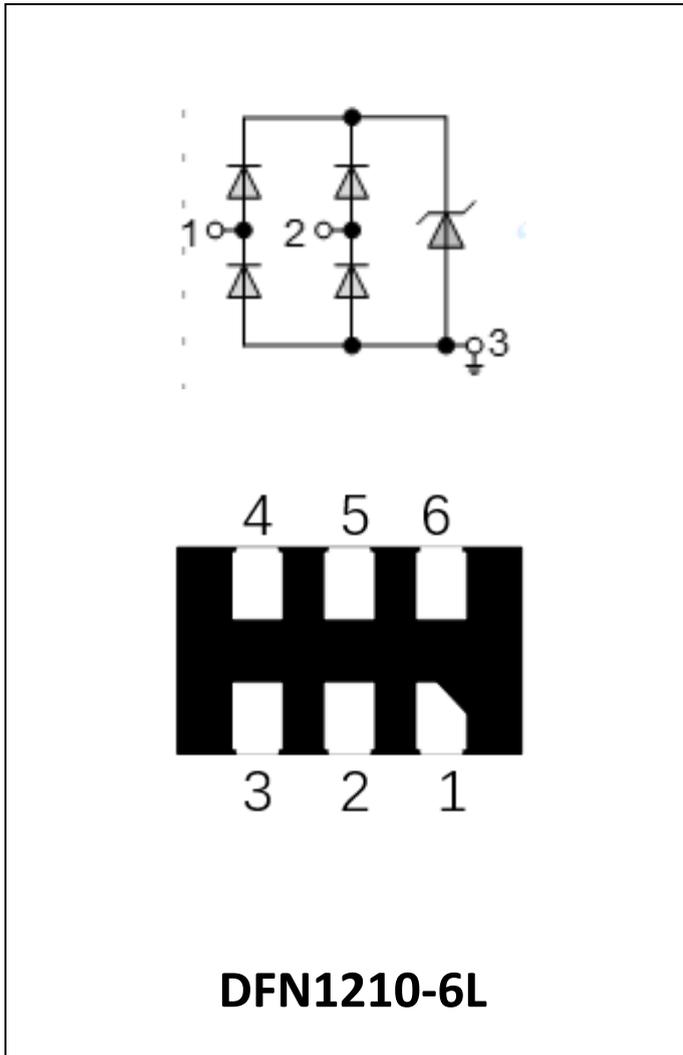


## 2-Line, Uni-directional, Ultra-low Capacitance, Transient Voltage Suppressor



### Features

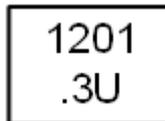
- Stand-off voltage: 3.3V Max.
- Transient protection for each line according to
  - IEC61000-4-2(ESD):  $\pm 30\text{kV}$  (contact)
  - IEC61000-4-5(surge): 8A (8/20 $\mu\text{s}$ )
- Ultra-low capacitance:  $C_j = 0.2\text{pF}$  typ.
- Ultra-low leakage current:  $I_R < 1\text{nA}$  typ.
- Low clamping voltage:  $V_{CL} = 7.0\text{V}$  typ. @  $I_{PP} = 16\text{A}$  (TLP)
- Solid-state silicon technology

