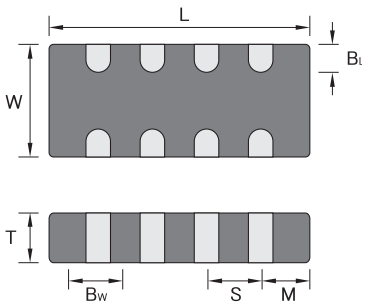
Array Type

Shape & Dimensions



(Unit : mm)

Type	MP4L1220	MP4L1632
L	2.0±0.20	3.2±0.2
W	1.25±0.20	1.60±0.20
T	0.6±0.1	1.2 Max.
S	0.5±0.05	0.80±0.1
M	0.2±0.15	0.40±0.1
BL	0.2±0.15	0.4±0.15
BW	0.25±0.1	0.20~0.45

How to Order(Product Identification)

MP 4 L 1632 A 05 N R

1 2 3 4 5 6 7 8

1 Series
Multi-Line Protection
Chip Varistor Array

2 Array Type
4 : 4Arrays

3 Style
L : Low Capacitance Type

4 Size Code
The first two digits : Width(mm)
The lost two digits : Length(mm)

5 Energy Rating Code
X : 0.05Joules

6 Wording Voltage Code

Code	Working Voltage
05	5.6 Vdc
09	9.0 Vdc
14	14 Vdc
□ □	Two digits are real value

7 Termination Type
N : Plating(Ni/Sn) Type

8 Packing Code

Code	Working Voltage
B	Bulk Pack
R	Tape & Reel Pack
E	Embossed Tape Pack

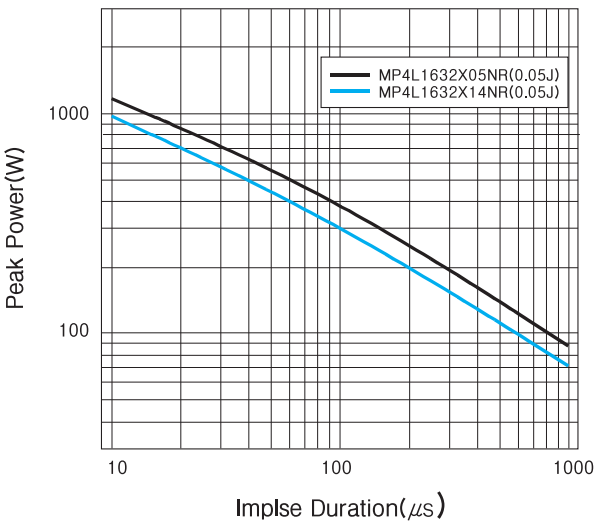
Specifications(Array Type)

ESD Protection of Keypad, I/O Port Protection

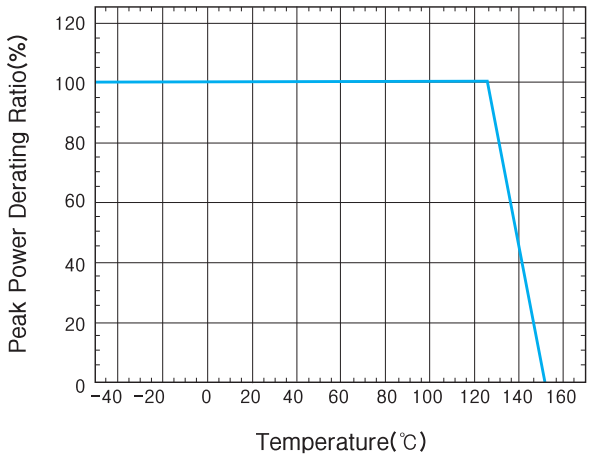
Part No.	Working Voltage	Varistor Voltage	Clamping Voltage	Max. Peak Current	Max Energy	Typical Capacitance pF@1MHz
	$V_{W(DC)}$	$V_{b(@1mA)}$	V_c	I_p(A)	E_t(J)	
MP4L1220X05NR	5.6	Typ.12	20	20	0.05	100
MP4L1220U05NR	5.6	Typ.12	20	15	0.01	50
MP4L1220X12NR	12	Typ.18	30	20	0.05	50
MP4L1220V12NR	12	Typ.18	30	15	0.02	25
MP4L1220V18NR	18	Typ.27	50	15	0.02	30
MP4L1220U18NR	18	Typ.27	50	10	0.01	15
MP4L1632X05NR	5.6	Typ.12	20	20	0.05	150
MP4L1632X12NR	12	Typ.18	30	20	0.05	100
MP4L1632X14NR	14	Typ.22	40	15	0.05	75
MP4L1632X18NR	18	Typ.27	50	15	0.05	50

Note) See Page 105

Peak Power vs Pulse Duration



Temperature Derating



Terminology

1. Working Voltage

$V_{w(DC)}$ - Maximum Continuous DC Voltage with which the waveform is flat. When a ripple voltage is supplied as from a rectifier source, make sure that the peak voltage is kept under the Vdcm.

