

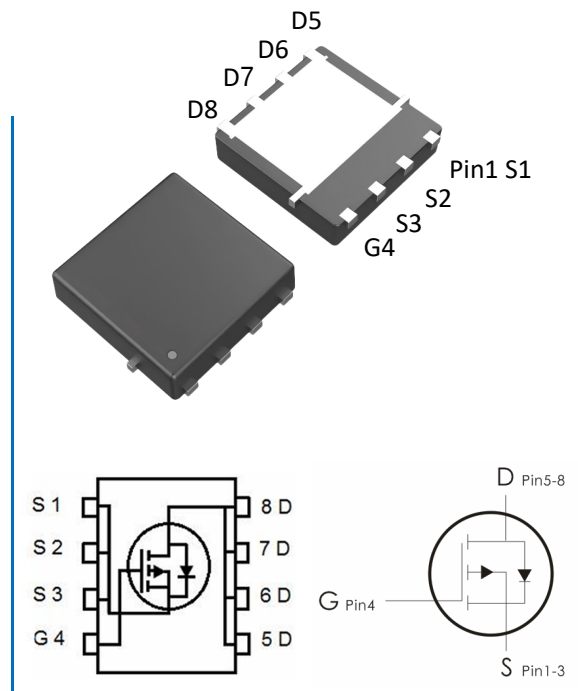
## Description:

This P-Channel MOSFET uses advanced trench technology and design to provide excellent  $R_{DS(on)}$  with low gate charge.

It can be used in a wide variety of applications.

## Features:

- 1)  $V_{DS}=-20V, I_D=-40A, R_{DS(on)}<8m\Omega @V_{GS}=-4.5V$  (Typ:  $6m\Omega$ )
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low  $R_{DS(on)}$ .
- 5) Excellent package for good heat dissipation.
- 6) MSL3



## Package Marking and Ordering Information:

| Part NO.  | Marking | Package  | Packing       |
|-----------|---------|----------|---------------|
| ZB008PG-B | B008P-B | DFN3*3-8 | 5000 pcs/Reel |

## Absolute Maximum Ratings: ( $T_c=25^\circ\text{C}$ unless otherwise noted)

| Symbol         | Parameter                                                      | Ratings  | Units            |
|----------------|----------------------------------------------------------------|----------|------------------|
| $V_{DS}$       | Drain-Source Voltage                                           | -20      | V                |
| $V_{GS}$       | Gate-Source Voltage                                            | $\pm 12$ | V                |
| $I_D$          | Continuous Drain Current <sup>1</sup>                          | -40      | A                |
|                | Continuous Drain Current- $T_c=100^\circ\text{C}$ <sup>1</sup> | -28      |                  |
| $I_{DM}$       | Pulsed Drain Current <sup>2</sup>                              | -160     |                  |
| $P_D$          | Power Dissipation                                              | 42       | W                |
| $E_{AS}$       | Single pulse avalanche energy <sup>3</sup>                     | 43       | mJ               |
| $T_J, T_{STG}$ | Operating and Storage Junction Temperature Range               | -55-+150 | $^\circ\text{C}$ |

## Thermal Characteristics:

| Symbol          | Parameter                            | Max | Units                     |
|-----------------|--------------------------------------|-----|---------------------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 3   | $^\circ\text{C}/\text{W}$ |

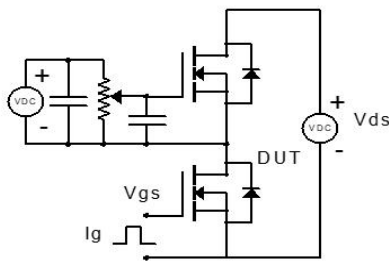
**Electrical Characteristics:** ( $T_c=25^{\circ}\text{C}$  unless otherwise noted)

