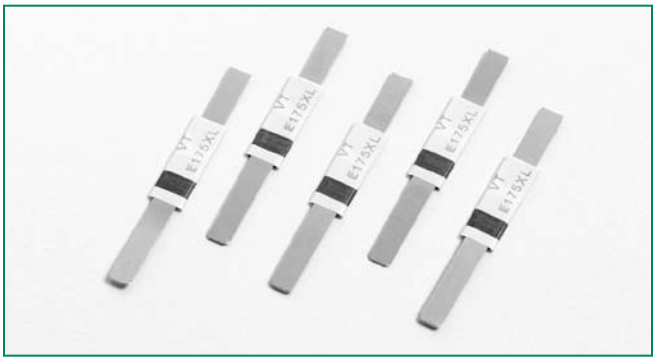
VT Series



Description

The new VT series device provides reliable, noncycling protection against overcharging and short circuits events for rechargeable battery cells where resettable protection is desired.

Features

- RoHS compliant and lead-free
- Weldable nickel terminals
- Slim, low profile design
- Compact design saves board space
- Low resistance

Agency Approvals

AGENCY	AGENCY FILE NUMBER
c UL us	E183209
TÜV	R50082521

Applications

- Rechargeable battery cell protection
  - Mobile phones
  - Laptop computers

Electrical Characteristics

Part Number	I_{hold} (A)	I_{trip} (A)	V_{max} (Vdc)	I_{max} (A)	P_d max. (W)	Maximum Time To Trip		Resistance			Agency Approvals	
						Current (A)	Time (Sec.)	R_{min} (Ω)	R_{typ} (Ω)	R_{1max} (Ω)	c UL us	TÜV
16VT170	1.70	3.40	16	100	1.4	8.50	3.00	0.030	0.052	0.105	X	X
16VT170XS	1.70	3.40	16	100	1.4	8.50	3.00	0.030	0.052	0.105	X	X
16VT175	1.75	3.80	16	100	1.4	9.00	3.00	0.025	0.045	0.090	X	X
16VT175S	1.75	3.80	16	100	1.4	9.00	3.00	0.025	0.045	0.090	X	X
16VT175L	1.75	3.80	16	100	1.4	9.00	3.00	0.025	0.045	0.090	X	X
16VT175XL	1.75	3.80	16	100	1.4	8.75	5.00	0.029	0.051	0.102	X	X
16VT175EL	1.75	3.60	16	100	1.4	8.75	5.00	0.029	0.051	0.102	X	X
16VT175NEL	1.75	3.60	16	100	1.4	8.75	5.00	0.029	0.051	0.102	X	X
16VT200	2.00	4.50	16	100	1.5	10.00	4.00	0.021	0.039	0.080	X	X
16VT200S	2.00	4.50	16	100	1.5	10.00	4.00	0.021	0.039	0.080	X	X
16VT200UL	2.00	4.70	16	100	1.5	10.00	5.00	0.022	0.039	0.076	X	X
16VT210	2.10	4.70	16	100	1.5	10.00	5.00	0.018	0.030	0.060	X	X
16VT210S	2.10	4.70	16	100	1.5	10.00	5.00	0.018	0.030	0.060	X	X
16VT210SS	2.10	4.70	16	100	1.5	10.00	5.00	0.018	0.030	0.060	X	X
16VT210L	2.10	4.70	16	100	1.5	10.00	5.00	0.018	0.030	0.060	X	X
16VT210NL	2.10	4.70	16	100	1.5	10.00	5.00	0.018	0.035	0.065	X	X
16VT210UL	2.10	4.70	16	100	1.5	10.00	5.00	0.018	0.035	0.065	X	X
16VT240	2.40	5.40	16	100	1.5	12.00	4.00	0.015	0.026	0.052	X	X

I_{hold} = Hold current: maximum current device will pass without tripping in 20°C still air.

I_{trip} = Trip current: minimum current at which the device will trip in 20°C still air.

V_{max} = Maximum voltage device can withstand without damage at rated current (I max)

I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max})

P_d = Power dissipated from device when in the tripped state at 20°C still air.

R_{min} = Minimum resistance of device in initial (un-soldered) state.

R_{typ} = Typical resistance of device in initial (un-soldered) state.

