



## Features

- RoHS compliant\*
- Surface Mount SMC package
- Standoff Voltage: 5.0 to 170 volts
- Power Dissipation: 3000 watts



Model CD214L is currently available, although not recommended for new designs. Model **SMLJ** is preferred.

## CD214L Transient Voltage Suppressor Diode Series

### General Information

The markets of portable communications, computing and video equipment are challenging the semiconductor industry to develop increasingly smaller electronic components.

Bourns offers Transient Voltage Suppressor Diodes for surge and ESD protection applications, in compact chip package DO-214AB (SMC) size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 5 V up to 170 V and Breakdown Voltage up to 200 V. Typical fast response times are less than 1.0 ns for unidirectional devices and less than 5.0 ns for bidirectional devices from 0 V to Minimum Breakdown Voltage.

Bourns® Chip Diodes conform to JEDEC standards, are easy to handle with standard pick and place equipment and their flat configuration minimizes roll away.

### Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Value	Unit
Minimum Peak Pulse Power Dissipation (T <sub>P</sub> = 1 ms) <sup>(Note 1,2)</sup>	P <sub>PK</sub>	3000	Watts
Peak Forward Surge Current 8.3ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) <sup>(Note 3)</sup>	I <sub>FSM</sub>	300	Amps
Steady State Power Dissipation @ T <sub>L</sub> = 75 °C	P <sub>M(AV)</sub>	5.0	Watts
Maximum Instantaneous Forward Voltage @ I <sub>PP</sub> = 100 A (For Unidirectional Units Only)	V <sub>F</sub>	<sup>(Note 5)</sup>	Volts
Operating Temperature Range	T <sub>J</sub>	-55 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +175	°C

1. Non-repetitive current pulse, per Pulse Waveform graph and derated above T<sub>A</sub> = 25 °C per Pulse Derating Curve.
2. Thermal Resistance Junction to Lead.
3. 8.3 ms Single Half-Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).
4. Single Phase, Half Wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20 %.
5. V<sub>F</sub> = 3.5 V on CD214L-T5.0ALF through CD214L-T90ALF and V<sub>F</sub> = 5.0 V on CD214L-T100ALF through CD214L-T170ALF.

# BOURNS®

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### How To Order

	<b>CD 214L - T 5.0 CA LF</b>
Common Code _____	
Chip Diode _____	
Package _____	
214L = 3 kW SMC/DO-214AB	
Model _____	
T = Transient Voltage Suppressor Series	
Working Peak Reverse Voltage _____	
5.0 = 5.0 V <sub>RWM</sub> (Volts)	
170 = 170 V <sub>RWM</sub> (Volts)	
Suffix _____	
A = 5 % Tolerance Device	
CA = 5 % Tolerance Bidirectional Device	
Terminations _____	
LF = 100 % Sn (RoHS Compliant)	

\*RoHS Directive 2002/95/EC Jan 27, 2003 including Annex.

Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

## Compliance

- IEC 61000-4-2 ESD (Min. Level 4)
- IEC 61000-4-4 EFT
- IEC 61000-4-5 Surge

## CD214L Transient Voltage Suppressor Diode Series

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### Electrical Characteristics (@T<sub>A</sub> = 25 °C unless otherwise noted)

