

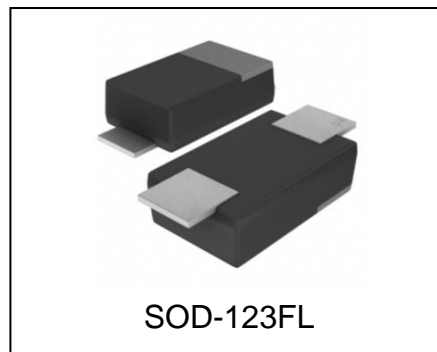


# SMFxx(C)A

## Power Transient Voltage Suppressor

### Features

- 200 watts Peak Pulse Power (10/1000µs)
- Unidirectional and Bidirectional Protection
- Fast Response Time : Typically < 1ns
- Excellent Clamping Capability
- Built-in Strain relief
- Low inductance
- Low profile package
- IEC 61000-4-2 (ESD) ±30kV(air), ±30kV(contact)
- MSL: Level 1



### Mechanical Characteristics

- SOD-123FL package
- Matte tin lead - free plated
- Marking: Marking Code
- RoHS Compliant

### Applications

- I/O Interfaces
- Power lines
- Telecommunication
- Industrial Electronics
- Consumer Electronics

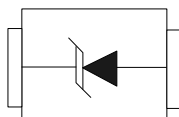
Absolute Maximum Rating			
Rating	Symbol	Value	Units
Peak Pulse Power (tp =10/1000µs) (see Note1&2)	P <sub>PPM</sub>	200	Watts
Peak pulse current (10/1000µs) (see Note2)	I <sub>PPM</sub>	See Electrical Characteristics	A
Peak Forward surge current (see Note3)	I <sub>FSM</sub>	20	A
Power Dissipation on infinite heat sink T <sub>L</sub> = 50 °C (Fig5)	P <sub>D</sub>	1.0	W
Operating Junction Temperature range	T <sub>J</sub>	-55 to + 150	°C
Thermal Resistance Junction-to-Ambient	R <sub>θJA</sub>	180	°C/W

**Note1:** Peak Pulse Power Rating as Pulse Width ,per Fig1.

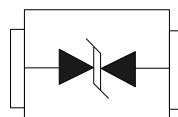
**Note2:** Peak Pulse Power or Current Derated above T<sub>A</sub>=25°C Per Fig. 2 and Non-Repetitive Current Pulse,Per Fig.3.