R_{1max} = Maximum resistance of device at 20°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

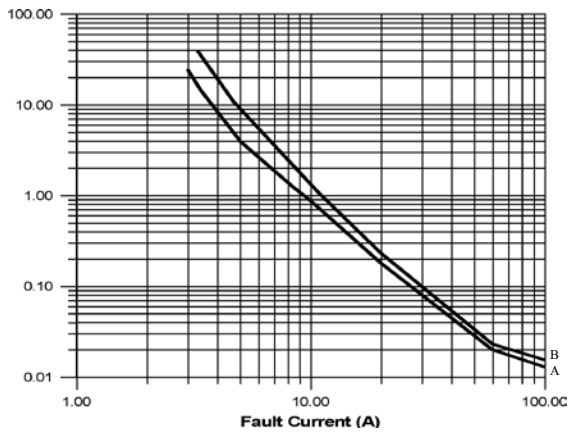
Caution: Operation beyond the specified rating may result in damage and possible arcing and flame.

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Temperature Rerating

	Ambient Operation Temperature								
	-40°C	-20°C	0°C	23°C	40°C	50°C	60°C	70°C	85°C
Part Number	Hold Current (A)								
16VT170	3.20	2.70	2.20	1.70	1.30	1.00	0.80	0.50	0.10
16VT170XS	3.20	2.70	2.20	1.70	1.30	1.00	0.80	0.50	0.10
16VT175	3.20	2.70	2.20	1.75	1.30	1.00	0.80	0.50	0.10
16VT175S	3.20	2.70	2.20	1.75	1.30	1.00	0.80	0.50	0.10
16VT175L	3.20	2.70	2.20	1.75	1.30	1.00	0.80	0.50	0.10
16VT175XL	3.20	2.70	2.20	1.75	1.30	1.00	0.80	0.50	0.10
16VT175EL	3.20	2.70	2.20	1.75	1.30	1.00	0.80	0.50	0.10
16VT175NEL	3.20	2.70	2.20	1.75	1.30	1.00	0.80	0.50	0.10
16VT200	3.70	3.20	2.60	2.00	1.50	1.20	0.90	0.50	0.10
16VT200S	3.70	3.20	2.60	2.00	1.50	1.20	0.90	0.50	0.10
16VT200UL	3.70	3.20	2.60	2.00	1.50	1.20	0.90	0.50	0.10
16VT210	4.10	3.50	2.90	2.10	1.60	1.30	1.00	0.70	0.10
16VT210S	4.10	3.50	2.90	2.10	1.60	1.30	1.00	0.70	0.10
16VT210SS	4.10	3.50	2.90	2.10	1.60	1.30	1.00	0.70	0.10
16VT210L	4.10	3.50	2.90	2.10	1.60	1.30	1.00	0.70	0.10
16VT210NL	4.10	3.50	2.90	2.10	1.60	1.30	1.00	0.70	0.10
16VT210UL	4.10	3.50	2.90	2.10	1.60	1.30	1.00	0.70	0.10
16VT240	4.40	3.70	3.10	2.40	1.80	1.50	1.20	0.90	0.10

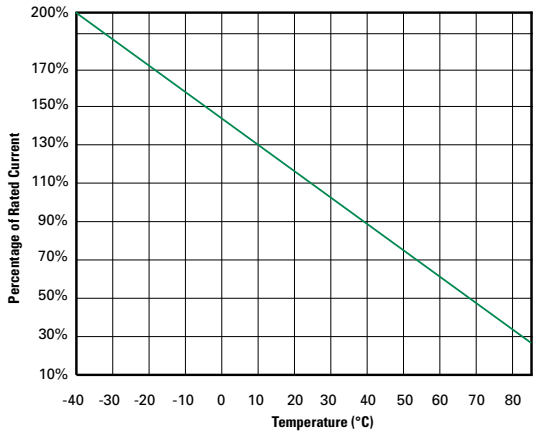
Average Time Current Curves



A: 16VT170XS

B: 16VT210S

Temperature Rerating Curve



The average time current curves and temperature rerating curve performance is affected by a number or variables, and these curves provided as guidance only. Customer must verify the performance in their application.

