



## DWOS1213NLA ESD Protection Diode

### Feature

- Uni-directional ESD protection of one line
- 5700Watts peak pulse power ( $t_p = 8/20\mu s$ )
- Working voltage: 12V
- Junction Capacitance: 1500pF(Typ)
- Low clamping voltage
- Low leakage current
- IEC 61000-4-2  $\pm 30kV$  contact  $\pm 30kV$  air
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 190A (8/20 $\mu s$ )

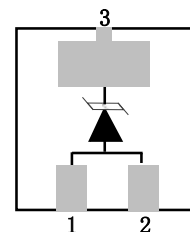
### Application

- Cellular Handsets
- Portable Electronics
- Computers and Peripheral

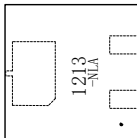
### Mechanical Data

- Package: DFN2020-3L
- Molding compound flammability rating: UL 94V-0
- RoHS/WEEE Compliant

### Schematic & PIN Configuration



### Ordering Information

| Part Number | Package    | Marking                                                                             | Packing          | Reel Size |
|-------------|------------|-------------------------------------------------------------------------------------|------------------|-----------|
| DWOS1213NLA | DFN2020-3L |  | 3000 Tape & Reel | 7 inches  |



## Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter                                                      | Symbol    | Value                | Units              |
|----------------------------------------------------------------|-----------|----------------------|--------------------|
| Peak Pulse Power ( $t_p = 8/20\mu\text{s}$ )                   | $P_{PP}$  | 5700                 | Watts              |
| Peak Pulse Current ( $t_p = 8/20\mu\text{s}$ ) (note1)         | $I_{pp}$  | 190                  | A                  |
| ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | $V_{ESD}$ | $\pm 30$<br>$\pm 30$ | kV                 |
| Lead Soldering Temperature                                     | $T_L$     | 260 (10seconds)      | $^{\circ}\text{C}$ |
| Junction Temperature                                           | $T_J$     | -55 to + 125         | $^{\circ}\text{C}$ |
| Storage Temperature                                            | $T_{stg}$ | -55 to + 125         | $^{\circ}\text{C}$ |

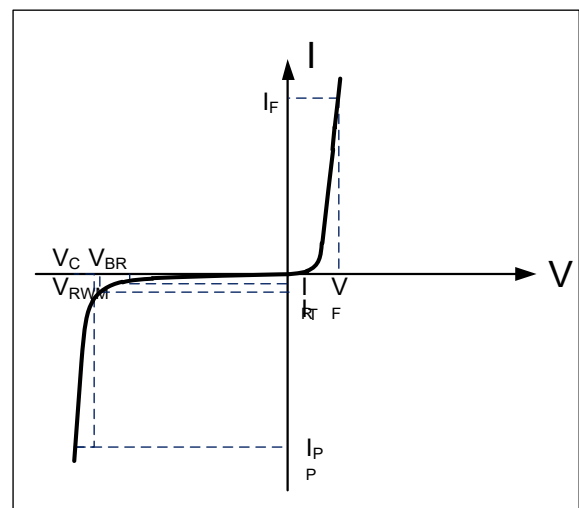
## Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter                 | Symbol    | Conditions                                 | Min  | Typical | Max  | Units         |
|---------------------------|-----------|--------------------------------------------|------|---------|------|---------------|
| Reverse Stand-Off Voltage | $V_{RWM}$ |                                            |      |         | 12.0 | V             |
| Reverse Breakdown Voltage | $V_{BR}$  | $I_T=1\text{mA}$                           | 12.8 |         |      | V             |
| Reverse Leakage Current   | $I_R$     | $V_{RWM}=12\text{V}, T=25^{\circ}\text{C}$ |      |         | 1.0  | $\mu\text{A}$ |
| Peak Pulse Current        | $I_{PP}$  | $t_p = 8/20\mu\text{s}$                    |      | 190     |      | A             |
| Clamping Voltage          | $V_C$     | $I_{PP}=190\text{A}, t_p=8/20\mu\text{s}$  |      | 30      |      | V             |
| Junction Capacitance      | $C_J$     | $V_R = 0\text{V}, f = 1\text{MHz}$         |      | 1500    |      | pF            |

## Electrical Parameters

| Symbol    | Parameter                                   |
|-----------|---------------------------------------------|
| $I_{PP}$  | Maximum Reverse Peak Pulse Current          |
| $V_C$     | Clamping Voltage @ $I_{PP}$                 |
| $V_{RWM}$ | Working Peak Reverse Voltage                |
| $I_R$     | Maximum Reverse Leakage Current @ $V_{RWM}$ |
| $V_{BR}$  | Breakdown Voltage @ $I_T$                   |
| $I_T$     | Test Current                                |

Note.: 8/20 $\mu\text{s}$  pulse waveform.





## Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

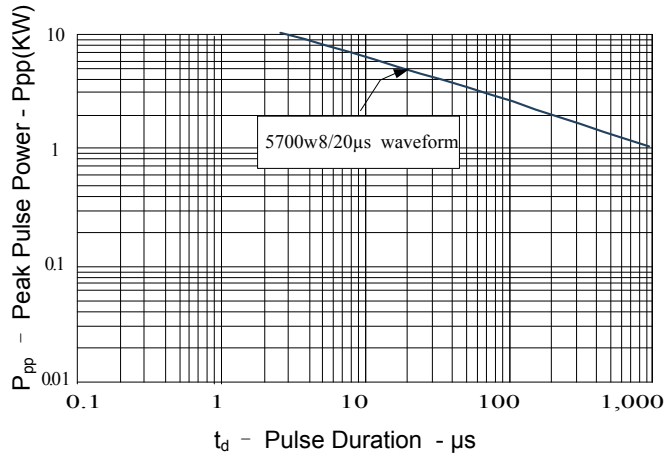


Figure 2: Power Derating Curve

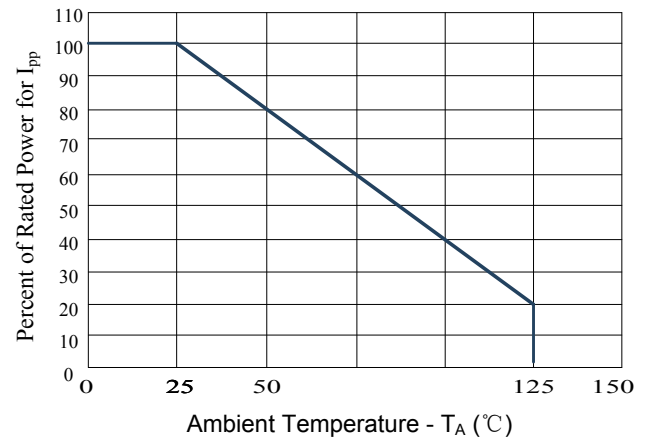


Figure3: Pulse Waveform

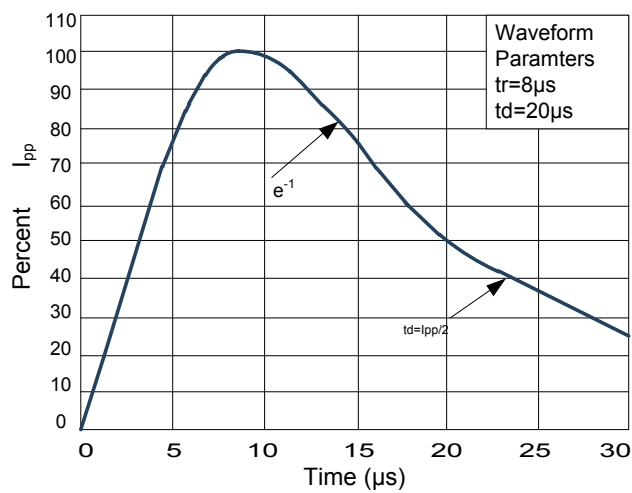
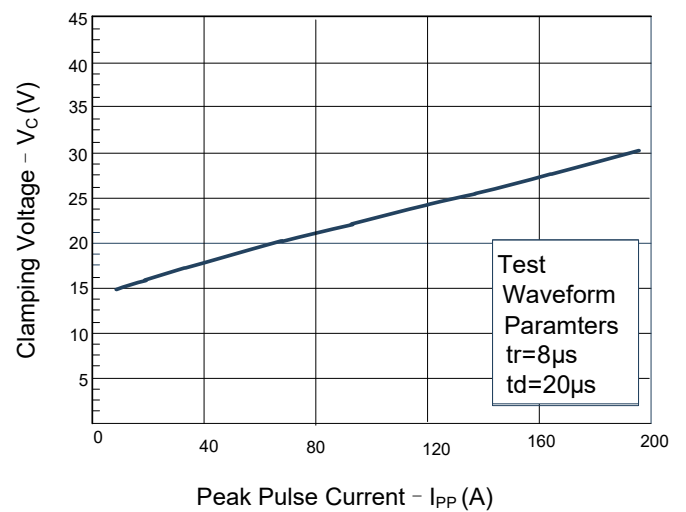
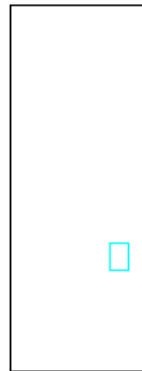
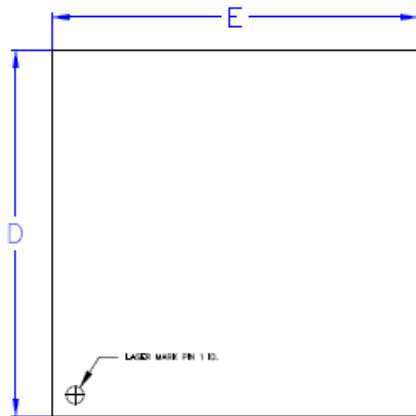


Figure 4: Clamping Voltage vs. Ipp

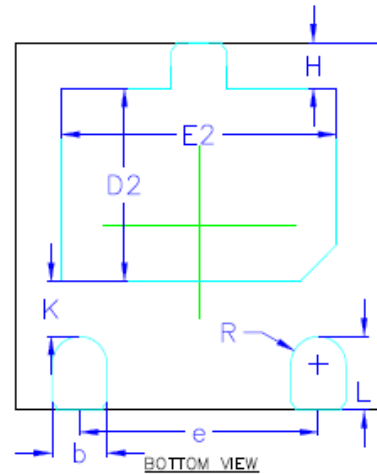




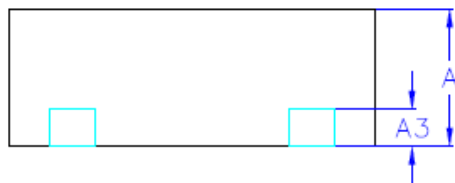
## DFN2020-3L Outline Drawing



SIDE VIEW



BOTTOM VIEW



SIDE VIEW

| COMMON DIMENSION (MM) |           |       |       |
|-----------------------|-----------|-------|-------|
| PKG                   | DFN2020   |       |       |
| REF.                  | MIN.      | NOM.  | MAX.  |
| A                     | 0.527     | 0.552 | 0.577 |
| A3                    | 0.127 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                     | 0.35      | 0.40  | 0.45  |
| R1                    | 0.13      | —     | —     |