**Note3:** 8.3ms Single Half Sine Wave or Equivalent Square Wave unidirectional device only.

### Pin Configuration



Unidirectional



Bidirectional

## Electrical Characteristics

Part Number	Marking code	Reverse Stand off Voltage $V_{RWM}$ (Volts)	Breakdown Voltage $V_{BR@I_T}$ (Volts)		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C@I_{PP}$ (Volts)	Maximum Peak Pulse Current $I_{pp}$ (Amps)	Maximum Reverse Leakage $I_R@V_{RWM}$ ( $\mu$ A)
			MIN	MAX				
SMF5.0CA	ETE	5.0	6.4	7.0	10	9.2	21.7	400
SMF6.0CA	ETG	6.0	6.67	7.37	10	10.3	19.4	400
SMF6.5CA	ETK	6.5	7.22	7.98	10	11.2	17.9	250
SMF7.0CA	ETM	7.0	7.78	8.6	10	12	16.7	100
SMF7.5CA	ETP	7.5	8.33	9.21	1	12.9	15.5	50
SMF8.0CA	ETR	8.0	8.89	9.83	1	13.6	14.7	25
SMF8.5CA	ETT	8.5	9.44	10.4	1	14.4	13.9	10
SMF9.0CA	ETV	9.0	10.0	11.1	1	15.4	13.0	5
SMF10CA	ETX	10	11.1	12.3	1	17	11.8	2.5
SMF11CA	ETZ	11	12.2	13.5	1	18.2	11.0	2.5
SMF12CA	EUE	12	13.3	14.7	1	19.9	10.1	2.5
SMF13CA	EUG	13	14.4	15.9	1	21.5	9.3	1
SMF14CA	EUK	14	15.6	17.2	1	23.2	8.6	1
SMF15CA	EUM	15	16.7	18.5	1	24.4	8.2	1
SMF16CA	EUP	16	17.8	19.7	1	26	7.7	1
SMF17CA	EUR	17	18.9	20.9	1	27.6	7.2	1
SMF18CA	EUT	18	20.0	22.1	1	29.2	6.8	1
SMF20CA	EUV	20	22.2	24.5	1	32.4	6.2	1
SMF22CA	EUX	22	24.4	26.9	1	35.5	5.6	1
SMF24CA	EUZ	24	26.7	29.5	1	38.9	5.1	1
SMF26CA	EVE	26	28.9	31.9	1	42.1	4.8	1
SMF28CA	EVG	28	31.1	34.4	1	45.4	4.4	1
SMF30CA	EVK	30	33.3	36.8	1	48.4	4.1	1
SMF33CA	EVM	33	36.7	40.6	1	53.3	3.8	1
SMF36CA	EVP	36	40.0	44.2	1	58.1	3.4	1
SMF40CA	EVR	40	44.4	49.1	1	64.5	3.1	1
SMF43CA	EVT	43	47.8	52.8	1	69.4	2.9	1
SMF45CA	EVV	45	50.0	55.3	1	72.7	2.8	1
SMF48CA	EVX	48	53.3	58.9	1	77.4	2.6	1
SMF51CA	EVZ	51	56.7	62.7	1	82.4	2.4	1
SMF54CA	EWE	54	60.0	66.3	1	87.1	2.3	1
SMF58CA	EWG	58	64.4	71.2	1	93.6	2.1	1
SMF60CA	EWK	60	66.7	73.7	1	96.8	1.8	1
SMF64CA	EWM	64	71.1	78.6	1	103	1.7	1
SMF70CA	EWP	70	77.8	86.0	1	113	1.5	1

## Electrical Characteristics (Cont.)

Part Number	Marking Code	Reverse Stand off Voltage $V_{RWM}$ (Volts)	Breakdown Voltage $V_{BR@I_T}$ (Volts)		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C@I_{PP}$ (Volts)	Maximum Peak Pulse Current $I_{PP}$ (Amps)	Maximum Reverse Leakage $I_R@V_{RWM}$ ( $\mu$ A)
			MIN	MAX				
SMF75CA	EWR	75	83.3	92.1	1	121	1.4	1
SMF78CA	EWT	78	86.7	95.8	1	126	1.4	1
SMF85CA	EWV	85	94.4	104	1	137	1.3	1
SMF90CA	EWX	90	100	111	1	146	1.2	1
SMF100CA	EWZ	100	111	123	1	162	1.1	1
SMF110CA	EXE	110	122	135	1	177	1.0	1
SMF120CA	EXG	120	133	147	1	193	0.9	1
SMF130CA	EXK	130	144	159	1	209	0.8	1
SMF150CA	EXM	150	167	185	1	243	0.7	1
SMF160CA	EXP	160	178	197	1	259	0.7	1
SMF170CA	EXR	170	189	209	1	275	0.6	1
SMF180CA	EXT	180	200	220	1	292	0.68	1
SMF190CA	EXV	190	211	232	1	308	0.65	1
SMF5.0A	EHE	5.0	6.4	7.0	10	9.2	21.7	400
SMF6.0A	EHG	6.0	6.67	7.37	10	10.3	19.4	400
SMF6.5A	EHK	6.5	7.22	7.98	10	11.2	17.9	250
SMF7.0A	EHM	7.0	7.78	8.6	10	12	16.7	100
SMF7.5A	EHP	7.5	8.33	9.21	1	12.9	15.5	50
SMF8.0A	EHR	8.0	8.89	9.83	1	13.6	14.7	25
SMF8.5A	EHT	8.5	9.44	10.4	1	14.4	13.9	10
SMF9.0A	EHV	9.0	10.0	11.1	1	15.4	13.0	5
SMF10A	EHX	10	11.1	12.3	1	17	11.8	2.5
SMF11A	EHZ	11	12.2	13.5	1	18.2	11.0	2.5
SMF12A	EIE	12	13.3	14.7	1	19.9	10.1	2.5
SMF13A	EIG	13	14.4	15.9	1	21.5	9.3	1
SMF14A	EIK	14	15.6	17.2	1	23.2	8.6	1
SMF15A	EIM	15	16.7	18.5	1	24.4	8.2	1
SMF16A	EIP	16	17.8	19.7	1	26	7.7	1
SMF17A	EIR	17	18.9	20.9	1	27.6	7.2	1
SMF18A	EIT	18	20.0	22.1	1	29.2	6.8	1
SMF20A	EIV	20	22.2	24.5	1	32.4	6.2	1
SMF22A	EIX	22	24.4	26.9	1	35.5	5.6	1
SMF24A	EIZ	24	26.7	29.5	1	38.9	5.1	1
SMF26A	EJE	26	28.9	31.9	1	42.1	4.8	1
SMF28A	EJG	28	31.1	34.4	1	45.4	4.4	1

