

Multilayer Chip Varistor – SDV Series

Operating Temp. : -55°C ~+125°C

FEATURES

- SMD type suitable for high density mounting
- Excellent clamping ratio and quick response time (<0.5ns)
- Excellent solderability (Ni, Sn plating)

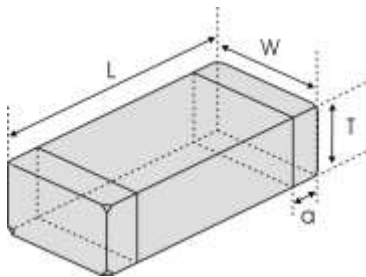
APPLICATIONS

- Transient voltage protection for IC and transistor
- ESD protection such as USB2.0, MIPI etc.
- MOSFET protection
- Portable equipment protection, such as mobile phone, TV, etc.

PRODUCT IDENTIFICATION

| <u>SDV</u> ① | <u>1608</u> ② | <u>A</u> ③ | <u>180</u> ④ | <u>C121</u> ⑤ | <u>N</u> ⑥ | <u>P</u> ⑦ | <u>T</u> ⑧ | <u>F</u> ⑨ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------------------------------------------------------------------------------|---------------------|---------------|-----------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------|---------------|---------|-------------|---------|-------------|---------|-------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--|---|-----------------|---|---------|---|----------------|---|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--|---------|---------------|-----|------|-----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--|---------|---------------|------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--|---|------|---|------------|---|---------|--------------------------------------------------------------------------------------------------------------------|---------------|--|---|----------------|---------------------------------------------------------------------------------------------------------------|---------|--|---|-------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--|---|--|
| <table border="1"> <tr><th colspan="2">Type</th></tr> <tr><td>SDV</td><td>Chip Varistor</td></tr> </table> | Type | | SDV | Chip Varistor | <table border="1"> <tr><th colspan="2">External Dimensions (LxW) (mm)</th></tr> <tr><td>0603 [0201]</td><td>0.6x0.3</td></tr> <tr><td>1005 [0402]</td><td>1.0x0.5</td></tr> <tr><td>1608 [0603]</td><td>1.6x0.8</td></tr> <tr><td>2012 [0805]</td><td>2.0x1.25</td></tr> </table> | External Dimensions (LxW) (mm) | | 0603 [0201] | 0.6x0.3 | 1005 [0402] | 1.0x0.5 | 1608 [0603] | 1.6x0.8 | 2012 [0805] | 2.0x1.25 | <table border="1"> <tr><th colspan="2">Feature Code</th></tr> <tr><td>A</td><td>For General Use</td></tr> <tr><td>E</td><td>For ESD</td></tr> <tr><td>H</td><td>For High Speed</td></tr> <tr><td>S</td><td>For Special Request</td></tr> </table> | Feature Code | | A | For General Use | E | For ESD | H | For High Speed | S | For Special Request | <table border="1"> <tr><th colspan="2">Maximum Continuous Working Voltage</th></tr> <tr><th>Example</th><th>Nominal Value</th></tr> <tr><td>5R5</td><td>5.5V</td></tr> <tr><td>180</td><td>18V</td></tr> </table> | Maximum Continuous Working Voltage | | Example | Nominal Value | 5R5 | 5.5V | 180 | 18V | <table border="1"> <tr><th colspan="2">Capacitance @1MHz</th></tr> <tr><th>Example</th><th>Nominal Value</th></tr> <tr><td>C121</td><td>120pF</td></tr> </table> | Capacitance @1MHz | | Example | Nominal Value | C121 | 120pF | <table border="1"> <tr><th colspan="2">Tolerance of Capacitance</th></tr> <tr><td>N</td><td>±30%</td></tr> <tr><td>Y</td><td>+100%~-50%</td></tr> <tr><td>G</td><td>Maximum</td></tr> </table> | Tolerance of Capacitance | | N | ±30% | Y | +100%~-50% | G | Maximum | <table border="1"> <tr><th colspan="2">Terminal Code</th></tr> <tr><td>P</td><td>Ni, Sn Plating</td></tr> </table> | Terminal Code | | P | Ni, Sn Plating | <table border="1"> <tr><th colspan="2">Packing</th></tr> <tr><td>T</td><td>Tape & Reel</td></tr> </table> | Packing | | T | Tape & Reel | <table border="1"> <tr><th colspan="2">Hazardous Substance Free Products</th></tr> <tr><td>F</td><td></td></tr> </table> | Hazardous Substance Free Products | | F | |
| Type | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SDV | Chip Varistor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| External Dimensions (LxW) (mm) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0603 [0201] | 0.6x0.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1005 [0402] | 1.0x0.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1608 [0603] | 1.6x0.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2012 [0805] | 2.0x1.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feature Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | For General Use | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | For ESD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | For High Speed | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | For Special Request | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Maximum Continuous Working Voltage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Example | Nominal Value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5R5 | 5.5V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 180 | 18V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance @1MHz | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Example | Nominal Value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C121 | 120pF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tolerance of Capacitance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N | ±30% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y | +100%~-50% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G | Maximum | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Terminal Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P | Ni, Sn Plating | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Packing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T | Tape & Reel | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hazardous Substance Free Products | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SHAPE AND DIMENSIONS



