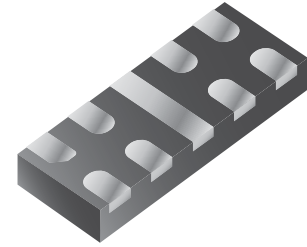


Ultra Low capacitance & Low Clamping Voltage Uni-directional ESD / Transient Protection Diodes

FEATURES



ULP-9 (leadless-type)

- Transient protection for data lines to
 - IEC61000-4-2(ESD) : Air mode $\pm 25\text{kV}$ / Contact mode $\pm 20\text{kV}$
 - IEC61000-4-5(Surge) : 4A($t_p=8/20 \mu\text{s}$)
- Low capacitance $C_T = 0.6\text{pF(Max)}$ Any I/O pin to ground
- Uni-directional working voltage up to : $V_{RWM} = 5\text{V}$
- Ultra small Size $2.0 \times 1.0 \times 0.4\text{mm}$
- Suffix U : Qualified to AEC-Q101.
ex) PS05TVUL9-RTL/HU

PRODUCT DESCRIPTION

- Molding compound flammability rating : UL 94V-0
- Pb-Free, Halogen-Free, RoHs Compliant

Package dimensions (ULP-9)	Pin configurations (Uni-directional)																																															
<table border="1" style="margin-top: 10px; width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">DIM</th> <th colspan="3">MILLIMETERS</th> </tr> <tr> <th>MIN</th> <th>NOM</th> <th>MAX</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>>0.3</td> <td>-</td> <td>0.40</td> </tr> <tr> <td>A1</td> <td>0.00</td> <td>-</td> <td>0.05</td> </tr> <tr> <td>A3</td> <td colspan="3">0.125REF.</td> </tr> <tr> <td>b</td> <td>0.15</td> <td>0.20</td> <td>0.25</td> </tr> <tr> <td>D</td> <td>1.95</td> <td>2.00</td> <td>2.05</td> </tr> <tr> <td>E</td> <td>0.95</td> <td>1.00</td> <td>1.05</td> </tr> <tr> <td>e</td> <td colspan="3">0.40 BSC</td> </tr> <tr> <td>L</td> <td>0.28</td> <td>0.38</td> <td>0.48</td> </tr> </tbody> </table>	DIM	MILLIMETERS			MIN	NOM	MAX	A	>0.3	-	0.40	A1	0.00	-	0.05	A3	0.125REF.			b	0.15	0.20	0.25	D	1.95	2.00	2.05	E	0.95	1.00	1.05	e	0.40 BSC			L	0.28	0.38	0.48	<table border="1" style="margin-top: 10px; width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Pin</th> <th>Identification</th> </tr> </thead> <tbody> <tr> <td>1,2,3,4</td> <td>Input Lines</td> </tr> <tr> <td>5,6,7,8</td> <td>Output Lines (No Internal Connection)</td> </tr> <tr> <td>Center Tab</td> <td>GND</td> </tr> </tbody> </table>	Pin	Identification	1,2,3,4	Input Lines	5,6,7,8	Output Lines (No Internal Connection)	Center Tab	GND
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ORDERING INFORMATION

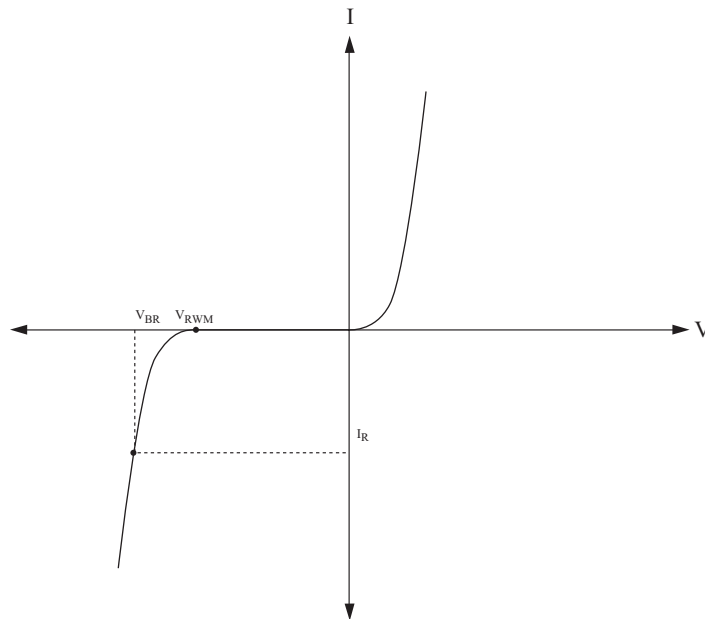
Part Number	Qty per Reel	Reel Size	Marking code
PS05TVUL9-RTK	5,000	7 inch	BY

