



ESDHLC3V301D3 THRU ESDHLC3601D3

Uni-directional TVS Diode for ESD Protection

1. Features

- 350 Watts peak pulse power per line ($t_p=8/20\mu s$)
- Protects one uni-directional I/O line
- Low clamping voltage
- Working voltage: 3.3V 12V 24V 36V
- Low leakage current
- RoHS compliant
- IEC61000-4-2 (ESD) $\pm 30kV$ (air), $\pm 30kV$ (contact)

SOD323



2. Mechanical Data

- Case: Molded Plastic, SOD323.
- Epoxy: UL 94V-0 rate flame retardant.
- Mounting Position : Any.



Maximum Ratings and Electrical Characteristics

ESDHLC3V301D3			
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs)	P_{pp}	350	W
Peak Pulse Current (8/20 μs)	I_{pp}	20	A
ESD per IEC 61000-4-2 (Air)	V _{ESD}	± 30	kV
ESD per IEC 61000-4-2 (Contact)		± 30	
Operating Temperature Range	T_J	-55 to +125	$^{\circ}C$
Storage Temperature Range	T_{stg}	-55 to +150	$^{\circ}C$
ESDHLC1201D3			
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs)	P_{pp}	350	W
Peak Pulse Current (8/20 μs)	I_{pp}	11	A
ESD per IEC 61000-4-2 (Air)	V _{ESD}	± 30	kV
ESD per IEC 61000-4-2 (Contact)		± 30	
Operating Temperature Range	T_J	-55 to +125	$^{\circ}C$
Storage Temperature Range	T_{stg}	-55 to +150	$^{\circ}C$



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Maximum Ratings and Electrical Characteristics

ESDHLC2401D3			
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	P _{pp}	350	W
Peak Pulse Current (8/20μs)	I _{pp}	7	A
ESD per IEC 61000-4-2 (Air)	V _{ESD}	±30	kV
ESD per IEC 61000-4-2 (Contact)		±30	
Operating Temperature Range	T _J	-55 to +125	°C
Storage Temperature Range	T _{stg}	-55 to +150	°C
ESDHLC3601D3			
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	P _{pp}	350	W
Peak Pulse Current (8/20μs)	I _{pp}	5	A
ESD per IEC 61000-4-2 (Air)	V _{ESD}	±30	kV
ESD per IEC 61000-4-2 (Contact)		±30	
Operating Temperature Range	T _J	-55 to +125	°C
Storage Temperature Range	T _{stg}	-55 to +150	°C

Electrical Characteristics (TA=25°C unless otherwise noted)

ESDHLC3V301D3						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			3.3	V	
Breakdown Voltage	V _{BR}	4.0			V	I _T = 1mA
Reverse Leakage Current	I _R			40	uA	V _{RWM} = 3.3V
Clamping Voltage	V _C		6.5		V	I _{PP} = 1A (8 x 20uS pulse)
Clamping Voltage	V _C			10.5	V	I _{PP} = 20A (8 x 20uS pulse)
Junction Capacitance	C _J		450		pF	V _R = 0V, f = 1MHz



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Electrical Characteristics (TA=25°C unless otherwise noted)