Unit: mm [inch]

| Type | L | W | T | a |
|----------------|--------------------------|--------------------------|--------------------------|---------------------------|
| SDV0603 [0201] | 0.6±0.05 [0.024±.002] | 0.3±0.05 [0.012±.002] | 0.3±0.05 [0.012±.002] | 0.15±0.05 [0.006±.002] |
| SDV1005 [0402] | 1.0±0.15 [.039±.006] | 0.5±0.15 [.020±.006] | 0.5±0.15 [.020±.006] | 0.25±0.1 [.010±.004] |
| SDV1608 [0603] | 1.6±0.15 [.063±.006] | 0.8±0.15 [.031±.006] | 0.8±0.15 [.031±.006] | 0.3±0.2 [.012±.008] |
| SDV2012 [0805] | 2.0±0.2 [.079±.008] | 1.25±0.2 [.049±.008] | 0.85±0.2 [.033±.008] | 0.5±0.3 [.020±.012] |

SPECIFICATIONS

SDV1608A TYPE

| Part Number | Max. Working Voltage | | Varistor Voltage | Max. Clamping Voltage | | Rated Single Pulse Transient | | Typical Capacitance |
|---------------------|----------------------|--------|------------------|-----------------------|-------|------------------------------|---------------------------|---------------------|
| | DC | AC RMS | | 8/20 μ s | ESD | Energy 10/1000 μ s | Peak Current 8/20 μ s | |
| Test Condition | <20 μ A | | @1mA DC | | | | | @0.5Vrms, 1MHz |
| Units | Volts | Volts | Volts | Volts | Volts | Joules | Amps | pF |
| Symbol | VWDC | VWAC | VB | VC*1 | VC*2 | ET | IP | C |
| SDV1608A5R5C121□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.05 | 20 | 120 |
| SDV1608A5R5C141□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.05 | 20 | 140 |
| SDV1608A5R5C231□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.1 | 30 | 230 |
| SDV1608A5R5C361□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.1 | 30 | 360 |
| SDV1608A090C121□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.05 | 20 | 120 |
| SDV1608A090C141□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.05 | 20 | 140 |
| SDV1608A090C201□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.1 | 30 | 200 |
| SDV1608A090C231□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.1 | 30 | 230 |
| SDV1608A090C361□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.1 | 30 | 360 |
| SDV1608A140C121□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.05 | 20 | 120 |
| SDV1608A140C141□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.05 | 20 | 140 |
| SDV1608A140C251□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.1 | 30 | 250 |
| SDV1608A140C361□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.1 | 30 | 360 |
| SDV1608A180C121□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.05 | 20 | 120 |
| SDV1608A180C141□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.05 | 20 | 140 |
| SDV1608A180C231□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.1 | 30 | 230 |
| SDV1608A180C361□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.1 | 30 | 360 |
| SDV1608A220C121□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.05 | 20 | 120 |
| SDV1608A220C141□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.05 | 20 | 140 |
| SDV1608A220C161□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.1 | 30 | 160 |
| SDV1608A220C231□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.1 | 30 | 230 |
| SDV1608A260C121□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.1 | 30 | 120 |
| SDV1608A260C161□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.1 | 30 | 160 |
| SDV1608A300C121□PTF | 30.0 | 21.3 | 37.0-46.0 | 65 | 78 | 0.1 | 30 | 120 |
| SDV1608A300C141□PTF | 30.0 | 21.3 | 37.0-46.0 | 65 | 78 | 0.1 | 30 | 140 |

