


### HF RoHS MC Series - DO-214



#### Agency Approvals

Agency	Agency File Number
	E133083

#### Pinout Designation

NOT APPLICABLE

#### Schematic Symbol



#### Description

MC Series DO-214 are low capacitance SIDACTor® devices designed to protect broadband equipment such as VOIP, DSL modems and DSLAMs from damaging overvoltage transients.

The series provides a surface mount solution that enables equipment to comply with global regulatory standards while limiting the impact to broadband signals.

#### Features and Benefits

- Low voltage overshoot
- Low on-state voltage
- Does not degrade with use
- Fails short circuit when surged in excess of ratings
- 40% lower capacitance than our Baseband Protectors, for applications that demand greater signal integrity

#### Applicable Global Standards

- TIA-968-A
- TIA-968-B
- ITU K.20/21 Enhanced Level\*
- ITU K.20/21 Basic Level\*
- GR 1089 Intra-building\*
- IEC 61000-4-5
- YD/T 1082
- YD/T 993
- YD/T 950

\*A-rated parts require series resistance

#### Electrical Characteristics

Part Number	Marking	$V_{DRM}$ @ $I_{DRM}=5\mu A$	$V_S$ @ 100V/ $\mu s$	$I_H$	$I_S$	$I_T$	$V_T$ @ $I_T=2.2$ Amps	Capacitance @ 1MHz, 2V bias	
		V min	V max	mA min	mA max	A max	V max	pF min	pF max
P0080SAMCLRP	P-8AM	6	25	50	800	2.2	4	25	55
P0220SAMCLRP	P02AM	15	32	50	800	2.2	4	25	50
P0300SAMCLRP	P03AM	25	40	50	800	2.2	4	15	35
P0080SCMCLRP	P-8CM	6	25	50	800	2.2	4	25	75
P0220SCMCLRP	P02CM	15	32	50	800	2.2	4	30	65
P0300SCMCLRP	P03CM	25	40	50	800	2.2	4	25	45
P0640SCMCLRP	P06CM	58	77	150	800	2.2	4	55	85
P0720SCMCLRP	P07CM	65	88	150	800	2.2	4	50	75
P0900SCMCLRP	P09CM	75	98	150	800	2.2	4	45	70
P1100SCMCLRP	P11CM	90	130	150	800	2.2	4	45	70
P1300SCMCLRP	P13CM	120	160	150	800	2.2	4	40	60
P1500SCMCLRP	P15CM	140	180	150	800	2.2	4	35	55
P1800SCMCLRP	P18CM	170	220	150	800	2.2	4	35	50
P2100SCMCLRP	P21CM	180	240	150	800	2.2	4	30	50
P2300SCMCLRP	P23CM	190	260	150	800	2.2	4	30	50
P2600SCMCLRP	P26CM	220	300	150	800	2.2	4	30	45
P3100SCMCLRP	P31CM	275	350	150	800	2.2	4	30	45
P3500SCMCLRP	P35CM	320	400	150	800	2.2	4	25	40

Notes:  
 - Absolute maximum ratings measured at  $T_A = 25^\circ C$  (unless otherwise noted).  
 - Capacitance is functional (unless otherwise noted).

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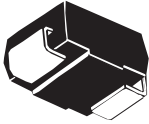
Please refer to [www.littelfuse.com](http://www.littelfuse.com) for current information.

**Surge Ratings**

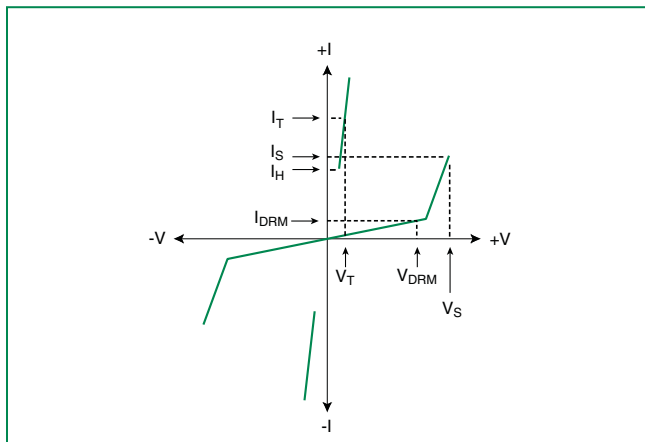
Series	$I_{PP}$										$I_{TSM}$ 50/60 Hz	di/dt
	0.2x310 <sup>1</sup>	2x10 <sup>1</sup>	8x20 <sup>1</sup>	10x160 <sup>1</sup>	10x560 <sup>1</sup>	5x320 <sup>1</sup>	10x360 <sup>1</sup>	10x1000 <sup>1</sup>	5x310 <sup>1</sup>	10x700 <sup>2</sup>		
	0.5x700 <sup>2</sup>	2x10 <sup>2</sup>	1.2x50 <sup>2</sup>	10x160 <sup>2</sup>	10x560 <sup>2</sup>	9x720 <sup>2</sup>	10x360 <sup>2</sup>	10x1000 <sup>2</sup>	10x700 <sup>2</sup>	10x700 <sup>2</sup>		
	A min	A min	A min	A min	A min	A min	A min	A min	A min	A min	A min	A/μs max
A	20	150	150	90	50	75	75	45	75	20	500	
C	50	500	400	200	150	200	175	100	200	30	500	