### Applications

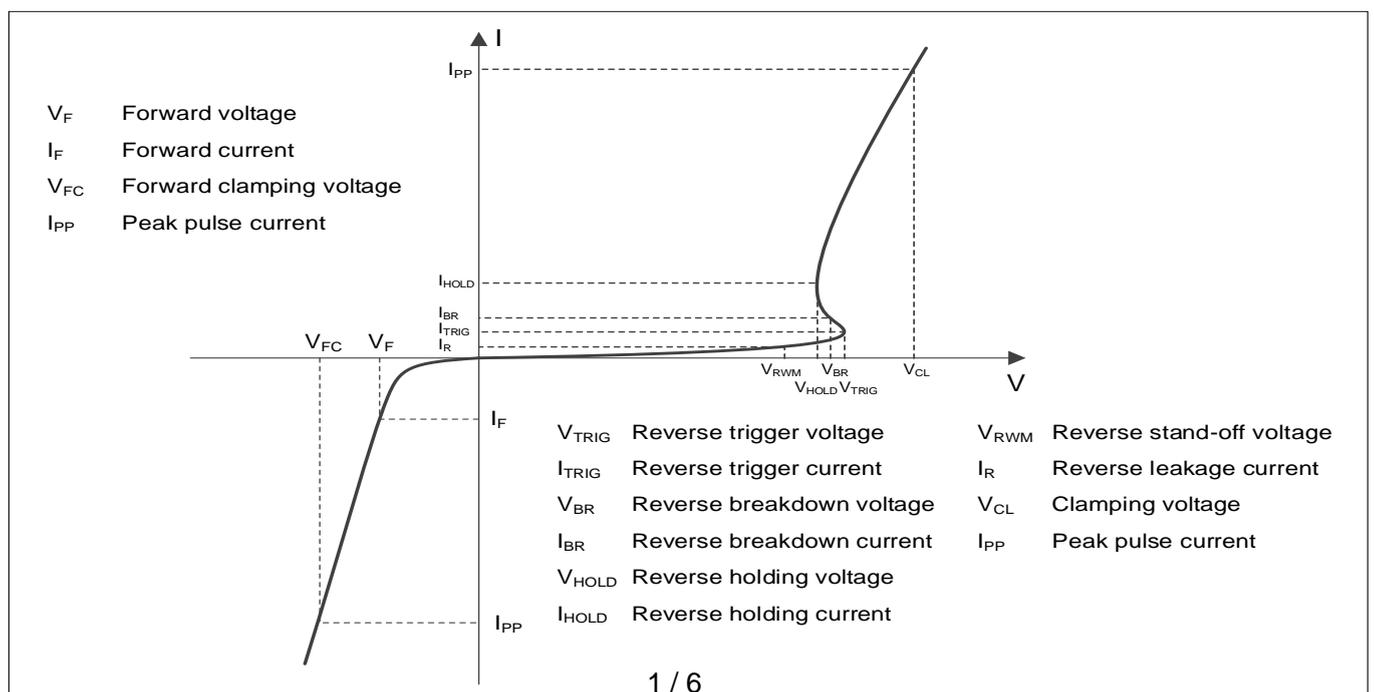
- USB 2.0 , USB 3.0 , USB 3.1 and USB type-C
- HDMI 1.3, HDMI 1.4 and HDMI 2.0
- SATA and eSATA interface
- DVI
- IEEE 1394
- Portable Electronics and Notebooks
- Ethernet port: 10/100/1000 Mb/s
- Desktop and Notebooks PCs

### Mechanical Data

- Package: DFN1210-6L
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- Moisture Sensitivity: Level 1 per J-STD-020
- Marking Information: See Below



### Definitions of electrical characteristics





# ESDULC3302P2

## ■Maximum Ratings

PARAMETER	SYMBOL	LIMITS	UNIT
Peak pulse power ( $t_p = 8/20\mu s$ )	$P_{pk}$	76	W
Peak pulse current ( $t_p = 8/20\mu s$ )	$I_{pp}$	8	A
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	$^{\circ}C$
Storage temperature	$T_{STG}$	-55~150	$^{\circ}C$

## ■Electrical Characteristics ( $T_a=25^{\circ}C$ Unless otherwise specified)

PARAMETER	Symbol	UNIT	Conditions	Min	Typ	Max
Reverse maximum working voltage	$V_{RWM}$	V				3.3
Reverse leakage current	$I_R$	nA	$V_{RWM} = 3.3V,$			100
Reverse breakdown voltage	$V_{(BR)}$	V	$I_T = 1mA,$	5		
Forward Voltage	$V_F$	V	$I_F=10mA$		0.7	
Clamping voltage <sup>1)</sup>	$V_{CL}$	V	$I_{PP} = 16A, t_p = 100ns$		9.9	
Clamping voltage <sup>2)</sup>	$V_{CL}$	V	$V_{ESD} = +8kV$		10	
Dynamic resistance <sup>1)</sup>	$R_{DYN}$	$\Omega$			0.3	
Clamping voltage	$V_{CL}$	V	$I_{PP} = 1A, t_p = 8/20\mu s$			6
		V	$I_{PP} = 8A, t_p = 8/20\mu s$			9.5
Junction capacitance	CJ	pF	$V_R = 0V, f = 1MHz$		0.2	0.27

Notes:

- (1). TLP parameter:  $Z_0 = 50\Omega, t_p = 100ns, t_r = 2ns,$  averaging window from 60ns to 80ns. RDYN 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

