

APPROVED SHEET

Product : VARISTORS

Part No. : 5D / 7D / 10D / 14D / 20D Series

UL File No. : E197799

CSA File No. : 215101

VDE File No. : 4008621

CQC File No. : CQC04001010844-48

You Part No. : _____

FOR CUSTOMER APPROVAL			APPROVAL		
PASS			APPROVAL	DRAFT	DATE
				孙露	2008-10-28



鸿志电子有限公司

HONGZHI ENTERPRISES LTD.

ADD:No.6,Pujiang Road,Shantou,Guangdong

TEL : + 86 - 754 - 8885 - 4060

FAX: + 86 - 754 - 8888 - 8417

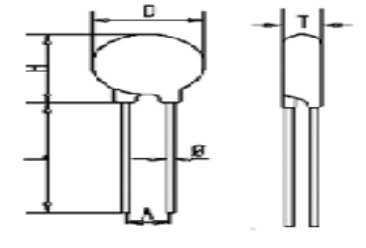
E-mail: hel@hongzhi.net

<http://www.hongzhi.net>

5D HEL VARISTOR

Style no.	Recognitions of Safety Agency Standards			Max. Continuous Applied Voltage		Voltage at DC 1mA (25°C)		Class Current (8/20 μsec)	Max. Voltage at Class Current	Max. Peak Current (8/20 μsec 1time)	Energy Surge Rating (10/1000 μsec)	Typical Capacitance Reference	Dimensions					
				AC (V)	DC (V)	Min (V)	Max (V)						Ip (A)	Vc (V)	(KA)	(J)	1KHz (PF)	Dmax (mm)
HEL-5D180L				11	14	15	21	1	38	0.25	1.1	1,700	8.5	11	25	5.0	0.6	4.4
HEL-5D220K				14	18	20	24	1	43	0.25	1.3	1,400	8.5	11	25	5.0	0.6	4.5
HEL-5D270K				17	22	24	30	1	53	0.25	1.6	1,100	8.5	11	25	5.0	0.6	4.6
HEL-5D330K				20	26	30	36	1	65	0.25	2.0	900	8.5	11	25	5.0	0.6	4.7
HEL-5D390K				25	31	35	43	1	77	0.25	2.4	750	8.5	11	25	5.0	0.6	4.8
HEL-5D470K				30	38	42	52	1	93	0.25	2.8	550	8.5	11	25	5.0	0.6	4.9
HEL-5D560K				35	45	50	62	1	110	0.25	3.4	500	8.5	11	25	5.0	0.6	5.0
HEL-5D680K				40	56	61	75	1	135	0.25	4.5	480	8.5	11	25	5.0	0.6	5.1
HEL-5D820K	☆	☆	☆	50	65	74	90	5	145	0.8	3.5	930	8.5	11	25	5.0	0.6	4.1
HEL-5D101K	☆	☆	☆	60	85	90	110	5	175	0.8	4.0	860	8.5	11	25	5.0	0.6	4.3
HEL-5D121K	☆	☆	☆	75	100	108	132	5	210	0.8	4.5	670	8.5	11	25	5.0	0.6	4.4
HEL-5D151K	☆	☆	☆	95	125	135	165	5	260	0.8	6.5	490	8.5	11	25	5.0	0.6	4.5
HEL-5D181K	☆	☆	☆	115	150	162	198	5	320	0.8	7.5	330	8.5	11	25	5.0	0.6	4.6
HEL-5D201K	☆	☆	☆	130	170	185	225	5	355	0.8	9.0	240	8.5	11	25	5.0	0.6	4.7
HEL-5D221K	☆	☆	☆	140	180	198	242	5	380	0.8	9.0	190	8.5	11	25	5.0	0.6	4.8
HEL-5D241K	☆	☆	☆	150	200	216	264	5	415	0.8	11	165	8.5	11	25	5.0	0.6	4.9
HEL-5D271K	☆	☆	☆	175	225	243	297	5	475	0.8	12	150	8.5	11	25	5.0	0.6	5.0
HEL-5D301K	☆	☆	☆	195	250	270	330	5	525	0.8	13	135	8.5	11	25	5.0	0.6	5.1
HEL-5D331K	☆	☆	☆	210	275	291	363	5	575	0.8	15	130	8.5	11	25	5.0	0.6	5.1
HEL-5D361K	☆	☆	☆	230	300	324	396	5	620	0.8	16	125	8.5	11	25	5.0	0.6	5.3
HEL-5D391K	☆	☆	☆	250	320	351	429	5	675	0.8	17	105	8.5	11	25	5.0	0.6	5.4
HEL-5D431K	☆	☆	☆	275	350	387	473	5	745	0.8	20	100	8.5	11	25	5.0	0.6	5.5
HEL-5D471K	☆	☆	☆	300	385	423	517	5	810	0.8	21	95	8.5	11	25	5.0	0.6	5.6
HEL-5D511K			☆	320	418	459	561	5	842	0.8	22	90	8.5	11	25	5.0	0.6	5.6
HEL-5D561K			☆	350	460	504	616	5	920	0.8	24	85	8.5	11	25	5.0	0.6	5.7
HEL-5D621K			☆	385	505	558	682	5	1025	0.8	26	80	8.5	11	25	5.0	0.6	5.8
HEL-5D681K			☆	420	560	612	748	5	1120	0.8	28	75	8.5	11	25	5.0	0.6	6.0

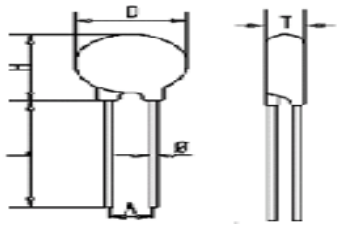
7D HEL VARISTOR

Style no.	Recognitions of Safety Agency Standards			Max. Continuous Applied Voltage		Voltage at DC 1mA (25°C)		Class Current (8/20 μsec)	Max. Voltage at Class Current	Max. Peak Current (8/20 μsec 1time)	Energy Surge Rating (10/1000 μsec)	Typical Capacitance Reference						
	UL	CSA	VDE	AC (V)	DC (V)	Min (V)	Max (V)						I _p (A)	V _c (V)	(KA)	(J)	1KHz (PF)	Dmax (mm)
HEL-7D180L				11	14	15	21	2.5	38	0.5	1.1	3,500	10	13	25	5.0	0.6	4.4
HEL-7D220K				14	18	20	24	2.5	43	0.5	1.3	2,800	10	13	25	5.0	0.6	4.5
HEL-7D270K				17	22	24	30	2.5	53	0.5	1.6	2,200	10	13	25	5.0	0.6	4.6
HEL-7D330K				20	26	30	36	2.5	65	0.5	2.0	1,800	10	13	25	5.0	0.6	4.7
HEL-7D390K				25	31	35	43	2.5	77	0.5	2.4	1,450	10	13	25	5.0	0.6	4.8
HEL-7D470K				30	38	42	52	2.5	93	0.5	2.8	1,150	10	13	25	5.0	0.6	4.9
HEL-7D560K				35	45	50	62	2.5	110	0.5	3.4	1,050	10	13	25	5.0	0.6	5.0
HEL-7D680K				40	56	61	75	2.5	135	0.5	4.5	970	10	13	25	5.0	0.6	5.1
HEL-7D820K	☆	☆	☆	50	65	74	90	10	135	1.75	7.0	930	10	13	25	5.0	0.6	4.0
HEL-7D101K	☆	☆	☆	60	85	90	110	10	165	1.75	8.5	860	10	13	25	5.0	0.6	4.1
HEL-7D121K	☆	☆	☆	75	100	108	132	10	200	1.75	10	670	10	13	25	5.0	0.6	4.3
HEL-7D151K	☆	☆	☆	95	125	135	165	10	250	1.75	13	490	10	13	25	5.0	0.6	4.4
HEL-7D181K	☆	☆	☆	115	150	162	198	10	300	1.75	15	330	10	13	25	5.0	0.6	4.5
HEL-7D201K	☆	☆	☆	130	170	185	225	10	340	1.75	18	240	10	13	25	5.0	0.6	4.6
HEL-7D221K	☆	☆	☆	140	180	198	242	10	360	1.75	19	190	10	13	25	5.0	0.6	4.7
HEL-7D241K	☆	☆	☆	150	200	216	264	10	395	1.75	21	165	10	13	25	5.0	0.6	4.8
HEL-7D271K	☆	☆	☆	175	225	243	297	10	455	1.75	24	150	10	13	25	5.0	0.6	4.9
HEL-7D301K	☆	☆	☆	195	250	270	330	10	505	1.75	26	135	10	13	25	5.0	0.6	5.0
HEL-7D331K	☆	☆	☆	210	275	291	363	10	550	1.75	29	130	10	13	25	5.0	0.6	5.1
HEL-7D361K	☆	☆	☆	230	300	324	396	10	595	1.75	32	125	10	13	25	5.0	0.6	5.2
HEL-7D391K	☆	☆	☆	250	320	351	429	10	650	1.75	35	105	10	13	25	5.0	0.6	5.3
HEL-7D431K	☆	☆	☆	275	350	387	473	10	710	1.75	40	100	10	13	25	5.0	0.6	5.4
HEL-7D471K	☆	☆	☆	300	385	423	517	10	775	1.75	42	90	10	13	25	5.0	0.6	5.5
HEL-7D511K	☆	☆	☆	320	418	459	561	10	842	1.75	43	80	10	13	25	5.0	0.6	5.6
HEL-7D561K	☆	☆	☆	350	460	504	616	10	920	1.75	46	75	10	13	25	5.0	0.6	5.7
HEL-7D621K	☆	☆	☆	385	505	558	682	10	1025	1.75	48	70	10	13	25	5.0	0.6	5.8
HEL-7D681K			☆	420	560	612	748	10	1120	1.75	50	66	10	13	25	5.0	0.6	6.0
HEL-7D751K			☆	460	615	657	825	10	1240	1.75	53	63	10	13	25	5.0	0.6	6.1
HEL-7D781K			☆	485	640	702	858	10	1290	1.75	55	60	10	13	25	5.0	0.6	6.2
HEL-7D821K			☆	510	670	738	902	10	1355	1.75	60	55	10	13	25	5.0	0.6	6.3

