

# LED Special Surge Protection Device

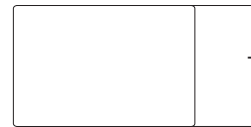
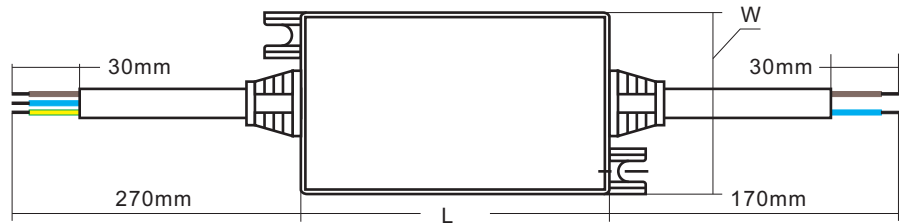


IP 67

Compact Size

High Surge

Special



## M998-10S

Authentication by EN61643-11

### Product Specification

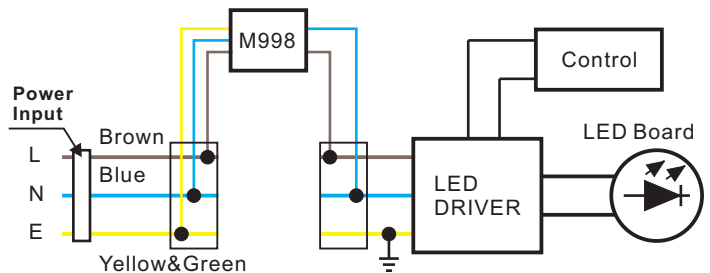
Product Type	LED Special SPD
Input Voltage	100-277VAC 50/60Hz
Maximum Continuous Voltage	320VAC
Voltage Protection Level(Up)	1200V
Surge Protection Voltage	10kV
Nominal Peak Current(8/20uS)	5kA
Maximum Peak Current(8/20uS)	10kA
Maximum Energy	820 Joules
Standard Leakage Current	<50uA
Response Time	<25nS
Interface Type	VDE Cable
Connection Type	Series
Ingress Protection	IP 67
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LXTXW=68X36X40mm

### Epcos MOV Panasonic MOV

### Product Features

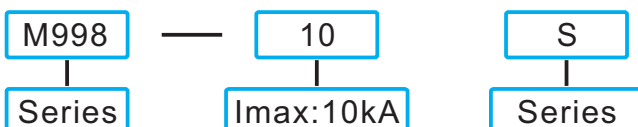
- Load Current  $I_c=5A$
- Piece Weight:190g/pcs
- Package:10pcs/box,200pcs/carton
- Common-Mode:  $I_{max}(8/20):10kA$
- L-N In(8/20):5kA,  $I_{max}(8/20):10kA$
- MLV L-N:840V;L-G/N-G:1140V
- Mounting Mode: Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

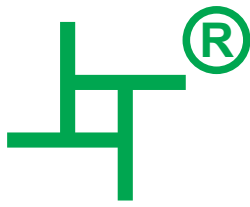
### Product Applications



Ordering Part Number:

Example:M998-10S





# LED Special Surge Protection Device



IP 67

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## M998-10S

Authentication by EN61643-11

### Product Specification

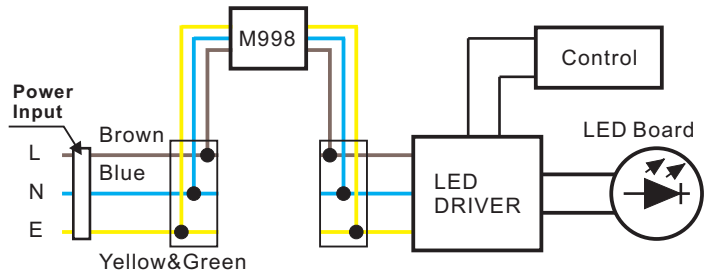
Product Type	LED Special SPD
Input Voltage	100-277VAC 50/60Hz
Maximum Continuous Voltage	320VAC
Voltage Protection Level(U <sub>p</sub> )	1200V
Surge Protection Voltage	10kV
Nominal Peak Current(8/20uS)	5kA
Maximum Peak Current(8/20uS)	10kA
Maximum Energy	820 Joules
Standard Leakage Current	<50uA
Response Time	<25nS
Interface Type	VDE Cable
Connection Type	Series
Ingress Protection	IP 67
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LXTXW=68X36X40mm

**Epcos MOV**  
**Panasonic MOV**

### Product Features

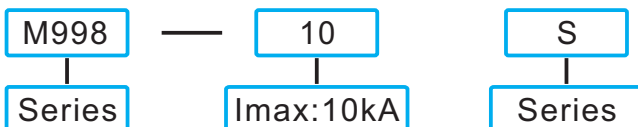
- Load Current I<sub>c</sub>=5A
- Piece Weight:190g/pcs
- Package:10pcs/box,200pcs/carton
- Common-Mode: I<sub>max</sub>(8/20):10kA
- L-N I<sub>n</sub>(8/20):5kA, I<sub>max</sub>(8/20):10kA
- MLV L-N:840V;L-G/N-G:1140V
- Mounting Mode: Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

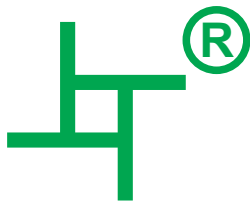
### Product Applications



Ordering Part Number:

