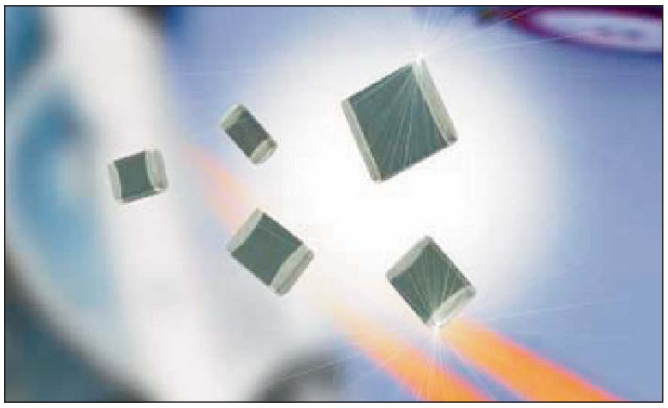
Medium Power MLV (VC13, 14, 15, 20)

Medium Power Multilayer Chip Varistor
Transient Voltage Suppression, ESD Protection Devices & EMI Devices



GENERAL DESCRIPTION

AVX's Transient Voltage Suppression (TVS) devices address six trends in today's electronic circuits: (1) mandatory ESD protection, (2) mandatory EMI control, (3) signal integrity improvement, (4) PCB downsizing, (5) reduced component placement costs, and (6) protection form induced slow speed transient voltages and currents.

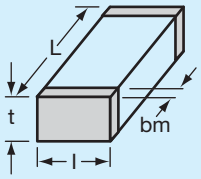
AVX's Medium Power Multilayer Varistors include 3 series of products as listed below:

- Standard 1210 Series (VJ13)
- Telecom Series (VC14)
- Automotive Range (VC13, 14, 15, 20)

TYPICAL APPLICATIONS

Mainly used to reduce transient over-voltages in a very wide range of electronic products. Some example applications are 1) Telecom, 2) Automotive, 3) Consumer Electronics, and 4) Industrial Applications.

PHYSICAL DIMENSIONS: mm (inches)



Type	IEC Size	L	l	bm	t max
VC20	1206	3.20±0.20 (0.126±0.008)	1.60±0.20 (0.063±0.008)	0.50±0.25 (0.020±0.010)	1.70 (0.067)
VC13	1210	3.20±0.20 (0.126±0.008)	2.50±0.20 (0.098±0.008)	0.50±0.25 (0.020±0.010)	1.70 (0.067)
VC14	1812	4.50±0.20 (0.177±0.008)	3.20±0.20 (0.126±0.008)	0.50±0.25 (0.020±0.010)	1.70 (0.067)
VC15	2220	5.70±0.20 (0.224±0.008)	5.00±0.20 (0.197±0.008)	0.50±0.25 (0.020±0.010)	1.70 (0.067)

PART NUMBERING

VC	14	M	T	0950	K	BA
Varistor Series VC = Unplated VJ = Plated	**Chip Size** 20 = 1206 13 = 1210 14 = 1812 15 = 2220	**Code** M = Standard P = Pro Grade	**Series Code** A = Automotive T = Telecom C = Standard	**AC Operating Voltage**	**1mA Voltage Tolerance** K = ±10%	**Packaging** BA = Tape & Reel VC20: 4000 pcs/reel VC13: 2000 pcs/reel VC14: 1500 pcs/reel VC15: 1250 pcs/reel

Medium Power MLV (VC13, 14, 15, 20)

Medium Power Multilayer Chip Varistor
Transient Voltage Suppression, ESD Protection Devices & EMI Devices

STANDARD SERIES - VJ13 (1210)

FEATURES

- Plated Ni Barrier Terminations
- Bi-Directional Protection
- Fast Turn-On Time
- Multiple Strike Capability
- Provides EMC Capacitance
- 1210 EIA Case Size

