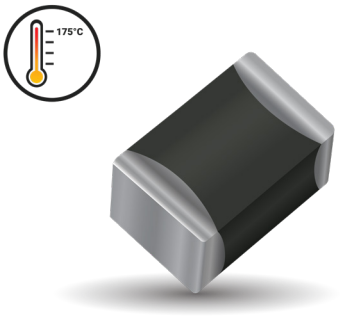
High Temperature +150°C and 175°C Automotive Series

+150°C and 175°C Rated Varistors (VT Series)



GENERAL DESCRIPTION

AVX High Temperature 150/175°C Multi-Layer Varistors are designed for underhood and other high temperature automotive or industrial applications. Parts are AEC-Q200 qualified.

They offer bi-directional overvoltage protection as well as EMI/RFI attenuation in a single SMT package. This allows designers the ability to combine the circuit protection and EMI/RFI attenuation function into a single highly reliable device.

Products have been tested, qualified, and specified to 150/175ºC and they do not require any derating over specified operating temperature range.

GENERAL DESCRIPTION

- Operating Temp.:
- VTA3: -55 to +150°C
  VTA7: -55 to +175°C
- Working Voltage: 14 - 31Vdc
- Case Size: 0603 - 1210

FEATURES

- +150/175°C rated, with no derating
- High Reliability
- AEC Q200Qualified
- Bi-Directional protection
- EMI/RFI attenuation
- ESD rated to 25kV (HBM ESD Level 6)

APPLICATIONS

- Under hood
- Down Hole Drilling
- High temperature Automotive and Industrial Applications

HOW TO ORDER

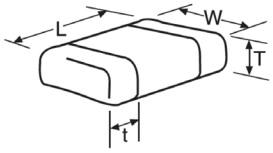
VT	A7	0603	18	A	400	R	P
Varistor Temp Rated	**Automotive 175°C** A3 = 150°C A7 = 175°C	**Case Size** 0603 0805 1206 1210	**Working Voltage** 14=14Vdc 18=18VdC 31=31Vdc	**Energy Rating** A=0.1J C=0.3J E=0.5J J=1.6J	**Clamping Voltage** 300=32V 400=42V 650=65V 670=67V	**Package** D = 7" (1,000) R = 7" (4,000) T = 13" (10,000)	**Termination** P = Ni/Sn plated

RoHS COMPLIANT

MSL 1
Pb Free 260°C

DIMENSIONS mm(inches)

Size (EIA)	Length (L)	Width (W)	Max Thickness (T)	Land Length (t)
0603	1.60±0.15 (0.063±0.006)	0.80±0.15 (0.031±0.006)	0.90 (0.035)	0.35±0.15 (0.014±0.006)
0805	2.01±0.20 (0.079±0.008)	1.25±0.20 (0.049±0.008)	1.02 (0.040)	0.71 max. (0.028 max.)
1206	3.20±0.20 (0.126±0.008)	1.60±0.20 (0.063±0.008)	1.02 (0.040)	0.94 max. (0.037 max.)
1210	3.20±0.20 (0.126±0.008)	2.49±0.20 (0.098±0.008)	1.70 (0.067)	1.14 max. (0.045 max.)



ELECTRICAL CHARACTERISTICS VTA3 (150°C)

AVX PN	V_W (DC)	V_W (AC)	V_B	V_C	I_{VC}	I_L	E_T	E_{LD}	I_P	Cap	Freq	V_{Jump}	$P_{Diss.\ Max}$
	Vdc	Vac	V	V	A	µA	J	J	A	pF		V	W
VTA3080514C300	14	10	18.5±12%	32	1	10	0.3	0.7	120	900	K	20	0.006
VTA3120614E300	14	10	18.5±12%	32	1	10	0.5	1.3	200	1400	K	20	0.01
VTA3121014J300	14	10	18.5±12%	32	2.5	10	1.6	3	500	5000	K	20	0.03
VTA3121031R650	31	25	39±10%	65	2.5	10	1.7	4.5	300	1500	K	20	0.03

ELECTRICAL CHARACTERISTICS VTA7 (175°C)

