

## Features

- 20V/6.5A,  
 $R_{DS(ON)} = 19m\Omega(Typ.)@V_{GS}=4.5V$   
 $R_{DS(ON)} = 28m\Omega(Typ.)@V_{GS}=2.5V$
- Low  $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged

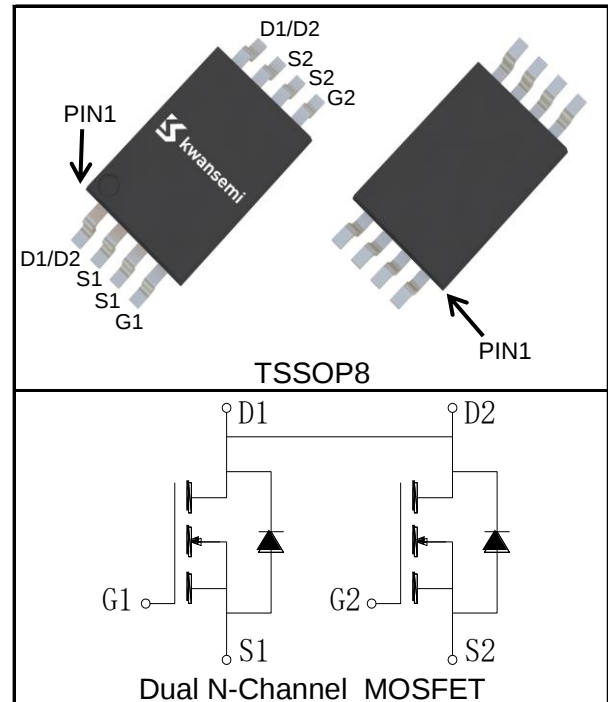
## Applications

- Power Management
- Battery Protection



Halogen-Free

## Pin Description



## Absolute Maximum Ratings

| Symbol                                                            | Parameter                                 | Rating                   | Unit          |
|-------------------------------------------------------------------|-------------------------------------------|--------------------------|---------------|
| <b>Common Ratings</b> ( $T_A=25^{\circ}C$ Unless Otherwise Noted) |                                           |                          |               |
| $V_{DSS}$                                                         | Drain-Source Voltage                      | 20                       | V             |
| $V_{GSS}$                                                         | Gate-Source Voltage                       | $\pm 12$                 | V             |
| $T_{Jmax}$                                                        | Maximum Junction Temperature              | 150                      | $^{\circ}C$   |
| $T_J, T_{STG}$                                                    | Operating and Storage Temperature Range   | -55 to 150               | $^{\circ}C$   |
| $I_S$                                                             | Diode Continuous Forward Current          | $T_A=25^{\circ}C$<br>1.9 | A             |
| <b>Mounted on Large Heat Sink</b>                                 |                                           |                          |               |
| $I_{DP}^{①}$                                                      | Pulse Drain Current                       | $T_A=25^{\circ}C$<br>26  | A             |
| $I_D^{②}$                                                         | Continuous Drain Current( $V_{GS}=4.5V$ ) | $T_A=25^{\circ}C$<br>6.5 | A             |
|                                                                   |                                           | $T_A=70^{\circ}C$<br>5.2 |               |
| $P_D$                                                             | Maximum Power Dissipation                 | $T_A=25^{\circ}C$<br>1.5 | W             |
|                                                                   |                                           | $T_A=70^{\circ}C$<br>1   |               |
| $R_{\theta JL}$                                                   | Thermal Resistance-Junction to Lead       | 25                       | $^{\circ}C/W$ |
| $R_{\theta JA}^{③}$                                               | Thermal Resistance-Junction to Ambient    | 83.5                     | $^{\circ}C/W$ |
| <b>Drain-Source Avalanche Ratings</b>                             |                                           |                          |               |
| $E_{AS}^{④}$                                                      | Avalanche Energy, Single Pulsed           | 2                        | mJ            |