Unidirectional Device		Bidirectional Device		Breakdown Voltage V <sub>BR</sub> (Volts)			Working Peak Reverse Voltage	Maximum Reverse Leakage @ V <sub>RWM</sub>	Maximum Reverse Voltage @ I <sub>RSM</sub>	Maximum Reverse Surge Current
Part Number	Part Marking	Part Number	Part Marking	Min.	Max.	@ I <sub>T</sub> (mA)	V <sub>RWM</sub> (Volts)	I <sub>R</sub> (uA)	V <sub>RSM</sub> (Volts)	I <sub>RSM</sub> (Amps)
CD214L-T5.0ALF	HDE	CD214L-T5.0CALF	IDE	6.40	7.82	10	5	1000	9.2	326.00
CD214L-T6.0ALF	HDG	CD214L-T6.0CALF	IDG	6.67	8.15	10	6	1000	10.3	291.30
CD214L-T6.5ALF	HDK	CD214L-T6.5CALF	IDK	7.22	7.98	10	6.5	500	11.2	267.90
CD214L-T7.0ALF	HDM	CD214L-T7.0CALF	IDM	7.78	8.60	10	7	200	12	250.00
CD214L-T7.5ALF	HDP	CD214L-T7.5CALF	IDP	8.33	9.21	1	7.5	100	12.9	232.60
CD214L-T8.0ALF	HDR	CD214L-T8.0CALF	IDR	8.89	9.83	1	8	50	13.6	220.60
CD214L-T8.5ALF	HDT	CD214L-T8.5CALF	IDT	9.44	10.43	1	8.5	25	14.4	208.40
CD214L-T9.0ALF	HDV	CD214L-T9.0CALF	IDV	10.00	11.05	1	9	10	15.4	194.80
CD214L-T10ALF	HDX	CD214L-T10CALF	IDX	11.10	12.27	1	10	5	17	176.40
CD214L-T11ALF	HDZ	CD214L-T11CALF	IDZ	12.20	13.50	1	11	5	18.2	164.80
CD214L-T12ALF	HEE	CD214L-T12CALF	IEE	13.30	14.70	1	12	5	19.9	150.60
CD214L-T13ALF	HEG	CD214L-T13CALF	IEG	14.40	15.90	1	13	5	21.5	139.40
CD214L-T14ALF	HEK	CD214L-T14CALF	IEK	15.60	17.20	1	14	5	23.2	129.40
CD214L-T15ALF	HEM	CD214L-T15CALF	IEM	16.70	18.50	1	15	5	24.4	123.00
CD214L-T16ALF	HEP	CD214L-T16CALF	IEP	17.80	19.70	1	16	5	26	115.40
CD214L-T17ALF	HER	CD214L-T17CALF	IER	18.90	20.90	1	17	5	27.6	106.60
CD214L-T18ALF	HET	CD214L-T18CALF	IET	20.00	22.10	1	18	5	29.2	102.80
CD214L-T20ALF	HEV	CD214L-T20CALF	IEV	22.20	24.50	1	20	5	32.4	92.60
CD214L-T22ALF	HEX	CD214L-T22CALF	IEX	24.40	27.00	1	22	5	35.5	84.40
CD214L-T24ALF	HEZ	CD214L-T24CALF	IEZ	26.70	29.50	1	24	5	38.9	77.20
CD214L-T26ALF	HFE	CD214L-T26CALF	IFE	28.90	31.90	1	26	5	42.1	71.20
CD214L-T28ALF	HFG	CD214L-T28CALF	IFG	31.10	34.40	1	28	5	45.4	66.00
CD214L-T30ALF	HFK	CD214L-T30CALF	IFK	33.30	36.80	1	30	5	48.4	62.00
CD214L-T33ALF	HFM	CD214L-T33CALF	IFM	36.70	40.60	1	33	5	53.3	56.20
CD214L-T36ALF	HFP	CD214L-T36CALF	IFP	40.00	44.20	1	36	5	58.1	51.60
CD214L-T40ALF	HFR	CD214L-T40CALF	IFR	44.40	49.10	1	40	5	64.5	46.40
CD214L-T43ALF	HFT	CD214L-T43CALF	IFT	47.80	52.80	1	43	5	69.4	43.20
CD214L-T45ALF	HFV	CD214L-T45CALF	IFV	50.00	55.30	1	45	5	72.7	41.20
CD214L-T48ALF	HFX	CD214L-T48CALF	IFX	53.30	58.90	1	48	5	77.4	38.80
CD214L-T51ALF	HFZ	CD214L-T51CALF	IFZ	56.70	62.70	1	51	5	82.4	36.40
CD214L-T54ALF	HGE	CD214L-T54CALF	IGE	60.00	66.30	1	54	5	87.1	34.40
CD214L-T58ALF	HGG	CD214L-T58CALF	IGG	64.40	71.20	1	58	5	93.6	32.00
CD214L-T60ALF	HGK	CD214L-T60CALF	IGK	66.70	73.70	1	60	5	96.8	31.00
CD214L-T64ALF	HGM	CD214L-T64CALF	IGM	71.10	78.60	1	64	5	103	29.20
CD214L-T70ALF	HGP	CD214L-T70CALF	IGP	77.80	86.00	1	70	5	113	26.60
CD214L-T75ALF	HGR	CD214L-T75CALF	IGR	83.30	92.10	1	75	5	121	24.80
CD214L-T78ALF	HGT	CD214L-T78CALF	IGT	86.70	95.80	1	78	5	126	22.80
CD214L-T85ALF	HGV	CD214L-T85CALF	IGV	94.40	104.30	1	85	5	137	20.80
CD214L-T90ALF	HGX	CD214L-T90CALF	IGX	100.00	110.50	1	90	5	146	20.60
CD214L-T100ALF	HGZ	CD214L-T100CALF	IGZ	111.00	122.70	1	100	5	162	18.60
CD214L-T110ALF	HHE	CD214L-T110CALF	IHE	122.00	134.80	1	110	5	177	16.80
CD214L-T120ALF	HHG	CD214L-T120CALF	IHG	133.00	147.00	1	120	5	193	15.60
CD214L-T130ALF	HHH	CD214L-T130CALF	IHH	144.00	159.20	1	130	5	209	14.40
CD214L-T150ALF	HHM	CD214L-T150CALF	IHM	167.00	184.60	1	150	5	243	12.40
CD214L-T160ALF	HHP	CD214L-T160CALF	IHP	178.00	196.70	1	160	5	259	11.60
CD214L-T170ALF	HHR	CD214L-T170CALF	IHR	189.00	208.90	1	170	5	275	11.00