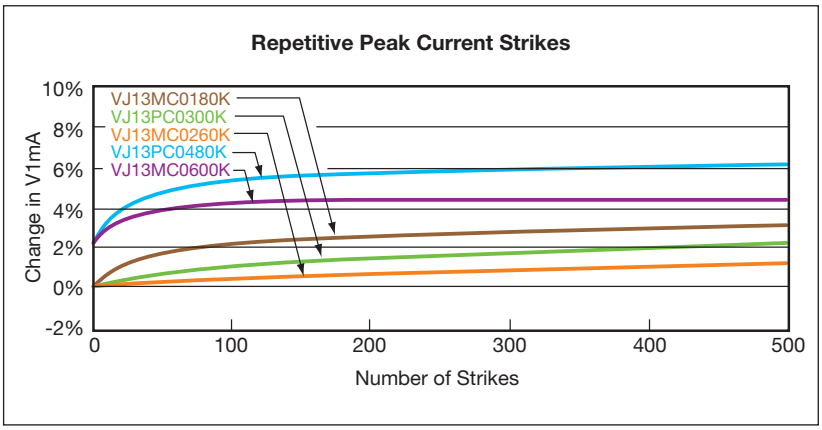
TARGET APPLICATIONS

Consumer Electronic Products

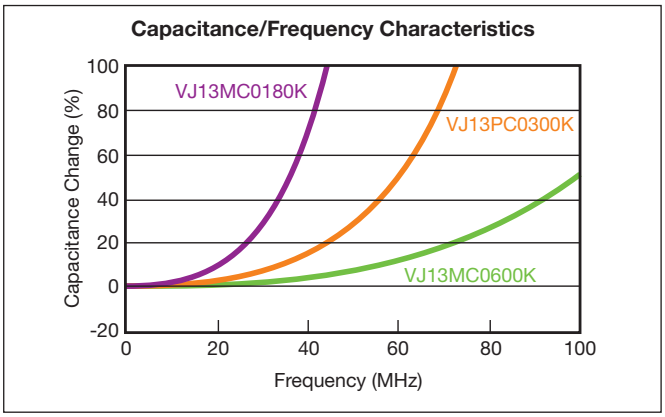
GENERAL CHARACTERISTICS

Storage Temperature: -55ºC to +125ºC
Operating Temperature: -55ºC to +125ºC

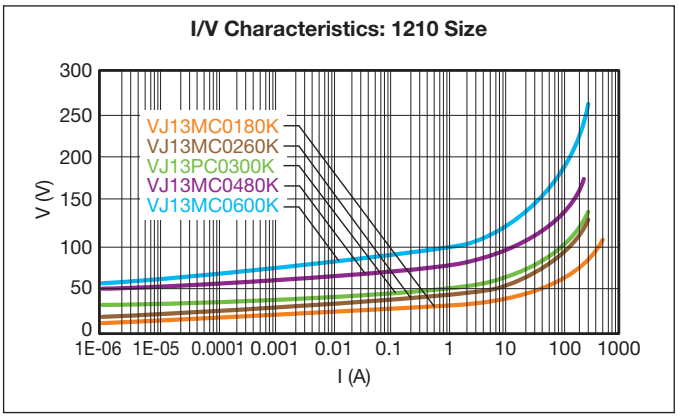
PULSE DEGRADATION



CAP VS FREQ CHARACTERISTICS



V/I CHARACTERISTICS

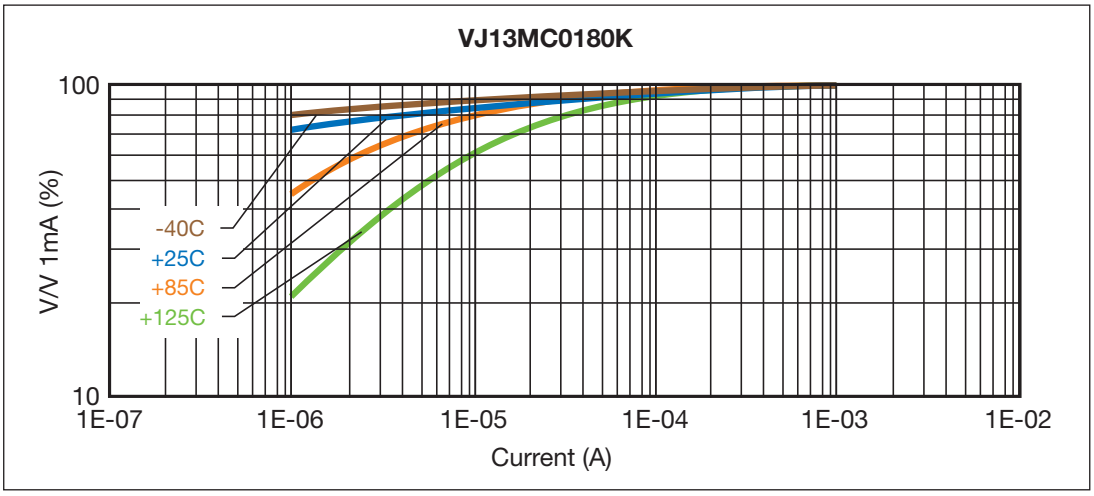


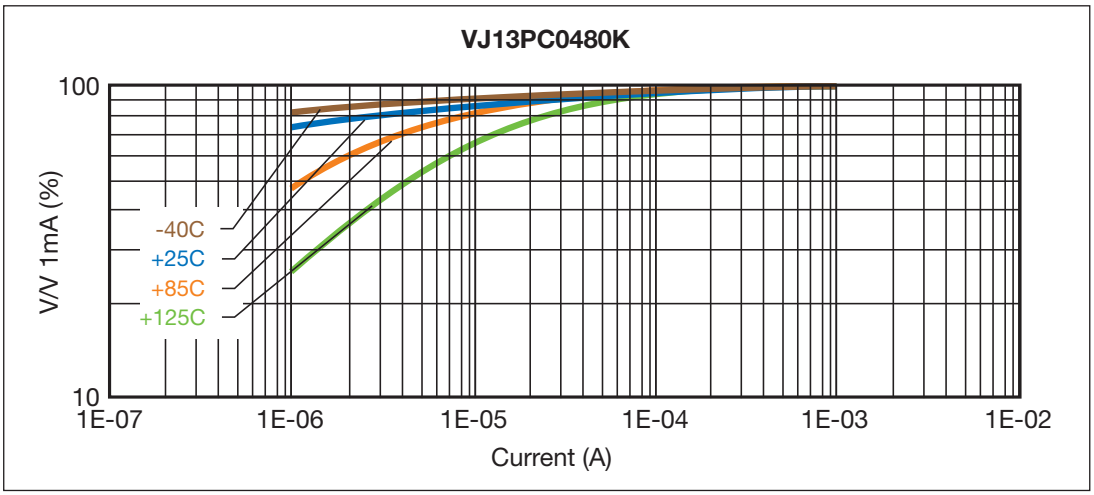
PART NUMBERS

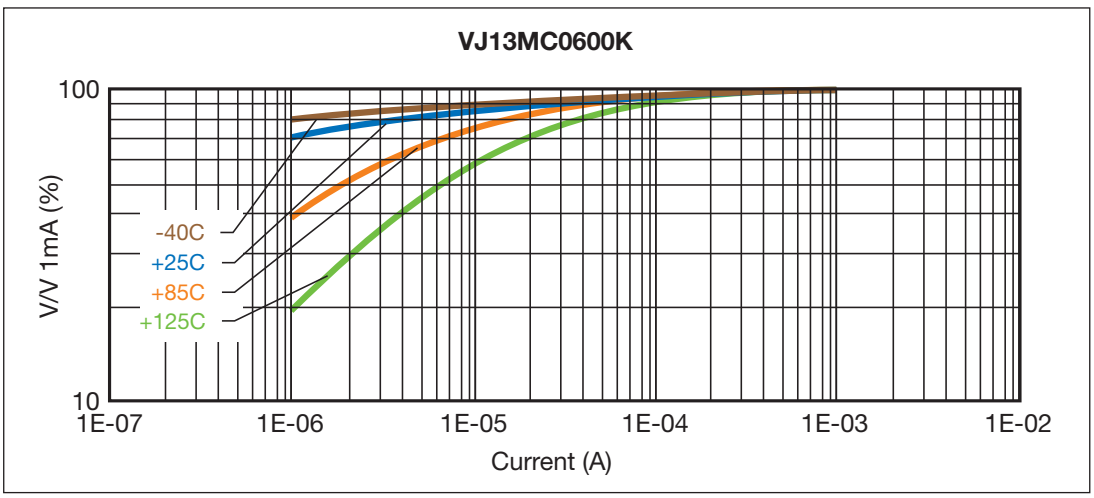
Part Number	Operating Voltage	Vnominal At 1mA DC			Vclamp (8x20µs)		Energy (10x1000µs)	Max. Peak Current (8x20µs)	Typical CAP (1kHz/.5Vrms)
	Vdc	min	Nom	max	Vp	Ip(A)	J	A	pF
VJ13MC0180KBA	18	21.5	24	26.5	45	10	1.5	500	3000
VJ13MC0260KBA	26	29.7	33	36.3	62	10	1.2	300	1120
VJ13MC0300KBA	30	35	39	43	73	10	0.9	220	1020
VJ13PC0300KBA	30	35	39	43	73	10	1.2	280	1150
VJ13MC0480KBA	48	54.5	60.5	66.5	110	10	0.9	220	800
VJ13PC0480KBA	48	54.5	60.5	66.5	110	10	1.2	250	840
VJ13MC0600KBA	60	67	75	83	126	10	1.5	250	600

