ESDHLC3V301D3 THRU ESDHLC3601D3

Uni-directional TVS Diode for ESD Protection

1. Features

SOD323

- 350 Watts peak pulse power per line (t_P=8/20μs)
- 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) ±30kV (air), ±30kV (contact)

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(1) -

2. Mechanical Data

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

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Uni-directional

Maximum Ratings and Electrical Characteristics

ESDHLC3V301D3

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	P_{PP}	350	W
Peak Pulse Current (8/20μs)	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	°C
Storage Temperature Range	Tstg	−55 to +150	°C

ESDHLC1201D3

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	P_{PP}	350	W
Peak Pulse Current (8/20μs)	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	°C
Storage Temperature Range	Tstg	−55 to +150	°C

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) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±30 ±30	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−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) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	±30 ±30	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

Electrical Characteristics (TA=25℃ unless otherwise noted)

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Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			3.3	V	
Breakdown Voltage	V_{BR}	4.0			V	IT = 1mA
Reverse Leakage Current	I_R			40	uA	VRWM = 3.3V
Clamping Voltage	V_C		6.5		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			10.5	V	IPP = 20A (8 x 20uS pulse)
Junction Capacitance	C_J		450		pF	VR = 0V, f = 1MHz

Electrical Characteristics (TA=25℃ unless otherwise noted)
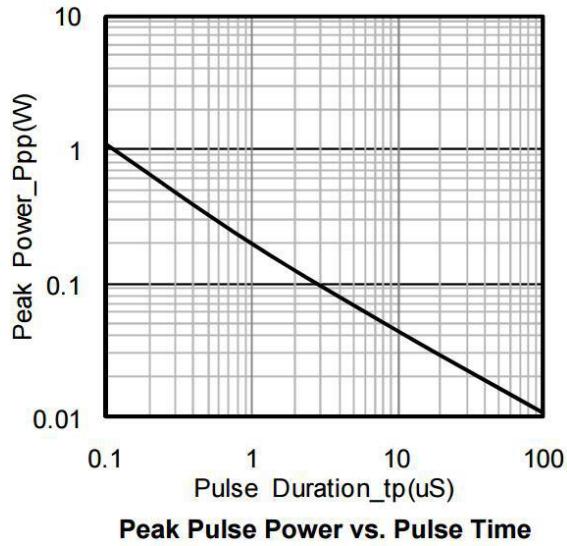
ESDHLC1201D3

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

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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

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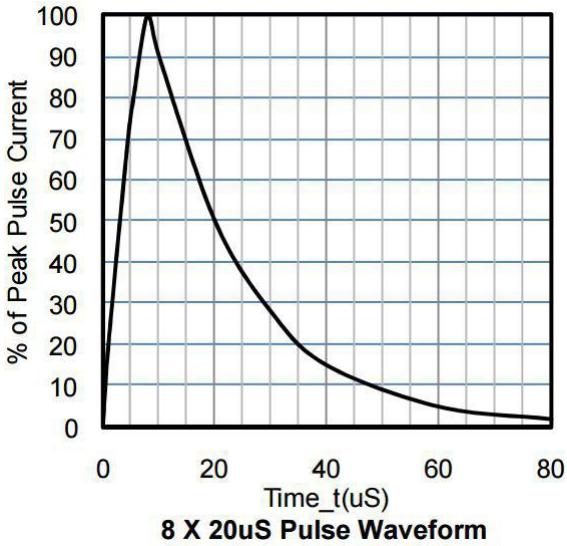| Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			36	V	
Breakdown Voltage	V_{BR}	40			V	IT = 1mA
Reverse Leakage Current	I_R			1	uA	VRWM =40V
Clamping Voltage	V_C		60		V	IPP = 1A (8 x 20uS pulse)
Clamping Voltage	V_C			52	V	IPP = 5A (8 x 20uS pulse)
Junction Capacitance	C_J		60		pF	VR = 0V, f = 1MHz
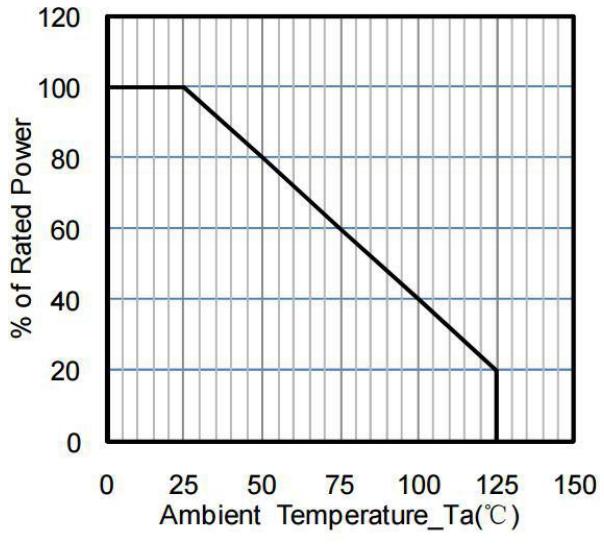
Rating And Characteristic Curves

Peak Pulse Power vs. Pulse Time

Power Derating Curve
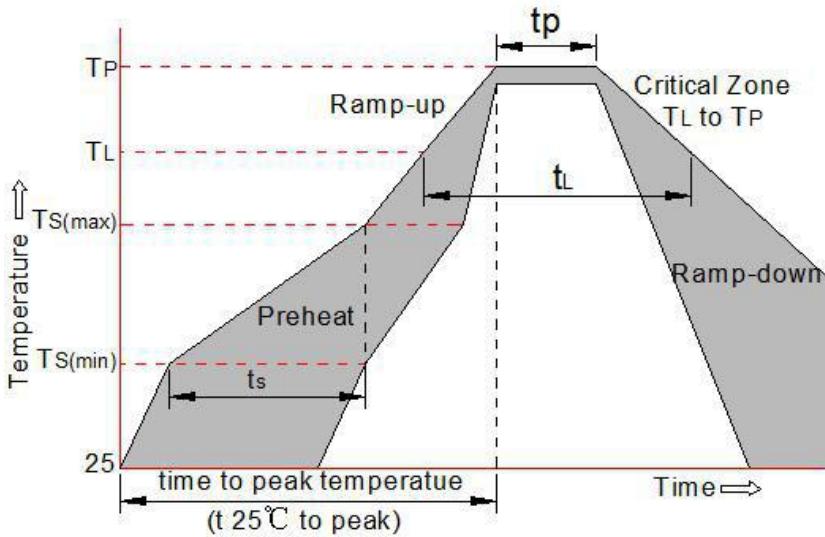
8 X 20uS Pulse Waveform

Soldering Parameters

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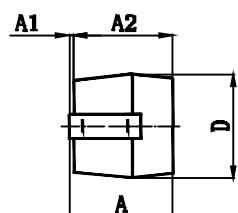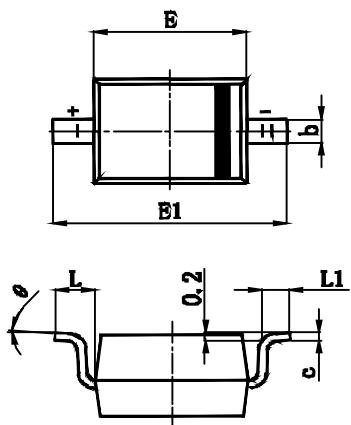
Package Mechanical Data

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	0º	8º

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