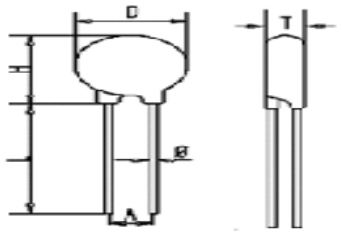
10D HEL VARISTOR

Style no.	Recognitions of Safety Agency Standards			Max. Continuous Applied Voltage		Voltage at DC 1mA (25°C)		Class Current (8/20 μ sec)	Max. Voltage at Class Current	Max. Peak Current (8/20 μ sec 1time)	Energy Surge Rating (10/1000 μ sec)	Typical Capacitance Reference	Typical Capacitance Reference					
	UL	CSA	VDE	AC (V)	DC (V)	Min (V)	Max (V)						I _p (A)	V _c (V)	(KA)	(J)	1KHz (PF)	Dmax (mm)
HEL-10D180L				11	14	15	21	5	38	1.0	2.3	7,500	13	16	25	7.5	0.8	4.4
HEL-10D220K				14	18	20	24	5	43	1.0	2.6	6,000	13	16	25	7.5	0.8	4.5
HEL-10D270K				17	22	24	30	5	53	1.0	3.9	4,800	13	16	25	7.5	0.8	4.6
HEL-10D330K				20	26	30	36	5	65	1.0	4.8	4,200	13	16	25	7.5	0.8	4.7
HEL-10D390K				25	31	35	43	5	77	1.0	5.6	3,700	13	16	25	7.5	0.8	4.8
HEL-10D470K				30	38	42	52	5	93	1.0	6.8	3,300	13	16	25	7.5	0.8	4.9
HEL-10D560K				35	45	50	62	5	110	1.0	8.1	2,900	13	16	25	7.5	0.8	5.0
HEL-10D680K				40	56	61	75	5	135	1.0	10	2,500	13	16	25	7.5	0.8	5.1
HEL-10D820K	☆	☆	☆	50	65	74	90	25	135	3.5	13	2,100	13	16	25	7.5	0.8	4.0
HEL-10D101K	☆	☆	☆	60	85	90	110	25	165	3.5	17	1,700	13	16	25	7.5	0.8	4.1
HEL-10D121K	☆	☆	☆	75	100	108	132	25	200	3.5	20	1,500	13	16	25	7.5	0.8	4.3
HEL-10D151K	☆	☆	☆	95	125	135	165	25	250	3.5	25	1,300	13	16	25	7.5	0.8	4.4
HEL-10D181K	☆	☆	☆	115	150	162	198	25	300	3.5	32	470	13	16	25	7.5	0.8	4.5
HEL-10D201K	☆	☆	☆	130	170	185	225	25	340	3.5	35	430	13	16	25	7.5	0.8	4.6
HEL-10D221K	☆	☆	☆	140	180	198	242	25	360	3.5	39	390	13	16	25	7.5	0.8	4.7
HEL-10D241K	☆	☆	☆	150	200	216	264	25	395	3.5	42	360	13	16	25	7.5	0.8	4.8
HEL-10D271K	☆	☆	☆	175	225	243	297	25	455	3.5	49	330	13	16	25	7.5	0.8	4.9
HEL-10D301K	☆	☆	☆	195	250	270	330	25	505	3.5	54	290	13	16	25	7.5	0.8	5.0
HEL-10D331K	☆	☆	☆	210	275	291	363	25	550	3.5	58	280	13	16	25	7.5	0.8	5.1
HEL-10D361K	☆	☆	☆	230	300	324	396	25	595	3.5	65	260	13	16	25	7.5	0.8	5.2
HEL-10D391K	☆	☆	☆	250	320	351	429	25	650	3.5	70	240	13	16	25	7.5	0.8	5.3
HEL-10D431K	☆	☆	☆	275	350	387	473	25	710	3.5	80	220	13	16	25	7.5	0.8	5.4
HEL-10D471K	☆	☆	☆	300	385	423	517	25	775	3.5	85	190	13	16	25	7.5	0.8	5.5
HEL-10D511K	☆	☆	☆	320	418	459	561	25	842	3.5	92	180	13	16	25	7.5	0.8	5.6
HEL-10D561K	☆	☆	☆	350	460	504	616	25	920	3.5	92	180	13	16	25	7.5	0.8	5.7
HEL-10D621K	☆	☆	☆	385	505	558	682	25	1025	3.5	97	160	14	16	25	7.5	0.8	5.8
HEL-10D681K	☆	☆	☆	420	560	612	748	25	1120	3.5	100	140	14	16	25	7.5	0.8	6.0
HEL-10D751K	☆	☆	☆	460	615	657	825	25	1240	3.5	105	130	14	16	25	7.5	0.8	6.1
HEL-10D781K	☆	☆	☆	485	640	702	858	25	1290	3.5	105	130	14	16	25	7.5	0.8	6.2
HEL-10D821K	☆	☆	☆	510	670	738	902	25	1355	3.5	110	130	14	16	25	7.5	0.8	6.3
HEL-10D911K	☆	☆	☆	550	745	819	1001	25	1500	3.5	130	120	14	16	25	7.5	0.8	6.4
HEL-10D951K	☆	☆	☆	575	765	855	1045	25	1580	3.5	135	110	14	16	25	7.5	0.8	6.8
HEL-10D102K	☆	☆		625	825	900	1100	25	1650	3.5	140	100	14	16	25	7.5	0.8	6.9
HEL-10D112K	☆	☆		680	895	990	1210	25	1815	3.5	155	90	14	16	25	7.5	0.8	7.0
HEL-10D122K				750	985	1080	1320	25	1900	3.5	165	80	14	16	25	7.5	0.8	7.1
HEL-10D152K				850	1185	1350	1650	25	2310	3.5	200	75	14	16	25	7.5	0.8	7.5
HEL-10D182K	☆	☆		1000	1330	1440	1760	25	2750	3.5	230	70	14	16	25	7.5	0.8	8.0

