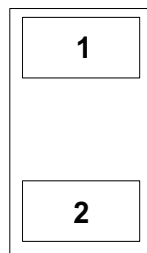


SCHVxx-01ETG-C

200 W Discrete Bidirectional TVS Diode



Pinout



Functional Block Diagram



Description

The SCHVxx-01ETG-C series is designed to provide an option for very fast acting, high performance over-voltage protection components. This series is ideally suited for power interfaces, passenger charging interfaces, and well as LED lighting modules, and low speed I/Os. It will protect sensitive equipment from damage due to electrostatic discharge (ESD) and other overvoltage transients.

The SCHVxx-01ETG-C series can safely absorb repetitive ESD strikes above the maximum level of the IEC 61000-4-2 international standard (Level 4, ± 8 kV contact discharge) without performance degradation and safely conduct up to 10 A (SCHV12-01ETG-C) of induced surge current (IEC 61000-4-5 2nd edition, $t_p = 8/20 \mu s$) with very low clamping voltages.

Features & Benefits

- ESD, IEC 61000-4-2, ± 30 kV contact, ± 30 kV air
- EFT, IEC 61000-4-4, 40 A 5/50 ns)
- Lightning, IEC 61000-4-5 2nd edition, 10 A (8/20 μs) for SCHV12-C
- Low clamping voltage
- Low leakage current
- Small SOD882 packaging helps save board space
- Moisture Sensitivity Level (MSL-1)
- Halogen free, lead free and RoHS compliant
- PPAP capable and AEC-Q101/AEC-Q006 qualified

Applications

- Automotive
- CAN and LIN Bus
- General Purpose I/O
- LED Lighting Modules
- Portable Instrumentation
- RS232 / RS485

Life Support Note:

Not Intended for Use in Life Support or Life Saving Applications

The products shown herein are not designed for use in life sustaining or life saving applications unless otherwise expressly indicated.

SCHVxx-01ETG-C

200 W Discrete Bidirectional TVS Diode

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
P_{pk}	Peak Pulse Power ($t_p = 8/20 \mu s$)	200	W
T_{OP}	Operating Temperature	-40 to 150	°C
T_{STOR}	Storage Temperature	-55 to 150	°C

Caution: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the component. This is a stress only rating and operation of the component at these or any other conditions above those indicated in the operational sections of this specification is not implied.

SCHV12-C Electrical Characteristics ($T_{OP} = 25^\circ C$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}	$I_R = 1 \mu A$			12.0	V
Breakdown Voltage	V_{BR}	$I_R = 1 \text{ mA}$	13.3			V
Reverse Leakage Current	I_{LEAK}	$V_R = 12 \text{ V}$			0.5	μA
Clamp Voltage ¹	V_C	$I_{PP} = 1 \text{ A}, t_p = 8/20 \mu s$			19.0	V
		$I_{PP} = 8 \text{ A}, t_p = 8/20 \mu s$			25.0	V
Dynamic Resistance ²	R_{DYN}	TLP, $t_p = 100 \text{ ns}$, I/O to GND		0.48		Ω
Peak Pulse Current	I_{PP}	$t_p = 8/20 \mu s$			10.0	A
ESD Withstand Voltage ¹	V_{ESD}	IEC 61000-4-2 (Contact Discharge)	± 30			kV
		IEC 61000-4-2 (Air Discharge)	± 30			kV
Diode Capacitance ¹	$C_{I/O-I/O}$	Reverse Bias=0V, f=1MHz			30	pF

SCHV15-C Electrical Characteristics ($T_{OP} = 25^\circ C$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}	$I_R = 1 \mu A$			15.0	V
Breakdown Voltage	V_{BR}	$I_R = 1 \text{ mA}$	16.7			V
Reverse Leakage Current	I_{LEAK}	$V_R = 15 \text{ V}$			0.5	μA
Clamp Voltage ¹	V_C	$I_{PP} = 1 \text{ A}, t_p = 8/20 \mu s$			22.0	V
		$I_{PP} = 5 \text{ A}, t_p = 8/20 \mu s$			30.0	V
Dynamic Resistance ²	R_{DYN}	TLP, $t_p = 100 \text{ ns}$, I/O to GND		0.43		Ω
Peak Pulse Current	I_{PP}	$t_p = 8/20 \mu s$			7.0	A
ESD Withstand Voltage ¹	V_{ESD}	IEC 61000-4-2 (Contact Discharge)	± 30			kV
		IEC 61000-4-2 (Air Discharge)	± 30			kV
Diode Capacitance ¹	$C_{I/O-I/O}$	Reverse Bias = 0 V, f = 1 MHz			24	pF