| Symbol                             | Parameter                               | Conditions                                                                                     | Min  | Typ  | Max   | Units |
|------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------------------|------|------|-------|-------|
| Off Characteristics                |                                         |                                                                                                |      |      |       |       |
| BV <sub>DSS</sub>                  | Drain-Source Breakdown Voltage          | V <sub>GS</sub> =0V, I <sub>D</sub> =250 μ A                                                   | -20  | ---  | ---   | V     |
| I <sub>DSS</sub>                   | Zero Gate Voltage Drain Current         | V <sub>GS</sub> =0V, V <sub>DS</sub> =-20V                                                     | ---  | ---  | -1    | μ A   |
| I <sub>GSS</sub>                   | Gate-Source Leakage Current             | V <sub>GS</sub> =± 12V, V <sub>DS</sub> =0A                                                    | ---  | ---  | ± 100 | nA    |
| On Characteristics                 |                                         |                                                                                                |      |      |       |       |
| V <sub>GS(th)</sub>                | Gate-Source Threshold Voltage           | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250 μ A                                     | -0.5 | -0.7 | -1    | V     |
| R <sub>DS(ON)</sub>                | Drain-Source On Resistance <sup>4</sup> | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-20A                                                   | ---  | 6    | 8     | m Ω   |
|                                    |                                         | V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-10A                                                   | ---  | 8    | 10    | m Ω   |
| Dynamic Characteristics            |                                         |                                                                                                |      |      |       |       |
| C <sub>iss</sub>                   | Input Capacitance                       | V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHz                                             | ---  | 2860 | ---   | pF    |
| C <sub>oss</sub>                   | Output Capacitance                      |                                                                                                | ---  | 308  | --    |       |
| C <sub>rss</sub>                   | Reverse Transfer Capacitance            |                                                                                                | ---  | 270  | ---   |       |
| Switching Characteristics          |                                         |                                                                                                |      |      |       |       |
| t <sub>d(on)</sub>                 | Turn-On Delay Time                      | V <sub>DS</sub> =-10V, I <sub>D</sub> =-13A,<br>R <sub>ENG</sub> =2.7 Ω ,V <sub>GS</sub> =-10V | ---  | 12   | ---   | ns    |
| t <sub>r</sub>                     | Rise Time                               |                                                                                                | ---  | 104  | ---   | ns    |
| t <sub>d(off)</sub>                | Turn-Off Delay Time                     |                                                                                                | ---  | 144  | ---   | ns    |
| t <sub>f</sub>                     | Fall Time                               |                                                                                                | ---  | 149  | ---   | ns    |
| Q <sub>g</sub>                     | Total Gate Charge                       | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-4.5V,<br>I <sub>D</sub> =-15A                         | ---  | 56.7 | ---   | nc    |
| Q <sub>gs</sub>                    | Gate-Source Charge                      |                                                                                                | ---  | 6    | ---   | nc    |
| Q <sub>gd</sub>                    | Gate-Drain “Miller” Charge              |                                                                                                | ---  | 13   | ---   | nc    |
| Drain-Source Diode Characteristics |                                         |                                                                                                |      |      |       |       |
| V <sub>SD</sub>                    | Diode Forward Voltage                   | V <sub>GS</sub> =0V, I <sub>SD</sub> =-10A                                                     | ---  | ---  | -1.2  | V     |
| I <sub>S</sub>                     | Continuous Drain Curren                 | V <sub>D</sub> =V <sub>G</sub> =0V                                                             | ---  | ---  | -40   | A     |
| I <sub>SM</sub>                    | Pulsed Drain Current                    |                                                                                                | ---  | ---  | -220  | A     |

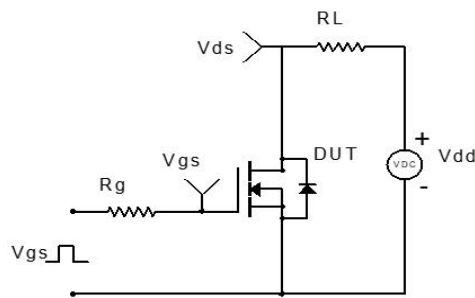
### Notes:

1. Computed continuous current assumes the condition of  $T_{j,Max}$  while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition :  $T_J=25^{\circ}C, V_{DD}=10V, V_G=4.5V, L=0.5mH$
4. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 0.5\%$

