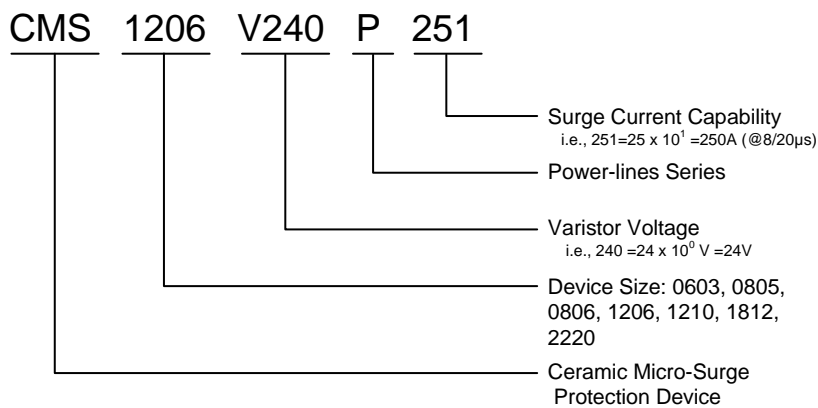


**CMS Surge Series (CMS)**
**Features 特征**

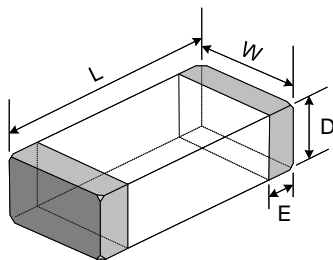
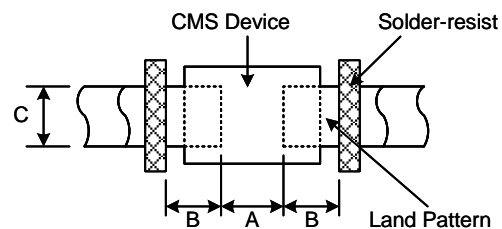
- Multi-Layers Construction Provides Higher Power Dissipation
- High Surge Current Capability and Low Clamping Voltage
- Better than UL94V-0 Flammability Rating
- Operating Temperature: -55 ~ 125°C
- Leakage Current <math><40\mu\text{A}</math>
- Inherent Bi-directional Clamping
- SMD type, Small Size Suitable for High Density Mounting
- Excellent Solderability (Ni, Sn plating)
- "Zero" Lead Inductance
- RoHS Compliant

**Applications 应用**

- Power Supply
- Network Interface
- LED Lighting
- Security System
- PLC
- Industrial Instrument
- Smart Meters

**Part Numbering System 型号说明**

**Order Information 最小包装**

Device Size	Quantity	Reel Size
0603	4K pcs	7 Inch (178mm)
0805	4K pcs	
0806	2K pcs	
1206	2K/3K pcs	
1210	1.5K/2K pcs	13 Inch (330mm)
1812	2K/4K pcs	
2220	2K/3K pcs	

**Product Dimensions 产品尺寸**

**Product Dimensions**

**Recommended PCB Pattern**

SIZE	L	W	D Max.	E	A	B	C
<b>0603</b>	1.6±0.15	0.8±0.15	1.0	0.10~0.50	0.6~0.8	0.6~0.8	0.6~0.8
<b>0805</b>	2.0±0.2	1.25±0.2	2.0	0.15~0.75	1.2~1.6	0.8~1.2	0.9~1.6
<b>0806</b>	2.20 +0.40/-0.20	1.60 +0.40/-0.20	2.0	0.15~0.75	1.2~1.6	0.8~1.2	1.6~2.0
<b>1206</b>	3.20 +0.60/-0.20	1.60 +0.40/-0.20	2.0	0.20~0.75	1.8~2.5	1.0~1.5	1.6~2.2
<b>1210</b>	3.20 +0.60/-0.20	2.50 +0.40/-0.20	2.6	0.20~0.75	1.9~2.5	1.2~1.6	2.6~3.0
<b>1812</b>	4.50 +0.80/-0.20	3.20 +0.80/-0.20	3.6	0.25~1.0	2.8~3.2	1.5~1.9	3.3~3.9
<b>2220</b>	6.00 +0.70/-0.30	5.30 +0.50/-0.30	4.0	0.25~1.3	4.0~4.2	1.8~2.0	5.2~5.8

