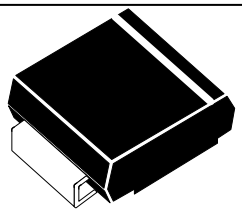
WSxxP4SMA(-B)

Power Transient Voltage Suppressor

Features

- 400 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



SMA
(JEDEC DO-214AC)

Mechanical Characteristics

- JEDEC DO-214AC package
- Molding compound flammability rating: UL 94V-0
- Marking: Marking Code
- Packaging: Tape and Reel per EIA 481
- RoHS & HF & UL497B Compliant

Applications

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

Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power (tp =10/1000μs) (see Note1,2& 3)	P_{PPM}	400	Watts
Peak pulse current (10/1000μs) (see Note2&3)	I_{PPM}	See Electrical Characteristics	A
Peak forward surge current (see Note4&5)	I_{FSM}	40	A
Power dissipation on infinite heat sink T_L = 50 °C (Fig5)	P_D	3.3	W
Operating junction temperature range	T_J	-65 to + 150	℃
Storage temperature range	T_{STG}	-65 to + 150	℃

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

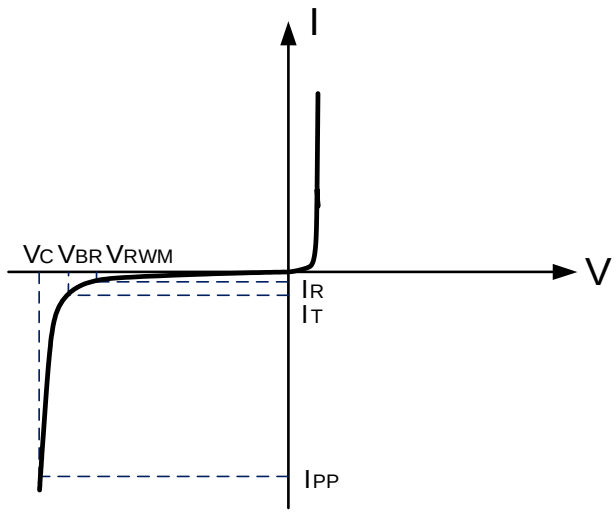
Note2: Peak Pulse Power or Current Derated above T_A=25℃ Per Fig. 2 and Non-Repetitive Current Pulse, Per Fig.3.

Note3: Mounted on 5.0x5.0mm^2 copper pad to each terminal.

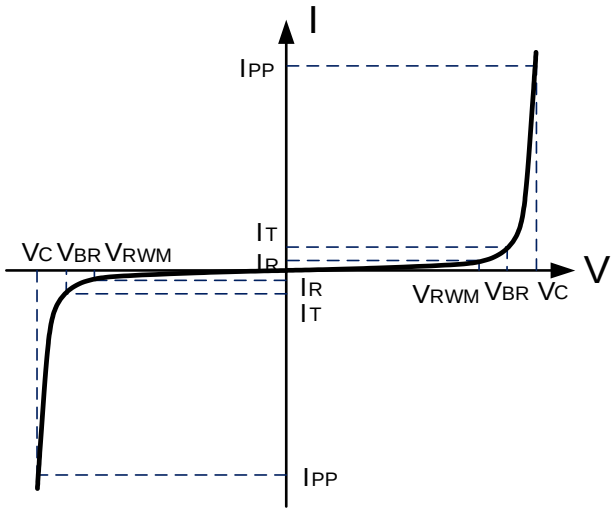
Note4: 8.3ms Single Half Sine Wave or Equivalent Square Wave.

Note5: Maximum Forward Surge Current only for Unidirectional Device per Fig6.

