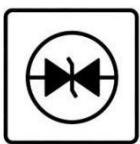




ESD



TVS



TSS



MOV



GDT



PLED

**MSESD56201D04**  
Product specification

## Features

- 2-pin lead-less package
- Junction capacitance (Max value: 650pF)
- Peak Pulse Current (8/20μs) Max: 135A
- IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact)
- Low clamping voltage
- Low leakage current
- Working voltages:4.5V
- RoHS Compliant

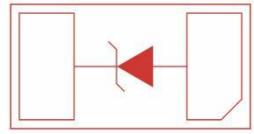
## Mechanical Characteristics

- Package: DFN1610-2L
- Lead Finish:Matte Tin
- Case Material: "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020

## Applications

- Mobile Phone, Digital cameras
- Battery Protection
- Power Line Protection
- Vbat pin for Mobile Devices
- Hand Held Portable Applications
- PCI xpress and Serial

## Reference News

DFN1610-2L	Graphic symbol	Marking
		

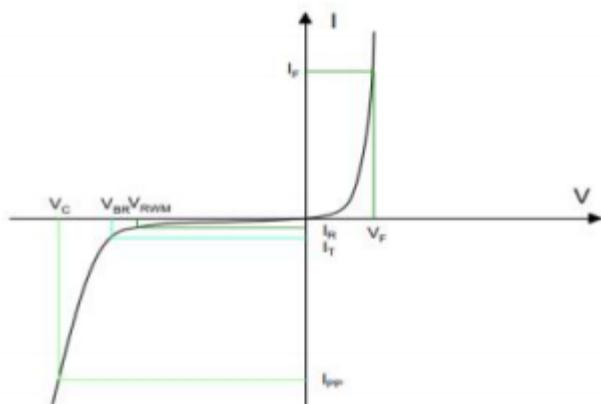
**Absolute Maximum Ratings (T=25°C, RH=45%-75%, unless otherwise noted)**

Parameters	Symbol	Value	Unit
Peak Pulse Power (tp=8/20μs waveform)	P <sub>PP</sub>	2700	W
Peak Pulse Current (8/20μs)	I <sub>PP</sub>	135	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V <sub>ESD</sub>	±30 ±30	kV
Operating Temperature Range	T <sub>J</sub>	-55 to +125	°C
Storage Temperature Range	T <sub>Stg</sub>	-55 to +150	°C

**Electrical Characteristics (T=25°C, RH=45%-75%, unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V <sub>RWM</sub>				4.5	V
Reverse Breakdown Voltage	V <sub>BR</sub>	I <sub>R</sub> = 1mA	4.8		7	V
Reverse Leakage Current	I <sub>R</sub>	V <sub>R</sub> = 4.5V			0.2	uA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 1A, T <sub>P</sub> =8/20us			8	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 135A, T <sub>P</sub> =8/20us			20	V
Junction Capacitance	C <sub>J</sub>	V <sub>R</sub> =0V, f=1MHz			650	pF

Symbol	Parameter
V <sub>RWM</sub>	Peak Reverse Working Voltage
I <sub>R</sub>	Reverse Leakage Current @V <sub>RWM</sub>
V <sub>BR</sub>	Breakdown Voltage @I <sub>T</sub>
I <sub>T</sub>	Test Current
I <sub>PP</sub>	Maximum Reverse Peak Pulse Current
V <sub>C</sub>	Clamping Voltage @I <sub>PP</sub>
P <sub>PP</sub>	Peak Pulse Power
C <sub>J</sub>	Junction Capacitance
I <sub>F</sub>	Forward Current
V <sub>F</sub>	Forward Voltage @I <sub>F</sub>



