

### 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



### Applications

- Rechargeable battery cell protection
  - Mobile phones
  - Laptop computers

### Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E183209
	R50119583

### Electrical Characteristics

Part Number	I <sub>hold</sub> (A)	I <sub>trip</sub> (A)	V <sub>max</sub> (Vdc)	I <sub>max</sub> (A)	P <sub>d max.</sub> (W)	Maximum Time To Trip		Resistance			Agency Approvals	
						Current (A)	Time (Sec.)	R <sub>min</sub> (Ω)	R <sub>typ</sub> (Ω)	R <sub>1max</sub> (Ω)		
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<sub>hold</sub> = Hold current: maximum current device will pass without tripping in 20°C still air.  
 I<sub>trip</sub> = Trip current: minimum current at which the device will trip in 20°C still air.  
 V<sub>max</sub> = Maximum voltage device can withstand without damage at rated current (I<sub>max</sub>)  
 I<sub>max</sub> = Maximum fault current device can withstand without damage at rated voltage (V<sub>max</sub>)  
 P<sub>d</sub> = Power dissipated from device when in the tripped state at 20°C still air.  
 R<sub>min</sub> = Minimum resistance of device in initial (un-soldered) state.

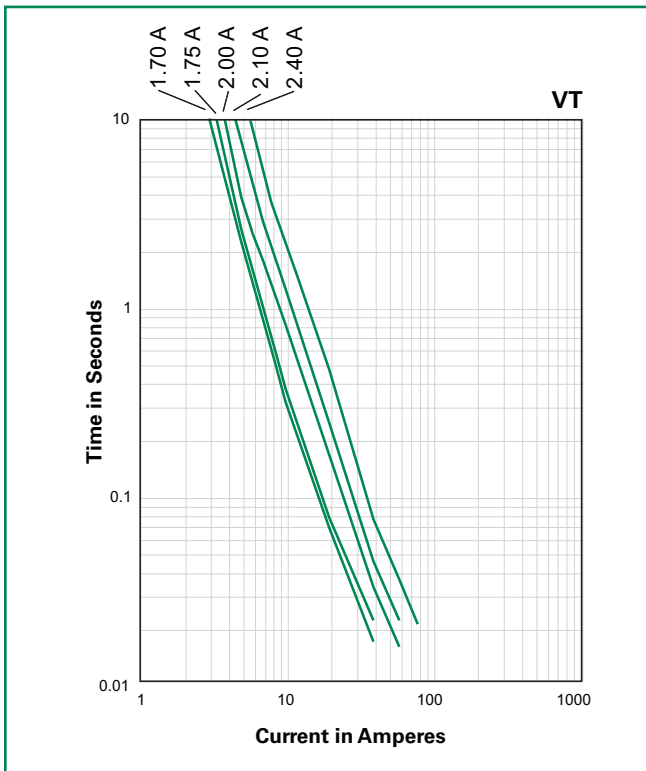
R<sub>typ</sub> = Typical resistance of device in initial (un-soldered) state.  
 R<sub>1max</sub> = Maximum resistance of device at 20°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

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

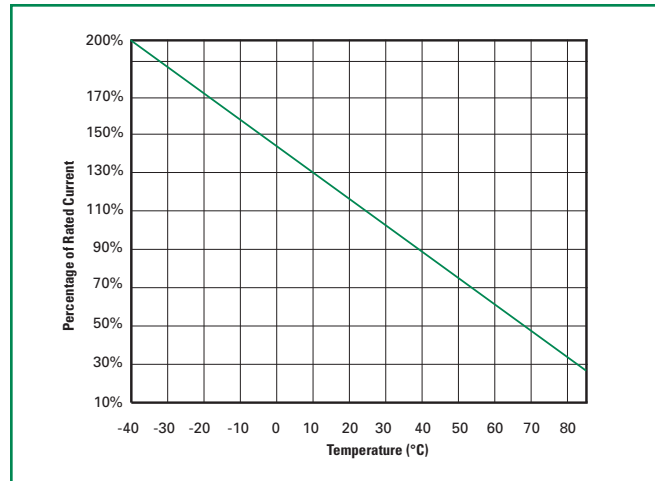
**Temperature Derating**

Part Number	Ambient Operation Temperature								
	-40°C	-20°C	0°C	23°C	40°C	50°C	60°C	70°C	85°C
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**