## Electrical Characteristics (Cont.)

Part Number	Marking Code	Reverse Stand off Voltage $V_{RWM}$ (Volts)	Breakdown Voltage $V_{BR@I_T}$ (Volts)		Test Current $I_T$ (mA)	Maximum Clamping Voltage $V_C@I_{PP}$ (Volts)	Maximum Peak Pulse Current $I_{PP}$ (Amps)	Maximum Reverse Leakage $I_R@V_{RWM}$ ( $\mu$ A)
			MIN	MAX				
SMF30A	EJK	30	33.3	36.8	1	48.4	4.1	1
SMF33A	EJM	33	36.7	40.6	1	53.3	3.8	1
SMF36A	EJP	36	40.0	44.2	1	58.1	3.4	1
SMF40A	EJR	40	44.4	49.1	1	64.5	3.1	1
SMF43A	EJT	43	47.8	52.8	1	69.4	2.9	1
SMF45A	EJV	45	50.0	55.3	1	72.7	2.8	1
SMF48A	EJX	48	53.3	58.9	1	77.4	2.6	1
SMF51A	EJZ	51	56.7	62.7	1	82.4	2.4	1
SMF54A	ERE	54	60.0	66.3	1	87.1	2.3	1
SMF58A	ERG	58	64.4	71.2	1	93.6	2.1	1
SMF60A	ERK	60	66.7	73.7	1	96.8	1.8	1
SMF64A	ERM	64	71.1	78.6	1	103	1.7	1
SMF70A	ERP	70	77.8	86	1	113	1.5	1
SMF75A	ERR	75	83.3	92.1	1	121	1.4	1
SMF78A	ERT	78	86.7	95.8	1	126	1.4	1
SMF85A	ERV	85	94.4	104	1	137	1.3	1
SMF90A	ERX	90	100	111	1	146	1.2	1
SMF100A	ERZ	100	111	123	1	162	1.1	1
SMF110A	ESE	110	122	135	1	177	1.0	1
SMF120A	ESG	120	133	147	1	193	0.9	1
SMF130A	ESK	130	144	159	1	209	0.8	1
SMF150A	ESM	150	167	185	1	243	0.7	1
SMF160A	ESP	160	178	197	1	259	0.7	1
SMF170A	ESR	170	189	209	1	275	0.6	1
SMF180A	EST	180	200	220	1	292	0.68	1
SMF190A	ESV	190	211	232	1	308	0.65	1