SDV2012A TYPE

| Part Number | Max. Working Voltage | | Varistor Voltage | Max. Clamping Voltage | Rated Single Pulse Transient | | Typical Capacitance |
|------------------------|----------------------|--------|------------------|-----------------------|------------------------------|---------------------------|---------------------|
| | DC | AC RMS | | | Energy 10/1000 μ s | Peak Current 8/20 μ s | |
| Test Condition 测试条件 | <20 μ A | | @1mA DC | 8/20 μ s | | | @0.5Vrms, 1MHz |
| Units 单位 | Volts | Volts | Volts | Volts | Joules | Amps | pF |
| Symbol 符号 | VWDC | VWAC | VB | VC*1 | ET | IP | C |
| SDV2012A5R5C901□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 0.2 | 60 | 900 |
| SDV2012A5R5C122□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 0.3 | 120 | 1200 |
| SDV2012A090C701□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 0.2 | 60 | 700 |
| SDV2012A090C102□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 0.3 | 120 | 1000 |
| SDV2012A140C401□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 0.2 | 60 | 400 |
| SDV2012A140C701□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 0.3 | 120 | 700 |
| SDV2012A140C901□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 0.4 | 150 | 900 |
| SDV2012A180C301□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 0.2 | 60 | 300 |
| SDV2012A180C501□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 0.3 | 120 | 500 |
| SDV2012A180C701□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 0.4 | 150 | 700 |
| SDV2012A220C251□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 0.2 | 60 | 250 |
| SDV2012A220C401□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 0.3 | 120 | 400 |

SPECIFICATIONS

SDV2012A TYPE

| Part Number | Max. Working Voltage | | Varistor Voltage | Max. Clamping Voltage | | Rated Single Pulse Transient | | Typical Capacitance |
|---------------------|----------------------|--------|------------------|-----------------------|-------|------------------------------|---------------------------|---------------------|
| | DC | AC RMS | | 8/20 μ s | ESD | Energy 10/1000 μ s | Peak Current 8/20 μ s | |
| Test Condition | <20 μ A | | @1mA DC | 8/20 μ s | | Energy 10/1000 μ s | Peak Current 8/20 μ s | @0.5Vrms, 1MHz |
| Units | Volts | Volts | Volts | Volts | Volts | Joules | Amps | pF |
| Symbol | VWDC | VWAC | VB | VC*1 | | ET | IP | C |
| SDV2012A220C501□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | | 0.3 | 120 | 500 |
| SDV2012A260C251□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | | 0.2 | 60 | 250 |
| SDV2012A260C401□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | | 0.3 | 120 | 400 |
| SDV2012A300C181□PTF | 30.0 | 21.3 | 37.0-46.0 | 65 | | 0.2 | 60 | 180 |
| SDV2012A300C301□PTF | 30.0 | 21.3 | 37.0-46.0 | 65 | | 0.3 | 120 | 300 |

SDV1005E TYPE

| Part Number | Max. Working Voltage | | Varistor Voltage | Max. Clamping Voltage | | Rated Single Pulse Transient | | Typical Capacitance |
|---------------------|----------------------|--------|------------------|-----------------------|-------|------------------------------|---------------------------|---------------------|
| | DC | AC RMS | | 8/20 μ s | ESD | Energy 10/1000 μ s | Peak Current 8/20 μ s | |
| Test Condition | <20 μ A | | @1mA DC | 8/20 μ s | ESD | Energy 10/1000 μ s | Peak Current 8/20 μ s | @0.5Vrms, 1MHz |
| Units | Volts | Volts | Volts | Volts | Volts | Joules | Amps | pF |
| Symbol | VWDC | VWAC | VB | VC*1 | VC*2 | ET | IP | C |
| SDV1005E5R5C180□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.005 | 3 | 18 |
| SDV1005E5R5C300□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.005 | 5 | 30 |
| SDV1005E5R5C400□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.005 | 5 | 40 |
| SDV1005E5R5C500□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.01 | 10 | 50 |
| SDV1005E5R5C700□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.01 | 10 | 70 |
| SDV1005E5R5C800□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.02 | 10 | 80 |
| SDV1005E090C180□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.005 | 3 | 18 |
| SDV1005E090C300□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.005 | 5 | 30 |
| SDV1005E090C500□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.01 | 10 | 50 |
| SDV1005E090C800□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.02 | 15 | 80 |
| SDV1005E140C180□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.005 | 3 | 18 |
| SDV1005E140C300□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.01 | 5 | 30 |
| SDV1005E140C500□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.02 | 10 | 50 |
| SDV1005E140C800□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.03 | 15 | 80 |
| SDV1005E180C150□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 15 |
| SDV1005E180C180□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.01 | 5 | 18 |
| SDV1005E180C300□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.02 | 10 | 30 |
| SDV1005E180C500□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.02 | 10 | 50 |
| SDV1005E180C800□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.03 | 15 | 80 |
| SDV1005E220C150□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.005 | 2 | 15 |
| SDV1005E220C180□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.01 | 5 | 18 |
| SDV1005E220C300□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.02 | 10 | 30 |
| SDV1005E220C500□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.02 | 10 | 50 |
| SDV1005E260C180□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.02 | 5 | 18 |
| SDV1005E260C300□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.03 | 10 | 30 |