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Physical Specifications

Terminal Material	0.13mm nominal thickness, quarter-hard nickel
Insulating Material	Polyester tape

Environmental Specifications

Operating/Storage Temperature	-40°C to +85°C
Passive Aging	+70°C, 1000 hours ±10% typical resistance change
Humidity Aging	+85°C, 85%R.H. 70days ±5% typical resistance change
Thermal Shock	MIL-STD-202 Method 107G +85°C/-40°C 20 times -30% typical resistance change
Vibration	MIL-STD-883C, Method 2007.1, Condition A No change

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Dimensions

Figure 1

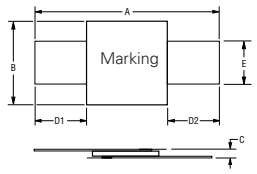


Figure 2

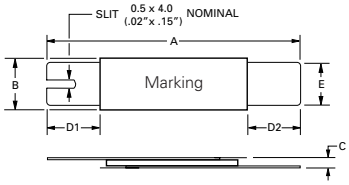


Figure 3

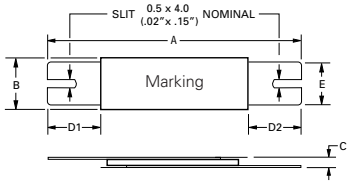


Figure 4

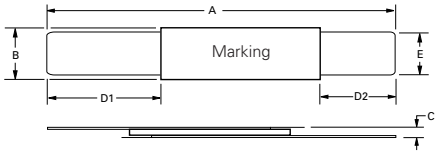


Figure 5

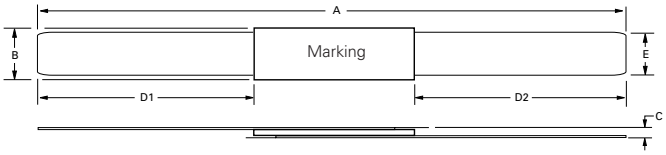
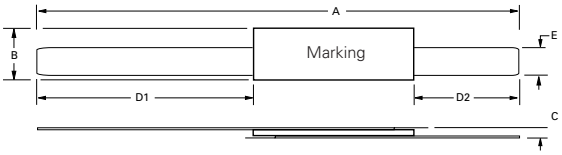


