4	0.3	3.3	28	25			PESD3V3L5UV		
5	4	0.025	5	19	25			PESD5V0L5UV		
6	5	0.025	5	19	35			PESD5V0L6US	SOT96-1 (SO8)	
6	5	0.025	5	19	35			PESD5V0L6UAS**	SOT505-1 (TSSOP8)	
6	5	0.025	5	19	35			PESD5V0L6UAS**		
6	5	0.025	5	19	35			PESD5V0L6UAS**		
	7	0.025	5	10	35			PESD5V0L7BS	SOT96-1 (SO8)	
	7	0.025	5	10	35			PESD5V0L7BAS**	SOT505-1 (TSSOP8)	
	7	0.025	5	10	35			PESD5V0L7BAS**		
	7	0.025	5	10	35			PESD5V0L7BAS**		
18	17	1	5.2	100	100	27.5		BZA100	SOT163 (SO20)	
18	17	1	5.2	100	100	27.5		PESD5V2S18U	SOT339-1 (SSOP20)	

*square pulse; $t_p=1ms$

**device is under development

***8/20 μ s surge pulse acc. to IEC61000-4-5

New ESD protection diodes

Safeguarding circuits everywhere



ESD protection for 1 to 2 lines

Number of lines		I_{RM} @ V_{RWM}		C	P_{pp}	Configuration	Types	Package (not true to scale)
Uni-directional	Bi-directional	max [μA]	[V]	max [pF]	max [W]			
	1	0.1	5	45	120	 mse211	PESD5V0S1BA	SOD323 (SC-76)
	1	0.1	5	45	120		PESD5V0S1BB	SOD523 (SC-79)
	1	0.1	5	45	120		PESD5V0S1BL	SOD882
2	1	2	3.3	300	330	 bra004	PESD5V2S2UAT	SOT23
2	1	1	5	200	260		PESD12VS2UAT	
2	1	0.05	12	75	180		PESD15VS2UAT	
2	1	0.05	15	70	160		PESD24VS2UAT	
2	1	1	3.3	300	330	 msa212	PESD3V3S2UT	SOT23
2	1	1	5.25	200	260		PESD5V2S2UT	
2	1	1	12	75	180		PESD12VS2UT	
2	1	1	15	70	160		PESD15VS2UT	
2	1	1	24	50	160		PESD24VS2UT	
2	1	3	3.3	275	110		PESD3V3S2UQ	
2	1	0.3	5	215	110	PESD5V0S2UQ		
2	1	0.03	12	100	110	PESD12VS2UQ		
2	1		15	70		PESD15VS2UQ**		
2	1		24	50		PESD24VS2UQ**	SOT883	
2	1	0.3	3.3	28	30	PESD3V3L2UM		
2	1	0.025	5	19	30	PESD5V0L2UM		
	2	0.1	5	45	120	 msa212	PESD5V0S2BT	SOT23

*8/20 μs surge pulse acc. to IEC61000-4-5

**device is under development

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