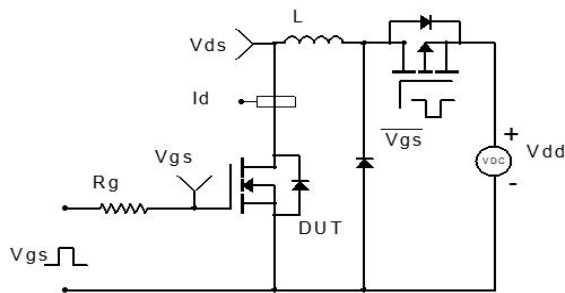
### Test Circuit



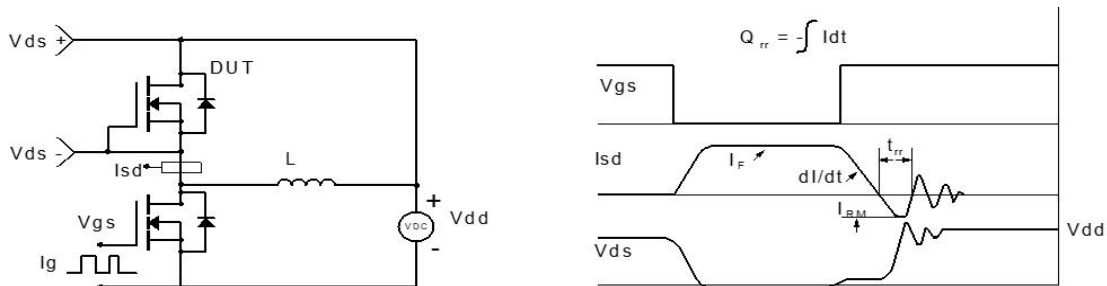
**Figure 1: Gate Charge Test Circuit & Waveform**



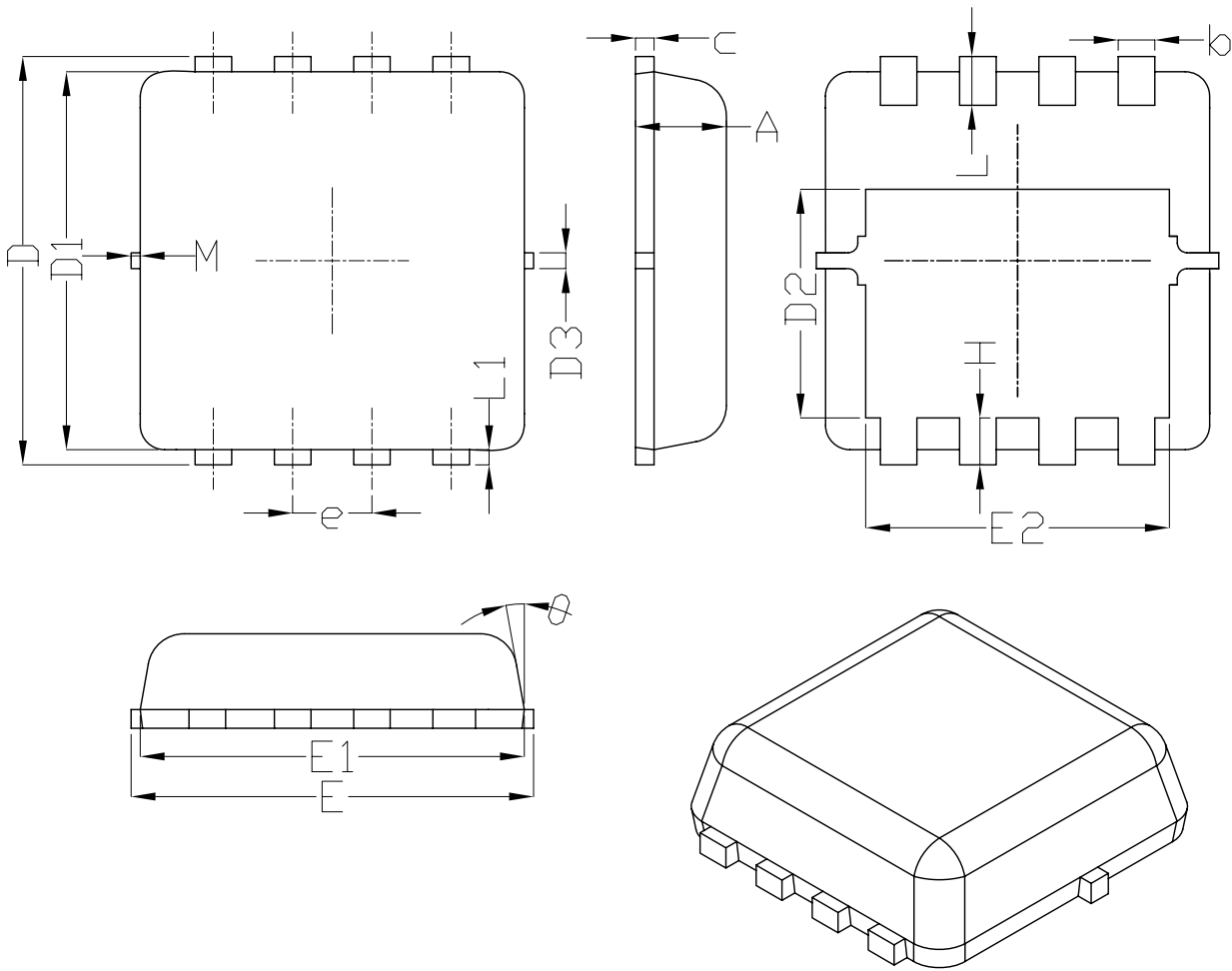
**Figure 2: Resistive Switching Test Circuit & Waveform**



