

Product Specification

Number: L-KLS6-XX(N/M/E)XXXX

Name: Varistors DIP Dia

Specification: _____

Date: 2024-12-17

Customer Signature:



WWW.KLSELE.COM

NINGBO KLS ELECTRONIC CO; LTD

Tel : 0086-574-86828566

Fax : 0086-574-86824882

ADD : NO. 8-1, RONGXIA RD. XIAPU SHANQIAN
INDUSTRIAL ZONE BEILUN NINGBO ZHEJIANG.

Compi	Check	Review	Approva
Jenny	Jack.C		

Part name	Varistors DIP Dia	Date	2024-12-17
Part number	L-KLS6-XX(N/M/E)XXXK	Edition	V1
Department		Page	3 / 12

1 / Features

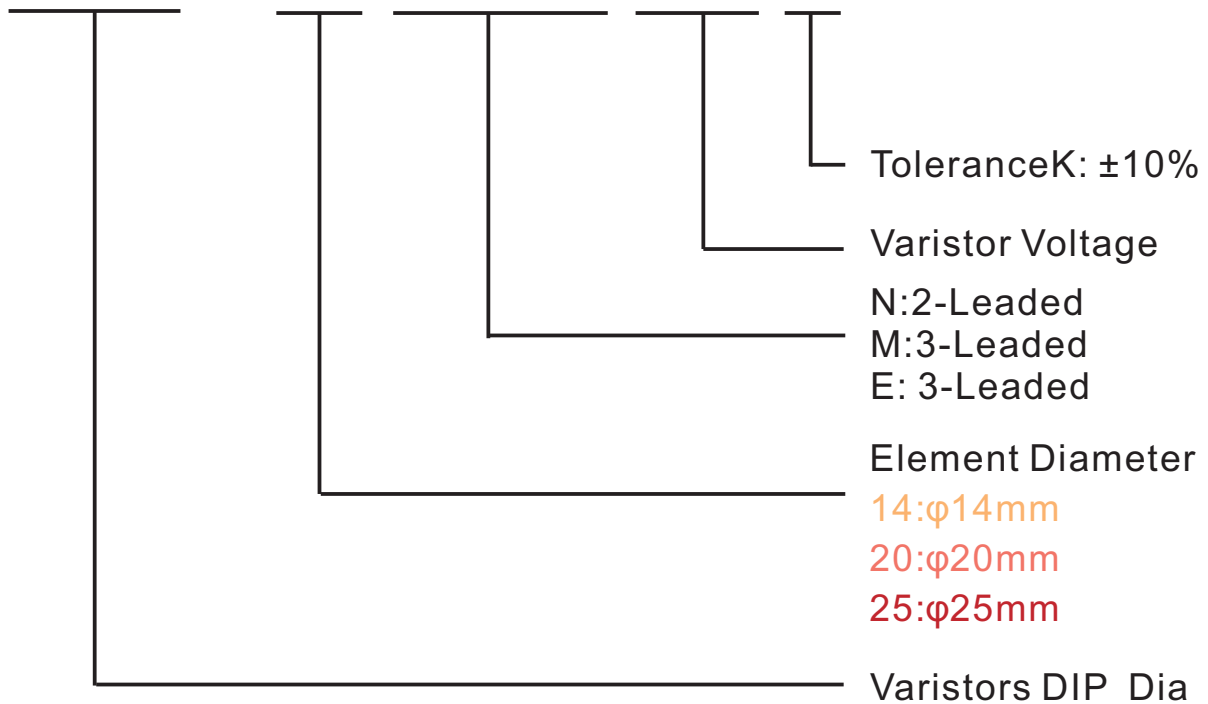
Fast responding to transient over-voltage
 Large absorbing transient energy capability
 Low clamping ratio and no follow-on current
 Meets MSL level 1, per J-STD-020
 Operating Temperature : -40 °C ~ +85°C
 Storage Temperature: -40 °C ~ +85°C

Applications

Power supply, Telecommunication, Smart meter, or PLC protection
 Surge protection in consumer electronics
 Surge protection in industrial electronics
 Surge protection in electronic home appliances, gas and petroleum appliances
 Relay and electromagnetic valve surge absorption

ORDER INFORMATION

L-KLS6 - XX (N/M/E) XXX K



Part name	Varistors DIP Dia	Date	2024-12-17
Part number	L-KLS6-14(N/M/E)XXXX	Edition	V1
Department		Page	4 / 12