**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  Unless Otherwise Noted)

| Symbol                        | Parameter                        | Test Condition                                                                         | KS8205BB |      |      | Unit |
|-------------------------------|----------------------------------|----------------------------------------------------------------------------------------|----------|------|------|------|
|                               |                                  |                                                                                        | Min.     | Typ. | Max. |      |
| Static Characteristics        |                                  |                                                                                        |          |      |      |      |
| BV <sub>DSS</sub>             | Drain-Source Breakdown Voltage   | V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA                                            | 20       |      |      | V    |
| I <sub>DSS</sub>              | Zero Gate Voltage Drain Current  | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V                                              |          |      | 1    | μA   |
|                               |                                  | T <sub>J</sub> =125°C                                                                  |          |      | 30   |      |
| V <sub>GS(th)</sub>           | Gate Threshold Voltage           | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA                              | 0.5      | 0.65 | 1.1  | V    |
| I <sub>GSS</sub>              | Gate Leakage Current             | V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V                                             |          |      | ±100 | nA   |
| R <sub>DS(ON)</sub> ⑤         | Drain-Source On-state Resistance | V <sub>GS</sub> =4.5V, I <sub>DS</sub> =4A                                             |          | 19   | 25   | mΩ   |
|                               |                                  | V <sub>GS</sub> =2.5V, I <sub>DS</sub> =3A                                             |          | 28   | 40   | mΩ   |
| Diode Characteristics         |                                  |                                                                                        |          |      |      |      |
| V <sub>SD</sub> ⑤             | Diode Forward Voltage            | I <sub>SD</sub> =2A, V <sub>GS</sub> =0V                                               |          | 0.79 | 1.2  | V    |
| t <sub>rr</sub>               | Reverse Recovery Time            | I <sub>SD</sub> =4A, dI <sub>SD</sub> /dt=100A/μs                                      |          | 13   |      | ns   |
| Q <sub>rr</sub>               | Reverse Recovery Charge          |                                                                                        |          | 6    |      | nC   |
| Dynamic Characteristics ⑥     |                                  |                                                                                        |          |      |      |      |
| R <sub>G</sub>                | Gate Resistance                  | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz                                       |          | 6.5  |      | Ω    |
| C <sub>iss</sub>              | Input Capacitance                | V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, Frequency=1.0MHz                            |          | 265  |      | pF   |
| C <sub>oss</sub>              | Output Capacitance               |                                                                                        |          | 75   |      |      |
| C <sub>rss</sub>              | Reverse Transfer Capacitance     |                                                                                        |          | 70   |      |      |
| t <sub>d(ON)</sub>            | Turn-on Delay Time               | V <sub>DD</sub> =100V, I <sub>DS</sub> =4A, V <sub>GEN</sub> =4.5V, R <sub>G</sub> =6Ω |          | 10   |      | ns   |
| t <sub>r</sub>                | Turn-on Rise Time                |                                                                                        |          | 15   |      |      |
| t <sub>d(OFF)</sub>           | Turn-off Delay Time              |                                                                                        |          | 24   |      |      |
| t <sub>f</sub>                | Turn-off Fall Time               |                                                                                        |          | 19   |      |      |
| Gate Charge Characteristics ⑥ |                                  |                                                                                        |          |      |      |      |
| Q <sub>g</sub>                | Total Gate Charge                | V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>DS</sub> =4A                       |          | 3.6  |      | nC   |
| Q <sub>gs</sub>               | Gate-Source Charge               |                                                                                        |          | 0.5  |      |      |
| Q <sub>gd</sub>               | Gate-Drain Charge                |                                                                                        |          | 1.4  |      |      |

- Notes:
- ① Pulse width limited by safe operating area.
  - ② Calculated continuous current based on maximum allowable junction temperature.
  - ③ When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ . The value in any given application depends on the user's specific board design.
  - ④ Limited by  $T_{Jmax}$ , Starting  $T_J = 25^{\circ}\text{C}$ ,  $I_{ASmax} = 3A$ ,  $L = 0.5\text{mH}$ ,  $V_{DD} = 12V$ ,  $R_G = 25\Omega$ ,  $V_{GS} = 4.5V$ . Part not recommended for use above this value.
  - ⑤ Pulse test; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
  - ⑥ Guaranteed by design, not subject to production testing.

