Sample Kit

Transient Voltage Suppressors – TVS

High-performance TVS Diodes for ICT, Consumer and High-speed Applications

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Excellent ESD protection for portable, wearable & high-speed applications

The new micro-packaged TVS diodes by TDK are designed to protect voltage-sensitive components from ESD, for existing and future applications in the direction of general-purpose and high-speed interfaces.

Excellent clamping voltage, low leakage and fast response time provide state-of-the-art protection for applications exposed to ESD. Due to their ultra-slim package, they are an excellent solution for smartphones, true wireless earbuds, smart watches, and many other portable applications with tight space requirements. Ultra-low capacitance permits excellent signal integrity for demanding high-speed interfaces, such as USB, HDMI, DisplayPort and Thunderbolt.

TDK's expanded TVS diode portfolio for 2023 is specifically designed to protect USB Type-C connectors. The portfolio offers ideal solutions for high-speed data pins up to 40 Gbps using the fast USB4 40G protocol as well as the Thunderbolt protocol and supports fast charging of devices via power delivery protocol.

Features

- Ultra-small wafer-level chip-scale package with a thickness of 100 µm and 150 µm
- Available in chip scale packages WL-CSP0201 and WL-CSP01005
- High ESD robustness up to 25 kV based on IEC61000-4-2
- Low clamping voltage down to 3.8 V (I_{TLP} = 8 A)
- Low leakage current as low as 1 nA (V_{RWM} = 3.3 V)
- Very low capacitance down to 0.18 pF

Applications

General purpose

- Smartphones
- Laptops
- Tablets
- Wearables, portable devices
- Network communication devices

High-speed interfaces

- USB, FireWire
- DVI, HDMI, DisplayPort
- S-ATA
- Thunderbolt
- SWP/NFC

Components

B74121
G0050M060

B74111
G0050M060

B74111
G0055M060

B74121
G0160M060

B74121
G0200M060

B74121
U0028M060

B74121
U0033M060

B74111
U0033M060

B74121
U0055M060

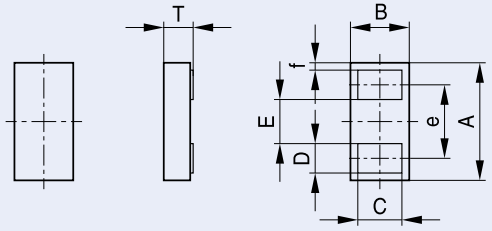
B74111
U0055M060

Product range

Electrical specifications and ordering codes

$V_{RWM, max}$ I/O to GND [V]	C_{typ} [pF]	$V_{BR, typ}$ 1 mA [V]	$I_{leak, typ}$ 3.3 V [nA]	$V_{clamp1, typ}$ I_{TLP} = 8 A [V]	$V_{clamp2, typ}$ I_{TLP} = 16 A [V]	$V_{ESD, max}$ 10 pulses [kV]	$R_{dyn, typ}$ [Ω]	Ordering code Type
General purpose applications, GP series								
±5.0	12	6.8	40	7.2	8.0	±25	0.10	B74121G0050M060 WL-CSP0201 SL
±5.0	5	6.8	20	7.6	8.9	±15	0.16	B74111G0050M060 WL-CSP01005 SL
±5.5	5	7.5	10	8.5	10.1	±15	0.2	B74111G0055M060 WL-CSP01005 SL
±16	5.5	21	5	23	25.7	±15	0.33	B74121G0160M060 WL-CSP0201 SL
±20	4.0	22	20	27	32	±15	0.6	B74121G0200M060 WL-CSP0201 SL
High-speed interface applications, ULC series								
±2.8	0.18	5.9	5	5.5	8.2	±15	0.27	B74121U0028M060 WL-CSP0201 SL
±3.3	0.65	6.3	1	3.9	5.2	±15	0.16	B74121U0033M060 WL-CSP0201 SL
±3.3	0.48	6.3	1	3.8	5.0	±15	0.15	B74111U0033M060 WL-CSP01005 SL
±5.5	0.55	10.3	1	4.1	5.6	±15	0.19	B74121U0055M060 WL-CSP0201 SL
±5.5	0.43	10.3	1	3.9	5.1	±15	0.15	B74111U0055M060 WL-CSP01005 SL

Dimensional drawings



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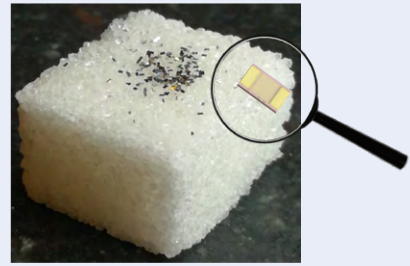

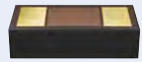

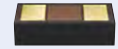

	WL-CSP0201 SL			WL-CSP01005 SL	
	B74121G0050M060 2			B74111G0050M060	
	B74121G0160M060 2			B74111G0055M060	
	B74121G0200M060 1				
	B74121U0028M060 1			B74111U0033M060	
	B74121U0033M060 2			B74111U0055M060	
	B74121U0055M060 2				
Symbol	**Mean**		**Tol.**	**Mean**	**Tol.**
	1	**2**			
A	0.58	0.60	±0.025	0.40	±0.020
B	0.28	0.30	±0.025	0.20	±0.020
T	0.15	0.15	±0.010	0.10	±0.010
C	0.24	0.22	±0.020	0.15	±0.020
D	0.17	0.13	±0.020	0.10	±0.020
E	0.19	0.26	(typical)	0.15	(typical)
e	0.36	0.39	(typical)	0.25	(typical)
f	0.025	0.04	(typical)	0.025	(typical)
Size	**580 x 280 µm / 600 x 300 µm**			**400 x 200 µm**	
Thickness	**150 µm**			**100 µm**	

Dimensions in mm

Symbols and terms

C	Capacitance
I_{leak}	Reverse leakage current
I_{pp}	Peak pulse current (8/20 µs)
I_{TLP}	Transmission-line pulse current
SL	Slim-line
TLP	Transmission-line pulse

R_{dyn}	Dynamic resistance
V_{BR}	Breakdown voltage
V_{clamp}	Clamping voltage TLP
V_{ESD}	ESD voltage
V_{RWM}	Reverse working voltage

For further information please refer to:

Important information: It is incumbent on the customer to check and decide whether a product is suitable for use in a particular application. Our products are described in detail in our data sheets. Our important notes and product specific Cautions and warnings must be observed. All relevant information is available through our sales offices.

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