Metal Oxide Varistors-Q Series (Automotive Grade) Data Sheet

Feature

■Varistor voltage range from 82V to 1000V

■Operating Temperature: -40℃~ +105℃

■Storage Temperature: 15℃~35℃

Applications

■The over-voltage protection for transistors, IC, SCR and semiconductor switching components and a variety of electronic, electrical equipment

■Surge absorption and over-voltage protection for household appliances

■Industrial electrical surge absorption

■Electrostatic discharge and noise signal cancellation

■Surge absorption of relays and solenoid valves

■Over-voltage protection for leakage switch

■The lightning protection and over-voltage protection for Telephone program-controlled switches and communications equipment

■Meet AEC-Q200 quality standard

Applicable Standard

Approval		Organization	Safety Standards	Certificate No.
China	CQC	CQC	GB/T10193 GB/T10194 GB 4943.1-2022; IEC 61051-2:1991 +Amd1:2009	10D: CQC19001213188
				14D: CQC19001213191
				20D: CQC19001213192
USA Canada	c UL us	UL/cUL	UL1449	E330837
Germany	VDE REG C559	VDE	IEC61051 IEC60950-1:2013 IEC62368-1:2018/G.8.1	40023049

Part numbering on request.

Electrical Characteristics

10D-Q Series

Part Number	Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Peak Current Rating(8/20μs)		Maximum Energy (10/1000μs)	Rated Power	Typical Capacitance (Reference)
	AC_{rms} (V)	DC_{rms} (V)	V_{1mA} (V)	VC (V)	IP (A)	1 pulse (A)	2 pulse (A)	(J)	(W)	1KHz (pF)
STE-10D391KQ	250	320	390(351-429)	650	25	3500	2500	81.2	0.4	300
STE-10D431KQ	275	350	430(387-473)	710	25	3500	2500	68.2	0.4	270
STE-10D471KQ	300	385	470(423-517)	775	25	3500	2500	99.4	0.4	230
STE-10D511KQ	320	415	510(459-561)	845	25	3500	2500	99.4	0.4	210
STE-10D561KQ	350	460	560(504-616)	925	25	3500	2500	99.4	0.4	180
STE-10D621KQ	385	505	620(558-682)	1025	25	3500	2500	102.2	0.4	190
STE-10D681KQ	420	560	680(612-748)	1120	25	3500	2500	102.2	0.4	170
STE-10D751KQ	460	615	750(675-825)	1240	25	3500	2500	124.6	0.4	160
STE-10D821KQ	510	670	820(738-902)	1355	25	3500	2500	124.6	0.4	140
STE-10D911KQ	550	745	910(819-1001)	1500	25	3500	2500	133	0.4	120
STE-10D102KQ	625	825	1000(900-1100)	1650	25	3500	2500	133	0.4	110