## Ordering and Marking Information

| Device   | Package | Packaging | Quantity | Reel Size | Tape width |
|----------|---------|-----------|----------|-----------|------------|
| KS8205BB | TSSOP8  | Tape&Reel | 3000     | 13"       | 12mm       |

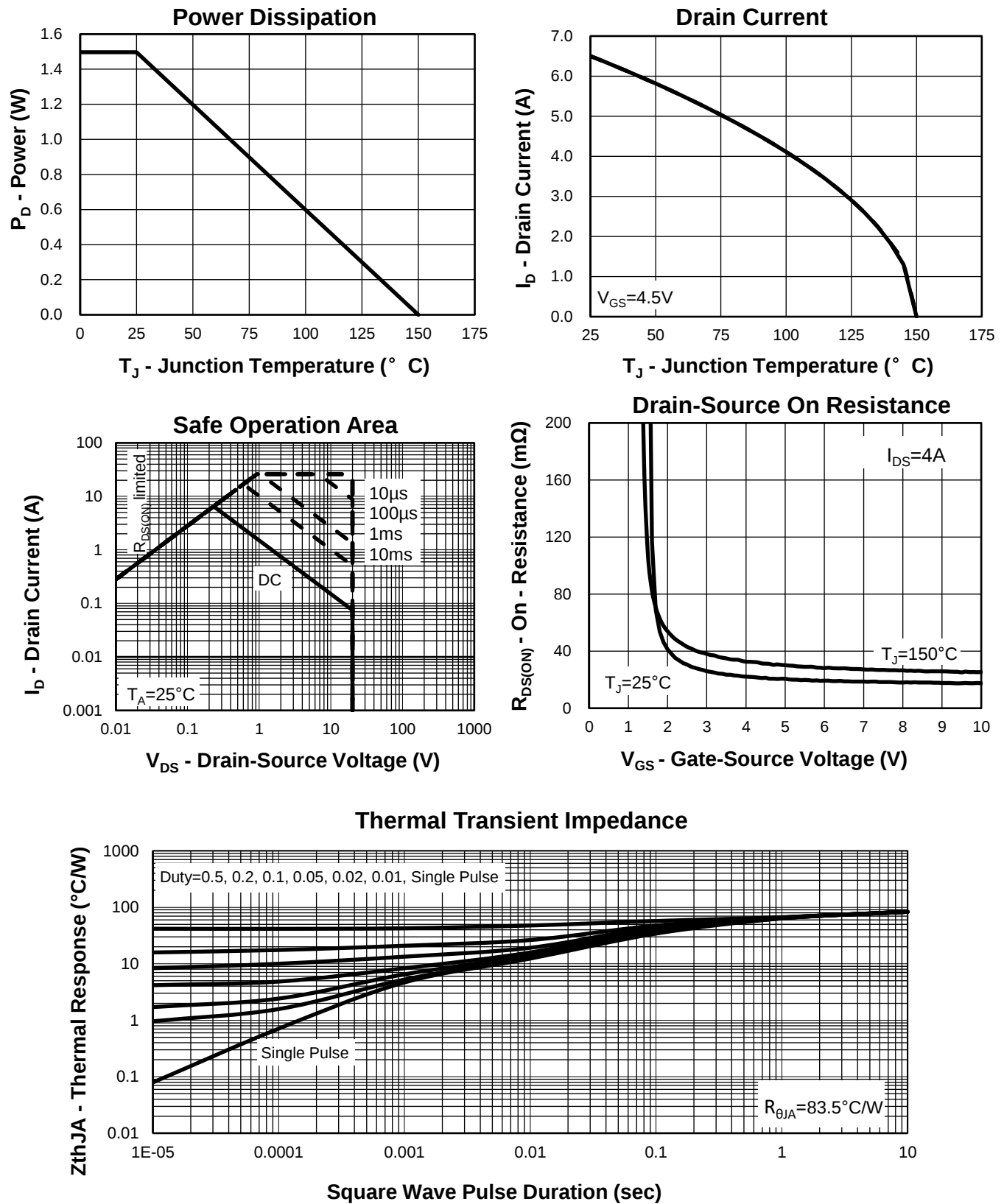


1st Line: Kwansemi LOGO, Kwansemi Code(KS)

