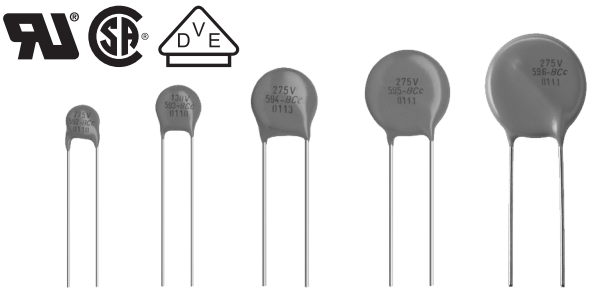
VDR Metal Oxide Varistors High Surge



FEATURES

- Zinc oxide disc, epoxy coated
- Straight or kinked leads
- Higher current surge/size ratio capability up to 10 kA for H20 types
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Certified according to UL 1449 edition 3, VDE/IEC 61051-1/2 and CSA

RoHS COMPLIANT

QUICK REFERENCE DATA		
PARAMETER	**VALUE**	**UNIT**
Maximum continuous voltage in operating temperature range:		
RMS	11 to 680	V
DC	14 to 895	V
Maximum non-repetitive transient current I_{NRP} (8 x 20 µs)	250 to 10 000	A
Detailed specification	Based on IEC 61051-1 IEC 61051-2 IEC 61051-2-2	
Storage temperature	- 40 to + 150	°C
Operating temperature	- 40 to + 125	°C

ORDERING INFORMATION

The varistors are available in a number of packaging options:

- Bulk
- On tape on reel
- On tape in ammopack

The basic ordering code for each option is given in tables titled Varistors on Tape on Reel, Varistors on Tape in Ammopack and Varistors in Bulk. To complete the catalog number and to determine the required operating parameters, see Electrical Data and Ordering Information table.

APPLICATION

- Overvoltage and transient voltage protection

DESCRIPTION

The varistors consist of a disc of low-ß ceramic material with two tinned solid copper leads. They are coated with a layer of ochre colored epoxy, which provides electrical, mechanical and climatic protection. The encapsulation is resistant to all cleaning solvents in accordance with IEC 60068-2-45.

MOUNTING

The varistors are suitable for processing on automatic insertion and cutting and bending equipment.

Typical Soldering

235 °C, duration: 5 s (Pb-bearing)
245 °C, duration: 5 s (lead (Pb)-free)

Resistance to soldering heat

260 °C; duration: 10 s max.

MARKING

The varistors are marked with the following information:

- Maximum continuous RMS voltage
- Series number (582, 583, 584, 585 or 586)
- Manufacture logo
- Date of manufacture (YYWW)

INFLAMMABILITY

The varistors are non-flammable. The encapsulation is made of flammable-resistant epoxy lacquer in accordance with UL 94 V-0.

ELECTRICAL DATA AND ORDERING INFORMATION

MAXIMUM CONTINUOUS VOLTAGE		VOLTAGE [3] at 1 mA	MAXIMUM VOLTAGE at STATED CURRENT		MAXIMUM ENERGY [4] (10 x 1000 µs)	MAXIMUM NON-REP. TRANSIENT CURRENT [5] I_{NRP} (8 x 20 µs)	TYPICAL CAPACITANCE at 1 kHz	T (max.)	E	CATALOG NUMBERS [1]	
RMS [2] (V)	DC (V)	(V)	V (V)	I (A)	(J)	(A)	(pF)	(mm)	(mm)	12NC [6]	SAP [7]
11	14	18	40	1.0	0.7	250	1600	3.4	0.5 ± 0.3	2381 582 x110y	VDRH05B011xyE
			36	2.5	1.5	500	3600	3.4	0.5 ± 0.3	2381 583 x110y	VDRH07D011xyE
			36	5.0	2.6	1000	8000	3.8	0.7 ± 0.3	2381 584 x110y	VDRH10G011xyE
			36	10.0	5.2	2000	20 000	3.8	0.7 ± 0.3	2381 585 x110y	VDRH14M011xyE
			36	20.0	13.0	3000	40 000	4.2	0.9 ± 0.3	2381 586 x110y	VDRH20R011ByE
14	18	22	48	1.0	0.8	250	1300	3.4	0.7 ± 0.3	2381 582 x140y	VDRH05B014xyE
			43	2.5	1.7	500	2800	3.4	0.7 ± 0.3	2381 583 x140y	VDRH07D014xyE
			43	5.0	3.2	1000	6000	3.8	0.9 ± 0.3	2381 584 x140y	VDRH10G014xyE
			43	10.0	6.3	2000	15 000	3.8	0.9 ± 0.3	2381 585 x140y	VDRH14M014xyE
			43	20.0	16.0	3000	30 000	4.2	1.1 ± 0.3	2381 586 x140y	VDRH20R014ByE
17	22	27	60	1.0	1.1	250	1050	3.7	0.8 ± 0.3	2381 582 x170y	VDRH05B017xyE
			53	2.5	2.1	500	2000	3.7	0.8 ± 0.3	2381 583 x170y	VDRH07D017xyE
			53	5.0	3.9	1000	4000	4.1	1.0 ± 0.3	2381 584 x170y	VDRH10G017xyE
			53	10.0	7.8	2000	10 000	4.1	1.0 ± 0.3	2381 585 x170y	VDRH14M017xyE
			53	20.0	19.0	3000	20 000	4.5	1.2 ± 0.3	2381 586 x170y	VDRH20R017ByE
20	26	33	73	1.0	1.3	250	900	3.9	1.0 ± 0.3	2381 582 x200y	VDRH05B020xyE
			65	2.5	2.8	500	1500	3.9	1.0 ± 0.3	2381 583 x200y	VDRH07D020xyE
			65	5.0	4.8	1000	3000	4.3	1.2 ± 0.3	2381 584 x200y	VDRH10G020xyE
			65	10.0	9.5	2000	7500	4.3	1.2 ± 0.3	2381 585 x200y	VDRH14M020xyE
			65	20.0	24.0	3000	15 000	4.7	1.4 ± 0.3	2381 586 x200y	VDRH20R020ByE
25	31	39	86	1.0	1.5	250	500	4.2	1.2 ± 0.3	2381 582 x250y	VDRH05B025xyE
			77	2.5	3.0	500	1350	4.2	1.2 ± 0.3	2381 583 x250y	VDRH07D025xyE
			77	5.0	5.6	1000	2600	4.6	1.4 ± 0.3	2381 584 x250y	VDRH10G025xyE
			77	10.0	11.0	2000	6500	4.6	1.4 ± 0.3	2381 585 x250y	VDRH14M025xyE
			77	20.0	28.0	3000	13 000	5.0	1.6 ± 0.3	2381 586 x250y	VDRH20R025ByE
30	38	47	104	1.0	1.8	250	700	4.4	1.4 ± 0.5	2381 582 x300y	VDRH05B030xyE
			93	2.5	3.8	500	1600	4.4	1.4 ± 0.5	2381 583 x300y	VDRH07D030xyE
			93	5.0	6.8	1000	2700	4.8	1.6 ± 0.5	2381 584 x300y	VDRH10G030xyE
			93	10.0	14.0	2000	6000	4.8	1.6 ± 0.5	2381 585 x300y	VDRH14M030xyE
			93	20.0	34.0	3000	12 000	5.2	1.8 ± 0.5	2381 586 x300y	VDRH20R030ByE
35	45	56	123	1.0	2.2	250	560	4.8	1.7 ± 0.5	2381 582 x350y	VDRH05B035xyE
			110	2.5	4.4	500	1300	4.8	1.7 ± 0.5	2381 583 x350y	VDRH07D035xyE
			110	5.0	8.1	1000	2200	5.2	1.9 ± 0.5	2381 584 x350y	VDRH10G035xyE
			110	10.0	16.0	2000	4800	5.2	1.9 ± 0.5	2381 585 x350y	VDRH14M035xyE
			110	20.0	41.0	3000	9600	5.6	2.1 ± 0.5	2381 586 x350y	VDRH20R035ByE
40	56	68	150	1.0	2.6	250	460	5.1	2.1 ± 0.5	2381 582 x400y	VDRH05B040xyE
			135	2.5	5.4	500	1000	5.1	2.1 ± 0.5	2381 583 x400y	VDRH07D040xyE
			135	5.0	9.8	1000	1800	5.5	2.3 ± 0.5	2381 584 x400y	VDRH10G040xyE
			135	10.0	20.0	2000	3800	5.5	2.3 ± 0.5	2381 585 x400y	VDRH14M040xyE
			135	20.0	49.0	3000	7600	5.9	2.5 ± 0.5	2381 586 x400y	VDRH20R040ByE
50	65	82	145	5.0	3.5	800	370	3.5	0.6 ± 0.3	2381 582 x500y	VDRH05E050xyE
			135	10.0	7.0	1750	900	3.5	0.6 ± 0.3	2381 583 x500y	VDRH07K050xyE
			135	25.0	14.0	3500	1500	3.9	0.8 ± 0.3	2381 584 x500y	VDRH10S050xyE
			135	50.0	28.0	6000	3100	3.9	0.8 ± 0.3	2381 585 x500y	VDRH14V050xyE

