

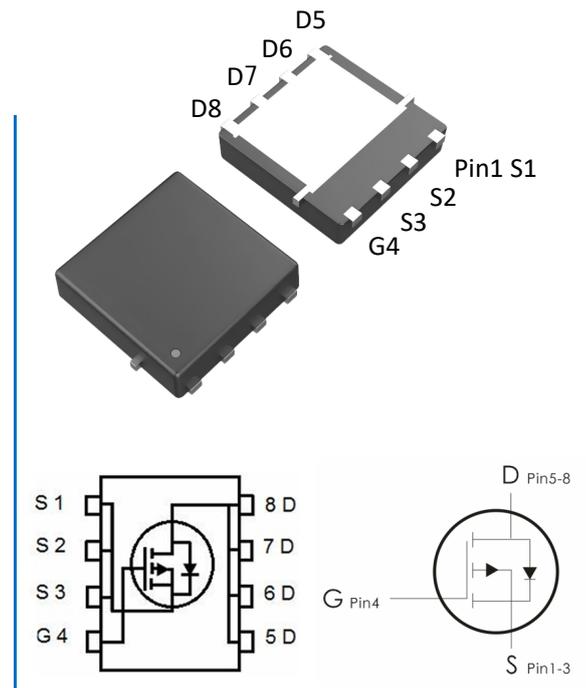
## Description:

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   | $^\circ\text{C}/\text{W}$ |

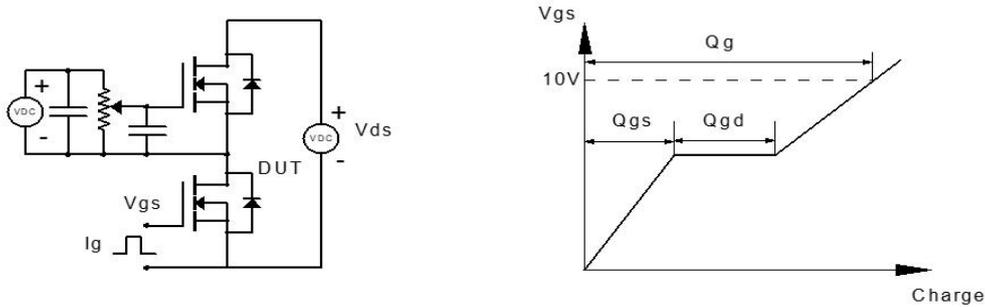
**Electrical Characteristics:** ( $T_c=25^\circ\text{C}$  unless otherwise noted)

| Symbol                                    | Parameter                               | Conditions   | Min  | Typ  | Max       | Units            |
|---|---|--|------|------|-----------|------------------|
| <b>Off Characteristics</b>                |   |  |      |      |           |                  |
| $BV_{DSS}$                                | Drain-Source Breakdown Voltage          | $V_{GS}=0V, I_D=250\ \mu\text{A}$                              | -20  | ---  | ---       | V                |
| $I_{DSS}$                                 | Zero Gate Voltage Drain Current         | $V_{GS}=0V, V_{DS}=-20V$                                       | ---  | ---  | -1        | $\mu\text{A}$    |
| $I_{GSS}$                                 | Gate-Source Leakage Current             | $V_{GS}=\pm 12V, V_{DS}=0A$                                    | ---  | ---  | $\pm 100$ | nA               |
| <b>On Characteristics</b>                 |   |  |      |      |           |                  |
| $V_{GS(th)}$                              | Gate-Source Threshold Voltage           | $V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$                          | -0.5 | -0.7 | -1        | V                |
| $R_{DS(on)}$                              | Drain-Source On Resistance <sup>4</sup> | $V_{GS}=-4.5V, I_D=-20A$                                       | ---  | 6    | 8         | $\text{m}\Omega$ |
|   |   | $V_{GS}=-2.5V, I_D=-10A$                                       | ---  | 8    | 10        | $\text{m}\Omega$ |
| <b>Dynamic Characteristics</b>            |   |  |      |      |           |                  |
| $C_{iss}$                                 | Input Capacitance                       | $V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}$                        | ---  | 2697 | ---       | pF               |
| $C_{oss}$                                 | Output Capacitance                      |  | ---  | 308  | --        |                  |
| $C_{rss}$                                 | Reverse Transfer Capacitance            |  | ---  | 270  | ---       |                  |
| <b>Switching Characteristics</b>          |   |  |      |      |           |                  |
| $t_{d(on)}$                               | Turn-On Delay Time                      | $V_{DS}=-10V, I_D=-13A,$<br>$R_{ENG}=2.7\ \Omega, V_{GS}=-10V$ | ---  | 12   | ---       | ns               |
| $t_r$                                     | Rise Time                               |  | ---  | 104  | ---       | ns               |
| $t_{d(off)}$                              | Turn-Off Delay Time                     |  | ---  | 144  | ---       | ns               |
| $t_f$                                     | Fall Time                               |  | ---  | 149  | ---       | ns               |
| $Q_g$                                     | Total Gate Charge                       | $V_{GS}=-10V, V_{DS}=-4.5V,$<br>$I_D=-15A$                     | ---  | 56.7 | ---       | nc               |
| $Q_{gs}$                                  | Gate-Source Charge                      |  | ---  | 6    | ---       | nc               |
| $Q_{gd}$                                  | Gate-Drain "Miller" Charge              |  | ---  | 13   | ---       | nc               |
| <b>Drain-Source Diode Characteristics</b> |   |  |      |      |           |                  |
| $V_{SD}$                                  | Diode Forward Voltage                   | $V_{GS}=0V, I_{SD}=-10A$                                       | ---  | ---  | -1.2      | V                |
| $I_S$                                     | Continuous Drain Current                | $V_D=V_G=0V$   | ---  | ---  | -40       | A                |
| $I_{SM}$                                  | Pulsed Drain Current                    |  | ---  | ---  | -220      | A                |

