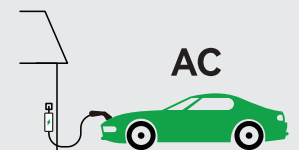
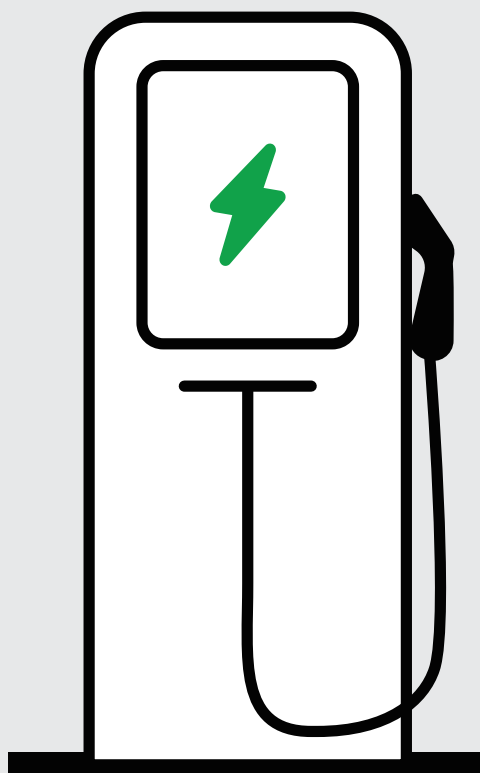


Electric Vehicle Charging Stations Circuit Protection **SETsafe | SETfuse Solution**



2025_{year}

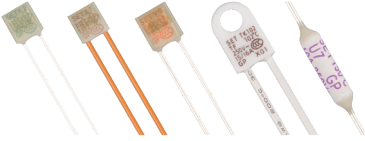
40+

The products sell well in
more than 40 countries.

Competitive Advantages of SETfuse | SETsafe Products



Thermal-Link - Alloy Type (ATCO)



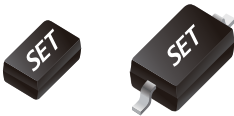
- Product models are the most extensive in the industry.
- Rated operating temperature: 76 ~ 230 °C
- Maximum rated current: 200 A
- Maximum rated voltage: 800 VAC / 850 VDC
- Customizable high-temperature resistant products.
- Fully automated intelligent manufacturing.

Transient Voltage Suppression (TVS Diodes)



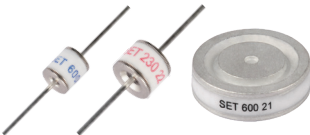
- Response time < 1 ns
- Nominal surge power: 200 ~ 30000 W
- Maximum surge current (8/20 μ s): 20 kA
- Low capacitance.
- High-reliability glass passivation protection.
- Fully automated intelligent manufacturing.

ESD TVS Diode Arrays (ESD TVS)



- Ultra-small footprint.
- Integrated multi-channel ESD & EOS protection.
- Low capacitance.
- Fully automated intelligent manufacturing.

Gas Discharge Tube (GDT)



- Product specifications cover a wide range.
- Key materials made in-house.
- Low residual voltage.
- High reliability.
- Automated intelligent manufacturing.

Metal Oxide Varistor (MOV)

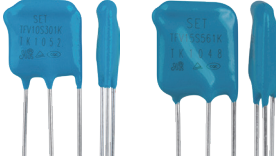


- In-house direct formula.
- Low residual voltage ratio.
- Small footprint.
- Comprehensive specifications.
- Fully automated intelligent manufacturing.

Competitive Advantages of SETfuse | SETsafe Products



Thermal Fuse Varistor (TFV)



- Board-mounted voltage upgrade.
- Thermal protection component integrated in compact product.
- Patented product.
- Complete certifications.
- High cost-effectiveness.

Thermally Protected Varistors (TFMOV)



- High surge capacity.
- Core materials made in-house.
- Fully automated manufacturing.
- No arc risk for DC/AC system.

Surge Protective Device (SPD)



- Available in Type 1+2 and Type 2 AC/DC SPD.
- In-house laboratory is qualified by UL & TUV under the WTDP (Witnessed Test Data Program).
- In-house manufacturer of SPD components, including MOVs, GDTs, and TVS Diodes.

Miniature Fuses



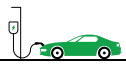
- Lead-free.
- High breaking capacity.
- Fully automated manufacturing.

Low Voltage Fuses (LV Fuses)



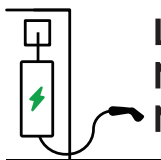
- Pioneer Non-destructive manufacturing, Reliable Performance to avoid failure in advance.
- Fully automated intelligent manufacturing.
- Higher consistency.

Types of Electric Vehicle Charging Stations

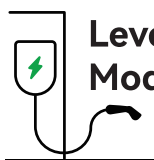
Voltage Type	AC		DC	AC+DC	Wireless
North American Classification	Level 1	Level 2	Level 3	/	/
European Classification	Model 1 Model 2	Model 3	Model 4	/	/
Icon					
Charging System Standard	North America UL 2594、UL2231	North America UL 2594、UL2231	North America UL 2594、UL2231	/	/
	Global IEC 61851	Global IEC 61851	Global IEC 61851		
	China GB 18487.1-2015	China GB 18487.1-2015	China GB 18487.1-2015		
Charging Gun Standard	US SAE J1772	US SAE J1772	US CCS Type1	/	/
	Europe Mennekes Type2 (IEC 62196-2 Type 2)	Europe Mennekes Type2 (IEC 62196-2 Type 2)	Europe CCS Type2		
	China GB/T 20234.2	China GB/T 20234.2	China GB/T 20234.3 Japan CHAdeMO		
Voltage (VAC)	Single-phase 120 / 240 220	Three-phase 120 / 208 220	Single-phase 120 / 240 220	Three-phase 277 / 480 220 / 380 347 / 600	Three-phase 277 / 480 220 / 380 347 / 600
	Single-phase 12 ~ 20	Three-phase 32	Single-phase 12 ~ 80 Three-phase 12 ~ 80	<400	125
Rated Current (A)	12 ~ 20	32	12 ~ 80	<400	125
⚡ Charging Loads (kW)	1 ~ 3.7		2.5 ~ 22	15 ~ 350	60
🕒 Charging Time (h)	6 ~ 43		1 ~ 11	0.25 ~ 1	60
📏 Miles of Range per Hour of Charge	3 ~ 20		16 ~ 120	250 ~ 1000	60
Installation	Wall Mounted	Wall Mounted Floor Mounted	Floor Mounted	Floor Mounted	Floor Mounted
Where to Charge	Home	Public Home	Public Commercial Home	Public Commercial	Public Home
Ports	one-for-one	one-for-one Multiple Filling for One Pile	one-for-one Multiple Filling for One Pile	one-for-one	/

SETsafe | SETfuse Products in Charging Stations

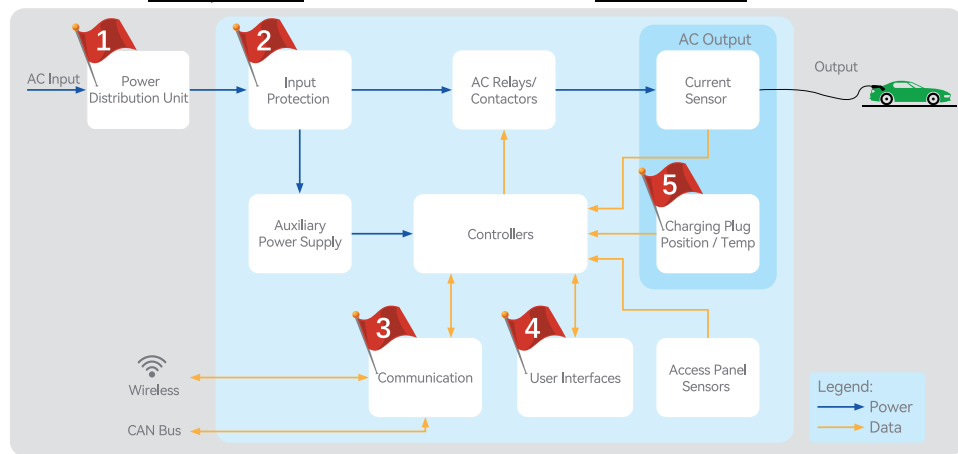
AC Charging Station



Level 1
Model 1
Model 2



Level 2
Model 3



SETsafe | SETfuse Products

1

Over Voltage Protection

- 1.1 Gas Discharge Tube (GDT)
- 1.2 Surge Protective Device (SPD)



3

Over Voltage Protection

- 3.1 ESD TVS Diode Arrays (ESD TVS)



4

Over Voltage Protection

- 4.1 ESD TVS Diode Arrays (ESD TVS)



5

Over Voltage Protection

- 5.1 Gas Discharge Tube (GDT)



2

Over Temperature Protection

- 2.1 Thermal-Link (ATCO)-Alloy Type



Over Voltage Protection

- 2.2 Transient Voltage Suppression (TVS)
- 2.3 Gas Discharge Tube (GDT)
- 2.4 Metal Oxide Varistor (MOV)
- 2.5 Thermal Fuse Varistor (TFV)
- 2.6 Thermally Protected Varistors (TFMOV)



Over Current Protection

- 2.7 Miniature Fuses (Mini Fuses)
- 2.8 Low Voltage Fuses (LV Fuses)



