

SMD metal oxide varistors

SMD varistors, High Surge, 4032 series

Series/Type: VCRR4032*KJ**
Orderingcode:VCRR4032*KJ**

Date: January 2020
Version: 1

Features

- Improved component design in a compact case
- High surge current capability of up to 500A-3500A
- Superior performance at high temperature
- White package design without shadow in LED lighting application
- SMD mountable disk varistors, suitable for lead-free reflow / wave soldering

Applications

- Power supplies for telecommunication systems
- Protection for LED circuits
- Protection for consumer, industrial equipment
- Protection for automotive electronics

Type Code Designation

VCRR	4032	-	471	K
Logo	Size	Separate	Varistor voltage	J: ±5% K: ±10%
	2220(5750)		180=18V	
	3220(8050)		471=470V	
	3325(8060)		102=1000V	
	4032(1008)			

Internal Chip Size

Page Size	Chip Size	Page Size	Chip Size
2220	4*4mm	3225	5*5mm
3220	5*5mm	4032	7*7mm

General Technical Data

Parameter	Value	Unit
Operating temperature	-55 to +125	℃
Storage temperature	-55 to +150	℃
Electric strength	≥2.5	kV _{RMS}
Insulation resistance	≥100	MΩ

Electrical Characteristics

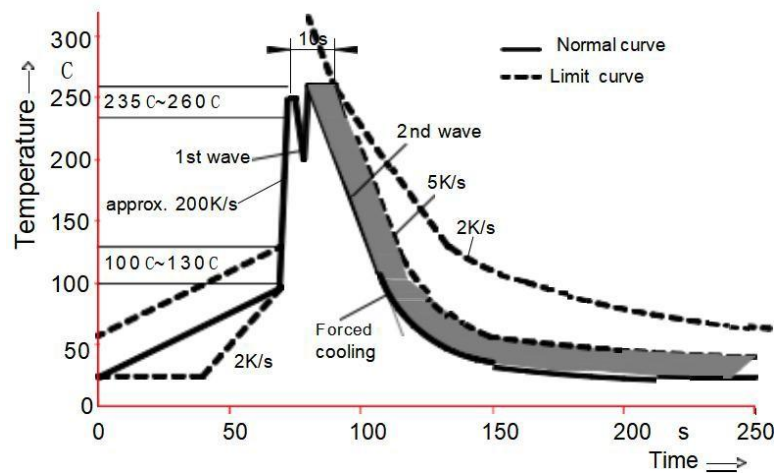
Part Number	Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current	Energy 10/1000 μ S		Rated Power	Typical Capacitance (Reference)
	AC (V)	DC (V)		IP(A)	VC(V)		(J) Standard	(J) High Surge		
Standard			V0.1mA(V)			I(A) Standard			(W)	@ 1 KHzPF
4032-180KJ	11	14	18(15.3~20.7)	2.5	36	800	0.9	2.1	0.05	5600
4032-220KJ	14	18	22(19.8~24.2)	2.5	43	800	1.1	2.5	0.05	4500
4032-270KJ	17	22	27(24.3~29.7)	2.5	53	800	1.4	3.0	0.05	3700
4032-330KJ	20	26	33(29.7~36.3)	2.5	65	800	1.7	4.0	0.05	3000
4032-390KJ	25	31	39(35.1~42.9)	2.5	77	800	2.1	4.6	0.05	2400
4032-470KJ	30	38	47(42.3~51.7)	2.5	93	800	2.5	5.5	0.05	2100
4032-560KJ	35	45	56(50.4~61.6)	2.5	110	800	3.1	7.0	0.05	1800
4032-680KJ	40	56	68(61.2~74.8)	2.5	135	800	3.6	8.2	0.05	1500
4032-820KJ	50	65	82(73.8~90.2)	10	135	1750	5.5	12	0.4	1200
4032-101KJ	60	85	100(90~110)	10	165	1750	6.5	15	0.4	1000
4032-121KJ	75	100	120(108~132)	10	200	3500	7.8	18	0.4	830
4032-151KJ	95	125	150(135~165)	10	250	3500	9.7	22	0.4	670
4032-181KJ	115	150	180(162~198)	10	300	3500	11.7	27	0.4	560
4032-201KJ	130	170	200(185~225)	10	330	3500	13	30	0.4	500
4032-221KJ	140	180	220(198~242)	10	360	3500	14	32	0.4	450
4032-241KJ	150	200	240(216~264)	10	395	3500	15	35	0.4	420
4032-271KJ	175	225	270(243~297)	10	455	3500	18	37	0.4	370
4032-301KJ	190	250	300(270~330)	10	505	3500	20	40	0.4	330
4032-331KJ	210	275	330(297~363)	10	550	3500	23	43	0.4	300
4032-361KJ	230	300	360(324~396)	10	595	3500	25	47	0.4	280
4032-391KJ	250	320	390(351~429)	10	650	3500	25	60	0.4	260
4032-431KJ	275	350	430(387~473)	10	710	3500	28	65	0.4	230
4032-471KJ	300	385	470(423~517)	10	775	3500	30	67	0.4	210
4032-511KJ	320	415	510(459~561)	10	845	3500	30	69	0.4	200
4032-561KJ	350	460	560(504~616)	10	920	3500	30	70	0.4	180
4032-621KJ	385	505	620(558~682)	10	1025	3500	33	72	0.4	160
4032-681KJ	420	560	680(612~748)	10	1120	3500	33	75	0.4	150
4032-751KJ	460	615	750(675~825)	10	1240	3500	65	78	0.4	140
4032-781KJ	485	640	780(702~858)	10	1290	3500	65	79	0.4	130
4032-821KJ	510	670	820(738~902)	10	1355	3500	65	80	0.4	120