2 / Electrical Characteristics:

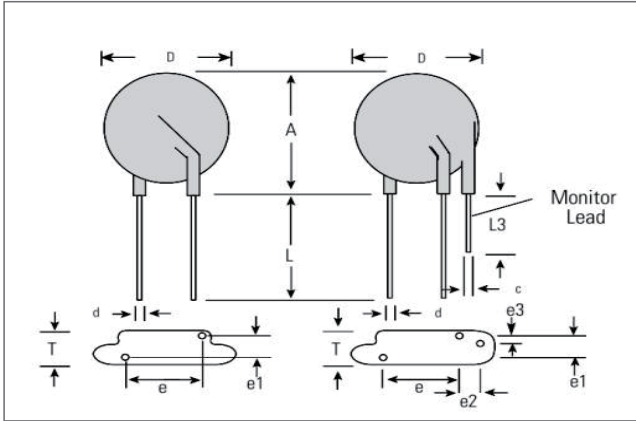
φ14 Series (Thermally Protected Varistors)

Part Number	Maximum Allowable Voltage		Varistor Voltage $V_{ma}(V)$	Maximum Clamping Voltage		Withstanding Surge current 8/20uS(A)	Maximum Energy (10/1000μs) (J)	Rated Power (W)	Dimension Tmax (mm)	Dimension el max (mm)
	$V_{ac}(V)$	$V_{dc}(V)$		$I_p(A)$	$V_c(V)$					
L-KLS6-14(N/M/E)181K	115	150	180(162-198)	50	300	6000	56	0.6	9.0	4
L-KLS6-14(N/M/E)201K	130	170	200(180-220)	50	340	6000	70	0.6	9.0	4
L-KLS6-14(N/M/E)221K	140	180	220(198-242)	50	360	6000	78	0.6	9.0	4
L-KLS6-14(N/M/E)241K	150	200	240(216-264)	50	395	6000	84	0.6	9.0	4
L-KLS6-14(N/M/E)271K	175	225	270(243-297)	50	455	6000	99	0.6	9.0	4
L-KLS6-14(N/M/E)301K	190	250	300(270-330)	50	500	6000	108	0.6	9.5	4.5
L-KLS6-14(N/M/E)331K	210	275	330(297-363)	50	550	6000	115	0.6	9.5	4.5
L-KLS6-14(N/M/E)361K	230	300	360(324-396)	50	595	6000	130	0.6	9.5	4.5
L-KLS6-14(N/M/E)391K	250	320	390(351-429)	50	650	6000	140	0.6	9.5	4.5
L-KLS6-14(N/M/E)431K	275	350	430(387-473)	50	710	6000	155	0.6	9.5	4.5
L-KLS6-14(N/M/E)471K	300	385	470(423-517)	50	775	6000	175	0.6	11	5.5
L-KLS6-14(N/M/E)511K	320	415	510(459-561)	50	845	6000	180	0.6	11	5.5
L-KLS6-14(N/M/E)561K	350	460	560(504-616)	50	925	6000	185	0.6	11	5.5
L-KLS6-14(N/M/E)621K	385	505	620(558-682)	50	102	6000	190	0.6	11	5.5
L-KLS6-14(N/M/E)681K	420	560	680(612-748)	50	112	6000	200	0.6	11	5.5
L-KLS6-14(N/M/E)751K	460	615	750(675-825)	50	124	6000	210	0.6	11	8
L-KLS6-14(N/M/E)781K	485	640	780(702-858)	50	129	6000	220	0.6	12	8
L-KLS6-14(N/M/E)821K	510	670	820(738-902)	50	135	6000	235	0.6	12	8
L-KLS6-14(N/M/E)911K	550	745	910(819-1001)	50	150	6000	255	0.6	12	8
L-KLS6-14(N/M/E)102K	625	825	1000(900-1100)	50	165	6000	280	0.6	13	8
L-KLS6-14(N/M/E)112K	680	895	1100(990-1210)	50	181	6000	310	0.6	13	10
L-KLS6-14(N/M/E)122K	750	990	1200(1080-1320)	50	198	6000	324	0.6	13	10