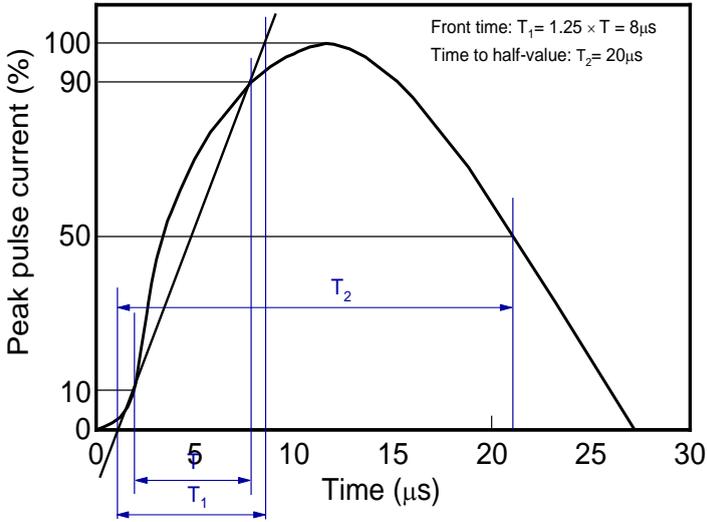
## ■Ordering Information (Example)

PREFERED P/N	PACKING CODE	UNIT WEIGHT(mg)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
ESDULC3302P2	F2	Approximate 16	3000	30000	120000	7 reel

