

DATA SHEET

METAL OXIDE VARISTORS POWER SUPPLY

431KD20J-X12

RoHS compliant & Halogen free



Product specification— November 13, 2024 V.0



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Part Number Code

431

(1)

K

(2)

D

(3)

20

(4)

J

(5)

—

X12

(6)

NO:	Item	Digit	Specification
(1)	Varistors Voltage	431	$43 \times 10^1 \text{ V} = 430\text{V} (V_{1\text{mA}})$
(2)	Tolerance of $V_{1\text{mA}}$	K	$K = \pm 10 \%$
(3)	Body shape & encapsulation material	D	D: Round, Epoxy Coating
(4)	Body Size	20	$20 = \Phi 20 \text{ mm}$
(5)	Surge Series	J	High Surge
(6)	Surge	X12	8/20uS 12KA

Dimensions

	Symbol	Dimension (mm)
	H	21.0~26.0
	L(min.)	20.0
	D	20.0~23.0
	F(±1.0)	10.0
	T	3.3~5.7
	d(±0.05)	1.0
	e(±0.8)	3.2

Electrical Characteristics

Model Number: 431KD20J					Part Number: 431KD20J-X12		
Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge current	Maximum Energy (10/1000µs)	Rated Power
V _{AC} (V)	V _{DC} (V)	V _{1mA} (V)	I _P (A)	V _C (V)	I (A)	(J)	(W)
275	350	430(387~473)	100	710	12000	305	1.0

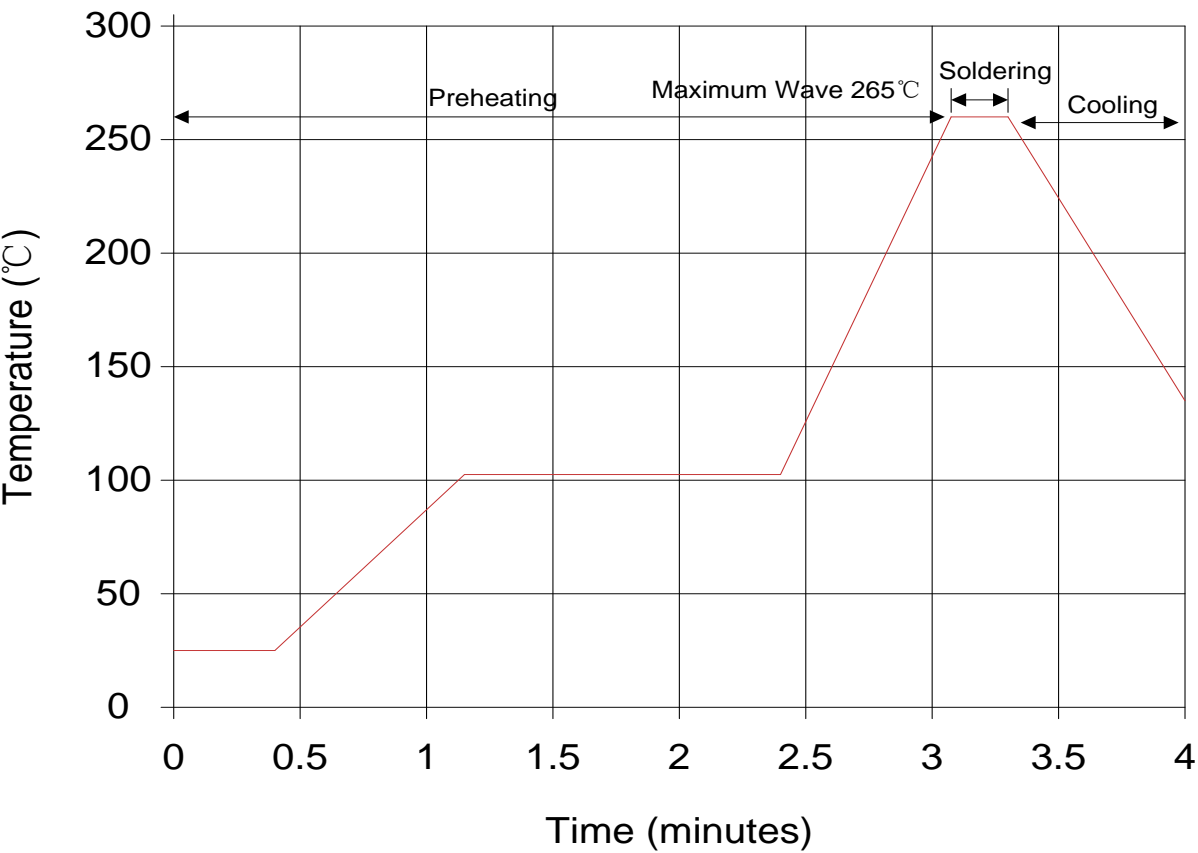
Leakage Current	Impulse Response Time	Typical Capacitance (Reference)	Operating Temperature	Storage Temperature
@83% of V _{1mA} (µA)	nSec	@1KHz (pf)	(°C)	(°C)
≤25	<25	930	-40~ +105	-40~ +125