SCHVxx-01ETG-C

200 W Discrete Bidirectional TVS Diode

SCHV24-C Electrical Characteristics ($T_{OP} = 25^{\circ}\text{C}$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}	$I_R = 1\ \mu\text{A}$			24.0	V
Breakdown Voltage	V_{BR}	$I_R = 1\ \text{mA}$	26.7			V
Reverse Leakage Current	I_{LEAK}	$V_R = 24\ \text{V}$			0.5	μA
Clamp Voltage ¹	V_C	$I_{PP} = 1\ \text{A}, t_p = 8/20\ \mu\text{s}$			36.0	V
		$I_{PP} = 3\ \text{A}, t_p = 8/20\ \mu\text{s}$			50.0	V
Dynamic Resistance ²	R_{DYN}	TLP, $t_p = 100\ \text{ns}$, I/O to GND		0.65		Ω
Peak Pulse Current	I_{PP}	$t_p = 8/20\ \mu\text{s}$			5.0	A
ESD Withstand Voltage ¹	V_{ESD}	IEC 61000-4-2 (Contact Discharge)	± 30			kV
		IEC 61000-4-2 (Air Discharge)	± 30			kV
Diode Capacitance ¹	$C_{I/O-I/O}$	Reverse Bias = 0 V, $f = 1\ \text{MHz}$			17	pF

SCHV36-C Electrical Characteristics ($T_{OP} = 25^{\circ}\text{C}$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Standoff Voltage	V_{RWM}	$I_R = 1\ \mu\text{A}$			36.0	V
Breakdown Voltage	V_{BR}	$I_R = 1\ \text{mA}$	40.0			V
Reverse Leakage Current	I_{LEAK}	$V_R = 36\ \text{V}$			0.5	μA
Clamp Voltage ¹	V_C	$I_{PP} = 1\ \text{A}, t_p = 8/20\ \mu\text{s}$			52.0	V
		$I_{PP} = 2\ \text{A}, t_p = 8/20\ \mu\text{s}$			65.0	V
Dynamic Resistance ²	R_{DYN}	TLP, $t_p = 100\ \text{ns}$, I/O to GND		1.33		Ω
Peak Pulse Current	I_{PP}	$t_p = 8/20\ \mu\text{s}$			3.0	A
ESD Withstand Voltage ¹	V_{ESD}	IEC 61000-4-2 (Contact Discharge)	± 18			kV
		IEC 61000-4-2 (Air Discharge)	± 25			kV
Diode Capacitance ¹	$C_{I/O-I/O}$	Reverse Bias = 0 V, $f = 1\ \text{MHz}$			13	pF

Note:

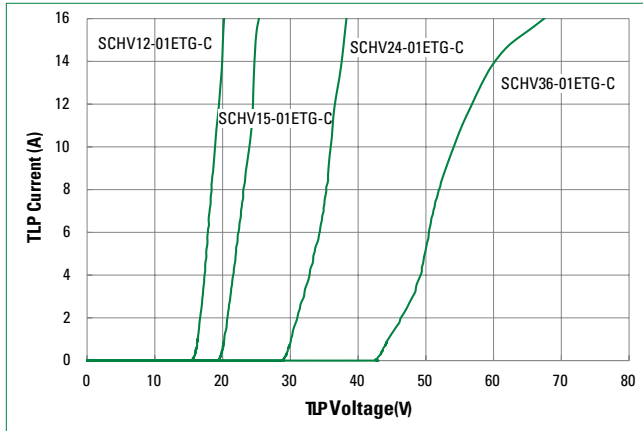
1. Parameter is guaranteed by design and/or component characterization.

2. Transmission Line Pulse (TLP) with 100 ns width, 2 ns rise time, and average window $t_1 = 70\ \text{ns}$ to $t_2 = 90\ \text{ns}$