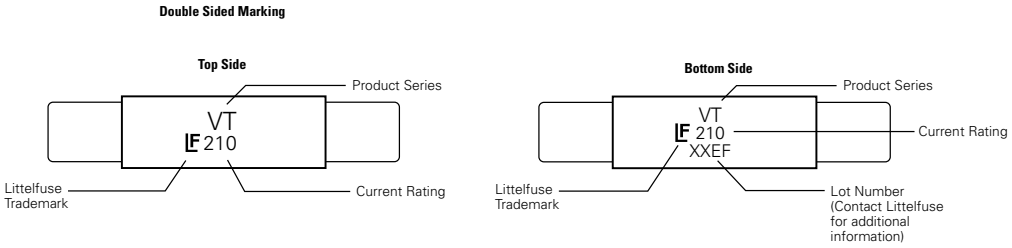
Figure 6



Part Number	A				B				C				D1				D2				E				Figure
	Inches		mm		Inches		mm		Inches		mm		Inches		mm		Inches		mm		Inches		mm		
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
16VT170	0.61	0.69	15.40	17.50	0.28	0.29	7.00	7.40	0.02	0.03	0.50	0.80	0.16	-	4.00	-	0.16	-	4.00	-	0.15	0.16	3.90	4.10	1
16VT170XS	0.82	0.90	20.90	22.90	0.19	0.21	4.90	5.30	0.02	0.03	0.50	0.80	0.16	-	4.00	-	0.16	-	4.00	-	0.15	0.16	3.90	4.10	2
16VT175	0.82	0.87	20.90	22.20	0.14	0.15	3.50	3.80	0.02	0.03	0.50	0.70	0.16	-	4.00	-	0.16	-	4.00	-	0.11	0.12	2.90	3.10	1
16VT175S	0.82	0.87	20.90	22.20	0.14	0.15	3.50	3.80	0.02	0.03	0.50	0.70	0.16	-	4.00	-	0.16	-	4.00	-	0.11	0.12	2.90	3.10	2
16VT175L	1.02	1.10	26.00	28.00	0.14	0.15	3.50	3.80	0.02	0.03	0.50	0.80	0.24	-	6.00	-	0.24	-	6.00	-	0.11	0.12	2.90	3.10	1
16VT175XL	1.00	1.11	25.50	28.20	0.14	0.15	3.50	3.90	0.02	0.03	0.50	0.80	0.34	0.41	8.70	10.30	0.22	0.29	5.70	7.30	0.09	0.10	2.40	2.60	4
16VT175EL	1.53	1.62	38.80	41.20	0.14	0.15	3.50	3.90	0.02	0.03	0.60	0.80	0.74	0.80	18.70	20.30	0.34	0.41	8.70	10.30	0.09	0.10	2.40	2.60	6
16VT175NEL	1.53	1.62	38.80	41.20	0.11	0.13	2.90	3.30	0.02	0.03	0.60	0.80	0.79	0.87	20.00	22.00	0.20	0.27	5.20	6.80	0.09	0.10	2.40	2.60	6
16VT200	0.82	0.91	20.90	23.10	0.15	0.17	3.80	4.30	0.02	0.03	0.60	0.70	0.16	-	4.00	-	0.16	-	4.00	-	0.11	0.12	2.90	3.10	1
16VT200S	0.82	0.91	20.90	23.10	0.15	0.17	3.80	4.30	0.02	0.03	0.60	0.70	0.16	-	4.00	-	0.16	-	4.00	-	0.11	0.12	2.90	3.10	2
16VT200UL	1.42	1.54	36.00	39.00	0.16	0.17	4.10	4.30	0.02	0.03	0.50	0.80	0.15	0.21	3.90	5.30	0.78	0.85	19.70	21.50	0.11	0.12	2.90	3.10	4
16VT210	0.82	0.91	20.90	23.10	0.19	0.21	4.90	5.30	0.02	0.03	0.60	0.80	0.16	-	4.10	-	0.16	-	4.10	-	0.15	0.16	3.90	4.10	1
16VT210S	0.82	0.91	20.90	23.10	0.19	0.21	4.90	5.30	0.02	0.03	0.60	0.80	0.16	0.23	4.10	5.80	0.16	0.23	4.10	5.80	0.15	0.16	3.90	4.10	2
16VT210SS	0.82	0.91	20.90	23.10	0.19	0.21	4.90	5.30	0.02	0.03	0.60	0.80	0.16	-	4.10	-	0.16	-	4.10	-	0.15	0.16	3.90	4.10	3
16VT210L	0.94	1.02	24.00	26.00	0.19	0.21	4.90	5.30	0.02	0.03	0.60	0.80	0.20	-	5.00	-	0.20	-	5.00	-	0.15	0.16	3.90	4.10	1
16VT210NL	2.78	2.81	70.50	71.50	0.15	0.17	3.80	4.30	0.02	0.03	0.60	0.80	0.98	-	25.00	-	0.98	-	25.00	-	0.11	0.12	2.90	3.10	5
16VT210UL	2.78	2.81	70.50	71.50	0.19	0.21	4.90	5.30	0.02	0.03	0.60	0.80	1.12	-	28.50	-	1.12	-	28.50	-	0.15	0.16	3.90	4.10	5
16VT240	0.95	1.03	24.20	26.20	0.19	0.21	4.90	5.30	0.02	0.03	0.60	0.80	0.20	-	5.00	-	0.20	-	5.00	-	0.15	0.16	3.90	4.10	1

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Part Marking System



Part Numbering System

16 VT 175 NEL U

- **U:** QUANTITY CODE — 500 (bulk)
- **LEAD OPTIONS:** Blank = standard; EL = extra long lead; L = long lead; NEL = narrow extra long lead; NL = narrow long lead; S = slit lead; SS = both leads slit; UL = ultra long lead; XL = extended long lead; XS = extended long lead slit
- **175:** HOLD CURRENT (VALUE DIVIDED BY 100 = HOLD CURRENT IN AMPS)
- **VT:** SERIES
- **16:** Voltage Rating (VDC)

Packaging

I_{hold} (A)	Packaging Option	Quantity	Quantity & Packaging Codes
All Ratings	Bulk	500	U

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