

# MSKSEMI

SEMICONDUCTOR



ESD



TVS



TSS



MOV

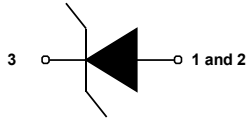


GDT



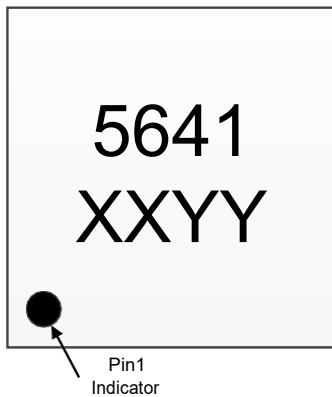
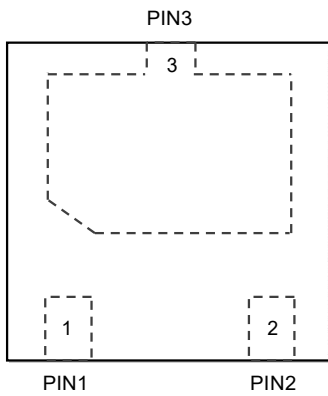
PLED

Product data sheet



**Circuit diagram**

**Pin configuration (Top View)**



**Marking**  
5641 = Series code  
XX = Device code  
YY = Date code

**Descriptions**

The MSESD5641DXX-3 is a transient voltage suppressor designed to protect power interfaces. It is suitable to replace multiple discrete components in portable electronics.

The MSESD5641DXX-3 is 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 in DFN2×2-3L package. Standard products are Pb-free and Halogen-free.

**Features**

- Reverse stand-off voltage: 7.5V ~ 15V
- Surge protection according to IEC61000-4-5  
8/20µs waveform: I<sub>PPM</sub> see Table 4
- Surge protection according to IEC61643-321  
10/1000µs waveform: I<sub>PPM</sub> see Table 4
- Low clamping voltage
- Solid-state silicon technology

**Applications**

- Power supply protection
- Power management

**Order information**

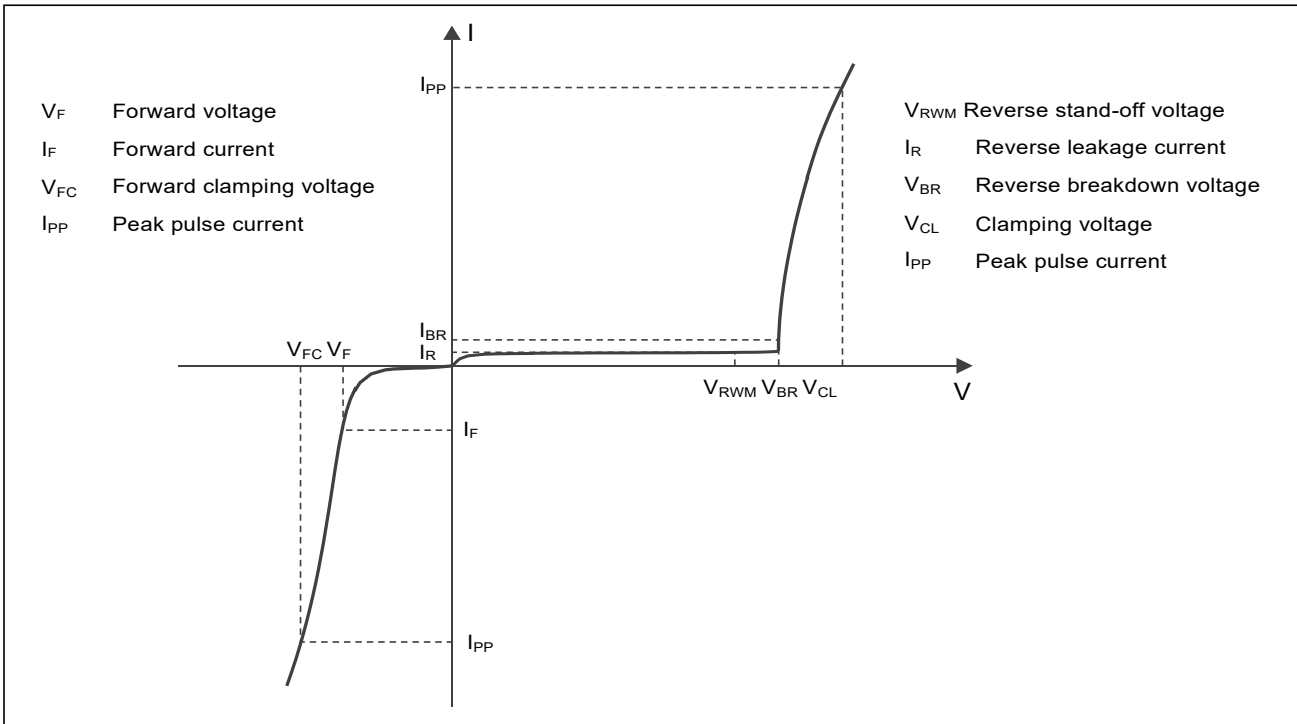
Device	Package	Shipping	Device code
MSESD5641D07-3	DFN2×2-3L	3000/Tape&Reel	07
MSESD5641D10-3	DFN2×2-3L	3000/Tape&Reel	10
MSESD5641D12-3	DFN2×2-3L	3000/Tape&Reel	12
MSESD5641D15-3	DFN2×2-3L	3000/Tape&Reel	15