## Typical Characteristics

FIG1: Power rating derating curve

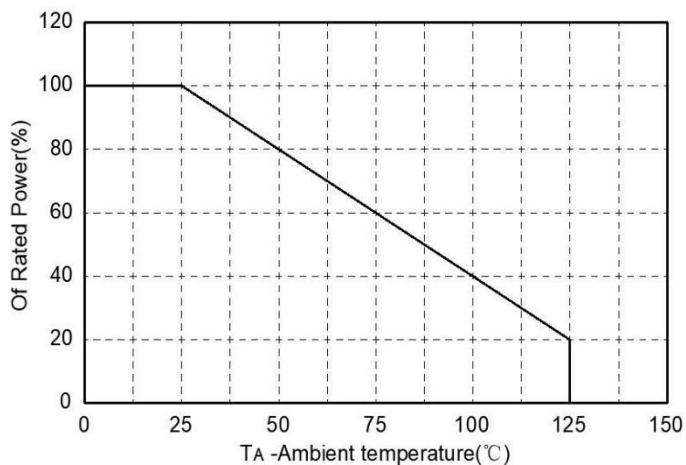


FIG2: pulse Waveform

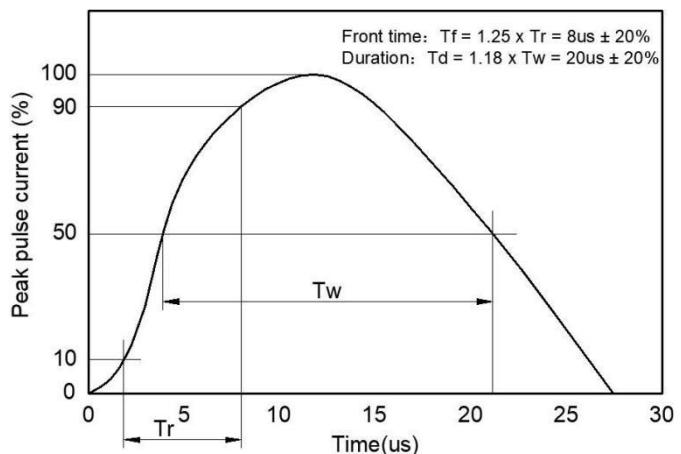


FIG3: Capacitance between terminals characteristics

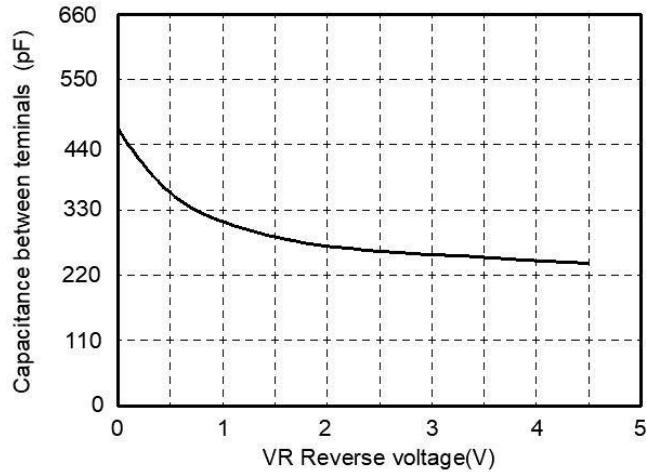
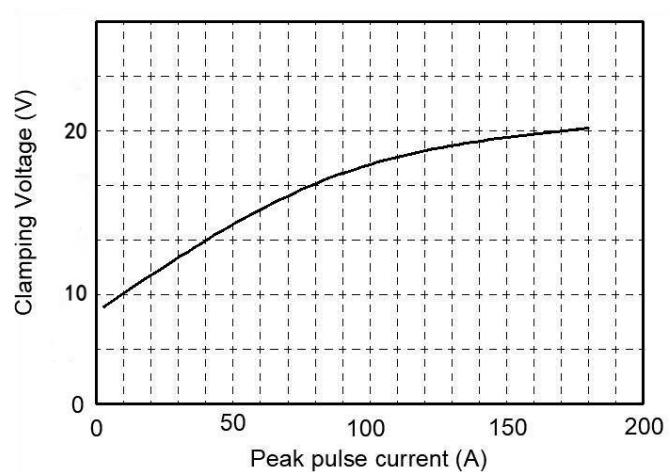
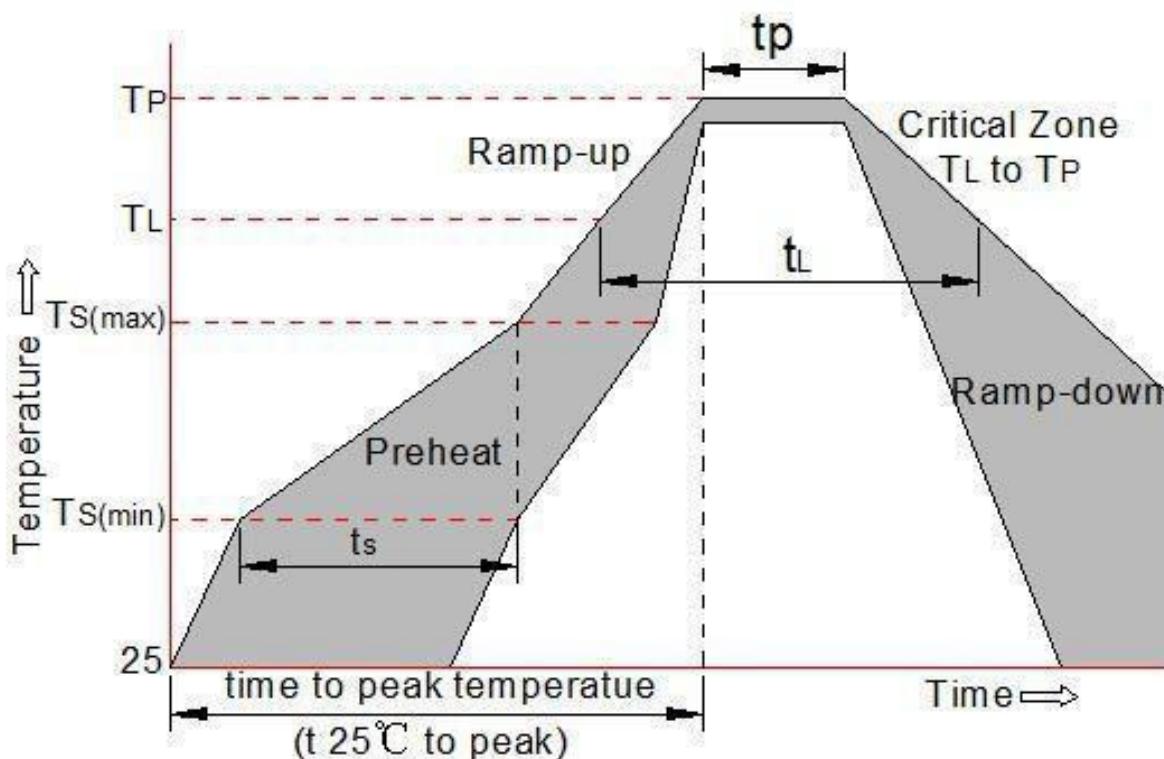