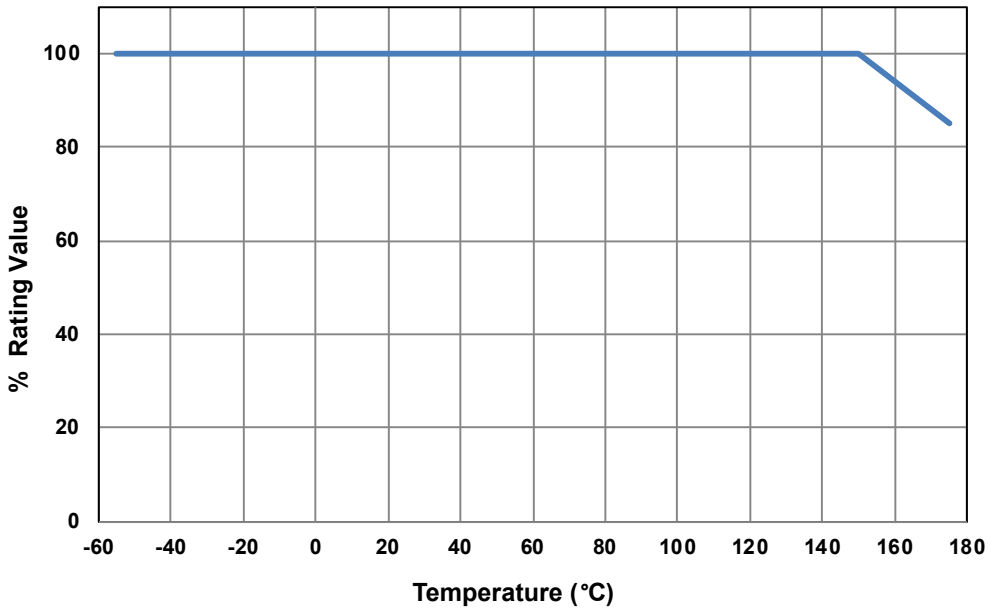
AVX PN	V_W (DC)	V_W (AC)	V_B	V_C	I_{VC}	I_L	E_T	E_{LD}	I_P	Cap	Freq	V_{Jump}	$P_{Diss.\ Max}$
	Vdc	Vac	V	V	A	µA	J	J	A	pF		V	W
VTA7060314A300	14	10	18.5±12%	32	1	10	0.1	-	50	400	K	20	0.003
VTA7060318A400	18	13	23±10%	42	1	10	0.1	0.25	30	275	K	27.5	0.003
VTA7080518C400	18	13	25.5±10%	42	1	10	0.3	1	120	450	K	27.5	0.006
VTA7060331A670	31	25	39±10%	67	1	10	0.1	0.25	30	90	M	29	0.003
VTA7080531C650	31	25	39±10%	65	1	10	0.3	1	80	275	K	29	0.006

V_W(DC)	DC Working Voltage [V]
V_W(AC)	AC Working Voltage [V]
V_B	Typical Breakdown Votage [V @ 1mA_{DC}]
V_C	Clamping Voltage [V @I_{IV}]
I_{VC}	Test Current for V_C
I_L	Maximum leakage current at the working voltage [µA]
E_T	Transient Energy Rating [J, 10x1000µS]
E_{LD}	Load Dump Energy (x10)
I_P	Peak Current Rating [A, 8x20µS]
Cap	Typical capacitance [pF] @ frequency specified and 0.5V_{RMS}
V_{Jump}	Jump Start (V)
$P_{Diss.\ Max}$	Power Dissipation (W)