ELECTRICAL DATA AND ORDERING INFORMATION

MAXIMUM CONTINUOUS VOLTAGE		VOLTAGE (3) at 1 mA	MAXIMUM VOLTAGE at STATED CURRENT		MAXIMUM ENERGY (4) (10 x 1000 µs)	MAXIMUM NON-REP. TRANSIENT CURRENT (5) I_{NRP} (8 x 20 µs)	TYPICAL CAPACITANCE at 1 kHz	T (max.)	E	CATALOG NUMBERS (1)	
RMS (2) (V)	DC (V)	(V)	V (V)	I (A)	(J)	(A)	(pF)	(mm)	(mm)	12NC (6)	SAP (7)
60	85	100	175	5.0	4.5	800	290	3.7	0.7 ± 0.3	2381 582 x600y	VDRH05E060xyE
			165	10.0	9.0	1750	700	3.7	0.7 ± 0.3	2381 583 x600y	VDRH07K060xyE
			165	25.0	18.0	3500	1200	4.1	0.9 ± 0.3	2381 584 x600y	VDRH10S060xyE
			165	50.0	36.0	6000	2300	4.1	0.9 ± 0.3	2381 585 x600y	VDRH14V060xyE
			165	100.0	72.0	10 000	4600	4.5	1.1 ± 0.3	2381 586 x600y	VDRH20X060ByE
75	100	120	210	5.0	5.5	800	240	4.0	0.9 ± 0.3	2381 582 x750y	VDRH05E075xyE
			200	10.0	11.0	1750	530	4.0	0.9 ± 0.3	2381 583 x750y	VDRH07K075xyE
			200	25.0	22.0	3500	1000	4.4	1.1 ± 0.3	2381 584 x750y	VDRH10S075xyE
			200	50.0	44.0	6000	1900	4.4	1.1 ± 0.3	2381 585 x750y	VDRH14V075xyE
			200	100.0	88.0	10 000	3800	4.8	1.3 ± 0.3	2381 586 x750y	VDRH20X075ByE
95	125	150	260	5.0	6.5	800	180	4.2	1.1 ± 0.3	2381 582 x950y	VDRH05E095xyE
			250	10.0	13.0	1750	450	4.2	1.1 ± 0.3	2381 583 x950y	VDRH07K095xyE
			250	25.0	25.0	3500	800	4.6	1.3 ± 0.3	2381 584 x950y	VDRH10S095xyE
			250	50.0	53.0	6000	1500	4.6	1.3 ± 0.3	2381 585 x950y	VDRH14V095xyE
			250	100.0	106.0	10 000	3000	5.0	1.5 ± 0.3	2381 586 x950y	VDRH20X095ByE
115	150	180	320	5.0	8.0	800	150	3.6	0.9 ± 0.3	2381 582 x111y	VDRH05E115xyE
			300	10.0	16.0	1750	390	3.6	0.9 ± 0.3	2381 583 x111y	VDRH07K115xyE
			300	25.0	32.0	3500	680	4.0	1.1 ± 0.3	2381 584 x111y	VDRH10S115xyE
			300	50.0	65.0	6000	1320	4.0	1.1 ± 0.3	2381 585 x111y	VDRH14V115xyE
			300	100.0	130.0	10 000	2640	4.4	1.3 ± 0.3	2381 586 x111y	VDRH20X115ByE
130	170	205	355	5.0	8.5	800	130	3.8	1.0 ± 0.3	2381 582 x131y	VDRH05E130xyE
			340	10.0	17.5	1750	320	3.8	1.0 ± 0.3	2381 583 x131y	VDRH07K130xyE
			340	25.0	35.0	3500	580	4.3	1.2 ± 0.3	2381 584 x131y	VDRH10S130xyE
			340	50.0	70.0	6000	1050	4.3	1.2 ± 0.3	2381 585 x131y	VDRH14V130xyE
			340	100.0	140.0	10 000	2100	4.8	1.4 ± 0.3	2381 586 x131y	VDRH20X130ByE
140	180	220	380	5.0	9.0	800	120	3.9	1.0 ± 0.3	2381 582 x141y	VDRH05E140xyE
			360	10.0	19.0	1750	290	3.9	1.0 ± 0.3	2381 583 x141y	VDRH07K140xyE
			360	25.0	39.0	3500	540	4.3	1.2 ± 0.3	2381 584 x141y	VDRH10S140xyE
			360	50.0	78.0	6000	950	4.3	1.2 ± 0.3	2381 585 x141y	VDRH14V140xyE
			360	100.0	155.0	10 000	1900	4.8	1.5 ± 0.3	2381 586 x141y	VDRH20X140ByE
150	200	240	415	5.0	10.5	800	110	4.1	1.1 ± 0.3	2381 582 x151y	VDRH05E150xyE
			395	10.0	21.0	1750	270	4.1	1.1 ± 0.3	2381 583 x151y	VDRH07K150xyE
			395	25.0	42.0	3500	490	4.3	1.3 ± 0.3	2381 584 x151y	VDRH10S150xyE
			395	50.0	84.0	6000	850	4.3	1.3 ± 0.3	2381 585 x151y	VDRH14V150xyE
			395	100.0	168.0	10 000	1700	4.8	1.5 ± 0.3	2381 586 x151y	VDRH20X150ByE
175	225	275	475	5.0	11.0	800	90	4.1	1.3 ± 0.3	2381 582 x171y	VDRH05E175xyE
			455	10.0	24.0	1750	230	4.1	1.3 ± 0.3	2381 583 x171y	VDRH07K175xyE
			455	25.0	49.0	3500	430	4.5	1.5 ± 0.3	2381 584 x171y	VDRH10S175xyE
			455	50.0	99.0	6000	750	4.5	1.5 ± 0.3	2381 585 x171y	VDRH14V175xyE
			455	100.0	190.0	10 000	1500	4.9	1.7 ± 0.3	2381 586 x171y	VDRH20X175ByE
195	250	300	525	5.0	12.0	800	80	4.3	1.4 ± 0.8	2381 582 x191y	VDRH05E195xyE
			455	10.0	26.0	1750	210	4.3	1.4 ± 0.8	2381 583 x191y	VDRH07K195xyE
			455	25.0	52.0	3500	380	4.8	1.6 ± 0.8	2381 584 x191y	VDRH10S195xyE
			455	50.0	105.0	6000	690	4.8	1.6 ± 0.8	2381 585 x191y	VDRH14V195xyE
			455	100.0	210.0	10 000	1350	5.1	1.9 ± 0.8	2381 586 x191y	VDRH20X195ByE

ELECTRICAL DATA AND ORDERING INFORMATION

MAXIMUM CONTINUOUS VOLTAGE		VOLTAGE [3] at 1 mA	MAXIMUM VOLTAGE at STATED CURRENT		MAXIMUM ENERGY [4] (10 x 1000 µs)	MAXIMUM NON-REP. TRANSIENT CURRENT [5] I_{NRP} (8 x 20 µs)	TYPICAL CAPACITANCE at 1 kHz	T (max.)	E	CATALOG NUMBERS [1]	
RMS [2] (V)	DC (V)	(V)	V (V)	I (A)	(J)	(A)	(pF)	(mm)	(mm)	12NC [6]	SAP [7]
210	275	330	575	5.0	13.0	800	75	4.4	1.6 ± 0.8	2381 582 x211y	VDRH05E210xyE
			505	10.0	28.0	1750	190	4.4	1.6 ± 0.8	2381 583 x211y	VDRH07K210xyE
			505	25.0	58.0	3500	350	4.8	1.8 ± 0.8	2381 584 x211y	VDRH10S210xyE
			505	50.0	115.0	6000	610	4.8	1.8 ± 0.8	2381 585 x211y	VDRH14V210xyE
			505	100.0	228.0	10 000	1250	5.3	2.0 ± 0.8	2381 586 x211y	VDRH20X210ByE
230	300	360	620	5.0	16.0	800	70	4.6	1.7 ± 0.8	2381 582 x231y	VDRH05E230xyE
			595	10.0	32.0	1750	170	4.6	1.7 ± 0.8	2381 583 x231y	VDRH07K230xyE
			595	25.0	65.0	3500	320	5.1	1.9 ± 0.8	2381 584 x231y	VDRH10S230xyE
			595	50.0	130.0	6000	540	5.1	1.9 ± 0.8	2381 585 x231y	VDRH14V230xyE
			595	100.0	255.0	10 000	1100	5.4	2.2 ± 0.8	2381 586 x231y	VDRH20X230ByE
250	320	390	675	5.0	17.0	800	60	4.8	1.9 ± 0.8	2381 582 x251y	VDRH05E250xyE
			650	10.0	35.0	1750	160	4.8	1.9 ± 0.8	2381 583 x251y	VDRH07K250xyE
			650	25.0	70.0	3500	300	5.1	2.1 ± 0.8	2381 584 x251y	VDRH10S250xyE
			650	50.0	140.0	6000	480	5.1	2.1 ± 0.8	2381 585 x251y	VDRH14V250xyE
			650	100.0	275.0	10 000	960	5.5	2.3 ± 0.8	2381 586 x251y	VDRH20X250ByE
275	350	430	745	5.0	20.0	800	55	4.9	2.0 ± 0.8	2381 582 x271y	VDRH05E275xyE
			710	10.0	40.0	1750	140	4.9	2.0 ± 0.8	2381 583 x271y	VDRH07K275xyE
			710	25.0	80.0	3500	270	5.3	2.2 ± 0.8	2381 584 x271y	VDRH10S275xyE
			710	50.0	155.0	6000	440	5.3	2.2 ± 0.8	2381 585 x271y	VDRH14V275xyE
			710	100.0	303.0	10 000	900	5.8	2.5 ± 0.8	2381 586 x271y	VDRH20X275ByE
300	385	470	810	5.0	21.0	800	50	5.1	2.2 ± 0.8	2381 582 x301y	VDRH05E300xyE
			775	10.0	42.0	1750	130	5.1	2.2 ± 0.8	2381 583 x301y	VDRH07K300xyE
			775	25.0	85.0	3500	240	5.5	2.4 ± 0.8	2381 584 x301y	VDRH10S300xyE
			775	50.0	175.0	6000	400	5.5	2.4 ± 0.8	2381 585 x301y	VDRH14V300xyE
			775	100.0	350.0	10 000	810	5.9	2.7 ± 0.8	2381 586 x301y	VDRH20X300ByE
320	420	510	880	5.0	22.0	800	45	5.5	2.4 ± 0.8	2381 582 x321y	VDRH05E320xyE
			842	10.0	45.0	1750	120	5.5	2.4 ± 0.8	2381 583 x321y	VDRH07K320xyE
			842	25.0	92.0	3500	220	6.0	2.6 ± 0.8	2381 584 x321y	VDRH10S320xyE
			842	50.0	190.0	6000	370	6.0	2.6 ± 0.8	2381 585 x321y	VDRH14V320xyE
			842	100.0	382.0	10 000	750	6.3	2.9 ± 0.8	2381 586 x321y	VDRH20X320ByE
350	460	560	940	5.0	25.0	800	42	5.8	2.7 ± 0.8	2381 582 x351y	VDRH05E350xyE
			920	10.0	51.0	1750	110	5.8	2.7 ± 0.8	2381 583 x351y	VDRH07K350xyE
			920	25.0	102.0	3500	200	6.1	2.9 ± 0.8	2381 584 x351y	VDRH10S350xyE
			920	50.0	205.0	6000	320	6.1	2.9 ± 0.8	2381 585 x351y	VDRH14V350xyE
			920	100.0	410.0	10 000	650	6.5	3.2 ± 0.8	2381 586 x351y	VDRH20X350ByE
385	505	620	1050	5.0	27.0	800	40	6.0	3.0 ± 0.8	2381 582 x381y	VDRH05E385xyE
			1025	10.0	54.0	1750	95	6.0	3.0 ± 0.8	2381 583 x381y	VDRH07K385xyE
			1025	25.0	107.0	3500	180	6.5	3.2 ± 0.8	2381 584 x381y	VDRH10S385xyE
			1025	50.0	215.0	6000	280	6.5	3.2 ± 0.8	2381 585 x381y	VDRH14V385xyE
			1025	100.0	420.0	10 000	570	6.8	3.5 ± 0.8	2381 586 x381y	VDRH20X385ByE
420	560	680	1150	5.0	28.0	800	35	6.3	3.2 ± 0.8	2381 582 x421y	VDRH05E420xyE
			1120	10.0	56.0	1750	85	6.3	3.2 ± 0.8	2381 583 x421y	VDRH07K420xyE
			1120	25.0	112.0	3500	165	6.7	3.4 ± 0.8	2381 584 x421y	VDRH10S420xyE
			1120	50.0	225.0	6000	250	6.7	3.4 ± 0.8	2381 585 x421y	VDRH14V420xyE
			1120	100.0	430.0	10 000	510	7.1	3.7 ± 0.8	2381 586 x421y	VDRH20X420ByE