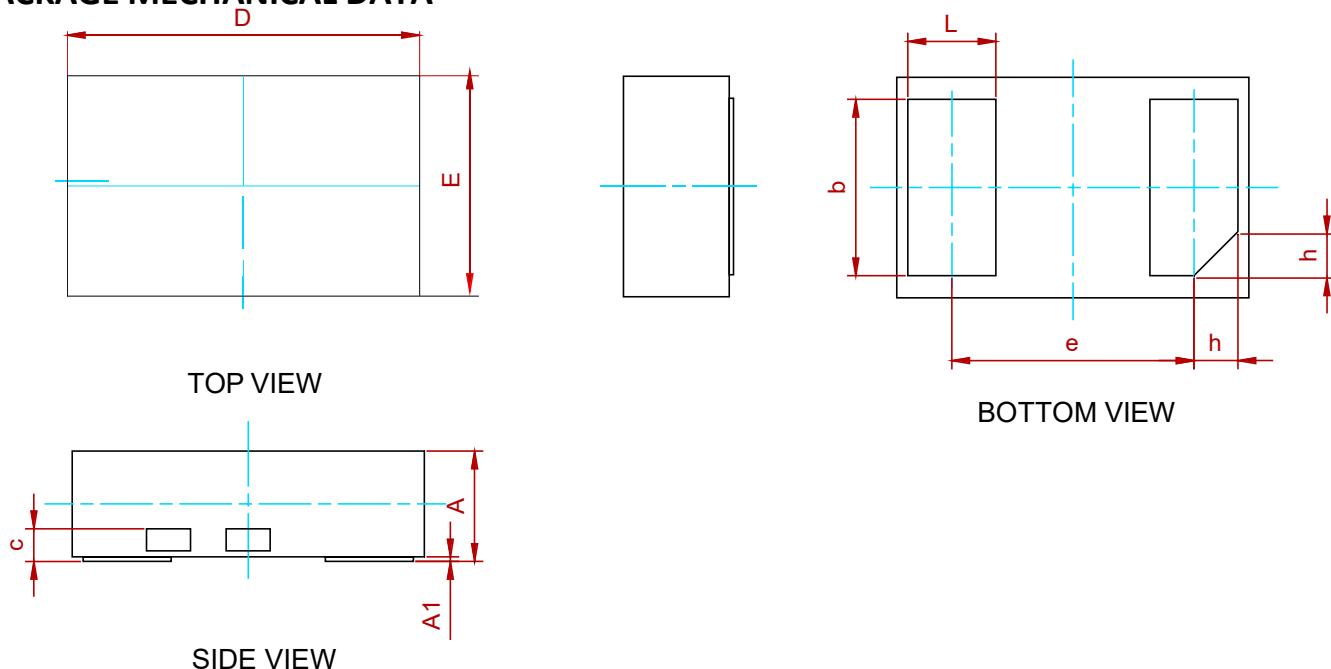
FIG4: Clamping Voltage vs. Peak Pulse Current



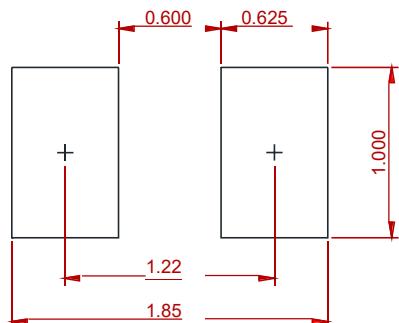
## Soldering Parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	+150°C
	-Temperature Max( $T_{s(max)}$ )	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp ( $T_L$ ) to peak)		3°C/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature( $T_L$ ) (Liquid us)	+217°C
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_p$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp ( $T_p$ )		8 min. Max
Do not exceed		+260°C



**PACKAGE MECHANICAL DATA**


Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.45	0.50	0.60
A1	0.00	0.02	0.05
c	0.15 Ref.		
b	0.75	0.80	0.95
L	0.35	0.40	0.45
D	1.55	1.60	1.70
E	0.95	1.00	1.10
e	1.10 BSC		
h	0.20 Ref.		

**Recommend PCB Layout (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.

**REEL SPECIFICATION**

P/N	PKG	QTY
MSESD56201D04	DFN1610-2L	3000

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