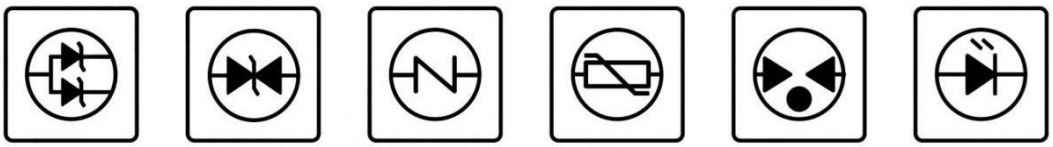
MSKSEMI 美森科
SEMICONDUCTOR



MSESD5641DXX-3

Product specification

Descriptions

The MSESD5641DXX-3 is a transient voltage suppressor designed to protectpower interfaces. Itis suitable to replace multiple discrete components in portable electronics.
The MSESD5641DXX-3 specifically designed to protect USB port. TVS diode with higher surge capability is used to protect USB voltage bus pin.
The MSESD5641DXX-3 is available inDFN2.0×2.0-3Lpackage.Standard products are Pb-free and Halogen-free.

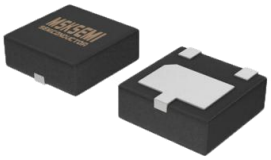
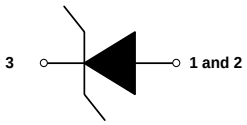
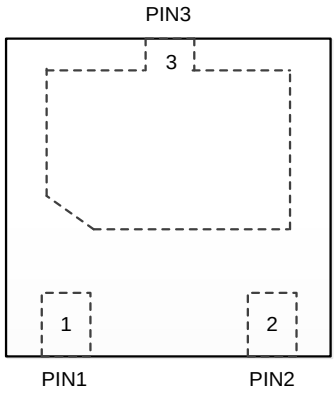
Features

- Reverse stand-offvoltage: 7.5V ~15V
- Surge protection according to IEC61000-4-5
  8/20μswaveform: I_{PPM}see Table 4
  Surge protection according to IEC61643-321
  10/1000μswaveform: I_{PPM}see Table 4
- Lowclampingvoltage
- Solid-state silicon technology

Applications

- Power supply protection
- Power management

Reference News Table 1.

PACKAGE OUTLINE	Circuit diagram	Pin configuration (Top View)
 DFN-3L(2x2)		

MSESD5641D07-3	MSESD5641D10-3	MSESD5641D12-3	MSESD5641D15-3
5641 07**	5641 10**	5641 12**	5641 15**

Order information

P/N	PKG	QTY
MSESD5641D07-3	DFN-3L(2x2)	3000
MSESD5641D10-3	DFN-3L(2x2)	3000
MSESD5641D12-3	DFN-3L(2x2)	3000
MSESD5641D15-3	DFN-3L(2x2)	3000

Absolute maximum ratings

Table 2.

Parameter	Symbol	Rating	Unit
Peak pulse power (tp=8/20μs)[1)3)]	P_{PK}	4000	W
Peak pulse power (tp=10/1000μs)[2)3)]	P_{PK}	350	W
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±30	kV
ESD according to IEC61000-4-2 contact discharge		±30	
Junction temperature	T_J	125	°C
Operating temperature	T_{OP}	-40~85	°C
Lead temperature	T_L	260	°C
Storage temperature	T_{STG}	-55~150	°C