SPECIFICATIONS

SDV1608E TYPE

| Part Number | Max. Working Voltage | | Varistor Voltage | Max. Clamping Voltage | | Rated Single Pulse Transient | | Typical Capacitance |
|---------------------|----------------------|--------|------------------|-----------------------|--------|------------------------------|------------------|---------------------|
| | <20μA | | | @1mA DC | 8/20μs | ESD | Energy 10/1000μs | |
| Test Condition | DC | AC RMS | | | | | | |
| Units | Volts | Volts | Volts | Volts | Volts | Joules | Amps | pF |
| Symbol | VWDC | VWAC | VB | VC*1 | VC*2 | ET | IP | C |
| SDV1608E5R5C180□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.005 | 3 | 18 |
| SDV1608E5R5C300□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.005 | 5 | 30 |
| SDV1608E5R5C500□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.01 | 10 | 50 |
| SDV1608E5R5C800□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.02 | 10 | 80 |
| SDV1608E5R5C101□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.05 | 20 | 100 |
| SDV1608E090C180□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.005 | 3 | 18 |
| SDV1608E090C300□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.005 | 5 | 30 |
| SDV1608E090C500□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.01 | 10 | 50 |
| SDV1608E090C800□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.02 | 15 | 80 |
| SDV1608E090C101□PTF | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.05 | 20 | 100 |
| SDV1608E140C180□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.005 | 3 | 18 |
| SDV1608E140C300□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.01 | 5 | 30 |
| SDV1608E140C500□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.02 | 10 | 50 |
| SDV1608E140C800□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.03 | 15 | 80 |
| SDV1608E140C101□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.05 | 20 | 100 |
| SDV1608E180C180□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.005 | 5 | 18 |
| SDV1608E180C300□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.02 | 10 | 30 |
| SDV1608E180C600□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.02 | 10 | 60 |
| SDV1608E180C800□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.03 | 15 | 80 |
| SDV1608E180C101□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.05 | 20 | 100 |
| SDV1608E220C180□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.005 | 5 | 18 |
| SDV1608E220C300□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.02 | 10 | 30 |
| SDV1608E220C500□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.02 | 10 | 50 |
| SDV1608E220C800□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.03 | 15 | 80 |
| SDV1608E220C101□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.05 | 20 | 100 |
| SDV1608E260C180□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.02 | 5 | 18 |
| SDV1608E260C300□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.03 | 10 | 30 |
| SDV1608E260C500□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.03 | 10 | 50 |

SDV2012E TYPE

| Part Number | Max. Working Voltage | | Varistor Voltage | Max. Clamping Voltage | | Rated Single Pulse Transient | | Typical Capacitance |
|---------------------|----------------------|--------|------------------|-----------------------|--------|------------------------------|------------------|---------------------|
| | <20μA | | | @1mA DC | 8/20μs | ESD | Energy 10/1000μs | |
| Test Condition | DC | AC RMS | | | | | | |
| Units | Volts | Volts | Volts | Volts | Volts | Joules | Amps | pF |
| Symbol | VWDC | VWAC | VB | VC*1 | VC*2 | ET | IP | C |
| SDV2012E5R5C180□PTF | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.005 | 3 | 18 |
| SDV2012E180C101□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.05 | 20 | 100 |
| SDV2012E260C800□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.05 | 20 | 80 |
| SDV2012E220C101□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.05 | 20 | 100 |
| SDV2012E300C500□PTF | 30.0 | 21.3 | 37.0-46.0 | 65 | 78 | 0.05 | 15 | 50 |

SPECIFICATIONS

SDV1005H TYPE

| Part Number | Max. Working Voltage | | Varistor Voltage | Max. Clamping Voltage | | Rated Single Pulse Transient | | Typical Capacitance |
|---------------------|----------------------|--------|------------------|-----------------------|-------|------------------------------|---------------------------|---------------------|
| | DC | AC RMS | | 8/20 μ s | ESD | Energy 10/1000 μ s | Peak Current 8/20 μ s | |
| Test Condition | <20 μ A | | @1mA DC | 8/20 μ s | ESD | Energy 10/1000 μ s | Peak Current 8/20 μ s | @0.5Vrms, 1MHz |
| Units | Volts | Volts | Volts | Volts | Volts | Joules | Amps | pF |
| Symbol | VWDC | VWAC | VB | VC*1 | Vc*2 | ET | IP | C |
| SDV1005H140C100□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.005 | 2 | 10 |
| SDV1005H140C120□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.005 | 2 | 12 |
| SDV1005H180C050□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 5 |
| SDV1005H180C100□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 10 |
| SDV1005H220C030YPTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.003 | 1 | 3 |
| SDV1005H220C050YPTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.005 | 2 | 5 |
| SDV1005H220C100□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.005 | 2 | 10 |
| SDV1005H220C120□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.005 | 2 | 12 |
| SDV1005H260C030□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.003 | 1 | 3 |
| SDV1005H260C100□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.005 | 2 | 10 |
| SDV1005H260C120□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.005 | 2 | 12 |