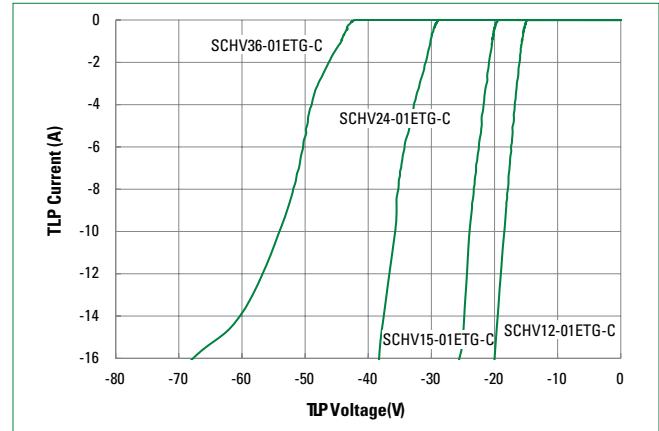
SCHVxx-01ETG-C

200 W Discrete Bidirectional TVS Diode

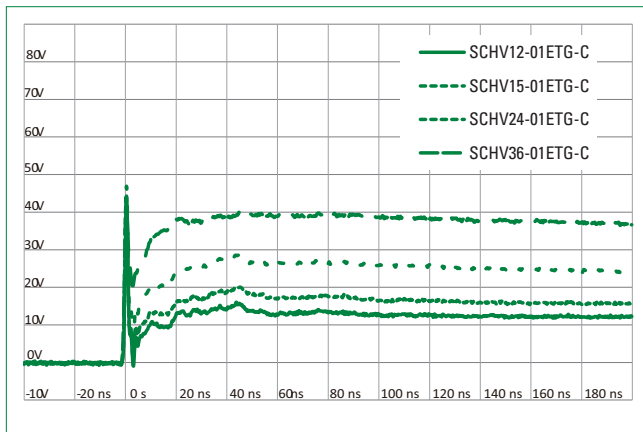
Positive Transmission Line Pulsing (TLP) Plot



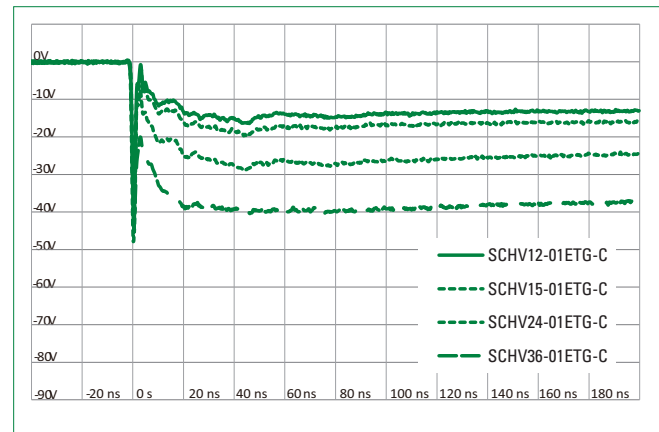
Negative Transmission Line Pulsing (TLP) Plot



IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage



IEC 61000-4-2 -8 kV Contact ESD Clamping Voltage

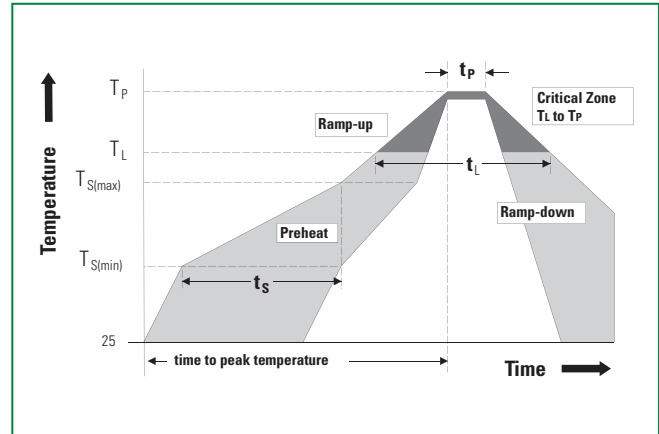


SCHVxx-01ETG-C

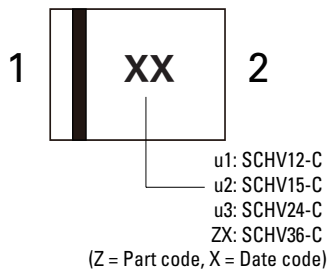
200 W Discrete Bidirectional TVS Diode

Soldering Parameters

Reflow Condition		Pb – Free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150 °C
	- Temperature Max ($T_{s(max)}$)	200 °C
	- Time (min to max) (t_s)	60 – 120 secs
Average Ramp Up Rate (Liquidus) Temp (T_L) to Peak		3 °C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3 °C/second max
Reflow	- Temperature (T_L) (Liquidus)	217 °C
	- Temperature (t_l)	60 – 150 seconds
Peak Temperature (T_p)		260 ^{+0/-5} °C
Time Within 5°C of Actual Peak Temperature (t_p)		30 seconds
Ramp-down Rate		6 °C/second max
Time 25 °C to Peak Temperature (T_p)		8 minutes max
Do Not Exceed		260 °C



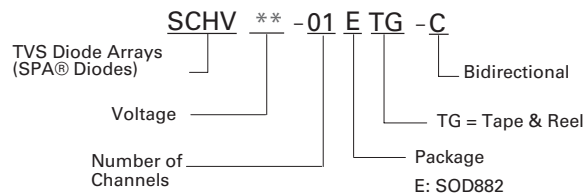
Part Marking System



Product Characteristics

Lead Plating	Pre-plated frame
Lead Material	Copper alloy
Body Material	Molded compound
Flammability	UL recognized compound meeting flammability rating V-0