ELECTRICAL DATA AND ORDERING INFORMATION

MAXIMUM CONTINUOUS VOLTAGE		VOLTAGE [3] at 1 mA	MAXIMUM VOLTAGE at STATED CURRENT		MAXIMUM ENERGY [4] (10 x 1000 µs)	MAXIMUM NON-REP. TRANSIENT CURRENT [5] I_{NRP} (8 x 20 µs)	TYPICAL CAPACITANCE at 1 kHz	T (max.)	E	CATALOG NUMBERS [1]	
RMS [2] (V)	DC (V)	(V)	V (V)	I (A)	(J)	(A)	(pF)	(mm)	(mm)	12NC [6]	SAP [7]
460	615	750	1290	5.0	29.0	800	30	6.6	3.6 ± 0.8	2381 582 x461y	VDRH05E460xyE
			1240	10.0	58.0	1750	75	6.6	3.6 ± 0.8	2381 583 x461y	VDRH07K460xyE
			1240	25.0	115.0	3500	150	7.0	3.8 ± 0.8	2381 584 x461y	VDRH10S460xyE
			1240	50.0	230.0	6000	225	7.0	3.8 ± 0.8	2381 585 x461y	VDRH14V460xyE
			1240	100.0	440.0	10 000	450	7.5	4.1 ± 0.8	2381 586 x461y	VDRH20X460ByE
485	640	780	1290	10.0	59.0	1750	65	6.8	3.7 ± 0.8	2381 583 x481y	VDRH07K485xyE
			1290	25.0	116.0	3500	145	7.3	3.9 ± 0.8	2381 584 x481y	VDRH10S485xyE
			1290	50.0	233.0	6000	220	7.3	3.9 ± 0.8	2381 585 x481y	VDRH14V485xyE
			1290	100.0	450.0	10 000	400	7.6	4.2 ± 0.8	2381 586 x481y	VDRH20X485ByE
510	670	820	1355	10.0	60.0	1750	62	7.0	3.9 ± 0.8	2381 583 x511y	VDRH07K510xyE
			1355	25.0	118.0	3500	135	7.5	4.1 ± 0.8	2381 584 x511y	VDRH10S510xyE
			1355	50.0	235.0	6000	220	7.5	4.1 ± 0.8	2381 585 x511y	VDRH14V510xyE
			1355	100.0	460.0	10 000	400	7.9	4.4 ± 0.8	2381 586 x511y	VDRH20X510ByE
550	745	910	1500	25.0	127.0	3500	120	7.9	4.5 ± 0.8	2381 584 x551y	VDRH10S550xyE
			1500	50.0	255.0	6000	180	7.9	4.5 ± 0.8	2381 585 x551y	VDRH14V550xyE
			1500	100.0	510.0	10 000	320	8.3	4.9 ± 0.8	2381 586 x551y	VDRH20X550ByE
625	825	1000	1650	25.0	140.0	3500	105	8.4	5.0 ± 0.8	2381 584 x6216	VDRH10S625ByE
			1650	50.0	283.0	6000	165	8.4	5.0 ± 0.8	2381 585 x6216	VDRH14V625ByE
			1650	100.0	566.0	10 000	280	8.8	5.3 ± 0.8	2381 586 x6216	VDRH20X625ByE
680	895	1100	1815	25.0	155.0	3500	80	9.8	5.4 ± 0.8	2381 584 x6816	VDRH10S680ByE
			1815	50.0	310.0	6000	150	9.8	5.4 ± 0.8	2381 585 x6816	VDRH14V680ByE
			1815	100.0	620.0	10 000	250	10.2	5.8 ± 0.8	2381 586 x6816	VDRH20X680ByE

Notes

(1) The products are certified according to (c)UL (E332800), VDE (40013495) and CSA (219883)

(2) The sinusoidal voltage is assumed as the normal operating condition. If a non-sinusoidal voltage is present, type selection should be based on multiplying the peak voltage by a factor of 0.707.

(3) The voltage measured at 1 mA meets the requirements of IEC 61051.
The tolerance on the voltage at 1 mA is ± 10 %.

(4) High energy surges are generally of longer duration. The maximum energy for one pulse of 10 x 1000 µs is given as a reference for longer duration pulses. This pulse can be characterised by peak current (I_p) and pulse width t_2 (virtual time of half I_p value, following *"IEC 60060-2, section 6"*). If V_p is the clamping voltage corresponding to I_p, the energy absorbed in the varistor is determined by the formula:
$E = K \times V_p \times I_p \times t_2$
where:
a) K is dependant on the value of t2 when the value of t1 is between 8 µs and 10 µs; see Peak Current as a Function of Pulse Width drawing.

(5) A current wave of 8 x 20 µs is used as a standard for pulse current and clamping voltage ratings. The maximum non-repetitive transient current is given for one pulse applied during the life of the component.

(6) For composition of the 12NC part number replace "x" and "y" by figures from the sections "Varistors in Bulk", "Varistors on Tape in Ammopack" and "Varistors on "Tape on Reel"

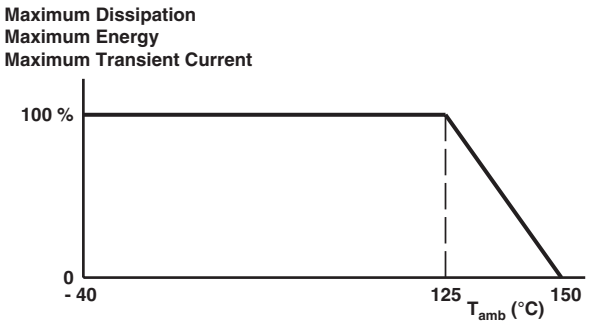
(7) For composition of the SAP part number:
Replace "x" by B for bulk type
T for tape and reel
A for tape and ammopack

Replace "y" by S for straight leads
K for kinked leads (bulk only)
L for kinked leads with H_0 = 16 mm (tape and reel/ammo)
M for kinked leads with H_0 = 18.25 mm (tape and reel/ammo)

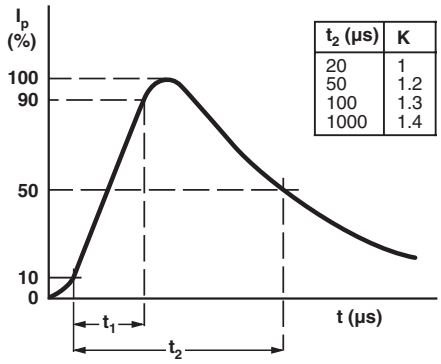
ELECTRICAL CHARACTERISTICS

ELECTRICAL DATA		
PARAMETER	**VALUE**	**UNIT**
Maximum continuous voltage:		
RMS	11 to 680	V
DC	14 to 895	V
Maximum non-repetitive transient current (I_{NRP}) (8 x 20 µs):		
2381 582 ...../VDRH05.....E	250 or 800	A
2381 583 ...../VDRH07.....E	500 or 1750	A
2381 584 ...../VDRH10.....E	1000 or 3500	A
2381 585 ...../VDRH14.....E	2000 or 6000	A
2381 586 ...../VDRH20.....E	3000 or 10 000	A
Thermal resistance:		
2381 582 ...../VDRH05.....E	≈ 80	K/W
2381 583 ...../VDRH07.....E	≈ 70	K/W
2381 584 ...../VDRH10.....E	≈ 60	K/W
2381 585 ...../VDRH14.....E	≈ 50	K/W
2381 586 ...../VDRH20.....E	≈ 40	K/W
Maximum dissipation:		
2381 582 ...../VDRH05.....E	100	mW
2381 583 ...../VDRH07.....E	250	mW
2381 584 ...../VDRH10.....E	400	mW
2381 585 ...../VDRH14.....E	600	mW
2381 586 ...../VDRH20.....E	1000	mW
Temperature coefficient of voltage at 1 mA maximum	± 0.05	%/K
Voltage proof between interconnected leads and case	2500	V
Storage temperature	- 40 to + 150	°C
Operating temperature	- 40 to + 125	°C