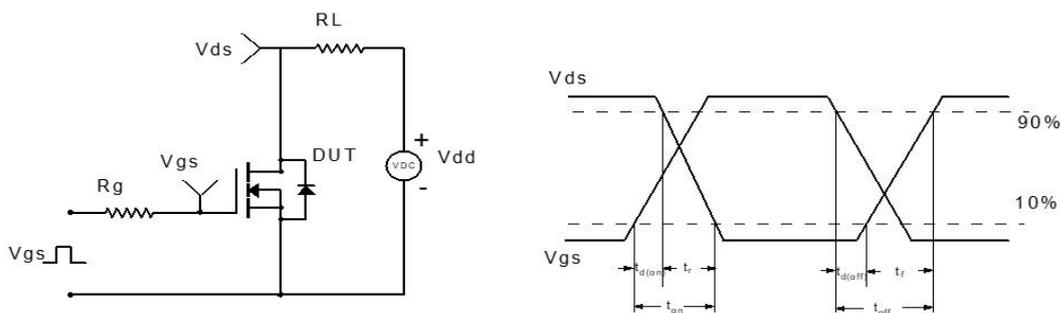
## Notes:

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  $\leq 0.5\%$

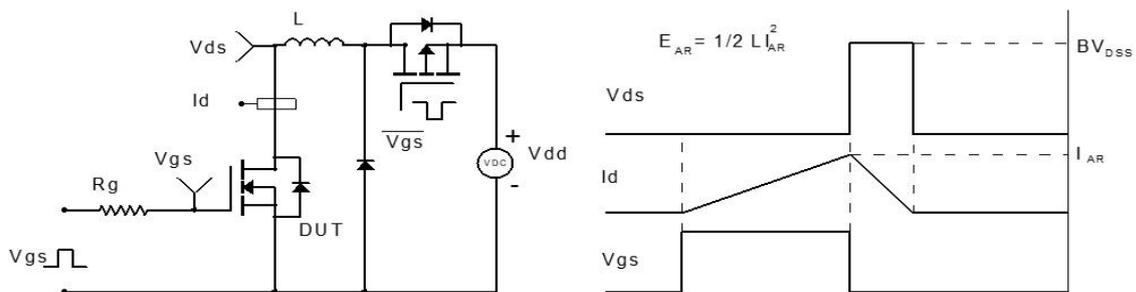
## Test Circuit



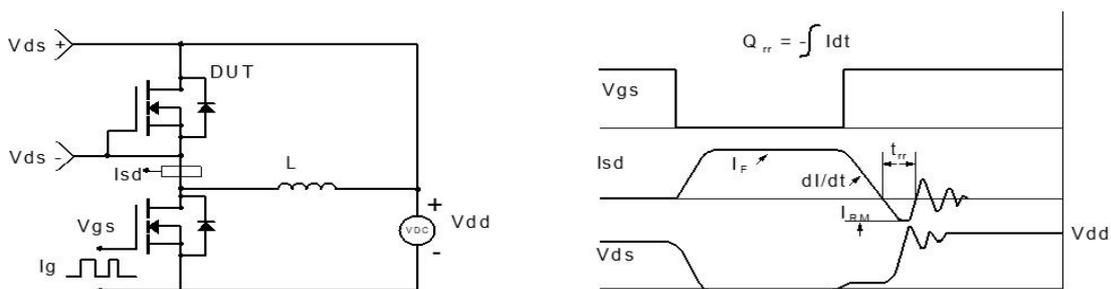
**Figure 1: Gate Charge Test Circuit & Waveform**