**Temperature Derating Curve**

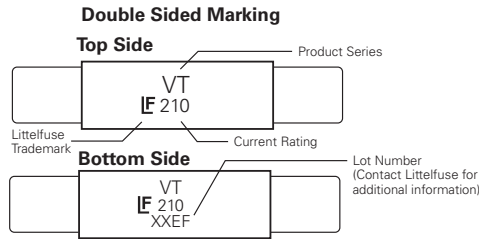


The average time current curves and Temperature Derating curve performance is affected by a number of variables, and these curves provided as guidance only. Customer must verify the performance in their application.

### Physical Specifications

<b>Terminal Material</b>	0.13mm nominal thickness, quarter-hard Nickel
<b>Insulating Material</b>	Polyester tape

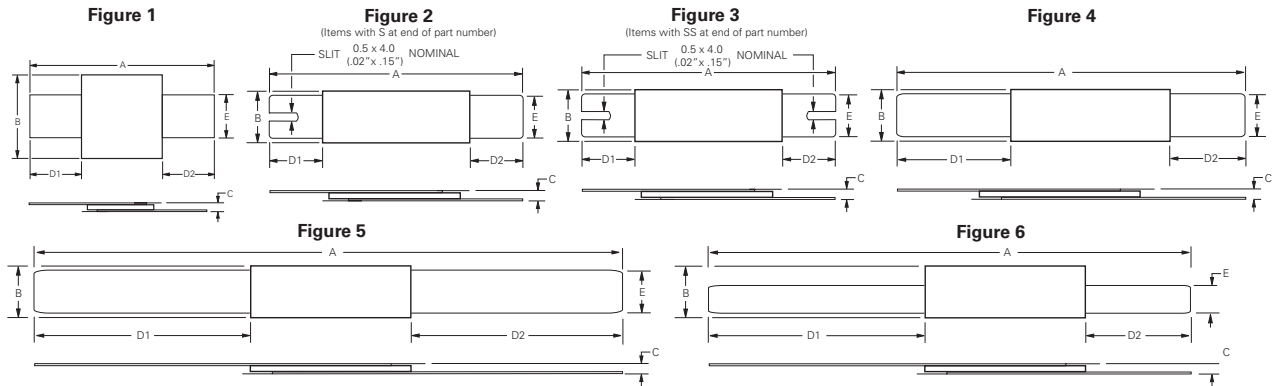
### Part Marking System



### Environmental Specifications

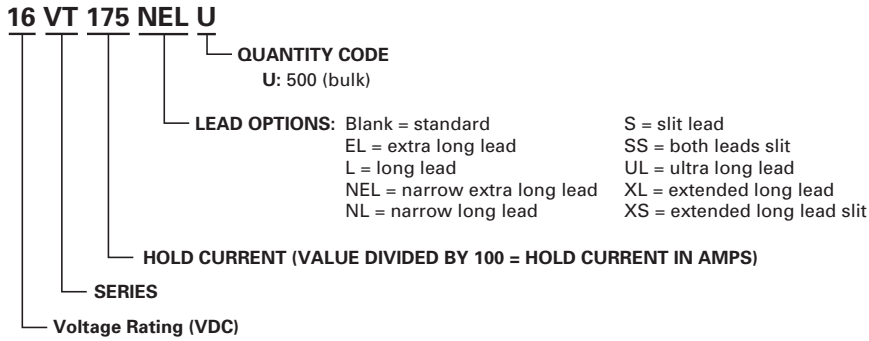
<b>Operating/Storage Temperature</b>	-40°C to +85°C
<b>Passive Aging</b>	+70°C, 1000 hours, +/-10% typical resistance change
<b>Humidity Aging</b>	+85°C, 85% R.H., 7 days, +/-5% typical resistance change
<b>Thermal Shock</b>	MIL-STD-202F, Method 107G, +85°C/-40°C 20 times, -30% typical resistance change
<b>Vibration</b>	MIL-STD-883C, Method 2007.1, Condition A, No change