STANDARD SERIES - VJ13 (1210)

TEMPERATURE DEPENDENCE OF V/I CHARACTERISTIC







Medium Power MLV (VC13, 14, 15, 20)

Medium Power Multilayer Chip Varistor
Transient Voltage Suppression, ESD Protection Devices & EMI Devices

TELECOM SERIES - VC14 (1812)

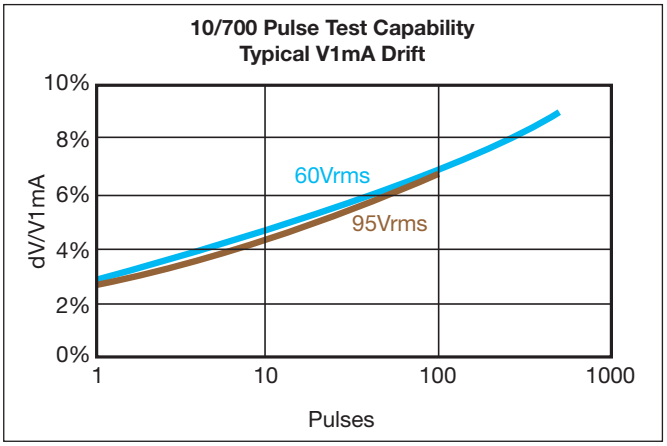
FEATURES

- Pd/Ag Terminations
- High Energy Ratings (up to 6 Joules with 1812 case)
- Multiple Strike Capability
- Provides EMC Capacitance
- Effective Alternative to Leaded MOVs between 60-90Vrms
- Specified in accordance to CCITT 10/700ms Pulse test

CCITT 10x700µs TEST

A test pulse of 10x700µs duration as specified by CCITT or IEC 61000-4-5 is often used to check the interference immunity of telecom equipment.

The curves show that the 60Vrms varistor can reduce the interference voltage at the equipment connected from 2kV to less than 200V.

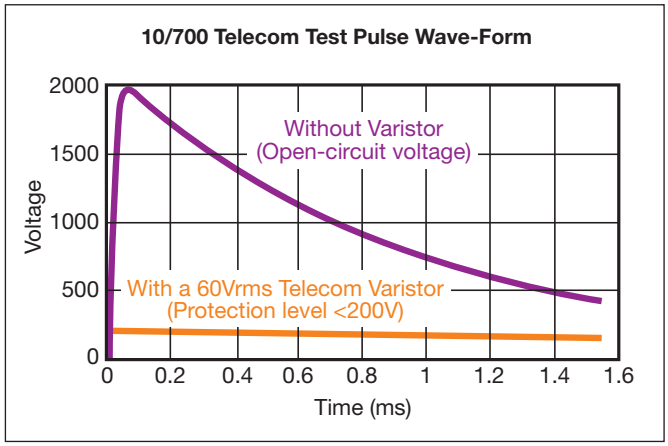


TARGET APPLICATIONS

- Phone Lines, ADSL Lines, and other Telecom Circuits
- Consumer Products

GENERAL CHARACTERISTICS

Storage Temperature: -55ºC to +125ºC
Operating Temperature: -55ºC to +125ºC



Ten pulses with a duration of 10x700µs applied at one minute intervals are specified for telecom equipment.

The curves show the V1mA drift when more than 10 pulses are applied.

PART NUMBERS

Part Number	Operating Voltage		Vclamp (8x20µs)		Energy (10x1000µs)	Max Ipeak (8x20µs) 1 Surge	Mean Power Dissipation	CCITT 10Pulse (10x700µs)	Typical Cap
	Vrms	Vdc	Vp	Ip	J	Ip (A)	W	V	pF
VC14MT0600KBA	60	85	200	45	6	400	0.015	2000	400
VC14MT0950KBA	95	125	270	45	5	250	0.015	2000	250

Medium Power MLV (VJ13, 14, 15, 20)

Medium Power Multilayer Chip Varistor
Transient Voltage Suppression, ESD Protection Devices & EMI Devices

AUTOMOTIVE SERIES – VJ13, 14, 15, 20

FEATURES

- Pd/Ag Terminations
- High Energy Ratings (up to 25 Joules with 2220 case size)
- Multiple Strike Capability
- Provides EMC Capacitance
- Well suited to protect against automotive related transients
- Specified with “Load Dump” and “Jump Start” Test Requirements

