ESD54191CZ

1-Line, Bi-directional, Transient Voltage Suppressors

http//:www.sh-willsemi.com

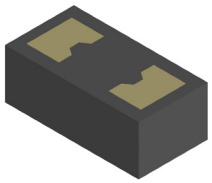
Descriptions

The ESD54191CZ is a TVS (Transient Voltage Suppressor) designed to protect high speed data interfaces. It has been specifically designed to protect sensitive electronic components which are connected to data and transmission lines from over-stress caused by ESD (Electrostatic Discharge).

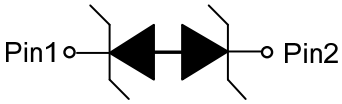
The ESD54191CZ incorporates one pair of low capacitance diodes.

The ESD54191CZ may be used to provide ESD protection up to ±30kV (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 13A (8/20μs) according to IEC61000-4-5.

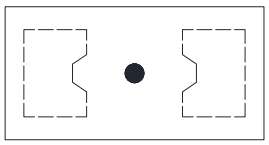
The ESD54191CZ is available in DWN0603-2L package. Standard products are Pb-free and Halogen-free.



DWN0603-2L (Bottom View)



Pin configuration



• = Device code

Marking (Top View)

Features

- Stand-off voltage: ±5.5V Max.
- Transient protection for each line according to
  IEC61000-4-2 (ESD): ±30kV (contact discharge)
  IEC61000-4-5 (surge): 13A (8/20μs)
- Low capacitance: C_J = 20pF typ.
- Low leakage current: I_R < 1nA typ.
- Low clamping voltage: V_{CL} = 9V typ. @ I_{PP} = 16A (TLP)
- Solid-state silicon technology

Applications

- Cellular handsets
- Tablets
- Laptops
- Other portable devices
- Network communication devices