DERATING CURVE



PEAK CURRENT AS A FUNCTION OF PULSE WIDTH



COMPONENT DIMENSIONS (BULK TYPE) in millimeters AND CATALOG NUMBERS								
D MAX.	**A MAX.**	**A_0 MAX.**	**L MIN.**	**T (1) MAX.**	**E (1)**	**d**	**F**	**CATALOG NUMBER**
7.0	9.0	11.0	24.0	6.5	0.7 to 3.6	0.6 ± 0.05	5 ± 1.0	2381 582 ...../VDRH05.....E
9.0	11.0	13.0	24.0	6.5	0.7 to 3.6	0.6 ± 0.05	5 ± 1.0	2381 583 ...../VDRH07.....E
13.5	15.5	18.0	17.0	8	0.9 to 4.5	0.8 ± 0.05	7.5 ± 1.0	2381 584 ...../VDRH10.....E
17.0	19.0	23.0	16.0	8	0.9 to 4.5	0.8 ± 0.05	7.5 ± 1.0	2381 585 ...../VDRH14.....E
23.0	25.0	28.0	24.0	10	1.1 to 5.8	1.0 ± 0.05	10 ± 1.0	2381 586 ...../VDRH20.....E

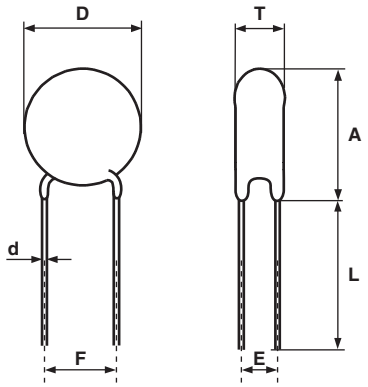
Note

(1) $T_{max.}$ and E values per size and voltage level can be found back in the Electrical Data table

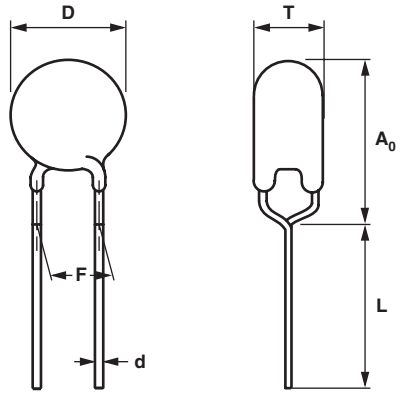
VARISTORS IN BULK					
TYPE	**2381 582 ..... Ø 5 mm 11 V to 460 V**	**2381 583 ..... Ø 7 mm 11 V to 510 V**	**2381 584 ..... Ø 10 mm 11 V to 680 V**	**2381 585 ..... Ø 14 mm 11 V to 680 V**	**2381 586 ..... Ø 20 mm 11 V to 680 V**
Straight leads; see outline of components with straight leads drawing	5...6	5...6	5...6	5...6	5...6
Kinked leads; see outline of components with kinked leads drawing	6...6	6...6	6...6	6...6	6...6
Packaging quantities					
14 V to 95 V	250	250	250	100	50
130 V to 385 V	250	250	250	100	50
420 V to 460 V	250	250	200	100	50
485 V to max. V	-	250	150	100	50

DIMENSIONS in millimeters: See Component Dimensions and Electrical Data table

OUTLINE of Component with Straight Leads



OUTLINE of Component with Kinked Leads

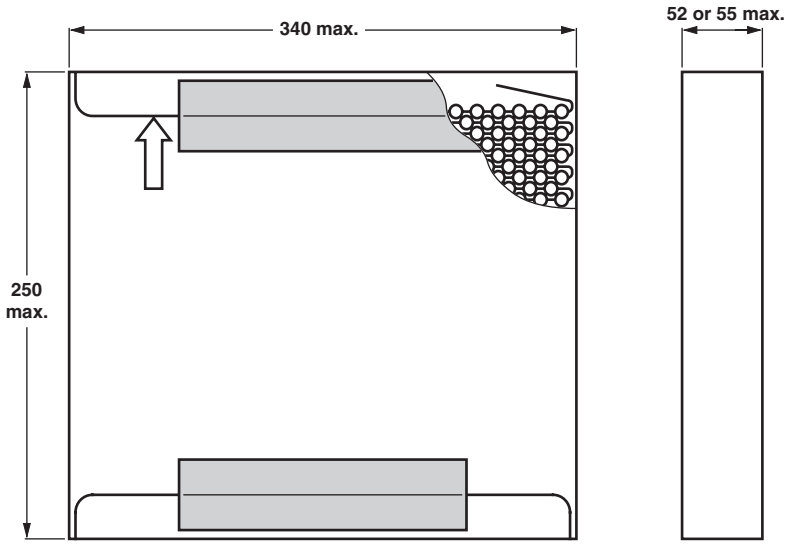


VARISTORS ON TAPE IN AMMOPACK				
TYPE	**2381 582 ..... Ø 5 mm 11 V to 460 V**	**2381 583 ..... Ø 7 mm 11 V to 510 V**	**2381 584 ..... Ø 10 mm 11 V to 550 V**	**2381 585 ..... Ø 14 mm 11 V to 550 V**
Straight leads H = 18 mm H = 20 mm See drawing: Taped version with straight leads	 - 0...7	 - 0...7	 0...7 -	 0...7 -
Kinked leads H_0 = 18.25 mm H_0 = 16 mm See drawing: Taped version with kinked leads	 3...7 8...7	 3...7 8...7	 3...7 8...7	 3...7 8...7
Packaging quantities				
14 V to 210 V	1500 (1)	1500 (1)	500	500
230 V to max. V	1000	1000	500	500

Note

(1) Except for 35 V and 40 V = 1000 pieces

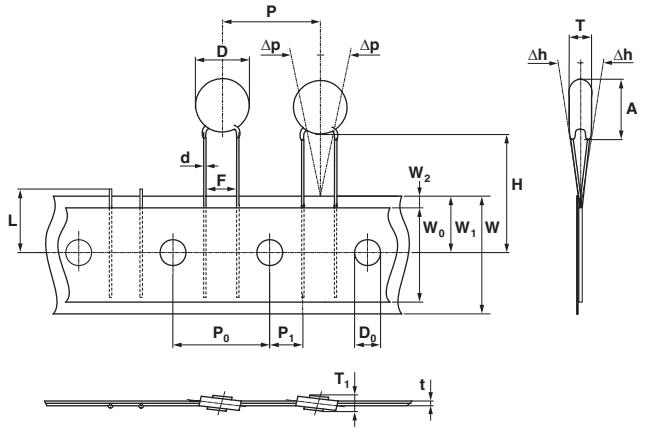
DIMENSIONS OF AMMOPACK in millimeters



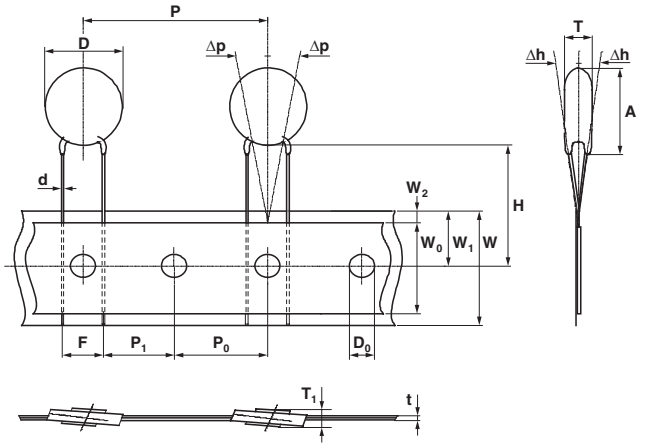
VARISTORS ON TAPE AND REEL				
TYPE	**2381 582 ..... Ø 5 mm 11 V to 460 V**	**2381 583 ..... Ø 7 mm 11 V to 510 V**	**2381 584 ..... Ø 10 mm 11 V to 550 V**	**2381 585 ..... Ø 14 mm 11 V to 550 V**
Straight leads H = 18 mm H = 20 mm See drawing: Taped version with straight leads	 - 0...6	 - 0...6	 0...6 -	 0...6 -
Kinked leads H_0 = 18.25 mm H_0 = 16 mm See drawing: Taped version with kinked leads	 3...6 8...6	 3...6 8...6	 3...6 8...6	 3...6 8...6
Packaging quantities				
14 V to 250 V	1500	1500	1000	750
275 V to 300 V	1500	1500	750	750
320 V to 350 V	1000	1000	500	500
385 V to max. V	1000	1000	500	500

PACKAGING

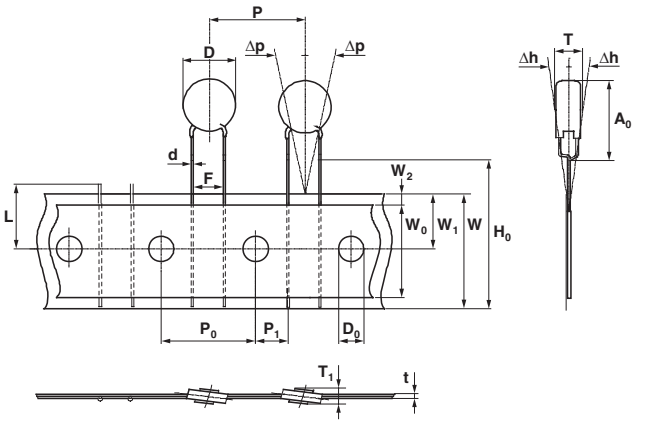
TAPED VERSION WITH STRAIGHT LEADS (only for 2381 582 ...../VDRH05.....E and 2381 583 ...../VDRH07.....E)



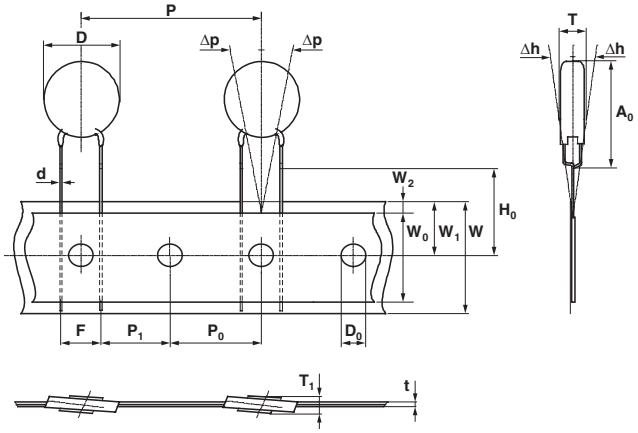
TAPED VERSION WITH STRAIGHT LEADS (only for 2381 584 ...../VDRH10.....E and 2381 585 ...../VDRH14.....E)