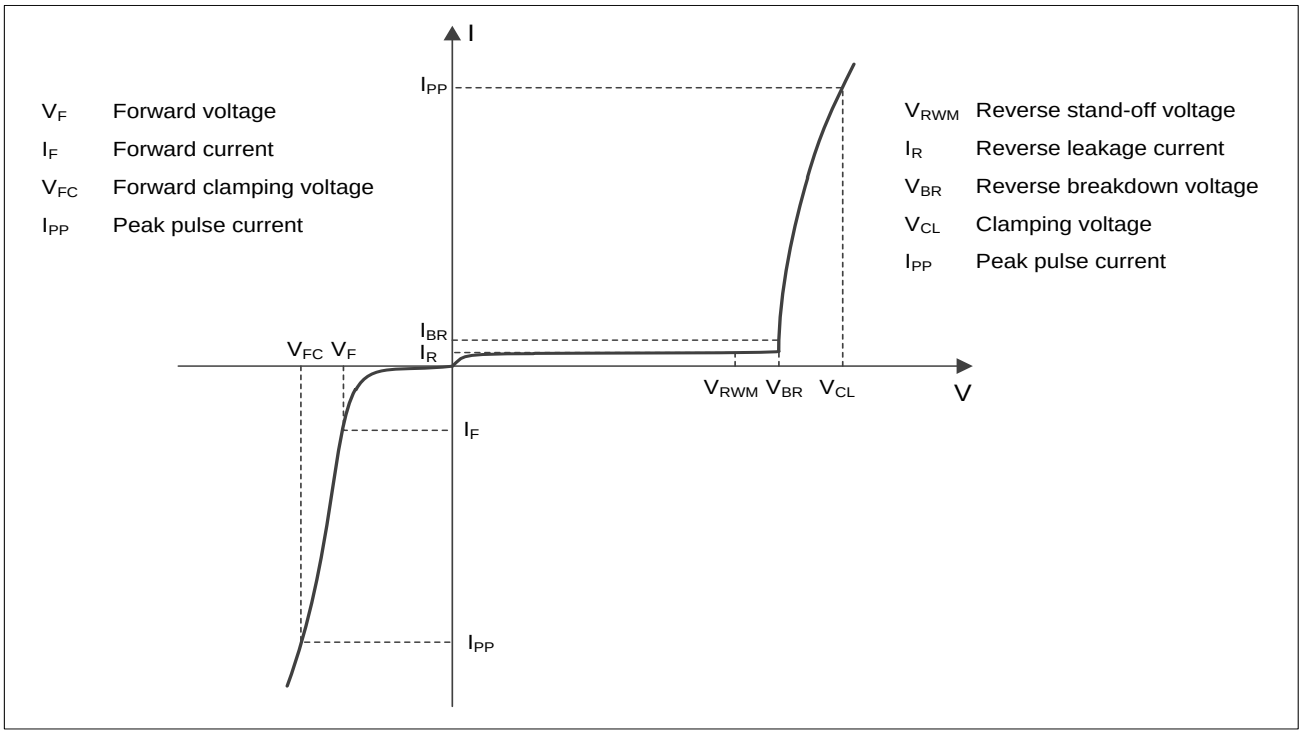
Notes:

1) Non-repetitive current pulse, according to IEC61000-4-5. （8/20μs current waveform）

2) Non-repetitive current pulse, according to IEC61643-321. （10/1000μs current waveform）

3) Measured from pin 3 topin 1 and pin 2.

Electrical characteristics (T_A = 25°C, unless otherwise noted)



Definitions of electrical characteristics

Electrical characteristics (T_A = 25°C, unless otherwise noted)

Table 3.

Type number	Reverse Standoff Voltage V_{RWM} (V)	Breakdown voltage V_{BR}(V) I_{BR} = 1mA			Reverse leakage current I_{RM}(nA) at V_{RWM}		Forward voltage V_F(V) I_F = 20mA		Junction capacitance F=1MHz, VR=0V (pF)	
	Max	Min	Typ	Max	Typ	Max	Min	Max	Typ	Max
MSESD5641D07-3	7.5	8.0	9.0	10.0	10	1000	0.45	1.25	2200	3000
MSESD5641D10-3	10.0	11.5	13.5	15.5	1	500	0.45	1.25	1500	2000
MSESD5641D12-3	12.0	13.0	15.0	17.0	1	100	0.45	1.25	1200	1800
MSESD5641D15-3	15.0	16.0	17.5	19.0	1	100	0.45	1.25	1000	1500

Table 4.