Typical Characteristics

Figure 1: Peak Pulse Power Rating Curve

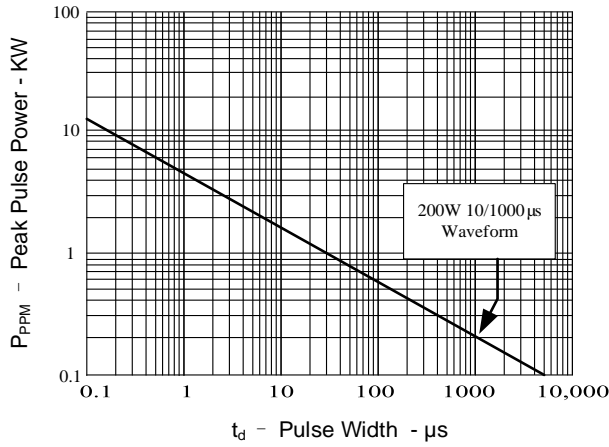


Figure 2: Pulse Derating Curve

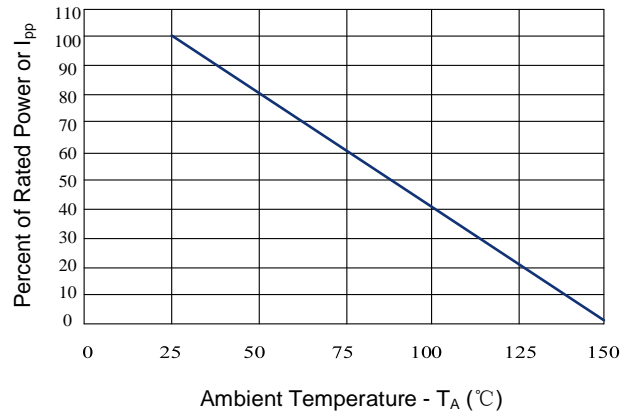


Figure 3: Pulse Waveform

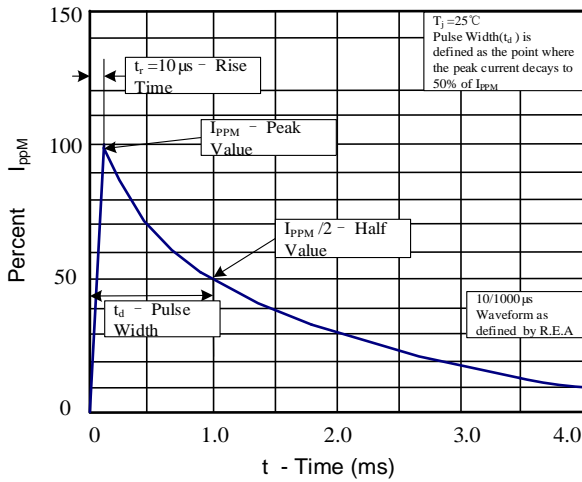


Figure 4: Typical Junction Capacitance

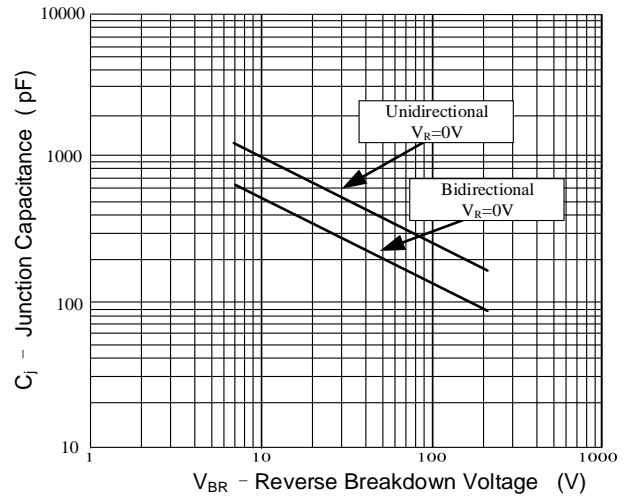


Figure 5: Steady State Power Dissipation Derating Curve

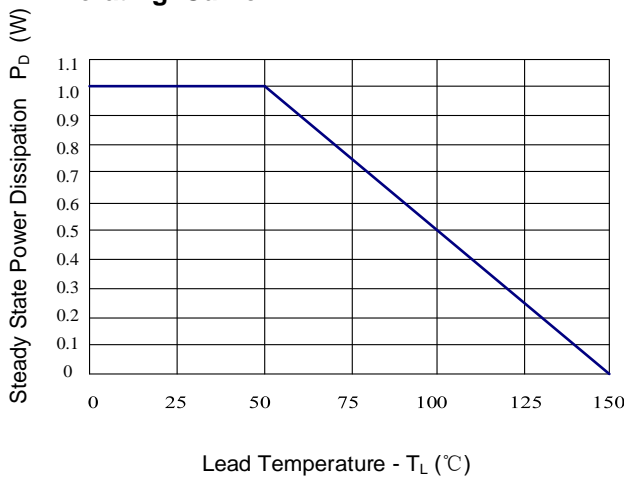
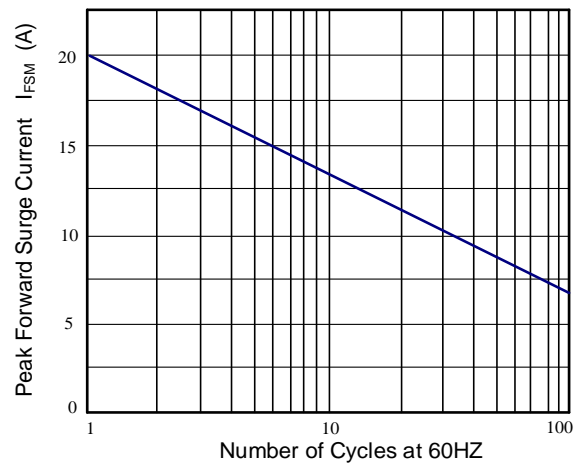