AC Charging Station

Benefits and Features of SETsafe | SETfuse Products

Code	Products	Series	Benefits	Features
	GDT  Learn more	• SPCxxxH • SPJxxxD • SPIxxxD	• High surge capability • Low residual voltage and high reliability • Collaborating with MOVs to extend device lifespan • Has strong ability to interrupt continuous follow current • Meet UL requirements • Compliant with RoHS and REACH	• DC breakdown voltage: (350 ~ 1500) V • 8/20μs surge capacity: (20 ~ 40) kA • Working temperature: (-40 ~ 125) °C • Diameter: (11.8 ~ 16.0) mm • Installation: Meet user customization design
Learn more: SPCxxxH: https://setsafe.com/Products/Over-Voltage-Protection/Gas-Discharge-Tube-GDT/High-Surge-Type/SPC-series.html SPJxxxD: https://setsafe.com/Products/Over-Voltage-Protection/Gas-Discharge-Tube-GDT/High-Surge-Type/SPJ-series.html SPIxxxD: https://setsafe.com/Products/Over-Voltage-Protection/Gas-Discharge-Tube-GDT/High-Surge-Type/SPI-series.html				
	SPD  Learn more	• SD25TxxxL205	• Over-temperature protection design, high reliability • Pluggable modules, anti-unintended locking • Single protection mode current capacity up to 50kA • Type I and Type II surge protectors, meeting IEC/EN 61643-11 standards • 2+0 / 4+0 protection mode	• Nominal discharge current (I_n) 25 kA, impulse discharge current (I_{imp}) 10 ~ 12.5 kA • Maximum continuous operating voltage U_c 275 ~ 440 VAC optional • Rated short-circuit current ISCCR up to 25 kA • IP20 enclosure protection level • Adapt to (-500 ~ 5000) M altitude working environment
Learn more: SD25TxxxL205: https://setsafe.com/Products/Over-Voltage-Protection/Surge-Protective-Device-SPD/SPD-for-Low-voltage-Power-Systems/SD25TxxxL205-series.html				
		• SD25TxxxA203	• Over-temperature protection design, high reliability • Pluggable modules, anti-unintended locking • Single protection mode current capacity up to 50 kA • Type I and Type II surge protectors, meeting IEC/EN 61643-11 standards and GB/T 1880-11 standards • 1+1 protection mode	• Nominal discharge current (I_n) 25 kA, impulse discharge current (I_{imp}) 11 ~ 12.5 kA • Maximum continuous operating voltage U_c 150 ~ 385 VAC optional • Rated short-circuit current ISCCR up to 25 kA • IP20 enclosure protection level • Adapt to (-500 ~ 5000) M altitude working environment
Learn more: SD25TxxxA203: https://setsafe.com/Products/Over-Voltage-Protection/Surge-Protective-Device-SPD/SPD-for-Low-voltage-Power-Systems/SD25TxxxA203-series.html				
	*ATCO  Learn more	• Y • C • S • U • T • R	• Non-resettable overheat protective device functioning one time only • High accuracy fusing temperature, customizable • Leakproof structure, High Reliability • Low impedance • Meet the requirements of RoHS & REACH • Meet the requirements of IEC 60691	• T_f: (76 ~ 230) °C • I_f: (5 ~ 200) A • U_f: (125 ~ 300) VAC, (50 ~ 100) VDC
Learn more: Y: https://setsafe.com/Products/Over-Temperature-Protection/Thermal-Link-ATCO-Alloy-Type/Y-series.html C: https://setsafe.com/Products/Over-Temperature-Protection/Thermal-Link-ATCO-Alloy-Type/C-series.html S: https://setsafe.com/Products/Over-Temperature-Protection/Thermal-Link-ATCO-Alloy-Type/S-series.html U: https://setsafe.com/Products/Over-Temperature-Protection/Thermal-Link-ATCO-Alloy-Type/U-series.html T: https://setsafe.com/Products/Over-Temperature-Protection/Thermal-Link-ATCO-Alloy-Type/T-series.html R: https://setsafe.com/Products/Over-Temperature-Protection/Thermal-Link-ATCO-Alloy-Type/R-series.html				
	GDT  Learn more	• SExxxM-L • SExxxH-L (T)	• Strong Surge capacity • Low residual voltage and high reliability • Collaborating with MOVs to extend device lifespan • Meet TUV and UL requirements • Compliant with RoHS and REACH	• DC breakdown voltage: (350 ~ 1500) V • 8/20μs surge capacity: (10 ~ 20) kA • Working temperature: (-40 ~ 125) °C • Diameter: Ø8.0 mm • Installation: Meet user customization design
Learn more: SExxxM-L: https://setsafe.com/Products/Over-Voltage-Protection/Gas-Discharge-Tube-GDT/DIP-Type/SE-series.html SExxxH-L (T): https://setsafe.com/Products/Over-Voltage-Protection/Gas-Discharge-Tube-GDT/DIP-Type/SE-series.html				

* : Used for varistor deterioration failure overheating protection

AC Charging Station

Benefits and Features of SETsafe | SETfuse Products

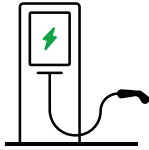
Code	Products	Series	Benefits	Features
	TVS  Learn more	• SPCL10 • SPCL6 • SPCL3 • SPCL1 • 30KPA • SMCJ • SMDJ • 5.0SMDJ	• Fast response time (ns level) for high-energy transient protection • High reliability glass passivated chip junction • Excellent clamping capability • Very low leakage and Precision response by Silicon Avalanche breakdown principle • No wear-out mechanism	• Peak power Dissipation with a 10/1000 μs waveform: (600 ~ 30000) W • High surge capability 8/20 μs rating from 1 kA to 20 kA • Operating temperature range: -55 °C to 175 °C • Low clamping ratio VCL/VBR < 1.3 • ns level supper fast response to transient events • Available for both through hole and SMD packages
Learn more: SPCL10: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SPCL10-series.html SPCL6: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SPCL6-series.html SPCL3: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SPCL3-series.html SPCL1: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SPCL1-series.html 30KPA: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/30KPA-series.html SMCJ: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SMCJ-series.html SMDJ: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SMDJ-series.html 5.0SMDJ: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/5.0SMDJ-series.html				
	MOV  Learn more	• SFV10D • SFV14D • SFV20D	• Low limiting voltage • High surge capability • The upper limit working temperature can reach 105 °C & 125 °C • Meet the long-term reliability work in high temperature and high humidity environment • Meet the requirements of IEC 62368	• Surge capacity: (3.5 ~ 10) kA • Surge impulse voltage (U_{OC}): (4 ~ 10) kV • Maximum AC working voltage: (130 ~ 750) V • Maximum DC working voltage: (170 ~ 990) V
Learn more: SFV10D: https://setsafe.com/Products/Over-Voltage-Protection/Metal-Oxide-Varistor-MOV-and-MOV-Disk/MOV-and-MOV-Disk-Standard-Type/SFV10D-series.html SFV14D: https://setsafe.com/Products/Over-Voltage-Protection/Metal-Oxide-Varistor-MOV-and-MOV-Disk/MOV-and-MOV-Disk-Standard-Type/SFV14D-series.html SFV20D: https://setsafe.com/Products/Over-Voltage-Protection/Metal-Oxide-Varistor-MOV-and-MOV-Disk/MOV-and-MOV-Disk-Standard-Type/SFV20D-series.html				
	TFV  Learn more	• TFV10S • TFV15S	• The thermal protection function can be added without changing the PCB design • Passed the IEC62368.1 G8.2 overload test certification • Comply with UL1449 standard requirements • The upper limit working temperature can reach 105 °C	• Surge capacity: (3.5 ~ 10) kA • Surge impulse voltage (U_{OC}): (4 ~ 10) kV • Maximum AC working voltage: (130 ~ 510) V • Maximum DC working voltage: (170 ~ 670) V
Learn more: TFV10S: https://setsafe.com/Products/Over-Voltage-Protection/TFV-and-TFMOV/Thermal-Fuse-Varistor-TFV/TFV10S-series.html TFV15S: https://setsafe.com/Products/Over-Voltage-Protection/TFV-and-TFMOV/Thermal-Fuse-Varistor-TFV/TFV15S-series.html				
	TFMOV  Learn more	• TFMOV10M	• Over-temperature protection design, high reliability • Small size, PCB mounting • High surge capacity • Mechanical tripping, fast response time, reliable action	• Nanosecond response time • V0 flame retardant housing • The nominal discharge current can reach 10 kA • The maximum discharge current (I_{max}) is 25 kA
Learn more: TFMOV10M: https://setsafe.com/Products/Over-Voltage-Protection/TFV-and-TFMOV/Thermally-Protected-Varistors-TFMOV/TFMOV10M-series.html				
	Mini Fuses  Learn more	• SCF632(P)	• Small size • Single cap structure, good connection reliability • Low temperature rise, low power consumption • Universal use of AC and DC • Multiple voltage parameters • Mounting options	• Dimensions: $\Phi 6.3 \times 31.8$ mm • U_n: (250 ~ 600) VAC / VDC • I_n: (0.5 ~ 30) A • High breaking capacity: 10 kA @ 600 VAC (≤ 12.5 A) 50 kA @ 600 VDC (≤ 12.5 A) 1000 A @ 600 VAC / VDC (15 ~ 30 A)
Learn more: SCF632(P): https://setsafe.com/Products/Over-Current-Protection/Miniature-Fuses/Cartridge-Fuse-links-CFL/SCF632-and-SCF632P-series.html				

AC Charging Station

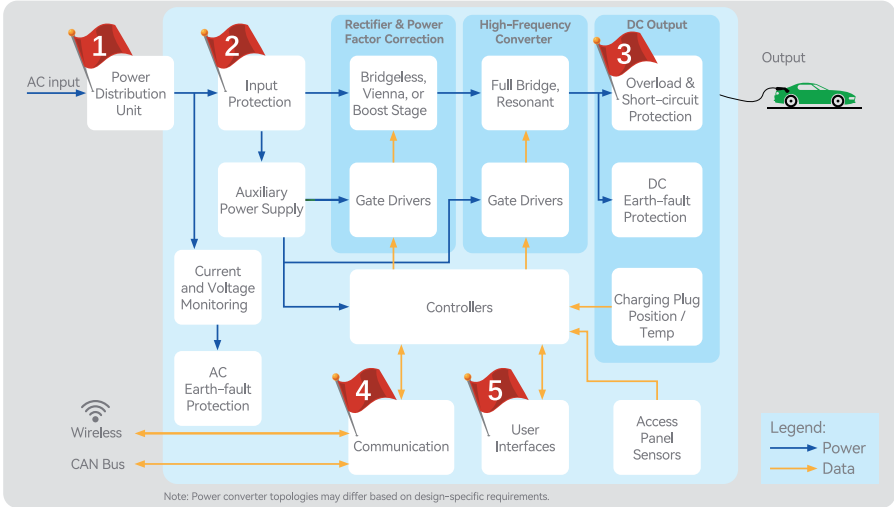
Benefits and Features of SETsafe | SETfuse Products