Reliability

Items	Standard	Test conditions / Methods	Specifications																		
Tensile Strength of Terminals	IEC60068-2-21	Gradually applying the force specified and keeping the unit fixed for 10±1 sec. <table><tr><td>Terminal diameter (mm)</td><td>Force (kg)</td></tr><tr><td>0.5<d≤0.8</td><td>1.0</td></tr><tr><td>0.8<d≤1.25</td><td>2.0</td></tr><tr><td>1.25<d</td><td>4.0</td></tr></table>	Terminal diameter (mm)	Force (kg)	0.5<d≤0.8	1.0	0.8<d≤1.25	2.0	1.25<d	4.0	No visible damage ΔV _{1mA} /V _{1mA} ≤5%										
Terminal diameter (mm)	Force (kg)																				
0.5<d≤0.8	1.0																				
0.8<d≤1.25	2.0																				
1.25<d	4.0																				
Bending Strength of Terminals	IEC60068-2-21	Hold specimen and apply the force specified below to each lead. Bend the specimen to 90°, then return to the original position. Repeat the procedure in the opposite direction. <table><tr><td>Terminal diameter (mm)</td><td>Force (kg)</td></tr><tr><td>0.5<d≤0.8</td><td>0.5</td></tr><tr><td>0.8<d≤1.25</td><td>1.0</td></tr><tr><td>1.25<d</td><td>2.0</td></tr></table>	Terminal diameter (mm)	Force (kg)	0.5<d≤0.8	0.5	0.8<d≤1.25	1.0	1.25<d	2.0	No visible damage ΔV _{1mA} /V _{1mA} ≤5%										
Terminal diameter (mm)	Force (kg)																				
0.5<d≤0.8	0.5																				
0.8<d≤1.25	1.0																				
1.25<d	2.0																				
Vibration	IEC60068-2-6	Frequency range: 10~55 Hz Amplitude: 0.75mm or 98m/s ² Direction: 3 mutually perpendicular directions, 2hrs each.	No visible damage ΔV _{1mA} /V _{1mA} ≤5%																		
Solderability	IEC60068-2-20	Solder Temp: 245±5℃ Dipping Time: 2±0.5 sec	At least 95% of terminal electrode is covered by new solder																		
Resistance to Soldering Heat	IEC60068-2-20	Solder Temp: 260±5℃ Dipping Time: 10±1 sec	No visible damage ΔV _{1mA} /V _{1mA} ≤10%																		
High Temperature Storage	IEC60068-2-2	Ambient Temp: 125±2℃ Duration: 1000±24hrs	No visible damage ΔV _{1mA} /V _{1mA} ≤5%																		
Low Temperature Storage	IEC60068-2-1	Ambient Temp: -40±2℃ Duration: 1000±24hrs	No visible damage ΔV _{1mA} /V _{1mA} ≤5%																		
Damp Heat, Steady State	IEC60068-2-78	The test is divided into two groups . a. 40±2℃ , 90~95% RH for 1344±24hrs b. 40±2℃ , 90~95% RH,at 10%VDC ,1344±24 hrs	No visible damage ΔV _{1mA} /V _{1mA} ≤10% Insulation Resistance ≧ 100MΩ																		
High Temperature Load	MIL-STD-202 Method 108	Ambient Temp: 105±2℃ Duration: 1000±24hrs Load: Max. Allowable Voltage In AC.	ΔV _{1mA} /V _{1mA} ≤10%																		
Temperature Cycle	IEC60068-2-14	<table><tr><td colspan="3">The conditions shown below shall be repeated 5 cycles</td></tr><tr><td>Step</td><td>Temperature (℃)</td><td>Period (minutes)</td></tr><tr><td>1</td><td>-40±3</td><td>30±3</td></tr><tr><td>2</td><td>Room temperature</td><td>5±3</td></tr><tr><td>3</td><td>125±3</td><td>30±3</td></tr><tr><td>4</td><td>Room temperature</td><td>5±3</td></tr></table>	The conditions shown below shall be repeated 5 cycles			Step	Temperature (℃)	Period (minutes)	1	-40±3	30±3	2	Room temperature	5±3	3	125±3	30±3	4	Room temperature	5±3	No visible damage ΔV _{1mA} /V _{1mA} ≤5%
The conditions shown below shall be repeated 5 cycles																					
Step	Temperature (℃)	Period (minutes)																			
1	-40±3	30±3																			
2	Room temperature	5±3																			
3	125±3	30±3																			
4	Room temperature	5±3																			
8/20uS Surge Life	IEC1051-1	8/20μS waveform,10 surge currents, unipolar, interval 30secs,amplitude corresponding to max. surge current derating curves for 20μS.	No visible damage △Vb(1mA) ≧ ±10%																		
10/1000μS Surge Life	IEC1051-1	10/1000μS waveform,10 surge currents, unipolar, interval 2mins,amplitude corresponding to max. surge current derating curves for 1000μS.	No visible damage ΔV _{1mA} /V _{1mA} ≤10%																		
Voltage Proof	IEC61051-1	Metal balls method, 2500Vac 1 min.	No visible damage																		