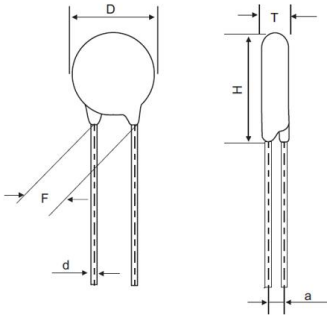
14D-Q Series

Part Number	Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Peak Current Rating(8/20μs)		Maximum Energy (10/1000μs)	Rated Power	Typical Capacitance (Reference)
	AC_{rms} (V)	DC_{rms} (V)	V_{1mA} (V)	VC (V)	IP (A)	1 pulse (A)	2 pulse (A)	(J)	(W)	1KHz (pF)
STE-14D820KQ	50	65	82(74-90)	135	50	6000	4500	29.4	0.6	3700
STE-14D101KQ	60	85	100(90-110)	165	50	6000	4500	33.6	0.6	3200
STE-14D121KQ	75	100	120(108-132)	200	50	6000	4500	40.6	0.6	2700
STE-14D151KQ	95	125	150(135-165)	250	50	6000	4500	51.8	0.6	2200
STE-14D181KQ	115	150	180(162-198)	300	50	6000	4500	58.8	0.6	1100
STE-14D201KQ	130	170	200(180-220)	340	50	6000	4500	79.8	0.6	770
STE-14D221KQ	140	180	220(198-242)	360	50	6000	4500	79.8	0.6	740
STE-14D241KQ	150	200	240(216-264)	395	50	6000	4500	82.6	0.6	700
STE-14D271KQ	175	225	270(243-297)	455	50	6000	4500	93.8	0.6	640
STE-14D301KQ	190	250	300(270-330)	500	50	6000	4500	103.6	0.6	670
STE-14D331KQ	210	275	330(297-363)	550	50	6000	4500	112	0.6	580
STE-14D361KQ	230	300	360(324-396)	595	50	6000	4500	123.2	0.6	540
STE-14D391KQ	250	320	390(351-429)	650	50	6000	4500	134.4	0.6	500
STE-14D431KQ	275	350	430(387-473)	710	50	6000	4500	145.6	0.6	450
STE-14D471KQ	300	385	470(423-517)	775	50	6000	4500	149.8	0.6	400
STE-14D511KQ	320	415	510(459-561)	845	50	6000	4500	149.8	0.6	350
STE-14D561KQ	350	460	560(504-616)	925	50	6000	4500	149.8	0.6	360
STE-14D621KQ	385	505	620(558-682)	1025	50	6000	4500	168	0.6	330
STE-14D681KQ	420	560	680(612-748)	1120	50	6000	4500	168	0.6	320
STE-14D751KQ	460	615	750(675-825)	1240	50	6000	4500	203	0.6	310
STE-14D821KQ	510	670	820(738-902)	1355	50	6000	4500	203	0.6	280
STE-14D911KQ	550	745	910(819-1001)	1500	50	6000	4500	217	0.6	250
STE-14D102KQ	625	825	1000(900-1100)	1650	50	6000	4500	217	0.6	230

20D-Q Series

Part Number	Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Peak Current Rating(8/20μs)		Maximum Energy (10/1000μs)	Rated Power	Typical Capacitance (Reference)
	AC_{rms} (V)	DC_{rms} (V)	V_{1mA} (V)	VC (V)	IP (A)	1 pulse (A)	2 pulse (A)	(J)	(W)	1KHz (pF)
STE-20D820KQ	50	65	82(74-90)	135	100	10000	6500	37.8	1.0	7500
STE-20D101KQ	60	85	100(90-110)	165	100	10000	6500	42	1.0	6500
STE-20D121KQ	75	100	120(108-132)	200	100	10000	6500	56	1.0	5500
STE-20D151KQ	95	125	150(135-165)	250	100	10000	6500	70	1.0	4500
STE-20D181KQ	115	150	180(162-198)	300	100	10000	6500	84	1.0	2200
STE-20D201KQ	130	170	200(180-220)	340	100	10000	6500	98	1.0	1700
STE-20D221KQ	140	180	220(198-242)	360	100	10000	6500	105	1.0	1600
STE-20D241KQ	150	200	240(216-264)	395	100	10000	6500	112	1.0	1500
STE-20D271KQ	175	225	270(243-297)	455	100	10000	6500	126	1.0	1300
STE-20D301KQ	190	250	300(270-330)	500	100	10000	6500	133	1.0	1300
STE-20D331KQ	210	275	330(297-363)	550	100	10000	6500	140	1.0	1100
STE-20D361KQ	230	300	360(324-396)	595	100	10000	6500	168	1.0	1100
STE-20D391KQ	250	320	390(351-429)	650	100	10000	6500	182	1.0	1100
STE-20D431KQ	275	350	430(387-473)	710	100	10000	6500	196	1.0	1000
STE-20D471KQ	300	385	470(423-517)	775	100	10000	6500	210	1.0	900
STE-20D511KQ	320	415	510(459-561)	845	100	10000	6500	210	1.0	800
STE-20D561KQ	350	460	560(504-616)	925	100	10000	6500	210	1.0	710
STE-20D621KQ	385	505	620(558-682)	1025	100	10000	6500	224	1.0	700
STE-20D681KQ	420	560	680(612-748)	1120	100	10000	6500	224	1.0	650
STE-20D751KQ	460	615	750(675-825)	1240	100	10000	6500	266	1.0	600
STE-20D821KQ	510	670	820(738-902)	1355	100	10000	6500	266	1.0	530
STE-20D911KQ	550	745	910(819-1001)	1500	100	10000	6500	280	1.0	500
STE-20D102KQ	625	825	1000(900-1100)	1650	100	10000	6500	280	1.0	450