Code	Products	Series	Benefits	Features
 2	 Learn more	• SCT520(P)	• Small size • Single cap structure, good connection reliability • Low temperature rise, low power consumption • Universal use of AC and DC • Multiple voltage parameters • Mounting options	• Dimensions: $\Phi 5.2 \times 20$ mm • U_n: (125 ~ 500) VAC / VDC • I_n: (0.4 ~ 30) A • High breaking capacity: 10 kA @ 250 VAC, 200 A @ 500 VAC (≤ 10 A) 3 kA @ 300 VDC, 500 A @ 500 VDC (≤ 10 A) 1 kA @ 250 VAC, 300 A @ 500 VAC (12.5~20 A)
		Learn more: SCT520(P): https://setsafe.com/Products/Over-Current-Protection/Miniature-Fuses/Cartridge-Fuse-links-CFL/SCT520-SCT520P-series.html		
		• SCT1032	• Small size • Low temperature rise, low power consumption • Universal use of AC and DC • Multiple voltage parameters • Pb free	• Dimensions: (10.3 x 3.3 x 3.3) mm • U_n: (125 ~ 350) VAC / (125 ~ 250) VDC • I_n: (0.1 ~ 15) A • High breaking capacity: 100 A @ 350 VAC, 1 kA @ 125 VDC (0.1~15 A) 30 A @ 250 VDC (0.1~2 A)
		Learn more: SCT1032: https://setsafe.com/Products/Over-Current-Protection/Miniature-Fuses/Surface-Mount-Fuse-links-SMFL/SCT1032-series.html		
 	 Learn more	• SCT6125	• Small size • Low temperature rise, low power consumption • Universal use of AC and DC • Multiple voltage parameters • Pb free	• Dimensions: (6.3 x 2.7 x 2.7) mm • U_n: (125 ~ 350) VAC / 125 VDC • I_n: (0.2 ~ 12.5) A • High breaking capacity: 50 A @ 250 VAC, 500 A @ 125 VDC (0.2~12.5 A) 500 A @ 125 VDC (0.2~12.5 A)
		Learn more: SCT6125: https://setsafe.com/Products/Over-Current-Protection/Miniature-Fuses/Surface-Mount-Fuse-links-SMFL/SCT6125-series.html		
 	 Learn more	• LFR15-xxxA06-BT	• High speed fuse • Low temperature rise, low power consumption • AC/DC optional • Excellent current limiting capability	• Dimensions: ($\Phi 17.5 \times 46$) mm • U_n: 500 VDC / 690 VAC • I_n: (32 ~ 100) A • High breaking capacity: 50 kA @ 500 VDC / 100 kA @ 690 VAC
		Learn more: LFR15-xxxA06-BT: https://setsafe.com/Products/Over-Current-Protection/Low-Voltage-Fuses/LV-Fuses/LV-Fuses-for-Energy-Storage-System/LFR15-xxxA06-BT-series.html		
 3	 Learn more	• GSM24CCAN • SD2403T23L	• Fast response time for ESD and EOS • Dual-line & Bi-directional ESD and EOS protection • Low leakage and clamping voltage • Low capacitance • No wear-out mechanism • AEC-Q101 qualified	• Meets ESD protection levels specified under IEC61000-4-2 level 4, up to 30 kV for Air and Contact discharge • Surge capability up to 350 W @ 8/20 μs • Low capacitance typical 13 pF • Low clamping voltage: VC < 35 V at IPP = 1 A • Low leakage: less than 1 μA
		Learn more: GSM24CCAN: https://setsafe.com/Products/Over-Voltage-Protection/ESD-TV5-Diode-Arrays/GSM24CCAN-series.html SD2403T23L: https://setsafe.com/Products/Over-Voltage-Protection/ESD-TV5-Diode-Arrays/SD2403T23L-series.html		
 4	 Learn more	• SD0504F10L • SD0520F10L	• Small form-factor • Fast response time for ESD and EOS • Bi-directional ESD and EOS protection • Low leakage and clamping voltage • Low capacitance • No wear-out mechanism	• Meets ESD protection levels specified under IEC61000-4-2 level 4, up to 30 kV for Air and Contact discharge • Surge capability up to 400 W @ 8/20 μs • Low capacitance typical 15pF • Low clamping voltage: VC<10 V at IPP=1 A • Low leakage: less than 1 μA
		Learn more: SD0504F10L: More information please contact: sales@SETfuse.com SD0520F10L: https://setsafe.com/Products/Over-Voltage-Protection/ESD-TV5-Diode-Arrays/SD0520F10L-series.html		
 5	 Learn more	• SE • SF	• Strong Surge capacity • Low residual voltage and high reliability • Collaborating with MOVs to extend device lifespan • High voltage withstand level • Meet TUV and UL requirements • Compliant with RoHS and REACH	• DC breakdown voltage: (350 ~ 4500) V • 8/20μs surge capacity: (3 ~ 20) kA • Working temperature: (-40 ~ 125) °C • Diameter: Φ(5.5 ~ 8.0) mm • Voltage withstand level: 1.25 ~ 2) kVAC @ 60 s • Installation: Meet user customization design
		Learn more: SE: https://www.setsafe.cn/Products/Over-Voltage-Protection/Gas-Discharge-Tube-GDT/DIP-Type/SE-series.html SF: https://www.setsafe.cn/Products/Over-Voltage-Protection/Gas-Discharge-Tube-GDT/DIP-Type/SF-series.html		

DC Charging Station



Level 3
Model 4



SETsafe | SETfuse Products



Over Voltage Protection

- 1.1 Gas Discharge Tube (GDT)
- 1.2 Surge Protective Device (SPD)



Over Current Protection

- 3.1 Low Voltage Fuses (LV Fuses)



Over Voltage Protection

- 4.1 ESD TVS Diode Arrays (ESD TVS)



Over Voltage Protection

- 5.1 ESD TVS Diode Arrays (ESD TVS)



Over Temperature Protection

- 2.1 Thermal-Link (ATCO)-Alloy Type



Over Voltage Protection

- 2.2 Transient Voltage Suppression (TVS)
- 2.3 Gas Discharge Tube (GDT)
- 2.4 Metal Oxide Varistor (MOV)
- 2.5 Thermal Fuse Varistor (TFV)
- 2.6 Thermally Protected Varistors (TFMOV)



Over Current Protection

- 2.7 Low Voltage Fuses (LV Fuses)



DC Charging Station

Benefits and Features of SETsafe | SETfuse Products

Code	Products	Series	Benefits	Features
	GDT  Learn more	• SPCxxxH • SPJxxxD • SPIxxxD	• High surge capability • Low residual voltage and high reliability • Collaborating with MOVs to extend device lifespan • Has strong ability to interrupt continuous follow current • Meet UL requirements • Compliant with RoHS and REACH	• DC breakdown voltage: (350 ~ 1500) V • 8/20μs surge capacity: (20 ~ 40) kA • Working temperature: (-40 ~ 125) °C • Diameter: (11.8 ~ 16.0) mm • Installation: Meet user customization design
Learn more: SPCxxxH: https://setsafe.com/Products/Over-Voltage-Protection/Gas-Discharge-Tube-GDT/High-Surge-Type/SPC-series.html SPJxxxD: https://setsafe.com/Products/Over-Voltage-Protection/Gas-Discharge-Tube-GDT/High-Surge-Type/SPJ-series.html SPIxxxD: https://setsafe.com/Products/Over-Voltage-Protection/Gas-Discharge-Tube-GDT/High-Surge-Type/SPI-series.html				
	SPD  Learn more	• SD25TxxxL201 • SD25TxxxL306	• Over-temperature protection design, high reliability • Pluggable module fixed firmly • High Surge rate • Type I and Type II surge protective devices that meet IEC/EN 61643-11 standards • 3+0 / split phase system protection	• Nominal discharge current (I_n) 20 ~ 25 kA, impulse discharge current (I_{imp}) 5 ~ 12.5 kA • Maximum continuous working voltage (U_c) 150 ~ 1300 VAC • Rated short-circuit current ISCCR up to 25 kA • IP20 shell protection level • Adapt to (-500 ~ 5000) M altitude working environment
Learn more: SD25TxxxL201: https://setsafe.com/Products/Over-Voltage-Protection/Surge-Protective-Device-SPD/SPD-for-Low-voltage-Power-Systems/SD25TxxxL201-series.html SD25TxxxL306: https://setsafe.com/Products/Over-Voltage-Protection/Surge-Protective-Device-SPD/SPD-for-Low-voltage-Power-Systems/SD25TxxxL306-4P-series.html				
	*ATCO  Learn more	• Y • C • S • U • T • R	• Non-resettable overheat protective device functioning one time only • High accuracy fusing temperature, customizable • Leakproof structure, High Reliability • Low impedance • Meet the requirements of RoHS & REACH • Meet the requirements of IEC 60691	• T_f: (76 ~ 230) °C • I_f: (5 ~ 200) A • U_f: (125 ~ 300) VAC, (50 ~ 100) VDC
Learn more: Y: https://setsafe.com/Products/Over-Temperature-Protection/Thermal-Link-ATCO-Alloy-Type/Y-series.html C: https://setsafe.com/Products/Over-Temperature-Protection/Thermal-Link-ATCO-Alloy-Type/C-series.html S: https://setsafe.com/Products/Over-Temperature-Protection/Thermal-Link-ATCO-Alloy-Type/S-series.html U: https://setsafe.com/Products/Over-Temperature-Protection/Thermal-Link-ATCO-Alloy-Type/U-series.html T: https://setsafe.com/Products/Over-Temperature-Protection/Thermal-Link-ATCO-Alloy-Type/T-series.html R: https://setsafe.com/Products/Over-Temperature-Protection/Thermal-Link-ATCO-Alloy-Type/R-series.html				
	GDT  Learn more	• SExxxM-L • SExxxH-L (T)	• Strong Surge capacity • Low residual voltage and high reliability • Collaborating with MOVs to extend device lifespan • Meet TUV and UL requirements • Compliant with RoHS and REACH	• DC breakdown voltage: (350 ~ 1500) V • 8/20μs surge capacity: (10 ~ 20) kA • Working temperature: (-40 ~ 125) °C • Diameter: Φ8.0 mm • Installation: Meet user customization design
Learn more: SExxxM-L: https://setsafe.com/Products/Over-Voltage-Protection/Gas-Discharge-Tube-GDT/DIP-Type/SE-series.html SExxxH-L (T): https://setsafe.com/Products/Over-Voltage-Protection/Gas-Discharge-Tube-GDT/DIP-Type/SE-series.html				

