



# PEC11SD03S1Q

## Ultra Low Capacitance ESD Protection

**Voltage**

**5 V**

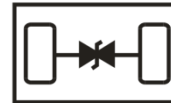
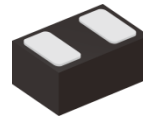
### Features

- IEC61000-4-2(ESD):  $\pm 15\text{kV}$  Air,  $\pm 11\text{kV}$  Contact
- IEC61000-4-4(EFT): 40A(5/50ns)
- IEC61000-4-5(Lightning): 3.5A(8/20uS)
- Low leakage current, maximum of  $1\mu\text{A}$  at rated voltage
- Low clamping voltage
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case : DFN0603-2L Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0004 grams

DFN0603-2L



## Maximum Ratings and Thermal Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNITS
ESD IEC61000-4-2(Air)	V <sub>ESD</sub>	$\pm 15$	kV
ESD IEC61000-4-2(Contact)		$\pm 11$	
Typical Thermal Resistance <sup>(Note 1)</sup>	R <sub>θJA</sub>	500	°C/W
Operating Junction Temperature Range	T <sub>J</sub>	-55~125	°C
Storage Temperature Range	T <sub>STG</sub>	-55~150	°C



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## Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Reverse Stand-Off Voltage <sup>(Note 2)</sup>	$V_{RWM}$	-	-	3.3	5	V
Reverse Breakdown Voltage	$V_{BR}$	$I_{BR} = 1 \text{ mA}$	4.5	-	-	V
Reverse Leakage Current	$I_R$	$V_R = 3.3 \text{ V}$	-	-	1	$\mu\text{A}$
Clamping Voltage	$V_{CL}$	$I_{PP} = 1 \text{ A}, t_P = 8/20 \text{ }\mu\text{s}$	-	7.7	-	V
		$I_{PP} = 3.5 \text{ A}, t_P = 8/20 \text{ }\mu\text{s}$	-	7.5	-	
Clamping Voltage TLP <sup>(Note 3)</sup>	$V_{CL}$	$I_{PP} = 8 \text{ A}, t_P = 100 \text{ ns},$	-	3.4	-	V
		$I_{PP} = 16 \text{ A}, t_P = 100 \text{ ns},$	-	5.5	-	
Dynamic Resistance	$R_{DYN}$	$t_P = 100 \text{ ns}$	-	0.26	-	$\Omega$
Off State Junction Capacitance <sup>(Note 4)</sup>	$C_J$	1.65Vdc Bias $f = 1 \text{ MHz}$	-	0.19	-	pF

**NOTES :**

1. Mounted on a FR4 PCB, Single-sided copper, mini pad.
2. A transient suppressor is selected according to the working peak reverse voltage( $V_{RWM}$ ), which should be equal to or greater than the DC or continuous peak operation voltage level.
3. Testing using Transmission Line Pulse (TLP) conditions:  $Z_0 = 50 \text{ }\Omega$ ,  $t_P = 100 \text{ ns}$ .
4. This parameter is guaranteed by design.
5. This snap-back behavior strongly reduces the clamping voltage to the system behind the ESD protection during an ESD event. Do not connect unlimited DC current sources to the data lines to avoid the ESD protection device maintain in snap-back state after exceeding breakdown voltage.



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## TYPICAL CHARACTERISTIC CURVES