Notes: Leakage Current (@83% of V1mA): $I_R \leq 25\mu A$

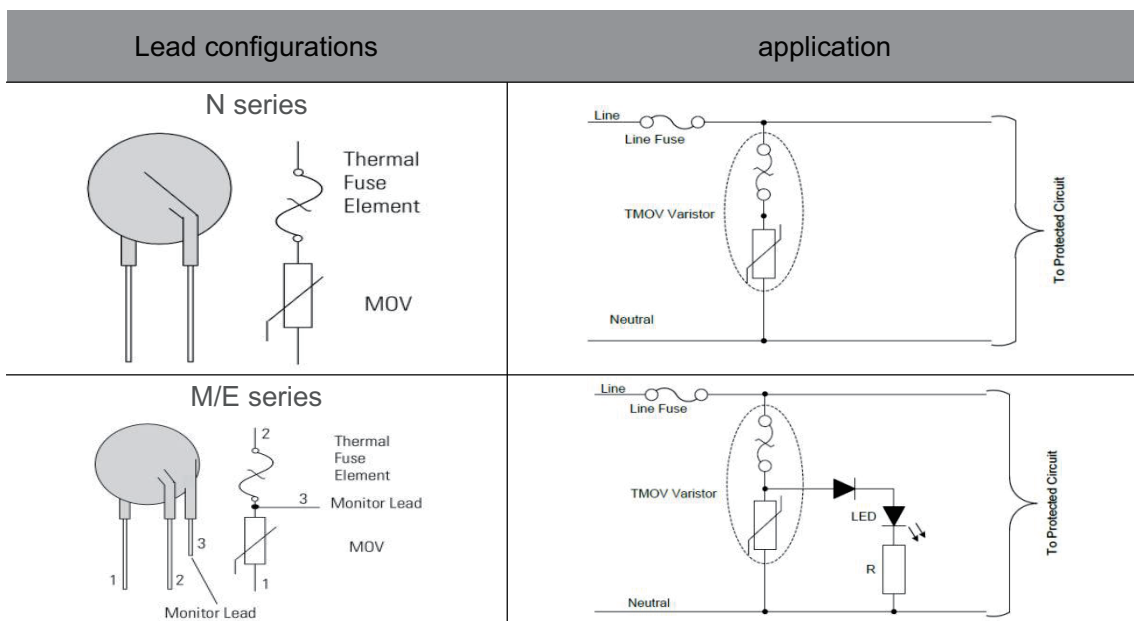
Part name	Varistors DIP Dia	Date	2024-12-17
Part number	L-KLS6-14(N/M/E)XXXX	Edition	V1
Department		Page	5 / 12

3 / Dimensions



Symbol	D (max.)	A (max.)	e (± 1)	e 2 (± 1)	e 3 (max.)	L (min.)	L3 (min.)	d (± 0.05)	c (± 0.05)	Tmax	e1
N series (mm)	17	22	7.5	n/a	n/a	25.4	n/a	0.8	n/a	Please refer to the Electrical Characteristics Table	
M/E series (mm)	17	22	7.5	5.0	2.0	25.4	6.0	0.8	0.8		

4 / Lead configurations and application examples



Part name	Varistors DIP Dia	Date	2024-12-17
Part number	L-KLS6-14(N/M/E)XXXX	Edition	V1
Department		Page	6 / 12

5 / Reliability

Items	Test conditions/Methods	Specifications															
High Temperature Storage	Ambient Temp: $85 \pm 2^{\circ}\text{C}$ Duration:1000hrs	$ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Low Temperature Storage	Ambient Temp: $-55 \pm 2^{\circ}\text{C}$ Duration: 1000hrs	$ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Humidity	Ambient Temp: $40 \pm 2^{\circ}\text{C}$,90~95% R.H. Duration: 1000hrs	$ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Temperature Cycle	<p>The conditions shown below shall be repeated 5 cycles</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature ($^{\circ}\text{C}$)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55 ± 3</td> <td>30 ± 3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>15 ± 3</td> </tr> <tr> <td>3</td> <td>85 ± 3</td> <td>30 ± 3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>15 ± 3</td> </tr> </tbody> </table>	Step	Temperature ($^{\circ}\text{C}$)	Period (minutes)	1	-55 ± 3	30 ± 3	2	Room temperature	15 ± 3	3	85 ± 3	30 ± 3	4	Room temperature	15 ± 3	<p>No visible damage</p> $ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$
Step	Temperature ($^{\circ}\text{C}$)	Period (minutes)															
1	-55 ± 3	30 ± 3															
2	Room temperature	15 ± 3															
3	85 ± 3	30 ± 3															
4	Room temperature	15 ± 3															
High Temperature Load	Ambient Temp: $85 \pm 2^{\circ}\text{C}$ Duration:1000hrs Load: Max.Allowable Voltage In AC eara.	$ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Damp Heat Load	Ambient Temp: $40 \pm 2^{\circ}\text{C}$ 90~95%R.H. Duration:1000hrs Load:Max.Allowable Voltage	<p>No visible damage</p> $ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Voltage Proof	Metal balls method, 2500Vac 1 min.	No visible damage															