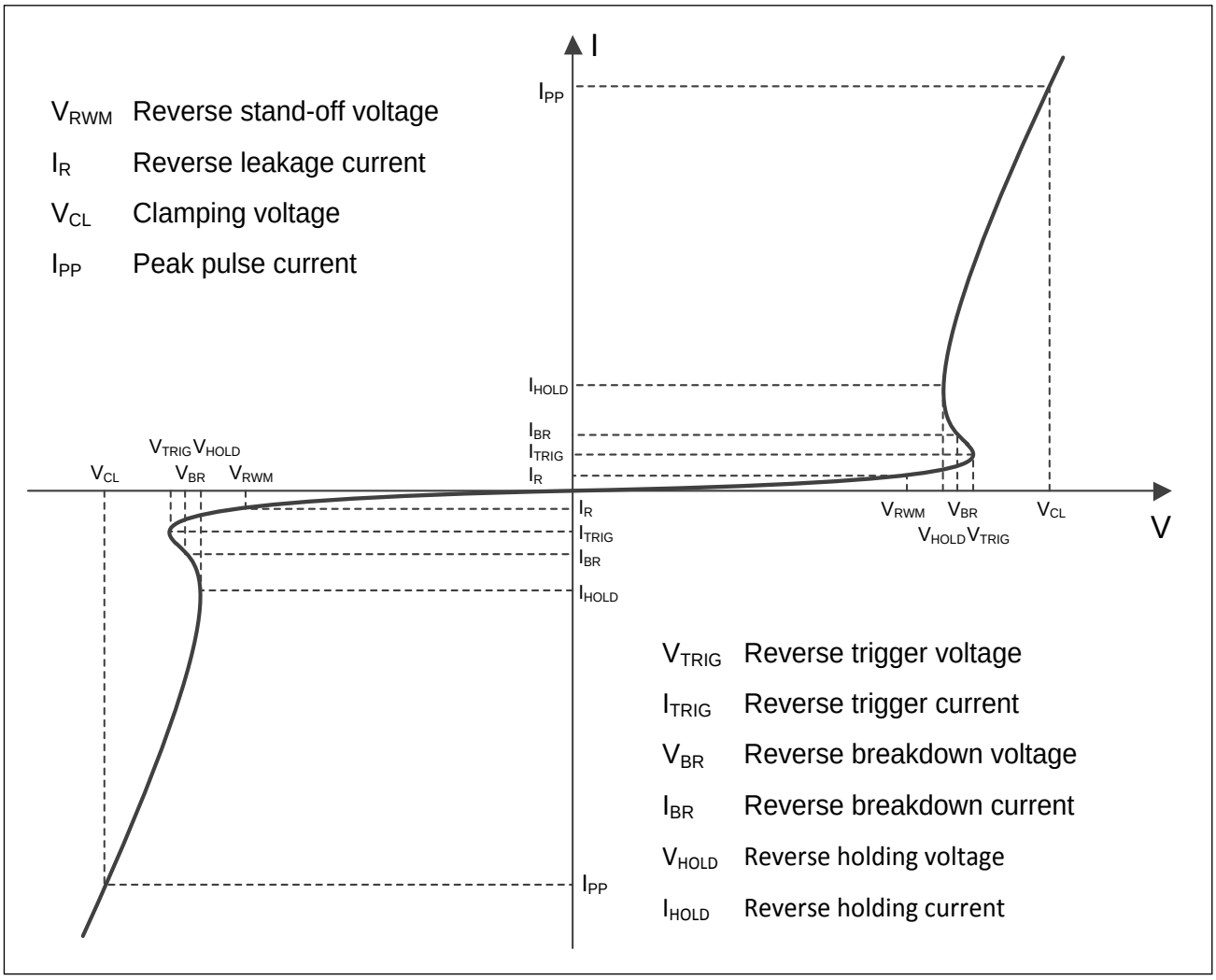
Order information

Device	Package	Shipping
ESD54191CZ-2/TR	DWN0603-2L	10000/Tape&Reel

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power (t_p = 8/20μs)	P_{pk}	182	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	13	A
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

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



Definitions of electrical characteristics

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

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse maximum working voltage	V_{RWM}				±5.5	V
Reverse leakage current	I_R	V_{RWM} = 5.5V		<1	50	nA
Reverse breakdown voltage	V_{BR}	I_T = 1mA	6.5	8.1	9.0	V
Clamping voltage *1)*	V_{CL}	I_{PP} = 16A, t_p = 100ns		9		V
Dynamic resistance *1)*	R_{DYN}			0.08		Ω
Clamping voltage *2)*	V_{CL}	V_{ESD} = 8kV		10		V
Clamping voltage *3)*	V_{CL}	I_{PP} = 1A, t_p = 8/20μs			10	V
		I_{PP} = 13A, t_p = 8/20μs			14	V
Junction capacitance	C_J	V_R = 0V, f = 1MHz		20	25	pF

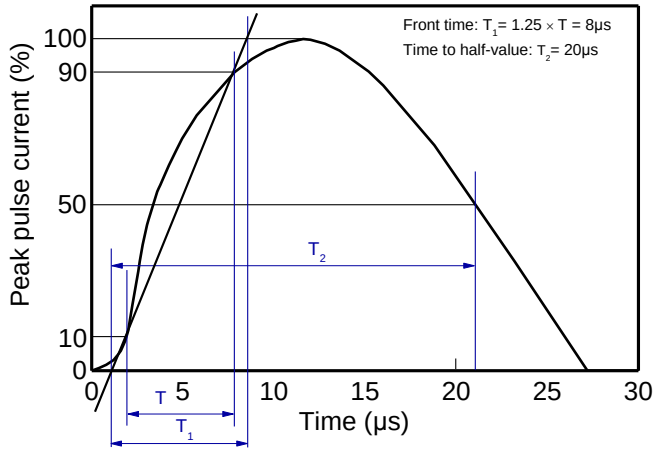
Notes:

1) TLP parameter: Z_0 = 50Ω, t_p = 100ns, t_r = 2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.

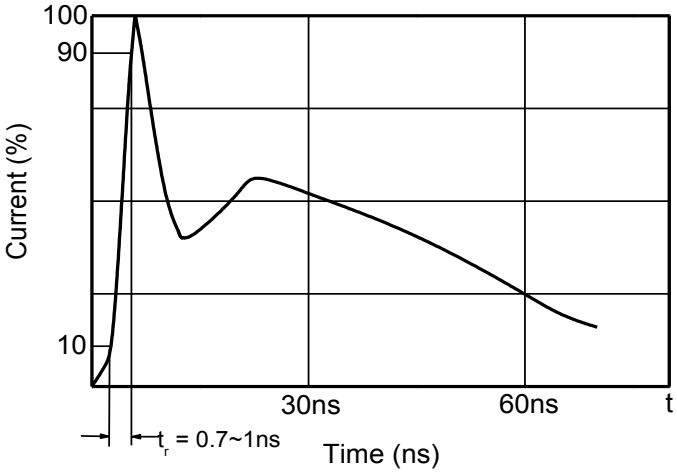
2) Contact discharge mode, according to IEC61000-4-2.