**Electrical Characteristics**
**0603 Type**

型号 Part Number	最大持续电压 Maximum Continuous Voltage		压敏电压 Varistor Voltage @1mA	最大钳位电压 Max. Clamping Voltage @8/20 $\mu$ s		能量 Energy @10/1000 $\mu$ s	峰值浪涌电流 Peak Pulse Current @8/20 $\mu$ s
	DC (V)	AC (V)	V <sub>N</sub> (V)	V <sub>C</sub> (V)	I <sub>C</sub> (A)	E <sub>T</sub> (J)	I <sub>PP</sub> (A)
CMS0603V120P300	5.5	4.0	12 [10-14]	23	1.0	0.05	30
CMS0603V120P600	5.5	4.0	12 [10-14]	23	1.0	0.1	60
CMS0603V140P300	9	6.4	14 [11-16]	30	1.0	0.05	30
CMS0603V140P101	9	6.4	14 [11-16]	30	1.0	0.1	100
CMS0603V180P300	14	10.0	18 [16-22]	35	1.0	0.05	30
CMS0603V180P101	14	10.0	18 [16-22]	35	1.0	0.1	100
CMS0603V240P101	18	12.7	24 [22-28]	45	1.0	0.1	100
CMS0603V330P300	26	18.4	33 [31-38]	60	1.0	0.05	30
CMS0603V330P101	26	18.4	33 [31-38]	60	1.0	0.1	100
CMS0603V420P101	30	21.3	42 [37-46]	70	1.0	0.1	100
CMS0603V500P800	38	30.0	50 [46-54]	80	1.0	0.08	80
CMS0603V600P600	48	34.1	60 [54-67]	110	1.0	0.08	60
CMS0603V680P300	56	40.0	68 [61-75]	125	1.0	0.05	30
CMS0603V750P300	60	46.0	75 [69-83]	130	1.0	0.05	30
CMS0603V820P300	65	50.0	82 [73-91]	135	1.0	0.05	30
CMS0603V101P200	85	60.0	100 [90-110]	165	1.0	0.03	20

**0805 Type**

型号 Part Number	最大持续电压 Maximum Continuous Voltage		压敏电压 Varistor Voltage @1mA	最大钳位电压 Max. Clamping Voltage @8/20 $\mu$ s		能量 Energy @10/1000 $\mu$ s	峰值浪涌电流 Peak Pulse Current @8/20 $\mu$ s
	DC (V)	AC (V)	V <sub>N</sub> (V)	V <sub>C</sub> (V)	I <sub>C</sub> (A)	E <sub>T</sub> (J)	I <sub>PP</sub> (A)
CMS0805V120P600	5.5	4	12 [10-14]	23	5.0	0.2	60
CMS0805V120P121	5.5	4	12 [10-14]	23	5.0	0.3	120
CMS0805V120P151	5.5	4	12 [10-14]	23	5.0	0.4	150
CMS0805V120P201	5.5	4	12 [10-14]	23	5.0	0.4	200
CMS0805V140P600	9.0	6.4	14 [11-16]	30	5.0	0.2	60
CMS0805V140P121	9.0	6.4	14 [11-16]	30	5.0	0.3	120
CMS0805V140P151	9.0	6.4	14 [11-16]	30	5.0	0.4	150
CMS0805V140P201	9.0	6.4	14 [11-16]	30	5.0	0.4	200
CMS0805V180P600	14	10	18 [16-22]	35	5.0	0.2	60
CMS0805V180P121	14	10	18 [16-22]	35	5.0	0.3	120
CMS0805V180P151	14	10	18 [16-22]	35	5.0	0.4	150
CMS0805V180P201	14	10	18 [16-22]	35	5.0	0.4	200
CMS0805V240P600	18	12.7	24 [22-28]	45	5.0	0.2	60
CMS0805V240P121	18	12.7	24 [22-28]	45	5.0	0.3	120
CMS0805V240P151	18	12.7	24 [22-28]	45	5.0	0.4	150
CMS0805V240P201	18	12.7	24 [22-28]	45	5.0	0.4	200
CMS0805V300P600	22	15.6	30 [26-34]	50	5.0	0.2	60
CMS0805V300P121	22	15.6	30 [26-34]	50	5.0	0.3	120
CMS0805V300P151	22	15.6	30 [26-34]	50	5.0	0.3	150
CMS0805V330P600	26	18.4	33 [31-38]	60	5.0	0.2	60
CMS0805V330P121	26	18.4	33 [31-38]	60	5.0	0.3	120
CMS0805V330P151	26	18.4	33 [31-38]	60	5.0	0.3	150
CMS0805V420P600	30	21.3	42 [37-46]	70	5.0	0.2	60
CMS0805V420P121	30	21.3	42 [37-46]	70	5.0	0.3	120