14D HEL VARISTOR

Style no.	Recognitions of Safety Agency Standards			Max. Continuous Applied Voltage		Voltage at DC 1mA (25°C)		Class Current (8/20 µsec)	Max. Voltage at Class Current	Max. Peak Current (8/20 µsec 1time)	Energy Surge Rating (10/1000 µsec)	Typical Capacitance Reference						
	UL	CSA	VDE	AC (V)	DC (V)	Min (V)	Max (V)						Ip (A)	Vc (V)	(KA)	(J)	1KHz (PF)	Dmax (mm)
HEL-14D180L				11	14	15	21	10	38	2	5.2	18,000	17	20	25	7.5	0.8	4.4
HEL-14D220K				14	18	20	24	10	43	2	6.3	15,000	17	20	25	7.5	0.8	4.5
HEL-14D270K				17	22	24	30	10	53	2	7.8	10,000	17	20	25	7.5	0.8	4.6
HEL-14D330K				20	26	30	36	10	65	2	9.5	8,500	17	20	25	7.5	0.8	4.7
HEL-14D390K				25	31	35	43	10	77	2	11	7,500	17	20	25	7.5	0.8	4.8
HEL-14D470K				30	38	42	52	10	93	2	13	6,500	17	20	25	7.5	0.8	4.9
HEL-14D560K				35	45	50	62	10	110	2	16	5,600	17	20	25	7.5	0.8	5.0
HEL-14D680K				40	56	61	75	10	135	2	20	4,700	17	20	25	7.5	0.8	5.1
HEL-14D820K	☆	☆	☆	50	65	74	90	50	135	6.5	28	3,900	17	20	25	7.5	0.8	4.0
HEL-14D101K	☆	☆	☆	60	85	90	110	50	165	6.5	35	3,400	17	20	25	7.5	0.8	4.1
HEL-14D121K	☆	☆	☆	75	100	108	132	50	200	6.5	42	3,100	17	20	25	7.5	0.8	4.3
HEL-14D151K	☆	☆	☆	95	125	135	165	50	250	6.5	53	3,000	17	20	25	7.5	0.8	4.4
HEL-14D181K	☆	☆	☆	115	150	162	198	50	300	6.5	65	1,030	17	20	25	7.5	0.8	4.5
HEL-14D201K	☆	☆	☆	130	170	185	225	50	340	6.5	70	970	17	20	25	7.5	0.8	4.6
HEL-14D221K	☆	☆	☆	140	180	198	242	50	360	6.5	78	840	17	20	25	7.5	0.8	4.7
HEL-14D241K	☆	☆	☆	150	200	216	264	50	395	6.5	84	710	17	20	25	7.5	0.8	4.8
HEL-14D271K	☆	☆	☆	175	225	243	297	50	455	6.5	99	650	17	20	25	7.5	0.8	4.9
HEL-14D301K	☆	☆	☆	195	250	270	330	50	505	6.5	108	600	17	20	25	7.5	0.8	5.0
HEL-14D331K	☆	☆	☆	210	275	291	363	50	550	6.5	115	550	17	20	25	7.5	0.8	5.1
HEL-14D361K	☆	☆	☆	230	300	324	396	50	595	6.5	130	500	17	20	25	7.5	0.8	5.2
HEL-14D391K	☆	☆	☆	250	320	351	429	50	650	6.5	140	480	17	20	25	7.5	0.8	5.3
HEL-14D431K	☆	☆	☆	275	350	387	473	50	710	6.5	155	440	17	20	25	7.5	0.8	5.4
HEL-14D471K	☆	☆	☆	300	385	423	517	50	775	6.5	175	420	17	20	25	7.5	0.8	5.5
HEL-14D511K	☆	☆	☆	320	418	459	561	50	842	6.5	190	390	17	20	25	7.5	0.8	5.6
HEL-14D561K	☆	☆	☆	350	460	504	616	50	920	6.5	192	360	17	20	25	7.5	0.8	5.7
HEL-14D621K	☆	☆	☆	385	505	558	682	50	1025	6.5	195	320	18	20	25	7.5	0.8	5.8
HEL-14D681K	☆	☆	☆	420	560	612	748	50	1120	6.5	200	290	18	20	25	7.5	0.8	6.0
HEL-14D751K	☆	☆	☆	460	615	657	825	50	1240	6.5	210	260	18	20	25	7.5	0.8	6.1
HEL-14D781K	☆	☆	☆	485	640	702	858	50	1290	6.5	225	230	18	20	25	7.5	0.8	6.2
HEL-14D821K	☆	☆	☆	510	670	738	902	50	1355	6.5	235	230	18	20	25	7.5	0.8	6.3
HEL-14D911K	☆	☆	☆	550	745	819	1001	50	1500	6.5	255	200	18	20	25	7.5	0.8	6.4
HEL-14D951K	☆	☆	☆	575	765	855	1045	50	1580	6.5	270	190	18	20	25	7.5	0.8	6.8
HEL-14D102K	☆	☆		625	825	900	1100	50	1650	6.5	280	180	18	20	25	7.5	0.8	6.9
HEL-14D112K	☆	☆		680	895	990	1210	50	1815	6.5	300	165	18	20	25	7.5	0.8	7.0
HEL-14D122K				750	985	1080	1320	50	1815	6.5	310	150	18	20	25	7.5	0.8	7.0
HEL-14D152K				850	1185	1350	1650	50	1990	6.5	335	145	18	20	25	7.5	0.8	7.1
HEL-14D182K	☆	☆		1000	1330	1440	1760	50	2310	6.5	405	140	18	20	25	7.5	0.8	7.5

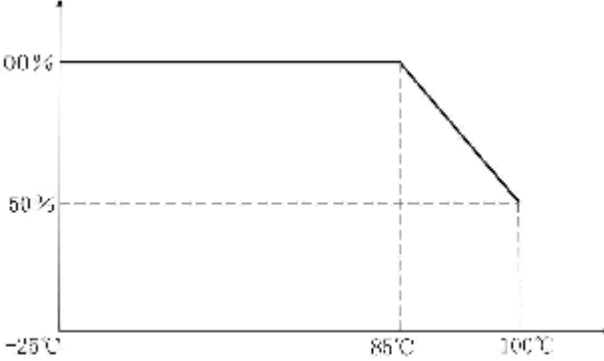
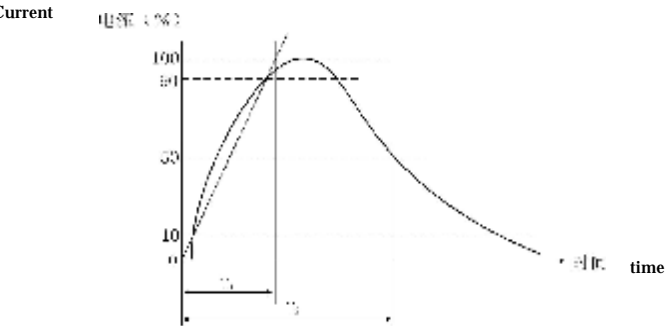
20D HEL VARISTOR

Style no.	Recognitions of Safety Agency Standards			Max. Continuous Applied Voltage		Voltage at DC 1mA (25°C)		Class Current (8/20 μsec)	Max. Voltage at Class Current	Max. Peak Current (8/20 μsec 1time)	Energy Surge Rating (10/1000 μsec)	Typical Capacitance Reference							
	UL	CSA	VDE	AC (V)	DC (V)	Min (V)	Max (V)						Ip (A)	Vc (V)	(KA)	(J)	1KHz (PF)	Dmax (mm)	Hmax (mm)
HEL-20D180L				11	14	15	21	20	38	3	13	39,000	23	26	25	10	1.0	4.4	
HEL-20D220K				14	18	20	24	20	43	3	16	32,000	23	26	25	10	1.0	4.5	
HEL-20D270K				17	22	24	30	20	53	3	19	22,000	23	26	25	10	1.0	4.6	
HEL-20D330K				20	26	30	36	20	65	3	24	18,000	23	26	25	10	1.0	4.7	
HEL-20D390K				25	31	35	43	20	77	3	28	16,000	23	26	25	10	1.0	4.8	
HEL-20D470K				30	38	42	52	20	93	3	34	14,000	23	26	25	10	1.0	4.9	
HEL-20D560K				35	45	50	62	20	110	3	41	12,000	23	26	25	10	1.0	5.0	
HEL-20D680K				40	56	61	75	20	135	3	49	10,000	23	26	25	10	1.0	5.1	
HEL-20D820K	☆	☆	☆	50	65	74	90	100	135	10	56	5,800	23	26	25	10	1	4.0	
HEL-20D101K	☆	☆	☆	60	85	90	110	100	165	10	72	4,800	23	26	25	10	1	4.1	
HEL-20D121K	☆	☆	☆	75	100	108	132	100	200	10	88	3,800	23	26	25	10	1	4.3	
HEL-20D151K	☆	☆	☆	95	125	135	165	100	250	10	106	3,000	23	26	25	10	1	4.4	
HEL-20D181K	☆	☆	☆	115	150	162	198	100	300	10	130	2,600	23	26	25	10	1	4.5	
HEL-20D201K	☆	☆	☆	130	170	185	225	100	340	10	160	2,000	23	26	25	10	1	4.6	
HEL-20D221K	☆	☆	☆	140	180	198	242	100	360	10	180	1,800	23	26	25	10	1	4.7	
HEL-20D241K	☆	☆	☆	150	200	216	264	100	395	10	200	1,500	23	26	25	10	1	4.8	
HEL-20D271K	☆	☆	☆	175	225	243	297	100	455	10	210	1,400	23	26	25	10	1	4.9	
HEL-20D301K	☆	☆	☆	195	250	270	330	100	505	10	216	1,350	23	26	25	10	1	5.0	
HEL-20D331K	☆	☆	☆	210	275	291	363	100	550	10	228	1,300	23	26	25	10	1	5.1	
HEL-20D361K	☆	☆	☆	230	300	324	396	100	595	10	255	1,250	23	26	25	10	1	5.2	
HEL-20D391K	☆	☆	☆	250	320	351	429	100	650	10	275	1,180	23	26	25	10	1	5.3	
HEL-20D431K	☆	☆	☆	275	350	387	473	100	710	10	303	1,100	23	26	25	10	1	5.4	
HEL-20D471K	☆	☆	☆	300	385	423	517	100	775	10	350	1,050	23	26	25	10	1	5.5	
HEL-20D511K	☆	☆	☆	320	418	459	561	100	842	10	382	1,000	23	26	25	10	1	5.6	
HEL-20D561K	☆	☆	☆	350	460	504	616	100	920	10	385	970	24	27	25	10	1	5.7	
HEL-20D621K	☆	☆	☆	385	505	558	682	100	1025	10	390	950	24	27	25	10	1	5.8	
HEL-20D681K	☆	☆	☆	420	560	612	748	100	1120	10	400	900	24	27	25	10	1	6.0	
HEL-20D751K	☆	☆	☆	460	615	657	825	100	1240	10	420	850	24	27	25	10	1	6.1	
HEL-20D781K	☆	☆	☆	485	640	702	858	100	1290	10	445	750	24	27	25	10	1	6.2	
HEL-20D821K	☆	☆	☆	510	670	738	902	100	1355	10	460	700	24	27	25	10	1	6.3	
HEL-20D911K	☆	☆	☆	550	745	819	1001	100	1500	10	510	600	24	27	25	10	1	6.4	
HEL-20D951K	☆	☆	☆	575	765	855	1045	100	1580	10	535	550	24	27	25	10	1	6.8	
HEL-20D102K	☆	☆		625	825	900	1100	100	1650	10	565	500	24	27	25	10	1	6.9	
HEL-20D112K	☆	☆		680	895	990	1210	100	1815	10	620	450	24	27	25	10	1	7.0	
HEL-20D122K				750	985	1080	1320	100	1990	10	675	400	24	27	25	10	1	7.1	
HEL-20D152K				850	1185	1350	1650	100	2310	10	810	350	24	27	25	10	1	7.5	
HEL-20D182K	☆	☆		1000	1330	1440	1760	100	2750	10	930	300	24	27	25	10	1	8.0	