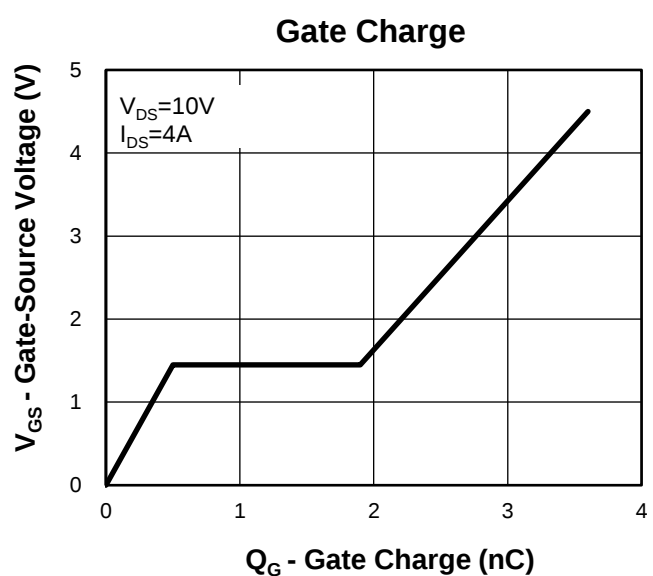
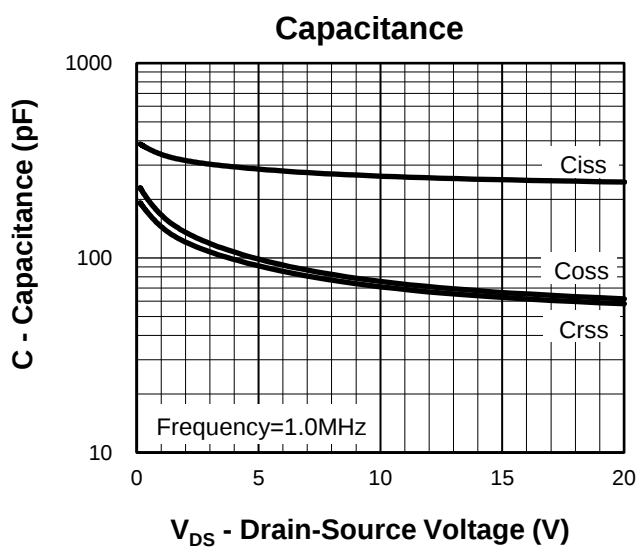
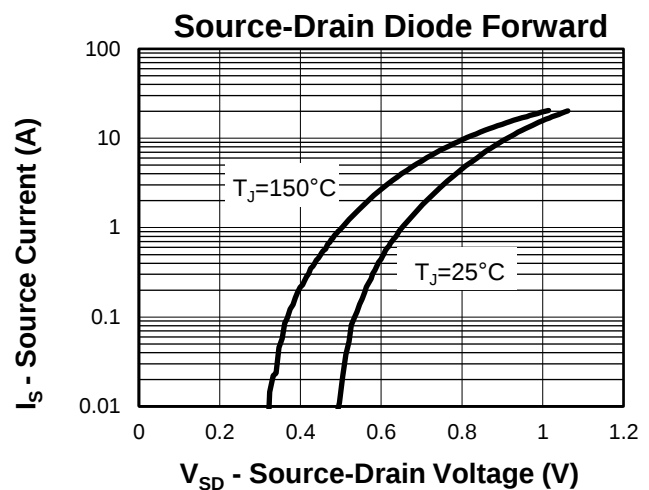
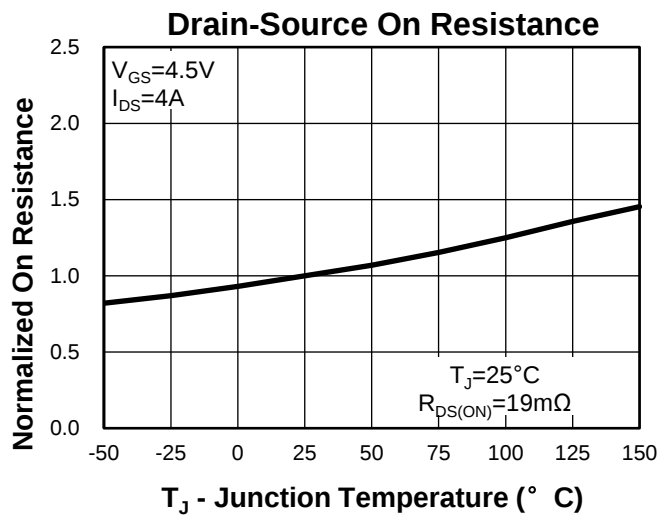