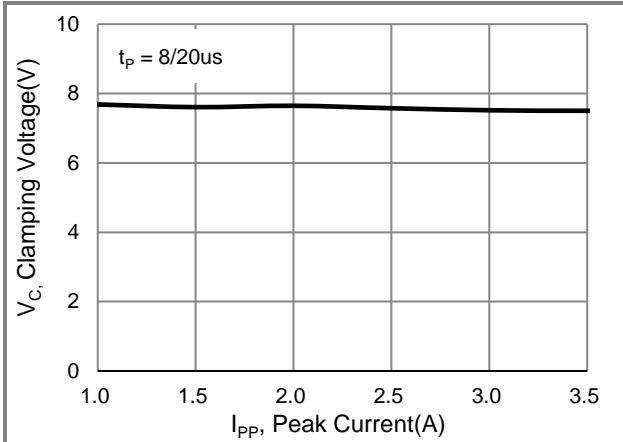


Fig.1 Typical Peak Clamping Voltage

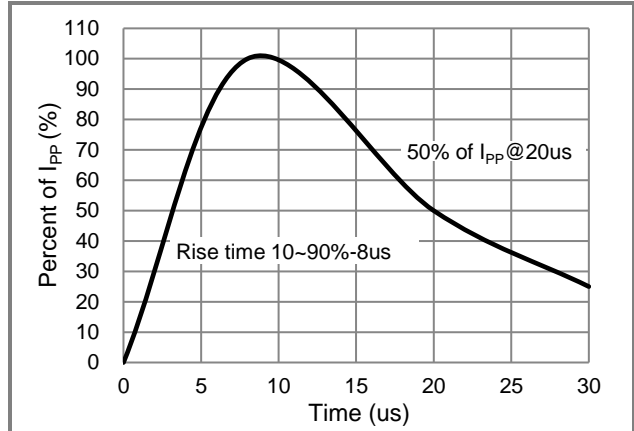


Fig.2 Pulse Waveform

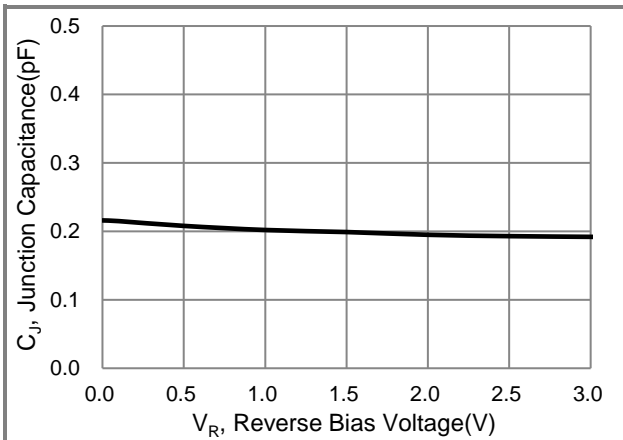


Fig.3 Typical Junction Capacitance

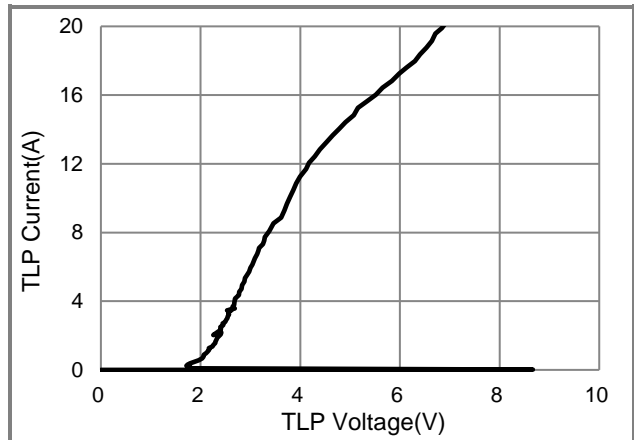


Fig.4 TLP Measurement

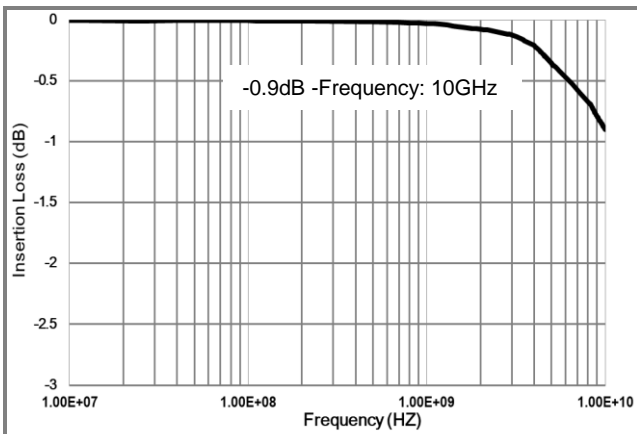


Fig.5 Insertion Loss

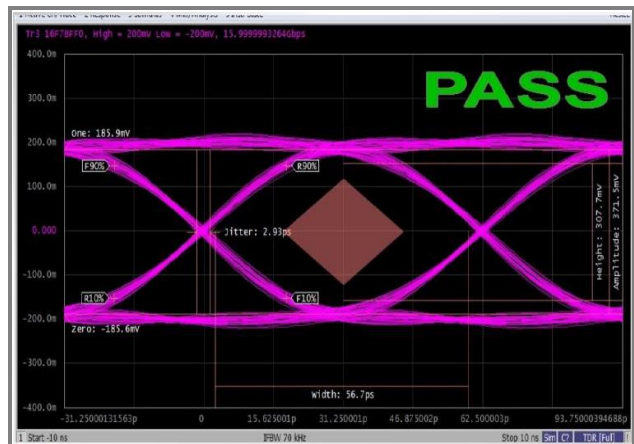