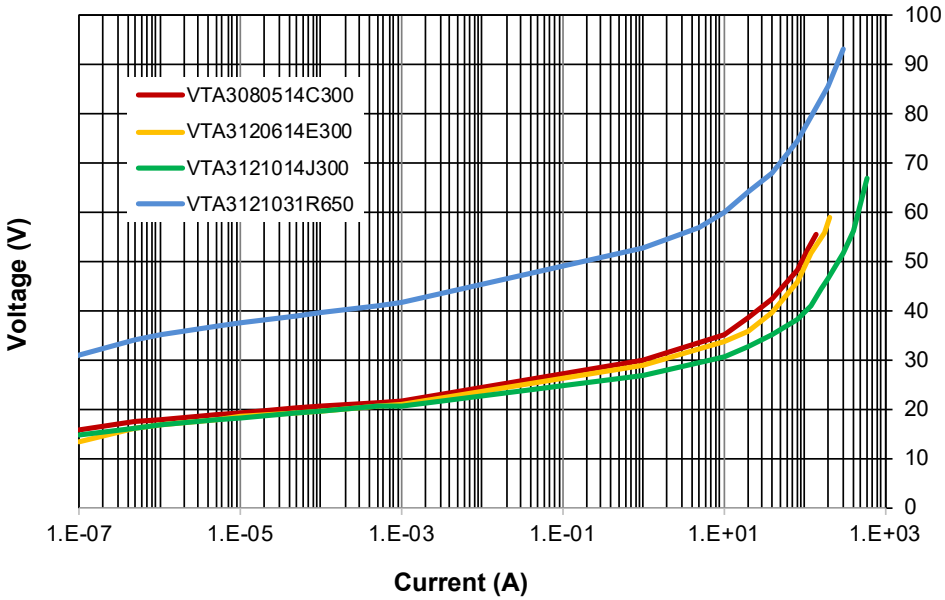
ESD RATING

AVX PN	IEC 61000-4-2	ISO 10605		AEC-Q200 (Lvl.6)
	150 pF / 330 Ω Contact Discharge	330 pF / 330 Ω Contact Discharge	330 pF / 2000 Ω Contact Discharge	150 pF / 2000 Ω Air Discharge
VTA3 (150°C)				
VTA3080514C300	30kV	30kV	30kV	25kV
VTA3120614E300	30kV	30kV	30kV	25kV
VTA3121014J300	30kV	30kV	30kV	25kV
VTA3121031R650	30kV	30kV	30kV	25kV
VTA7 (175°C)				
VTA7060318A400	25 kV	30 kV	30 kV	25 kV
VTA7080518C400	30 kV	30 kV	30 kV	25 kV
VTA7060331A670	30 kV	30 kV	30 kV	25 kV
VTA7080531C650	30 kV	30 kV	30 kV	25 kV

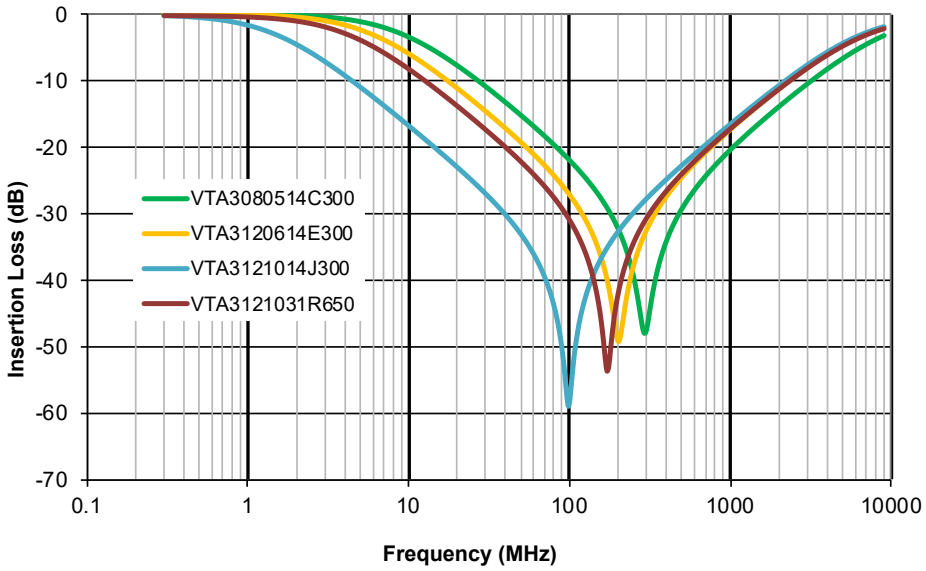
VTA3 (+150°C): POWER DERATING CURVE (CURRENT, ENERGY, POWER)