**0806 Type**

型号 Part Number	最大持续电压 Maximum Continuous Voltage		压敏电压 Varistor Voltage @1mA	最大钳位电压 Max. Clamping Voltage @8/20μs		能量 Energy @10/1000μs	峰值浪涌电流 Peak Pulse Current @8/20μs
	DC (V)	AC (V)	V <sub>N</sub> (V)	V <sub>C</sub> (V)	I <sub>C</sub> (A)	E <sub>T</sub> (J)	I <sub>PP</sub> (A)
CMS0806V140P201	9	6.4	14 [11-16]	30	5.0	0.3	200
CMS0806V140P401	9	6.4	14 [11-16]	30	5.0	0.5	400
CMS0806V180P201	14	10.0	18 [16-22]	35	5.0	0.3	200
CMS0806V180P401	14	10.0	18 [16-22]	35	5.0	0.5	400
CMS0806V240P201	18	12.7	24 [22-28]	45	5.0	0.3	200
CMS0806V240P401	18	12.7	24 [22-28]	45	5.0	0.5	400
CMS0806V330P201	26	18.4	33 [31-38]	60	5.0	0.3	200
CMS0806V330P401	26	18.4	33 [31-38]	60	5.0	0.5	400
CMS0806V420P201	30	21.3	42 [37-46]	70	5.0	0.3	200
CMS0806V420P401	30	21.3	42 [37-46]	70	5.0	0.5	400
CMS0806V500P401	38	30.0	50 [46-54]	80	5.0	0.7	400
CMS0806V600P301	48	34.1	60 [54-67]	110	5.0	0.7	300
CMS0806V680P301	56	40.0	68 [61-75]	125	5.0	0.7	300
CMS0806V750P301	60	46.0	75 [69-83]	130	5.0	0.7	300
CMS0806V820P301	65	50.0	82 [73-91]	135	5.0	0.7	300
CMS0806V101P201	85	60.0	100 [90-110]	165	5.0	0.7	200
CMS0806V121P201	100	75.0	120 [108-132]	200	5.0	0.7	200
CMS0806V151P151	125	95.0	150 [135-185]	260	5.0	0.5	150
CMS0806V181P101	150	115	180 [162-198]	325	5.0	0.5	100