Part name	Varistors DIP Dia	Date	2024-12-17
Part number	L-KLS6-20(N/M/E)XXXX	Edition	V1
Department		Page	7 / 12

1 / Electrical Characteristics:

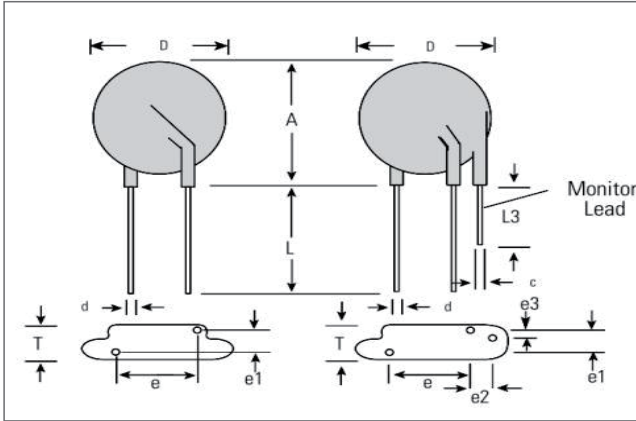
φ20 Series (Thermally Protected Varistors)

Part Number	Maximum Allowable Voltage		Varistor Voltage $V_{ma}(V)$	Maximum Clamping Voltage		Withstanding Surge current $8/20\mu S(A)$	Maximum Energy (10/1000 μs) (J)	Rated Power (W)	Dimension Tmax (mm)	Dimension el max (mm)
	$V_{ac}(V)$	$V_{dc}(V)$		$I_p(A)$	$V_c(V)$					
L-KLS6-20(N/M/E)181K	115	150	180(162-198)	100	300	10000	110	1.0	9.0	4
L-KLS6-20(N/M/E)201K	130	170	200(180-220)	100	340	10000	140	1.0	9.0	4
L-KLS6-20(N/M/E)221K	140	180	220(198-242)	100	360	10000	155	1.0	9.0	4
L-KLS6-20(N/M/E)241K	150	200	240(216-264)	100	395	10000	170	1.0	9.0	4
L-KLS6-20(N/M/E)271K	175	225	270(243-297)	100	455	10000	190	1.0	9.0	4
L-KLS6-20(N/M/E)301K	190	250	300(270-330)	100	500	10000	205	1.0	9.5	4.5
L-KLS6-20(N/M/E)331K	210	275	330(297-363)	100	550	10000	215	1.0	9.5	4.5
L-KLS6-20(N/M/E)361K	230	300	360(324-396)	100	595	10000	225	1.0	9.5	4.5
L-KLS6-20(N/M/E)391K	250	320	390(351-429)	100	650	10000	240	1.0	9.5	4.5
L-KLS6-20(N/M/E)431K	275	350	430(387-473)	100	710	10000	270	1.0	9.5	5.5
L-KLS6-20(N/M/E)471K	300	385	470(423-517)	100	775	10000	350	1.0	11	5.5
L-KLS6-20(N/M/E)511K	320	415	510(459-561)	100	845	10000	380	1.0	11	5.5
L-KLS6-20(N/M/E)561K	350	460	560(504-616)	100	925	10000	400	1.0	11	5.5
L-KLS6-20(N/M/E)621K	385	505	620(558-682)	100	102	10000	425	1.0	11	6.0
L-KLS6-20(N/M/E)681K	420	560	680(612-748)	100	112	10000	435	1.0	11	6.0
L-KLS6-20(N/M/E)751K	460	615	750(675-825)	100	124	10000	455	1.0	11	7.0
L-KLS6-20(N/M/E)781K	485	640	780(702-858)	100	129	10000	461	1.0	12	7.0
L-KLS6-20(N/M/E)821K	510	670	820(738-902)	100	135	10000	475	1.0	12	7.0
L-KLS6-20(N/M/E)911K	550	745	910(819-1001)	100	150	10000	500	1.0	12	8.0
L-KLS6-20(N/M/E)102K	625	825	1000(900-1100)	100	165	10000	560	1.0	13	8.0
L-KLS6-20(N/M/E)112K	680	895	1100(990-1210)	100	181	10000	610	1.0	13	9.0
L-KLS6-20(N/M/E)122K	750	990	1200(1080-1320)	100	198	10000	650	1.0	13	9.0