Dimensions (mm) and Approval



10D-Q Series

Part No.	Size (mm)				Approval			
	D Max.	T Max.	F±0.5	d±0.05	CQC	VDE	UL (USA)	cUL (Canada)
STE-10D391KQ	14.0	6.0	7.5	0.7	√	√	√	√
STE-10D431KQ	14.0	6.5	7.5	0.7	√	√	√	√
STE-10D471KQ	14.0	6.5	7.5	0.7	√	√	√	√
STE-10D511KQ	14.0	7.0	7.5	0.7	√	√	√	√
STE-10D561KQ	14.0	7.0	7.5	0.7	√	√	√	√
STE-10D621KQ	14.0	7.5	7.5	0.7	√	√	√	√
STE-10D681KQ	14.0	8.0	7.5	0.7	√	√	√	√
STE-10D751KQ	14.0	8.0	7.5	0.7	√	√	√	√
STE-10D821KQ	14.0	8.5	7.5	0.7	√	√	√	√
STE-10D911KQ	14.0	9.0	7.5	0.7	√	√	√	√
STE-10D102KQ	14.0	9.5	7.5	0.7	√	√	√	√

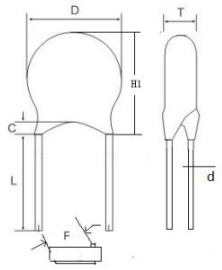
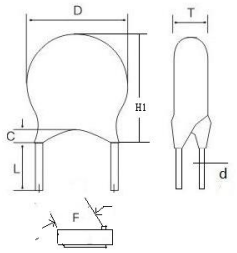
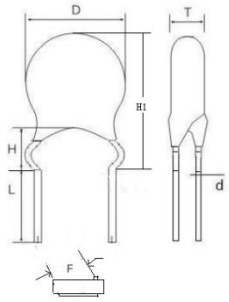
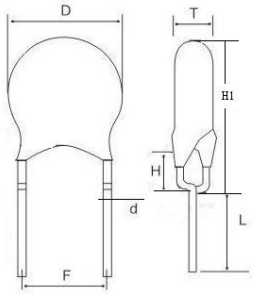
14D-Q Series

Part No.	Size (mm)				Approval			
	D Max.	T Max.	F±0.5	d±0.05	CQC	VDE	UL (USA)	cUL (Canada)
STE-14D820KQ	16.5	4.5	7.5	0.7	√	√	√	√
STE-14D101KQ	16.5	4.5	7.5	0.7	√	√	√	√
STE-14D121KQ	16.5	4.5	7.5	0.7	√	√	√	√
STE-14D151KQ	16.5	5.0	7.5	0.7	√	√	√	√
STE-14D181KQ	16.5	5.0	7.5	0.7	√	√	√	√
STE-14D201KQ	16.5	5.0	7.5	0.7	√	√	√	√
STE-14D221KQ	16.5	5.5	7.5	0.7	√	√	√	√
STE-14D241KQ	16.5	5.0	7.5	0.7	√	√	√	√
STE-14D271KQ	16.5	5.0	7.5	0.7	√	√	√	√
STE-14D301KQ	16.5	5.0	7.5	0.7	√	√	√	√
STE-14D331KQ	16.5	5.5	7.5	0.7	√	√	√	√
STE-14D361KQ	16.5	5.5	7.5	0.7	√	√	√	√
STE-14D391KQ	16.5	6.0	7.5	0.7	√	√	√	√
STE-14D431KQ	16.5	6.0	7.5	0.7	√	√	√	√
STE-14D471KQ	16.5	6.5	7.5	0.7	√	√	√	√
STE-14D511KQ	16.5	6.5	7.5	0.7	√	√	√	√
STE-14D561KQ	16.5	7.0	7.5	0.7	√	√	√	√
STE-14D621KQ	16.5	7.0	7.5	0.7	√	√	√	√
STE-14D681KQ	16.5	7.5	7.5	0.7	√	√	√	√
STE-14D751KQ	16.5	8.0	7.5	0.7	√	√	√	√
STE-14D821KQ	16.5	8.5	7.5	0.7	√	√	√	√
STE-14D911KQ	16.5	9.0	7.5	0.7	√	√	√	√
STE-14D102KQ	16.5	9.5	7.5	0.7	√	√	√	√

