

## CMS Power-lines Protection Series (CMS-P)

### Descriptions

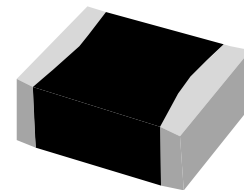
The Ceramic Micro-Surge Protection Device (CMS) is manufactured from semiconducting ceramics which offer rugged protection and excellent transient energy absorption in a small SMD package. These devices are designed to suppress a variety of transient events, including those specified in IEC61000-4-2, IEC61000-4-5 and other standards used for Electromagnetic Compliance (EMC).

These devices are available in ceramic leadless chip form, eliminating lead inductance and assuring fast speed of response to transient surges. In addition, The CMS transient suppressors have temperature independent suppression characteristics, affording protection from -55°C to 125°C, which is much better than suppressors based on silicon semiconductor technology.

The CMS-P Series is specially designed for power-lines protection applications. It features a very high current protection capability with a very small size, also a very fast response thus a ultra low clamping voltage. These characteristics make CMS-P Series devices the best replacement of TVS and improvement of metal oxide (MOV) in high working voltage applications.

### Features

- Multi-Layers Construction Provides Higher Power Dissipation
- Surge Current Capability: 200A (@8/20μs)
- Better than UL94V-0 Flammability Rating
- No Temperature Derating up to 125°C Ambient
- Reliable ESD Protection up to 30kV acc. to IEC61000-4-2
- Inherent Bi-directional Clamping
- SMD type Body size 1206
- "Zero" Lead Inductance
- Very low Clamping Voltage
- RoHS compliant



**Top View (1206)**

### Order Information

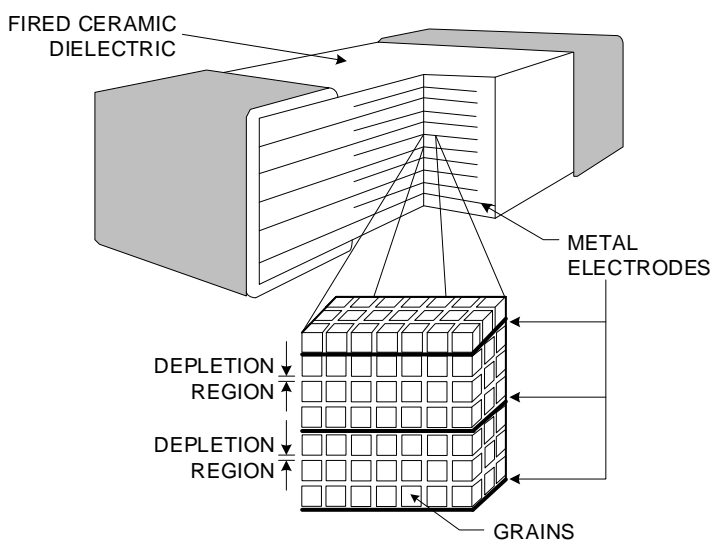
Device	Quantity	Reel Size
CMS1206	2000 pcs	7 Inch (178.0mm)

### Applications

- LED
- Surge protection for IEC/EN 61547
- Surge protection for IEC61000-4-5
- EFT protection for IEC 61000-4-4 (Level 4)
- ESD protection for IEC 61000-4-2 (Level 4)