Example:M998-10S





# LED Special Surge Protection Device

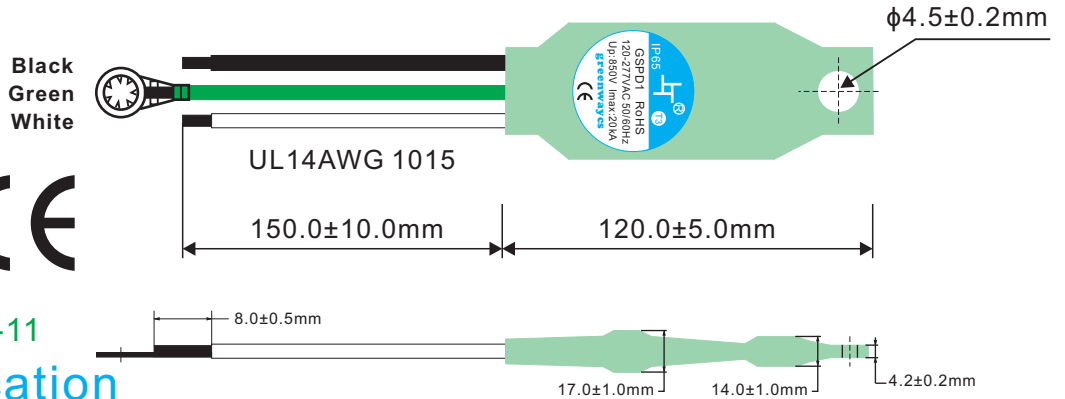


IP 65

Compact Size

High Surge

Special



## GSPD1 IP65

Authentication by EN61643-11



### Product Specification

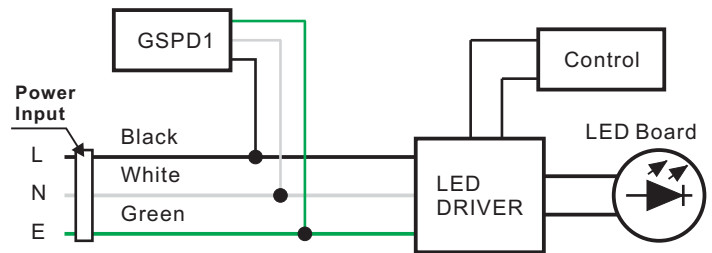
Product Type	LED Special SPD
Input Voltage	120-277VAC 50/60Hz
Maximum Continuous Voltage	320VAC
Voltage Protection Level(Up)	850V
Surge Protection Voltage	10kV
Nominal Peak Current(8/20uS)	10kA
Maximum Peak Current(8/20uS)	20kA
Maximum Energy	820 Joules
Standard Leakage Current	<50uA
Response Time	<25nS
Interface Type	3 Wires
Connection Type	Parallel
Ingress Protection	IP 65
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LXTXW=270X17X20mm

### Epcos MOV Panasonic MOV

### Product Features

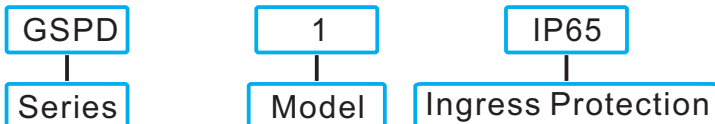
- Certificate by: CE
- Piece Weight:47g/pcs
- Package:20pcs/box,400pcs/carton
- Common-Mode: I<sub>max</sub>(8/20):20kA
- L-N In(8/20):10kA,I<sub>max</sub>(8/20):20kA
- MLV L-N:850V;L-G/N-G:850V
- Mounting Mode: Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

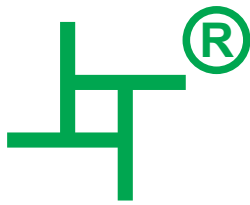
### Product Applications



Ordering Part Number:

Example:GSPD1 IP65





# LED Special Surge Protection Device

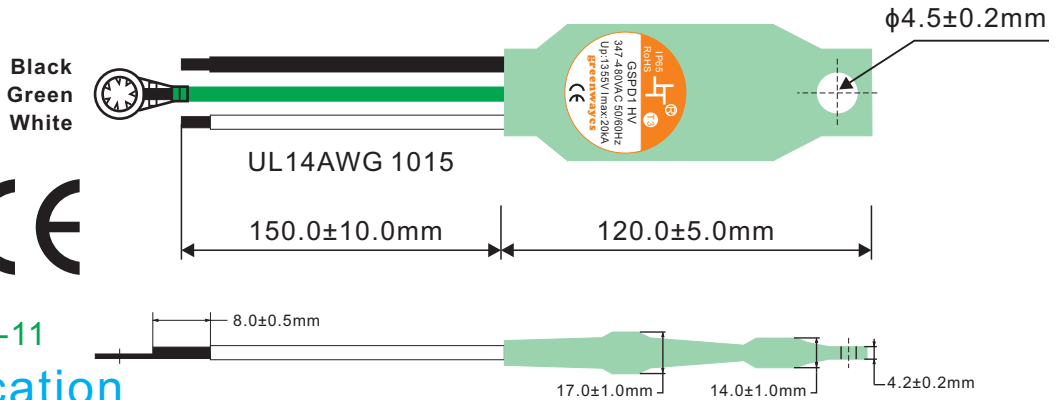


IP 65

Compact Size

High Surge

Special



## GSPD1 HV

Authentication by EN61643-11

### Product Specification

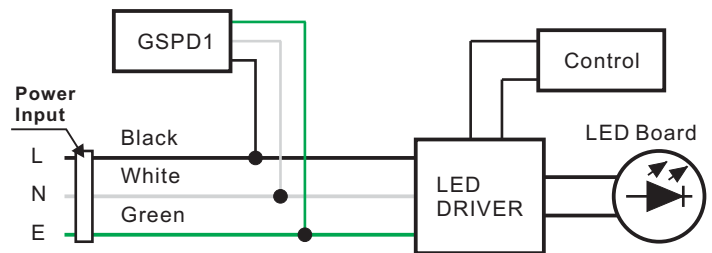
Product Type	LED Special SPD
Input Voltage	347-480VAC 50/60Hz
Maximum Continuous Voltage	510VAC
Voltage Protection Level(Up)	1355V
Surge Protection Voltage	10kV
Nominal Peak Current(8/20uS)	10kA
Maximum Peak Current(8/20uS)	20kA
Maximum Energy	1200 Joules
Standard Leakage Current	<50uA
Response Time	<25nS
Interface Type	3 Wires
Connection Type	Parallel
Ingress Protection	IP 65
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LXTXW=270X17X20mm

### Epcos MOV Panasonic MOV

### Product Features

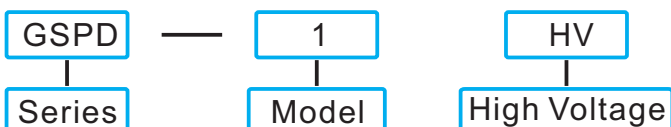
- Certificate by: CE
- Piece Weight:55g/pcs
- Package:20pcs/box,400pcs/carton
- Common-Mode: I<sub>max</sub>(8/20):20kA
- L-N In(8/20):10kA,I<sub>max</sub>(8/20):20kA
- MLV L-N:1355V;L-G/N-G:1355V
- Mounting Mode: Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

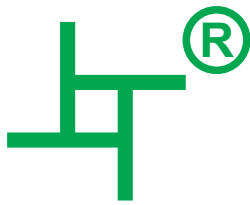
### Product Applications



Ordering Part Number:

Example:GSPD1 HV





# LED Special Surge Protection Device

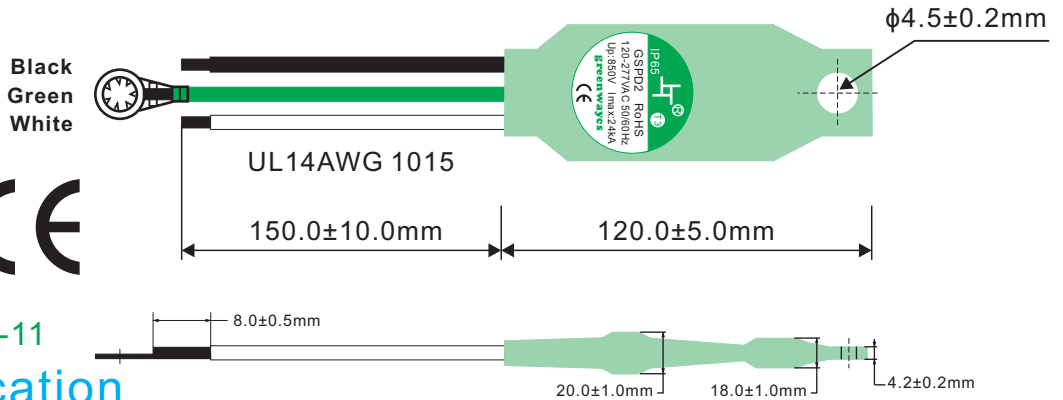


IP 65

Compact Size

High Surge

Special



## GSPD2 IP65

Authentication by EN61643-11

### Product Specification

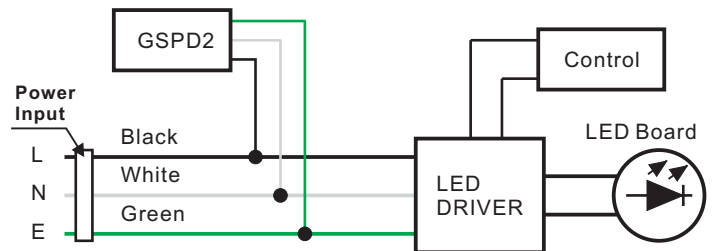
Product Type	LED Special SPD
Input Voltage	120-277VAC 50/60Hz
Maximum Continuous Voltage	320VAC
Voltage Protection Level(Up)	850V
Surge Protection Voltage	20kV
Nominal Peak Current(8/20uS)	12kA
Maximum Peak Current(8/20uS)	24kA
Maximum Energy	1020 Joules
Standard Leakage Current	<50uA
Response Time	<25nS
Interface Type	3 Wires
Connection Type	Parallel
Ingress Protection	IP 65
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LXTXW=270X20X25mm

### Epcos MOV Panasonic MOV

### Product Features

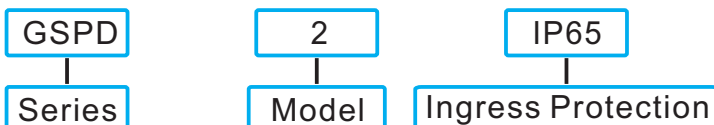
- Certificate by: CE
- Piece Weight:60g/pcs
- Package:20pcs/box,400pcs/carton
- Common-Mode: I<sub>max</sub>(8/20):24kA
- L-N In(8/20):12kA,I<sub>max</sub>(8/20):24kA
- MLV L-N:850V;L-G/N-G:850V
- Mounting Mode: Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