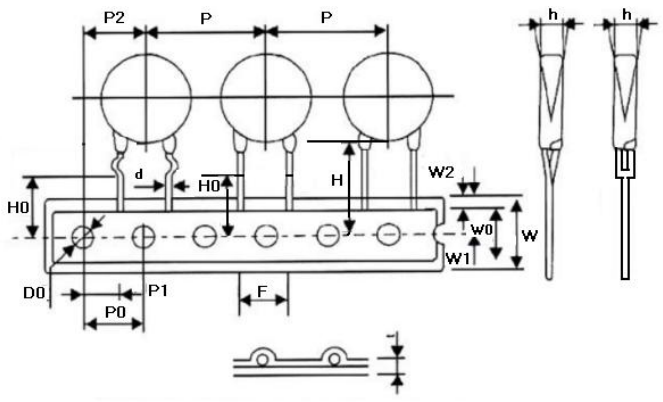
20D-Q Series

Part No.	Size (mm)					Approval			
	D Max.	T Max.	F± 0.5	d±0.05		CQC	VDE	UL (USA)	cUL (Canada)
				Straight lead	Crimped lead				
STE-20D820KQ	21.0	4.5	10.0	1.0	0.8	√	√	√	√
STE-20D101KQ	21.0	5.0	10.0	1.0	0.8	√	√	√	√
STE-20D121KQ	21.0	5.0	10.0	1.0	0.8	√	√	√	√
STE-20D151KQ	21.0	5.5	10.0	1.0	0.8	√	√	√	√
STE-20D181KQ	21.0	5.5	10.0	1.0	0.8	√	√	√	√
STE-20D201KQ	21.0	5.5	10.0	1.0	0.8	√	√	√	√
STE-20D221KQ	21.0	6.0	10.0	1.0	0.8	√	√	√	√
STE-20D241KQ	21.0	5.5	10.0	1.0	0.8	√	√	√	√
STE-20D271KQ	21.0	6.0	10.0	1.0	0.8	√	√	√	√
STE-20D301KQ	21.0	6.0	10.0	1.0	0.8	√	√	√	√
STE-20D331KQ	21.0	6.0	10.0	1.0	0.8	√	√	√	√
STE-20D361KQ	21.0	6.0	10.0	1.0	0.8	√	√	√	√
STE-20D391KQ	21.0	6.5	10.0	1.0	0.8	√	√	√	√
STE-20D431KQ	21.0	6.5	10.0	1.0	0.8	√	√	√	√
STE-20D471KQ	21.0	7.0	10.0	1.0	0.8	√	√	√	√
STE-20D511KQ	21.0	7.0	10.0	1.0	0.8	√	√	√	√
STE-20D561KQ	21.0	7.5	10.0	1.0	0.8	√	√	√	√
STE-20D621KQ	21.0	7.5	10.0	1.0	0.8	√	√	√	√
STE-20D681KQ	21.0	8.0	10.0	1.0	0.8	√	√	√	√
STE-20D751KQ	21.0	8.0	10.0	1.0	0.8	√	√	√	√
STE-20D821KQ	21.0	8.5	10.0	1.0	0.8	√	√	√	√
STE-20D911KQ	21.0	9.0	10.0	1.0	0.8	√	√	√	√
STE-20D102KQ	21.0	9.5	10.0	1.0	0.8	√	√	√	√