TARGET APPLICATIONS

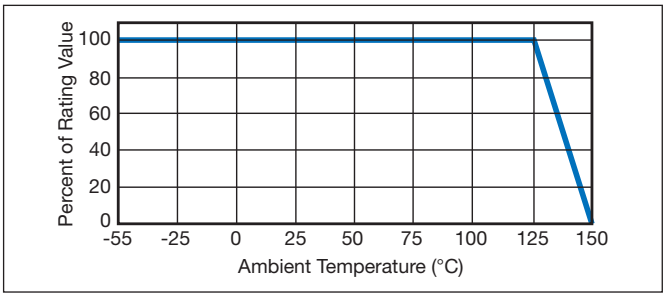
Automotive and other Consumer Products

GENERAL CHARACTERISTICS

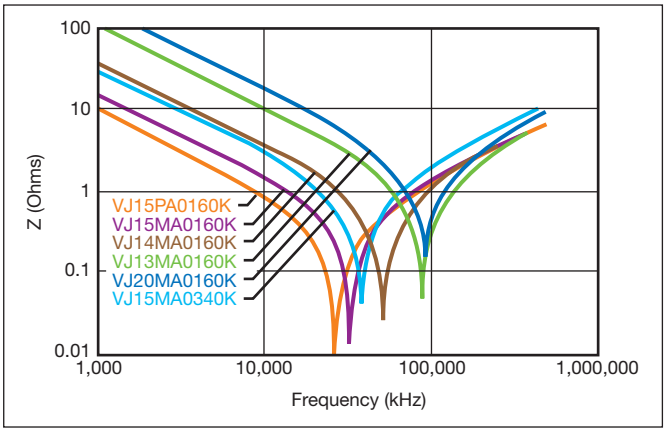
Storage Temperature: -55ºC to +125ºC
Operating Temperature: -55ºC to +125ºC