**1206 Type**

型号 Part Number	最大持续电压 Maximum Continuous Voltage		压敏电压 Varistor Voltage @1mA	最大钳位电压 Max. Clamping Voltage @8/20μs		能量 Energy @10/1000μs	峰值浪涌电流 Peak Pulse Current @8/20μs
	DC (V)	AC (V)	V <sub>N</sub> (V)	V <sub>C</sub> (V)	I <sub>C</sub> (A)	E <sub>T</sub> (J)	I <sub>PP</sub> (A)
CMS1206V120P251	5.5	4.0	12 [10-14]	23	5.0	0.3	250
CMS1206V140P251	9	6.4	14 [12-16]	30	5.0	0.3	250
CMS1206V140P501	9	6.4	14 [12-16]	30	5.0	0.6	500
CMS1206V180P251	14	10.0	18 [16-22]	35	5.0	0.3	250
CMS1206V180P501	14	10.0	18 [16-22]	35	5.0	0.6	500
CMS1206V240P251	18	12.7	24 [22-28]	45	5.0	0.3	250
CMS1206V240P501	18	12.7	24 [22-28]	45	5.0	0.6	500
CMS1206V330P251	26	18.4	33 [31-38]	60	5.0	0.3	250
CMS1206V330P501	26	18.4	33 [31-38]	60	5.0	0.6	500
CMS1206V420P201	30	21.3	42 [37-46]	70	5.0	0.4	200
CMS1206V420P501	30	21.3	42 [37-46]	70	5.0	0.7	500
CMS1206V500P201	38	30.0	50 [46-54]	80	5.0	0.4	200
CMS1206V500P501	38	30.0	50 [46-54]	80	5.0	0.8	500
CMS1206V600P151	48	34.1	60 [54-67]	110	5.0	0.4	150
CMS1206V600P501	48	34.1	60 [54-67]	110	5.0	1.0	500
CMS1206V680P151	56	40.0	68 [61-75]	125	5.0	0.4	150
CMS1206V680P501	56	40.0	68 [61-75]	125	5.0	1.2	500
CMS1206V750P151	60	46.0	75 [69-83]	130	5.0	0.4	150
CMS1206V750P501	60	46.0	75 [69-83]	130	5.0	1.2	500
CMS1206V820P151	65	50.0	82 [73-91]	135	5.0	0.5	150
CMS1206V820P501	65	50.0	82 [73-91]	135	5.0	1.2	500
CMS1206V101P151	85	60.0	100 [90-110]	165	5.0	0.5	150
CMS1206V101P401	85	60.0	100 [90-110]	165	5.0	1.2	400
CMS1206V121P151	100	75.0	120 [108-132]	200	5.0	0.5	150
CMS1206V121P401	100	75.0	120 [108-132]	200	5.0	1.2	400
CMS1206V151P301	125	95.0	150 [135-185]	260	5.0	1.2	300
CMS1206V181P201	150	115	180 [162-198]	325	5.0	1.2	200

**1210 Type**

型号 Part Number	最大持续电压 Maximum Continuous Voltage		压敏电压 Varistor Voltage @1mA	最大钳位电压 Max. Clamping Voltage @8/20µs		能量 Energy @10/1000µs	峰值浪涌电流 Peak Pulse Current @8/20µs
	DC (V)	AC (V)	V <sub>N</sub> (V)	V <sub>C</sub> (V)	I <sub>C</sub> (A)	E <sub>T</sub> (J)	I <sub>PP</sub> (A)
CMS1210V120P401	5.5	4.0	12 [10-14]	23	5.0	0.5	400
CMS1210V140P401	9	6.4	14 [12-16]	30	5.0	0.5	400
CMS1210V180P401	14	10.0	18 [16-22]	35	5.0	0.5	400
CMS1210V180P102	14	10.0	18 [16-22]	35	5.0	1.5	1000
CMS1210V240P401	18	12.7	24 [22-28]	45	5.0	0.5	400
CMS1210V240P102	18	12.7	24 [22-28]	45	5.0	1.5	1000
CMS1210V330P401	26	18.4	33 [31-38]	60	5.0	0.5	400
CMS1210V330P102	26	18.4	33 [31-38]	60	5.0	1.5	1000
CMS1210V420P301	30	21.3	42 [37-46]	70	5.0	0.5	300
CMS1210V420P102	30	21.3	42 [37-46]	70	5.0	2	1000
CMS1210V500P301	38	30.0	50 [46-54]	80	5.0	0.8	300
CMS1210V500P102	38	30.0	50 [46-54]	80	5.0	2.5	1000
CMS1210V600P301	48	34.1	60 [54-67]	110	5.0	0.8	300
CMS1210V600P102	48	34.1	60 [54-67]	110	5.0	3	1000
CMS1210V680P301	56	40.0	68 [61-75]	125	5.0	1	300
CMS1210V680P801	56	40.0	68 [61-75]	125	5.0	3	800
CMS1210V680P122	56	40.0	68 [61-75]	125	5.0	4	1200
CMS1210V750P301	60	46.0	75 [69-83]	130	5.0	1	300
CMS1210V750P801	60	46.0	75 [69-83]	130	5.0	3	800
CMS1210V750P122	60	46.0	75 [69-83]	130	5.0	4	1200
CMS1210V820P301	65	50.0	82 [73-91]	135	5.0	1.6	300
CMS1210V820P122	65	50.0	82 [73-91]	135	5.0	4	1200
CMS1210V101P201	85	60.0	100 [90-110]	165	5.0	0.7	200
CMS1210V101P401	85	60.0	100 [90-110]	165	5.0	1.6	400
CMS1210V101P152	85	60.0	100 [90-110]	165	5.0	5	1500
CMS1210V121P201	100	75.0	120 [108-132]	200	5.0	1	200
CMS1210V121P102	100	75.0	120 [108-132]	200	5.0	5	1000
CMS1210V151P801	125	95.0	150 [135-185]	260	5.0	5	800
CMS1210V181P801	150	115	180 [162-198]	325	5.0	5	800

