



GiGuard®

ESD PROTECTION FOR HIGH SPEED CIRCUITS

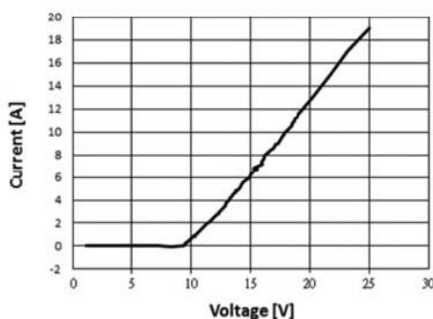
GENERAL DESCRIPTION

Utilizing the latest in TVS Technology combined with a unique leadless package, the new GiGuard® series of ESD Suppression Diodes offers Clamping Voltages below 12v and cap values as low as 0.3pfd. This combination of excellence both protects sensitive ICs during ESD events and preserves the integrity of the protected high speed signals. The KYOCERA AVX GG® series fits perfectly onto the same PCB

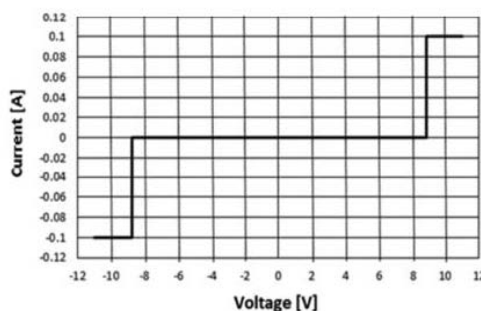
solder pads as standard EIA 0201 / 0402 / 0603 components. The GG® series complies with IEC 61000-4-2(ESD), Level 4+ ($\pm 20\text{kV}$ air, $\pm 20\text{kV}$ contact discharge), IEC 61000-4-4 (electrical fast transient -EFT) (20A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE).

GG0402060R3C2P (0.3PF)

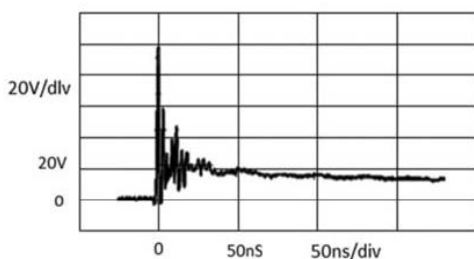
TLP Measurement



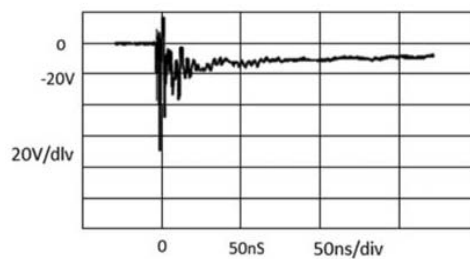
Voltage Sweeping of I/O_1 to I/O_2



ESD Clamping of I/O_1 to I/O_2
(+8kV Contact per IEC 61000-4-2)



ESD Clamping of I/O_1 to I/O_2
(-8kV Contact per IEC 61000-4-2)



APPLICATIONS

- » USB 2.0/3.0
- » Tablets/Cell Phones Touch Screens
- » Network Communications
- » Gigabyte Ethernet
- » High Def Multimedia Interface (HDMI)
- » Mobile Phone Touchscreen

FEATURES

- » Low Capacitance (.3pF to 17pF typ)
- » Low Vc (<12v @ 1a)
- » Bi-Directional protection
- » Leadless 0201/0402 case size
- » -55°C ~ 125°C Operating Range