SDV1608H TYPE

| Part Number | Max. Working Voltage | | Varistor Voltage | Max. Clamping Voltage | | Rated Single Pulse Transient | | Typical Capacitance |
|---------------------|----------------------|--------|------------------|-----------------------|-------|------------------------------|---------------------------|---------------------|
| | DC | AC RMS | | 8/20 μ s | ESD | Energy 10/1000 μ s | Peak Current 8/20 μ s | |
| Test Condition | <20 μ A | | @1mA DC | 8/20 μ s | ESD | Energy 10/1000 μ s | Peak Current 8/20 μ s | @0.5Vrms, 1MHz |
| Units | Volts | Volts | Volts | Volts | Volts | Joules | Amps | pF |
| Symbol | VWDC | VWAC | VB | VC*1 | VC*2 | ET | IP | C |
| SDV1608H140C100□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.005 | 2 | 10 |
| SDV1608H140C120□PTF | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.005 | 2 | 12 |
| SDV1608H180C050□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.003 | 1 | 5 |
| SDV1608H180C100□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 10 |
| SDV1608H180C120□PTF | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 12 |
| SDV1608H220C030YPTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.003 | 1 | 3 |
| SDV1608H220C050YPTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.003 | 1 | 5 |
| SDV1608H220C100□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.005 | 2 | 10 |
| SDV1608H220C120□PTF | 22.0 | 15.6 | 26.0-34.0 | 45 | 54 | 0.005 | 2 | 12 |
| SDV1608H260C030□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.003 | 1 | 3 |
| SDV1608H260C100□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.005 | 2 | 10 |
| SDV1608H260C120□PTF | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.005 | 2 | 12 |
| SDV1608H300C100□PTF | 30.0 | 21.3 | 37.0-46.0 | 65 | 78 | 0.005 | 2 | 10 |
| SDV1608H480C100□PTF | 48.0 | 34.1 | 54.0-67.0 | 100 | 120 | 0.005 | 5 | 10 |

SPECIFICATIONS

SDV1005S TYPE

| Part Number | Max. Working Voltage | | Varistor Voltage | Max. Clamping Voltage | | Rated Single Pulse Transient | | Typical Capacitance |
|---------------------|----------------------|------------------|------------------|------------------------------|------------------------------|------------------------------|---------------------------|-----------------------------|
| | DC | AC RMS | | 8/20 μ s | ESD | Energy 10/1000 μ s | Peak Current 8/20 μ s | |
| Test Condition | <20 μ A | | @1mA DC | 8/20 μ s | ESD | Energy 10/1000 μ s | Peak Current 8/20 μ s | @0.5V _{rms} , 1MHz |
| Units | Volts | Volts | Volts | Volts | Volts | Joules | Amps | pF |
| Symbol | V _{WDC} | V _{WAC} | V _B | V _C ^{*1} | V _C ^{*2} | E _T | I _P | C |
| SDV1005S5R5C030□PTF | 5.5 | 4.0 | 31.0-38.0 | 58 | 70 | 0.003 | 1 | 3 |
| SDV1005S5R5C050□PTF | 5.5 | 4.0 | 22.0-28.0 | 40 | 48 | 0.003 | 1 | 5 |
| SDV1005S5R5C100□PTF | 5.5 | 4.0 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 10 |
| SDV1005S5R5C120□PTF | 5.5 | 4.0 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 12 |
| SDV1005S090C030□PTF | 9.0 | 6.4 | 31.0-38.0 | 58 | 70 | 0.003 | 1 | 3 |
| SDV1005S090C050□PTF | 9.0 | 6.4 | 22.0-28.0 | 40 | 48 | 0.003 | 1 | 5 |
| SDV1005S090C100□PTF | 9.0 | 6.4 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 10 |
| SDV1005S090C120□PTF | 9.0 | 6.4 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 12 |
| SDV1005S140C030□PTF | 14.0 | 10.0 | 31.0-38.0 | 58 | 70 | 0.003 | 1 | 3 |
| SDV1005S140C050□PTF | 14.0 | 10.0 | 22.0-28.0 | 40 | 48 | 0.003 | 1 | 5 |
| SDV1005S180C030□PTF | 18.0 | 12.7 | 31.0-38.0 | 58 | 70 | 0.003 | 1 | 3 |