Soldering Recommendation

Lead-free Wave Soldering Recommendation




Item	Conditions
Peak Temperature	265°C
Dipping Time	10 seconds (max.)
Soldering	1 time

Recommendation Reworking Conditions with Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360°C (max.)
Soldering Time	3 seconds (max.)
Distance from Varistor	2mm (min.)

Safety Approval (Model No:431KD20J)

Agency	Evaluated to	Certificate No.	
		BrightKing	YAGEO
	UL 1449 4th	E327997	E504762
	IEC 61051-1:2007 IEC 61051-2:1991 IEC 61051-2:1991/AMD1:2009 IEC 61051-2-2:1991	40050493	40053394
	CSA 269. 5-17	2161766	80073905
	GB/T1093-1997 GB/T10194-1997 GB4943.1-2011 GB8898-2011	20D : CQC08001027200	20D: CQC21001289068

Note:The safety certificate number is based on the official website, and the safety certificate number in the specification is subject to change without notice.

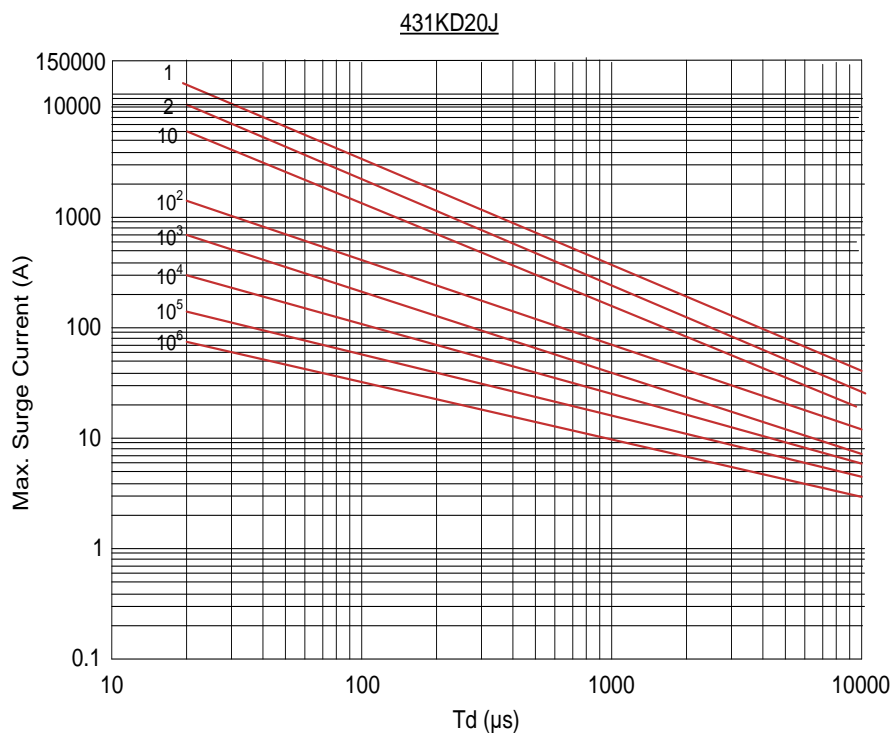
Certificate

- 1.ISO 9001 certificate
- 2.IATF 16949 certificate

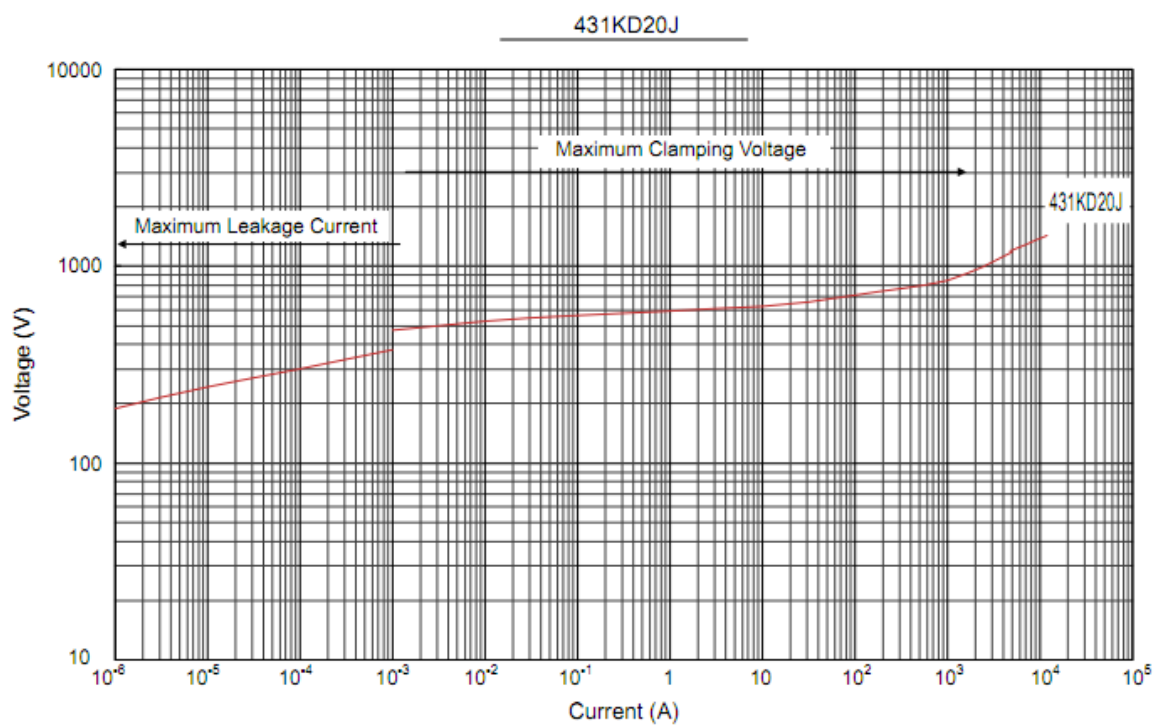
Test Report

- 1.RoHS SGS test report
- 2.Halogen-free test report

Maximum Surge Current Derating Curve

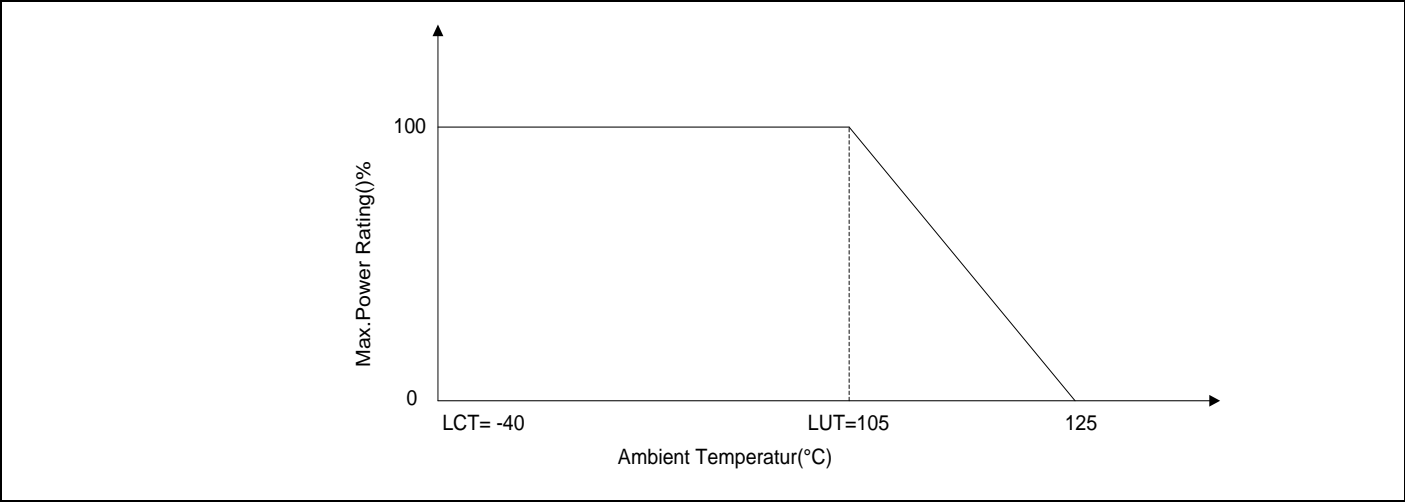


Max. Leakage Current and Max. Clamping Voltage Curve