*: Used for varistor deterioration failure overheating protection

DC Charging Station

Benefits and Features of SETsafe | SETfuse Products

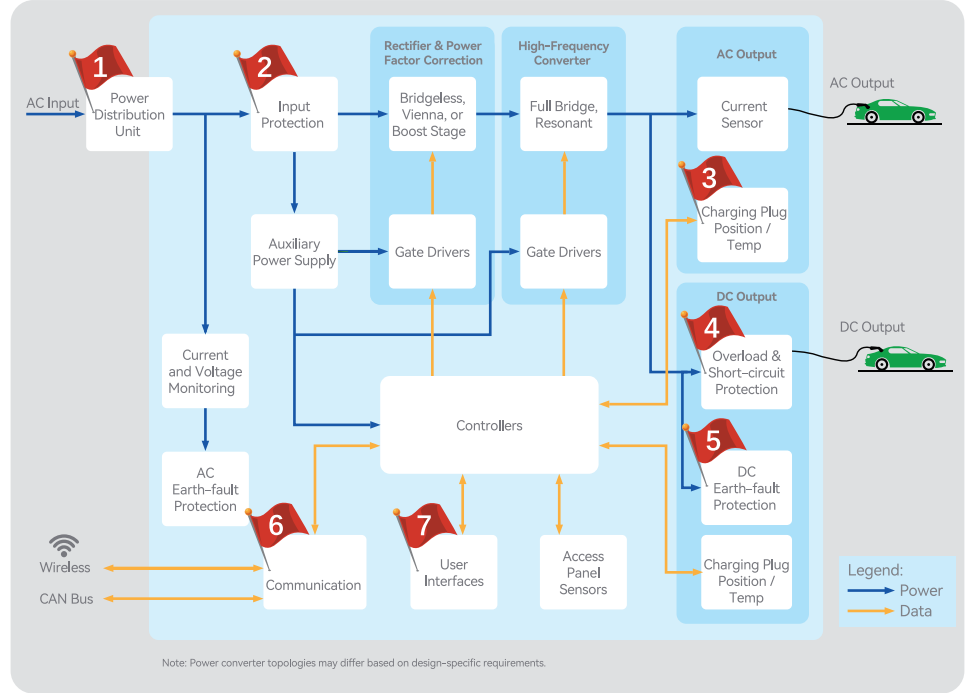
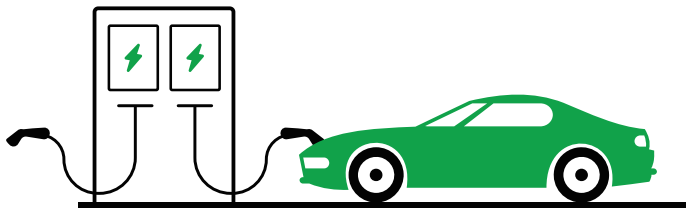
Code	Products	Series	Benefits	Features
	TVS  Learn more	• SPCL10 • SPCL6 • SPCL3 • SPCL1 • 30KPA • SMCJ • SMDJ • 5.0SMDJ	• Fast response time (ns level) for high-energy transient protection • High reliability glass passivated chip junction • Excellent clamping capability • Very low leakage and Precision response by Silicon Avalanche breakdown principle • No wear-out mechanism	• Peak power Dissipation with a 10/1000 μs waveform: (600 ~ 30000) W • High surge capability 8/20 μs rating from 1 kA to 20 kA • Operating temperature range: -55 °C to 175 °C • Low clamping ratio VCL/VBR < 1.3 • ns level supper fast response to transient events • Available for both through hole and SMD packages
Learn more: SPCL10: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SPCL10-series.html SPCL6: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SPCL6-series.html SPCL3: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SPCL3-series.html SPCL1: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SPCL1-series.html 30KPA: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/30KPA-series.html SMCJ: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SMCJ-series.html SMDJ: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SMDJ-series.html 5.0SMDJ: https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/5.0SMDJ-series.html				
	MOV  Learn more	• SFV10D • SFV14D • SFV20D	• Low limiting voltage • High surge capability • The upper limit working temperature can reach 105 °C & 125 °C • Meet the long-term reliability work in high temperature and high humidity environment • Meet the requirements of IEC 62368	• Surge capacity: (3.5 ~ 10) kA • Surge impulse voltage (U_{OC}): (4 ~ 10) kV • Maximum AC working voltage: (130 ~ 750) V • Maximum DC working voltage: (170 ~ 990) V
Learn more: SFV10D: https://setsafe.com/Products/Over-Voltage-Protection/Metal-Oxide-Varistor-MOV-and-MOV-Disk/MOV-and-MOV-Disk-Standard-Type/SFV10D-series.html SFV14D: https://setsafe.com/Products/Over-Voltage-Protection/Metal-Oxide-Varistor-MOV-and-MOV-Disk/MOV-and-MOV-Disk-Standard-Type/SFV14D-series.html SFV20D: https://setsafe.com/Products/Over-Voltage-Protection/Metal-Oxide-Varistor-MOV-and-MOV-Disk/MOV-and-MOV-Disk-Standard-Type/SFV20D-series.html				
	TFV  Learn more	• TFV10S • TFV15S	• The thermal protection function can be added without changing the PCB design • Passed the IEC62368.1 G8.2 overload test certification • Comply with UL1449 standard requirements • The upper limit working temperature can reach 105 °C	• Surge capacity: (3.5 ~ 10) kA • Surge impulse voltage (U_{OC}): (4 ~ 10) kV • Maximum AC working voltage: (130 ~ 510) V • Maximum DC working voltage: (170 ~ 670) V
Learn more: TFV10S: https://setsafe.com/Products/Over-Voltage-Protection/TFV-and-TFMOV/Thermal-Fuse-Varistor-TFV/TFV10S-series.html TFV15S: https://setsafe.com/Products/Over-Voltage-Protection/TFV-and-TFMOV/Thermal-Fuse-Varistor-TFV/TFV15S-series.html				
	TFMOV  Learn more	• TFMOV10M	• Over-temperature protection design, high reliability • Small size, PCB mounting • High surge capacity • Mechanical tripping, fast response time, reliable action	• Nanosecond response time • V0 flame retardant housing • The nominal discharge current can reach 10 kA • The maximum discharge current (I_{max}) is 25 kA
Learn more: TFMOV10M: https://setsafe.com/Products/Over-Voltage-Protection/TFV-and-TFMOV/Thermally-Protected-Varistors-TFMOV/TFMOV10M-series.html				
	LV Fuses  Learn more	• LFR15-xxxA06-BT	• High speed fuse • Low temperature rise, low power consumption • AC/DC optional • Excellent current limiting capability	• Dimensions: (Φ17.5 x 46) mm • U_n: 500 VDC / 690 VAC • I_n: (32 ~ 100) A • High breaking capacity: 50 kA @ 500 VDC / 100 kA @ 690 VAC
Learn more: LFR15-xxxA06-BT: https://setsafe.com/Products/Over-Current-Protection/Low-Voltage-Fuses-LV-Fuses/LV-Fuses-for-Energy-Storage-System/LFR15-xxxA06-BT-series.html				

DC Charging Station

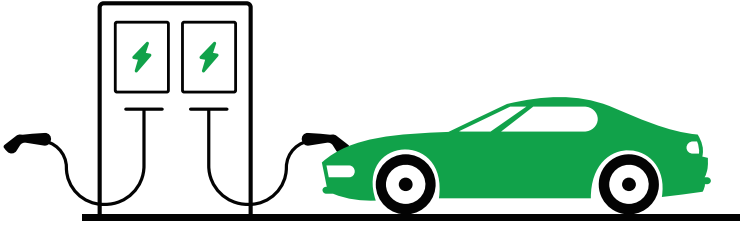
Benefits and Features of SETsafe | SETfuse Products