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

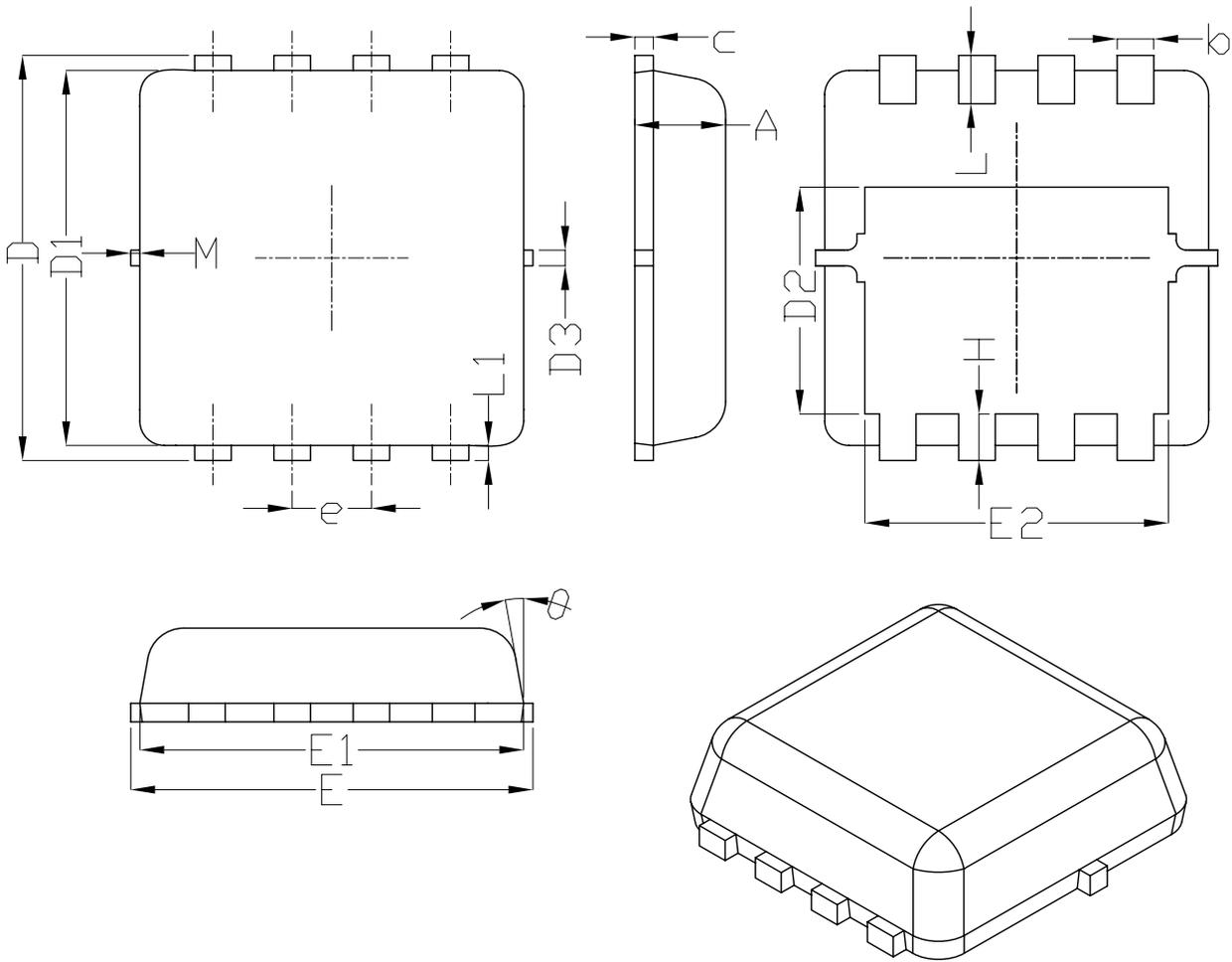


**Figure 3: Unclamped Inductive Switching Test Circuit & Waveform**



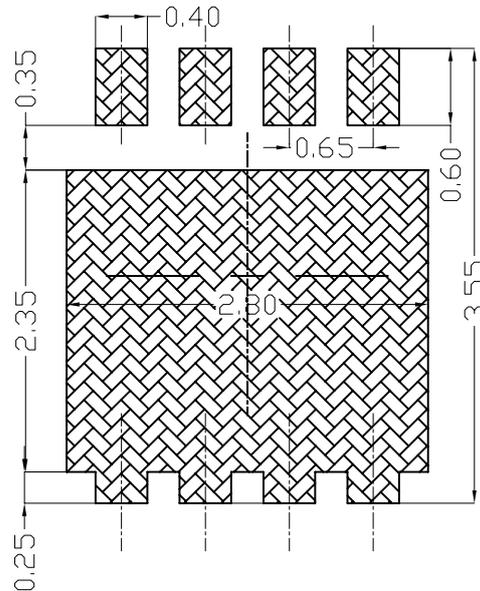
**Figure 4: Diode Recovery Test Circuit & Waveform**