### Agency Information

- UL/cUL: E498596
- CQC: CQC21001318502
- TUV: B002653 0001 Rev.01

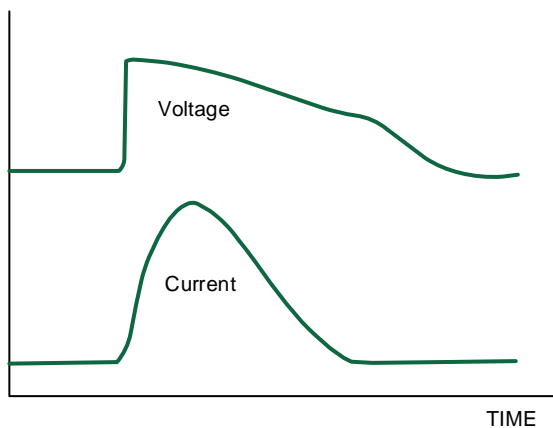


### Multilayer Internal Construction

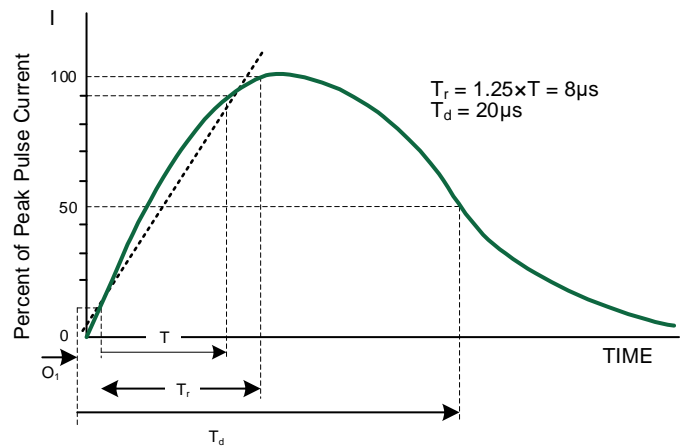
## Device Ratings and Specifications

Parameter	Symbol	Condition	Value	Unit
Maximum Continuous a.c. Voltage	$V_{M(AC)}$	50~60Hz	300	V
Maximum Continuous d.c. Voltage	$V_{M(DC)}$		385	V
Nominal Varistor Voltage	$V_N$	@1mA	423~517	V
Maximum Leakage Current	$I_L$	@ $V_M$	30	$\mu A$
Maximum Clamping Voltage	$V_C$	@ $I_C$	710	V
Class Current	$I_C$	$t_p = 8/20\mu s$	5	A
Peak Pulse Current	$I_{PP}$	$t_p = 8/20\mu s$	200	A
Rated Energy	$E_M$	10/1000 $\mu s$	2.0	J
Operating Temperature Range			-55 to +125	$^{\circ}C$
Storage Temperature			-55 to +150	$^{\circ}C$

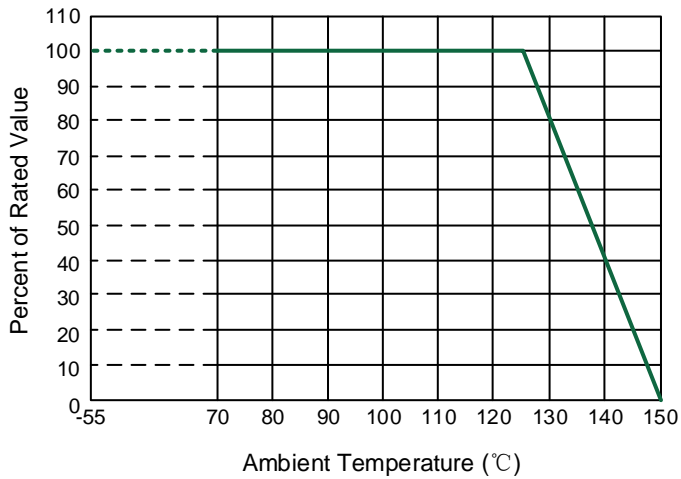
### Surge Response - 8/20 $\mu s$ waveform



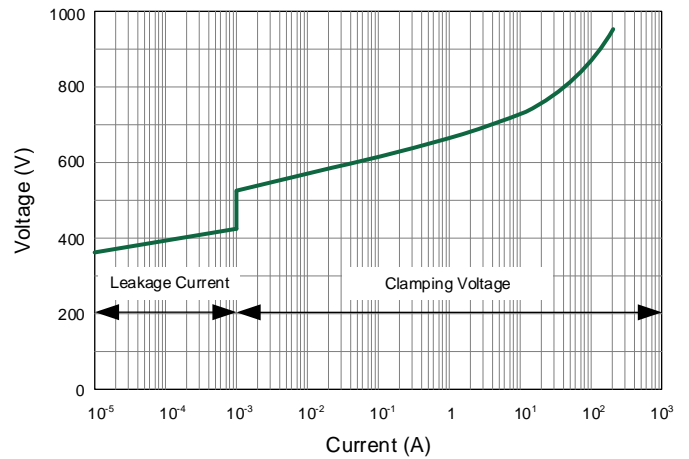
### Pulse Waveform - 8/20 $\mu s$ waveform