Parameter	Symbol	Rating	Unit
Peak pulse power ( $t_p=8/20\mu s$ ) <sup>1)3)</sup>	$P_{PK}$	4000	W
Peak pulse power ( $t_p=10/1000\mu s$ ) <sup>2)3)</sup>	$P_{PK}$	350	W
ESD according to IEC61000-4-2 air discharge	$V_{ESD}$	$\pm 30$	kV
ESD according to IEC61000-4-2 contact discharge		$\pm 30$	
Junction temperature	$T_J$	125	$^{\circ}C$
Operating temperature	$T_{OP}$	-40~85	$^{\circ}C$
Lead temperature	$T_L$	260	$^{\circ}C$
Storage temperature	$T_{STG}$	-55~150	$^{\circ}C$

Notes:

- 1 Non-repetitive current pulse, according to IEC61000-4-5. (8/20 $\mu s$  current waveform)
- 2 Non-repetitive current pulse, according to IEC61643-321. (10/1000 $\mu s$  current waveform)
- 3 Measured from pin 3 to pin 1 and pin 2.

**Electrical characteristics ( $T_A = 25^{\circ}C$ , unless otherwise noted)**



**Definitions of electrical characteristics**

**Electrical characteristics (T<sub>A</sub> = 25°C, unless otherwise noted)**

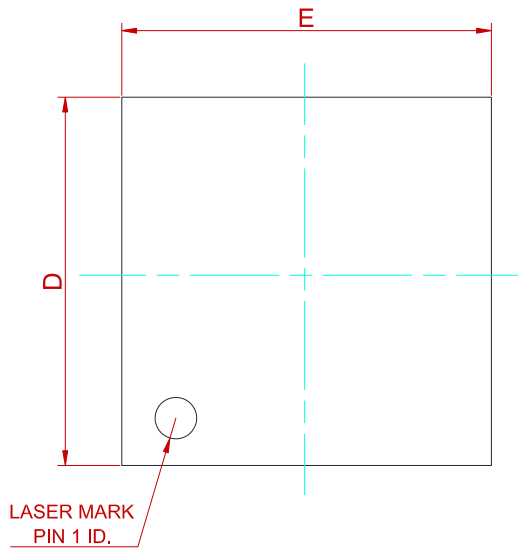
P/N	Reverse Standoff Voltage V <sub>RWM</sub> (V)	Breakdown voltage V <sub>BR</sub> (V) I <sub>BR</sub> = 1mA			Reverse leakage current I <sub>RM</sub> (nA) at V <sub>RWM</sub>		Forward voltage V <sub>F</sub> (V) I <sub>F</sub> = 20mA		Junction capacitance F=1MHz, VR=0V (pF)	
	Max	Min	Typ	Max	Typ	Max	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