Electrical Characteristics (T_A=25°C unless otherwise noted)



I-V curve of unidirectional device



I-V curve of bidirectional device

Part Number		Reverse Stand off Voltage V_{RWM} (Volts)	Breakdown Voltage V_{BR}(Volts)@I_T		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} (μA)
UNI-POLAR	BI-POLAR		MIN	MAX				
WS5.0P4SMA	WS5.0P4SMA-B	5.0	6.40	7.07	10	9.2	43.5	800
WS6.0P4SMA	WS6.0P4SMA-B	6.0	6.67	7.37	10	10.3	38.8	800
WS6.5P4SMA	WS6.5P4SMA-B	6.5	7.22	7.98	10	11.2	35.7	500
WS7.0P4SMA	WS7.0P4SMA-B	7.0	7.78	8.60	10	12.0	33.3	200
WS7.5P4SMA	WS7.5P4SMA-B	7.5	8.33	9.21	1	12.9	31.0	100
WS8.0P4SMA	WS8.0P4SMA-B	8.0	8.89	9.83	1	13.6	29.4	50
WS8.5P4SMA	WS8.5P4SMA-B	8.5	9.44	10.40	1	14.4	27.8	20
WS9.0P4SMA	WS9.0P4SMA-B	9.0	10.00	11.10	1	15.4	26.0	10
WS10P4SMA	WS10P4SMA-B	10	11.10	12.30	1	17.0	23.5	5
WS11P4SMA	WS11P4SMA-B	11	12.20	13.50	1	18.2	22.0	5
WS12P4SMA	WS12P4SMA-B	12	13.30	14.7	1	19.9	20.1	5
WS13P4SMA	WS13P4SMA-B	13	14.40	15.90	1	21.5	18.6	1
WS14P4SMA	WS14P4SMA-B	14	15.60	17.20	1	23.2	17.2	1
WS15P4SMA	WS15P4SMA-B	15	16.70	18.50	1	24.4	16.4	1
WS16P4SMA	WS16P4SMA-B	16	17.80	19.70	1	26.0	15.4	1
WS17P4SMA	WS17P4SMA-B	17	18.90	20.90	1	27.6	14.5	1
WS18P4SMA	WS18P4SMA-B	18	20.00	22.10	1	29.2	13.7	1
WS20P4SMA	WS20P4SMA-B	20	22.20	24.50	1	32.4	12.3	1
WS22P4SMA	WS22P4SMA-B	22	24.40	26.90	1	35.5	11.3	1

Electrical Characteristics (Cont.)

Part Number		Reverse Stand off Voltage V_{RWM} (Volts)	Breakdown Voltage V_{BR}(Volts)@I_T		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} (μA)
UNI-POLAR	BI-POLAR		MIN	MAX				
WS24P4SMA	WS24P4SMA-B	24	26.70	29.50	1	38.9	10.3	1
WS26P4SMA	WS26P4SMA-B	26	28.90	31.90	1	42.1	9.5	1
WS28P4SMA	WS28P4SMA-B	28	31.10	34.40	1	45.4	8.8	1
WS30P4SMA	WS30P4SMA-B	30	33.30	36.80	1	48.4	8.3	1
WS33P4SMA	WS33P4SMA-B	33	36.70	40.60	1	53.3	7.5	1
WS36P4SMA	WS36P4SMA-B	36	40.00	44.20	1	58.1	6.9	1
WS40P4SMA	WS40P4SMA-B	40	44.40	49.10	1	64.5	6.2	1
WS43P4SMA	WS43P4SMA-B	43	47.80	52.80	1	69.4	5.8	1
WS45P4SMA	WS45P4SMA-B	45	50.00	55.30	1	72.7	5.5	1
WS48P4SMA	WS48P4SMA-B	48	53.30	58.90	1	77.4	5.2	1
WS51P4SMA	WS51P4SMA-B	51	56.70	62.70	1	82.4	4.9	1
WS54P4SMA	WS54P4SMA-B	54	60.00	66.30	1	87.1	4.6	1
WS58P4SMA	WS58P4SMA-B	58	64.40	71.20	1	93.6	4.3	1
WS60P4SMA	WS60P4SMA-B	60	66.70	73.70	1	96.8	4.1	1
WS64P4SMA	WS64P4SMA-B	64	71.10	78.60	1	103	3.9	1
WS70P4SMA	WS70P4SMA-B	70	77.80	86.00	1	113	3.5	1
WS75P4SMA	WS75P4SMA-B	75	83.30	92.10	1	121	3.3	1
WS78P4SMA	WS78P4SMA-B	78	86.70	95.80	1	126	3.2	1
WS85P4SMA	WS85P4SMA-B	85	94.40	104	1	137	2.9	1
WS90P4SMA	WS90P4SMA-B	90	100	111	1	146	2.7	1
WS100P4SMA	WS100P4SMA-B	100	111	123	1	162	2.5	1
WS110P4SMA	WS110P4SMA-B	110	122	135	1	177	2.3	1
WS120P4SMA	WS120P4SMA-B	120	133	147	1	193	2.0	1
WS130P4SMA	WS130P4SMA-B	130	144	159	1	209	1.9	1
WS150P4SMA	WS150P4SMA-B	150	167	185	1	243	1.6	1
WS160P4SMA	WS160P4SMA-B	160	178	197	1	259	1.5	1
WS170P4SMA	WS170P4SMA-B	170	189	209	1	275	1.4	1
WS180P4SMA	WS180P4SMA-B	180	201	222	1	292	1.4	1
WS200P4SMA	WS200P4SMA-B	200	224	247	1	324	1.2	1