TAPED VERSION WITH KINKED LEADS
(only for 2381 582 ...../VDRH10.....E and
2381 583 ...../VDRH07.....E)



TAPED VERSION WITH KINKED LEADS
(only for 2381 584 ...../VDRH10.....E and
2381 585 ...../VDRH14.....E)

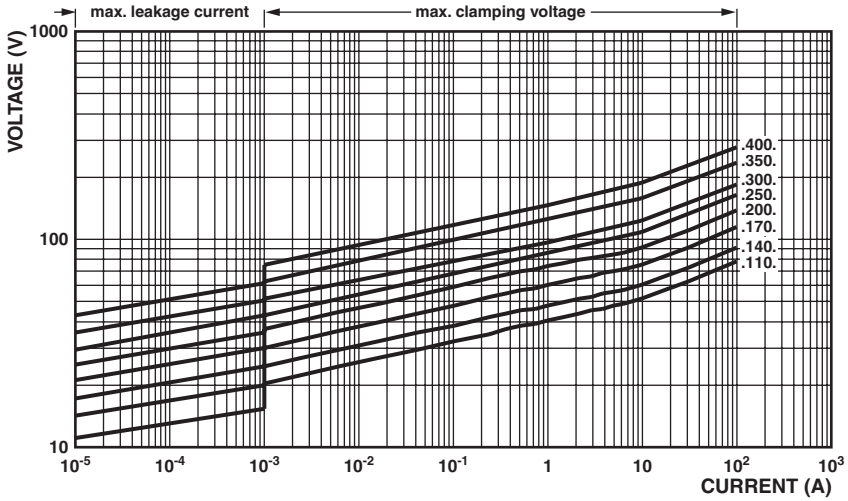


TAPING DATA (based on IEC 60286-2)					
SYMBOL	**PARAMETER**	**DIMENSIONS/TOLERANCE**			
		582	**583**	**584**	**585**
A	Mounting height	9.0 max.	11.0 max.	15.5 max.	19.0 max.
A_o	Mounting height	11.0 max.	13.0 max.	18.0 max.	23.0 max.
D	Body diameter	7.0 max.	9.0 max.	13.5 max.	17.0 max.
d	Lead wire diameter	0.6 ± 0.05		0.8 ± 0.05	
F	Lead to lead distance (1)	5.0 + 0.8/- 0.2		7.5 ± 0.8	
H	Distance component to tape center (2)	20.0 + 2.0/- 0.0		18.0 + 2.0/- 0.0	
H_0	Lead-wire clinch height	16.0 or 18.25 ± 0.5			
P	Pitch of components on tape	12.7 ± 1.0		25.4 ± 1.0	
T	Total thickness	See Electrical Data table			

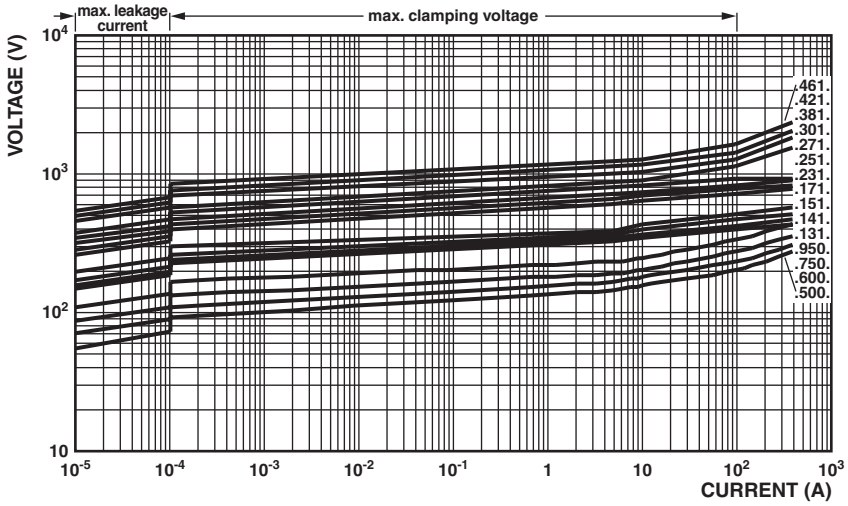
Notes
(1) Guaranteed between component and tape
(2) For 2381 585 0511y and 2381 585 0551y: H = 20 mm ± 1 mm

V/I CHARACTERISTICS

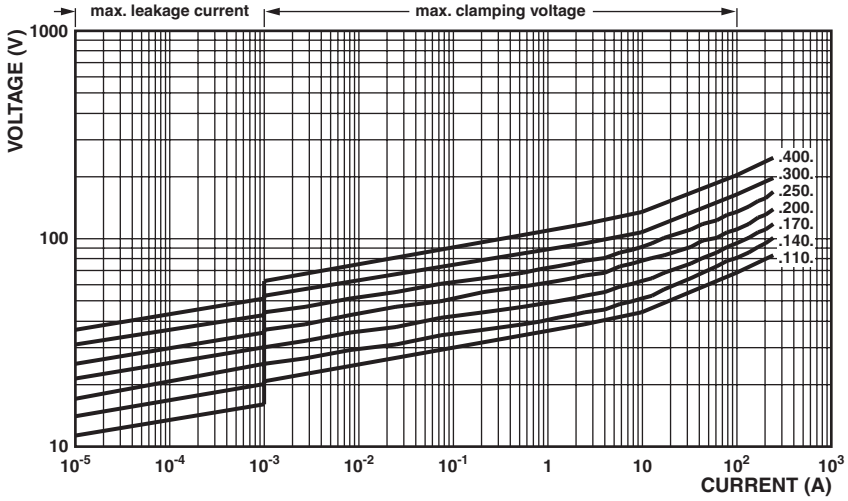
11 V_{RMS} to 40 V_{RMS}; 2381 582 ...../VDRH05.....E



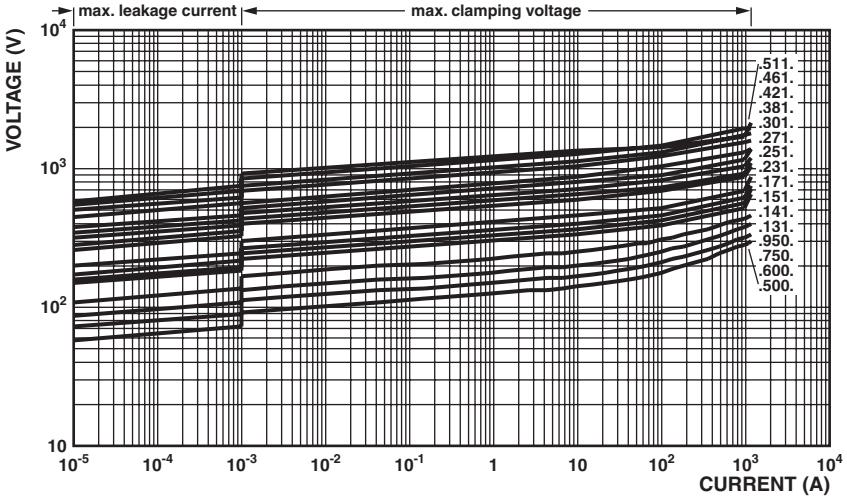
50 V_{RMS} to 460 V_{RMS}; 2381 582 ...../VDRH05.....E



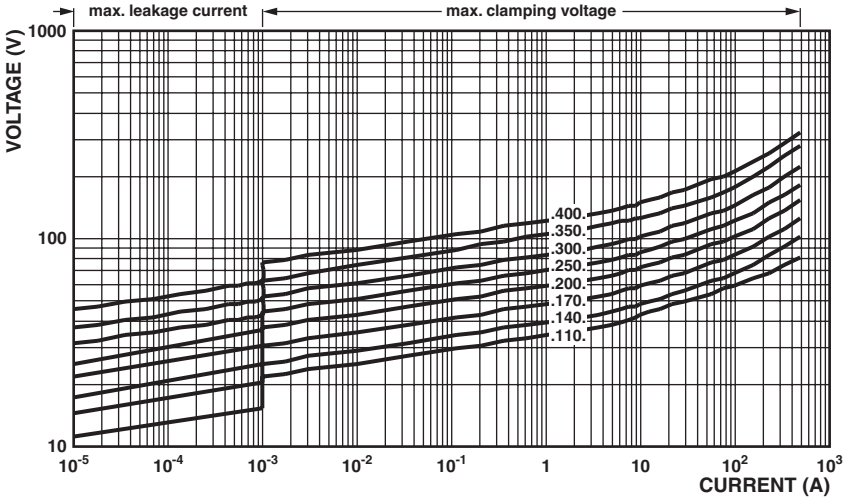
11 V_{RMS} to 40 V_{RMS}; 2381 583 ...../VDRH07.....E



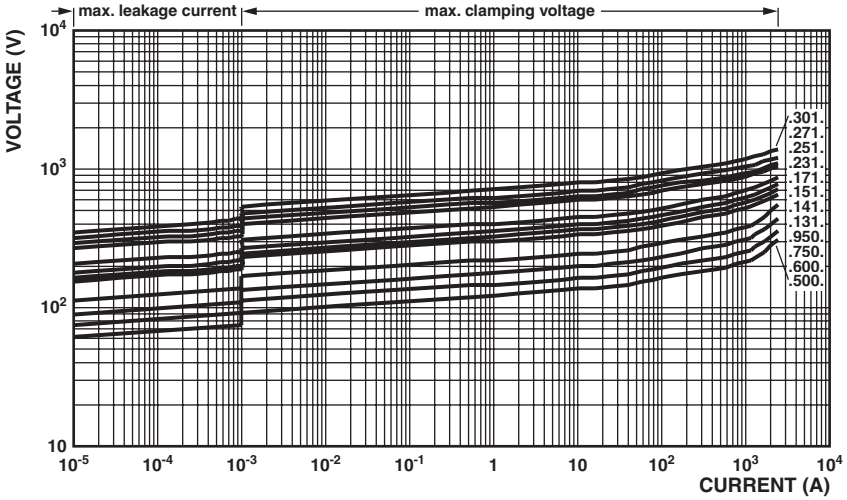
50 V_{RMS} to 510 V_{RMS}; 2381 583 ...../VDRH07.....E