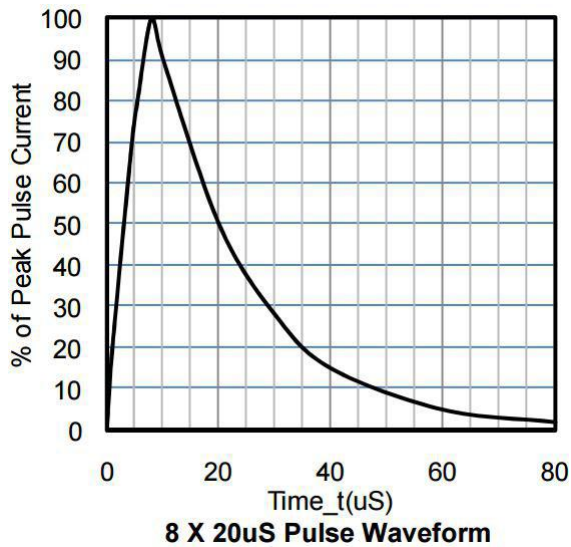
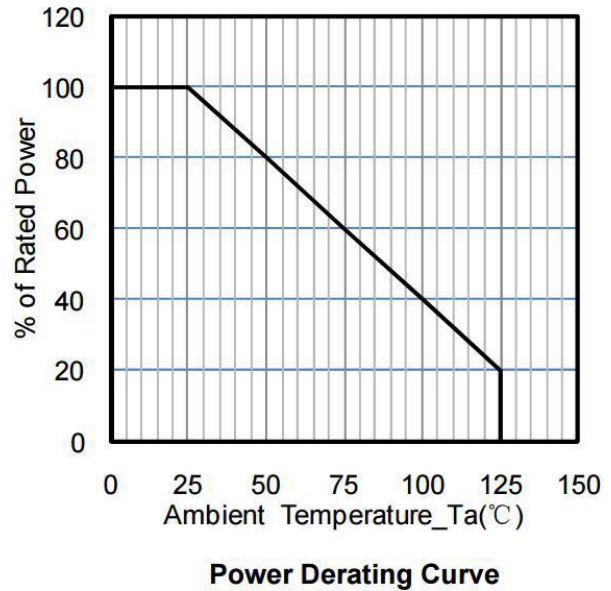
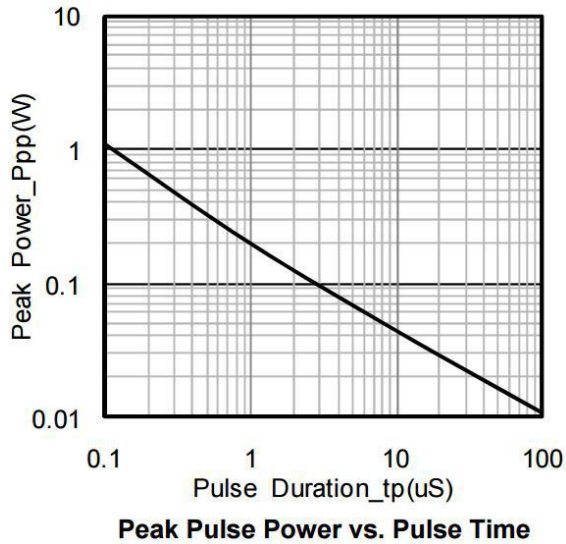
ESDHLC1201D3						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			12	V	
Breakdown Voltage	V _{BR}	13.3			V	IT = 1mA
Reverse Leakage Current	I _R			1	uA	VRWM = 12V
Clamping Voltage	V _C		19		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V _C			32	V	IPP = 11A (8 x 20uS pulse)
Junction Capacitance	C _J		130		pF	VR = 0V, f = 1MHz
ESDHLC2401D3						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			24	V	
Breakdown Voltage	V _{BR}	26.7			V	IT = 1mA
Reverse Leakage Current	I _R			1	uA	VRWM = 24V
Clamping Voltage	V _C		43		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V _C			52	V	IPP = 7A (8 x 20uS pulse)
Junction Capacitance	C _J		80		pF	VR = 0V, f = 1MHz
ESDHLC3601D3						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			36	V	
Breakdown Voltage	V _{BR}	40			V	IT = 1mA
Reverse Leakage Current	I _R			1	uA	VRWM = 40V
Clamping Voltage	V _C		60		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V _C			52	V	IPP = 5A (8 x 20uS pulse)
Junction Capacitance	C _J		60		pF	VR = 0V, f = 1MHz



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Rating And Characteristic Curves



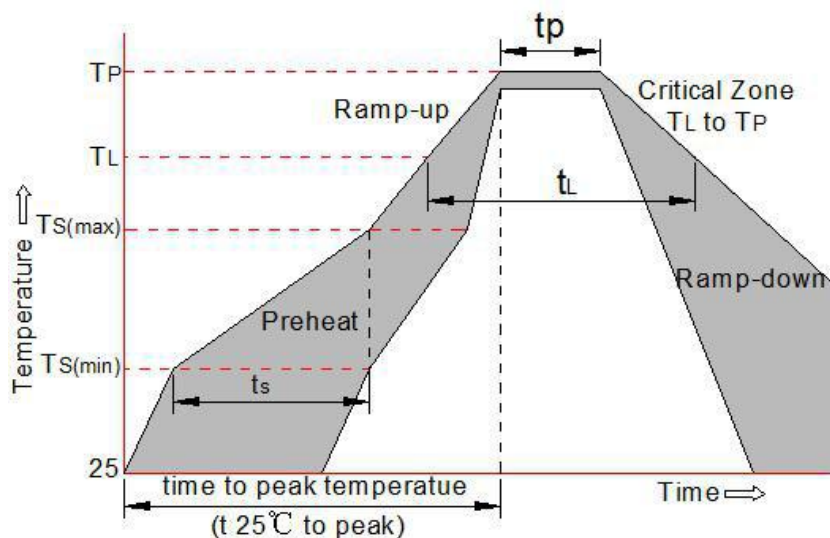


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Uni-directional TVS Diode for ESD Protection

Soldering Parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L) (Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_p)		8 min. Max
Do not exceed		+260°C

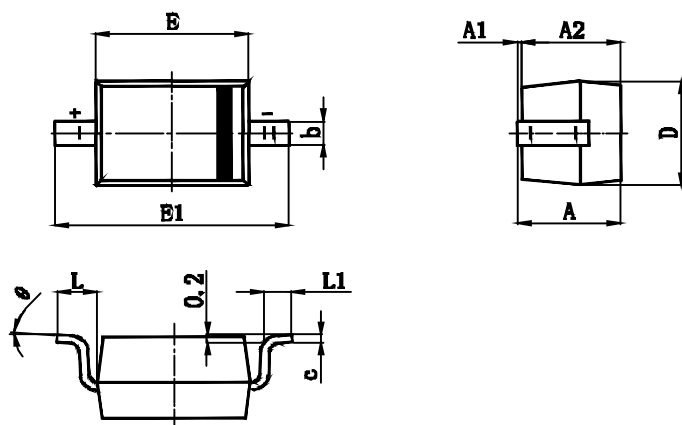




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Package Mechanical Data



Symbol	Min.(mm)	Max.(mm)
A		1.000
A1	0.000	0.100
A2	0.800	0.900
b	0.250	0.350
c	0.080	0.150
D	1.200	1.400
E	1.600	1.800
E1	2.500	2.700
L	0.475REF	
L1	0.250	0.400
θ	0°	8°



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