Type number	Rated peak pulse current I_{PP} （A） 1)3)	Clamping voltage V_{CL}(V) at I_{PP}（A） 1)3)	Rated peak pulse current I_{PP} （A） 2)3)	Clamping voltage V_{CL}(V) at I_{PP}（A） 2)3)
	Max	Max	Max	Max
MSESD5641D07-3	190	18	28	13
MSESD5641D10-3	170	23	22	18
MSESD5641D12-3	150	27	16	20
MSESD5641D15-3	130	30	13	25

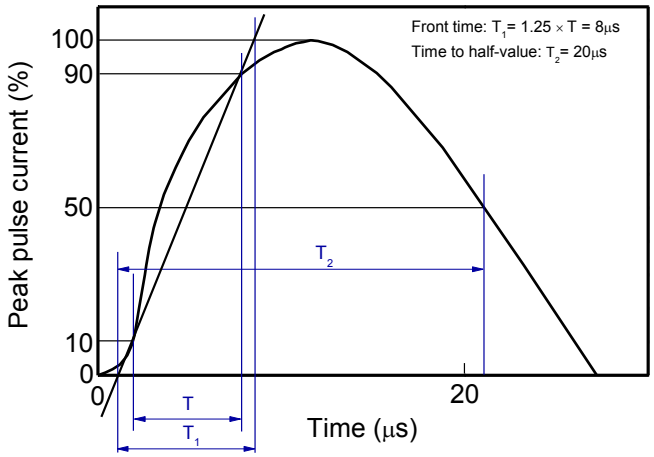
Notes:

1) Non-repetitive current pulse, according to IEC61000-4-5. (8/20μs current waveform)

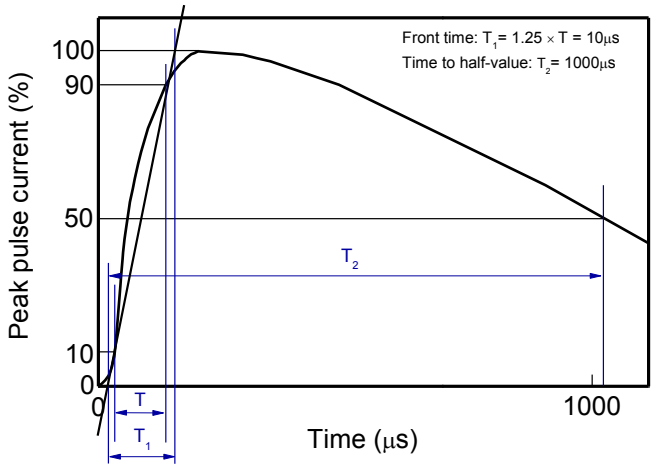
2) Non-repetitive current pulse, according to IEC61643-321. (10/1000μs current waveform)

3) Measured from pin 3 topin 1 and pin 2.

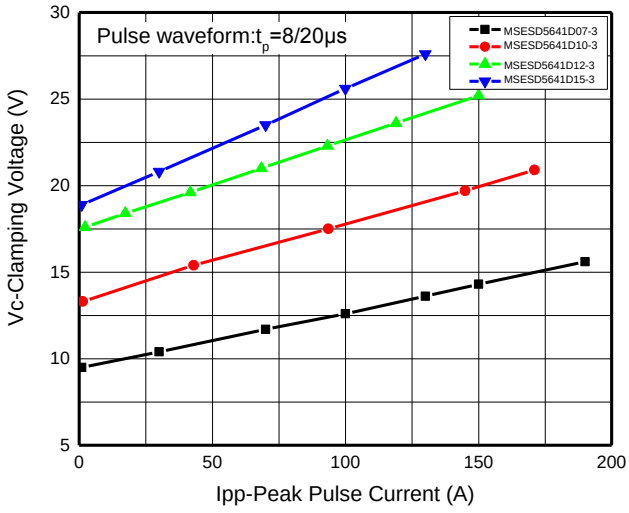
Typical characteristics (T_A = 25°C, unless otherwise noted)