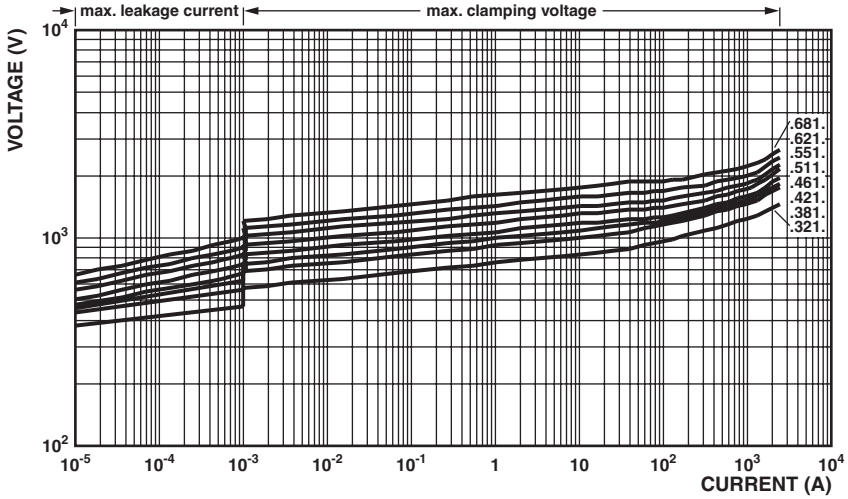
11 V_{RMS} to 40 V_{RMS}; 2381 584 ...../VDRH10.....E



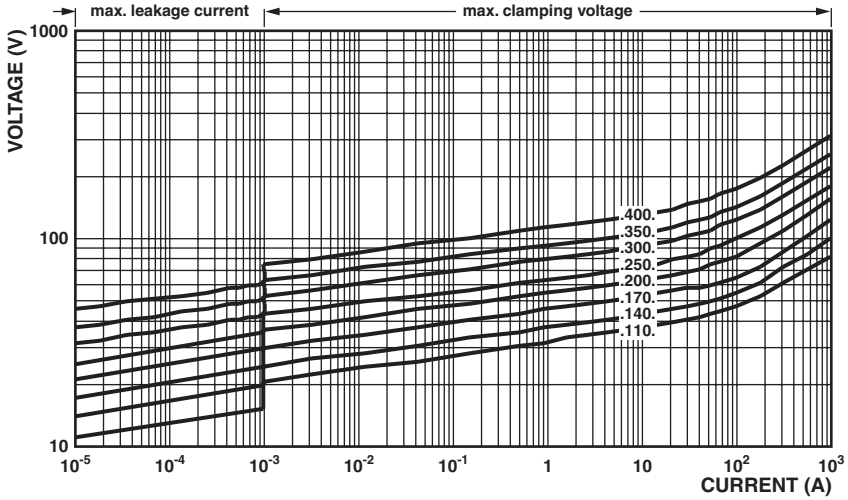
50 V_{RMS} to 300 V_{RMS}; 2381 584 ...../VDRH10.....E



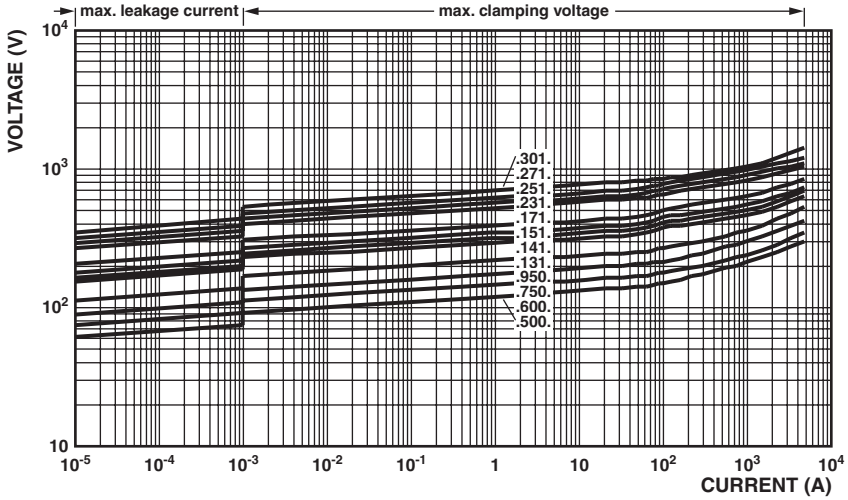
320 V_{RMS} to 680 V_{RMS}; 2381 584 ...../VDRH10.....E



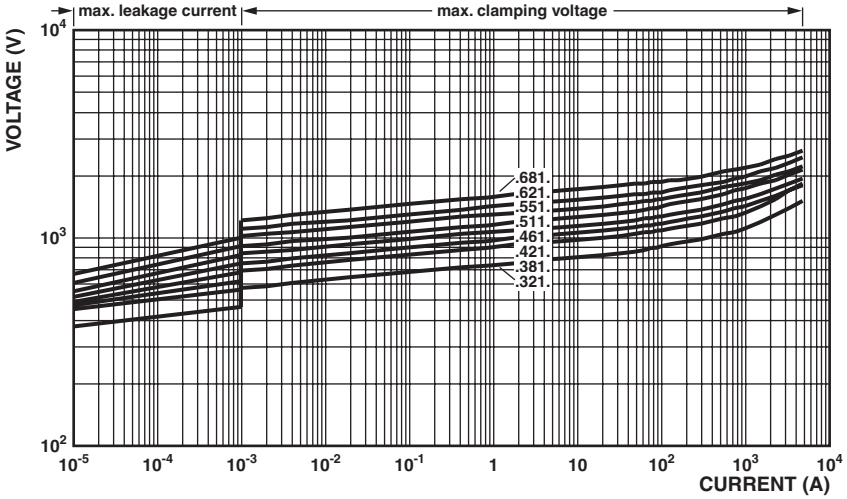
11 V_{RMS} to 40 V_{RMS}; 2381 585 ...../VDRH14.....E



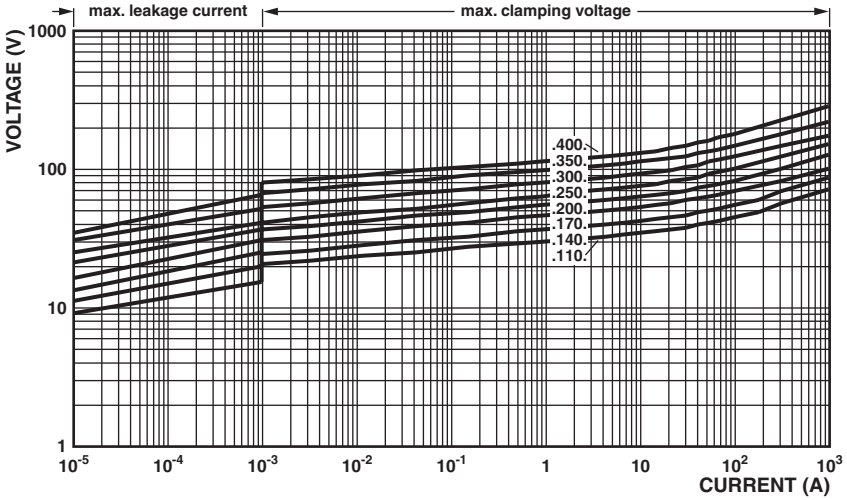
50 V_{RMS} to 300 V_{RMS}; 2381 585 ...../VDRH14.....E



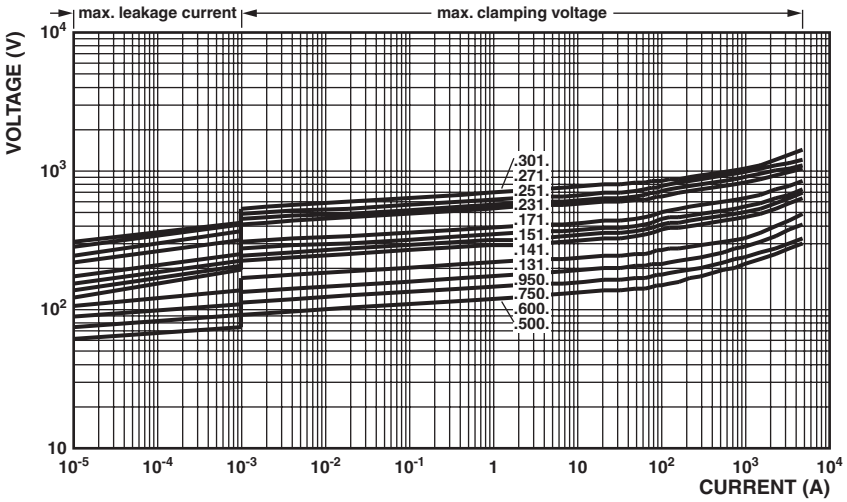
320 V_{RMS} to 680 V_{RMS}; 2381 585 ...../VDRH14.....E



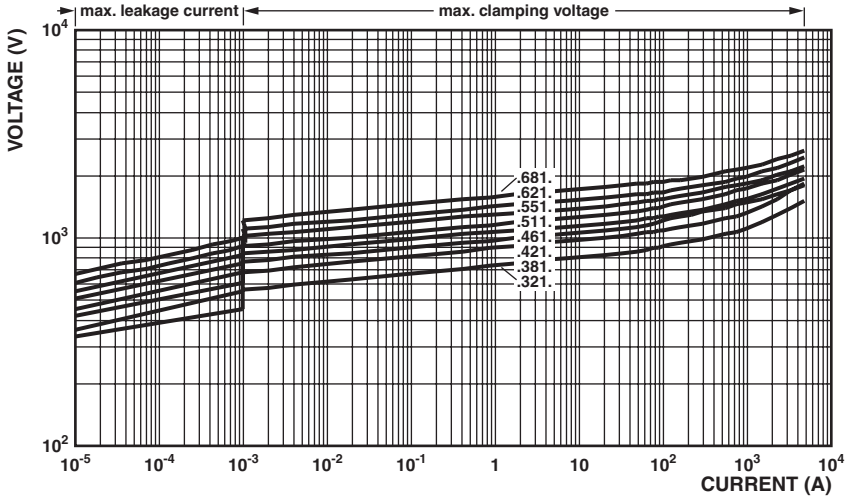
11 V_{RMS} to 40 V_{RMS}; 2381 586 ...../VDRH20.....E