**1812 Type**

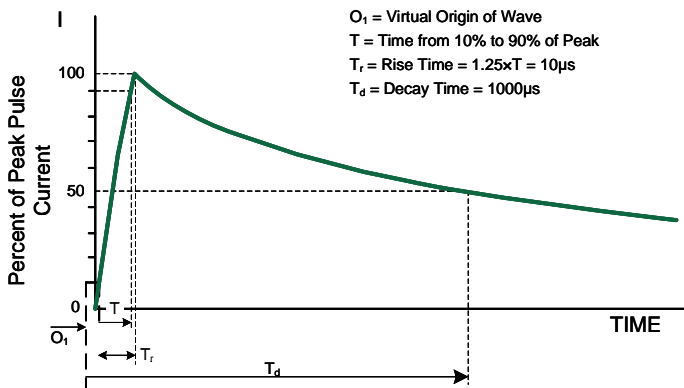
型号 Part Number	最大持续电压 Maximum Continuous Voltage		压敏电压 Varistor Voltage @1mA	最大钳位电压 Max. Clamping Voltage @8/20μs		能量 Energy @10/1000μs	峰值浪涌电流 Peak Pulse Current @8/20μs
	DC (V)	AC (V)	V <sub>N</sub> (V)	V <sub>C</sub> (V)	I <sub>C</sub> (A)	E <sub>T</sub> (J)	I <sub>PP</sub> (A)
CMS1812V120P801	5.5	4.0	12 [10-14]	23	5.0	1.2	800
CMS1812V140P801	9	6.4	14 [12-16]	30	5.0	1.2	800
CMS1812V180P801	14	10.0	18 [16-22]	35	5.0	1.2	800
CMS1812V180P202	14	10.0	18 [16-22]	35	5.0	2.0	2000
CMS1812V240P801	18	12.7	24 [22-28]	45	5.0	1.2	800
CMS1812V240P202	18	12.7	24 [22-28]	45	5.0	2.0	2000
CMS1812V330P801	26	18.4	33 [31-38]	60	5.0	1.5	800
CMS1812V330P142	26	18.4	33 [31-38]	60	5.0	1.8	1400
CMS1812V330P202	26	18.4	33 [31-38]	60	5.0	2.2	2000
CMS1812V420P801	30	21.3	42 [37-46]	70	5.0	1.5	800
CMS1812V420P202	30	21.3	42 [37-46]	70	5.0	2.5	2000
CMS1812V500P801	38	30.0	50 [46-54]	80	5.0	1.5	800
CMS1812V500P202	38	30.0	50 [46-54]	80	5.0	2.5	2000
CMS1812V600P601	48	34.1	60 [54-67]	110	5.0	1.2	600
CMS1812V600P202	48	34.1	60 [54-67]	110	5.0	3	2000
CMS1812V680P601	56	40.0	68 [61-75]	125	5.0	1.2	600
CMS1812V680P202	56	40.0	68 [61-75]	125	5.0	3.5	2000
CMS1812V750P601	60	46.0	75 [69-83]	130	5.0	1.2	600
CMS1812V750P202	60	46.0	75 [69-83]	130	5.0	3.5	2000
CMS1812V820P601	65	50.0	82 [73-91]	135	5.0	1.5	600
CMS1812V820P202	65	50.0	82 [73-91]	135	5.0	3.5	2000
CMS1812V820P302	65	50.0	82 [73-91]	135	5.0	7.5	3000
CMS1812V101P501	85	60.0	100 [90-110]	165	5.0	2	500
CMS1812V101P152	85	60.0	100 [90-110]	165	5.0	6.5	1500
CMS1812V121P501	100	75.0	120 [108-132]	200	5.0	2	500
CMS1812V121P152	100	75.0	120 [108-132]	200	5.0	7	1500
CMS1812V151P501	125	95.0	150 [135-165]	260	5.0	2	500
CMS1812V151P102	125	95.0	150 [135-165]	260	5.0	7	1000
CMS1812V181P501	150	115	180 [162-198]	325	5.0	1.8	500
CMS1812V181P102	150	115	180 [162-198]	325	5.0	7	1000