3) Non-repetitive current pulse, according to IEC61000-4-5.

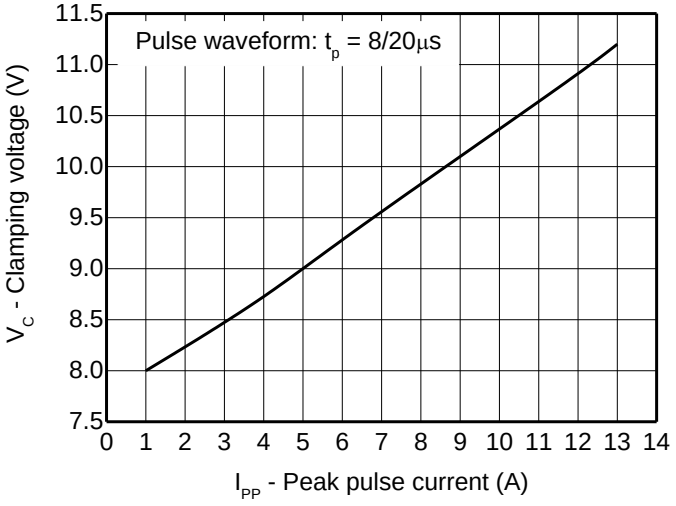
Typical characteristics (T_A=25°C, unless otherwise noted)



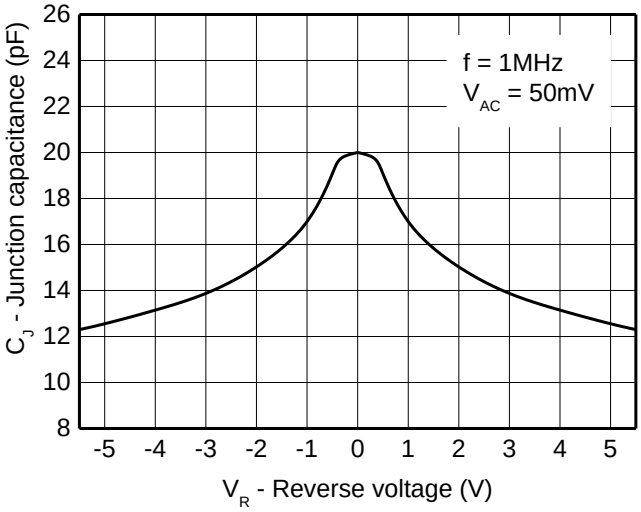
8/20μs waveform per IEC61000-4-5



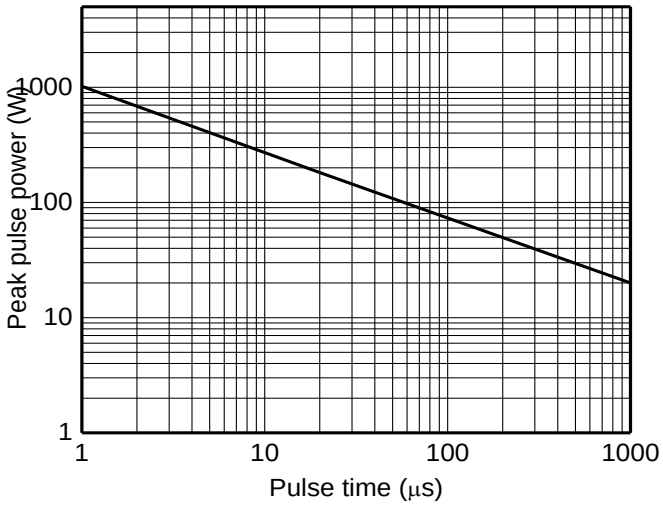
Contact discharge current waveform per IEC61000-4-2