### Dimensions



Part Number	Figure	A		B		C		D1		D2		E													
		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.										
16VT170	1	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	0.24	4.0	6.2	0.16	0.24	4.0	6.2	0.15	0.16	3.90	4.10
16VT170XS	2	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	0.34	4.0	8.6	0.16	0.34	4.0	8.6	0.15	0.16	3.90	4.10
16VT175	1	0.82	0.87	20.90	22.20	0.14	0.15	3.50	3.80	0.02	0.03	0.50	0.80	0.16	0.20	4.0	5.0	0.16	0.20	4.0	5.0	0.11	0.12	2.90	3.10
16VT175S	2	0.82	0.87	20.90	22.20	0.14	0.15	3.50	3.80	0.02	0.03	0.50	0.80	0.16	0.20	4.0	5.0	0.16	0.20	4.0	5.0	0.11	0.12	2.90	3.10
16VT175L	1	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	-	6.0	-	0.24	-	6.0	-	0.11	0.12	2.90	3.10
16VT175XL	4	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	8.7	10.3	0.22	0.29	5.7	7.3	0.09	0.10	2.40	2.60
16VT175EL	6	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	18.7	20.3	0.34	0.41	8.7	10.3	0.09	0.10	2.40	2.60
16VT175NEL	6	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	20.0	22.0	0.20	0.27	5.2	6.8	0.09	0.10	2.40	2.60
16VT200	1	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	0.20	4.0	5.0	0.16	0.20	4.0	5.0	0.11	0.12	2.90	3.10
16VT200S	2	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	0.20	4.0	5.0	0.16	0.20	4.0	5.0	0.11	0.12	2.90	3.10
16VT200UL	4	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	3.9	5.3	0.78	0.85	19.7	21.5	0.11	0.12	2.90	3.10
16VT210	1	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	4.1	5.8	0.16	0.23	4.1	5.8	0.15	0.16	3.90	4.10
16VT210S	2	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	4.1	5.8	0.16	0.23	4.1	5.8	0.15	0.16	3.90	4.10
16VT210SS	3	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	4.1	5.8	0.16	0.23	4.1	5.8	0.15	0.16	3.90	4.10
16VT210L	1	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	0.28	5.0	7.1	0.20	0.28	5.0	7.1	0.15	0.16	3.90	4.10
16VT210NL	5	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	-	25.0	-	0.98	-	25.0	-	0.11	0.12	2.90	3.10
16VT210UL	5	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	-	28.5	-	1.12	-	28.5	-	0.15	0.16	3.90	4.10
16VT240	1	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	0.22	5.0	5.7	0.20	0.22	5.0	5.7	0.15	0.16	3.90	4.10

**Part Ordering Number System**



**Packaging**

Part Number	Ordering Number	$I_{hold}$ (A)	$I_{hold}$ Code	Packaging Option	Quantity	Quantity & Packaging Codes
16VT170	16VT170U	1.70	170	Bulk	500	U
16VT170XS	16VT170XSU	1.70	170	Bulk	500	U
16VT175	16VT175U	1.75	175	Bulk	500	U
16VT175S	16VT175SU	1.75	175	Bulk	500	U
16VT175L	16VT175LU	1.75	175	Bulk	500	U
16VT175XL	16VT175XLU	1.75	175	Bulk	500	U
16VT175EL	16VT175ELU	1.75	175	Bulk	500	U
16VT175NEL	16VT175NELU	1.75	175	Bulk	500	U
16VT200	16VT200U	2.00	200	Bulk	500	U
16VT200S	16VT200SU	2.00	200	Bulk	500	U
16VT200UL	16VT200ULU	2.00	200	Bulk	500	U
16VT210	16VT210U	2.10	210	Bulk	500	U
16VT210S	16VT210SU	2.10	210	Bulk	500	U
16VT210SS	16VT210SSU	2.10	210	Bulk	500	U
16VT210L	16VT210LU	2.10	210	Bulk	500	U
16VT210NL	16VT210NLU	2.10	210	Bulk	500	U
16VT210UL	16VT210ULU	2.10	210	Bulk	500	U
16VT240	16VT240U	2.40	240	Bulk	500	U