SDV1608S TYPE

| Part Number | Max. Working Voltage | | Varistor Voltage | Max. Clamping Voltage | | Rated Single Pulse Transient | | Typical Capacitance |
|---------------------|----------------------|------------------|------------------|------------------------------|------------------------------|------------------------------|---------------------------|-----------------------------|
| | DC | AC RMS | | 8/20 μ s | ESD | Energy 10/1000 μ s | Peak Current 8/20 μ s | |
| Test Condition | <20 μ A | | @1mA DC | 8/20 μ s | ESD | Energy 10/1000 μ s | Peak Current 8/20 μ s | @0.5V _{rms} , 1MHz |
| Units | Volts | Volts | Volts | Volts | Volts | Joules | Amps | pF |
| Symbol | V _{WDC} | V _{WAC} | V _B | V _C ^{*1} | V _C ^{*2} | E _T | I _P | C |
| SDV1608S5R5C030□PTF | 5.5 | 4.0 | 31.0-38.0 | 58 | 70 | 0.003 | 1 | 3 |
| SDV1608S5R5C050□PTF | 5.5 | 4.0 | 22.0-28.0 | 40 | 48 | 0.003 | 1 | 5 |
| SDV1608S5R5C100□PTF | 5.5 | 4.0 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 10 |
| SDV1608S5R5C120□PTF | 5.5 | 4.0 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 12 |
| SDV1608S090C030□PTF | 9.0 | 6.4 | 31.0-38.0 | 58 | 70 | 0.003 | 1 | 3 |
| SDV1608S090C050□PTF | 9.0 | 6.4 | 22.0-28.0 | 40 | 48 | 0.003 | 1 | 5 |
| SDV1608S090C100□PTF | 9.0 | 6.4 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 10 |
| SDV1608S090C120□PTF | 9.0 | 6.4 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 12 |
| SDV1608S140C030□PTF | 14.0 | 10.0 | 31.0-38.0 | 58 | 70 | 0.003 | 1 | 3 |
| SDV1608S140C050□PTF | 14.0 | 10.0 | 22.0-28.0 | 40 | 48 | 0.003 | 1 | 5 |
| SDV1608S180C030□PTF | 18.0 | 12.7 | 31.0-38.0 | 58 | 70 | 0.003 | 1 | 3 |

※V_{dc}: Max DC working voltage of varistor must exceed or equal to 1.5 times that of the application circuit voltage, V_{dc} ≥ 1.5 V_n.

※□: Please specify the capacitance tolerance code (N=±30%, Y=+100%--50%, G=Maximum).

※*1: V_c, Maximum peak voltage across the varistor measured at a specified pulse current and waveform.

Energy Rating Pulse & Waveform

0.00-0.05 Joule 1A, 8/20 μ s

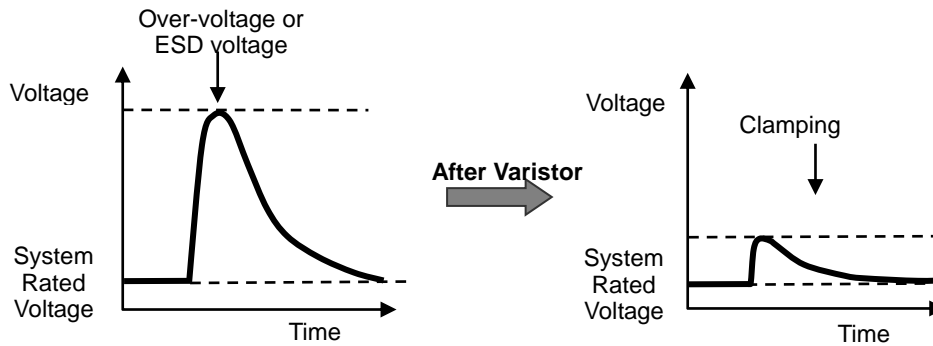
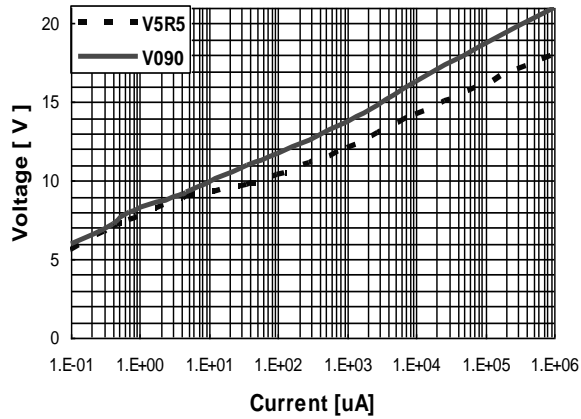
0.10 Joule 2A, 8/20 μ s

0.20-0.50 Joule 5A, 8/20 μ s

※*2: V_c, Maximum peak voltage across the varistor measured at 30ns after initiation of pulse on IEC61000-4-2 30A/8kV. And products with other electrical characteristics can be provided upon customer's request. Please contact your local sales.