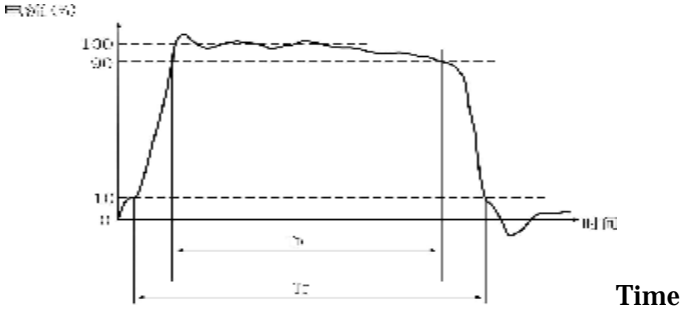
Note : Recognitions to safety agency standards UL File No.E197799 CSA File No.215101

PERFORMANCE CHARACTERISTIC

1.1 HEL VARISTORS ELECTRICAL CHARACTERISTICS

Technical term	Test Methods Description	Specifications
Varistors Voltage	The voltage between two terminals with the specified measuring current 1mA DC applied is called V _{1mA} ,The measurement shall be made as fast as possible to avoid heat affection.	The usual tolerance on varistors voltage is $\pm 10\%$.
Maximum Continuous AC or DC Voltage	 <p style="text-align: center;">最大允许使用电压率曲线</p> <p style="text-align: center;">Maximum Allowable Voltage Derating Curve</p>	Maximum Continuous AC Voltage 0.62multility Varistor voltage
Leakage Current	The current passing through the varistors at the maximum continuous DC voltage.	$\leq 20\mu\text{A}$
Clamping Voltage	<p>The peak voltage at class current (Standard surge current waveform is 8/20μs). The class current is a peak value of current which is 1/10 of the maximum peak current for 100 impulses at per minute for 8/20μs.</p> 	See specification tables.

1.2 HEL VARISTORS ELECTRICAL CHARACTERISTICS





<p>Energy</p>	<p>The maximum energy within the varistors voltage change of $\pm 10\%$ when one impulse of 2ms or 10/1000μS is applied.</p> <p>For the 2mS waveform :</p> $J = 2 \cdot I_p \cdot V_c \cdot 10^{-3}$ <p>For the 10/1000μS waveform :</p> $J = 1391 \cdot I_p \cdot V_c \cdot 10^{-6}$ <p>Where J -- Energy absorbed in joules. I_p -- Maximum let-through current in amps. V_c -- Measured clamping voltage in volts.</p> <p>Current</p> 	<p>$\Delta V_{1mA} / V_{1mA} \leq 10\%$.</p>
<p>Maximum Peak current</p>	<p>The maximum current within the varistors voltage change of $\pm 10\%$ with the standard impulse current (8/20μS) applied one time.</p>	<p>$\Delta V_{1mA} / V_{1mA} \leq 10\%$.</p>
<p>Varistors voltage Temperature Coefficient</p>	$\frac{V_{1mA} (85^\circ\text{C}) - V_{1mA} (25^\circ\text{C})}{V_{1mA} (25^\circ\text{C})} \times \frac{1}{60} \times 100\%$	<p>$\leq -0.05 \%/^\circ\text{C}$.</p>
<p>Capacitance</p>	<p>Typical value measured at 1Vrms and test frequency of 1kHz</p>	<p>See specification tables.</p>

Standard test condition Temperature : 15 $^\circ$ C-35 $^\circ$ C; Relative humidity : 45%-75%; Air pressure : 86 Pa~106kPa .

2. HEL VARISTORS TECHNOLOGIC & MECHANICAL CHARACTERISTICS

Technical term	Test Methods Description	Specifications								
Solderability	After dipping the terminals to a depth of 3.5-0.5 mm from the body in a soldering bath of temperature $235^{\circ}\text{C}\pm 5^{\circ}\text{C}$ for 2 ± 0.5 seconds, the terminal shall be visually examined.	Approximately 95% of the terminals shall be covered with solder uniformly.								
Resistance to Soldering heat	After each lead shall be dipped into a solder bath having a temperature $260^{\circ}\text{C}\pm 5^{\circ}\text{C}$, to a point 2.0 to 2.5mm from the body of the unit. Using shielding Board($t=1.5\text{mm}$) ,be held there for specified time (5D series: 5 ± 1 seconds and other series:10 s),and then be stored at room temperature and humidity for 1 to 2 hours. The change of $V_{1\text{mA}}$ and mechanical damages are examined.	No outstanding damage. $\Delta V_{1\text{mA}} / V_{1\text{mA}} \leq \pm 5\%$.								
Solvent resistance of marking	Solvent: alcohol Rubbing material: cotton wool Recovery: 4hours. Thereafter, visual examination and the change of $V_{1\text{mA}}$ shall be examined.	Legible marking.								
Component Solvent resistance	Solvent: $70\pm 5\%$ and F113+ $30\pm 5\%$ strang third mellow mixture, Solvent temperature: $23\pm 5^{\circ}\text{C}$, $5\pm 0.5\text{Min}$. Recovery: 4hours. Thereafter, visual examination and the change of $V_{1\text{mA}}$ shall be examined.	No outstanding damage. $\Delta V_{1\text{mA}} / V_{1\text{mA}} \leq \pm 5\%$.								
Robustness of Terminations	After gradually applying the force specified below and keeping the unit fixed for ten seconds. The terminal shall be visually examined for any damage. <table style="margin-left: 40px; border: none;"> <tr> <td>Lead diameter (mm) :</td> <td>0.6</td> <td>0.8</td> <td>1.0</td> </tr> <tr> <td>Force (N):</td> <td>1</td> <td>10</td> <td>20</td> </tr> </table>	Lead diameter (mm) :	0.6	0.8	1.0	Force (N):	1	10	20	No visible damage
Lead diameter (mm) :	0.6	0.8	1.0							
Force (N):	1	10	20							
Shock(or bump)	Pulse shape half sine acceleration: 490 m/s^2 . Pulse duration: 11ms. Thereafter, visual examination and the change of $V_{1\text{mA}}$ shall be examined.	No visible damage. $\Delta V_{1\text{mA}} / V_{1\text{mA}} \leq \pm 5\%$.								
vibration	Frequency range: 10Hz--55Hz. Amplitude: 0.75mm or 98 m/s^2 whichever is the less severe. Total duration: 6 hours . Thereafter, visual examination and the change of $V_{1\text{mA}}$ shall be examined.	No visible damage. $\Delta V_{1\text{mA}} / V_{1\text{mA}} \leq \pm 5\%$.								