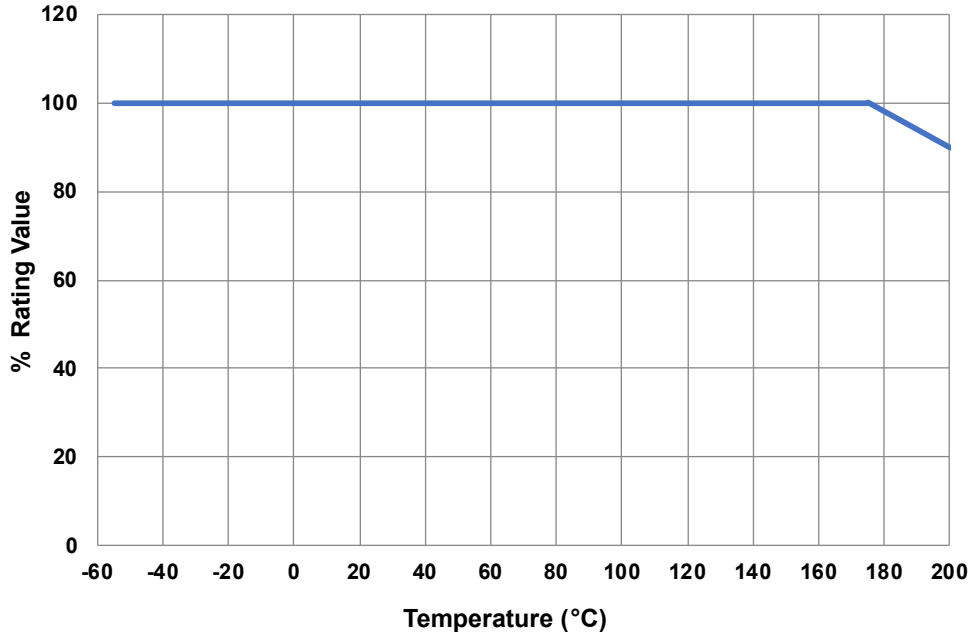
VTA3 (+150°C): V-I CHARACTERISTICS



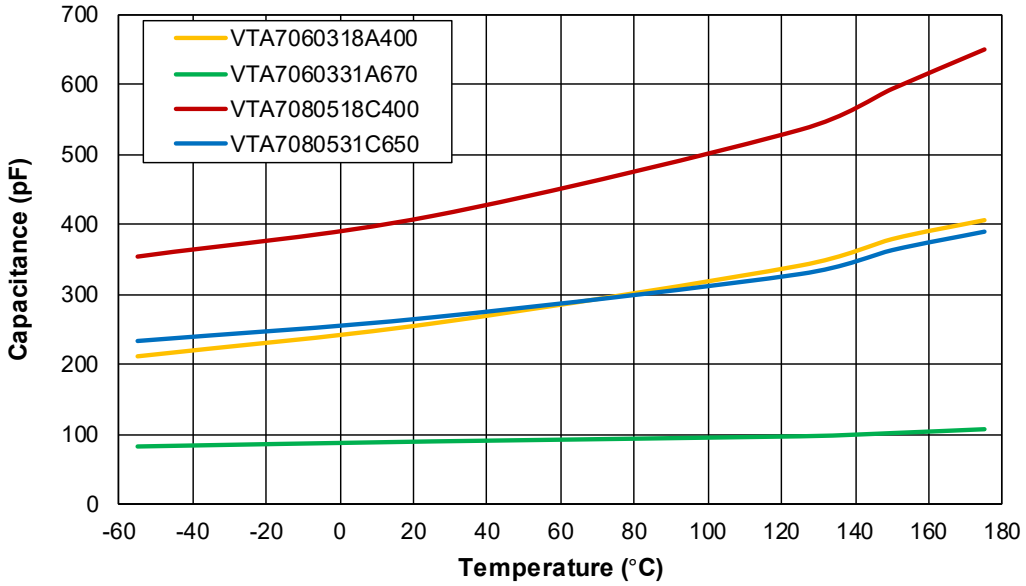
VTA3 (+150°C): FORWARD TRANSMISSION CHARACTERISTICS (S21)



VTA7 (+175°C): POWER DERATING CURVE (CURRENT, ENERGY, POWER)

