

UltraGuard® Series

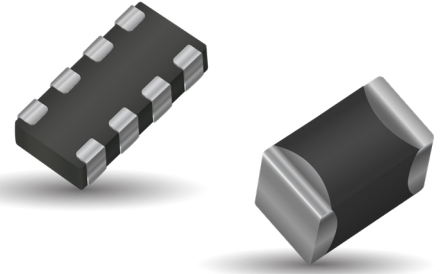
ESD Protection for Low Leakage Requirements



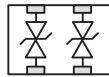
GENERAL DESCRIPTION

Faster semiconductor clock speeds and an increasing reliance on batteries as power sources have resulted in the need for varistors that exhibit very low leakage current. The UltraGuard® (UG) Series of KYOCERA AVX Transient Voltage Suppressors address this problem.

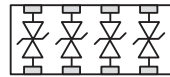
The UG® Series is the ideal transient protection solution for high clock speed integrated circuit application, battery-operated device, backlit display, medical/instrument application, low voltage power conversion circuits and power supervisory chip sets. In addition, UltraGuard® has low leakage characteristics that are also suitable for optic circuits like LDD, SerDes, and laser diodes.



Discrete Chips
0402, 0603,
and 0805



2-Element Arrays
(0405 and 0508)



4-Element Arrays
(0612)

GENERAL CHARACTERISTICS

- Operating Temperature: -55°C to +125°C
- Working Voltage: 3.0dc - 32Vdc
- Case Size: 0402-1206
0405 2xArray, 0508 2xArray
0612 4xArray
- Leakage: 1µA Max
- Energy: 0.02-1.2J
- Peak Current: 80-200A
- Typ Cap: 30-5000pF

FEATURES

- Bi-Directional protection
- Ultra low leakage 1uA max
- Multi-strike capability
- Single, 2 and 4 element components
- Compact footprint
- EMI/RFI filtering

APPLICATIONS

- Battery operated devices
- High clock speed IC
- Low voltage power conversion
- Power supervisory chip sets
- Optic circuits (LDD, SerDes)
- Laser diodes
- Any circuit with low leakage requirements

HOW TO ORDER

VC T Surface Mount Chip	UG T Series Low Leakage Series	04 T Case Size 04 = 0402 06 = 0603 08 = 0805 12 = 1206	0180 T Maximum Working Voltage 0030 = 3.0VDC 0050 = 5.0VDC 0075 = 7.5VDC 0100 = 10.0VDC 0150 = 15.0VDC 0180 = 18.0VDC 0320 = 32.0VDC	L T Capacitance L = Low H = High	1 T No. of Elements	W T Packaging (pieces per reel) D = 1,000 (7" reel) R = 4,000 (7" reel) T = 10,000 (13" reel) W = 10,000 (7" reel, 0402 only)	P T Termination Finish P = Ni/Sn (Plated)
MG T Array	UG T Series Low Leakage Series	06 T Case Size 04 = 0405 05 = 0508 06 = 0612	0150 T Maximum Working Voltage 0030 = 3.0VDC 0050 = 5.0VDC 0075 = 7.5VDC 0100 = 10.0VDC 0150 = 15.0VDC	L T Capacitance L = Low H = High	4 T No. of Elements 2 = 2 Elements 4 = 4 Elements	W T Packaging (pieces per reel) D = 1,000 (7" reel) R = 4,000 (7" reel) T = 10,000 (13" reel)	P T Termination Finish P = Ni/Sn (Plated)

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ESD Protection for Low Leakage Requirements



