

## Surface Mount TVS Diodes

### Ultra Low Capacitance ESD Protection Diode, TS04021C05VR30



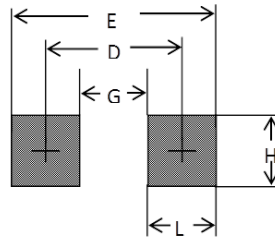
#### Applications:

- Cellular handsets and accessories
- Portable electronics
- Notebooks, desktops and servers
- HDMI1.3/1.4, PCI express, SATA, USB 2.0, DVI, display port
- High-speed data lines

#### Features:

- Bi-directional ESD protection of one line.
- IEC 61000-4-2, level 4 (ESD) protection
- IEC61000-4-4 (EFT) rating - 40A (5/50 $\mu$ s)
- IEC61000-4-5 (Lightning) rating - 24A (8/20 $\mu$ s)
- Low capacitance (0.3pF typical)
- Ultra small SMD special packages (0402)
- Pb-Free, Halogen free and RoHS compliant
- Operating junction temperature -55 $^{\circ}$ C~+125 $^{\circ}$ C
- Storage temperature range -55 $^{\circ}$ C~+150 $^{\circ}$ C

#### Recommended Foot Print Dimensions:



Unit	Inch	mm
L	0.020	0.50
G	0.010	0.25
H	0.028	0.70
D	0.030	0.75
E	0.049	1.25

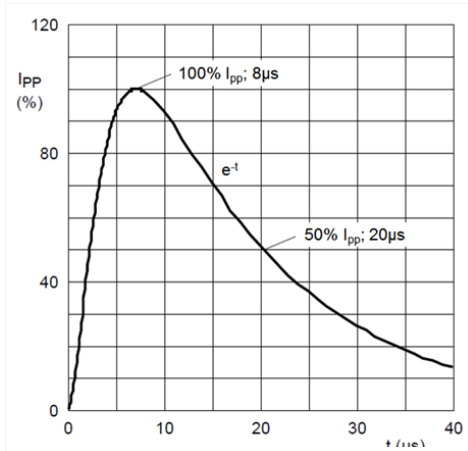
#### Electrical Characteristics (@25 $^{\circ}$ C):

Characteristic	Condition	Value		
		Min.	Typical	Max.
ESD per IEC61000-4-2 Direct Discharge			$\pm 8$ kV	
ESD per IEC61000-4-2 Air Discharge			$\pm 16$ kV	
Peak Pulse Power ( $P_{PK}$ )	$t_p = 8/20\mu s$		30 W	
Reverse Stand-Off Voltage ( $V_{RWM}$ )				5 V
Reverse Breakdown Voltage ( $V_{BV}$ )	$I_{BV} = 1mA$	6.0 V	7.8 V	
Clamping Voltage ( $V_{CL}$ )	$I_{PP} = 1A, t_p = 8/20\mu s$			14 V
Junction Capacitance ( $C_j$ )	$V_{RWM} = 0V, f = 1MHz$		0.3 pF	
Reverse Leakage Current ( $I_{RM}$ )	$V_{RWM} = 5V$			1 $\mu A$

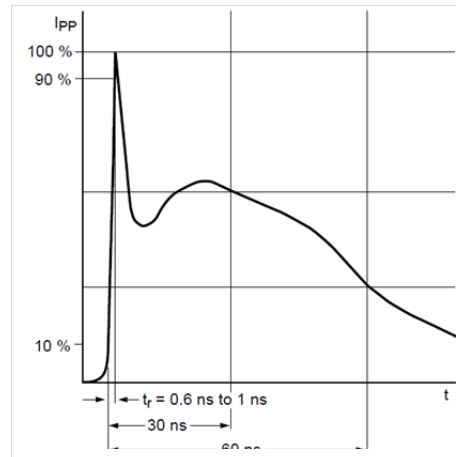
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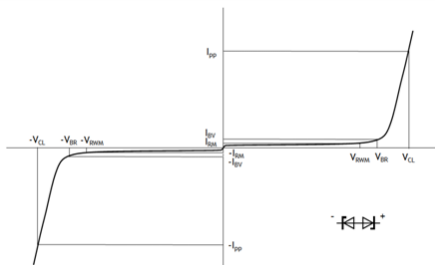
### Electrical Characteristics (@25°C):



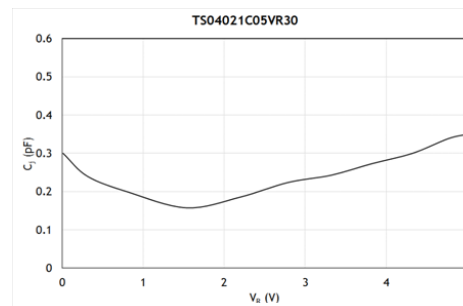
**Fig. 1**  
8/20µs pulse waveform  
according to IEC 61000-4-5