Code	Products	Series	Benefits	Features	
	 Learn more	• LFR01- xxxA10-xx	• High speed fuse • Low temperature rise, low power consumption • Optional installation method • Micro switches are optional • Excellent current limiting ability	• Dimensions: (43 x 43 x 79) mm • U_n : 800 / 1000 VDC • I_n : (50 ~ 450) A • High breaking capacity: 50 kA @ 1000 VDC (50 A ~ 400 A) 50 kA @ 800 VDC (450 A)	
		Learn more: LFR01-xxxA10-xx: https://setsafe.com/Products/Over-Current-Protection/Low-Voltage-Fuses-LV-Fuses/LV-Fuses-for-Energy-Storage-System/LFR01-xxxA10-xx-series.html	• LFR000- xxxA10-xx	• High speed fuse • Low temperature rise, low power consumption • Excellent current limiting ability	• Dimensions: (36 x 24 x 75) mm • U_n : 1000 VDC • I_n : (50 ~ 250) A • High breaking capacity: 50 kA @ 1000 VDC
		Learn more: LFR000-xxxA10-xx: https://setsafe.com/Products/Over-Current-Protection/Low-Voltage-Fuses-LV-Fuses/LV-Fuses-for-Energy-Storage-System/LFR000-xxxA10-xx-series.html	• LFR15- xxxA06-BT	• High speed fuse • Low temperature rise, low power consumption • AC/DC optional • Excellent current limiting capability	• Dimensions: (Φ17.5 x 46) mm • U_n : 500 VDC / 690 VAC • I_n : (32 ~ 100) A • High breaking capacity: 50 kA @ 500 VDC / 100 kA @ 690 VAC
		Learn more: LFR15-xxxA06-BT: https://setsafe.com/Products/Over-Current-Protection/Low-Voltage-Fuses-LV-Fuses/LV-Fuses-for-Energy-Storage-System/LFR15-xxxA06-BT-series.html			
	 Learn more	• GSM24CCAN • SD2403T23L	• Fast response time for ESD and EOS • Dual-line & Bi-directional ESD and EOS protection • Low leakage and clamping voltage • Low capacitance • No wear-out mechanism • AEC-Q101 qualified	• Meets ESD protection levels specified under IEC61000-4-2 level 4, up to 30 kV for Air and Contact discharge • Surge capability up to 350 W @ 8/20 μs • Low capacitance typical 13 pF • Low clamping voltage: VC<35 V at IPP =1 A • Low leakage: less than 1 μA	
		Learn more: GSM24CCAN: https://setsafe.com/Products/Over-Voltage-Protection/ESD-TVS-Diode-Arrays/GSM24CCAN-series.html SD2403T23L: https://setsafe.com/Products/Over-Voltage-Protection/ESD-TVS-Diode-Arrays/SD2403T23L-series.html			
	 Learn more	• SD0504F10L • SD0520F10L	• Small form-factor • Fast response time for ESD and EOS • Bi-directional ESD and EOS protection • Low leakage and clamping voltage • Low capacitance • No wear-out mechanism	• Meets ESD protection levels specified under IEC61000-4-2 level 4, up to 30 kV for Air and Contact discharge • Surge capability up to 400 W @ 8/20 μs • Low capacitance typical 15pF • Low clamping voltage: VC < 10 V at IPP=1 A • Low leakage: less than 1 μA	
		Learn more: SD0504F10L: More information please contact: sales@SETfuse.com SD0520F10L: https://setsafe.com/Products/Over-Voltage-Protection/ESD-TVS-Diode-Arrays/SD0520F10L-series.html			

AC+DC Charging Station



AC+DC Charging Station



SETsafe | SETfuse Products

1

Over Voltage Protection

- 1.1 Gas Discharge Tube (GDT)
- 1.2 Surge Protective Device (SPD)



2

Over Temperature Protection

- 2.1 Thermal-Link (ATCO)-Alloy Type



Over Voltage Protection

- 2.2 Transient Voltage Suppression (TVS)
- 2.3 Gas Discharge Tube (GDT)
- 2.4 Metal Oxide Varistor (MOV)
- 2.5 Thermal Fuse Varistor (TFV)
- 2.6 Thermally Protected Varistors (TFMOV)



Over Current Protection

- 2.7 Miniature Fuses (Mini Fuses)
- 2.8 Low Voltage Fuses (LV Fuses)



3

Over Voltage Protection

- 3.1 Gas Discharge Tube (GDT)



4

Over Current Protection

- 4.1 Miniature Fuses (Mini Fuses)
- 4.2 Low Voltage Fuses (LV Fuses)



5

Over Voltage Protection

- 5.1 Thermally Protected Varistors (TFMOV)



6

Over Voltage Protection

- 6.1 Transient Voltage Suppression (TVS)
- 6.2 ESD TVS Diode Arrays (ESD TVS)



7

Over Voltage Protection

- 7.1 Transient Voltage Suppression (TVS)
- 7.2 ESD TVS Diode Arrays (ESD TVS)



AC+DC Charging Station

Benefits and Features of SETsafe | SETfuse Products

Code	Products	Series	Benefits	Features
	GDT  Learn more	• SPCxxxH • SPJxxxD • SPIxxxD	• High surge capacity • Low residual voltage and high reliability • Collaborating with MOVs to extend device lifespan • Has strong ability to interrupt continuous follow current • Meet UL requirements • Compliant with RoHS and REACH	• DC breakdown voltage: (350 ~ 1500) V • 8/20μs surge capacity: (20 ~ 40) kA • Working temperature: (-40 ~ 125) °C • Diameter: (11.8 ~ 16.0) mm • Installation: Meet user customization design
	SPD  Learn more	• SD25TxxxA404	• Over-temperature Protection, High Reliability • Pluggable Modules, Anti-false unlocking • Single protection mode flow capacity is up to 50 kA • Type I and Type II SPD, Meet the requirements of IEC/EN 61643-11 • Multiple protection modes are available	• Nominal discharge current (I_n) 20 ~ 30 kA, impulse discharge current (I_{imp}) 11 ~ 12.5 kA • Maximum continuous operating voltage (U_c) 150 ~ 385 VAC • Rated short-circuit current ISCCR up to 25 kA • IP20 enclosure protection level • Adapt to (-500 ~ 5000) M altitude working environment
	*ATCO  Learn more	• Y • C • S • U • T • R	• Non-resettable overheat protective device functioning one time only • High accuracy fusing temperature, customizable • Leakproof structure, High Reliability • Low impedance • Meet the requirements of RoHS & REACH • Meet the requirements of IEC 60691	• T_f: (76 ~ 230) °C • I_f: (5 ~ 200) A • U_f: (125 ~ 300) VAC, (50 ~ 100) VDC
	TVS  Learn more	• SPCL10 • SPCL6 • SPCL3 • SPCL1 • 30KPA • SMCJ • SMDJ • 5.0SMDJ	• Fast response time (ns level) for high-energy transient protection • High reliability glass passivated chip junction • Excellent clamping capability • Very low leakage and Precision response by Silicon Avalanche breakdown principle • No wear-out mechanism	• Peak power Dissipation with a 10/1000 μs waveform: (600 ~ 30000) W • High surge capacity 8/20 μs rating from 1 kA to 20 kA • Operating temperature range: -55°C to 175 °C • Low clamping ratio VCL/VBR < 1.3 • ns level supper fast response to transient events • Available for both through hole and SMD packages
	GDT  Learn more	• SExxxM-L • SExxxH-L (T)	• Strong Surge capacity • Low residual voltage and high reliability • Collaborating with MOVs to extend device lifespan • Meet TUV and UL requirements • Compliant with RoHS and REACH	• DC breakdown voltage: (350 ~ 1500) V • 8/20 μs surge capacity: (10 ~ 20) kA • Working temperature: (-40 ~ 125) °C • Diameter: Φ8.0 mm • Installation: Meet user customization design

* : Used for varistor deterioration failure overheating protection

AC+DC Charging Station

Benefits and Features of SETsafe | SETfuse Products

Code	Products	Series	Benefits	Features
	MOV  Learn more	• SFV10D • SFV14D • SFV20D	• Low limiting voltage • High surge capability • The upper limit working temperature can reach 105 °C & 125 °C • Meet the long-term reliability work in high temperature and high humidity environment • Meet the requirements of IEC 62368	• Surge capacity: (3.5 ~ 10) kA • Surge impulse voltage (U_{oc}): (4 ~ 10) kV • Maximum AC working voltage: (130 ~ 750) V • Maximum DC working voltage: (170 ~ 990) V
	TFV  Learn more	• TFV10S • TFV15S	• The thermal protection function can be added without changing the PCB design • Passed the IEC62368.1 G8.2 overload test certification • Comply with UL1449 standard requirements • The upper limit working temperature can reach 105 °C	• Surge capacity: (3.5 ~ 10) kA • Surge impulse voltage (U_{oc}): (4 ~ 10) kV • Maximum AC working voltage: (130 ~ 510) V • Maximum DC working voltage: (170 ~ 670) V
	TFMOV  Learn more	• TFMOV10M	• Over-temperature protection design, high reliability • Small size, PCB mounting • High surge capacity • Mechanical tripping, fast response time, reliable action	• Nanosecond response time • V0 flame retardant housing • The nominal discharge current can reach 10 kA • The maximum discharge current (I_{max}) is 25 kA
	Mini Fuses  Learn more	• SCF632(P)	• Small size • Single cap structure, good connection reliability • Low temperature rise, low power consumption • Universal use of AC and DC • Multiple voltage parameters • Mounting options	• Dimensions: $\Phi 6.3 \times 31.8$ mm • U_n: (250 ~ 600) VAC / VDC • I_n: (0.5 ~ 30) A • High breaking capacity: 10 kA @ 600 VAC (≤ 12.5 A) 50 kA @ 600 VDC (≤ 12.5 A) 1000 A @ 600 VAC / VDC (15 ~ 30 A)
	LV Fuses  Learn more	• LFR15-xxxA06-BT	• High speed fuse • Low temperature rise, low power consumption • AC/DC optional • Excellent current limiting capability	• Dimensions: ($\Phi 17.5 \times 46$) mm • U_n: 500 VDC / 690 VAC • I_n: (32 ~ 100) A • High breaking capacity: 50 kA @ 500 VDC / 100 kA @ 690 VAC
	GDT  Learn more	• SE • SF	• Strong Surge capacity • Low residual voltage and high reliability • Collaborating with MOVs to extend device lifespan • High voltage withstand level • Meet TUV and UL requirements • Compliant with RoHS and REACH	• DC breakdown voltage: (350 ~ 4500) V • 8/20μs surge capacity: (3 ~ 20) kA • Working temperature: (-40 ~ 125) °C • Diameter: $\Phi(5.5 \sim 8.0)$ mm • Voltage withstand level: (1.25 ~ 2) kVAC @ 60 s • Installation: Meet user customization design