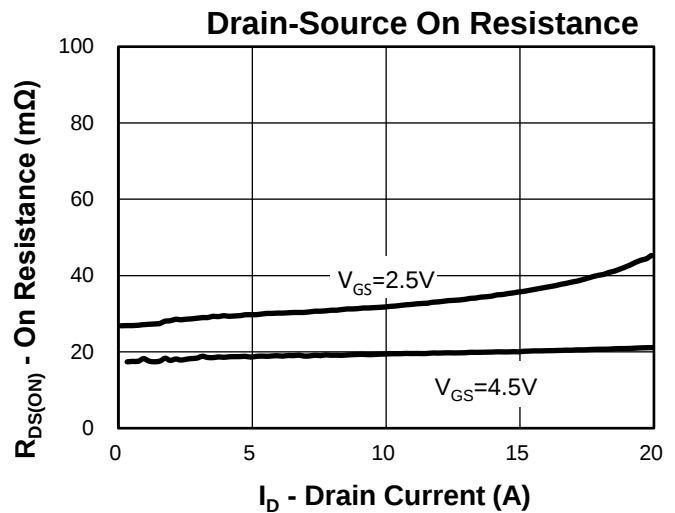
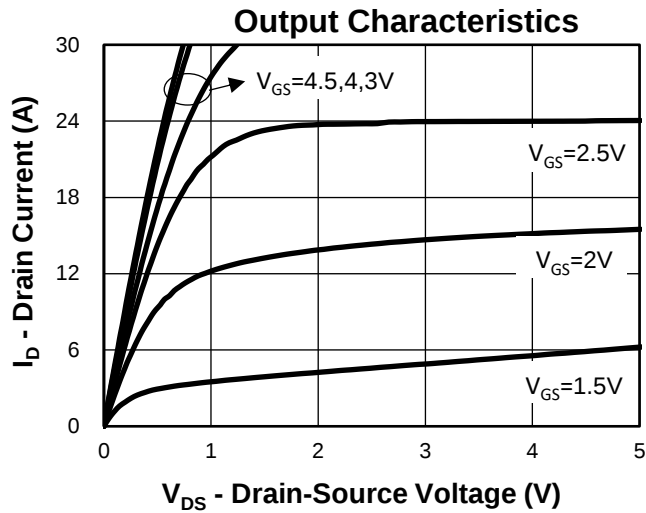
2nd Line: Part Number(8205)

3rd Line: Lot Number(YWWXXX)