Notes: Leakage Current (@83% of V1mA): $I_R \leq 25\mu A$

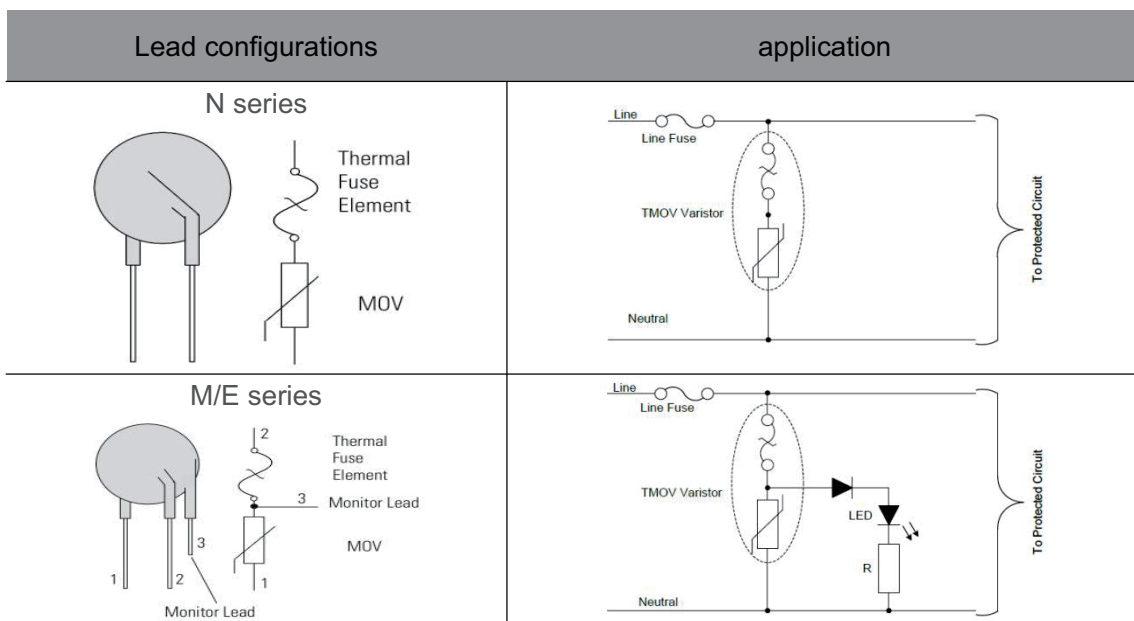
Part name	Varistors DIP Dia	Date	2024-12-17
Part number	L-KLS6-20(N/M/E)XXXX	Edition	V1
Department		Page	8 / 12

2 / Dimensions



Symbol	D (max.)	A (max.)	e (± 1)	e 2 (± 1)	e 3 (max.)	L (min.)	L3 (min.)	d (± 0.05)	c (± 0.05)	Tmax	e1
N series (mm)	23	28	7.5	n/a	n/a	25.4	n/a	0.8/1.0	n/a	Please refer to the Electrical Characteristics Table	
M/E series (mm)	23	28	7.5	5.0	2.0	25.4	6.0	0.8/1.0	0.8		

3 / Lead configurations and application examples



Part name	Varistors DIP Dia	Date	2024-12-17
Part number	L-KLS6-20(N/M/E)XXXX	Edition	V1
Department		Page	9 / 12