Notes:  
 - Peak pulse current rating ( $I_{pp}$ ) is repetitive and guaranteed for the life of the product.  
 -  $I_{pp}$  ratings applicable over temperature range of -40°C to +85°C  
 - The device must initially be in thermal equilibrium with -40°C ≤  $T_j$  ≤ +150°C

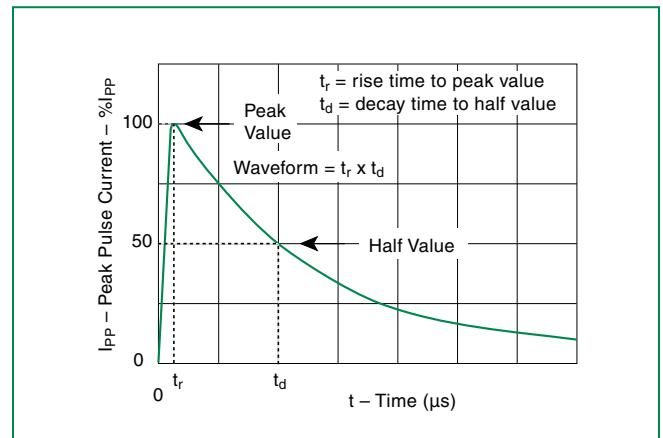
**Thermal Considerations**

Package	Symbol	Parameter	Value	Unit
DO-214AA 	$T_j$	Operating Junction Temperature Range	-40 to +150	°C
	$T_s$	Storage Temperature Range	-65 to +150	°C
	$R_{θJA}$	Thermal Resistance: Junction to Ambient	90	°C/W

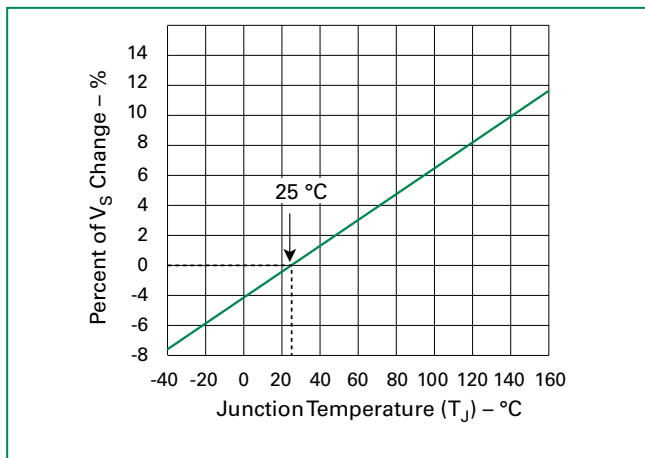
**V-I Characteristics**



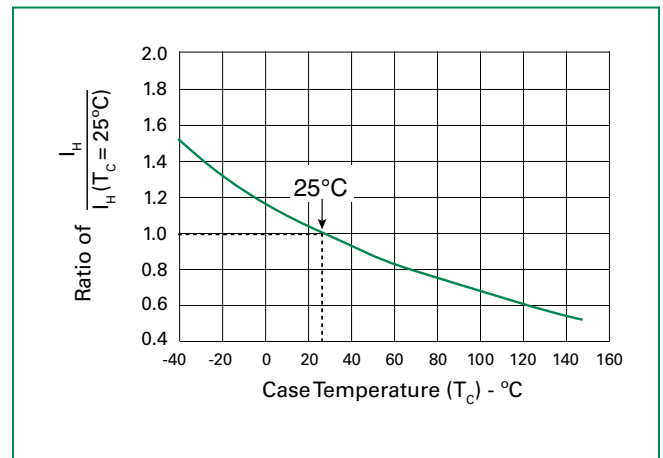
**$t_r \times t_d$  Pulse Waveform**



**Normalized  $V_s$  Change vs. Junction Temperature**

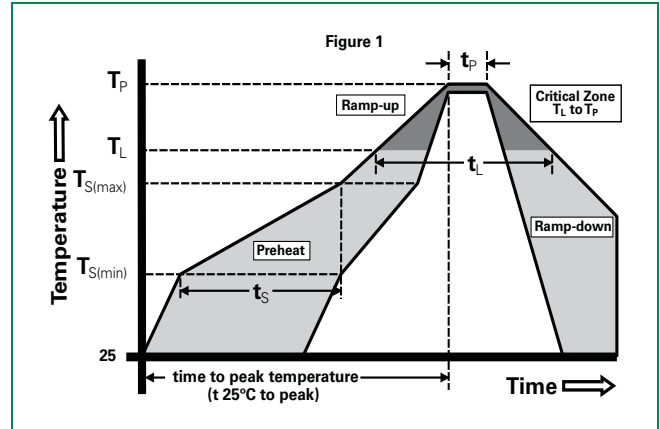


**Normalized DC Holding Current vs. Case Temperature**



### Soldering Parameters

Reflow Condition		Pb-Free assembly (see Fig. 1)
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 (LiquidusTemp ( $T_L$ ) to peak)		3°C/sec. Max.
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max.
Reflow	- Temperature ( $T_L$ ) (Liquidus)	+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