AC+DC Charging Station

Benefits and Features of SETsafe | SETfuse Products

Code	Products	Series	Benefits	Features
	Mini Fuses  Learn more	• SCF632(P)	• Small size • Single cap structure, good connection reliability • Low temperature rise, low power consumption • Universal use of AC and DC • Multiple voltage parameters • Mounting options	• Dimensions: $\Phi 6.3 \times 31.8$ mm • U_n: (250 ~ 600) VAC / VDC • I_n: (0.5 ~ 30) A • High breaking capacity: 10 kA @ 600 VAC (≤ 12.5 A) 50 kA @ 600 VDC (≤ 12.5 A) 1000 A @ 600 VAC / VDC (15 ~ 30 A)
	LV Fuses  Learn more	• LFR01-xxxA10-xx • LFR000-xxxA10-xx • LFR15-xxxA06-BT	• High speed fuse • Low temperature rise, low power consumption • Optional installation method • Micro switches are optional • Excellent current limiting ability	• Dimensions: (43 x 43 x 79) mm • U_n: 800 / 1000 VDC • I_n: (50 ~ 450) A • High breaking capacity: 50 kA @ 1000 VDC (50 A ~ 400 A) 50 kA @ 800 VDC (450 A)
	TFMOV  Learn more	• TFMOV10M	• Over-temperature protection design, high reliability • Small size, PCB mounting • High surge capacity • Mechanical tripping, fast response time, reliable action	• Nanosecond response time • V0 flame retardant housing • The nominal discharge current can reach 10 kA • The maximum discharge current (I_{max}) is 25 kA
	TVS  Learn more	• SMF • SMAJ • SMBJ	• Fast response time(ns level) for high-energy transient protection • High reliability glass passivated chip junction • Excellent clamping capability • Very low leakage and Precision response by Silicon Avalanche breakdown principle • No wear-out mechanism	• Rated Peak power Dissipation with a 10/1000 μs waveform: 200 W, 400 W, 600 W • Operating Temperature range: (-55 ~ 175) °C • Low clamping ratio $V_{CL}/V_{BR} < 1.3$ • ns level supper fast response to transient events • Surface Mount (SMD) packages
	ESD TVS  Learn more	• GSM24CCAN • SD2403T23L	• Fast response time for ESD and EOS • Dual-line & Bi-directional ESD and EOS protection • Low leakage and clamping voltage • Low capacitance • No wear-out mechanism • AEC-Q101 qualified	• Meets ESD protection levels specified under IEC61000-4-2 level 4, up to 30 kV for Air and Contact discharge • Surge capability up to 350 W @ 8/20 μs • Low capacitance typical 13 pF • Low clamping voltage: $V_C < 35$ V at IPP = 1 A • Low leakage: less than 1 μA

AC+DC Charging Station

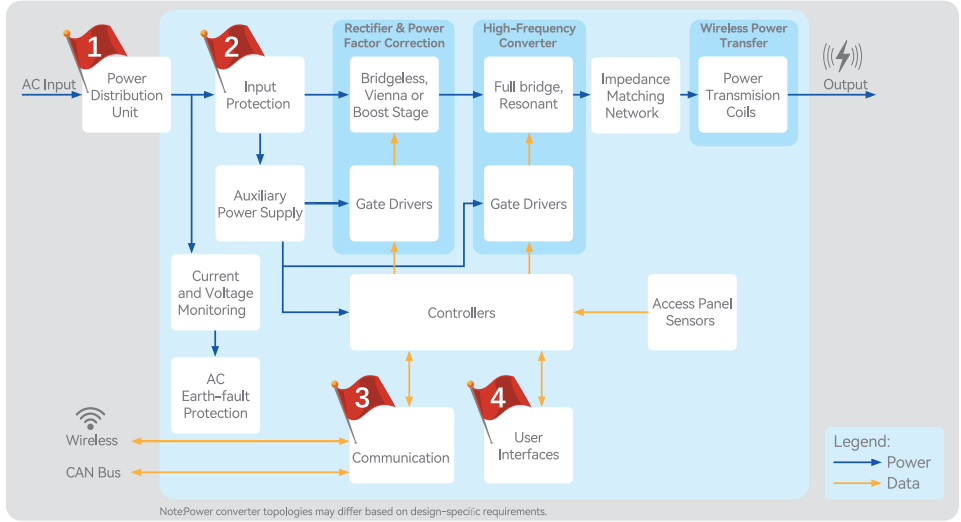
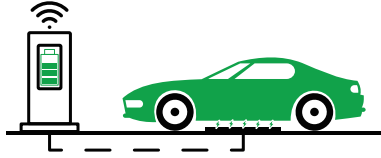
Benefits and Features of SETsafe | SETfuse Products

Code	Products	Series	Benefits	Features
	TVS  Learn more	• SMF • SMAJ • SMBJ	• Fast response time(ns level) for high-energy transient protection • High reliability glass passivated chip junction • Excellent clamping capability • Very low leakage and Precision response by Silicon Avalanche breakdown principle • No wear-out mechanism	• Rated Peak power Dissipation with a 10/1000 μs waveform: 200 W, 400 W, 600 W • Operating Temperature range: (-55 ~ 175) °C • Low clamping ratio VCL/VBR < 1.3 • ns level supper fast response to transient events • Surface Mount (SMD) packages
 	ESD TVS  Learn more	• GSM24CCAN • SD2403T23L	• Fast response time for ESD and EOS • Dual-line & Bi-directional ESD and EOS protection • Low leakage and clamping voltage • Low capacitance • No wear-out mechanism • AEC-Q101 qualified	• Meets ESD protection levels specified under IEC61000-4-2 level 4, up to 30 kV for Air and Contact discharge • Surge capability up to 350 W @ 8/20 μs • Low capacitance typical 13 pF • Low clamping voltage: VC<35 V at IPP =1 A • Low leakage: less than 1 μA

Learn more:
SMF: <https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SMF-series.html>
SMAJ: <https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SMAJ-series.html>
SMBJ: <https://setsafe.com/Products/Over-Voltage-Protection/Transient-Voltage-Suppression-Diodes-TVS/TVS-Standard-Type/SMBJ-series.html>

Learn more:
GSM24CCAN: <https://setsafe.com/Products/Over-Voltage-Protection/ESD-TVS-Diode-Arrays/GSM24CCAN-series.html>
SD2403T23L: <https://setsafe.com/Products/Over-Voltage-Protection/ESD-TVS-Diode-Arrays/SD2403T23L-series.html>

Wireless Charging Station



SETsafe | SETfuse Products

1

Over Voltage Protection

- 1.1 Gas Discharge Tube (GDT)
- 1.2 Surge Protective Device (SPD)



3

Over Voltage Protection

- 3.1 Transient Voltage Suppression (TVS)
- 3.2 ESD TVS Diode Arrays (ESD TVS)



4

Over Voltage Protection

- 4.1 Transient Voltage Suppression (TVS)
- 4.2 ESD TVS Diode Arrays (ESD TVS)



2

Over Temperature Protection

- 2.1 Thermal-Link (ATCO)-Alloy Type



Over Voltage Protection

- 2.2 Transient Voltage Suppression (TVS)
- 2.3 Gas Discharge Tube (GDT)
- 2.4 Metal Oxide Varistor (MOV)
- 2.5 Thermal Fuse Varistor (TFV)
- 2.6 Thermally Protected Varistors (TFMOV)



Over Current Protection

- 2.7 Miniature Fuses (Mini Fuses)
- 2.8 Low Voltage Fuses (LV Fuses)



Wireless Charging Station

Benefits and Features of SETsafe | SETfuse Products

Code	Products	Series	Benefits	Features
	GDT  Learn more	• SPCxxxH • SPJxxxD • SPIxxxD	• High surge capacity • Low residual voltage and high reliability • Collaborating with MOVs to extend device lifespan • Has strong ability to interrupt continuous follow current • Meet UL requirements • Compliant with RoHS and REACH	• DC breakdown voltage: (350 ~ 1500) V • 8/20μs surge capacity: (20 ~ 40) kA • Working temperature: (-40 ~ 125) °C • Diameter: (11.8 ~ 16.0) mm • Installation: Meet user customization design
	SPD  Learn more	• SD25TxxxA404	• Over-temperature Protection, High Reliability • Pluggable Modules, Anti-false unlocking • Single protection mode flow capacity is up to 50 kA • Type I and Type II SPD, Meet the requirements of IEC/EN 61643-11 • Multiple protection modes are available	• Nominal discharge current (I_n) 20 ~ 30 kA, impulse discharge current (I_{imp}) 11 ~ 12.5 kA • Maximum continuous operating voltage (U_c) 150 ~ 385 VAC • Rated short-circuit current ISCCR up to 25 kA • IP20 enclosure protection level • Adapt to (-500 ~ 5000) M altitude working environment
	*ATCO  Learn more	• Y • C • S • U • T • R	• Non-resettable overheat protective device functioning one time only • High accuracy fusing temperature, customizable • Leakproof structure, High Reliability • Low impedance • Meet the requirements of RoHS & REACH • Meet the requirements of IEC 60691	• T_f: (76 ~ 230) °C • I_f: (5 ~ 200) A • U_f: (125 ~ 300) VAC, (50 ~ 100) VDC
	TVS  Learn more	• SPCL10 • SPCL6 • SPCL3 • SPCL1 • 30KPA • SMCJ • SMDJ • 5.0SMDJ	• Fast response time (ns level) for high-energy transient protection • High reliability glass passivated chip junction • Excellent clamping capability • Very low leakage and Precision response by Silicon Avalanche breakdown principle • No wear-out mechanism	• Peak power Dissipation with a 10/1000 μs waveform: (600 ~ 30000) W • High surge capacity 8/20 μs rating from 1 kA to 20 kA • Operating temperature range: -55 °C to 175 °C • Low clamping ratio VCL/VBR < 1.3 • ns level supper fast response to transient events • Available for both through hole and SMD packages
	GDT  Learn more	• SExxxM-L • SExxxH-L (T)	• Strong Surge capacity • Low residual voltage and high reliability • Collaborating with MOVs to extend device lifespan • Meet TUV and UL requirements • Compliant with RoHS and REACH	• DC breakdown voltage: (350 ~ 1500) V • 8/20μs surge capacity: (10 ~ 20) kA • Working temperature: (-40 ~ 125) °C • Diameter: Ø8.0 mm • Installation: Meet user customization design