## DFN3X3-8 Package Information:



| SYMBOL   | DIMENSIONAL REOMTS |      |      |
|----------|--------------------|------|------|
|          | 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 |

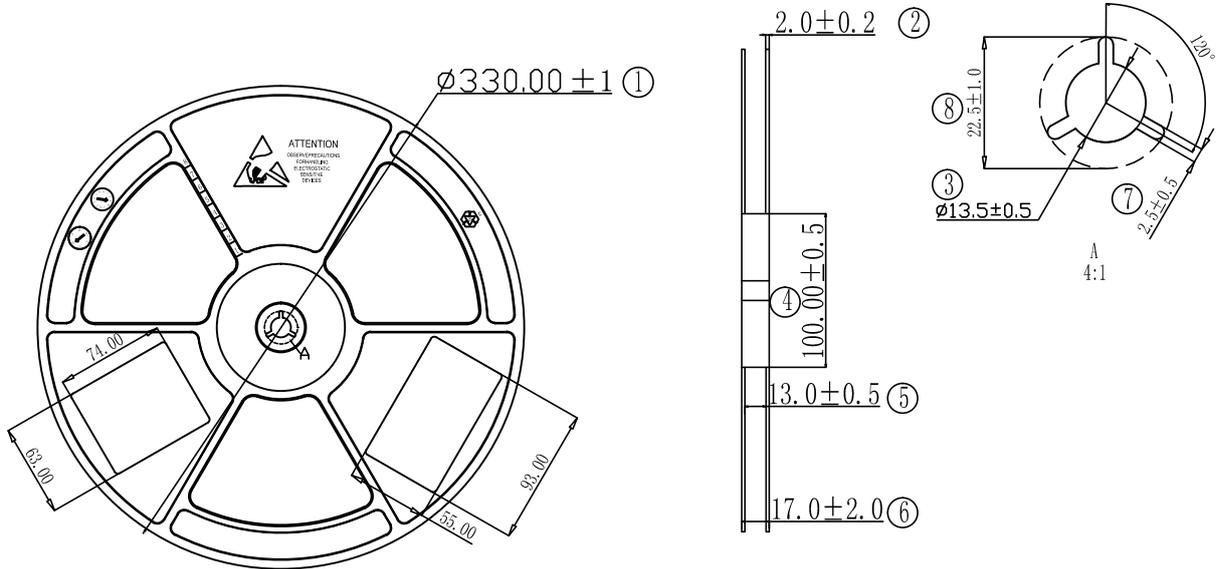
\* Not specified



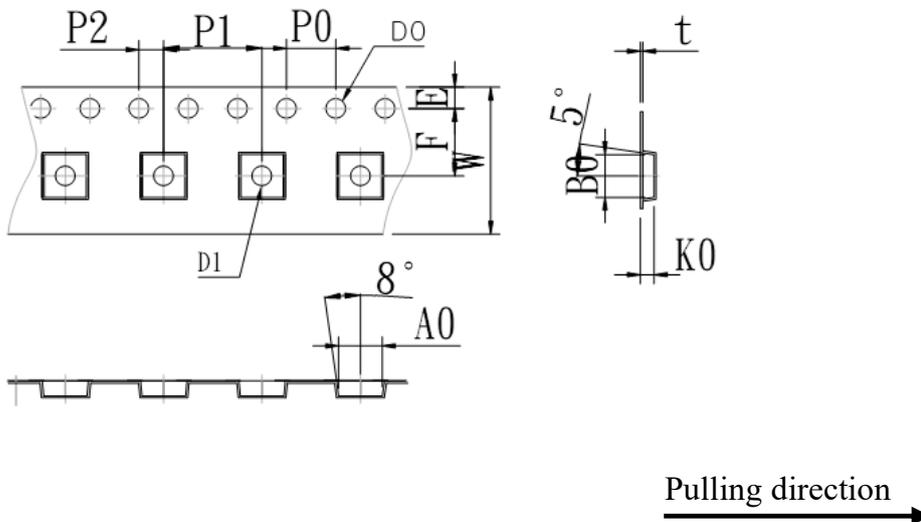
UNIT: mm

## Tape & Reel Information

Dimensions in mm



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



**Marking Information:**

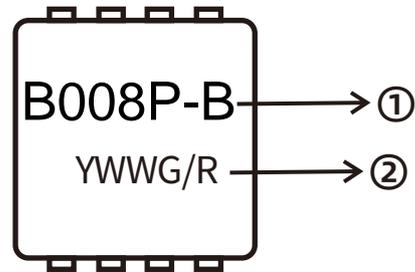
①. Part NO.

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) |
|---------|------------|--|
| 1.0     | 2025-03-07 | Release of final version                     |

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