

Surge Absorbers

Varistors

- **Features**
 1. Bi-directional surge absorption is possible.
 2. Low junction capacitance.
- **Applications**
 1. Telephone set surge absorption.
 2. Digital communications circuit surge absorption.
 3. ISDN terminal surge absorption.

Surface Mount



1F



1Y

Type No.	Absolute Maximum Ratings				Electrical Characteristics (Ta=25°C)						Outline	
	I _o	I _{FSM}	T _{stg}	T _j	V _{F1}	I _{F1}	V _{F2}	I _{F2}	V _{F3}	I _{F3}	Package	Fig.
	[mA]	[V]	[°C]	[°C]	[V]	[mA]	[V]	[mA]	[V]	[mA]		
VR-61F1 *1	370	7.5	-55 to 150	150	2.3±0.25	1	2.75±0.25	10	3.1±0.25	70	1F	14-1
VRYA6 *2	310	8	-30 to 125	125	2.3±0.25	1	2.75±0.25	10	3.1±0.25	70	1Y	*3
VRYA15 *2	140	6.5		125	5.75±0.62	1	6.875±0.625	10	7.75±0.62	70		

* 1: On alumina substrate * 2: On alumina substrate, 1 element operation, 2 elements in parallel
 * 3: SMD package Fig. 21; THD package Fig. 22-2

Axial



AX06

Type No.	Absolute Maximum Ratings				Electrical Characteristics (Ta=25°C)						Outline		
	I _o	I _{FSM}	T _{stg}	T _j	V _{F1}	I _{F1}	V _{F2}	I _{F2}	V _{F3}	I _{F3}	Package	Color Code	Fig.
	[mA]	[V]	[°C]	[°C]	[V]	[mA]	[V]	[mA]	[V]	[mA]			
VR-60B(A)	500	16	-30 to 125	125	1.5	1000	—	—	0.2	0.02	AX06	Orange	3
VR-60BP(A)	500	16			1.5		0.58±0.03	1	0.2			Orange	
VR-51B	150	7.5			1.8±0.25	1	2.1±0.25	10	2.4±0.25	70		*1	4
VR-61B(A)	150	7.5			2.3±0.25	1	2.75±0.25	10	3.1±0.25	70		*2	

* 1: Silver-Silver * 2: Orange-Red
 Spec Code 5□□□ (See page 44 for the last 3 digits of the Spec Code)

Trankillers

- **Features**
 1. High speed response.
 2. Absorption energy tolerance capacity.
 3. Narrow clamping voltage width.
- **Applications**
 1. IC protection for telephones.
 2. IC protection against abnormal voltage.
 3. Protection for load dump noise.

Surface Mount



1F



2F



STO-220

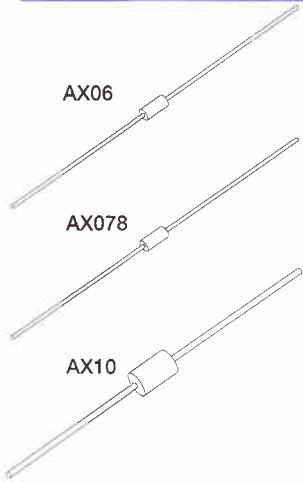
Type No.	Absolute Maximum Ratings				Electrical Characteristics						Outline				
	P _{PRSM}	T _{stg}	T _j	V _{RM} (max)	V _{BR} (typ)	Conditions: I _R [mA]	I _R (max)	Conditions: V _R [V]	r _z (max)	V _{CL} (max)	Conditions: I _{PP} [A]	Package	Fig.		
	[W]	[°C]	[°C]	[V]	[V]		[μA]		[V]	[% / °C]				[V]	
ST02D-170F2*	200	-40 to 150	150	145	170	1	5	145	—	280	0.75	2F	16-3		
ST03-58F1	300	-55 to 150	150	45	58			45	—	—	—	1F	13-2		
☆ST03-68F1		-55 to 175	175	58	68			58	—	100	3				
☆ST04-14F1	400	-55 to 175	175	12.4	14			12.4	—	22	16				
ST04-16F1	400	-55 to 175	175	13.6	16			13.6	—	23	15				
☆ST04-18F1	400	-55 to 175	175	15.3	18			15.3	—	26	15				
ST04-27F1	400	-55 to 175	175	23	27			23	—	37	10				
ST50V-27F	5000	-40 to 150	150	23	27			23	0.09	40	130			STO-220	36-4
ST70-27F	7000	-40 to 150	150	23	27			23	0.09	40	180			STO-220	36-6
DL04-18F1◎	400	-55 to 150	150	13	18			13	—	26	15			1F	14-2