* : Used for varistor deterioration failure overheating protection

Wireless Charging Station

Benefits and Features of SETsafe | SETfuse Products

Code	Products	Series	Benefits	Features
	MOV  Learn more	• SFV10D • SFV14D • SFV20D	• Low limiting voltage • High surge capability • The upper limit working temperature can reach 105 °C & 125 °C • Meet the long-term reliability work in high temperature and high humidity environment • Meet the requirements of IEC 62368	• Surge capacity: (3.5 ~ 10) kA • Surge impulse voltage (U_{oc}): (4 ~ 10) kV • Maximum AC working voltage: (130 ~ 750) V • Maximum DC working voltage: (170 ~ 990) V
	TFV  Learn more	• TFV10S • TFV15S	• The thermal protection function can be added without changing the PCB design • Passed the IEC62368.1 G8.2 overload test certification • Comply with UL1449 standard requirements • The upper limit working temperature can reach 105 °C	• Surge capacity: (3.5 ~ 10) kA • Surge impulse voltage (U_{oc}): (4 ~ 10) kV • Maximum AC working voltage: (130 ~ 510) V • Maximum DC working voltage: (170 ~ 670) V
	TFMOV  Learn more	• TFMOV10M	• Over-temperature protection design, high reliability • Small size, PCB mounting • High surge capacity • Mechanical tripping, fast response time, reliable action	• Nanosecond response time • V0 flame retardant housing • The nominal discharge current can reach 10 kA • The maximum discharge current (I_{max}) is 25 kA
	Mini Fuses  Learn more	• SCF632(P)	• Small size • Single cap structure, good connection reliability • Low temperature rise, low power consumption • Universal use of AC and DC • Multiple voltage parameters • Mounting options	• Dimensions: $\Phi 6.3 \times 31.8$ mm • U_n: (250 ~ 600) VAC / VDC • I_n: (0.5 ~ 30) A • High breaking capacity: 10 kA @ 600 VAC (≤ 12.5 A) 50 kA @ 600 VDC (≤ 12.5 A) 1000 A @ 600 VAC / VDC (15 ~ 30 A)
	LV Fuses  Learn more	• LFR15-xxxA06-BT	• High speed fuse • Low temperature rise, low power consumption • AC/DC optional • Excellent current limiting capability	• Dimensions: ($\Phi 17.5 \times 46$) mm • U_n: 500 VDC / 690 VAC • I_n: (32 ~ 100) A • High breaking capacity: 50 kA @ 500 VDC / 100 kA @ 690 VAC

Wireless Charging Station

Benefits and Features of SETsafe | SETfuse Products

Code	Products	Series	Benefits	Features
  	TVS  Learn more	• SMF • SMAJ • SMBJ	• Fast response time(ns level) for high-energy transient protection • High reliability glass passivated chip junction • Excellent clamping capability • Very low leakage and Precision response by Silicon Avalanche breakdown principle • No wear-out mechanism	• Rated Peak power Dissipation with a 10/1000 μs waveform: 200 W, 400 W, 600 W • Operating Temperature range: (-55 ~ 175) °C • Low clamping ratio VCL/VBR < 1.3 • ns level supper fast response to transient events • Surface Mount (SMD) packages
	ESD TVS  Learn more	• GSM24CCAN • SD2403T23L	• Fast response time for ESD and EOS • Dual-line & Bi-directional ESD and EOS protection • Low leakage and clamping voltage • Low capacitance • No wear-out mechanism • AEC-Q101 qualified	• Meets ESD protection levels specified under IEC61000-4-2 level 4, up to 30 kV for Air and Contact discharge • Surge capability up to 350W @ 8/20 μs • Low capacitance typical 13 pF • Low clamping voltage: VC<35 V at IPP =1 A • Low leakage: less than 1 μ A
  	TVS  Learn more	• SMF • SMAJ • SMBJ	• Fast response time(ns level) for high-energy transient protection • High reliability glass passivated chip junction • Excellent clamping capability • Very low leakage and Precision response by Silicon Avalanche breakdown principle • No wear-out mechanism	• Rated Peak power Dissipation with a 10/1000 μs waveform: 200 W, 400 W, 600 W • Operating Temperature range: (-55 ~ 175) °C • Low clamping ratio VCL/VBR < 1.3 • ns level supper fast response to transient events • Surface Mount (SMD) packages
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What Can We Do For You ① ②

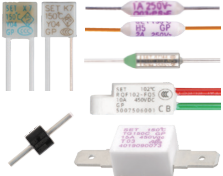
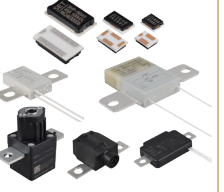
www.SETsafe.com,

www.SETfuse.com

① Design, Manufacture and Sell Circuit Control and Safety Protection Components

Over Temperature Protection, Over Voltage Protection, Over Current Protection, Active Protection circuit control and safety protection components by 2025.

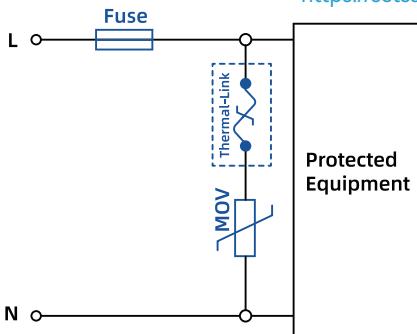
<https://setsafe.com/products.html>

Over Temperature Protection	Over Voltage Protection	Over Current Protection	Active Protection
			
• Thermal-Link - Alloy Type • Direct Current Thermal-Link - Alloy Type • Thermal-Link - Organic Type • Thermal Turn On - Organic Type	• Transient Voltage Suppression Diodes • Thermal Protected Transient Suppression Diode • ESD TVS Diode Arrays • Thyristor Surge Suppressor • Gas Discharge Tube • Thermally Protected Gas Discharge Tube • Metal Oxide Varistor & MOV Disk • Thermal Fuse & MOV • Surge Protective Devices Module • Surge Protective Device	• Cartridge Fuse-links • Sub-miniature Fuse-links • Surface Mount Fuse-links • Fusible Wire Wound Resistor • Thermal-Link & Fusing Resistor • Thermally Protected Resistor • Low Voltage Fuses	• Heat CutOff • Idea Thermal CutOff • Pyro CutOff • Mechanical CutOff

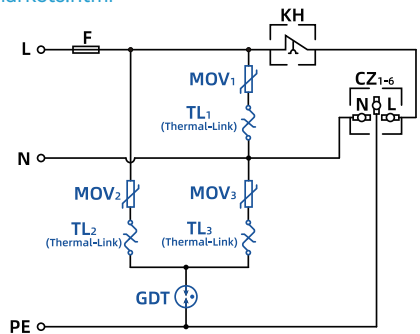
② Provides Circuit Safety Solutions

Typical applications of SETsafe | SETfuse products such as Current Fuse, Thermal-Link, Metal Oxide Varistor (MOV) and Gas Discharge Tube (GDT) circuits (for reference only).

<https://setsafe.com/markets.html>



Examples are for reference only.



Examples are for reference only.

Different electrical equipment have different circuit protection solutions. If you need further information, please contact us.

About SETsafe | SETfuse

www.SETsafe.com, www.SETfuse.com

MISSION

- ① Design, Manufacture and Sell Circuit Control and Safety Protection Components.
- ② Provide Circuit Safety Solutions.

Key Markets:

New Energy, Energy Storage, Telecommunications, Surge Protector, Power, Lighting, Home Appliances, Mobile Devices, Medical, etc.

SETsafe | SETfuse was established in 2000 in Xiamen, China. We have a presence in more than 40 countries. Some of the world's 500 fortune companies are our valuable customers. We have pioneered, innovated and developed several products exclusively. Products are complied with CB, CCC, CQC, TLC, UL, cUL, ETL, TÜV, CE, VDE, DEKRA, KEMA-KEUR, KC, PSE, IATF 16949, ISO 9001, ISO 14001, ISO 45001, ISO 50001, GB/T 29490 certificates, meeting RoHS and REACH requirements. We are in one of the core participating teams for revising and setting several national & international standards in the field of Circuit Protection.

Learn more: <https://setsafe.com/About-SETsafe-and-SETfuse/About-Us.html>



SETsafe | SETfuse Industrial Park

Make Global Electricity Safe

SETsafe | SETfuse is Your First Choice

Establishment and Customer

<https://setsafe.com/About-SETsafe-and-SETfuse/About-Us.html>

2000

Establishment in 2000,
it focuses on the design, manufacture and sales of
circuit control and safety protection components,
and provides circuit safety solutions.

40+

The products sell well in more than 40 countries.

Efficient Intelligent Manufacturing

Products are manufactured fully automatically with
automated processes and data is traceable.

500

A brand chosen by fortune 500 companies.

Global Business Mode

Direct Sales

Distribution

Distributor and Agency.

REP

- We can jointly develop customers, and customers can specify the method of cooperation.
- More details, please contact SETsafe | SETfuse: sales@SETfuse.com

Approved Management System

<https://setsafe.com/Management-System.html>

IATF 16949

Certification by TÜV Rheinland,
Germany.