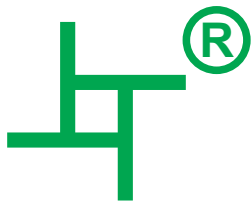
### Product Applications



Ordering Part Number:

Example:GSPD2 IP65





# LED Special Surge Protection Device

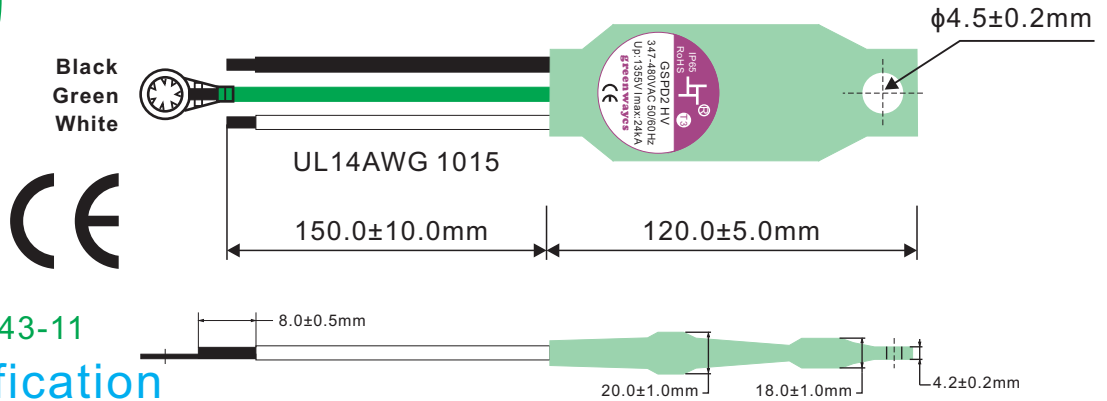


IP 65

Compact Size

High Surge

Special



## GSPD2 HV

Authentication by EN61643-11

### Product Specification

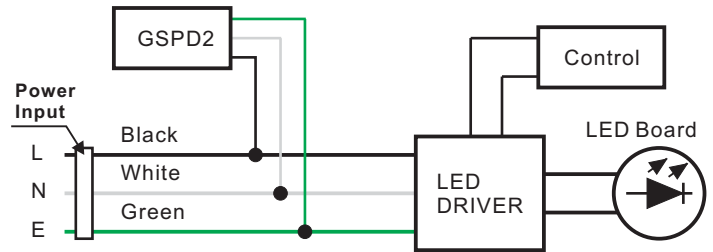
Product Type	LED Special SPD
Input Voltage	347-480VAC 50/60Hz
Maximum Continuous Voltage	510VAC
Voltage Protection Level(Up)	1355V
Surge Protection Voltage	20kV
Nominal Peak Current(8/20uS)	12kA
Maximum Peak Current(8/20uS)	24kA
Maximum Energy	1320 Joules
Standard Leakage Current	<50uA
Response Time	<25nS
Interface Type	3 Wires
Connection Type	Parallel
Ingress Protection	IP 65
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LXTXW=270X20X25mm

### Epcos MOV Panasonic MOV

### Product Features

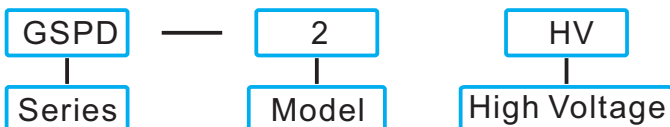
- Certificate by: CE
- Piece Weight:75g/pcs
- Package:20pcs/box,400pcs/carton
- Common-Mode: I<sub>max</sub>(8/20):24kA
- L-N In(8/20):12kA,I<sub>max</sub>(8/20):24kA
- MLV L-N:1355V;L-G/N-G:1355V
- Mounting Mode: Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

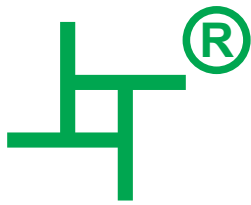
### Product Applications



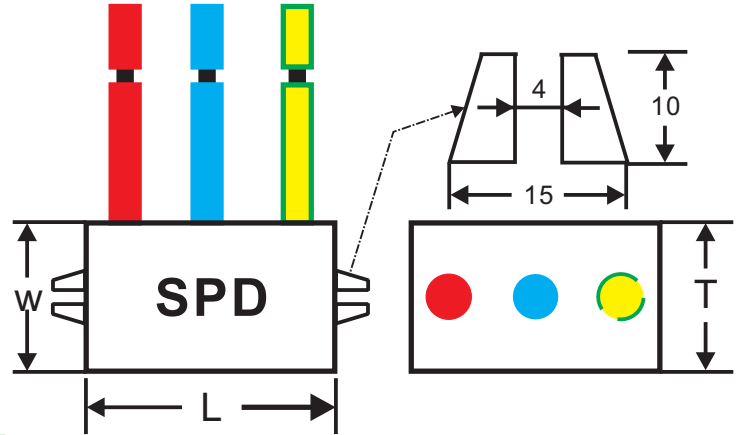
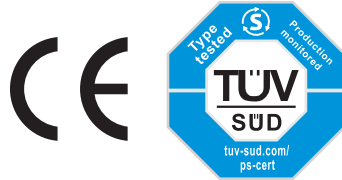
Ordering Part Number:

Example:GSPD2 HV





# LED Special Surge Protection Device



## M999-1200

Authentication by EN61643-11

### Product Specification

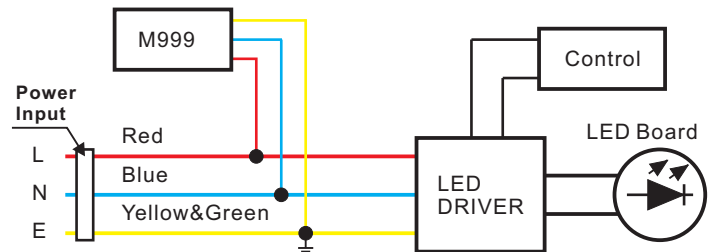
Product Type	LED Special SPD
Input Voltage	277VAC 50/60Hz
Maximum Continuous Voltage	320VAC
Voltage Protection Level(Up)	1200V
Surge Protection Voltage	10kV
Nominal Peak Current(8/20uS)	6kA
Maximum Peak Current(8/20uS)	10kA
Maximum Energy	820 Joules
Standard Leakage Current	<5uA
Response Time	<25nS
Interface Type	3 Wires
Connection Type	Parallel
Ingress Protection	IP 67
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LXTXW=47X36X49mm

**Epcos MOV**  
**Panasonic MOV**

### Product Features

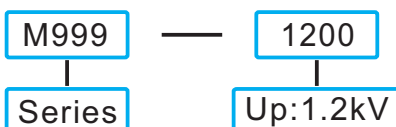
- Certificate by: CE TUV
- Piece Weight: 148g/pcs
- Package: 10pcs/box, 200pcs/carton
- Common-Mode: I<sub>max</sub>(8/20): 10kA
- L-N In(8/20): 6kA, I<sub>max</sub>(8/20): 10kA
- MLV L-N: 1140V; L-G/N-G: 1140V
- Mounting Mode: Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

### Product Applications

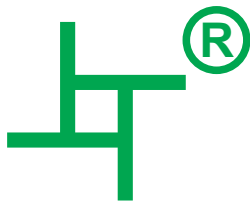


Ordering Part Number:

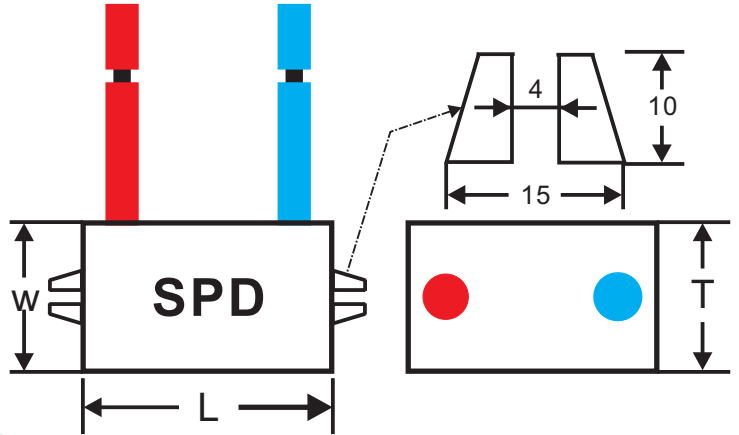
Example: M999-1200







# LED Special Surge Protection Device



## M999-1200

Authentication by EN61643-11

### Product Specification

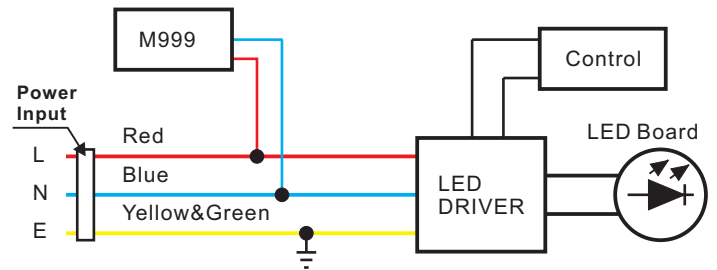
Product Type	LED Special SPD
Input Voltage	277VAC 50/60Hz
Maximum Continuous Voltage	320VAC
Voltage Protection Level(Up)	1200V
Surge Protection Voltage	10kV
Nominal Peak Current(8/20uS)	6kA
Maximum Peak Current(8/20uS)	10kA
Maximum Energy	820 Joules
Standard Leakage Current	<5uA
Response Time	<25nS
Interface Type	2 Wires
Connection Type	Parallel
Ingress Protection	IP 67
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LXTXW=47X36X49mm

Epcos MOV  
Panasonic MOV

### Product Features

- Certificate by: CE TUV
- Piece Weight: 145g/pcs
- Package: 10pcs/box, 200pcs/carton
- L-N In(8/20): 6kA
- L-N I<sub>max</sub>(8/20): 10kA
- MLV L-N: 1140V
- Mounting Mode: Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

### Product Applications

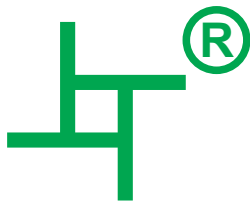


Ordering Part Number:

Example: M999-1200







# LED Special Surge Protection Device

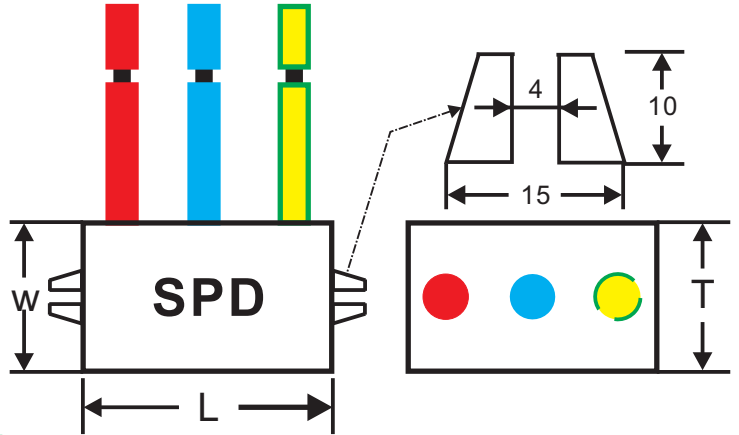


IP 67

Compact Size

High Surge

Special



## M999-1800

Authentication by EN61643-11

### Product Specification

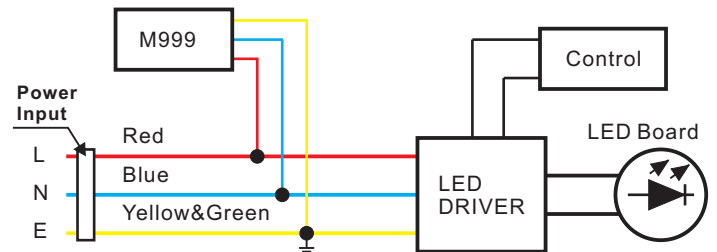
Product Type	LED Special SPD
Input Voltage	277VAC 50/60Hz
Maximum Continuous Voltage	320VAC
Voltage Protection Level(Up)	1800V
Surge Protection Voltage	10kV
Nominal Peak Current(8/20uS)	6kA
Maximum Peak Current(8/20uS)	10kA
Maximum Energy	820 Joules
Standard Leakage Current	<5uA
Response Time	<25nS
Interface Type	3 Wires
Connection Type	Parallel
Ingress Protection	IP 67
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LXTXW=47X36X49mm

Epcos MOV  
Panasonic MOV

### Product Features

- Certificate by: CE TUV
- Piece Weight: 150g/pcs
- Package: 10pcs/box, 200pcs/carton
- Common-Mode: I<sub>max</sub>(8/20): 10kA
- L-N In(8/20): 6kA, I<sub>max</sub>(8/20): 10kA
- MLV L-N: 1625V; L-G/N-G: 1625V
- Mounting Mode: Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

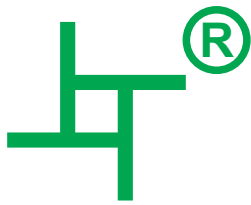
### Product Applications



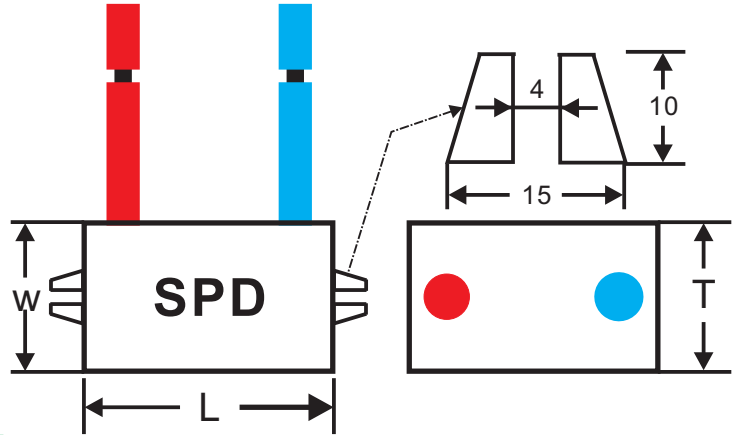
Ordering Part Number:

Example: M999-1800





# LED Special Surge Protection Device



## M999-1800

Authentication by EN61643-11

### Product Specification

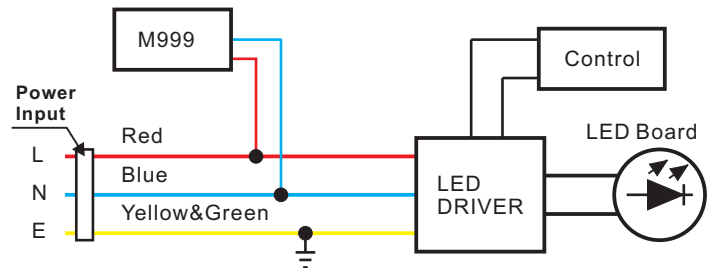
Product Type	LED Special SPD
Input Voltage	277VAC 50/60Hz
Maximum Continuous Voltage	320VAC
Voltage Protection Level(Up)	1800V
Surge Protection Voltage	10kV
Nominal Peak Current(8/20uS)	6kA
Maximum Peak Current(8/20uS)	10kA
Maximum Energy	820 Joules
Standard Leakage Current	<5uA
Response Time	<25nS
Interface Type	2 Wires
Connection Type	Parallel
Ingress Protection	IP 67
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LXTXW=47X36X49mm

**Epcos MOV**  
**Panasonic MOV**

### Product Features

- Certificate by: CE TUV
- Piece Weight:145g/pcs
- Package:10pcs/box,200pcs/carton
- L-N In(8/20):6kA
- L-N I<sub>max</sub>(8/20):10kA
- MLV L-N:1625V
- Mounting Mode: Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

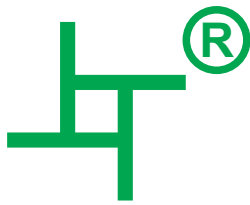
### Product Applications



Ordering Part Number:

Example:M999-1800





# LED Special Surge Protection Device

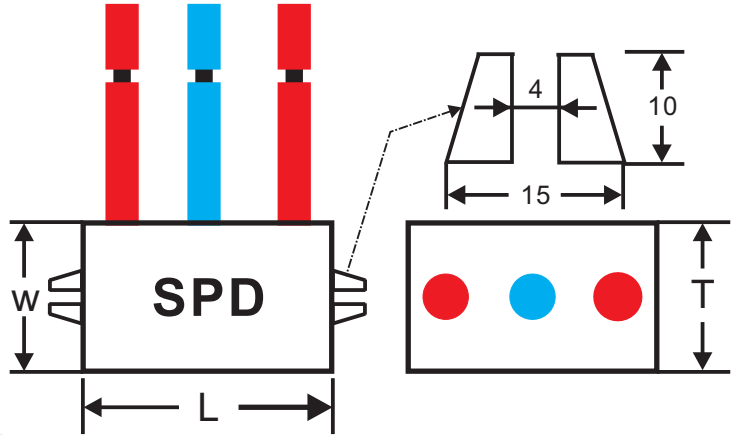


IP 67

Compact Size

High Surge

Special



## M999-480LL

Authentication by EN61643-11

### Product Specification

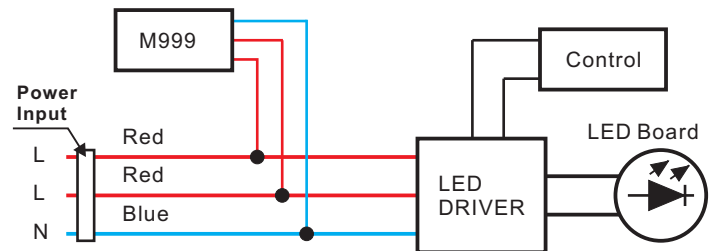
Product Type	LED Special SPD
Input Voltage	347-480VAC 50/60Hz
Maximum Continuous Voltage	510VAC
Voltage Protection Level(Up)	2000V
Surge Protection Voltage	10kV
Nominal Peak Current(8/20uS)	6kA
Maximum Peak Current(8/20uS)	10kA
Maximum Energy	970 Joules
Standard Leakage Current	<50uA
Response Time	<25nS
Interface Type	3 Wires
Connection Type	Parallel
Ingress Protection	IP 67
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LXTXW=47X36X49mm

Epcos MOV  
Panasonic MOV

### Product Features

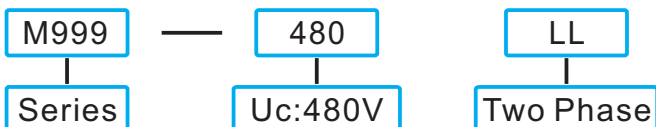
- Certificate by: CE
- Piece Weight: 152g/pcs
- Package: 10pcs/box, 200pcs/carton
- Common-Mode: I<sub>max</sub>(8/20): 10kA
- L-N In(8/20): 6kA, I<sub>max</sub>(8/20): 10kA
- MLV L-N: 1355V; L-G/N-G: 1440V
- Mounting Mode: Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

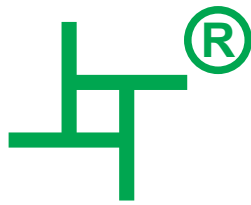
### Product Applications



Ordering Part Number:

Example: M999-480LL





# LED Special Overvoltage Protection



Overvoltage  
Protection

Compact  
Size

High  
Surge

Special



## M985

Authentication by EN61643-11

### Product Specification

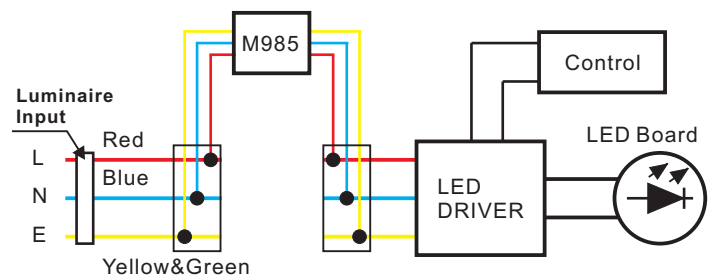
Product Type	LED Special SPD
Input Voltage	120-270VAC 50/60Hz
Maximum Continuous Voltage	277VAC
Voltage Protection Level(Up)	775V
Surge Protection Voltage	2.5kV
Nominal Peak Current(8/20uS)	1.2kA
Maximum Peak Current(8/20uS)	2.0kA
Over-Voltage Protection	280VAC
Standard Leakage Current	<50uA
Interface Type	3 Terminal
Connection Type	Series
Protection Class	IP 67
Operating Temperature Range	-40--+85°C
Dimensions	LXTXW=50X16X14mm

### TI IC NSF FUSE Samwin MOSFET

### Product Features

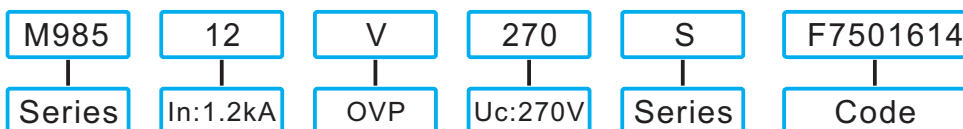
- Load Current: I<sub>c</sub>=1A
- Maximum energy: 120 Joules
- Common-Mode: I<sub>max</sub>(8/20uS): 2.0kA
- L-N I<sub>n</sub>(8/20uS): 1.2kA, I<sub>max</sub>(8/20uS): 2.0kA
- MLV L-N: 775V; L-G/N-G: 775V
- Mounting Mode: Fixed
- RoHS Compliant