TYPICAL ELECTRICAL CHARACTERISTICS

SDV-A/E/H series



SPECIFICATIONS

Ultra low capacitance type (C=0.5pF, 1pF or 2pF)

| Part Number | Max. Working Voltage | | Varistor Voltage | Typical Capacitance | Min. Cut-off Frequency |
|---------------------|----------------------|------------------|------------------|-----------------------------|------------------------|
| | <20µA | | | | |
| Test Condition | DC | AC RMS | @1mA DC | @0.5V _{rms} , 1MHz | @-3dB |
| Units | Volts | Volts | Volts | pF | MHz |
| Symbol | V _{WDC} | V _{WAC} | V _B | C | f ₀ |
| SDV0603S5R5C0R5YPTF | 5.5 | 4.0 | 100-160 | 0.5 | 2000 |
| SDV0603S5R5C010YPTF | 5.5 | 4.0 | 100-160 | 1 | 1250 |
| SDV0603S5R5C020YPTF | 5.5 | 4.0 | 60-80 | 2 | 600 |
| SDV0603S090C0R5YPTF | 9.0 | 6.4 | 100-160 | 0.5 | 2000 |
| SDV0603S090C010YPTF | 9.0 | 6.4 | 100-160 | 1 | 1250 |
| SDV0603S090C020YPTF | 9.0 | 6.4 | 60-80 | 2 | 600 |
| SDV1005H260C0R5YPTF | 26.0 | 18.4 | 100-160 | 0.5 | 2000 |
| SDV1005H260C010YPTF | 26.0 | 18.4 | 100-160 | 1 | 1250 |
| SDV1005H260C020YPTF | 26.0 | 18.4 | 60-80 | 2 | 600 |
| SDV1005S5R5C0R5YPTF | 5.5 | 4.0 | 100-160 | 0.5 | 2000 |
| SDV1005S5R5C010YPTF | 5.5 | 4.0 | 100-160 | 1 | 1250 |
| SDV1005S5R5C020YPTF | 5.5 | 4.0 | 60-80 | 2 | 600 |
| SDV1005S090C0R5YPTF | 9.0 | 6.4 | 100-160 | 0.5 | 2000 |
| SDV1005S090C010YPTF | 9.0 | 6.4 | 100-160 | 1 | 1250 |
| SDV1005S090C020YPTF | 9.0 | 6.4 | 60-80 | 2 | 600 |
| SDV1005S140C0R5YPTF | 14.0 | 10.0 | 100-160 | 0.5 | 2000 |
| SDV1005S140C010YPTF | 14.0 | 10.0 | 100-160 | 1 | 1250 |
| SDV1005S140C020YPTF | 14.0 | 10.0 | 60-80 | 2 | 600 |
| SDV1005S180C0R5YPTF | 18.0 | 12.7 | 100-160 | 0.5 | 2000 |

SPECIFICATIONS

Ultra low capacitance type (C=0.5pF, 1pF or 2pF)

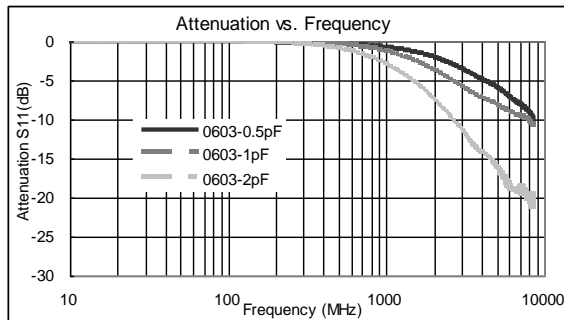
| Part Number | Max. Working Voltage | | Varistor Voltage | Typical Capacitance | Min. Cut-off Frequency |
|---------------------|----------------------|------------------|------------------|-----------------------------|------------------------|
| | <20 μ A | | | | |
| | DC | AC RMS | | | |
| Test Condition | | | @1mA DC | @0.5V _{rms} , 1MHz | @-3dB |
| Units | Volts | Volts | Volts | pF | MHz |
| Symbol | V _{WDC} | V _{WAC} | V _B | C | f ₀ |
| SDV1005S180C010YPTF | 18.0 | 12.7 | 100-160 | 1 | 1250 |
| SDV1005S180C020YPTF | 18.0 | 12.7 | 60-80 | 2 | 600 |
| SDV1608H260C0R5YPTF | 26.0 | 18.4 | 100-160 | 0.5 | 2000 |
| SDV1608H260C010YPTF | 26.0 | 18.4 | 100-160 | 1 | 1250 |
| SDV1608H260C020YPTF | 26.0 | 18.4 | 60-80 | 2 | 600 |
| SDV1608S5R5C0R5YPTF | 5.5 | 4.0 | 100-160 | 0.5 | 2000 |
| SDV1608S5R5C010YPTF | 5.5 | 4.0 | 100-160 | 1 | 1250 |
| SDV1608S5R5C020YPTF | 5.5 | 4.0 | 60-80 | 2 | 600 |
| SDV1608S090C0R5YPTF | 9.0 | 6.4 | 100-160 | 0.5 | 2000 |
| SDV1608S090C010YPTF | 9.0 | 6.4 | 100-160 | 1 | 1250 |
| SDV1608S090C020YPTF | 9.0 | 6.4 | 60-80 | 2 | 600 |
| SDV1608S140C0R5YPTF | 14.0 | 10.0 | 100-160 | 0.5 | 2000 |
| SDV1608S140C010YPTF | 14.0 | 10.0 | 100-160 | 1 | 1250 |
| SDV1608S140C020YPTF | 14.0 | 10.0 | 60-80 | 2 | 600 |
| SDV1608S180C0R5YPTF | 18.0 | 12.7 | 100-160 | 0.5 | 2000 |
| SDV1608S180C010YPTF | 18.0 | 12.7 | 100-160 | 1 | 1250 |
| SDV1608S180C020YPTF | 18.0 | 12.7 | 60-80 | 2 | 600 |