**Figure 3: Unclamped Inductive Switching Test Circuit & Waveform**

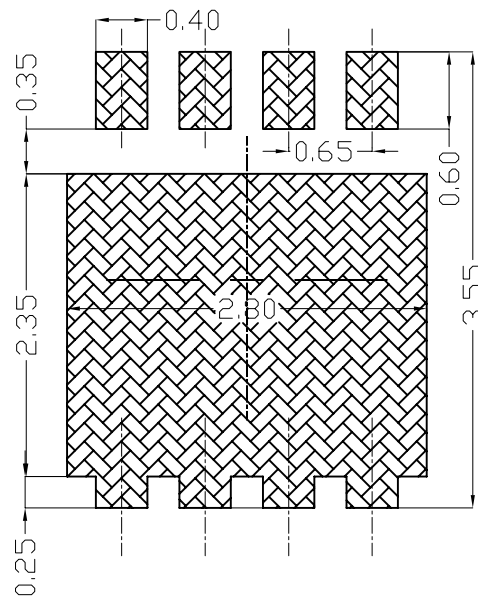


**Figure 4: Diode Recovery Test Circuit & Waveform**

**DFN3X3-8 Package Information:**


| SYMBOL   | DIMENSIONAL REQMTS |      |      |
|----------|--------------------|------|------|
|          | MIN                | NOM  | MAX  |
| A        | 0.70               | 0.75 | 0.80 |
| b        | 0.25               | 0.30 | 0.35 |
| c        | 0.10               | 0.15 | 0.25 |
| D        | 3.25               | 3.35 | 3.45 |
| D1       | 3.00               | 3.10 | 3.20 |
| D2       | 1.78               | 1.88 | 1.98 |
| D3       | ---                | 0.13 | ---  |
| E        | 3.20               | 3.30 | 3.40 |
| E1       | 3.00               | 3.15 | 3.20 |
| E2       | 2.39               | 2.49 | 2.59 |
| e        | 0.65BSC            |      |      |
| H        | 0.30               | 0.39 | 0.50 |
| L        | 0.30               | 0.40 | 0.50 |
| L1       | ---                | 0.13 | ---  |
| $\theta$ | ---                | 10°  | 12°  |
| M        | *                  | *    | 0.15 |