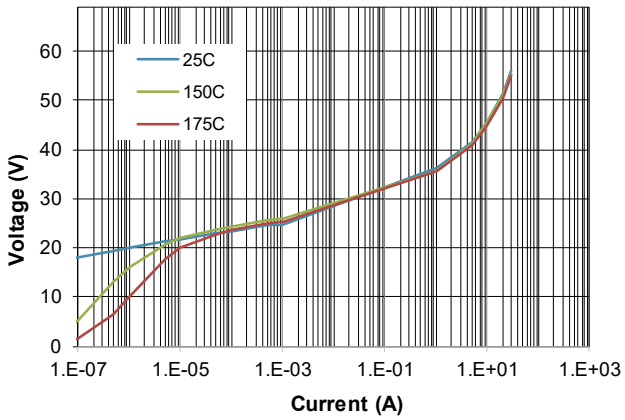


VTA7 (+175°C): CAPACITANCE VS TEMPERATURE

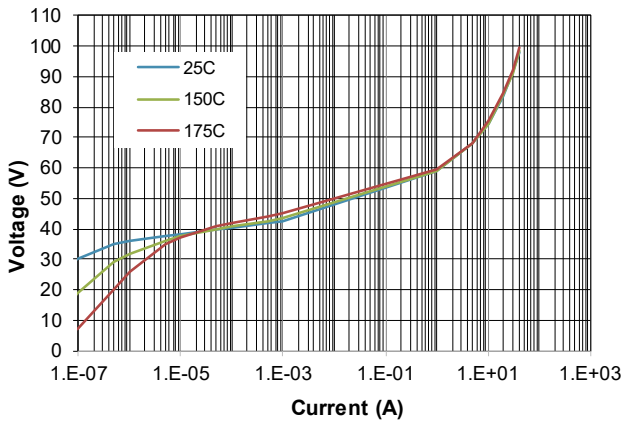


VTA7 (+175°C): V-I CHARACTERISTICS

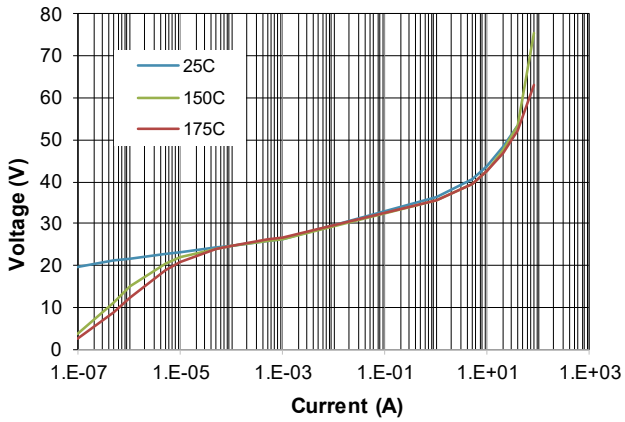
VTA7060318A400



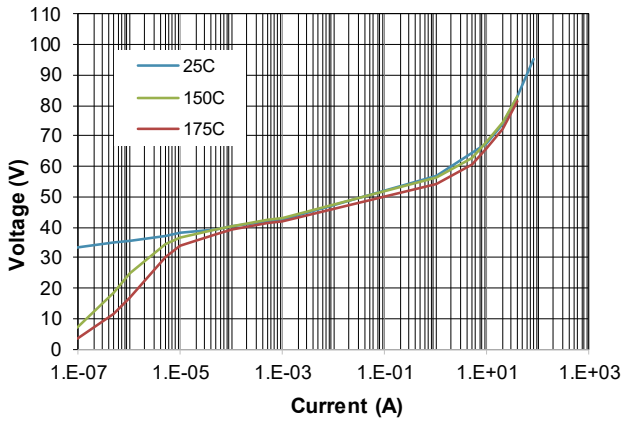
VTA7060331A650



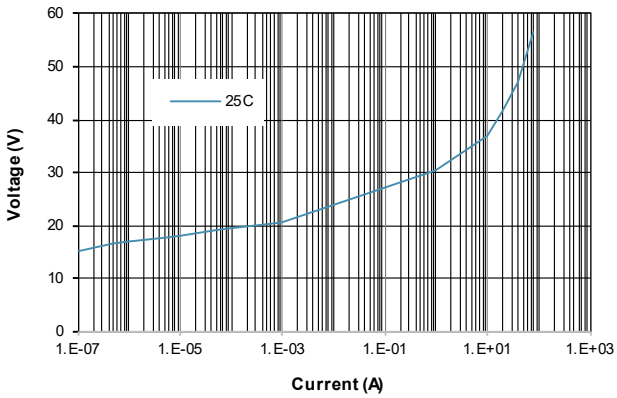
VTA7080518C400



VTA7080531C650



VTA7060314A300



VTA7 (+175°C): FORWARD TRANSMISSION CHARACTERISTICS (S21)