**2220 Type**

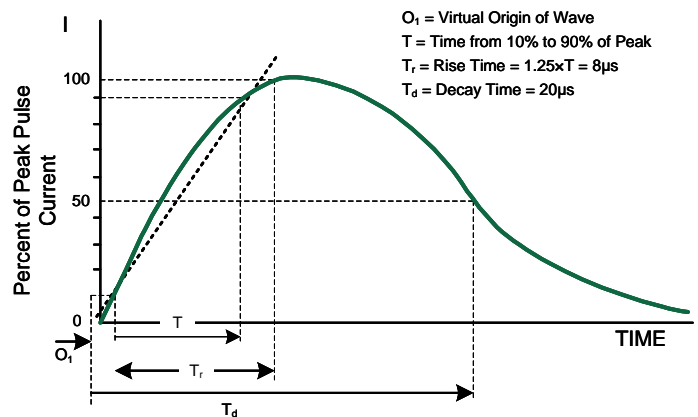
型号 Part Number	最大持续电压 Maximum Continuous Voltage		压敏电压 Varistor Voltage @1mA	最大钳位电压 Max. Clamping Voltage @8/20µs		能量 Energy @10/1000µs	峰值浪涌电流 Peak Pulse Current @8/20µs
	DC (V)	AC (V)	V <sub>N</sub> (V)	V <sub>C</sub> (V)	I <sub>C</sub> (A)	E <sub>T</sub> (J)	I <sub>PP</sub> (A)
CMS2220V120P122	5.5	4.0	12 [10-14]	23	5.0	1.5	1200
CMS2220V140P122	9	6.4	14 [12-16]	30	10.0	1.5	1200
CMS2220V180P122	14	10.0	18 [16-22]	35	10.0	1.5	1200
CMS2220V180P302	14	10.0	18 [16-22]	35	10.0	4	3000
CMS2220V240P122	18	12.7	24 [22-28]	45	10.0	1.5	1200
CMS2220V240P302	18	12.7	24 [22-28]	45	10.0	4	3000
CMS2220V240P502	18	12.7	24 [22-28]	45	10.0	8	5000
CMS2220V330P122	26	18.4	33 [31-38]	60	10.0	1.5	1200
CMS2220V330P302	26	18.4	33 [31-38]	60	10.0	4	3000
CMS2220V330P502	26	18.4	33 [31-38]	60	10.0	8	5000
CMS2220V420P122	30	21.3	42 [37-46]	70	10.0	2.6	1200
CMS2220V420P302	30	21.3	42 [37-46]	70	10.0	7	3000
CMS2220V420P502	30	21.3	42 [37-46]	70	10.0	9	5000
CMS2220V500P122	38	30.0	50 [46-54]	80	10.0	2.6	1200
CMS2220V500P302	38	30.0	50 [46-54]	80	10.0	8	3000
CMS2220V500P502	38	30.0	50 [46-54]	80	10.0	10	5000
CMS2220V500P802	38	30.0	50 [46-54]	80	10.0	6	8000
CMS2220V600P901	48	34.1	60 [54-67]	110	10.0	3	900
CMS2220V600P302	48	34.1	60 [54-67]	110	10.0	10	3000
CMS2220V680P901	56	40.0	68 [61-75]	125	10.0	3	900
CMS2220V680P502	56	40.0	68 [61-75]	125	10.0	17	5000
CMS2220V750P901	60	46.0	75 [69-83]	130	10.0	2.7	900
CMS2220V750P502	60	46.0	75 [69-83]	130	10.0	5	5000
CMS2220V820P901	65	50.0	82 [73-91]	135	10.0	3	900
CMS2220V820P302	65	50.0	82 [73-91]	135	10.0	10	3000
CMS2220V820P502	65	50.0	82 [73-91]	135	10.0	18	5000
CMS2220V101P801	85	60.0	100 [90-110]	165	10.0	4	800
CMS2220V101P452	85	60.0	100 [90-110]	165	10.0	21	4500
CMS2220V121P801	100	75.0	120 [108-132]	200	10.0	4	800
CMS2220V121P402	100	75.0	120 [108-132]	200	10.0	21	4000
CMS2220V151P202	125	95.0	150 [135-165]	260	5.0	12	2000
CMS2220V181P152	150	115	180 [162-198]	325	5.0	12	1500