Soldering Guidelines

The usage of mild, non-activated fluxes for soldering is recommended, as well as proper cleaning of the PCB.

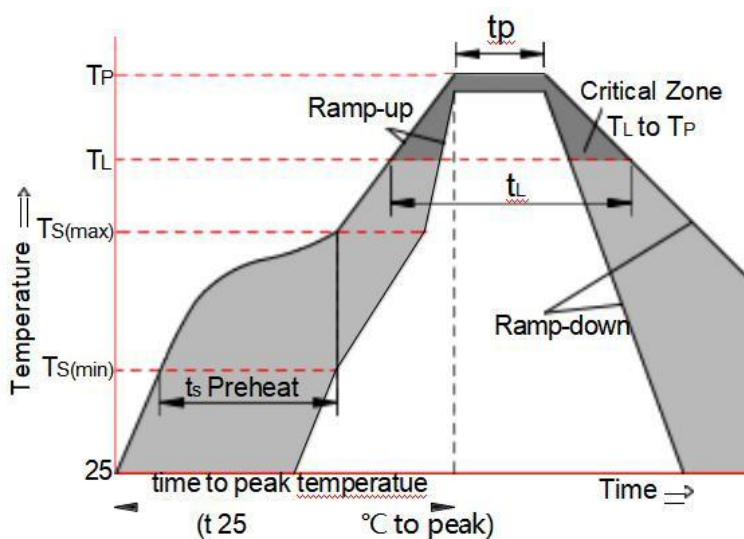
The components are suitable for reflow soldering per JEDEC J-STD-020C.

Wave Soldering



Temperature characteristics at component terminal with dual-wave soldering

Reflow Soldering



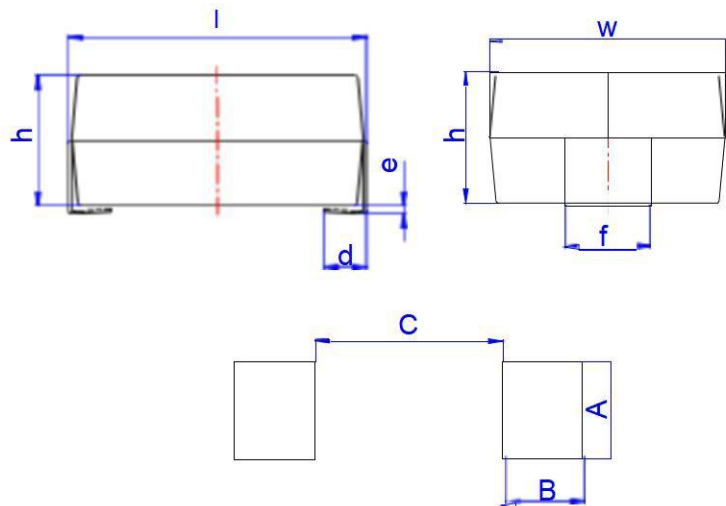
Profile feature		Sn-Pb assembly	Pb-Free assembly
Average ramp-up rate ($T_{S(max)}$ to T_P)		3 C/ sec. Max	3 C/ sec. Max
Preheat	-Temperature min. ($T_{S(min)}$)	+ 10 0 C	+ 15 0 C
	-Temperature max. ($T_{S(max)}$)	+ 15 0 C	+ 20 0 C
	-Time (t_{Smin} to t_{Smax})	60-120 secs.	60-180 secs.
$T_{S(max)}$ to T_L - Ramp-up Rate		3 C/ sec. Max	3 C/ sec. Max
Time maintained above	-Temperature min. (T_L)	+ 18 3 C	+ 21 7 C
	-Time (t_L)	60-150 secs.	60-150 secs.
Peak classification temperature (T_P)		+220 C to +240C	+240 C to +260C
Time within 5C of actual peak temperature (t_p)		10 secs. to 30 secs.	20 secs. to 40 secs.
Ramp-down rate		6 C/ sec. max.	6 C/ sec. max.
Time 25C to peak temperature		6 min. max.	8 min. max.