P/N	Rated peak pulse current I <sub>PP</sub> (A) <sup>1)3)</sup>	Clamping voltage V <sub>CL</sub> (V) at I <sub>PP</sub> (A) <sup>1)3)</sup>	Rated peak pulse current I <sub>PP</sub> (A) <sup>2)3)</sup>	Clamping voltage V <sub>CL</sub> (V) at I <sub>PP</sub> (A) <sup>2)3)</sup>
	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

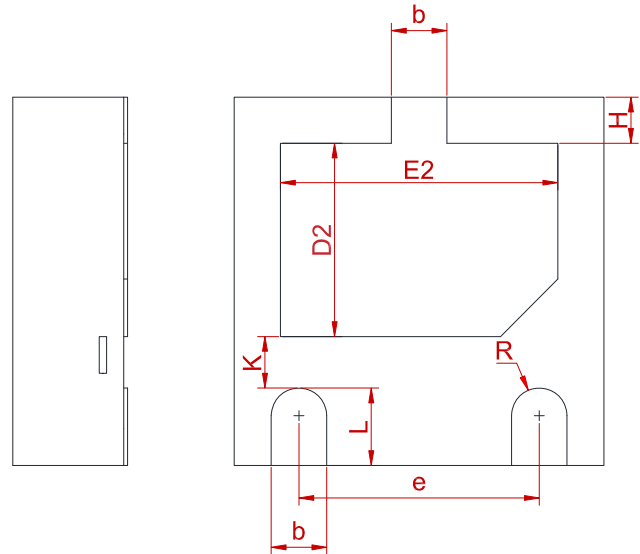
**Notes:**

- 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 to pin 1 and pin 2.

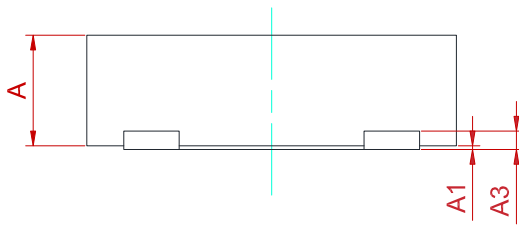
**PACKAGE MECHANICAL DATA**



**Top View**

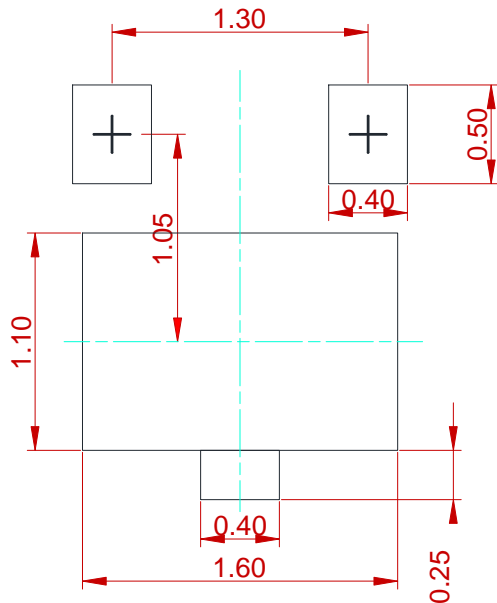


**Bottom View**



**Side View**

**Recommended land pattern (Unit: mm)**



Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	0.50	0.58	0.65
A1	0.00	0.02	0.05
A3	0.10 REF.		
b	0.25	0.30	0.35
D	1.90	2.00	2.10
E	1.90	2.00	2.10
D2	0.95	1.05	1.15
E2	1.40	1.50	1.60
e	1.20	1.30	1.40
H	0.20	0.25	0.30
K	0.20	0.30	0.40
L	0.33	0.39	0.45
R	0.13	-	-

**Notes:**

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

**REEL SPECIFICATION**

P/N	PKG	QTY
MSESD5641DXX-3	DFN2x2-3L	3000

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