Part Number	VW	VW	VB (Min)	VC	IVC	IL	ET	IP	Cap	Freq	Case	Elements
MGUG040030L2__	3.0	2.3	6.8	18	1	1	0.05	15	300	M	0405	2
MGUG050030L2__	3.0	2.3	17.2	32	1	1	0.1	30	425	M	0508	2
MGUG060030L4__	3.0	2.3	17.2	32	1	1	0.1	30	425	M	0612	4
VCUG040030L1__	3.0	2.3	6.8	18	1	1	0.05	20	175	M	0402	1
VCUG060030L1__	3.0	2.3	6.8	18	1	1	0.1	30	750	K	0603	1
VCUG080030H1__	3.0	2.3	6.8	18	1	1	0.3	120	3000	K	0805	1
VCUG080030L1__	3.0	2.3	6.8	18	1	1	0.1	40	1100	K	0805	1
VCUG120030H1__	3.0	2.3	6.8	18	1	1	0.4	150	3000	K	1206	1
VCUG120030L1__	3.0	2.3	6.8	18	1	1	0.1	40	1200	K	1206	1
MGUG040050L2__	5.0	3.5	20	50	1	1	0.02	15	40	M	0405	2
MGUG050050L2__	5.0	3.5	17.2	32	1	1	0.1	30	425	M	0508	2
MGUG060050L4__	5.0	3.5	17.2	32	1	1	0.1	30	425	M	0612	4
VCUG040050L1__	5.0	3.5	10.8	22	1	1	0.05	20	175	M	0402	1
VCUG060050L1__	5.0	3.5	10.8	22	1	1	0.1	30	550	K	0603	1
VCUG080050L1__	5.0	3.5	10.8	22	1	1	0.1	40	750	K	0805	1
VCUG120050H1__	5.0	3.5	16.3	32	1	1	0.4	150	1050	K	1206	1
VCUG120050L1__	5.0	3.5	16.3	32	1	1	0.1	40	600	K	1206	1
MGUG040075L2__	7.5	5.3	20	50	1	1	0.02	15	40	M	0405	2
MGUG050075L2__	7.5	5.3	17.2	32	1	1	0.1	30	425	M	0508	2
MGUG060075L4__	7.5	5.3	17.2	32	1	1	0.1	30	425	M	0612	4
VCUG040075L1__	7.5	5.3	16.3	32	1	1	0.05	20	85	M	0402	1
VCUG060075L1__	7.5	5.3	16.3	32	1	1	0.1	30	350	K	0603	1
VCUG080075H1__	7.5	5.3	16.3	32	1	1	0.3	120	900	K	0805	1
VCUG080075L1__	7.5	5.3	16.3	32	1	1	0.1	40	325	K	0805	1
VCUG120075H1__	7.5	5.3	16.3	32	1	1	0.4	150	1050	K	1206	1
VCUG120075L1__	7.5	5.3	16.3	32	1	1	0.1	40	600	K	1206	1
MGUG040100L2__	10	7.1	20	50	1	1	0.02	15	40	M	0405	2
MGUG050100L2__	10	7.1	23	42	1	1	0.1	30	225	M	0508	2
MGUG060100L4__	10	7.1	23	42	1	1	0.1	15	120	M	0612	4
VCUG040100L1__	10	7.1	23	42	1	1	0.05	20	65	M	0402	1
VCUG060100L1__	10	7.1	23	42	1	1	0.1	30	150	K	0603	1
VCUG080100H1__	10	7.1	23	42	1	1	0.3	100	550	K	0805	1
VCUG080100L1__	10	7.1	23	42	1	1	0.1	30	225	K	0805	1
VCUG120100H1__	10	7.1	23	42	1	1	0.4	150	900	K	1206	1
VCUG120100L1__	10	7.1	23	42	1	1	0.1	30	350	K	1206	1
MGUG040150L2__	15	11	20	50	1	1	0.02	15	50	M	0405	2
MGUG050150L2__	15	11	20	50	1	1	0.1	20	50	M	0508	2
MGUG060150L4__	15	11	20	50	1	1	0.05	20	75	M	0612	4
VCUG040150L1__	15	11	25	50	1	1	0.02	15	40	M	0402	1
VCUG060150L1__	15	11	31.1	60	1	1	0.1	30	155	K	0603	1
VCUG080150H1__	15	11	31.1	60	1	1	0.3	100	250	K	0805	1
VCUG080150L1__	15	11	31.1	60	1	1	0.1	30	120	K	0805	1
VCUG120150H1__	15	11	31.1	60	1	1	0.4	120	500	K	1206	1
VCUG040180L1__	18	14	28	55	1	1	0.05	10	30	M	0402	1
VCUG080320L1__	32	22	42.3	77	1	1	0.1	40	50	M	0805	1

└ Termination Finish Code
└ Packaging Code

V_{CIR} (DC) DC Circuit Voltage (V)
 V_{CIR} (AC) AC Circuit Voltage (V)
 Cap Req Standard or Low
 I_L Maximum Leakage Current at the Circuit Voltage (μA)
 Cap Typical Capacitance (pF) @ frequency specified and 0.5 Vrms
 Freq Frequency at which capacitance is measured (K = 1kHz, M = 1MHz)

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ESD Protection for Low Leakage Requirements



PHYSICAL DIMENSIONS

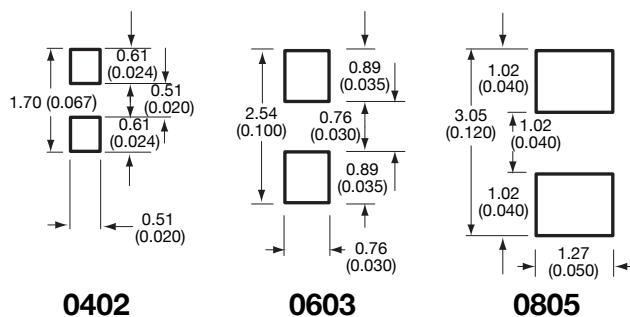
mm (inches)

	0402 Discrete	0603 Discrete	0805 Discrete
Length	1.00 ±0.10 (0.040 ±0.004)	1.60 ±0.15 (0.063 ±0.006)	2.01 ±0.20 (0.079 ±0.008)
Width	0.50 ±0.10 (0.020 ±0.004)	0.80 ±0.15 (0.032 ±0.006)	1.25 ±0.20 (0.049 ±0.008)
Thickness	0.60 Max. (0.024 Max.)	0.90 Max. (0.035 Max.)	1.02 Max. (0.040 Max.)
Term Band Width	0.25 ±0.15 (0.010 ±0.006)	0.35 ±0.15 (0.014 ±0.006)	0.71 Max. (0.028 Max.)

	0405 Array	0508 Array	0612 Array
Length	1.00 ±0.15 (0.039 ±0.006)	1.25 ±0.20 (0.049 ±0.008)	1.60 ±0.20 (0.063 ±0.008)
Width	1.37 ±0.15 (0.054 ±0.006)	2.01 ±0.20 (0.079 ±0.008)	3.20 ±0.20 (0.126 ±0.008)
Thickness	0.66 Max. (0.026 Max.)	1.02 Max. (0.040 Max.)	1.22 Max. (0.048 Max.)
Term Band Width	0.36 ±0.10 (0.014 ±0.004)	0.41 ±0.10 (0.016 ±0.004)	0.41 ±0.10 (0.016 ±0.004)

SOLDER PAD DIMENSIONS

mm (inches)



0612 4-Element Array

A	B	C	D	E
0.89 (0.035)	1.65 (0.065)	2.54 (0.100)	0.46 (0.018)	0.76 (0.030)

2-Element Arrays

	A	B	C	D	E
0405	0.46 (0.018)	0.74 (0.029)	1.20 (0.047)	0.38 (0.015)	0.64 (0.025)
0508	0.89 (0.035)	1.27 (0.050)	2.16 (0.085)	0.46 (0.018)	0.76 (0.030)