$V_{w(ac)}$ - Maximum Continuous AC Voltage from a sine-wave shape. When the distortion in the waveform is extensive, make sure that the peak voltage is less than $\sqrt{2}$ times the $V_{w(AC)}$

2. Varistor Voltage($V_{b(@1mA)}$, Breakdown Voltage)

The varistor terminal voltage which measured with supplying 1㎃ DC current.

3. Maximum Transient Clamping Voltage(V_c)

The peak terminal voltage which measured with an 8/20㎲ impulse of a given peak current

Transient Energy Rating	Specified Peak Current & Waveform
≤0.05J	1A 8/20㎲
0.1J	2A 8/20㎲
0.2~0.3J	5A 8/20㎲
0.4J≥	10A 8/20㎲

4. Maximum Transient Peak Current(I_p)

Maximum single peak current which is based on 8/20㎲ current wave shape, without the device failure

5. Maximum Transient Energy(E_t)

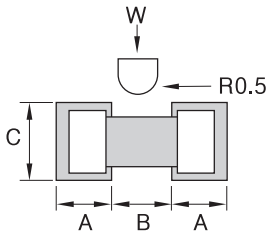
Maximum single peak current which is based on 10/1000㎲ current wave shape, without the device failure

6. Capacitance

The Capacitance measured at a specified frequency 1MHz and zero voltage bias with 0.5Vrms

Reliability and Test conditions

Item	Requirements	Test Conditions
Operating Temperature Range	−40℃~+125℃	
Storage Temp	40℃ Max., 70% RH Max.	At packing condition
Temperature Cycle	① No visible damage ② ⊿V/V1mA ≤ ±10%	1. −40±3℃ for 30minutes 2. 85±3℃ for 30minutes 3. Repeat 100 cycle
Low Temperature Resistance	① No visible damage ② ⊿V/V1mA ≤ ±10%	Temperature : −40±2℃ Tim : 1000±72/−24hours Measurement at room temperature after placing for 24±2hours
Humidity Resistance	① No visible damage ② ⊿V/V1mA ≤ ±10%	Temperature : 40±2℃ Humidity : 90~95 % RH Tim : 500±12hours Measurement at room temperature after placing for 24hours
Humidity Load Resistance	① No visible damage such as cracks ② ⊿V/V1mA ≤ ±10%	Temperature : 40±2℃ Humidity : 90~95 % RH Applied Voltage : Rated Voltage Tim : 500±12hours Measurement at room temperature after placing for 24hours
High Temperature Load Resistance	① No visible damage such as cracks ② ⊿V/V1mA ≤ ±10%	Temperature : 125±2℃ Applied Voltage : Rated Voltage Tim : 1000+72/-24hours Measurement at room temperature after placing for 24hours
Resistance to Soldering Heat	① No visible damage such as cracks ② ⊿V/V1mA ≤ ±10%	Preheat : 120~150℃ 1minutes Solder Temperature : 260±5℃ Immersion Time : 10±1Sec. Take it out and set if for 1~2hours then measure.

<table>
<tr><th>Item</th><th>Requirements</th><th>Test Conditions</th></tr>
<tr><td>Solderability</td><td>① More than 90% of the terminal electrode shall be covered with new solder
② ⊿V/V1mA ≤ ±10%</td><td>Preheat Temperature : 120~150℃
Solder : 60Sn/40Pb
Preheat Time : 60Sec.
Solder Temperature : 230±5℃
Soldering Time : 3±1Sec.</td></tr>
<tr><td>Reflow Soldering</td><td>① Termination should be covered with now solder more than 20% of the terminal electrode height
② ⊿V/V1mA ≤ ±10%</td><td>At reflow soldering profile about 230℃</td></tr>
<tr><td>Lateral Push Strength</td><td>No Mechanical Damage
<table>
<tr><th>Chip Size</th><th>1005</th><th>1608</th><th>2012</th><th>3216</th></tr>
<tr><td>A(mm)</td><td>-</td><td>1.0</td><td>1.0</td><td>1.3</td></tr>
<tr><td>B(mm)</td><td>-</td><td>0.8</td><td>1.0</td><td>1.5</td></tr>
<tr><td>C(mm)</td><td>-</td><td>1.3</td><td>1.3</td><td>3.0</td></tr>
<tr><td>W(kgf)</td><td>-</td><td>2.0</td><td>4.0</td><td>5.0</td></tr>
</table></td><td> 
</td></tr>
<tr><td>Bending Strength</td><td>① No visible damage
② ⊿V/V1mA ≤ ±10%</td><td>According to JIS C 6485
Distance : 1mm
Speed : 30mm/Min.</td></tr>
<tr><td>Max. Peak Current Ip(A)</td><td>① No visible damage
② ⊿V/V1mA ≤ ±10%</td><td>8/20μs waveform
Impulse of +/−each polarity
Measurement at room temperature after placing for 25 hours</td></tr>
<tr><td>Max. Transient Energy Et(J)</td><td>① No visible damage
② ⊿V/V1mA ≤ ±10%</td><td>One standard circumstance Impulse the 10/1000μs specified current wave 1 times.
Measurement at room temperature afger placing for 24 hours</td></tr>
</table>