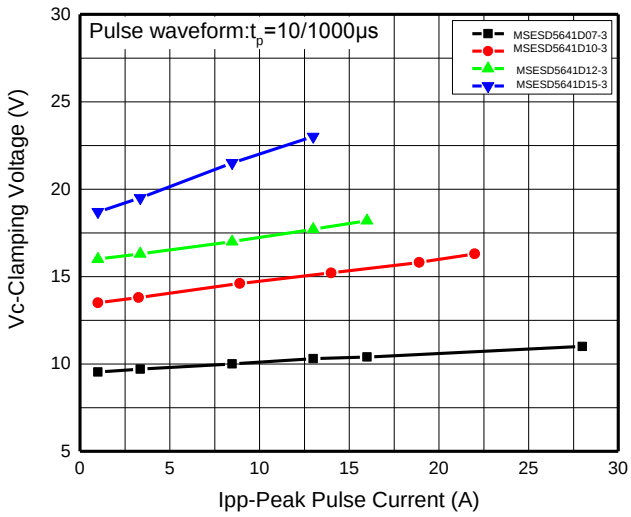
8/20μs waveform per IEC61000-4-5



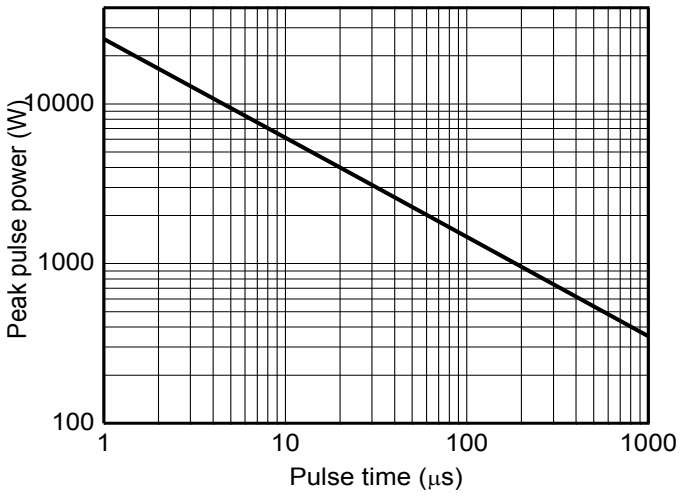
10/1000μs waveform per IEC61643-321



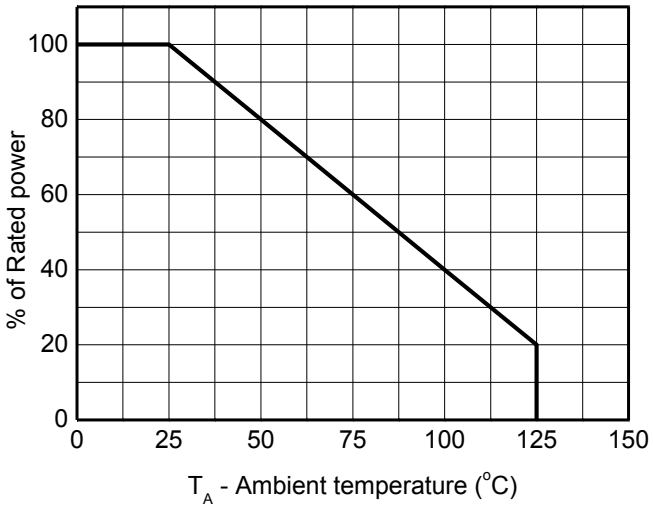
Clamping voltage vs. Peak pulse current



Clamping voltage vs. Peak pulse current



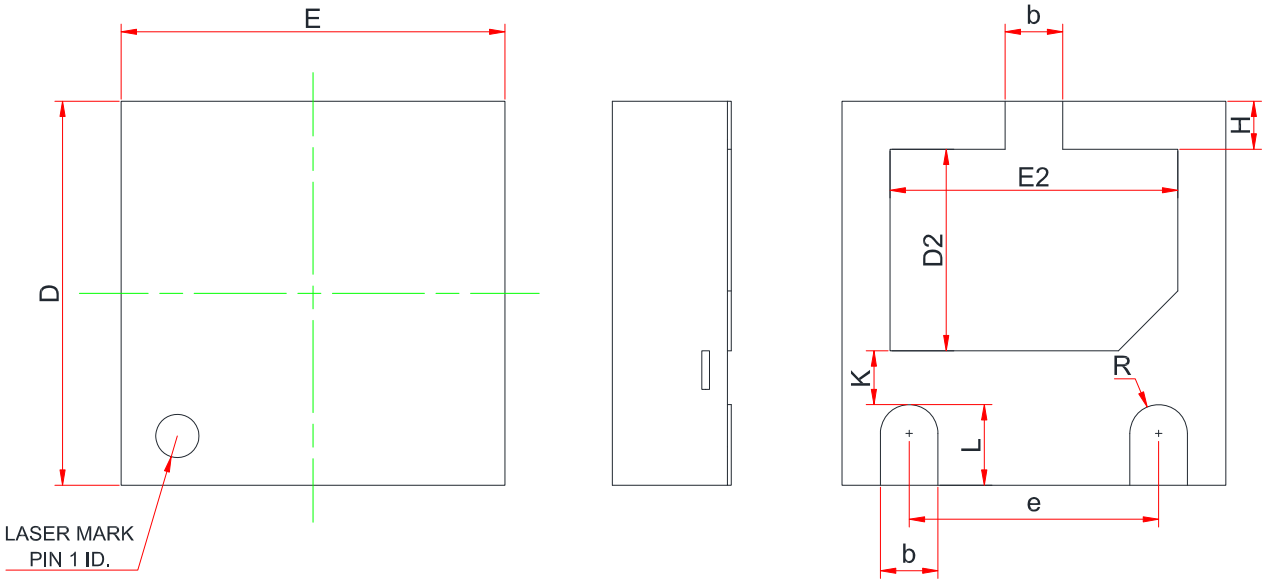
Non-repetitive peak pulse power vs. Pulse time

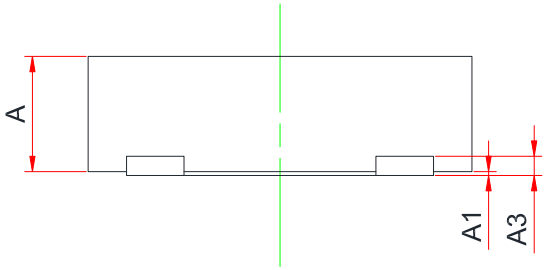


Power derating vs. Ambient temperature

Package outline dimensions

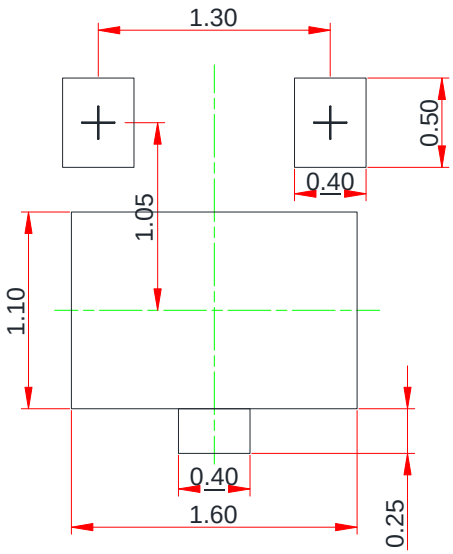
DFN-3L(2x2)





Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	0.550	0.600	0.650
A1	0.000	0.020	0.050
A3	0.100 REF.		
b	0.250	0.300	0.350
D	1.900	2.000	2.100
E	1.900	2.000	2.100
D2	0.950	1.050	1.150
E2	1.400	1.500	1.600
e	1.200	1.300	1.400
H	0.200	0.250	0.300
K	0.200	0.300	0.400
L	0.350	0.400	0.450
R	0.130	-	-

Recommended land pattern (Unit: mm)



Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.

Attention

■ Any and all MSKSEMI Semiconductor products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your MSKSEMI Semiconductor representative nearest you before using any MSKSEMI Semiconductor products described or contained herein in such applications.

■ MSKSEMI Semiconductor assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specificationsof any andall MSKSEMI Semiconductor products described orcontained herein.

■ Specifications of any and all MSKSEMI Semiconductor products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer'sproducts orequipment.

■ MSKSEMI Semiconductor. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with someprobability. It is possiblethat these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits anderror prevention circuitsfor safedesign, redundant design, and structural design.

■ In the event that any or all MSKSEMI Semiconductor products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from theauthorities concerned in accordance with the above law.

■ No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of MSKSEMI Semiconductor.

■ Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. MSKSEMI Semiconductor believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringementsof intellectual property rights or other rightsof third parties.

■ Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. Whendesigning equipment, referto the "Delivery Specification" for the MSKSEMI Semiconductor productthat you intend to use.