50 V_{RMS} to 300 V_{RMS}; 2381 586 ...../VDRH20.....E

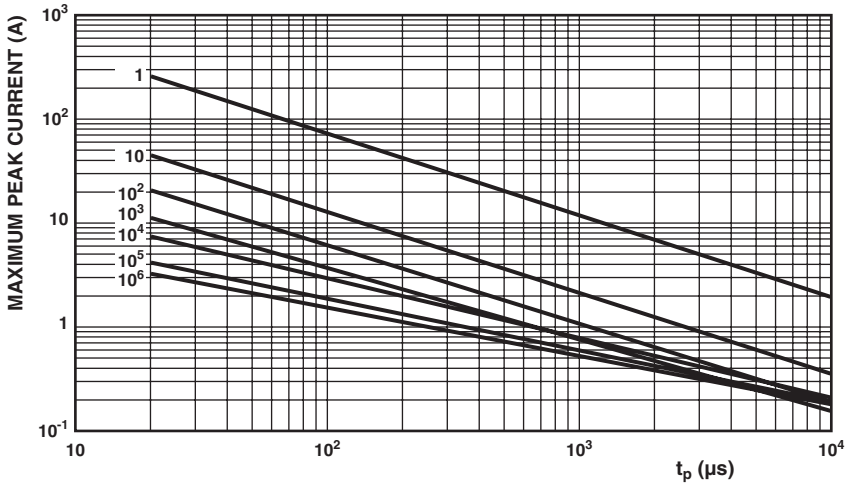


320 V_{RMS} to 680 V_{RMS}; 2381 586 ...../VDRH20.....E

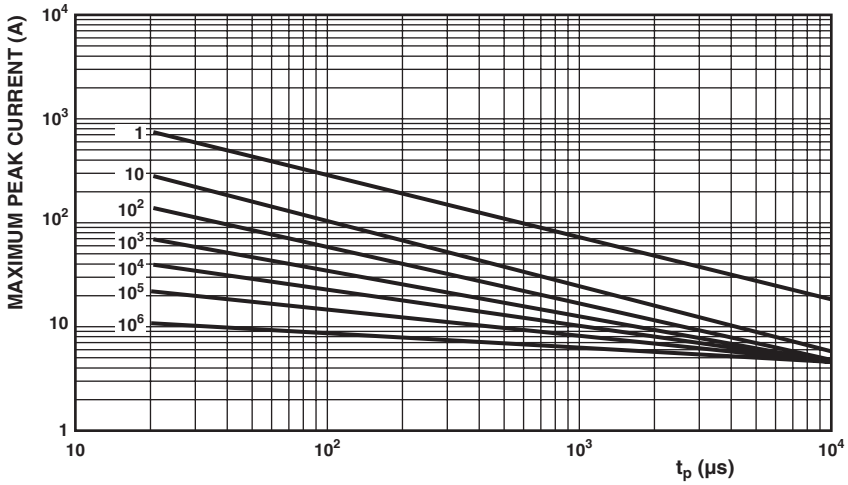


MAXIMUM APPLICABLE TRANSIENT CURRENT AS A FUNCTION OF PULSE DURATION

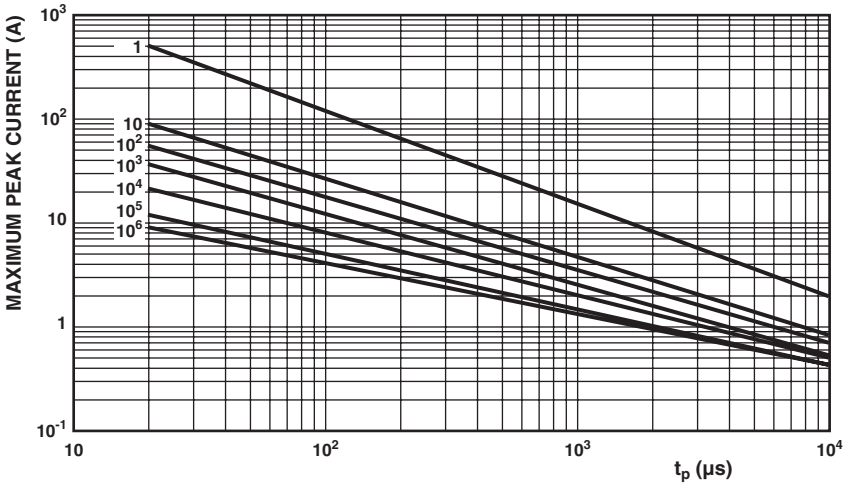
11 V_{RMS} to 40 V_{RMS}; 2381 582 ...../VDRH05.....E



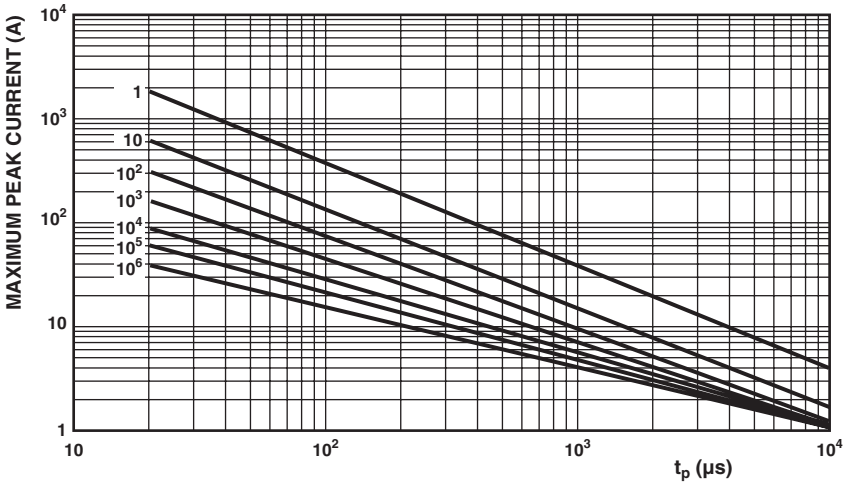
50 V_{RMS} to 300 V_{RMS}; 2381 582 ...../VDRH05.....E



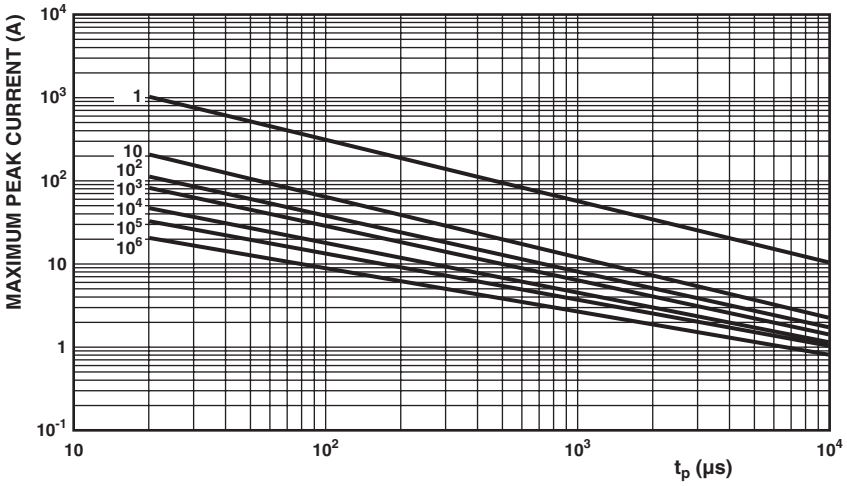
11 V_{RMS} to 40 V_{RMS}; 2381 583 ...../VDRH07.....E



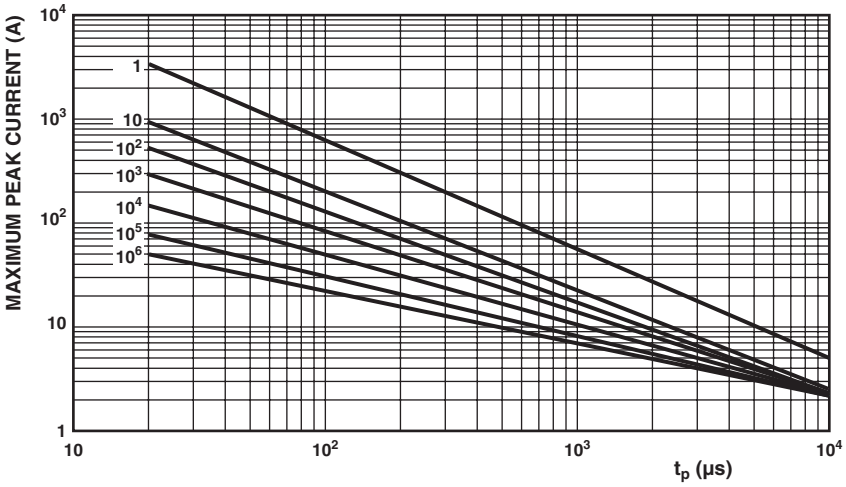
50 V_{RMS} to 300 V_{RMS}; 2381 583 ...../VDRH07.....E