TEMPERATURE CHARACTERISTICS

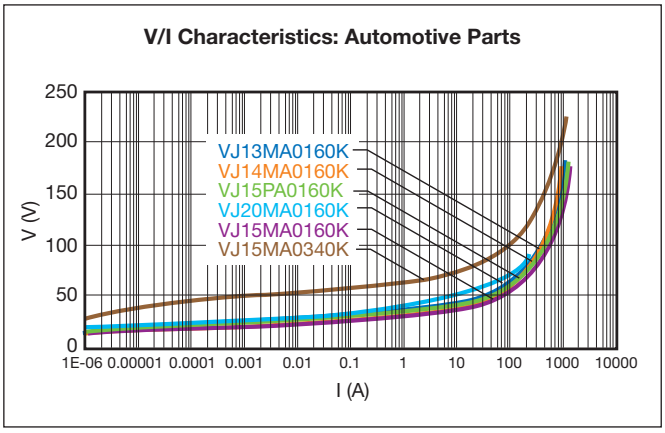
For Current, Energy and Power



IMPEDANCE CHARACTERISTICS



V/I CHARACTERISTICS



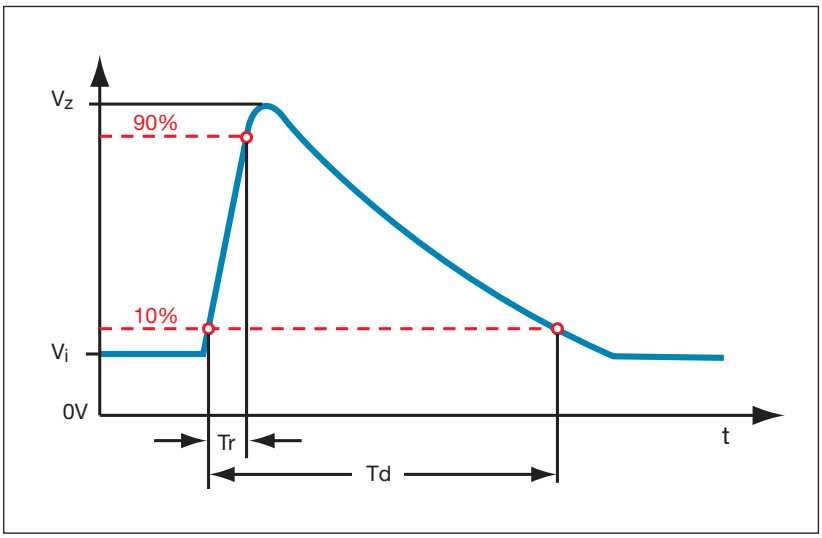
PART NUMBERS

Part Number	Case Size	Operating Voltage		Vnominal At 1mA DC			Vclamp (8x20µs)		Leakage At Vdc	Energy (10x1000µs)	Load Dump (10x)	Jump Start 5min	Max.Peak Current (8x20µs)	Mean Power Dissipation	CAP (1kHz/ .5Vrms)
	EIA	Vrms	Vdc	min	Nom	max	Vp	Ip(A)	µA	J	J	Max V	Ip (A)	W	pF
VJ20MA0160KBA	1206	14	16	22	24.5	27	40	1	50	0.6	1.5	24.5	200	0.008	900
VJ13MA0160KBA	1210	14	16	22	24.5	27	40	2.5	25	1.6	3	24.5	400	0.010	1800
VJ14MA0160KBA	1812	14	16	22	24.5	27	40	5	100	2.4	6	24.5	800	0.015	5000
VJ15MA0160KBA	2220	14	16	22	24.5	27	40	10	100	5.8	12	24.5	1200	0.030	11000
VJ15PA0160KBA	2220	14	16	22	24.5	27	40	10	100	5.8	25	24.5	1200	0.030	16000
VJ15MA0340KBA	2220	30	34	42.3	47	51.7	77	10	100	12	12	50	1200	0.030	4000

AUTOMOTIVE SERIES – VJ13, 14, 15, 20

AUTOMOTIVE LOAD DUMP TEST

(According to ISO DP7637/2 Pulse 5)



When using the test method indicated below, the amount of Energy dissipated by the varistor must not exceed the Load Dump Energy value specified in the product table.

Voltage Pulse applied to the varistor:

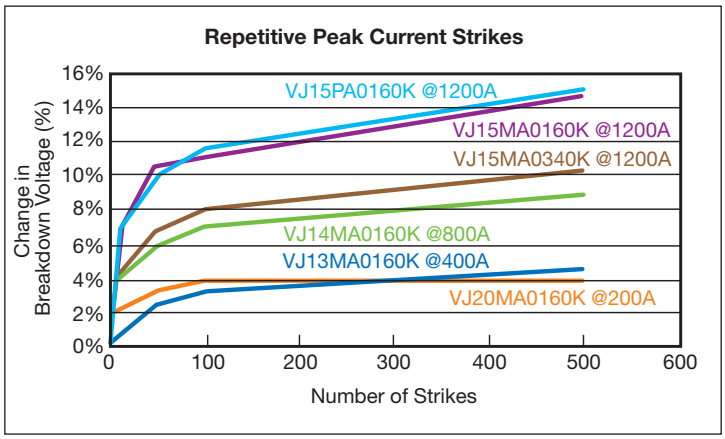
12V Network

Vi = 13.5V
Td = 100 to 350ms
Ri = 2 Ohms (Internal Resistance)
Vz - 70 to 200V
Number of Pulses = 10 Pulses
Other Load Dump Simulations can be achieved

24V Network

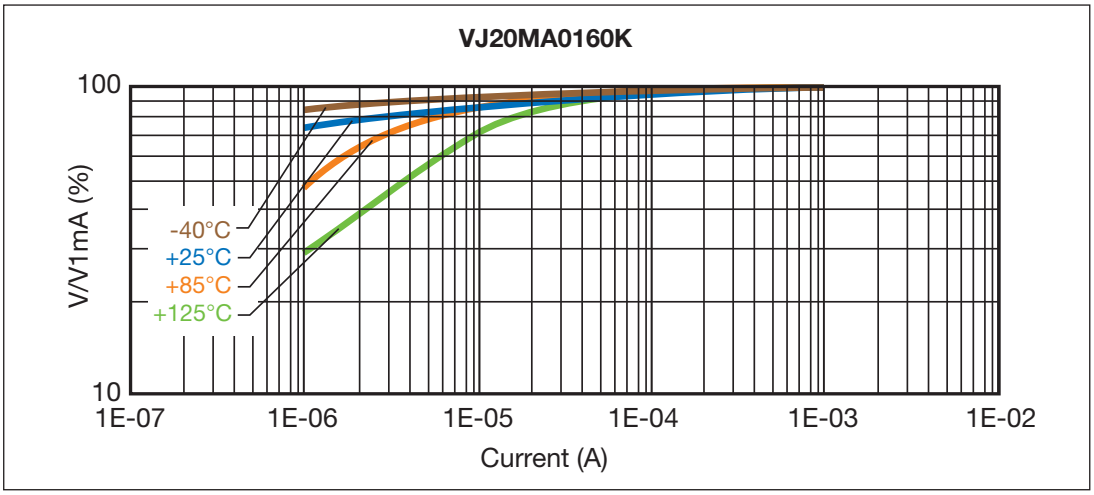
Vi = 27V
Td = 100 to 350ms
Ri = 2 Ohms (Internal Resistance)
Vz - 70 to 200V
Number of Pulses = 10 Pulses