4 / Reliability

Items	Test conditions/Methods	Specifications															
High Temperature Storage	Ambient Temp: $85 \pm 2^{\circ}\text{C}$ Duration:1000hrs	$ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Low Temperature Storage	Ambient Temp: $-55 \pm 2^{\circ}\text{C}$ Duration: 1000hrs	$ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Humidity	Ambient Temp: $40 \pm 2^{\circ}\text{C}$,90~95% R.H. Duration: 1000hrs	$ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Temperature Cycle	<p>The conditions shown below shall be repeated 5 cycles</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature ($^{\circ}\text{C}$)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55 ± 3</td> <td>30 ± 3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>15 ± 3</td> </tr> <tr> <td>3</td> <td>85 ± 3</td> <td>30 ± 3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>15 ± 3</td> </tr> </tbody> </table>	Step	Temperature ($^{\circ}\text{C}$)	Period (minutes)	1	-55 ± 3	30 ± 3	2	Room temperature	15 ± 3	3	85 ± 3	30 ± 3	4	Room temperature	15 ± 3	<p>No visible damage</p> $ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$
Step	Temperature ($^{\circ}\text{C}$)	Period (minutes)															
1	-55 ± 3	30 ± 3															
2	Room temperature	15 ± 3															
3	85 ± 3	30 ± 3															
4	Room temperature	15 ± 3															
High Temperature Load	Ambient Temp: $85 \pm 2^{\circ}\text{C}$ Duration:1000hrs Load: Max.Allowable Voltage In AC eara.	$ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Damp Heat Load	Ambient Temp: $40 \pm 2^{\circ}\text{C}$ 90~95%R.H. Duration:1000hrs Load:Max.Allowable Voltage	<p>No visible damage</p> $ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Voltage Proof	Metal balls method, 2500Vac 1 min.	No visible damage															

Part name	Varistors DIP Dia	Date	2024-12-17
Part number	L-KLS6-25(N/M/E)XXXX	Edition	V1
Department		Page	10 / 12

1 / Electrical Characteristics:

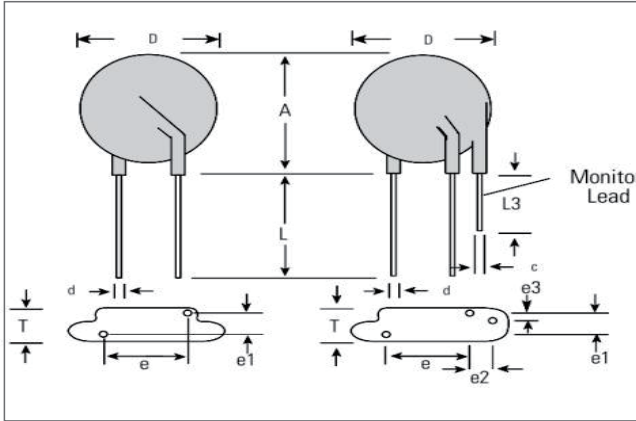
φ25 Series (Thermally Protected Varistors)

Part Number	Maximum Allowable Voltage		Varistor Voltage $V_{ma}(V)$	Maximum Clamping Voltage		Withstanding Surge current $8/20\mu S(A)$	Maximum Energy (10/1000 μs) (J)	Rated Power (W)	Dimension Tmax (mm)	Dimension el max (mm)
	$V_{ac}(V)$	$V_{dc}(V)$		$I_p(A)$	$V_c(V)$					
L-KLS6-25(N/M/E)181K	115	150	180(162-198)	150	300	15000	175	1.2	11.8	3.8
L-KLS6-25(N/M/E)201K	130	170	200(180-220)	150	340	15000	210	1.2	11.9	3.8
L-KLS6-25(N/M/E)221K	140	180	220(198-242)	150	360	15000	230	1.2	12.0	3.8
L-KLS6-25(N/M/E)241K	150	200	240(216-264)	150	395	15000	255	1.2	12.0	3.8
L-KLS6-25(N/M/E)271K	175	225	270(243-297)	150	455	15000	285	1.2	12.0	3.8
L-KLS6-25(N/M/E)301K	190	250	300(270-330)	150	500	15000	310	1.2	12.0	4.5
L-KLS6-25(N/M/E)331K	210	275	330(297-363)	150	550	15000	325	1.2	12.0	4.5
L-KLS6-25(N/M/E)361K	230	300	360(324-396)	150	595	15000	340	1.2	12.0	4.5
L-KLS6-25(N/M/E)391K	250	320	390(351-429)	150	650	15000	360	1.2	12.0	4.5
L-KLS6-25(N/M/E)431K	275	350	430(387-473)	150	710	15000	440	1.2	13.5	5.5
L-KLS6-25(N/M/E)471K	300	385	470(423-517)	150	775	15000	490	1.2	13.5	5.5
L-KLS6-25(N/M/E)511K	320	415	510(459-561)	150	845	15000	530	1.2	13.5	5.5
L-KLS6-25(N/M/E)561K	350	460	560(504-616)	150	925	15000	560	1.2	13.5	5.5
L-KLS6-25(N/M/E)621K	385	505	620(558-682)	150	102	15000	590	1.2	13.5	5.5
L-KLS6-25(N/M/E)681K	420	560	680(612-748)	150	112	15000	620	1.2	15.8	7.8
L-KLS6-25(N/M/E)751K	460	615	750(675-825)	150	124	15000	630	1.2	15.8	7.8
L-KLS6-25(N/M/E)781K	485	640	780(702-858)	150	129	15000	675	1.2	15.8	7.8
L-KLS6-25(N/M/E)821K	510	670	820(738-902)	150	135	15000	690	1.2	15.8	7.8
L-KLS6-25(N/M/E)911K	550	745	910(819-1001)	150	150	15000	715	1.2	15.8	7.8
L-KLS6-25(N/M/E)102K	625	825	1000(900-1100)	150	165	15000	750	1.2	18.0	10.0
L-KLS6-25(N/M/E)112K	680	895	1100(990-1210)	150	181	15000	780	1.2	18.0	10.0
L-KLS6-25(N/M/E)122K	750	990	1200(1080-1320)	150	198	15000	840	1.2	18.0	10.0