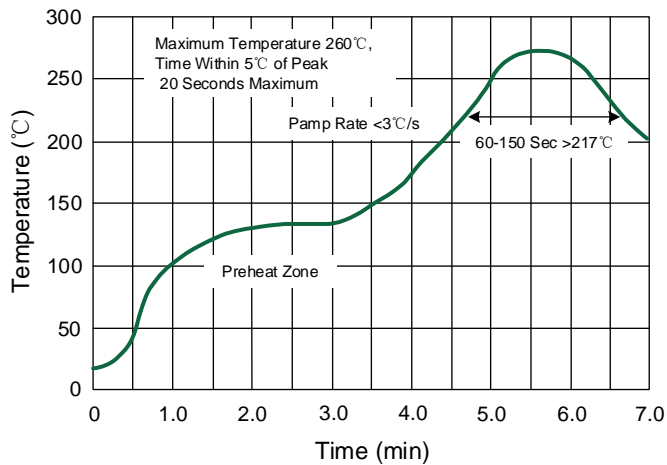
### Current, Energy and Power Derating Curve



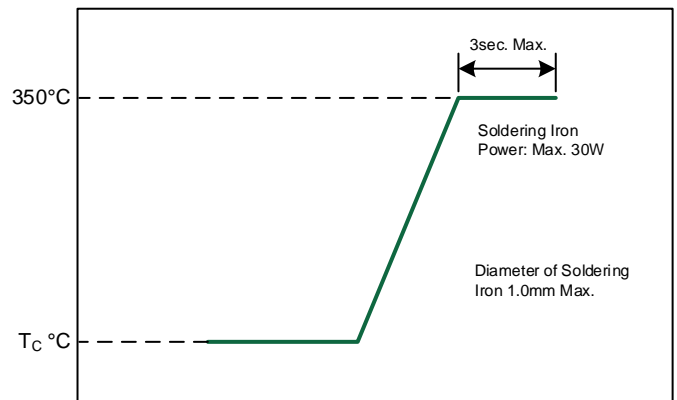
### V/I characteristics



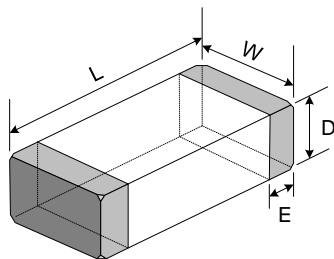
### Lead-free Re-flow Solder Profile



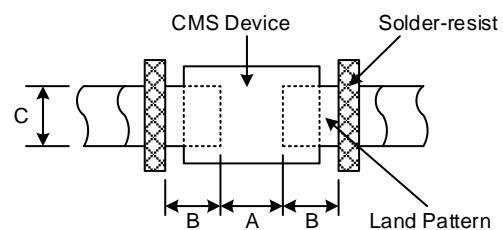
### Iron Soldering Profile



### Product Dimensions



**Product Dimensions**



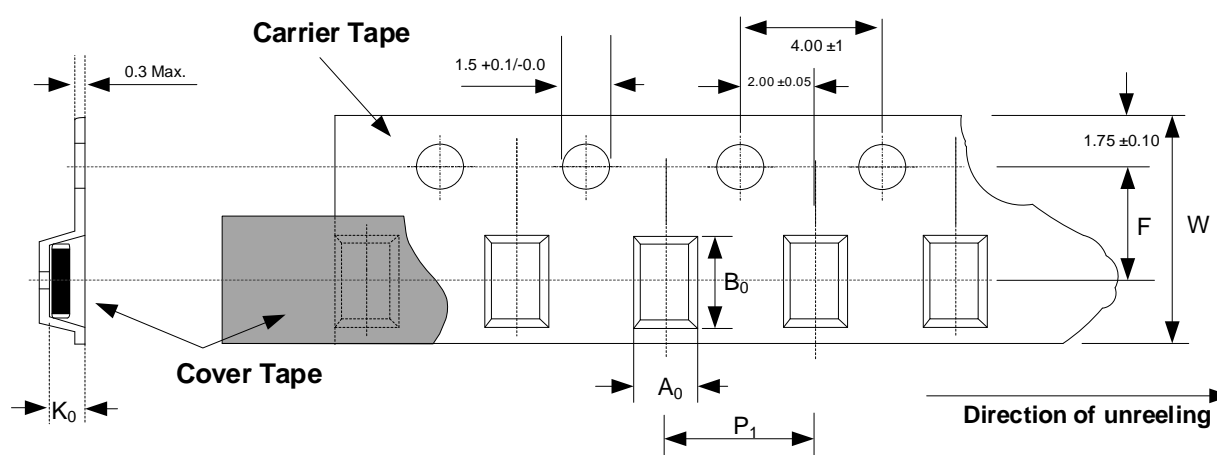
**Recommended PCB Pattern**

Size	L	W	D	E	A	B	C
1206	3.2 +0.6/-0.2	1.6 +0.4/-0.2	1.3~2.0	0.20~0.75	1.8~2.5	1.0~1.5	1.6~2.2