CIRCUIT DIAGRAM



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More Information

ELECTRICAL CHARACTERISTICS

GENERAL ELECTRICAL CHARACTERISTICS

KYOCERA AVX Part Number	V _{rwv} (V)	C _{nom} (pF)	Cap Min (pf)	Cap Max (pF)	V _{br} Typ (V)	IL (μa)	V _c (@I _{pp} =1a, tp=8x20ns) (V)	I _{pp} (A)	V _c (@I _{pp} , tp=8x20ns) (V)	P _{pp} (W)	V _{air} (KV)	V _{con} (KV)	V _c (@8KV) (V)	Pack QTY
GG020103100N2P	3.3	10.0	7	13	4.0	<0.1	≤6	7	≤10	70.0	±20	±20	≤12	15000
GG020105100N2P	5.0	10.0	7	13.0	5.5	<0.1	≤8	6	≤12	60.0	±20	±20	≤12	15000
GG0201052R542P	5.0	2.5	0.5	4.5	6.7	<0.1	≤12	3	≤15	46.0	±20	±15	≤16	15000
GG040203100N2P	3.3	10.0	7	13	4.0	<0.1	≤6	8	≤10	80.0	±30	±30	≤10	10000
GG0402052R542P	5.0	2.5	0.5	4.5	5.5	<0.1	≤12	3	≤15.5	46.0	±15	±15	≤16	10000
GG0402055R042P	5.0	5.0	3	7.0	5.2	<0.1	≤12	4	≤16	60.0	±15	±15	≤15	10000
GG040205100N2P	5.0	10.0	7	13.0	5.5	<0.1	≤8	8	≤12	96.0	±25	±25	≤12	10000
GG040205170N2P	5.0	17.0	11.9	22.0	5.1	<0.1	≤6.5	8	≤10	80.0	±30	±30	≤12	10000
GG040205320M2P	5.0	32.0	25.6	38.4	6	<0.1	≤7	18	≤11	200.0	±30	±30	≤11	10000
GG040207100N2P	7.0	10.0	7	13	9.0	<0.1	≤10	6	≤12	72.0	±30	±30	≤13	10000
GG0402126R042P	12.0	6.0	4	8	18.0	<0.1	≤18	6	≤22	130.0	±25	±25	≤22	10000
GG060303100N2P	3.3	10.0	7	13	3.4	<0.1	≤6	8	≤10	80.0	±30	±30	≤10	5000
GG0603052R542P	5.0	2.5	0.5	4.5	6.7	<0.1	≤12	3	≤15	45.0	±15	±15	≤16	5000
GG060305100N2P	5.0	10.0	7	13	7.5	<0.1	≤8	8	≤12	96.0	±25	±25	≤12	5000

HIGH POWER ELECTRICAL CHARACTERISTICS

KYOCERA AVX Part Number	V _{rwv} (V)	C _{nom} (pF)	Cap Min (pf)	Cap Max (pF)	V _{br} Typ (V)	IL (μa)	V _c (@I _{pp} =1a, tp=8x20ns) (V)	I _{pp} (A)	V _c (@I _{pp} , tp=8x20ns) (V)	P _{pp} (W)	V _{air} (KV)	V _{con} (KV)	V _c (@8KV) (V)	Pack QTY
GG0402050R8L2P	5.0	0.8	0.5	2.5	8.0	<0.1	≤9	7	≤15	100	±30	±30	≤13	10000
GG0402051R5L2P	5.0	1.5	0.5	2.5	8.0	<0.1	≤9	15	≤20	300	±30	±30	≤12	10000

LOW CAP ELECTRICAL CHARACTERISTICS

KYOCERA AVX Part Number	V _{rwv} (V)	C _{nom} (pF)	Cap Min (pf)	Cap Max (pF)	V _{br} Typ (V)	IL (μa)	V _c (@I _{pp} =1a, tp=8x20ns) (V)	I _{pp} (A)	V _c (@I _{pp} , tp=8x20ns) (V)	P _{pp} (W)	V _{air} (KV)	V _{con} (KV)	V _c (@8KV) (V)	Pack QTY
GG0201050R3C2P	5.0	0.3	0.15	0.55	8.0	<0.1	≤15	3	≤20	60.0	±20	±20	≤30	15000
GG0402050R4C2P	5.0	0.35	0.15	0.65	8.5	<0.1	≤10	4	≤12	60.0	±20	±20	≤15	10000
GG0402050R3C2P	5.0	0.3	0.15	0.55	7.0	<0.1	≤12	3	≤15.5	54.0	±20	±20	≤30	10000
GG0402060R3C2P	6.5	0.3	0.15	0.55	7.0	<0.1	≤12	3	≤15.5	54.0	±20	±20	≤30	10000

CHARACTERISTIC TEST DESCRIPTION

Characteristic Test Description	Symbol	Units
Nominal Reverse Working Voltage	V _{wrm}	V
Reverse Typ. Breakdown Voltage @ 1ma	V _{br}	V
Reverse Leakage Current @Vwrm	IL	ua
Peak Pulse Power (tp=8x20us)	P _{pp}	W
Peak Pulse Current (tp=8x20us)	I _{pp}	A
ESD Rating - Air (150pf, 330Ω network)	V _{air}	KV
ESD Rating - Contact (150pf, 330Ω network)	V _{con}	KV

Characteristic Test Description	Symbol	Units
Max Clamp Voltage @ Ipp = 16a	V _{c16a}	V
Max ESD Clamp Voltage @ 8KV	V _{c8k}	V
Max Clamp Voltage @ Ipp = 1a	V _c	V
Max Clamp Voltage @ Ipp	V _{cIpp}	V
Nominal Capacitance (Vr=0v, f=1Mhz)	C _{nom}	pF
Allowable Capacitance Range	C _{ap} (pF)	min-max