※ : Products with other electrical characteristics can be provided upon customer's request. Please contact your local sales.

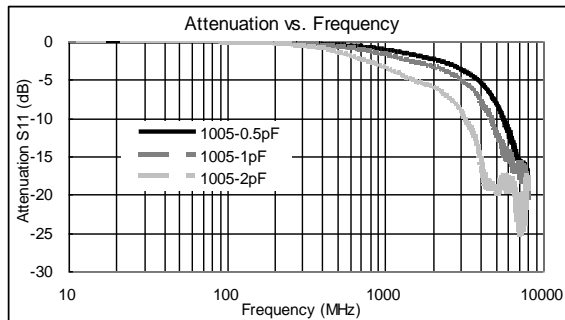
TYPICAL ELECTRICAL CHARACTERISTICS

Ultra low capacitance type: SDV0603/SDV1005/SDV1608 series, C=0.5pF, 1pF, 2pF

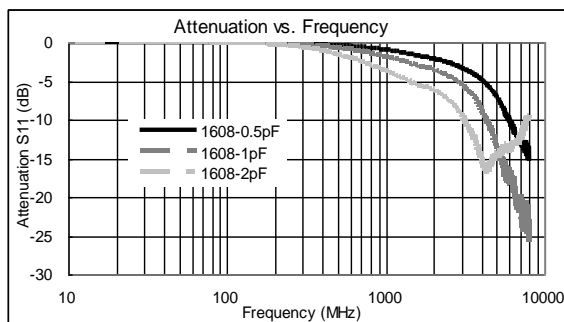
SDV0603 series



SDV1005 series



SDV1608 series



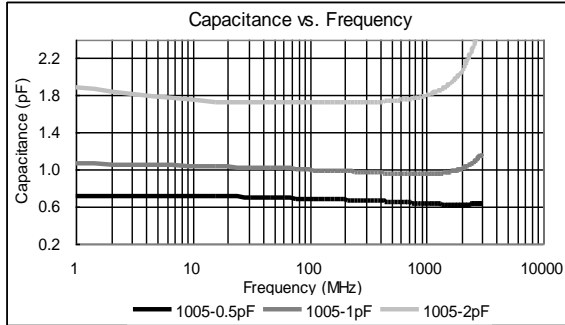
TYPICAL ELECTRICAL CHARACTERISTICS

Ultra low capacitance type: SDV0603/SDV1005/SDV1608 series, C=0.5pF, 1pF, 2pF

SDV0603 series



SDV1005 series



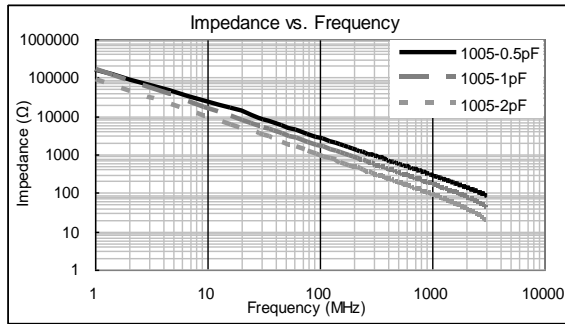
SDV1608 series



SDV0603 series



SDV1005 series



SDV1608 series



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