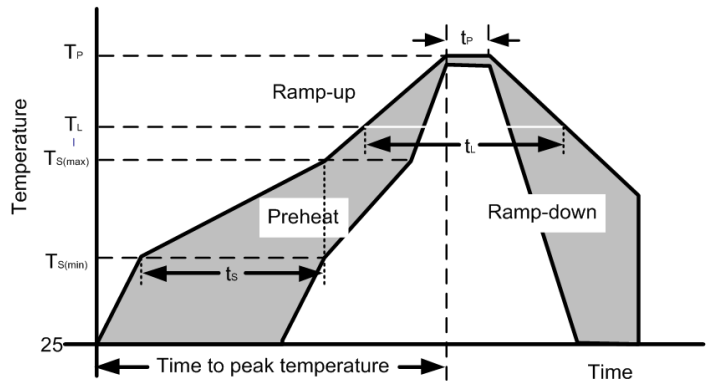
Figure 6: Maximum Non-Repetitive Forward Surge Current Only Unidirectional



Note: The above typical parameters or typical characteristics are only indicative and do not make specific guarantees. If detailed values are required, additional communication and provision are required.

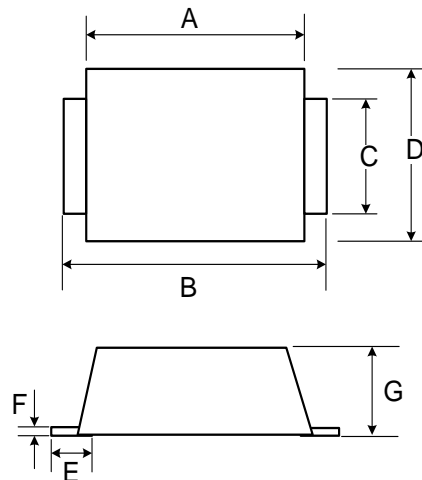
Soldering Parameters

Reflow Condition		
Pre-Heat	Temperature min ( $T_{s(min)}$ )	150°C
	Temperature max ( $T_{s(max)}$ )	200°C
	Time (min to max) ( $t_s$ )	60-190 s
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/s max
Ts(max) to $T_L$ - Ramp-up Rate		3°C/s max
Reflow	Temperature ( $T_L$ ) (Liquidus)	217°C
	Temperature ( $t_L$ )	60-150 s
Peak Temperature ( $T_P$ )		260 <sup>+0/-5</sup> °C
Time within actual peak Temperature ( $t_p$ )		20-40 s
Ramp-down Rate		5°C/s max
Time 25°C to peak Temperature ( $T_P$ )		8 minutes max
Do not exceed		260°C

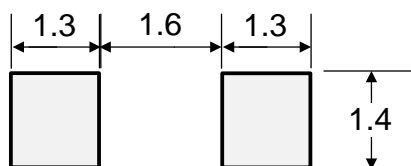


Outline Drawing – SOD-123FL

Ref. (mm)	Millimeters	
	Min.	Max.
A	2.50	2.95
B	3.40	3.95
C	0.70	1.10
D	1.50	1.90
E	0.45	0.95
F	0.05	0.26
G	0.90	1.35