Part Numbering System



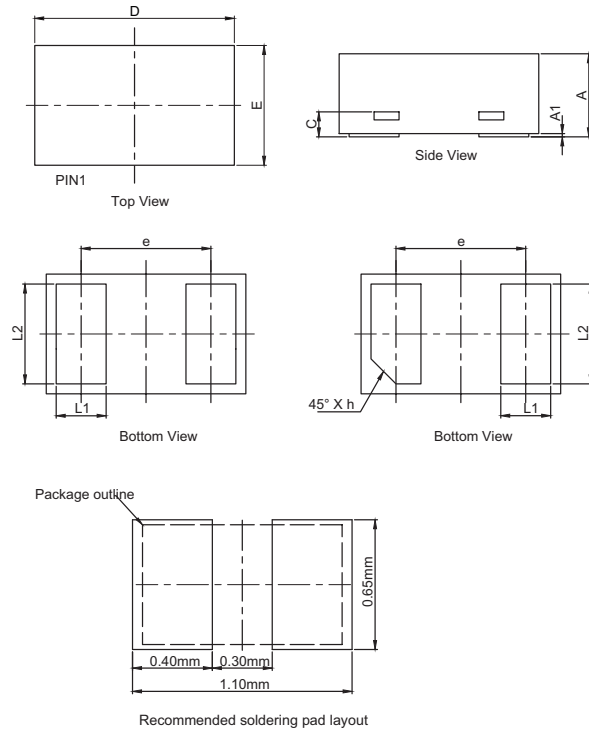
Ordering Information

Part Number	Package	Min. Order Qty.
SCHV12-01ETG-C	SOD882	10000
SCHV15-01ETG-C		
SCHV24-01ETG-C		
SCHV36-01ETG-C		

SCHVxx-01ETG-C

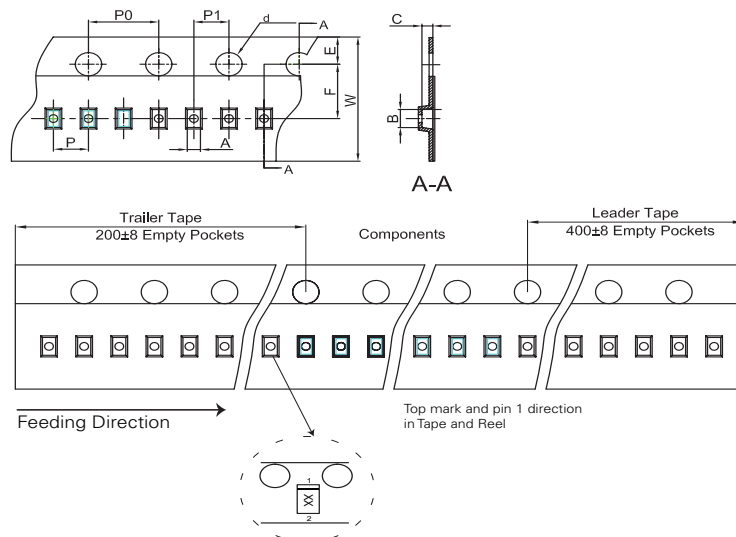
200 W Discrete Bidirectional TVS Diode

Package Dimensions — SOD882

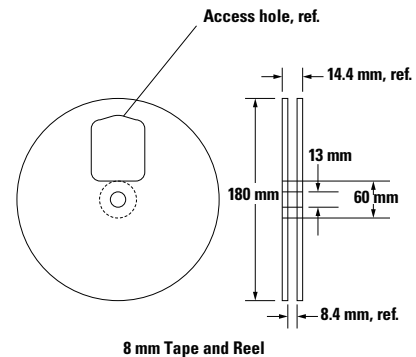


Symbol	Millimeters		
	Min	Nom	Max
A	0.45	0.50	0.55
A1	0.00	0.02	0.05
L1	0.20	0.25	0.30
L2	0.45	0.50	0.55
D	0.95	1.00	1.05
E	0.55	0.60	0.65
e	0.65 BSC		
h	0.07	0.12	0.17
C	0.125 / 0.150 REF.		

Embossed Carrier Tape & Reel Specification



Symbol	Millimeters
A	0.70+/-0.045
B	1.10+/-0.045
C	0.65+/-0.045
d	1.55+/-0.10
E	1.75+/-0.05
F	3.50+/-0.05
P	2.00+/-0.10
P0	4.00+/-0.10
P1	2.00+/-0.10
W	8.00 + 0.30 -0.10



8 mm Tape and Reel

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