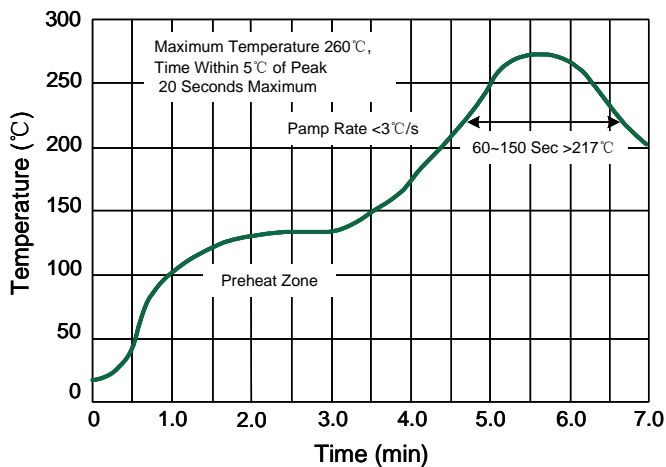
**Pulse Waveform - 10/1000µs waveform**



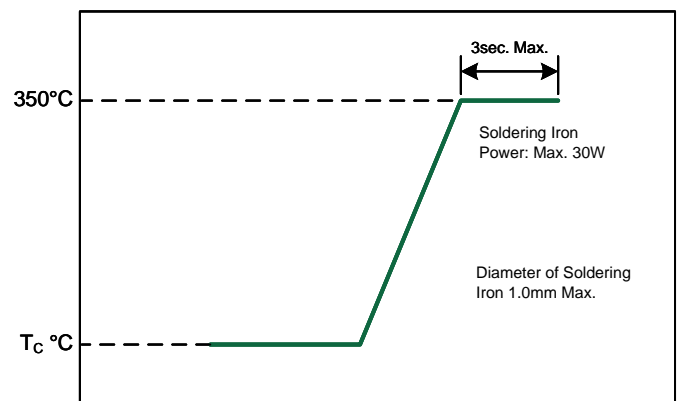
**Pulse Waveform - 8/20µs waveform**



**Lead-free Re-flow Solder Profile**

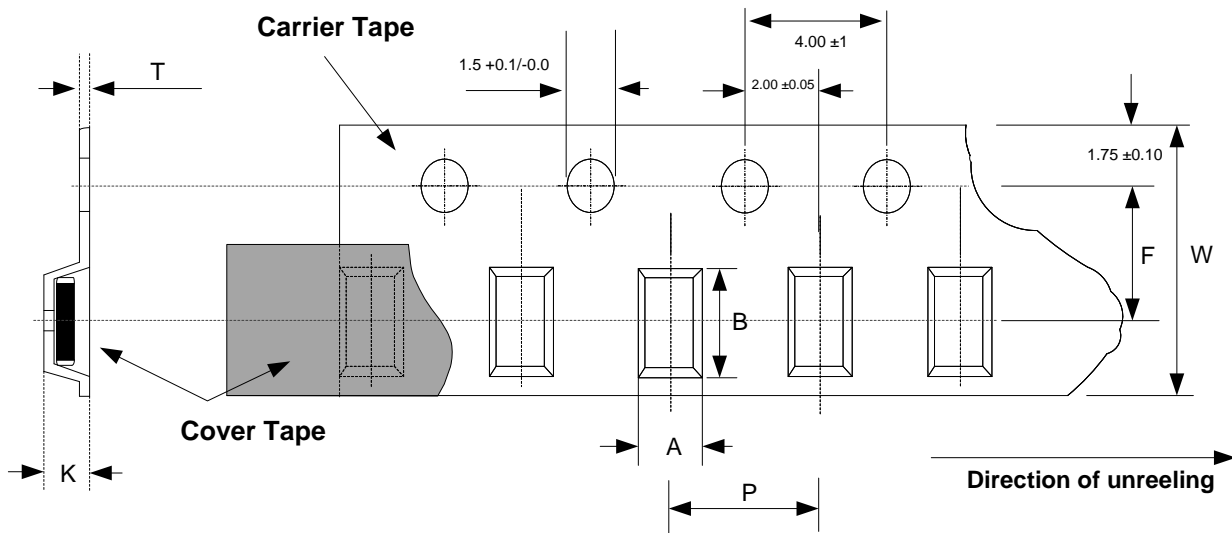


**Iron Soldering Profile**

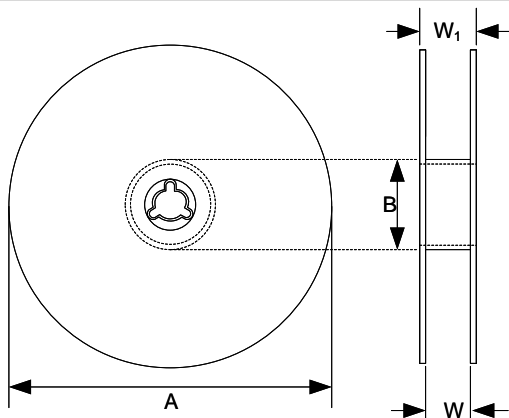


**Storage 存储条件**

- Operating and storage temperature range (individual chip without packing):  $-55^\circ C \sim +125^\circ C$ .  
工作和存储温度范围 (未包装的产品)  $-55^\circ C \sim +125^\circ C$
- Storage temperature range (packaging conditions):  $-10^\circ C \sim +40^\circ C$  RH 70% (Max.).  
存储温度范围 (包装情况下)  $-10^\circ C \sim +40^\circ C$  RH 70% (最高.).
- 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  $40^\circ C$  or less and 70% RH or less.  
如果将包装存放在暴露的高湿度地方, 则外部电极的可焊性可能会变差。包装必须储存在 $40^\circ C$ 或更低, RH为70%或更低。
- 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  $H_2S$ ).  
如果将包装存放在暴露的有害气体 (例如HCl,  $H_2S$ 的含硫气体) 以及粉尘地方, 则外部电极的可焊性可能会变差。
- Packaging material may be deformed if package are stored where they are exposed o heat of direct sunlight.  