Notes: All temperature refer to topside of the package, measured on the package body surface
Maximum number of reflow cycles: 3

Storage Condition

- As far as possible, the components should be employed within 24 months after delivery from Kangtai Semiconductor.
- They should be left in their original packing to avoid soldering problems due to oxidized contacts.
- Storage temperature: - 25 up to + 45°C.
- Relative humidity: < 75 % annual average, < 95 % on max. 30 days in a year.

Dimensional Drawings

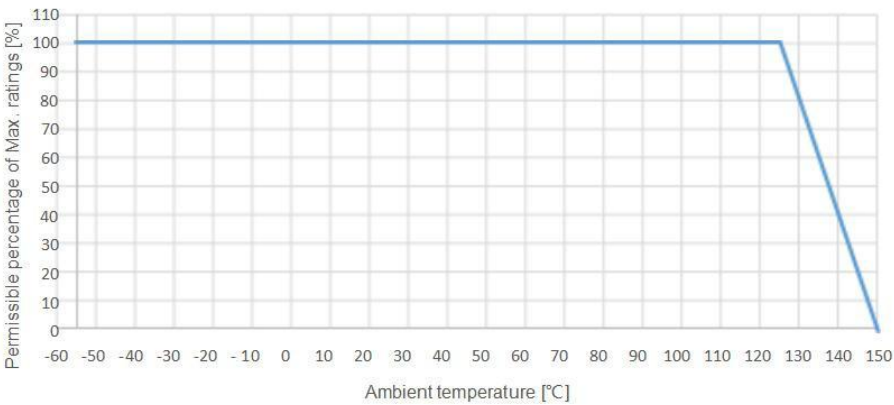


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
l	7.7		8.3	0.303		0.327
w	6.0		6.6	0.236		0.260
h	3.3		4.0	0.122		0.150
d	1.2		1.8	0.047		0.071
e	0		0.3	0		0.012
f	2.70		3.3	0.106		0.130
A		3.5			0.138	
B		2.8			0.110	
C		4.5			0.177	

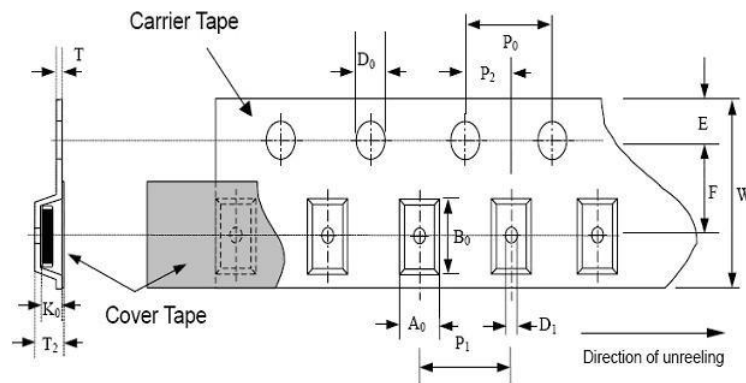
Recommended solder pad layout

Temperature Rating Curve

Max. current, energy, operating voltage and average power dissipation depending on ambient temperature

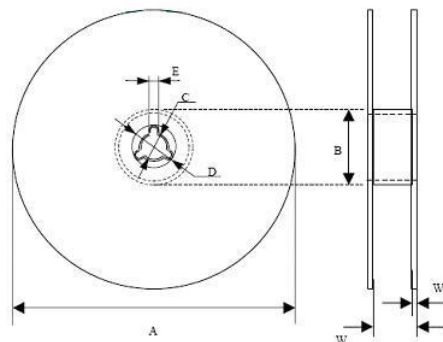


Packaging Specification



Type	A ₀ ±0.20	B ₀ ±0.20	K ₀ ±0.10	T max	T ₂ max	D ₀ +0.05	D ₁ ±0.05	P ₁ ±0.10	P ₂ ±0.05	P ₀ ±0.1	W ±0.30	E ±0.10	F ±0.05
4032	7.0	8.7	3.85	0.3	5.50	1.55	1.55	12.00	2.00	4.00	16.00	1.75	7.50
4032	8.4	10.8	3.85	0.3	5.50	1.55	1.55	12.00	2.00	4.00	24.00	1.75	11.50

Reel dimension



Type	A	B	C	D	E	W-W1	W ₁
4032	329.0±1.0	60.0±0.5	13.0±0.2	21.0±0.2	2.0±0.5	17.2±0.7	2.3±0.15

Quantity of taping packing(pcs) : 1500