☆: New product

◎: Bi-directional type

*: Reverse blocking type

Axial



Type No.	Absolute Maximum Ratings			Electrical Characteristics								Outline		
	PRSM [W]	Tstg [°C]	Tj [°C]	VRM (max) [V]	VBR (typ) [V]	Conditions IR [mA]	IR (max) [μA]	Conditions VR [V]	rz (max) [%/°C]	VCL (max) [V]	Conditions IPP [A]	Package	Color Code	Fig.
ST02D-82*	200	-40 to 150	150	67	82	1	5	67	—	118	1.7	AX078	Silver	5-2
☆ST02D-140*				120	145			120	—	200	0.75		Blue	
ST02D-170*				145	170			145	—	280	0.75		Red	
ST02D-200*				170	200			170	—	300	0.75		Yellow	
ST03D-82*	300	-40 to 150	150	67	82	1	5	67	—	118	2.5	AX10	Silver	6-2
☆ST03D-140*				120	145			120	—	200	0.75		Blue	
ST03D-170*				145	170			145	—	280	1.1		Red	
ST03D-200*				170	200			170	—	300	1		Yellow	
ST04-16	400	-40 to 150	150	13.6	16	1	5	13.6	0.09	23	15	AX06	Silver	2-2
ST04-27				23	27			23	0.09	37	10			

☆: New product
*: Reverse blocking type

Spec Code 4□□□ (See page 44 for the last 3 digits of the Spec Code)

Thyristor Surge Suppressors

- Features**
 1. Bi-directional or uni-directional characteristics.
 2. High speed response.
 3. Large surge current capacity.
 4. Repetitive use against surges is possible.
- Applications**
 1. Lightning surge adsorption for communications circuits.
 2. Lightning surge adsorption for transmitters and switchboards.
 3. Surge protection for ISDN terminals.

Surface Mount



Type No.	Absolute Maximum Ratings				Electrical Characteristics							Outline	
	ITSM [A]	Conditions [μS]	VDRM [V]	Tstg [°C]	Tj [°C]	VBO (min) [V]	VCL (max) [V]	IDRM (max) [μA]	Conditions VD [V]	IH (min) [mA]	Cj (max) [pF]	Package	Fig.
KL3Z07	30	10/1000	5	-40 to 125	125	5.5*	—	10	5	50	—	1F	14-3
KL3Z18			15			15.5*	—	10	15	50	—		
KL3L07			58			65	80	10	58	100	90		
KL3N14			120			130	195	10	120	100	50		
KL3R20	40	10/1000	175	-40 to 125	125	180	250	10	175	100	30	2F	16-2
KP4L07			58			65	80	10	58	100	90		
KP4N12			100			110	135	10	100	100	50		
KU5N12			100			110	135	5	100	100	90		
KU5R29N	50	10/1000	250	-40 to 125	125	275	400	5	250	100	70	M2F	15-2
KP10L06			48			55	70	10	48	100	235		
KP10L07			58			65	80	10	58	100	180		
KU10L08			63			70	100	5	63	100	180		
KP10L08	100	10/1000	63	-40 to 125	125	75	100	10	63	100	180	M2F	15-2
KU10N14			120			125	195	5	120	100	140		
KP10N14			120			130	195	10	120	100	140		
☆KU10N16			140			145	200	5	140	100	150		
☆KU10R23N	150	10/1000	190	-40 to 125	125	200	260	5	190	100	90	M2F	15-2
KP10R25			190			220	290	10	190	100	90		
☆KU10R27N			220			230	300	5	220	100	70		
KU10R29N			250			275	400	5	250	100	90		
☆KU10S35N	150	10/1000	275	-40 to 125	125	310	450	5	275	100	90	M2F	15-2
KU10S40N			300			350	500	5	300	100	60		
KP15L08			63			70	100	10	63	100	180		
KU15N14			120			125	195	5	120	100	110		
KP15N14	150	10/1000	120	-40 to 125	125	125	195	10	120	100	200	2F	16-2
KP15R25			190			220	290	10	190	100	150		

☆: New product *: VBR
KU: UL497B recognized File No. E183905