## Typical Characteristics

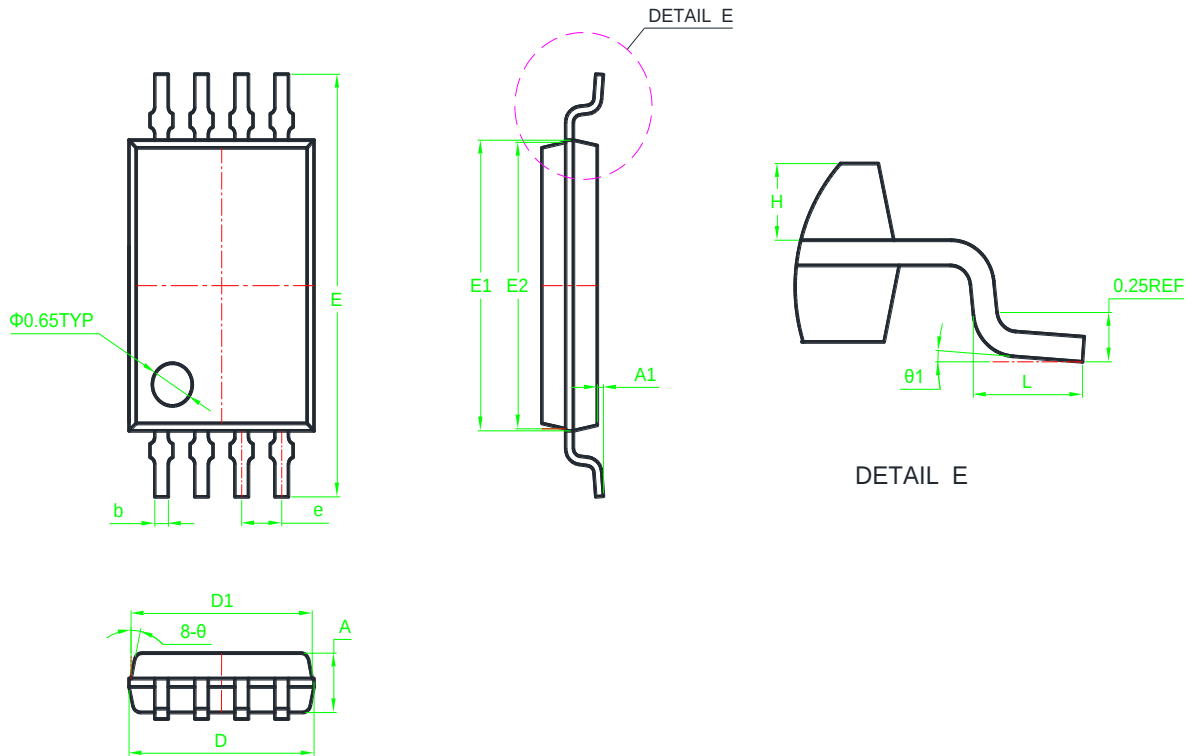


## Typical Characteristics



## Package Information

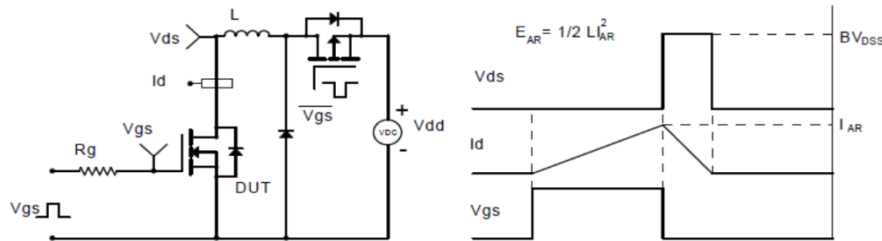
### TSSOP8



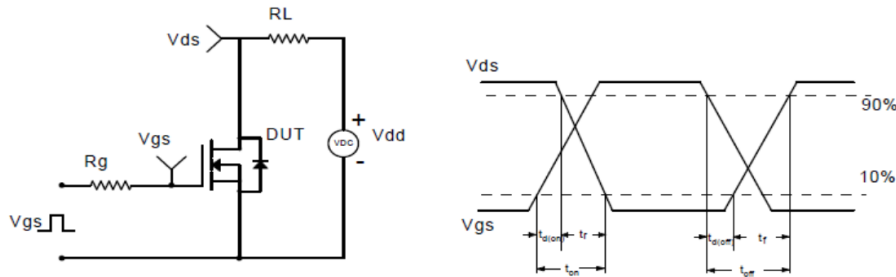
| SYMBOL | MM      |      |      | INCH     |       |       |
|--------|---------|------|------|----------|-------|-------|
|        | MIN     | NOM  | MAX  | MIN      | NOM   | MAX   |
| A      | 0.85    | 0.90 | 0.95 | 0.033    | 0.035 | 0.037 |
| A1     | 0.05    | 0.10 | 0.15 | 0.002    | 0.004 | 0.006 |
| b      | 0.17    | 0.22 | 0.30 | 0.007    | 0.009 | 0.012 |
| D      | 2.90    | 3.00 | 3.10 | 0.114    | 0.118 | 0.122 |
| D1     | 2.84    | 3.94 | 3.04 | 0.112    | 0.155 | 0.120 |
| e      | 0.65TYP |      |      | 0.026TYP |       |       |