Electrical Characteristics (Cont.)

Part Number		Reverse Stand off Voltage V_{RWM} (Volts)	Breakdown Voltage V_{BR}(Volts)@I_T		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} (μA)
UNI-POLAR	BI-POLAR		MIN	MAX				
WS220P4SMA	WS220P4SMA-B	220	246	282	1	356	1.1	1
WS250P4SMA	WS250P4SMA-B	250	279	309	1	405	1.0	1
WS300P4SMA	WS300P4SMA-B	300	335	371	1	486	0.8	1
WS350P4SMA	WS350P4SMA-B	350	391	432	1	567	0.7	1
WS400P4SMA	WS400P4SMA-B	400	447	492	1	648	0.6	1
WS440P4SMA	WS440P4SMA-B	440	492	543	1	713	0.6	1

Typical Characteristics

Figure 1: Peak Pulse Power Rating Curve

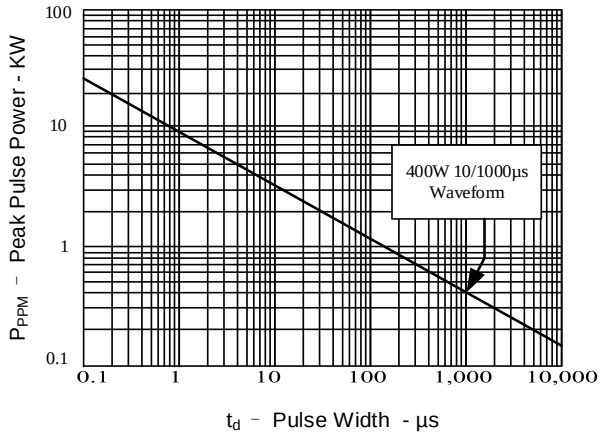


Figure 2: Pulse Derating Curve

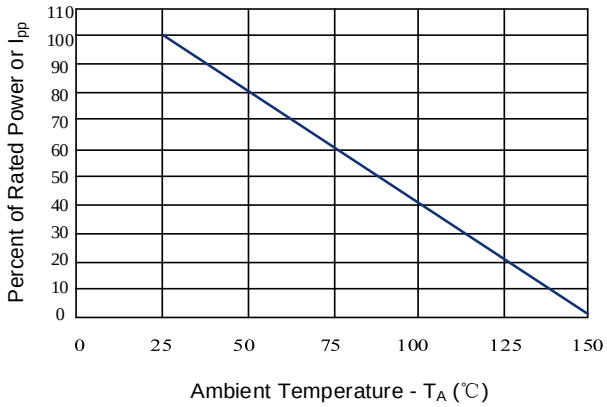


Figure 3: Pulse Waveform

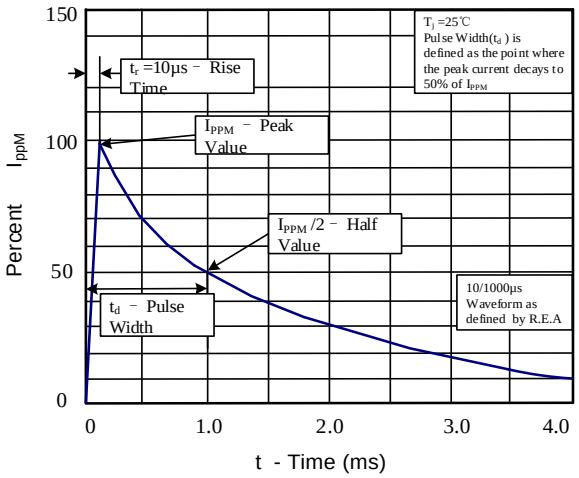


Figure 4: Typical Junction Capacitance

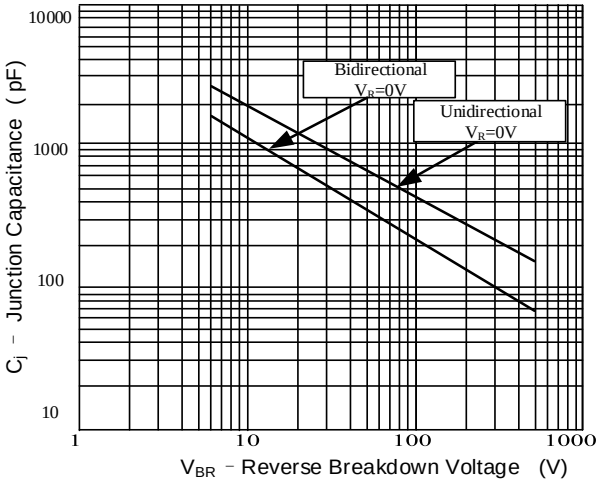


Figure 5: Steady State Power Dissipation Derating Curve

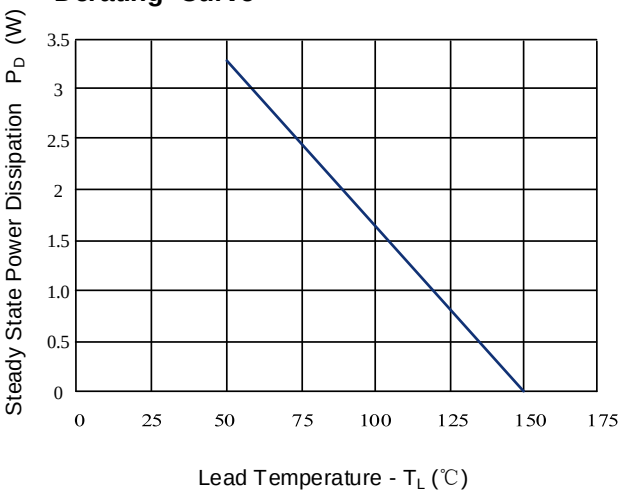
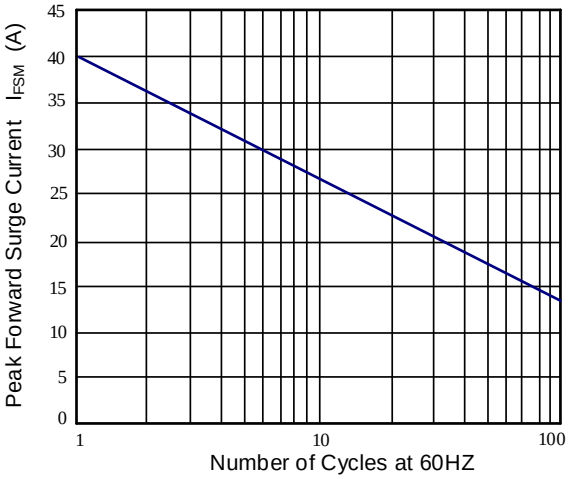