3.1 HEL VARISTORS SECURITY AND ENVIRONMENTAL TEST

Technical term	Test Methods Description		Specifications																										
Safety Agency Approvals	Agency	Agency File Number	See Specification Tables.																										
		UL1449 File No. E197799																											
		CSA C22.2 File No. 215101																											
		VDE File No. 40008621																											
		CQC File No. 04001010844-48																											
Surge Life	<p>The change of ΔV_{1mA} shall be measured. After the impulse listed below is applied 10,000 times. Continuously with the interval of ten seconds at room temperature.</p> <table border="1" data-bbox="483 857 1088 1285"> <thead> <tr> <th></th> <th>18v--68v</th> <th>8A</th> </tr> </thead> <tbody> <tr> <td rowspan="2">5D</td> <td>82v--680v</td> <td>22A</td> </tr> <tr> <td>18v--68v</td> <td>22A</td> </tr> <tr> <td rowspan="2">7D</td> <td>82v--820v</td> <td>80A</td> </tr> <tr> <td>18v--68v</td> <td>35A</td> </tr> <tr> <td rowspan="2">10D</td> <td>82v--1800v</td> <td>120A</td> </tr> <tr> <td>18v--68v</td> <td>75A</td> </tr> <tr> <td rowspan="2">14D</td> <td>82v--1800v</td> <td>200A</td> </tr> <tr> <td>18v--68v</td> <td>120A</td> </tr> <tr> <td rowspan="2">20D</td> <td>82v--1800v</td> <td>250A</td> </tr> </tbody> </table>			18v--68v	8A	5D	82v--680v	22A	18v--68v	22A	7D	82v--820v	80A	18v--68v	35A	10D	82v--1800v	120A	18v--68v	75A	14D	82v--1800v	200A	18v--68v	120A	20D	82v--1800v	250A	No visible damage. $\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$.
	18v--68v	8A																											
5D	82v--680v	22A																											
	18v--68v	22A																											
7D	82v--820v	80A																											
	18v--68v	35A																											
10D	82v--1800v	120A																											
	18v--68v	75A																											
14D	82v--1800v	200A																											
	18v--68v	120A																											
20D	82v--1800v	250A																											
	Temperature Cycle	<p>Condition the specimen to each temperature from step 1 to step 4 in this order for the period shown in the table of specifications. The change of V_{1mA} and mechanical damage shall be examined after 24 ± 2 hours</p> <table border="1" data-bbox="507 1599 1094 1912"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Period</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>$-40 \pm 3^\circ\text{C}$</td> <td>30 Min</td> </tr> <tr> <td>2</td> <td>Room Temp.</td> <td>15 Min</td> </tr> <tr> <td>3</td> <td>$+85 \pm 2^\circ\text{C}$</td> <td>30 Min</td> </tr> <tr> <td>4</td> <td>Room Temp.</td> <td>15 Min</td> </tr> </tbody> </table> <p>5 Cycles</p>		Step	Temperature	Period	1	$-40 \pm 3^\circ\text{C}$	30 Min	2	Room Temp.	15 Min	3	$+85 \pm 2^\circ\text{C}$	30 Min	4	Room Temp.	15 Min	No visible damage. $\Delta V_{1mA} / V_{1mA} \leq \pm 10\%$.										
Step	Temperature	Period																											
1	$-40 \pm 3^\circ\text{C}$	30 Min																											
2	Room Temp.	15 Min																											
3	$+85 \pm 2^\circ\text{C}$	30 Min																											
4	Room Temp.	15 Min																											

3.2 HEL VARISTORS SECURITY AND ENVIRONMENTAL TEST

<p>Damp Heat /Humidity(Steady State)</p>	<p>The varistor shall be divided into two groups The first group shall be subjected to this test without voltage applied, The second group shall be Applied a DC voltage . Ambient condition.: 40℃±2℃, 90~95%RH Period: 1000 ±24hours Then stored at room temperature and normal humidity for 1 to 4 hours. Thereafter, the change of V_{1mA} and the insulation resistance shall be examined.</p>	<p>No visible damage. ΔV_{1mA} /V_{1mA}≤±10%. The insulation resistance≥ 10,000MΩ.</p>
<p>Endurance at upper category temperature</p>	<p>The specimen shall be applied continuously the Max. AC allowable voltage at 1000 Hours and 85℃±2℃ The specimen shall be applied in cycles of 90Min on and 30Min off throughout the test . Then stored at room temperature and normal humidity for 4±0.5 hours. Thereafter, the change of V_{1mA} and the voltage at class current ,the insulation resistance and mechanical damage shall be examined.</p>	<p>No visible damage. ΔV_{1mA} /V_{1mA}≤±10%. The change of the voltage at class current ≤±20%. The insulation resistance≥ 10,000MΩ.</p>
<p>Climatic Category</p>	<p>Dry heat : +85℃±2℃, 16hours ; Damp heat, cyclic :IEC68-2-30 Test Db, 55℃, First cycle 24 hours ; Cold : -40℃±3℃, 2 hours ; (Low air pressure test not applicable) Damp heat, cyclic, Test Db, remaining cycles. Then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of V_{1mA} and the insulation resistance shall be examined.</p>	<p>No visible damage. ΔV_{1mA} /V_{1mA}≤±10%. The insulation resistance≥ 10,000MΩ.</p>



Zinc Oxide Varistor Current Information

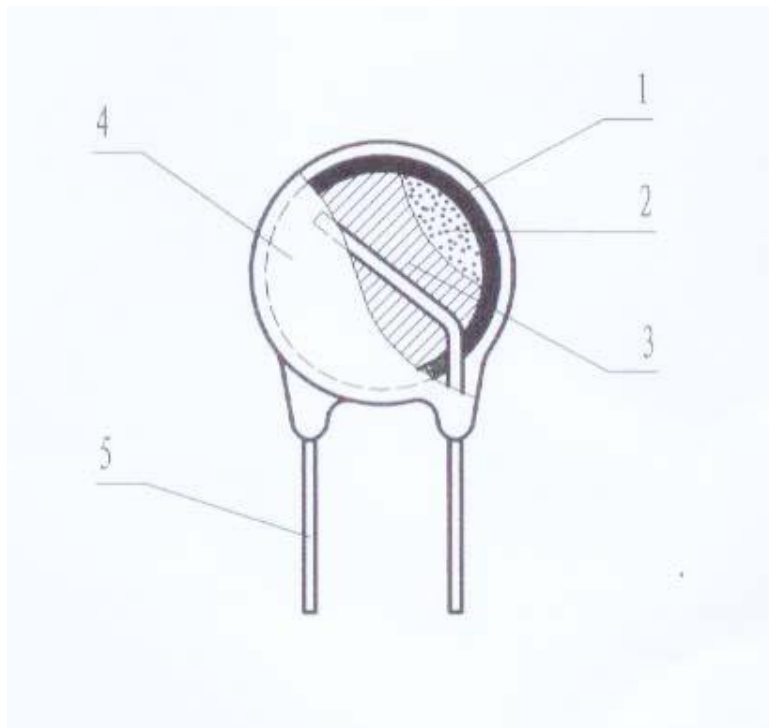
Package
Standard Bulk Pack Quantity

Dimension of the Carton: 42×27×32cm³

Varistor Model Size	Varistor Voltage Model	Normal Lead Length		Lead Cutting	
		Quantities/Carton (Kpcs)	Quantities/InnerBox (Kpcs)	Quantities/Carton (Kpcs)	Quantities/InnerBox (Kpcs)
5mm	180K-821K	24	4	30	5
7mm	180K-271K	24	4	30	5
	301K-561K	18	3	30	5
	621K-821K	12	2	24	4
10mm	180K-561K	9	2	12	2
	681K-821K	6	1.5	12	2
14mm	180K-781K	6	1	9	1.5
	821K-182K	3	1		
20mm	180K-821K	3	1	6	1
	911K-122K	1.5	0.5		

Material Safety Data Sheet (MSDS)

1. Composition/ ingredients



No.	Component	Chemical Ingredient	Proportion
1	Ceramic Disc	Zn,Mn,Sb,Co,Ni... Oxide	65%-81%
2	Electrode	Ag	0.1%-1.7%
3	Solder	97.5Sn,2.0Ag,0.5Cu	0.8-7.8%
4	Coating	Epoxy Resin	6.5%-22%
5	Crimped Lead	CP Wire (Tinned Copper Weld Wire)	4%-68%

2. Physical and Chemical Properties

Appearance:	
Substance's state: Solid	Colour:Blue Odour:-
Boiling point/range	-
Melting point/range	-
Density	4-6 g/cm ³
Decomposing temperature	-
Self-ignite temperature	-
Vapour pressure	-
Solubility in water	Not dissolve with water
Exploding boundary	-

Material Safety Data Sheet (MSDS)

3. Storage

Storage:1.Store in the temperature-40-125

2.Store in the enviroment with the humidity<75%RH

3.Far from the straight sunlight, rain, steam, oil and the eroded gas.