| E      | 6.25    | 6.40 | 6.55 | 0.246    | 0.252 | 0.258 |
| E1     | 4.30    | 4.40 | 4.50 | 0.169    | 0.173 | 0.177 |
| E2     | 4.24    | 4.34 | 4.44 | 0.167    | 0.171 | 0.175 |
| H      | 0.34    | 0.39 | 0.44 | 0.013    | 0.015 | 0.017 |
| L      | 0.45    | 0.60 | 0.75 | 0.018    | 0.024 | 0.030 |
| θ      | 12° TYP |      |      | 12° TYP  |       |       |
| θ1     | 0~7°    |      |      | 0~7°     |       |       |

Note: Dimensions do not inclusive burrs and mold flash.

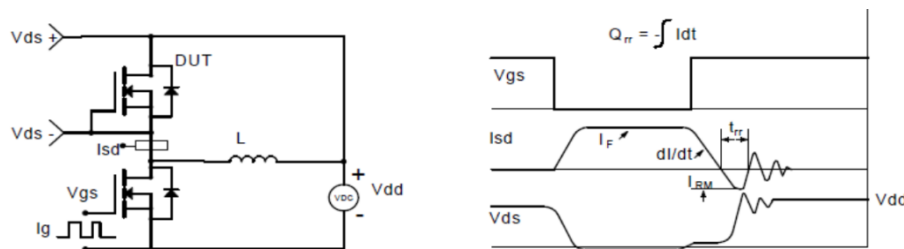
### Avalanche Test Circuit and Waveforms



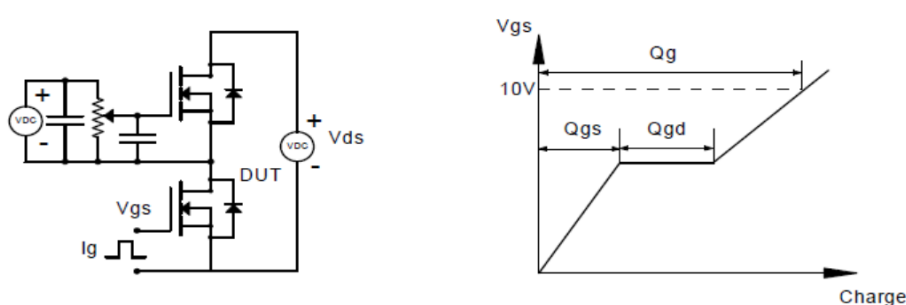
### Switching Time Test Circuit and Waveforms



### Diode Recovery Test Circuit and Waveforms



### Gate Charge Test Circuit and Waveform



### Customer Service

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