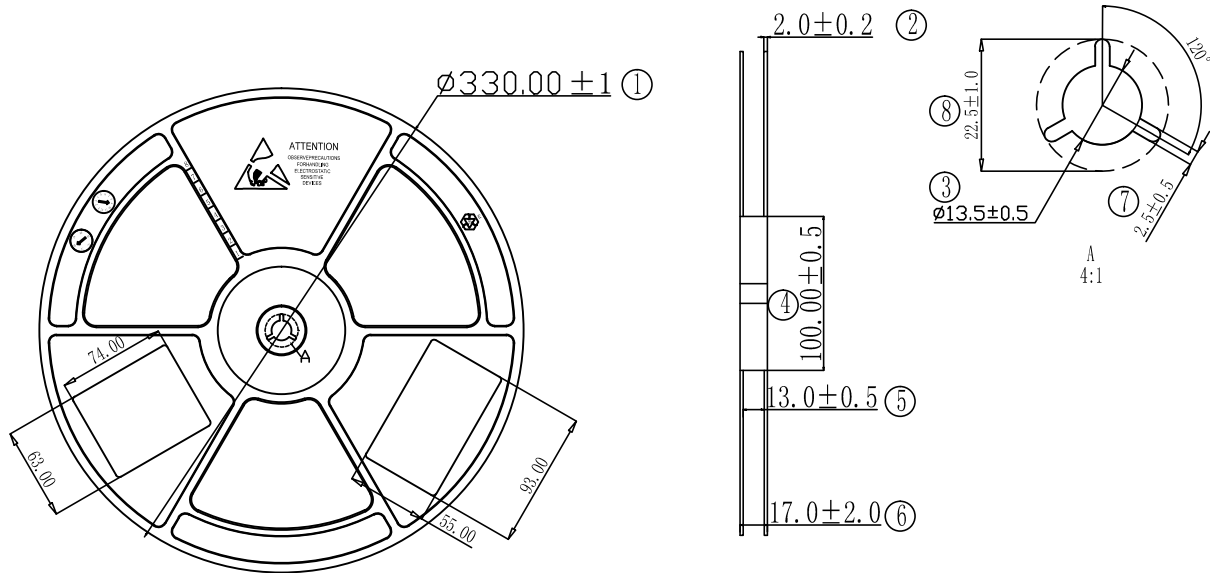
\* Not specified



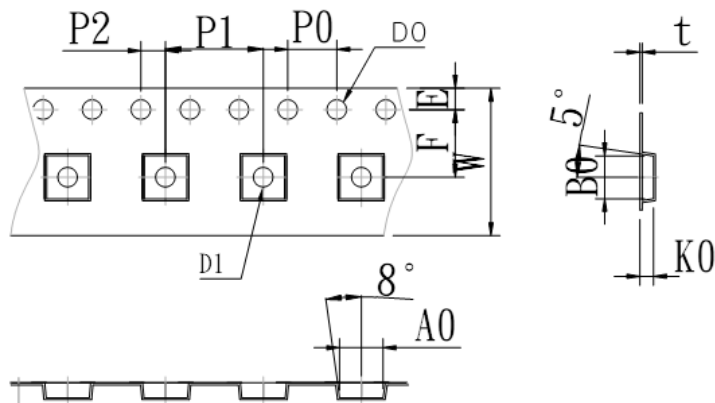
UNIT: mm

## Tape & Reel Information

Dimensions in mm



|        |                  |                 |                 |                 |                 |                 |                 |                 |
|--------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Symbol | A0               | B0              | K0              | D0              | D1              | P0              | P1              | 10*P0           |
| Spec   | 3.55 $\pm$ 0.10  | 3.45 $\pm$ 0.10 | 1.13 $\pm$ 0.10 | 1.55 $\pm$ 0.10 | 1.55 $\pm$ 0.10 | 4.00 $\pm$ 0.10 | 8.00 $\pm$ 0.10 | 40.0 $\pm$ 0.10 |
| Symbol | W                | E               | F               | P2              | t               |                 |                 |                 |
| Spec   | 12.00 $\pm$ 0.10 | 1.75 $\pm$ 0.10 | 5.50 $\pm$ 0.10 | 2.00 $\pm$ 0.10 | 0.20 $\pm$ 0.05 |                 |                 |                 |



Pulling direction →

## Marking Information:

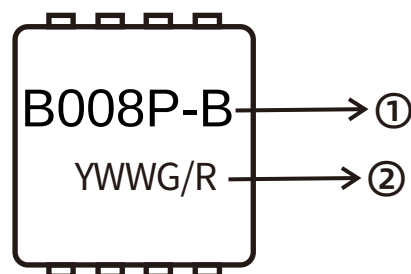
①. Part NO.

②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)



## Previous Version

| Version | Date       | Subjects (major changes since last revision) |
|---------|------------|----------------------------------------------|
| 1.1     | 2026-01-27 | Release of final version                     |

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