PS05TVUL9

MAXIMUM RATING (Ta=25)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Peak Pulse Power (tp=8/20 μs)	P _{PK}	60	W
Peak Pulse Current (tp=8/20 μs)	I _{PP}	4	A
Junction Temperature	T _J	150	
Operating Junction Temperature	T _{opr}	-40 150	
Storage Temperature	T _{STG}	-55 150	

DEFINITIONS OF ELECTRICAL CHARACTERISTIC SYMBOL

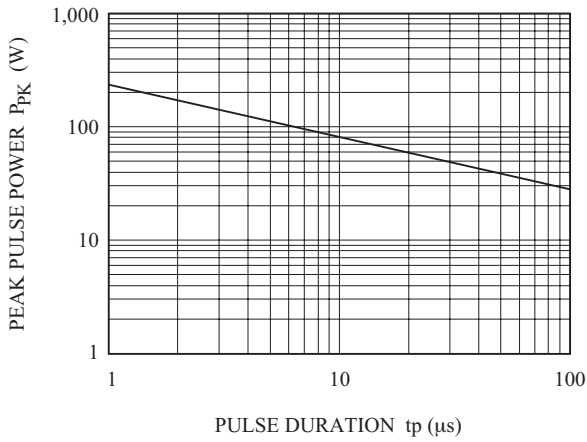


ELECTRICAL CHARACTERISTICS (Ta=25)

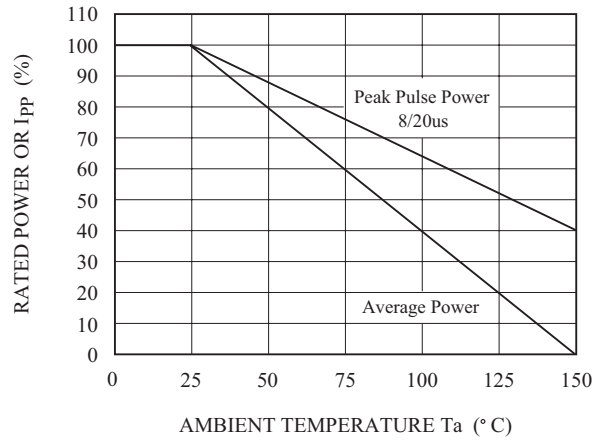
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Reverse Stand-Off Voltage	V _{RWM}	Any I/O pin to ground	-	-	5	V
Reverse Leakage Current	I _R	V _{RWM} =5V Any I/O pin to ground	-	-	0.3	μA
Breakdown Voltage	V _{BR}	I _t =1mA Any I/O pin to ground	6	-	11	V
Clamping Voltage	V _C	I _{PP} =1A, tp=8/20 μs Any I/O pin to ground	-	-	12	V
		I _{PP} =4A, tp=8/20 μs Any I/O pin to ground	-	-	15	
Total Capacitance	C _T	V _R =0V, f=1MHz Between I/O pins	-	0.3	0.4	pF
		V _R =0V, f=1MHz Any I/O pin to ground	-	0.45	0.6	
Electrostatic Discharge	V _{ESD}	IEC61000-4-2	Air	± 25	-	kV
			Contact	± 20	-	

PS05TVUL9

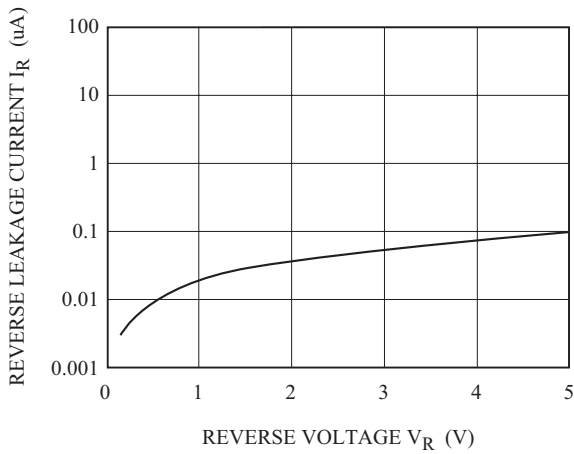
NON-REPETITIVE PEAK PULSE POWER VS. PULSE TIME