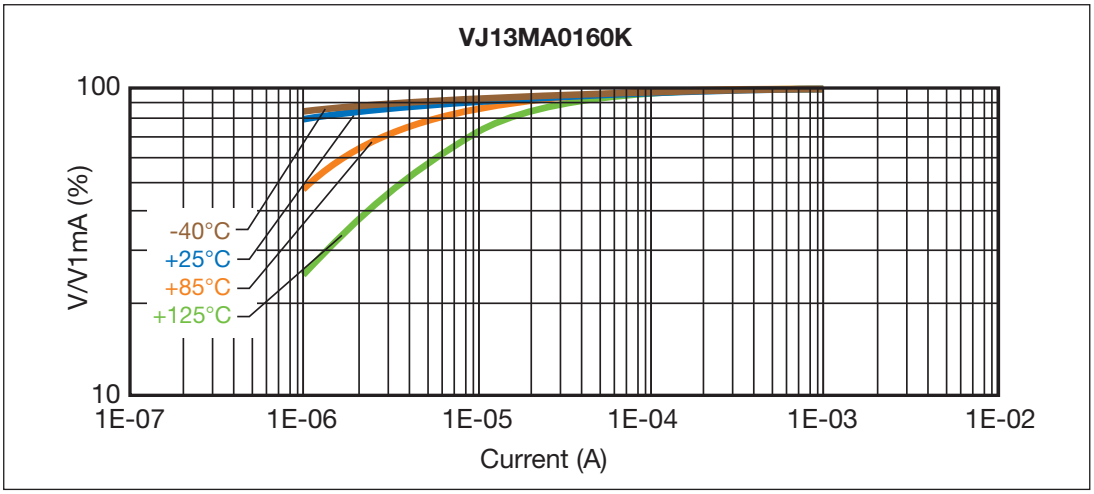
PULSE DEGRADATION

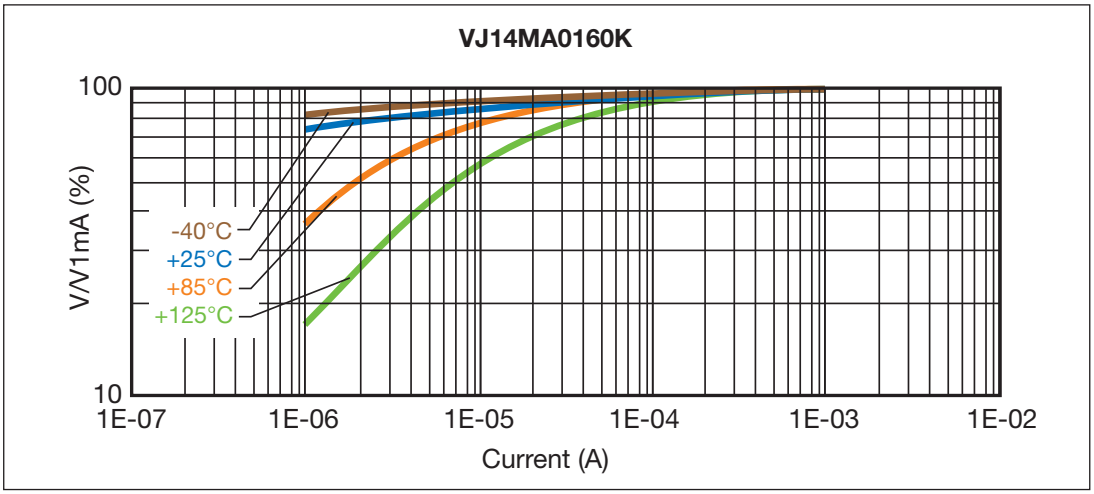


AUTOMOTIVE SERIES – VJ13, 14, 15, 20

TEMPERATURE DEPENDENCE OF V/I CHARACTERISTIC



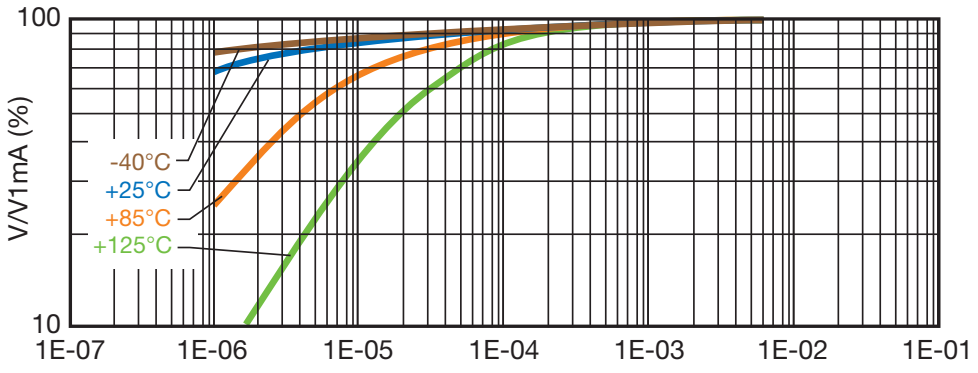




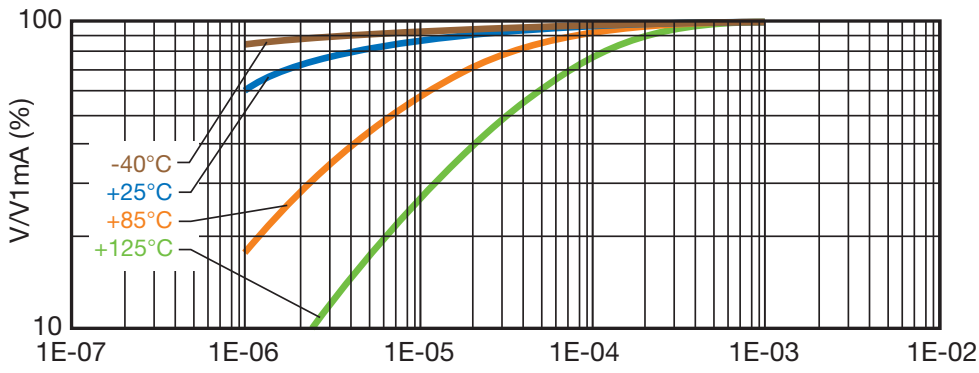
AUTOMOTIVE SERIES – VJ13, 14, 15, 20

TEMPERATURE DEPENDENCE OF V/I CHARACTERISTIC

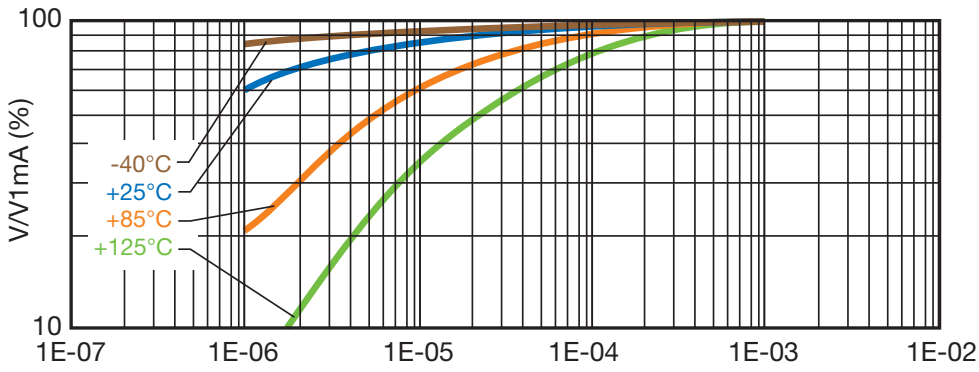
VJ15MA0160K



VJ15PA0160K



VJ15MA0340K



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

AVX:

VJ13MC0180KBA VC13MA0160KBA VJ13MC0300KBA VJ13MC0260KBA VJ13PC0300KBA VJ13MC0480KBA VJ13PC0480KBA VJ13MC0600KBA VC15MA0340KBA VC14MA0160KBA VC15MA0160KBA VC15PA0160KBA VC20MA0160KBA VC32M00151K-- VC32M00231K-- VC32M00251K-- VC32M00301K-- VC32M01750K-- VC32M02750K-- VJ14MA0160KBA VJ15MA0340KBA VJ15PA0160KBA VC14MT0600KBA VC20M00140KBA