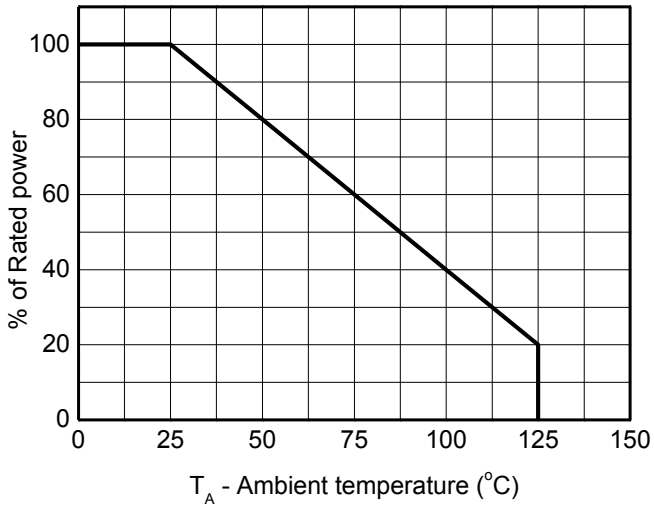
Clamping voltage vs. Peak pulse current



Capacitance vs. Reverse voltage

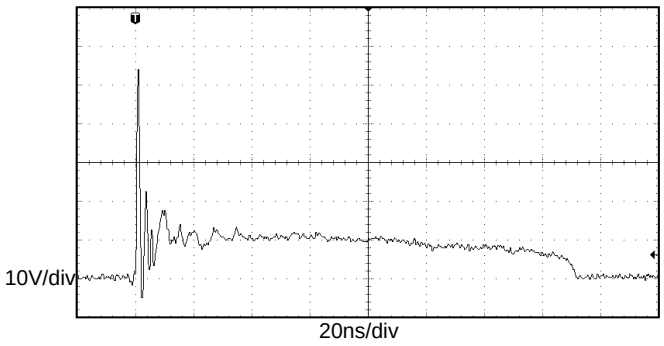


Non-repetitive peak pulse power vs. Pulse time

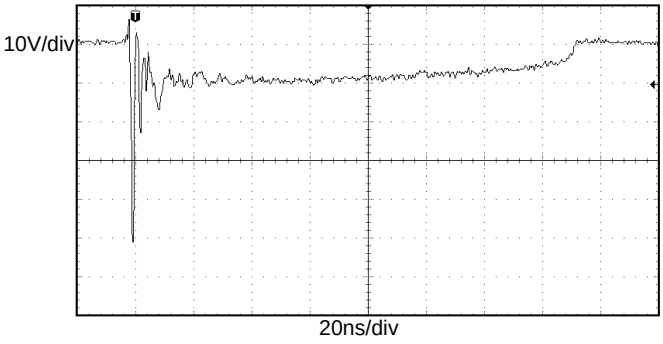


Power derating vs. Ambient temperature

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



ESD clamping
(+8kV contact discharge per IEC61000-4-2)



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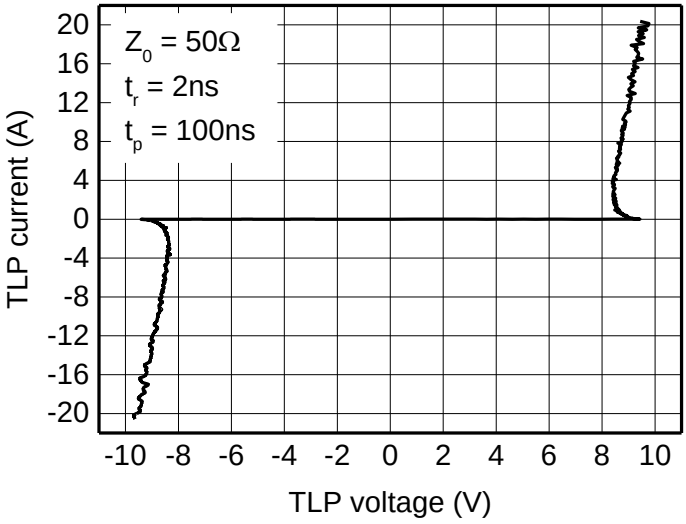
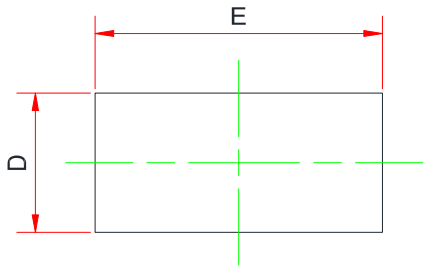