#### Notes:

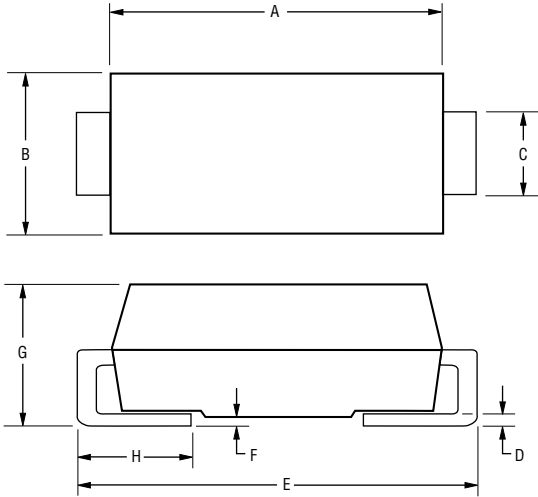
1. Suffix 'A' denotes a 5 % tolerance device.
2. Suffix 'CA' denotes a 5 % tolerance bidirectional device.
3. For bidirectional devices with a V<sub>R</sub> of 10 volts or less, the I<sub>R</sub> limit is double.
4. For unidirectional devices with a V<sub>F</sub> max. of 3.5 V at an I<sub>F</sub> of 35 A, 0.5 Sine Wave of 8.3 ms Pulse Width.

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# CD214L Transient Voltage Suppressor Diode Series



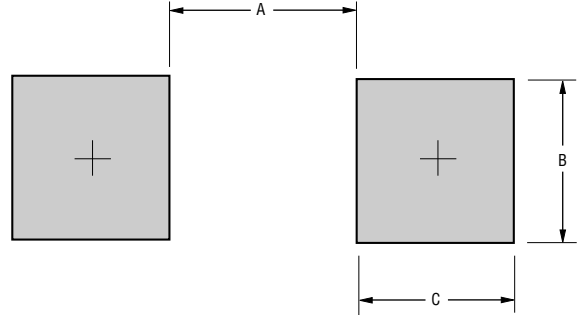
## Product Dimensions



Dimension	SMC (DO-214AB)
A	$\frac{6.60 - 7.11}{(0.260 - 0.280)}$
B	$\frac{5.59 - 6.22}{(0.220 - 0.245)}$
C	$\frac{2.92 - 3.18}{(0.115 - 0.125)}$
D	$\frac{0.15 - 0.31}{(0.006 - 0.112)}$
E	$\frac{7.75 - 8.13}{(0.305 - 0.320)}$
F	$\frac{0.05 - 0.20}{(0.002 - 0.008)}$
G	$\frac{2.01 - 2.62}{(0.080 - 0.103)}$
H	$\frac{0.76 - 1.52}{(0.030 - 0.060)}$

DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

## Recommended Pad Layout



Dimension	SMC (DO-214AB)
A (Max.)	$\frac{4.69}{(0.185)}$
B (Min.)	$\frac{3.07}{(0.121)}$
C (Min.)	$\frac{1.52}{(0.060)}$

DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

## Physical Specifications

Case .....Molded plastic per UL Class 94V-0  
 Polarity .....Cathode band indicates unidirectional device  
                     No cathode band indicates bidirectional device  
 Weight .....0.007 ounces / 0.21 grams

# CD214L Transient Voltage Suppressor Diode Series

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## Rating and Characteristic Curves

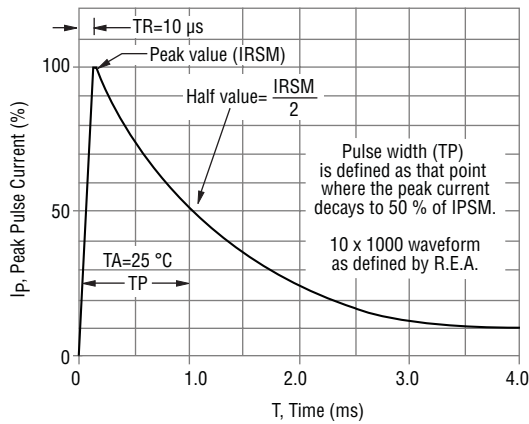
### Pulse Derating Curve



### Maximum Non-Repetitive Surge Current



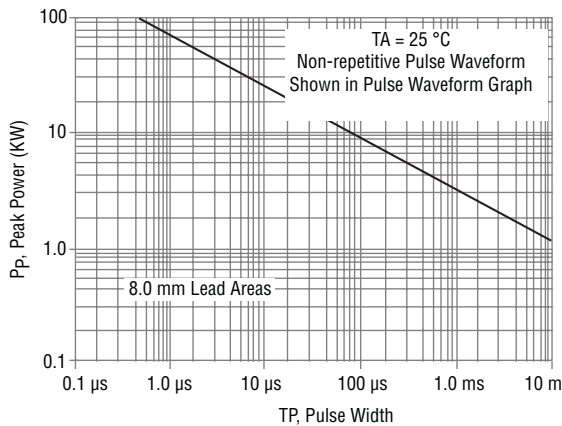
### Pulse Waveform



### Typical Junction Capacitance



### Pulse Rating Curve



### Steady State Power Derating Curve



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# CD214L Transient Voltage Suppressor Diode Series

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## Packaging Information

The product will be dispensed in Tape and Reel format (see diagram below).



Devices are packed in accordance with EIA standard RS-481-A and specifications shown here.

Item	Symbol	SMC (DO-214AB)
Carrier Width	A	$\frac{7.22 \pm 0.10}{(0.284 - 0.004)}$
Carrier Length	B	$\frac{8.11 \pm 0.10}{(0.319 - 0.004)}$
Carrier Depth	C	$\frac{2.36 \pm 0.10}{(0.093 - 0.004)}$
Sprocket Hole	d	$\frac{1.55 \pm 0.05}{(0.061 - 0.002)}$
Reel Outside Diameter	D	$\frac{330}{(12.992)}$
Reel Inner Diameter	D <sub>1</sub>	$\frac{50.0}{(1.969)}$ MIN.
Feed Hole Diameter	D <sub>2</sub>	$\frac{13.0 \pm 0.20}{(0.512 - 0.008)}$
Sprocket Hole Position	E	$\frac{1.75 \pm 0.10}{(0.069 - 0.004)}$
Punch Hole Position	F	$\frac{7.50 \pm 0.10}{(0.295 - 0.004)}$
Punch Hole Pitch	P	$\frac{4.00 \pm 0.10}{(0.157 - 0.004)}$
Sprocket Hole Pitch	P <sub>0</sub>	$\frac{4.00 \pm 0.10}{(0.157 - 0.004)}$
Embossment Center	P <sub>1</sub>	$\frac{2.00 \pm 0.10}{(0.079 - 0.004)}$
Overall Tape Thickness	T	$\frac{0.30 \pm 0.10}{(0.012 - 0.004)}$
Tape Width	W	$\frac{16.00 \pm 0.20}{(0.630 - 0.008)}$
Reel Width	W <sub>1</sub>	$\frac{22.4}{(0.882)}$ MAX.
Quantity per Reel	--	3,000

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