如果包装材料存放在暴露的阳光直射高温下, 包装材料可能会变形。
- 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 solderability before use.  
自交货之日起, 可焊性应保证12个月, 前提是储存在第2条规定的环境中。对于超过12个月的产品, 应在使用前检查可焊性。

**Tape Specifications 编带规格**


Dimension	0603	0805	0806	1206	1210	1812	2220
A	1.00	1.50	2.10	2.10	3.00	3.80	5.40
B	1.80	2.30	2.50	3.90	3.90	5.20	6.10
K	1.10.	1.10.	2.20.	2.20.	2.90.	3.80.	3.80.
P	4.00 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	8.00 ± 0.10	8.00 ± 0.10
W	8.00 ± 0.30	8.00 ± 0.30	8.00 ± 0.30	8.00 ± 0.30	8.00 ± 0.30	12.00 ± 0.20	12.00 ± 0.20
F	3.50 ± 0.05	3.50 ± 0.05	3.50 ± 0.05	3.50 ± 0.05	3.50 ± 0.05	5.50 ± 0.05	5.50 ± 0.05
K max	1.10.	1.10.	2.20.	2.20.	2.90.	3.80.	4.20
T max	0.33	0.33	0.33	0.33	0.33	0.33	0.40

**Reel Dimension**


Type	Dimensions (mm)			
	A	B	W	W1
7"	178±2.0	58±2.0	8.4+1.5/-0.0	Max. 14.4
13"	330±2.0	100±2.0	12.4+2.0/-0.0	Max. 14.4

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Specifications are subject to change without notice.

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