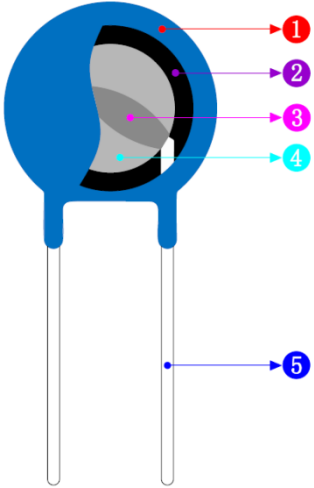


Power Derating Curve

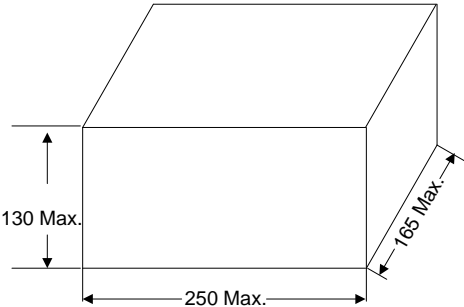
When operating temperature exceeds 105 °C, the power, the Max. continuous operation Voltage, the Max. Surge Current and the Max. Energy should be derated as below figure, the derated coefficient is -5%.



Structure

	NO	Part name
	①	Coating
	②	Varistor Element
	③	Solder
	④	Electrode
	⑤	Leads wire

Quantity

Packaging Dimensions (Unit: mm)	Quantity
<div>In bulk for Terminals Untrimmed Products</div> <div></div>	<div>200pcs/bag</div> <div>4bags/box</div>

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