ISO 9001

Certification by TÜV Rheinland,
Germany.

ISO 14001

Environmental management
system.

ISO 45001

Occupational health and safety
management system.

ISO 50001

Energy Management System.

GB/T 29490

Intellectual property system.

The actual certificate prevails.

Make Global Electricity Use Safe SETsafe | SETfuse is Your First Choice

Testing Center (Laboratory)

<https://setsafe.com/Testing-Center-Laboratory.html>

ISO

The laboratory is built in accordance with ISO/IEC 17025.

3000+

The laboratory area is over 3,000 square meters.

300+

More than 300 sets of specialized testing equipment.

1000+

More than 1000 testing items.

Standards

Has the testing capabilities of IEC international standards, ITU standards, European standards, UL standards, and national and industry standards.

WTDP

The laboratory has obtained the qualification of UL under Witnessed Test Data Program (WTDP) and the accreditation qualification by TÜV Rheinland. SETsafe | SETfuse have nine types of products that can be witnessed tested.

CTF

CUSTOMERS TESTING FACILITIES (CTF)

CTF laboratory qualification approved by TÜV Rheinland.
CTF laboratory standards: IEC61643-11, IEC61643-31.
Products: SPD for Low-voltage Power Systems, SPD for Low-voltage DC Systems (PV, ESS).

Function and Performance Testing Laboratory

It has more than ten functional and performance testing laboratories, including but not limited to lightning surge laboratory, electrical testing laboratory, temperature testing laboratory, material testing laboratory, environmental testing laboratory, thermal analysis laboratory, durability testing laboratory, mechanical testing laboratory, product application testing laboratory, etc.

Make Global Electricity Use Safe SETsafe | SETfuse is Your First Choice

Quality First, Select with Confidence

#

APQP

Advanced Product
Quality Planning.

#

FMEA

Failure Mode and Effects Analysis.

#

MSA

Measurement Systems Analysis.

#

SPC

Statistical Process Control.

#

PPAP

Production Part Approval Process.

Suppliers

Choose High-quality Suppliers.

Design

Quality Assurance for
Product Design.

IQC

Quality Assurance for Incoming
Material Inspection.

IPQC

Quality Assurance for
In-process Control.

FQC

Quality Assurance for Finished
Product Inspection.

OQC

Quality Assurance for
Shipment Inspection.

#

CCD

Online Inspection, Appearance,
and Size.

Reliability

Performance Testing,
Reliability Testing.

Life Testing

Life Testing and Calculation.

Data Tracking

It's able to trace product
Production Time, Raw Materials,
Equipment and so on.

Calibration

Calibrate Related Testing
Equipment and Instruments.

#

Safety Certification

The Product has Corresponding
Safety Certification.

#

Quality Tools, Management

QCC, Six Sigma, TQM

- From development and design, supplier selection to production and manufacturing, SETsafe | SETfuse products follow the principle of the most competitive quality, including but not limited to the use of the above quality tools and test items, which are subject to the actual situation of each product.
- # Each product is different, please refer to the actual situation.

Make Global Electricity Use Safe SETsafe | SETfuse is Your First Choice

Digitalization and Greening

Digital Management Enterprise

Since 2006, we have combined system requirements with management practices to create a digital management system and digital team with SETsafe | SETfuse characteristics. It fully covers the entire product life cycle and daily collaborative office, providing strong support for business decision-making and quality management. We have obtained the third-level digital level certification and the title of the National Excellent Digital Intelligence Team.

Customer First, Attentive Service

Worry-Free Before, During and After Sales, Buy and Use With Confidence

Optional Logistics, Free Technical Consultation, FAE, Quality Assurance.

Reduce Pollution and Protect the Earth

HSF

No harmful substances.

RoHS

Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

REACH

Regulations concerning the Registration, Evaluation, Authorization and Restriction of Chemicals.

Halogen Free

No Red Phosphorus

PFAS

Per- and polyfluoroalkyl substances.

SETsafe | SETfuse's products comply with relevant environmental regulations and the limits of hazardous substances. Each product is different, please refer to the actual situation.

Carbon Peak and Carbon Neutrality

700

Reduce carbon dioxide emissions by about 700 tons per year.

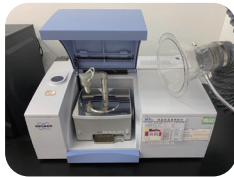
800

Total solar installed capacity is 800 KWP.

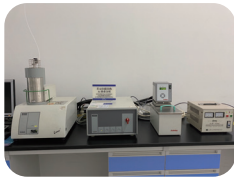
100

The average solar power generation is about 100 kWh / year.

Some Test Equipment



The testing focus of the laboratory covers material analysis class, temperature test class, environmental test class, electrical test class, lightning current test class, with more than 1000 testing items.



The laboratory has the testing capabilities of IEC international standards, EN European standards, UL standards, and national and industry standards.

Test items include Marking test, Tensile test, Thrust test, Creepage distances and clearances, Dielectric strength, Insulation resistance, Holding temperature, Functioning temperature, Maximum temperature limit, Ageing, Varistor voltage, Leakage current, Voltage proof.....

Witnessed Test Data Program (WTDP)

<https://setsafe.com/Testing-Center-Laboratory/Witnessed-Test-Data-Program-WTDP.html>



SETsafe | SETfuse Obtained Permanent Authorization:

- UL 60691, CSA C22.2 NO.60691:19.
- UL 1449, EDITION 5, ISSUE DATE 01/08/2021 (Surge Protective Devices).
- UL 1434, EDITION 1, REVISION DATE 05/18/2020 (THERMISTOR-TYPE DEVICES).
- CSA Component Acceptance Service, T.I.L., Class No.9073-31, ISSUE DATE 07/09/1991.
- CSA C22.2 No.269.5, EDITION 2, ISSUE, DATE 09/2017 (Surge Protective Devices – Type 5 – Components).
- CSA C22.2 No.269.4, EDITION 2, ISSUE, DATE 03/2017 (Surge Protective Devices – Type 4 – Component Assemblies).

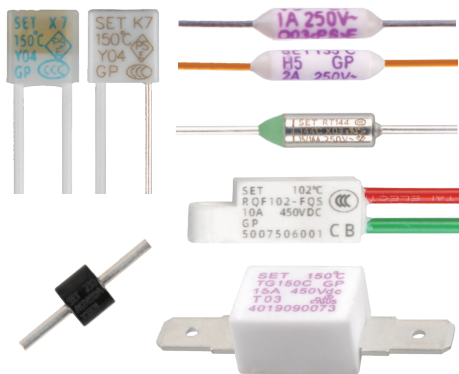


SETsafe | SETfuse Obtained Permanent Authorization:

- IEC 60127.
- IEC 60539-1:2016.
- IEC 60691:2015+A1.
- EN 60691:2016+A1.
- IEC 61051-1:2018.
- EN IEC 61051-1:2018.
- IEC 61051-2:1991+A1.
- IEC 61051-2-2:1991.
- IEC 62368-1:2020 Annex G.8.
- EN IEC 62368-1:2020 Annex G.8.
- EN 50539-11:2013+A1.
- IEC 61643-11:2011.
- EN 61643-11:2012+A11.
- IEC 61643-21:2012.
- EN 61643-21:2001+A1+A2.
- IEC 61643-31:2018.
- EN 61643-31:2018.
- IEC 61643-311.

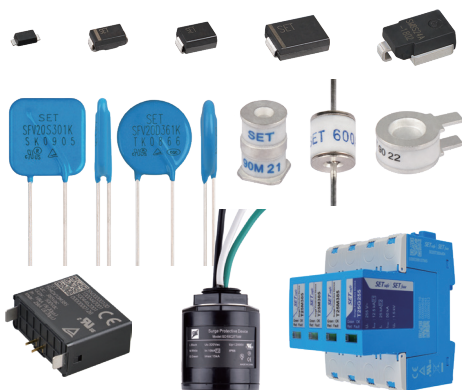
SETsafe | SETfuse Main Products

Over Temperature Protection



- Thermal-Link - Alloy Type
- Direct Current Thermal-Link - Alloy Type
- Thermal-Link - Organic Type
- Thermal Turn On - Organic Type

Over Voltage Protection

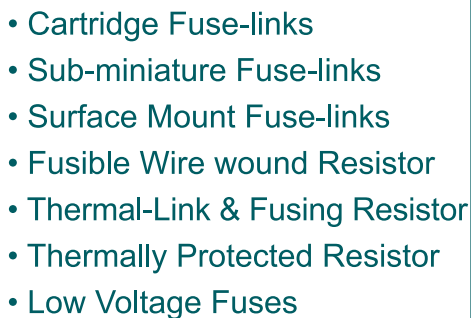


- Transient Voltage Suppression Diodes
- Thermal Protected Transient Suppression Diode
- ESD TVS Diode Arrays
- Thyristor Surge Suppressor
- Gas Discharge Tube
- Thermally Protected Gas Discharge Tube
- Metal Oxide Varistor & MOV Disk
- Thermal Fuse & MOV
- Surge Protective Devices Module
- Surge Protective Device

<https://setsafe.com/Products/Over-Temperature-Protection.html>

<https://setsafe.com/Products/Over-Voltage-Protection.html>

Over Current Protection



- Heat CutOff
- idea Thermal CutOff
- Pyro CutOff
- Mechanical CutOff

<https://setsafe.com/Products/Active-Protection.html>

Products Links



Over Temperature Protection

<https://setsafe.com/Products/Over-Temperature-Protection.html>



Over Voltage Protection

<https://setsafe.com/Products/Over-Voltage-Protection.html>



Over Current Protection

<https://setsafe.com/Products/Over-Current-Protection.html>



Active Protection

<https://setsafe.com/Products/Active-Protection.html>

Products Datasheet Download Link



<https://setsafe.com/Support/Datasheet-Download.html>

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