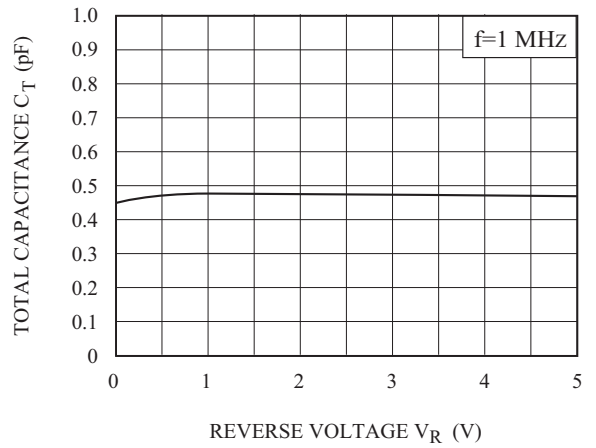
POWER DERATION CURVE



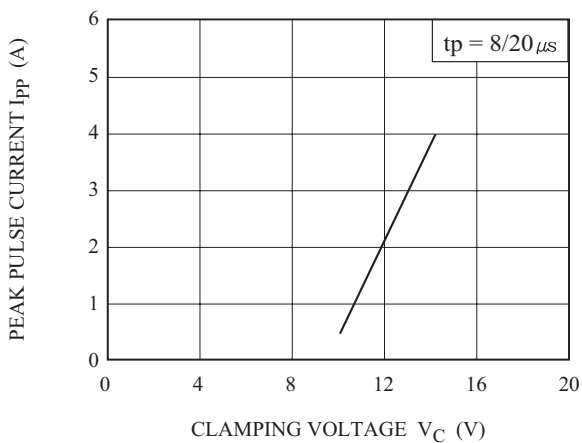
$I_R - V_R$ (I/O to GND)



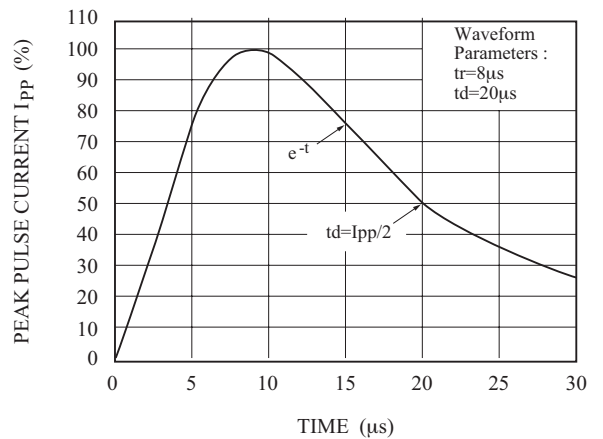
$C_T - V_R$ (I/O to GND)



$I_{pp} - V_C$ (I/O to GND)



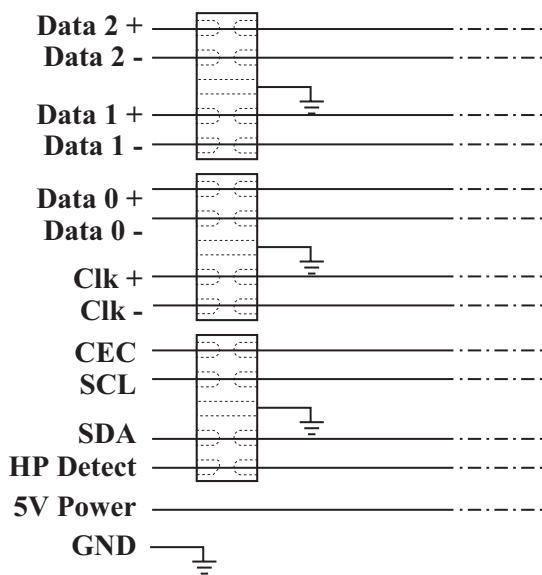
PULSE WAVEFORM



PS05TVUL9

APPLICATIONS

- USB 2.0, 10/100/1000 Ethernet, DVI, HDMI, S-ATA
- Mobile Display Digital Interface (MDDI)
- LCD-Display, Camera
- GPS / FM Antennas
- Low Voltage Differential Signaling (LVDS)
- High speed data lines



Recommended pad dimension & Marking Information

Recommended pad dimension	Marking Code
<p>The diagram illustrates the recommended pad dimensions for the component. The dimensions are as follows:</p> <ul style="list-style-type: none"> Pad width: 0.40 Pad pitch: 0.88 Pad offset: 0.21 Pad thickness: 0.20 Pad length: 0.67 Overall component length: 1.55 	<p>The marking code is 'BY 10', where 'BY' is the manufacturer code and '10' is the part number. The code is shown within a dashed rectangular box on a component pad.</p>