## Storage

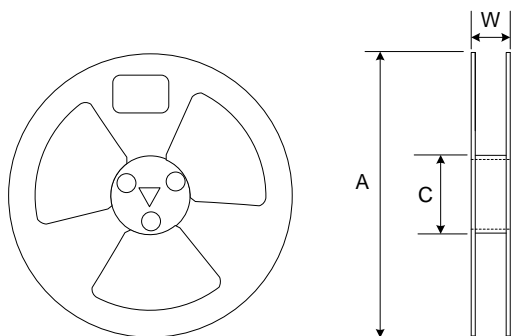
- Storage temperature range (packaging conditions):  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$  RH 70% (Max.).
- The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to high humidity. Package must be stored at  $40^{\circ}\text{C}$  or less and 70% RH or less.
- The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust of harmful gas (e.g. HCl, sulfurous gas of  $\text{H}_2\text{S}$ ).
- Packaging material may be deformed if package are stored where they are exposed to heat of direct sunlight.
- Solderability shall be guaranteed for 12 months from the date of delivery on condition that they are stored at the environment specified in Clause 2. For those parts, which passed more than 12 months shall be checked solder-ability before use.

## Tape and Reel Specifications



Type	A <sub>0</sub>	B <sub>0</sub>	K <sub>0</sub>	P <sub>1</sub>	W	F
CMS1206	2.10 $\pm 0.20$	3.90 $\pm 0.20$	2.20 Max.	4.00 $\pm 0.10$	8.00 $\pm 0.20$	3.50 $\pm 0.05$

Reel Dimension



Spec.	Dimensions(mm)		
	A	W	C
7"×8mm	178	8.4 $\pm 1.5/-0.0$	58

**Environmental Reliability Test**

Item	Requirment	Test Condition
High Temperature Storage	<ul style="list-style-type: none"> <li>Breakdown voltage change: within <math>\pm 10\%</math></li> <li>No mechanical damage</li> </ul>	<ul style="list-style-type: none"> <li>Temperature: <math>150 \pm 2^{\circ}\text{C}</math></li> <li>Time: 1000 (+24) hours</li> <li>Test after placing in ambient temperature for 1~2hours</li> </ul>
Low Temperature Storage	<ul style="list-style-type: none"> <li>Breakdown voltage change: within <math>\pm 10\%</math></li> <li>No mechanical damage</li> </ul>	<ul style="list-style-type: none"> <li>Temperature: <math>-55 \pm 2^{\circ}\text{C}</math></li> <li>Time: 1000 (+24) hours</li> <li>Test after placing in ambient temperature for 1~2hours</li> </ul>
Thermal Shock	<ul style="list-style-type: none"> <li>Breakdown voltage change: within <math>\pm 10\%</math></li> <li>No mechanical damage</li> </ul>	<ul style="list-style-type: none"> <li>Temperature, Time: <math>-55 (\pm 2)^{\circ}\text{C}/30\text{min} \sim 125 (\pm 2)^{\circ}\text{C}/30\text{min}</math></li> <li>Transforming interval: 2~3min.</li> <li>Tested cycle: 100 cycles.</li> <li>Test after placing in ambient temperature for 1~2hours</li> </ul>
High Temperature Load	<ul style="list-style-type: none"> <li>Breakdown voltage change: within <math>\pm 10\%</math></li> <li>No mechanical damage</li> </ul>	<ul style="list-style-type: none"> <li>Temperature: <math>125 \pm 2^{\circ}\text{C}</math></li> <li>Rated working voltage applied</li> <li>Time: 1000 (+24) hours</li> <li>Test after placing in ambient temperature for 1~2hours</li> </ul>
Damp Heat Load / Humidity Load	<ul style="list-style-type: none"> <li>Breakdown voltage change: within <math>\pm 10\%</math></li> <li>No mechanical damage</li> </ul>	<ul style="list-style-type: none"> <li>Temperature: <math>85 \pm 2^{\circ}\text{C}</math></li> <li>Humidity: <math>85\% \pm 2\text{RH}</math></li> <li>Rated working voltage applied</li> <li>Time: 500 (+24) hours</li> <li>Test after placing in ambient temperature for 1~2hours</li> </ul>

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Specifications are subject to change without notice.

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