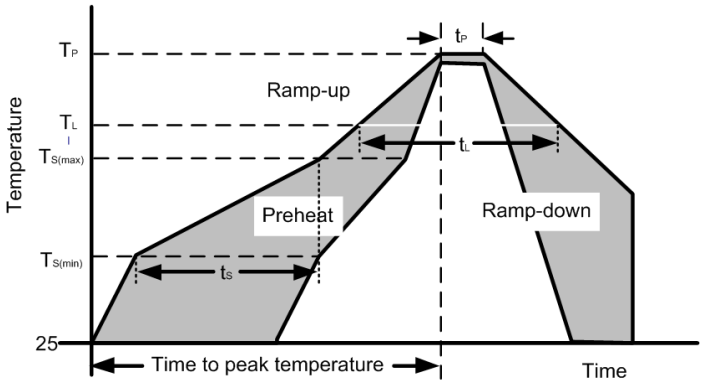
Figure 6: Maximum Non-Repetitive Forward Surge Current Only Unidirectional



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.

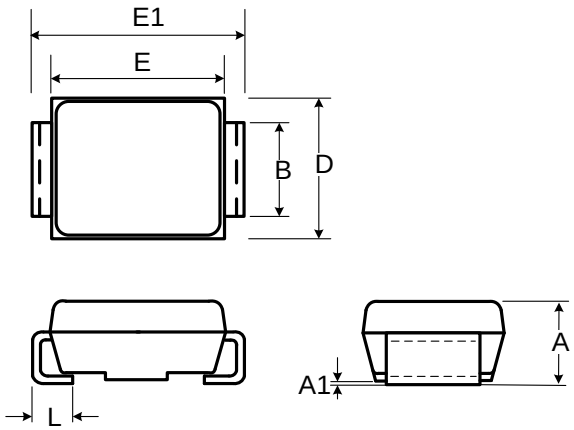
Soldering Parameters

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 TL - Ramp-up Rate		3°C/s max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Temperature (t_L)	60-150 s
Peak Temperature (T_P)		$260^{+0/-5}$ °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

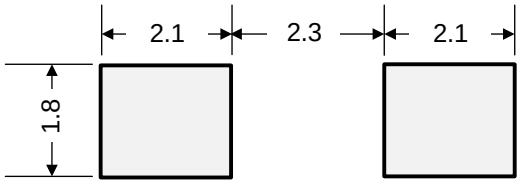


Outline Drawing – SMA(DO-214AC)

Ref.（mm）	Millimeters	
	Min.	Max.
A	1.980	2.290
A1	-	0.203
B	1.250	1.650
E	3.990	4.500
E1	4.930	5.280
D	2.540	2.790
L	0.780	1.520