4.avoid the pressing and shaking.

5.far from the hot fountain.

6.The store district should have enough usable extinguishers.

4. Disposal considerations

Wastes dealing measure:

1. Should dispart the product for three parts: coating, lead and noumenon.

2. Mix and dissolve the coating parts and combustibile solvent, and then cremate with the chemical incinerator.

3. The lead part is mostly with metals,sort and callback.

4. Noumenon part is metal oxide,should deal with the common wastes.

5. Stability And Reactivity

Stability:	stabile in normal state
The possible and harmful reaction in special state:	-
The state that should be avoided:	Sunlight shines straightly or to be heated, spark, damp.
Harmful decomposition substances:	Powder,CO.
The substance that should be avoided:	Alkali,strong oxidizer,and water.

Material Safety Data Sheet (MSDS)

6. Fire-Fighting Measures

Fire extinguishing method:Foam fire extinguisher,Dry powder extinguisher,concealed by sand and soil,concealed by waterish clothes.

The special hazardous material that may be produced when extinguishing:Epoxy resin will split in the fire and produce CO, CO₂,and the organic chips.

The special protective clothing for the fire fighters:safety dress and air breather.

Accidental release measures:It may produce a large amount of dust while releasing in volume, escaper should cover the mouth and nose with wet cloth.

Environmental protected:Pay attention to ventilating and remove the entire fire fountainhead.

Methods of cleaning up: Separate the hazard district, avoid someone coming in.



Test Report

No. CANEC0802349701

Date: 17 May 2008

Page 1 of 4

SHAN TOU HONG ZHI ELECTRONIC LTD
NO.6 PUJIANG ROAD,SHANTOU,GUANGDONG
CHINA

The following sample(s) was/were submitted and identified on behalf of the clients as :

Varistor

SGS Job No. : 11023702 - GZ
Date of Sample Received : 13 May 2008
Testing Period : 13 May 2008 - 17 May 2008
Test Requested : Selected test(s) as requested by client.
Test Method : Please refer to next page(s).
Test Results : Please refer to next page(s).
Conclusion : Based on the performed tests on submitted sample(s), the results **comply with the RoHS Directive 2002/95/EC and its subsequent amendments.**

Signed for and on behalf of
SGS-CSTC Ltd.

Huang Fang, Sunny
Sr. Engineer

This document is issued by the Company under its General Conditions of Service printed overleaf or available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not generate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested. This document cannot be reproduced except in full, without prior approval of the Company.



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Chemical Laboratory

196 Kezhu Road, Science Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075125 www.cn.sgs.com
中国·广州·经济技术开发区科学城科珠路196号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075125 e sgs.china@sgs.com

GZCM 2126262

Member of the SGS Group (SGS SA)

Test Results:

ID for specimen 1 : CAN08-023497.001
 Description for specimen 1 : Blue body w/ black printing (mixed)

RoHS Directive 2002/95/EC

Test Item(s)	Unit	Test Method (Reference)	Result	MDL	Limit
Cadmium (Cd)	mg/kg	IEC 62321/2nd CDV (111/95/CDV), ICP-OES	N.D.	2	100
Lead (Pb)	mg/kg	IEC 62321/2nd CDV (111/95/CDV), ICP-OES	15	2	1000
Mercury (Hg)	mg/kg	IEC 62321/2nd CDV (111/95/CDV), ICP-OES	N.D.	2	1000
Hexavalent Chromium (CrVI) by alkaline extraction	mg/kg	IEC 62321/2nd CDV (111/95/CDV), UV-Vis	N.D.	2	1000
Sum of PBBs	mg/kg	-	N.D.	-	1000
Monobromobiphenyl	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Dibromobiphenyl	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Tribromobiphenyl	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Tetrabromobiphenyl	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Pentabromobiphenyl	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Hexabromobiphenyl	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Heptabromobiphenyl	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Octabromobiphenyl	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Nonabromobiphenyl	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Decabromobiphenyl	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Sum of PBDEs(Mono to Nona) (Note 4)	mg/kg	-	N.D.	-	1000
Monobromodiphenyl ether	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Dibromodiphenyl ether	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Tribromodiphenyl ether	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Tetrabromodiphenyl ether	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Pentabromodiphenyl ether	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Hexabromodiphenyl ether	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Heptabromodiphenyl ether	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Octabromodiphenyl ether	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Nonabromodiphenyl ether	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Decabromodiphenyl ether	mg/kg	IEC 62321/2nd CDV (111/95/CDV), GC-MS	N.D.	5	
Sum of PBDEs(Mono to Deca)	mg/kg	-	N.D.	-	-

Note:

1. mg/kg = ppm
2. N.D. = Not Detected (< MDL)
3. MDL = Method Detection Limit
4. Sum of Mono to NonaBDE & according to 2005/717/EC DecaBDE is exempt.
5. " " = Not regulated

This document is issued by the Company under its General Conditions of Service printed overleaf or available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects only the findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not generate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This document cannot be reproduced except in full, without prior approval of the Company.



SGS Standards Technical Services Co., Ltd.
 Guangzhou Economic & Technology Development District Science City Kezhong Road 198 No. Chemical Laboratory

198 Kezhong Road, Science City, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 | (86-20) 82155555 | (86-20) 82075125 | www.cn.sgs.com
 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 | (86-20) 82155555 | (86-20) 82075125 | sgs.china@sgs.com

GZCM 2 1 2 6 2 6 3

Member of the SGS Group (SGS SA)

Test Report

No. CANEC0802349701

Date: 17 May 2008

Page 3 of 4

ID for specimen 2 : CAN08-023497.002
 Description for specimen 2 : Silvery metal pin

RoHS Directive 2002/95/EC

Test Item(s)	Unit	Test Method (Reference)	Result	MDL	Limit
Cadmium (Cd)	mg/kg	IEC 62321/2nd CDV (111/95/CDV), ICP-OES	N.D.	2	100
Lead (Pb)	mg/kg	IEC 62321/2nd CDV (111/95/CDV), ICP-OES	N.D.	2	1000
Mercury (Hg)	mg/kg	IEC 62321/2nd CDV (111/95/CDV), ICP-OES	N.D.	2	1000
Hexavalent Chromium (CrVI) by boiling water extraction	-	IEC 62321/2nd CDV (111/95/CDV), UV-Vis	Negative	◇	#

Note:

1. mg/kg = ppm
2. N.D. = Not Detected (< MDL)
3. MDL = Method Detection Limit
4. ◇ = Spot-Test:

Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result is negative or cannot be confirmed.)

Boiling-water-extraction:

Negative = Absence of CrVI coating

Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

5. # = Positive indicates the presence of CrVI on the tested areas.

Negative indicates the absence of CrVI on the tested areas.

6. "-" = Not regulated

Remark : As requested by client, the testing of specimen 1 was conducted as whole / part sample, for the sample can't be disjointed.

This document is issued by the Company under its General Conditions of Service printed overleaf or available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not absolve parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This document cannot be reproduced except in full, without prior approval of the Company.



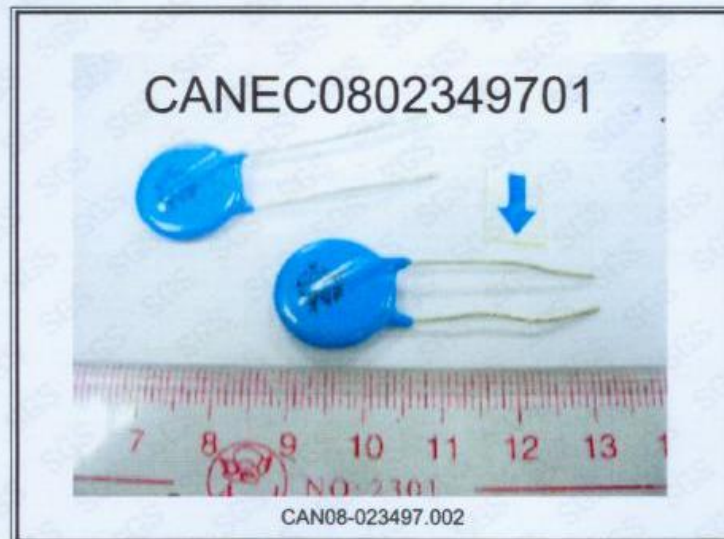
SGS-CSI Technical Service Co., Ltd.
 Guangzhou Environmental Chemical Laboratory

198 Kezhu Road, Sientech Park Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075125 www.cn.sgs.com
 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075125 e sgs.china@sgs.com

GZCM 2 1 2 6 2 6 4

Member of the SGS Group (SGS SA)

Sample photo:



SGS authenticate the photo on original report only

*** End of Report ***

This document is issued by the Company under its General Conditions of Service printed overleaf or available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not separate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested. This document cannot be reproduced except in full, without prior approval of the Company.