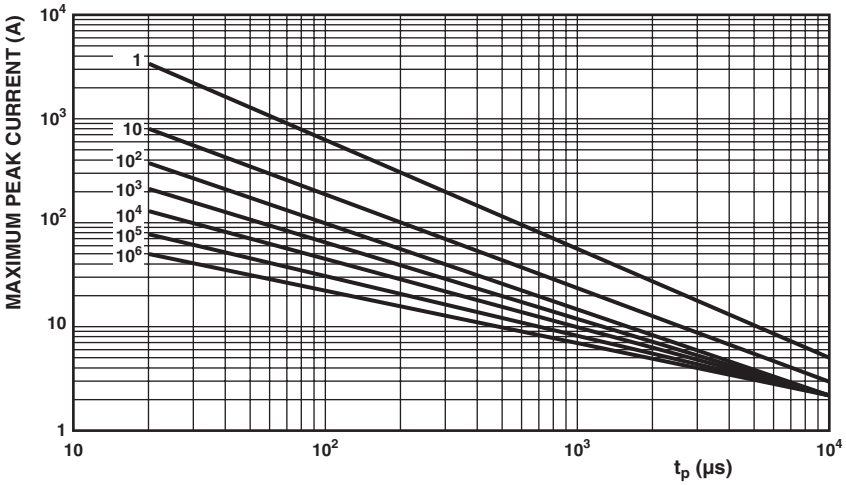
11 V_{RMS} to 40 V_{RMS}; 2381 584 ...../VDRH10.....E



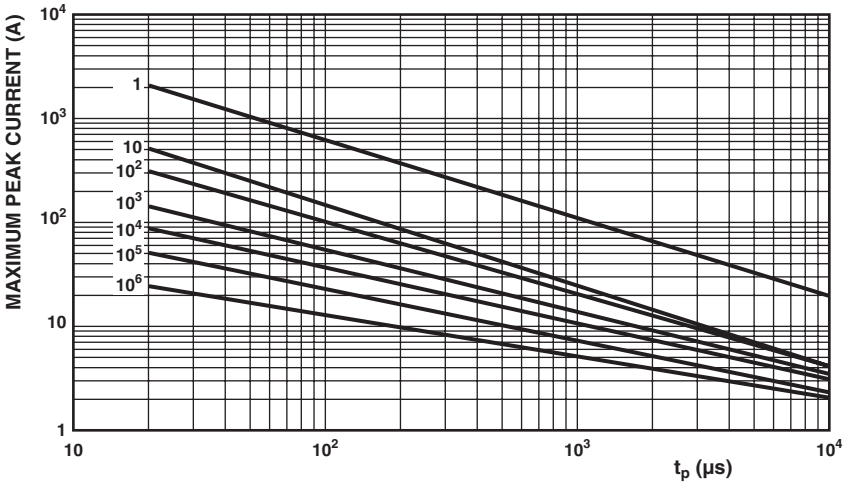
50 V_{RMS} to 300 V_{RMS}; 2381 584 ...../VDRH10.....E



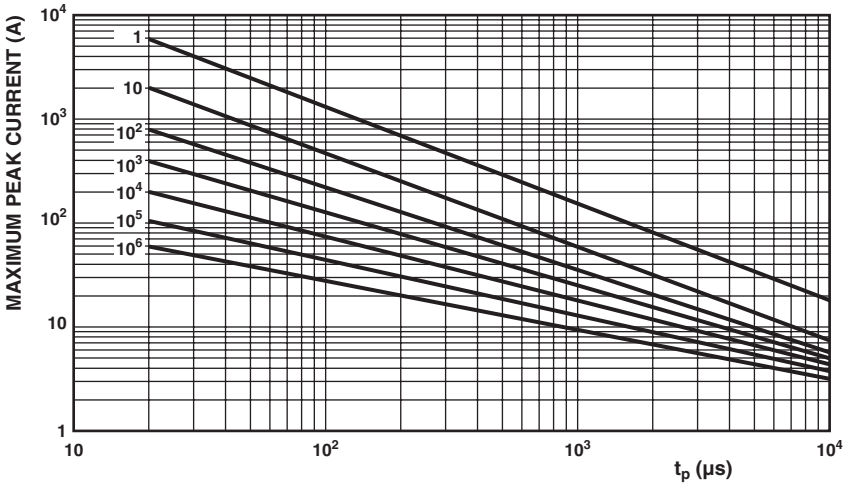
320 V_{RMS} to 680 V_{RMS}; 2381 584 ...../VDRH10.....E



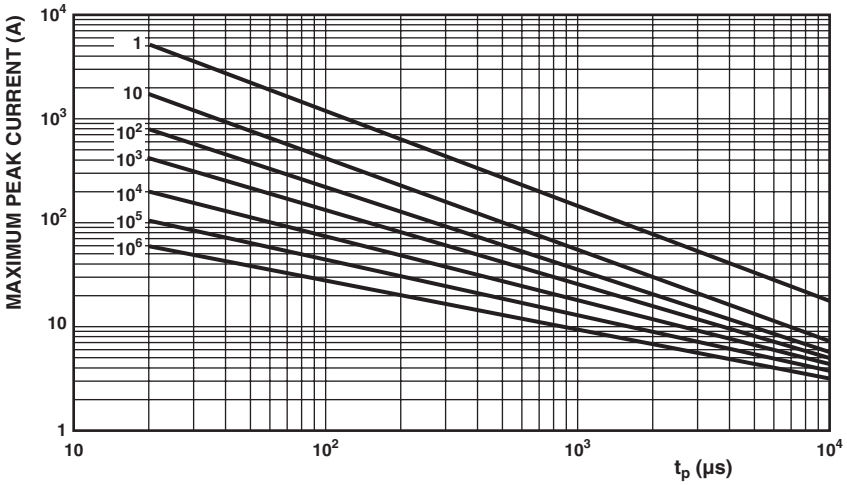
11 V_{RMS} to 40 V_{RMS}; 2381 585 ...../VDRH14.....E



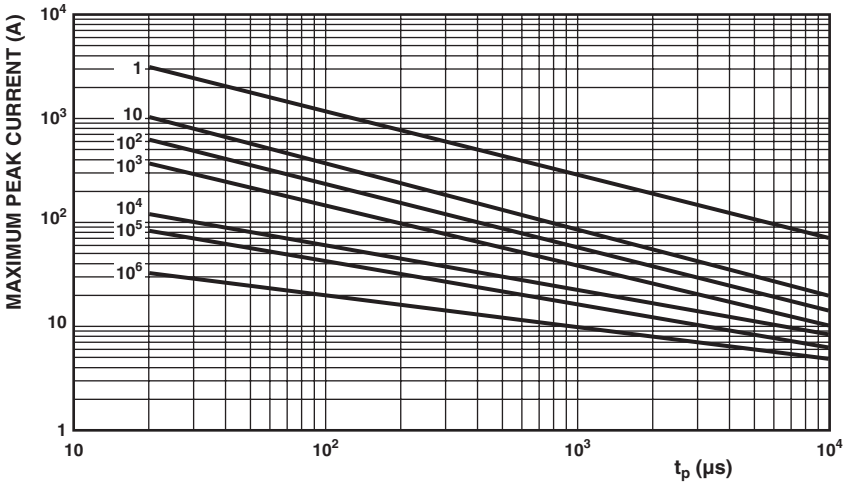
50 V_{RMS} to 300 V_{RMS}; 2381 585 ...../VDRH14.....E



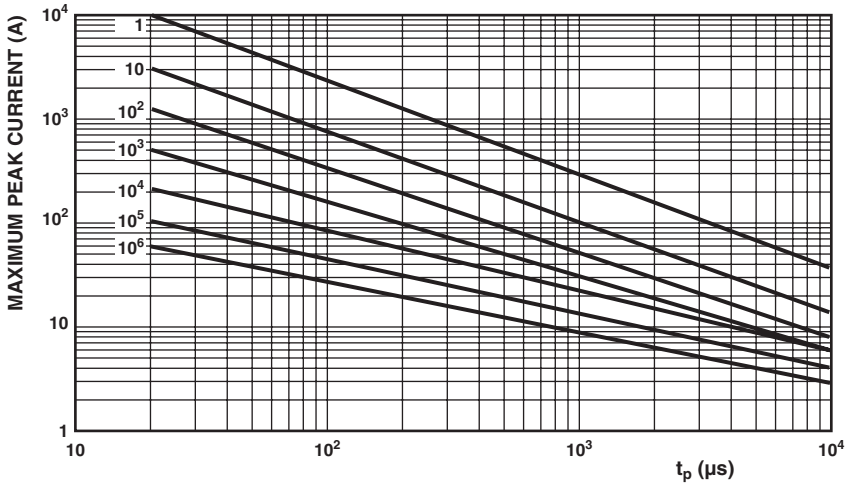
320 V_{RMS} to 680 V_{RMS}; 2381 585 ...../VDRH14.....E



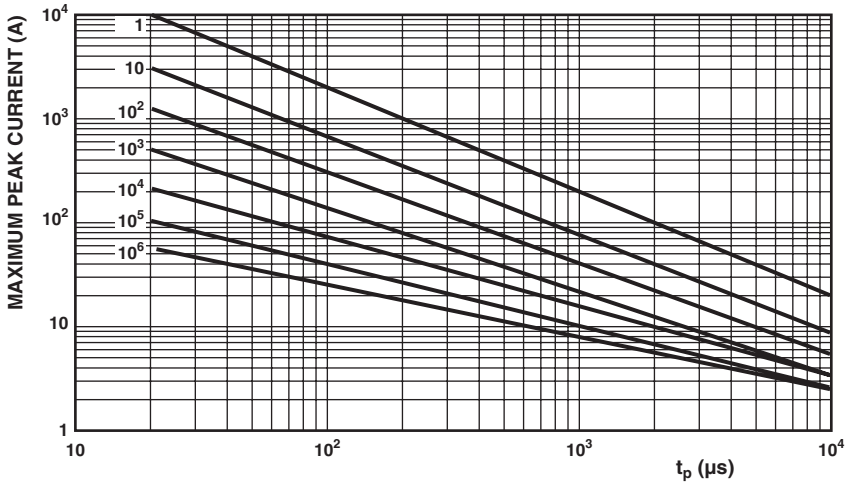
11 V_{RMS} to 40 V_{RMS}; 2381 586 ...../VDRH20.....E



50 V_{RMS} to 300 V_{RMS}; 2381 586 ...../VDRH20.....E



320 V_{RMS} to 680 V_{RMS}; 2381 586 ...../VDRH20.....E



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