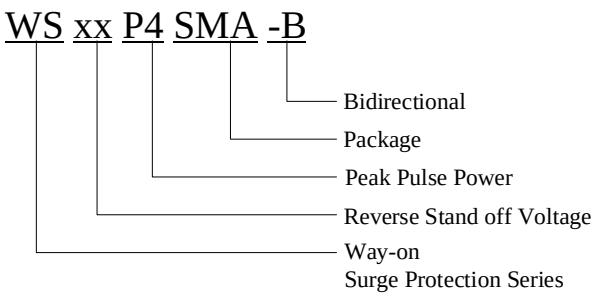


Recommended Solder Pad Layout

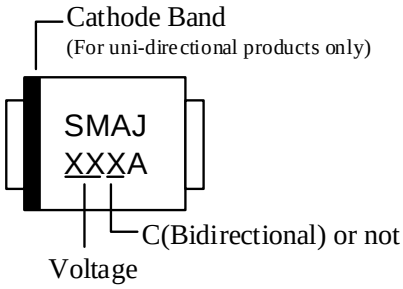


Dimensions in mm

Part Numbering System



Part Marking System



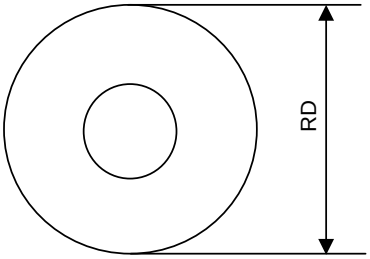
Package Information

Package Type	Description	Quantity（pcs）	Standard
SMA(DO-214AC)	Tape & Reel -12mm/13″ tape	5000	EIA-481-D

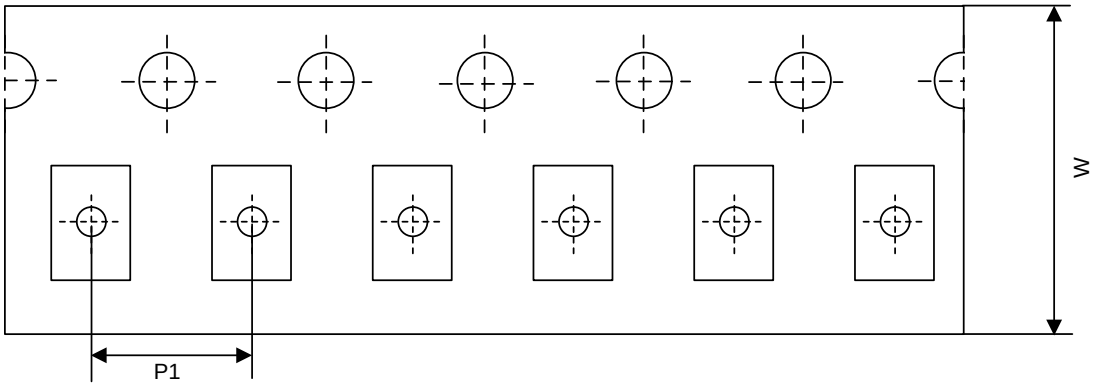
Tape and Reel Information

RD	Reel Dimensions	13 inch
W	Overall width of the carrier tape	12 mm
P1	Pitch between successive cavity centers	4 mm

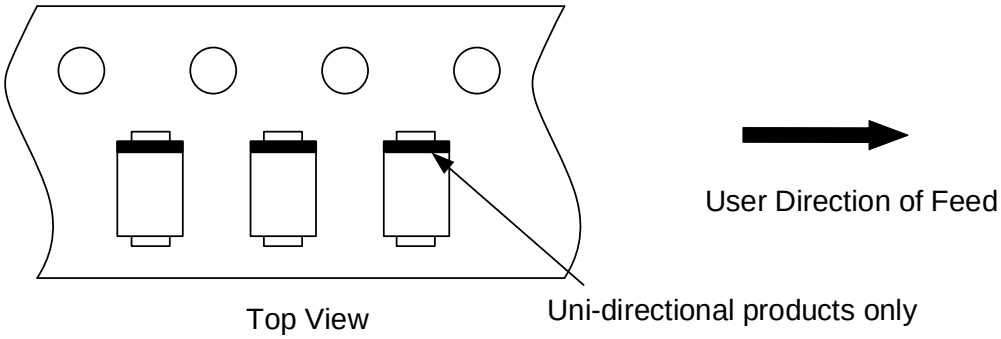
Reel Dimensions



Tape Dimensions



Quadrant Assignments for PIN1 Orientation in tape



CONTACT INFORMATION

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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.

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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.

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