SGS Standards Technical Service Co., Ltd.
Guangzhou SGS Chemical Laboratory

106 Kaifu Road, Science Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663
中国·广州·经济技术开发区科学城科珠路198号

510663 (86-20) 82155555 (86-20) 82075125 www.cn.sgs.com
邮编: 510663 (86-20) 82155555 (86-20) 82075125 e sgs.china@sgs.com

GZCM 2126265

Member of the SGS Group (SGS SA)



产品认证证书

证书编号: CQC04001010844

申 请 人: 汕头市鸿志电子有限公司

商 标: HEL

型号/名称: 14D(820K~162K) (压敏电压:82-1600V~; 允许偏差: K=±10%; 气候类别:40/085/21)
氧化锌压敏电阻器

标 准: GB/T 10193-1997、GB/T 10194-1997

生产厂/地址: 汕头市鸿志电子有限公司
广东省汕头市龙湖区浦江路6号3-4楼

生产厂编号: V004315

认 证 模 式: 第五种认证模式

主 任:

李怀林



中国质量认证中心

中国·北京·朝阳区芳草地西街15号 100020

<http://www.cqc.com.cn>

A 0011909



产品认证证书

证书编号: CQC04001010845

申 请 人: 汕头市鸿志电子有限公司
商 标: HEL
型 号 / 名 称: 5D(820K~561K) (压敏电压:82-560V~; 允许
偏差: ±10%; 气候类别:40/085/21)
氧化锌压敏电阻器
标 准: GB/T 10193-1997、GB/T 10194-1997
生产厂/地址: 汕头市鸿志电子有限公司
广东省汕头市龙湖区浦江路6号3-4楼
生产厂编号: V004315
认 证 模 式: 第五种认证模式

主 任:

李怀林



中国质量认证中心

中国·北京·朝阳区芳草地西街15号 100020

<http://www.cqc.com.cn>

A 0011906



产品认证证书

证书编号: CQC04001010848

申请人: 汕头市鸿志电子有限公司

商 标: HEL

型号/名称: 20D(820K~182K) (压敏电压:82-1800V~; 允许偏差: K=±10%; 气候类别:40/085/21)
氧化锌压敏电阻器

标 准: GB/T 10193-1997、GB/T 10194-1997

生产厂/地址: 汕头市鸿志电子有限公司
广东省汕头市龙湖区浦江路6号3-4楼

生产厂编号: V004315

认证模式: 第五种认证模式

主 任:

李怀林



中国质量认证中心

中国·北京·朝阳区芳草地西街15号 100020

<http://www.cqc.com.cn>

A 0011910



产品认证证书

证书编号: CQC04001010846

申 请 人: 汕头市鸿志电子有限公司
商 标: HEL
型号/名称: 10D(820K~162K) (压敏电压:82-1600V~; 允
许偏差: K=±10%气候类别:40/085/21)
氧化锌压敏电阻器
标 准: GB/T 10193-1997、GB/T 10194-1997
生产厂/地址: 汕头市鸿志电子有限公司
广东省汕头市龙湖区浦江路6号3-4楼
生产厂编号: V004315
认 证 模 式: 第五种认证模式

主 任:

李怀林



中国质量认证中心

中国·北京·朝阳区芳草地西街15号 100020

<http://www.cqc.com.cn>

A 0011908



产品认证证书

证书编号: CQC04001010847

申请人: 汕头市鸿志电子有限公司

商 标: HEL

型号/名称: 7D(820K~511K)压敏电压:82-510V~; 允许偏差: ±10%; 气候类别:40/085/21)
氧化锌压敏电阻器

标 准: GB/T 16193-1997、GB/T 10194-1997

生产厂/地址: 汕头市鸿志电子有限公司
广东省汕头市龙湖区浦江路6号3-4楼

生产厂编号: V004316

认证模式: 第五种认证模式

主任: 李怀林



中国质量认证中心

中国·北京·朝阳区芳草地西街15号 100029
<http://www.cqc.com.cn>

A 0011907



XUHT2.E197799

Transient Voltage Surge Suppressors - Component

[Page Bottom](#)
[Questions?](#)
[Previous Page](#)

Transient Voltage Surge Suppressors - Component

Guide Information

HONGZHI ENTERPRISES LTD.
6 LONGHU PUJIANG W RD
SHANTOU
GUANGDONG 515041, CHINA

E197799

Varistors, Cat. No. HEL05D followed by 820, 101, 121, 151, 181, 201, 221, 241, 271, 301, 331, 361, 391, 431, 471; Cat. No. HEL07D followed by 820, 101, 121, 151, 181, 201, 221, 241, 271, 301, 331, 361, 391, 431, 471, 511, 561, 621; Cat. No. HEL10D followed by 820, 101, 121, 151, 181, 201, 221, 241, 271, 301, 331, 361, 391, 431, 471, 511, 561, 621, 681, 751, 821, 911, 102, 112, 182; Cat. No. HEL14D followed by 820, 101, 121, 151, 181, 201, 221, 241, 271, 301, 331, 361, 391, 431, 471, 511, 561, 621, 681, 751, 821, 911, 102, 112, 182; Cat. No. HEL20D followed by 820, 101, 121, 151, 181, 201, 221, 241, 271, 301, 331, 361, 391, 431, 471, 511, 561, 621, 681, 751, 821, 911, 102, 112, 182.

Model HEL-34S followed by 201, 221, 241, 271, 301, 331, 361, 391, 431, 471, 511, 561, 621, 681, 751, 781, 821, 911, 951, 102, 122, 142, 162, 182, followed by K.

Marking: Company name,  and catalog designation.

[Page Top](#)
[Notice of Disclaimer](#)
[Questions?](#)
[Previous Page](#)
[UL Listed and Classified Products](#)
[UL Recognized Components](#)
[Products Certified for Canada](#)

This page and all contents are Copyright © 2004 by Underwriters Laboratories Inc. ®

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Listed and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained on UL's Website subject to the following conditions: 1. The Guide Information, Designs and/or Listings (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from Underwriters Laboratories Inc." must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "Copyright © 2004 Underwriters Laboratories Inc. ®"

<http://database.ul.com/cgi-bin/XYV/template/LISEXT/IFRAME/showpage...> 2004-4-27

VDE Prüf- und Zertifizierungsinstitut

GUTACHTEN MIT FERTIGUNGSÜBERWACHUNG CERTIFICATE OF CONFORMITY WITH FACTORY SURVEILLANCE

Hongzhi Enterprises Ltd.
Longhu Pujiang,
Road No. 6
Shangtou
Guangdong
CHINA

ist berechtigt, für ihr Produkt /
is authorized to use for their product

Varistor
Varistor

die hier abgebildeten markenrechtlich geschützten Zeichen
für die ab Blatt 2 aufgeführten Typen zu benutzen /
the legally protected Marks as shown below for the types referred to on page 2 ff.



REG.-Nr. A499 oder/oder



oder/oder VDE-REG.-Nr. A499

REG.-Nr. A499

Gepflicht und zertifiziert nach /
Tested and certified according to

CECC 42000/A1, 1979
CECC 42000/A1, 1986
CECC 42001/A1, 1986
IEC 61051-1:1991
IEC 61051-2:1991
IEC 61051-2-2:1991

VDE Prüf- und Zertifizierungsinstitut
VDE Testing and Certification Institute
Zertifizierungsstelle
Certification

Schlippe

Aktenzeichen: 5000238-4795-0001 / 25376
File ref.:
Ausweis-Nr. 40008621 Blatt 1
Licence No. Page

Keine Bedingungen zum Abdruck und Vervielfältigen /
No conditions for reprint and copying please

Offendruck, 2003-12-01

VDEI VERBAND DER ELEKTROTECHNIK /
ELEKTRONIK INFORMATIKTECHNIK e.V.



Name und Sitz des Genehmigungs-Inhabers / Name and registered seat of the Licence holder
Hongzhi Enterprises Ltd., Longhu Pujiang Road No. 6, Shangtou, Guangdong, CHINA

Aktenzeichen / File ref.
5000238-4790-0001 / 25376 / F330 / BKA

Datum / Date
2003-12-01

Dieses Blatt gilt nur in Verbindung mit Blatt 1 des Gutachtens mit Fertigungsüberwachung Nr. 40008621.
This supplement is only valid in conjunction with page 1 of the Certificate of Conformity with factory surveillance No. 40008621.