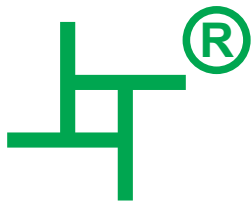
### Product Applications



Ordering Part Number:

Example: M985 F501614





# LED Special Surge Protection Device



## M997

Authentication by EN61643-11

### Product Specification

Product Type	LED Special SPD
Input Voltage	220-240VAC 50/60Hz
Maximum Continuous Voltage	320VAC
Voltage Protection Level(Up)	1500V
Surge Protection Voltage	10kV
Nominal Peak Current(8/20uS)	5kA
Maximum Peak Current(8/20uS)	10kA
Maximum Energy	273 Joules
Standard Leakage Current	<5uA
Response Time	<25nS
Interface Type	4 Terminal
Connection Type	Series
Ingress Protection	IP 67
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LXTXW=37X20X30mm

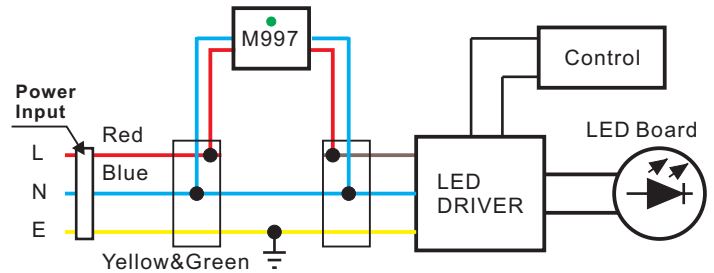
### EPCOS MOV

### Bourns GDT

### Product Features

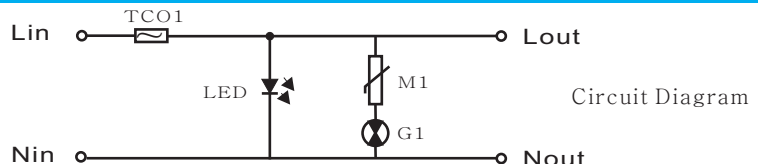
- Load Current  $I_c=5A$
- Piece Weight:78g/pcs
- Package:20pcs/box,400pcs/carton
- With LED Indicator,OFF:Replace
- L-N In(8/20):5kA,  $I_{max}(8/20):10kA$
- MLV L-N:1440V
- Mounting Mode: Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

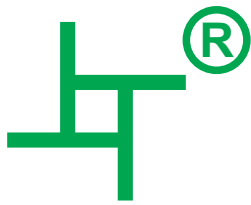
### Product Applications



Ordering Part Number:

Example:M997





# LED Special Surge Protection Device

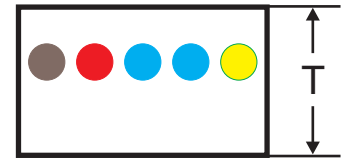
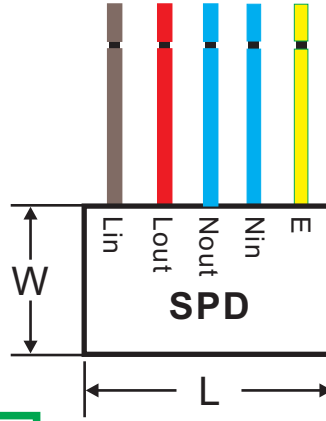


IP 67

Compact Size

High Surge

Special



## M995

Authentication by EN61643-11

### Product Specification

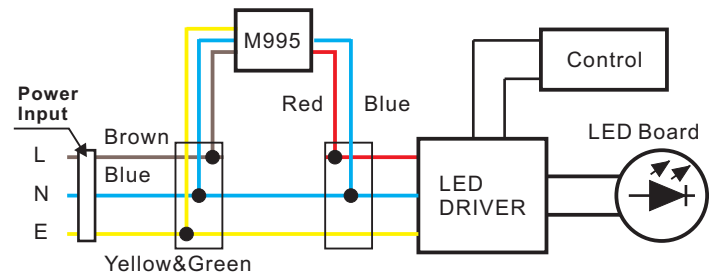
Product Type	LED Special SPD
Input Voltage	120-277VAC 50/60Hz
Maximum Continuous Voltage	320VAC
Voltage Protection Level(Up)	1000V
Surge Protection Voltage	10kV
Nominal Peak Current(8/20uS)	5kA
Maximum Peak Current(8/20uS)	10kA
Maximum Energy	820 Joules
Standard Leakage Current	<50uA
Response Time	<25nS
Interface Type	5 Wires
Connection Type	Series
Ingress Protection	IP 67
Quality Assurance	Five Years
Relative Humidity	<95%(25°C)
Above Sea Level	<3000m
Operating Temperature Range	-40--+85°C
Storage Temperature Range	-40--+125°C
Dimensions	LTXW=32X18X30mm

### Epcos MOV

### Product Features

- Load Current  $I_c=3A$
- Piece Weight:58g/pcs
- Package:20pcs/box,400pcs/carton
- Common-Mode:  $I_{max}(8/20):10kA$
- L-G In(8/20):5kA,  $I_{max}(8/20):10kA$
- MLV L-N:840V,L-G/N-G:840V
- Mounting Mode: No Fixed
- Designed in IEC61643-11
- Designed in UL1449
- RoHS Compliant

### Product Applications



Ordering Part Number:

Example:M995