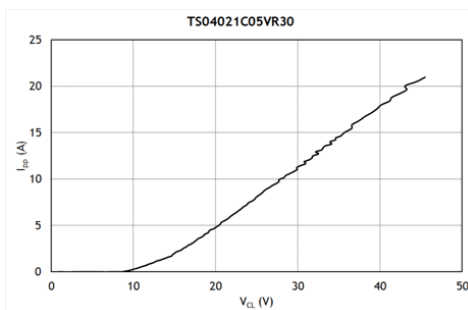
**Fig. 2**  
ESD pulse waveform  
according to IEC 61000-4-2



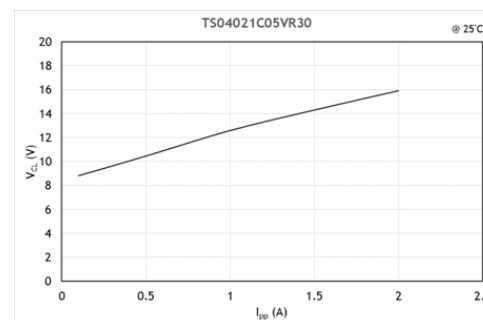
**Fig. 3**  
V-I characteristics for bidirectional ESD  
protection diode



**Fig. 4**  
Junction capacitance as a function of re-  
verse voltage; typical value



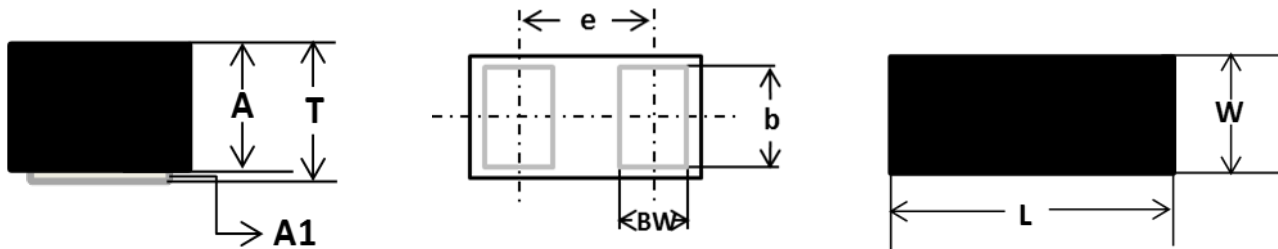
**Fig. 5**  
Dynamic resistance with positive clamping  
voltage  $t_p = 10\text{ns}$ ; Transmission Line Pulse  
(TLP)



**Fig. 6**  
Clamping voltage ( $V_{CL}$ ) as a function of peak  
current ( $I_{PP}$ );  $t_p = 8/20\mu\text{s}$

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### Shape and Dimensions:



Package	Size inch/(mm)							
	L	W	T	BW	b	e	A	A1
<b>0201</b> <b>(DN0603)</b>	0.024±0.002 (0.60±0.05)	0.013±0.002 (0.32±0.05)	0.012±0.002 (0.30±0.05)	0.006±0.002 (0.15±0.05)	0.010±0.002 (0.25±0.05)	0.015 (0.38)	0.011±0.002 (0.29±0.05)	0.0004 (0.01)
<b>0402</b> <b>(DFN1006)</b>	0.039±0.002 (1.00±0.05)	0.024±0.002 (0.60±0.05)	0.020±0.002 (0.50±0.05)	0.014±0.002 (0.35±0.05)	0.020±0.002 (0.50±0.05)	0.026 (0.65)	0.019±0.002 (0.49±0.05)	0.0004 (0.01)

### Packaging Information:

Package	Tape & Reel Quantity (piece)	Marking
0201 (DFN0603)	15,000	I
0402 (DFN1006)—TS04021C05V100	10,000	E5
0402 (DFN1006)—TS04021C05VR30	10,000	S

### Storage Conditions:

Storage Time: 12 months max

Storage Temperature : 5°C to 30°C

Relative Humidity: < 60% RH

## Disclaimer

*Specifications are subject to change without notice. AEM products are designed for specific applications and should not be used for any purpose (including, without limitation, automotive, aerospace, medical, life-saving applications, or any other application which requires especially high reliability for the prevention of such defect as may directly cause damage to the third party's life, body or property) not expressly set forth in applicable AEM product documentation. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Warranties granted by AEM shall be deemed void for products used for any purpose not expressly set forth in applicable AEM product documentation. AEM shall not be liable for any claims or damages arising out of products used in applications not expressly intended by AEM as set forth in applicable AEM product documentation. The sale and use of AEM products is subject to AEM terms and conditions of sale. Please refer to AEM's website for updated catalog and terms and conditions of sale.*