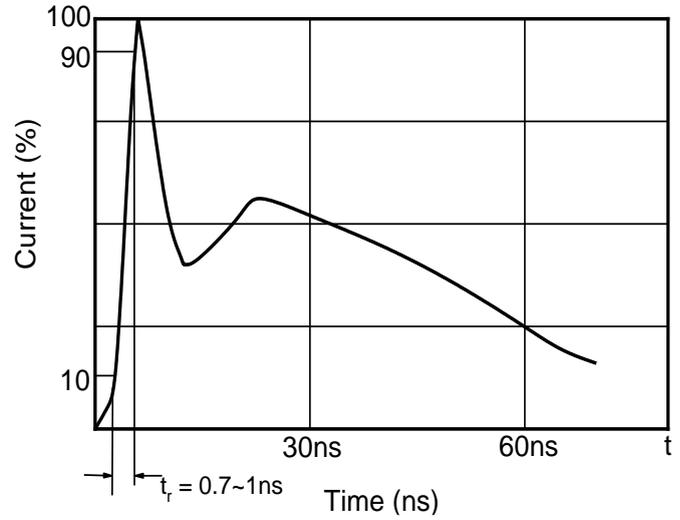


## ■ Characteristics (Typical)

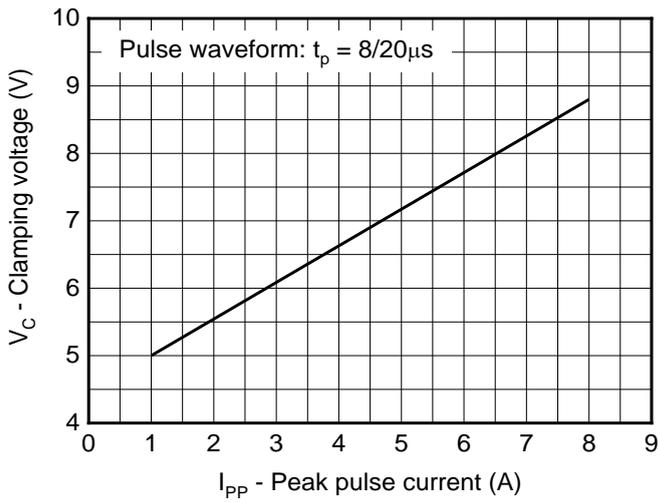
### 8/20μs waveform per IEC61000-4-5



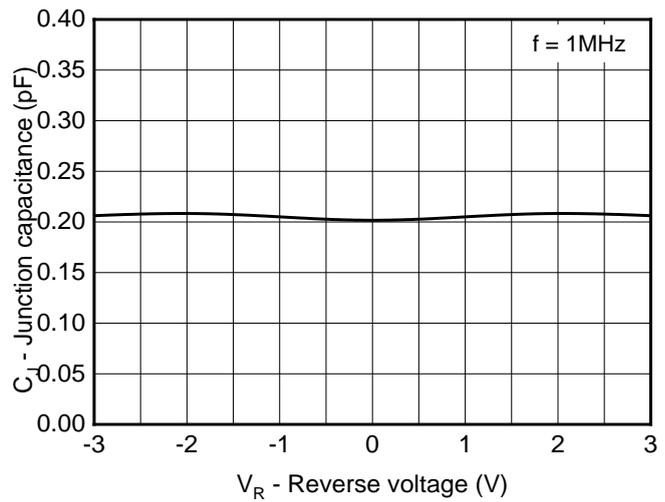
### Contact discharge current waveform per IEC61000-4-2



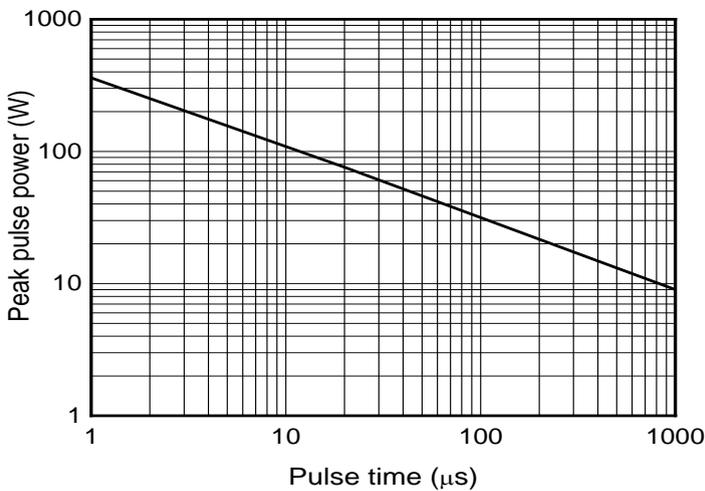
### Clamping voltage vs. Peak pulse current



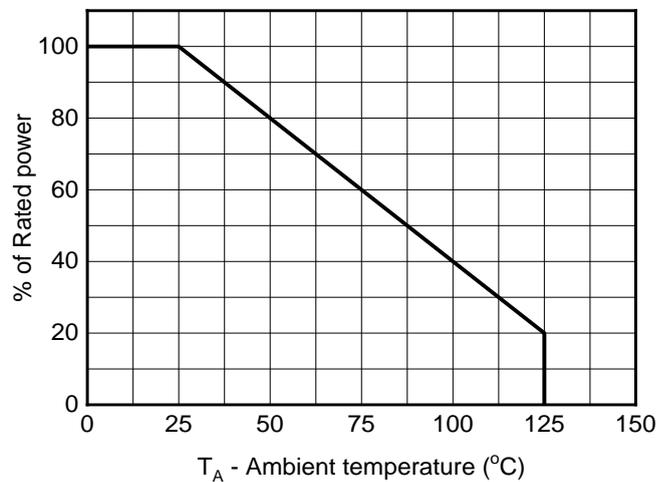
### Capacitance vs. Reverse voltage



### Non-repetitive peak pulse power vs. Pulse time

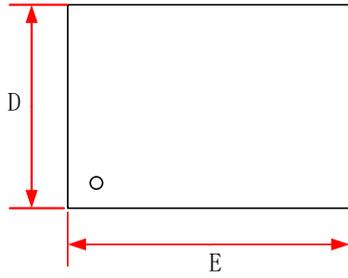


### Power derating vs. Ambient temperature

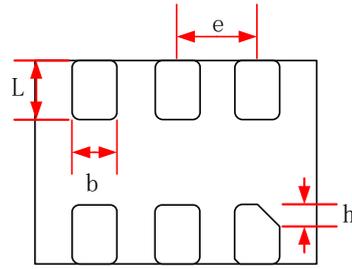




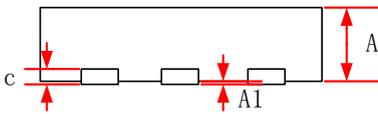
## ■ Outline Dimensions



**Top View**



**Bottom View**



**Side View**

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.45	0.50	0.55
A1	0.00	0.02	0.05
c	0.152 Ref.		
D	0.95	1.00	1.05
E	1.15	1.20	1.25
b	0.15	0.20	0.25
L	0.34	0.38	0.42
e	0.40 BSC		



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