Varistor Varistor

Typ(en) / Type(s)	Typstrom Class current	Max. Spitzenstrom Max. peak current	Max. Dauerspannung Max. continuous voltage
	8/20 μ s	1 time 8/20 μ s	
HEL-5D561K bis/to HEL-5D681K	5 A	400 A	AC 350 - 420 V DC 460 - 560 V
HEL-7D820K bis/to HEL-7D271K	10 A	1200 A	AC 50 - 175 V DC 65 - 225 V
HEL-7D331K bis/to HEL-7D751K	10 A	1200 A	AC 210 - 460 V DC 275 - 615 V
HEL-7D821K	10 A	1200 A	AC 510 V/DC 670 V
HEL-10D820K bis/to HEL-10D271K	25 A	2500 A	AC 50 - 175 V DC 65 - 225 V
HEL-10D331K bis/to HEL-10D751K	25 A	2500 A	AC 210 - 460 V DC 275 - 615 V
HEL-10D821K bis/to HEL-10D951K	25 A	2500 A	AC 510 - 670 V DC 575 - 765 V
HEL-14D820K bis/to HEL-14D271K	50 A	4000 A	AC 50 - 175 V DC 65 - 225 V
HEL-14D331K bis/to HEL-14D751K	50 A	4000 A	AC 210 - 460 V DC 275 - 615 V
HEL-14D821K bis/to HEL-14D951K	50 A	4000 A	AC 510 - 670 V DC 575 - 765 V

Fortsetzung siehe Blatt 3 /
continued on page 3

VDE Testing and Certification Institute * Institut VDE d'Essais et de Certification

Metzgerstrasse 23, D-62083 Offenbach



Phone +49 (0) 69 83 06-0
Telefax +49 (0) 69 83 06-535

VDE Prüf- und Zertifizierungsinstitut Gutachten mit Fertigungsüberwachung

Ausweis-Nr. / Blatt /
Licence No. page
40008621 3

Name und Sitz des Genehmigungs-Inhabers / Name and registered seat of the Licence holder
Hongzhi Enterprises Ltd., Longhu Pujiang Road No. 6, Shangtou, Guangdong, CHINA

Aktenzeichen / File ref.
5000238-4790-0001 / 25376 / F330 / BKA

Datum / Date
2003-12-01

Dieses Blatt gilt nur in Verbindung mit Blatt 1 des Gutachtens mit Fertigungsüberwachung Nr. 40008621.
This supplement is only valid in conjunction with page 1 of the Certificate of Conformity with factory surveillance No. 40008621.

Typen / Types:	Typstrom Class current	Max. Spitzenstrom Max. peak current	Max. Dauerspannung Max. continuous voltage
	8/20 μ s	1 time 8/20 μ s	
HEL-20D820K bis/to HEL-20D271K	100 A	6500 A	AC 50 - 175 V DC 85 - 225 V
HEL-20D331K bis/to HEL-20D751K	100 A	6500 A	AC 210 - 460 V DC 275 - 615 V
HEL-20D821K bis/to HEL-20D951K	100 A	6500 A	AC 510 - 670 V DC 575 - 765 V
Spannungsprüfung Voltage test	AC 2500 V		
Klimakategorie Climatic category	10/050/04		
Betriebstemperatur Operating temperature	-10°C bis/to +70°C (siehe Derating Kurve) (see derating curve)		
Temperaturbeiwert der Spannung Temperature coefficient of voltage	max. -0,05% /k		
Referenzspannung Voltage at reference current	I = 0,1 mA; I = 1,0 mA siehe Anlage Nr. 1 see Appendix No. 1		
Spannung bei Typstrom Voltage at class current	8/20 μ s siehe Anlage Nr. 1 see Appendix No. 1		

Fortsetzung siehe Blatt 4 /
continued on page 4

VDE Testing and Certification Institute * Institut VDE d'Essais et de Certification

Muster-Nr. 25, D-62360 Offenbach

Phone +49 (0) 69 83 06-0
Telefax +49 (0) 69 83 06-535





认证注册证书

本证书证实以下机构

汕头市鸿志电子有限公司

广东省汕头市浦红路6号

已通过中鉴认证有限责任公司的认证，其质量管理体系符合以下国际质量管理体系标准的要求：

ISO9001:2000

特此准予注册。任何时候，与认证有关的规则和条件均须被遵守
认证范围：

陶瓷电容、薄膜电容、NTC热敏电阻及压敏电阻的生产和服务

(涉及本证书范围和 GB/T19001-2000-ISO9001:2000 标准要求的适用性问题，可以通过向该组织咨询而得到进一步的澄清)

证书首次签发日期

2006年6月7日

证书更新日期

有效日期

2009年6月6日

证书编号：UKAS2006Q0333



中鉴认证有限责任公司



通过UKAS
UKAS认可提供
国际认可证书
和标志，请向
颁发证书的
机构。



0158

在认证有效期内，请向中鉴认证有限公司。

第一次符合标志
(贴花)

第二次符合标志
(贴花)

第三次符合标志
(贴花)

证书时效及适用性可向获证组织查询，或电话：020-87389002 网址：WWW.GZCC.CN 向认证机构查询。

Certificate of Compliance

Certificate: 1309525

Master Contract: 215101


Project: 1309525

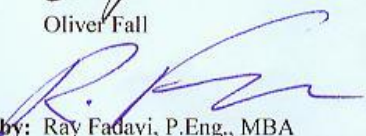
Date Issued: July 4, 2002

Issued to: Hongzhi Enterprises Ltd.
1 Floor West
C1 Ind Building Da Bei Shan 2 Rd
Long Hu Industrial Zone
Shantou, Guangdong
CHINA
Attention: Mr. Sheng Lin

The products listed below are eligible to bear the CSA Mark shown



Issued by: 
Oliver Fall

Authorized by: 
Ray Fadavi, P.Eng., MBA
Operations Manager

PRODUCTS

CLASS 2221 01 - AUDIO AND VIDEO EQUIPMENT - Accessories and Parts for Electronic Equipment

Metal oxide varistors, for across-the-line use on systems up to 250V ac, catalogue numbers HEL05D, HEL07D, HEL10D, HEL14D, HEL20D:

HEL05D-: 820, 101, 121, 151, 181, 201, 221, 241, 271, 301, 331, 361, 391, 431, 471 (5 mm dia.)

HEL07D-: 820, 101, 121, 151, 181, 201, 221, 241, 271, 301, 331, 361, 391, 431, 471, 511, 561, 621 (7 mm dia.)

HEL10D-: 820, 101, 121, 151, 181, 201, 221, 241, 271, 301, 331, 361, 391, 431, 471, 511, 561, 621, 681, 751, 821, 911, 102, 112, 182 (10 mm dia.)

HEL14D-: 820, 101, 121, 151, 181, 201, 221, 241, 271, 301, 331, 361, 391, 431, 471, 511, 561, 621, 681, 751, 821, 911, 102, 112, 182 (14 mm dia.)

HEL20D-: 820, 101, 121, 151, 181, 201, 221, 241, 271, 301, 331, 361, 391, 431, 471, 511, 561, 621, 681, 751, 821, 911, 102, 112, 182 (20 mm dia.)

Notes:

1. These varistors are Certified for use only as components of other Certified products where the suitability of the combination is to be determined by CSA International.
2. Fuse protection may be required in combustible enclosure, where the varistor is surge rated 6000A or less.
3. Values following catalogue numbers represent DC Varistor Voltage Rating coded as follows:
The first 2 digits represent the value and the last digit is the base 10 multiplier.

APPLICABLE REQUIREMENTS

CSA-C22.2 No. 1-98 - Audio, Video and Similar Electronic Equipment General Instruction No. 2
(Including Amendment 1)



中鉴认证有限责任公司

环境管理体系认证证书

NO: 00706E20186R0M

兹 证 明

汕头市鸿志电子有限公司

广东省汕头市浦江路 6 号

邮编: 515041

建立的环境管理体系符合标准:

GB/T24001-2004 idt ISO14001:2004

通过认证范围如下:

位于广东省汕头市浦江路 6 号的汕头市鸿志电子有限公司的陶瓷电容、薄膜电容、NTC 热敏电阻及压敏电阻的生产服务所涉及的活动及覆盖场所

颁证日期: 2006 年 6 月 28 日

本证书有效期自 2006 年 6 月 28 日始 (第 6-16-26 个月监督审核合格) 至 2009 年 6 月 27 日

第一次监督合格标志
(贴花)

第二次监督合格标志
(贴花)

第三次监督合格标志
(贴花)

公司代表 (签名)



认可注册号: CNAB007-E

证书时效及适用性可向获证组织查询, 或电话: 020-87369002 网址: WWW.GZCC.ORG.CN 向认证机构查询。