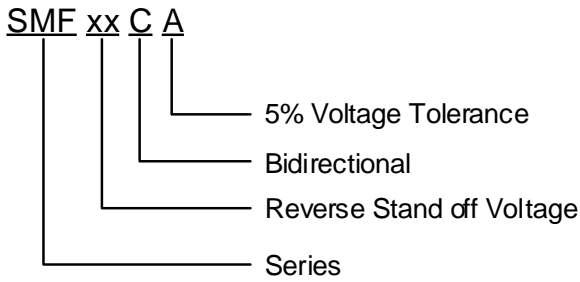


Recommended Solder Pad Layout

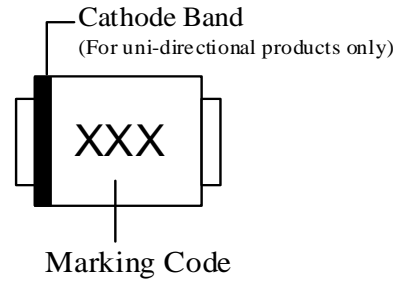


Dimensions in mm

Part Numbering System



Part Marking System

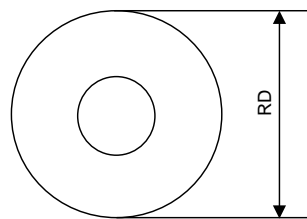


Package Information

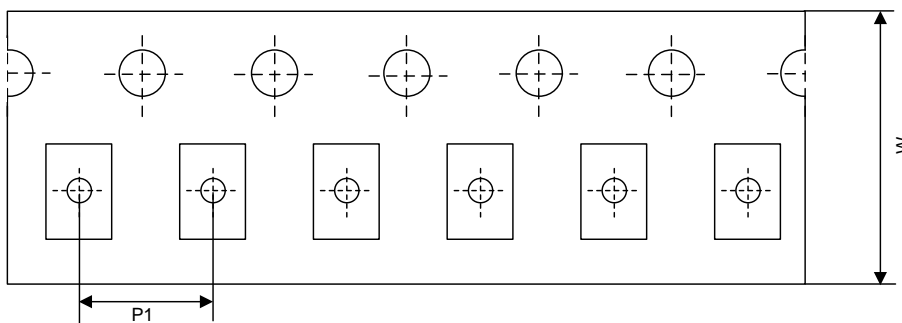
3000 Pcs/Reel

Tape and Reel Information

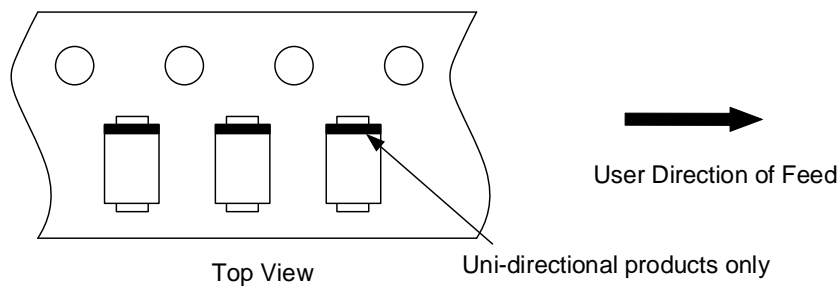
Reel Dimensions



Tape Dimensions



Quadrant Assignments for PIN1 Orientation in tape



RD	Reel Dimensions	7 inch
W	Overall width of the carrier tape	8 mm
P1	Pitch between successive cavity centers	4 mm

## Contact Information

No.1001, Shiwan(7) Road, Pudong District, Shanghai, P.R.China.201207

Tel: 86-21-50310888 Fax: 86-21-50757680 Email: market@way-on.com

WAYON website: <http://www.way-on.com>

For additional information, please contact your local Sales Representative.

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## Product Specification Statement

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. WAYON shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and WAYON assumes no responsibility for the application of the product.

WAYON strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, WAYON cannot guarantee that the information provided in the product specification is entirely accurate and error-free. WAYON shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications. WAYON reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with WAYON to ensure that the product specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult WAYON in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.

Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. WAYON shall assume no responsibility for any consequences resulting from such usage.

Users should also comply with relevant laws, regulations, policies, and standards when using the product specification. Users are responsible for the risks and liabilities arising from the use of the product specification and must ensure that it is not used for illegal purposes. Additionally, users should respect the intellectual property rights related to the product specification and refrain from infringing upon any third-party legal rights. WAYON shall assume no responsibility for any disputes or controversies arising from the above-mentioned issues in any form.