Notes: Leakage Current (@83% of V1mA): $I_R \leq 25\mu A$

Part name	Varistors DIP Dia	Date	2024-12-17
Part number	L-KLS6-25(N/M/E)XXXX	Edition	V1
Department		Page	11 / 12

2 / Dimensions



Symbol	D (max.)	A (max.)	e (± 1)	e 2 (± 1)	e 3 (max.)	L (min.)	L3 (min.)	d (± 0.05)	c (± 0.05)	Tmax	e1
N series (mm)	28.5	35.5	12.7	n/a	n/a	25.4	n/a	1.0	n/a	Please refer to the Electrical Characteristics Table	
M/E series (mm)	28.5	35.5	12.7	6.5	2.5	25.4	6.0	1.0	0.8		

3 / Lead configurations and application examples

Lead configurations	application
<p>N series</p> <p>Thermal Fuse Element MOV</p>	<p>Line Line Fuse TMOV Varistor Neutral To Protected Circuit</p>
<p>M/E series</p> <p>Thermal Fuse Element Monitor Lead MOV</p>	<p>Line Line Fuse TMOV Varistor LED R Neutral To Protected Circuit</p>

Part name	Varistors DIP Dia	Date	2024-12-17
Part number	L-KLS6-25(N/M/E)XXXX	Edition	V1
Department		Page	12 / 12

4 / Reliability

Items	Test conditions/Methods	Specifications															
High Temperature Storage	Ambient Temp: $85 \pm 2^{\circ}\text{C}$ Duration:1000hrs	$ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Low Temperature Storage	Ambient Temp: $-55 \pm 2^{\circ}\text{C}$ Duration: 1000hrs	$ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Humidity	Ambient Temp: $40 \pm 2^{\circ}\text{C}$,90~95% R.H. Duration: 1000hrs	$ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Temperature Cycle	<p>The conditions shown below shall be repeated 5 cycles</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature ($^{\circ}\text{C}$)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55 ± 3</td> <td>30 ± 3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>15 ± 3</td> </tr> <tr> <td>3</td> <td>85 ± 3</td> <td>30 ± 3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>15 ± 3</td> </tr> </tbody> </table>	Step	Temperature ($^{\circ}\text{C}$)	Period (minutes)	1	-55 ± 3	30 ± 3	2	Room temperature	15 ± 3	3	85 ± 3	30 ± 3	4	Room temperature	15 ± 3	<p>No visible damage</p> $ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$
Step	Temperature ($^{\circ}\text{C}$)	Period (minutes)															
1	-55 ± 3	30 ± 3															
2	Room temperature	15 ± 3															
3	85 ± 3	30 ± 3															
4	Room temperature	15 ± 3															
High Temperature Load	Ambient Temp: $85 \pm 2^{\circ}\text{C}$ Duration:1000hrs Load: Max.Allowable Voltage In AC eara.	$ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Damp Heat Load	Ambient Temp: $40 \pm 2^{\circ}\text{C}$ 90~95%R.H. Duration:1000hrs Load:Max.Allowable Voltage	<p>No visible damage</p> $ \Delta V1\text{mA}/V1\text{mA} \leq 5\%$															
Voltage Proof	Metal balls method, 2500Vac 1 min.	No visible damage															