### Physical Specifications

<b>Lead Material</b>	Copper Alloy
<b>Terminal Finish</b>	100% Matte-Tin Plated
<b>Body Material</b>	UL recognized epoxy meeting flammability classification 94V-0

### Environmental Specifications

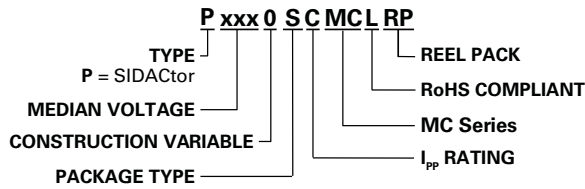
<b>High Temp Voltage Blocking</b>	80% Rated $V_{DRM}$ ( $V_{AC Peak}$ ) +125°C or +150°C, 504 or 1008 hrs. MIL-STD-750 (Method 1040) JEDEC, JESD22-A-101
<b>Temp Cycling</b>	-65°C to +150°C, 15 min. dwell, 10 up to 100 cycles. MIL-STD-750 (Method 1051) EIA/JEDEC, JESD22-A-104
<b>Biased Temp &amp; Humidity</b>	52 $V_{DC}$ (+85°C) 85%RH, 504 up to 1008 hrs. EIA/JEDEC, JESD22-A-101
<b>High Temp Storage</b>	+150°C 1008 hrs. MIL-STD-750 (Method 1031) JEDEC, JESD22-A-101
<b>Low Temp Storage</b>	-65°C, 1008 hrs.
<b>Thermal Shock</b>	0°C to +100°C, 5 min. dwell, 10 sec. transfer, 10 cycles. MIL-STD-750 (Method 1056) JEDEC, JESD22-A-106
<b>Autoclave (Pressure Cooker Test)</b>	+121°C, 100%RH, 2atm, 24 up to 168 hrs. EIA/JEDEC, JESD22-A-102
<b>Resistance to Solder Heat</b>	+260°C, 30 secs. MIL-STD-750 (Method 2031)
<b>Moisture Sensitivity Level</b>	85%RH, +85°C, 168 hrs., 3 reflow cycles (+260°C Peak). JEDEC-J-STD-020, Level 1

**Dimensions — DO-214AA**

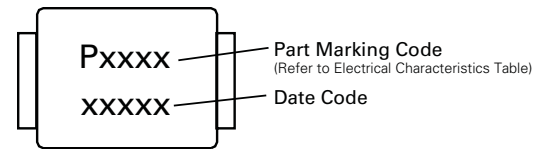


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.130	0.156	3.30	3.95
B	0.201	0.220	5.10	5.60
C	0.077	0.087	1.95	2.20
D	0.159	0.181	4.05	4.60
E	0.030	0.063	0.75	1.60
F	0.075	0.096	1.90	2.45
G	0.002	0.008	0.05	0.20
H	0.077	0.104	1.95	2.65
K	0.006	0.016	0.15	0.41

**Part Numbering**



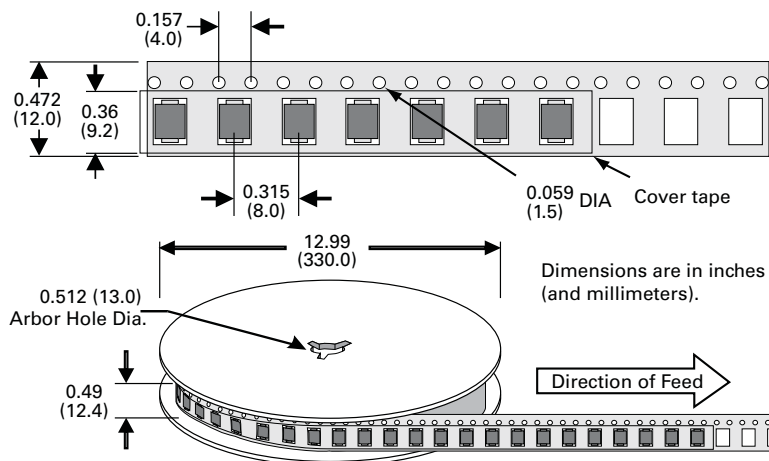
**Part Marking**



**Packing Options**

Package Type	Description	Quantity	Added Suffix	Industry Standard
S	DO-214AA Tape & Reel Pack	2500	N/A	EIA-481-D

**Tape and Reel Specification — DO-214AA**



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