Fig.6 USB4.0 Eye Diagram

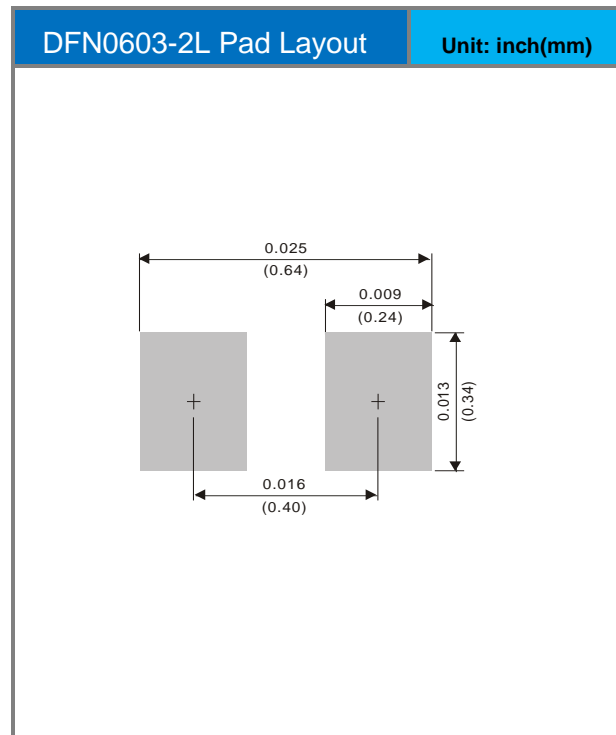
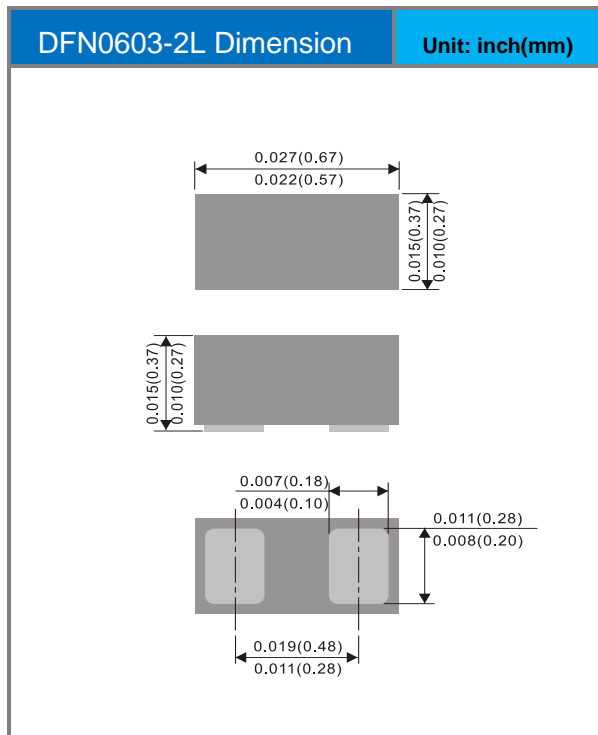


# PEC11SD03S1Q

**Part No. Packing Code Version**

Part No.	Package Type	Packing Type	Marking	Version
PEC11SD03S1Q	DFN0603-2L	10K / 7" Reel	3	Halogen free RoHS compliant

## Packaging Information & Mounting Pad Layout





## PEC11SD03S1Q

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