Lead Configuration

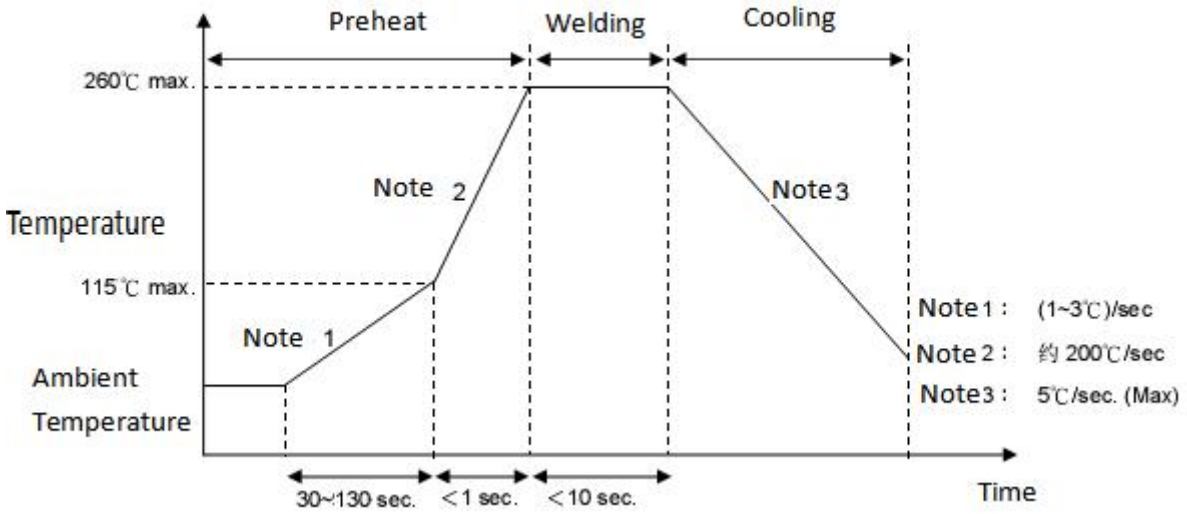
Lead Style	Drawing	Lead Length L (mm)	Coating Lead Length C (mm)	Height H (mm)
Long Straight		16.0 min	3.0 Max	/
Short Straight		①[2.5≤L＜6.0]+/-0.5; ②[6.0≤L≤10]+/-1.0	3.0 Max	/
Outside Crimped		①[2.5≤L＜6.0]+/-0.5; ②[6.0≤L≤10]+/-1.0	Not exceed the bend point	5.5mm Max
Vertical Crimped		①[2.5≤L＜6.0]+/-0.5; ②[6.0≤L≤10]+/-1.0	Not exceed the bend point	4.5mm Max

Taping And Dimensions (mm)

Figure	Symbol	P=7.5		P=10.0	
	Po	12.7±0.3		12.7±0.3	
	P	25.4±1.0		25.4±1.0	
	P1	8.95±0.7		7.7±0.7	
	P2	12.7±1.3		12.7±1.3	
	F	7.5±0.5		10.0±0.5	
	Δh	0±2.0		0±2.0	
	W	18.0 +1.5/-1.0		18.0 +1.5/-1.0	
	Wo	10.5 Max		10.5 Max	
	W1	9.0+0.75/-0.5		9.0+0.75/-0.5	
	W2	3.0 Max		3.0 Max	
	Do	4.0±0.2		4.0±0.2	
	H	20+1.5/-1.0		20+1.5/-1.0	
	Ho	16.5&17.0&19.0 +1.5/-1.0		16.5&17.0&19.0 +1.5/-1.0	
	L	Straight Lead	Crimped Lead	Straight Lead	Crimped Lead
		11.0 Max	9.0 Max	11.0 Max	9.0 Max
	t1	0.5±0.2		0.5±0.2	
	t2	1.7 Max		1.7 Max	

Soldering Condition

Wave Soldering Graph



Iron Soldering Condition

Item	Condition
Temperature of soldering copper bit	350℃（max.）
Soldering duration	3sec（max.）
Space between soldering position and coating layer	2mm（min.）

Storage Conditions

- Storage Temperature: ≤35℃.
- Relative Humidity: ≤70% RH.
- Keep away from corrosive atmosphere and sunlight.
- Shelf Life: No more than 12 months. (from the date on the packaging).