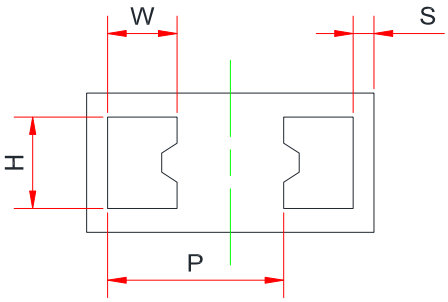
TLP Measurement

PACKAGE OUTLINE DIMENSIONS

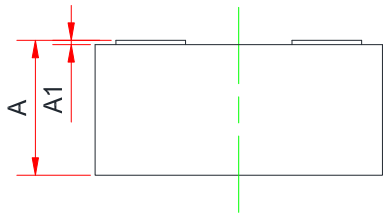
DWN0603-2L



Top View



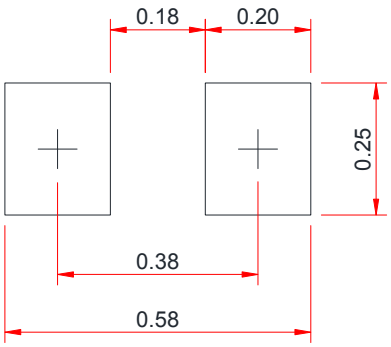
Bottom View



Side View

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.268	0.310	0.352
A1	0.000	-	0.005
D	0.290	0.320	0.350
E	0.590	0.620	0.650
W	0.150 Ref.		
H	0.210 Ref.		
S	0.045 Ref.		
P	0.380 Ref.		

Recommend land pattern (Unit: mm)

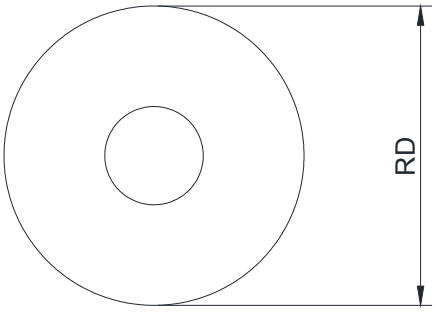


Notes:

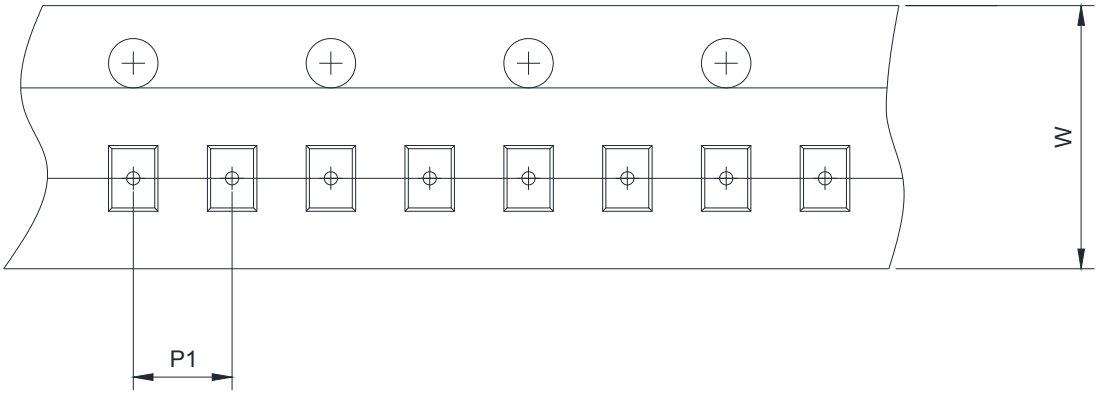
This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.

TAPE AND REEL INFORMATION

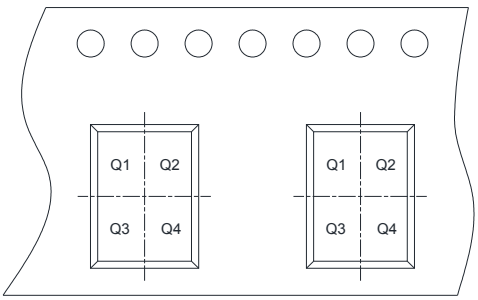
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



User Direction of Feed

RD	Reel Dimension	☑ 7inch	☐ 13inch		
W	Overall width of the carrier tape	☑ 8mm	☐ 12mm		
P1	Pitch between successive cavity centers	☑ 2mm	☐ 4mm	☐ 8mm	
Pin1	Pin1 Quadrant	☐ Q1	☐ Q2	☐ Q3	☐ Q4