

Features

- Uses PingWei advanced PerfectMOS4 technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- Excellent Low Ciss
- Qualified according to JEDEC criteria

Benefits

- High robustness and reliability
- Increases maximum current capability
- Low power loss, high power density
- Easy paralleling

Applications

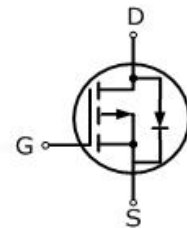
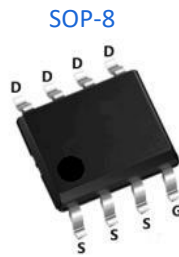
- Synchronous Rectification for AC/DC Quick Charger
- Battery management
- UPS (Uninterruptible Power Supplies)



100% DVDS Tested
100% Avalanche Tested

Product Summary

| | |
|------------------------|------|
| V_{DS} | -60V |
| $R_{DS(on)@10V\ typ}$ | 21mΩ |
| $R_{DS(on)@4.5V\ typ}$ | 25mΩ |
| I_D | -11A |



Package Marking and Ordering Information

| Part # | Marking | Package | Packing | Reel Size | Tape Width | Qty |
|-------------|-----------|---------|-----------|-----------|------------|---------|
| PW250P06PSL | 250P06PSL | SOP-8 | Tape&Reel | 13 inches | 12mm | 3000pcs |

Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|----------------|------------|------------------|
| Drain-source voltage | V_{DS} | -60 | V |
| Continuous drain current | I_D | -11 | A |
| $T_C = 25^\circ\text{C}$ (Silicon limit) | | -43 | |
| $T_C = 25^\circ\text{C}$ (Package limit) | | -7 | |
| $T_C = 100^\circ\text{C}$ (Silicon limit) | | -7 | |
| $T_a = 25^\circ\text{C}$ | | | |
| Pulsed drain current ($T_C = 25^\circ\text{C}$, $t_p = 100\mu\text{s}$) | $I_{D\ pulse}$ | -44 | A |
| Avalanche energy, single pulse ($L=0.5\text{mH}$, $V_{ds}=48\text{V}$) | E_{AS} | 52 | mJ |
| Gate-Source voltage | V_{GS} | ± 20 | V |
| Power dissipation | P_{tot} | 5 | W |
| $T_C = 25^\circ\text{C}$ | | 2.0 | |
| $T_a = 25^\circ\text{C}$ | | | |
| Operating junction and storage temperature | T_j, T_{stg} | -55...+150 | $^\circ\text{C}$ |
| Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s) | T_{sold} | 260 | $^\circ\text{C}$ |

Thermal Resistance

| Parameter | Symbol | Value | | | Unit | Test Condition |
|--|--------|-------|------|------|------|----------------|
| | | min. | typ. | max. | | |
| Thermal resistance, junction – case. | RthJC | - | - | 24.0 | °C/W | - |
| Thermal resistance, junction - ambient(min. footprint) | RthJA | - | - | 62.5 | °C/W | - |

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

| Parameter | Symbol | Value | | | Unit | Test Condition |
|-----------|--------|-------|------|------|------|----------------|
| | | min. | typ. | max. | | |

Static Characteristic

| | | | | | | |
|----------------------------------|--------------|------|----------|-----------|---------|---|
| Drain-source breakdown voltage | BV_{DSS} | -60 | - | - | V | $V_{GS}=0V, I_D=-250\mu A$ |
| Gate threshold voltage | $V_{GS(th)}$ | -1.0 | - | -2.5 | V | $V_{DS}=V_{GS}, I_D=-250\mu A$ |
| Zero gate voltage drain current | I_{DSS} | - | -0.02 | -1 | μA | $V_{DS}=-60V, V_{GS}=0V$ $T_j=25^\circ C$ $T_j=150^\circ C$ |
| Gate-source leakage current | I_{GSS} | - | ± 10 | ± 100 | nA | $V_{GS}=\pm 20V, V_{DS}=0V$ |
| Drain-source on-state resistance | $R_{DS(on)}$ | - | 21 | 25 | mΩ | $V_{GS}=-10V, I_D=-5.5A$ $V_{GS}=-4.5V, I_D=-5.5A$ |
| Transconductance | g_{fs} | - | - | - | S | $V_{DS}=-5V, I_D=-20A$ |

Dynamic Characteristic

| | | | | | | |
|------------------------------|--------------|---|------|---|----|---|
| Input Capacitance | C_{iss} | - | 1632 | - | pF | $V_{GS}=0V, V_{DS}=-30V,$ $f=1MHz$ |
| Output Capacitance | C_{oss} | - | 246 | - | | |
| Reverse Transfer Capacitance | C_{rss} | - | 29 | - | | |
| Gate Total Charge | Q_G | - | 27 | - | nC | $V_{DS}=-30V, I_D=-20A,$ $V_{GS}=-10V$ |
| Gate-Source charge | Q_{gs} | - | 7 | - | | |
| Gate-Drain charge | Q_{gd} | - | 4 | - | | |
| Turn-on delay time | $t_{d(on)}$ | - | 14 | - | ns | $V_{GS}=-10V, V_{DD}=-30V,$ $R_{G_ext}=2.2\Omega, I_D=-15A$ |
| Rise time | t_r | - | 1.2 | - | | |
| Turn-off delay time | $t_{d(off)}$ | - | 70 | - | | |
| Fall time | t_f | - | 3.6 | - | | |
| Gate resistance | R_G | - | 7 | - | Ω | $V_{GS}=0V, V_{DS}=0V,$ $f=1MHz$ |



Body Diode Characteristic

| Parameter | Symbol | Value | | | Unit | Test Condition |
|---------------------------------------|-------------|-------|-------|------|------|---|
| | | min. | typ. | max. | | |
| Body Diode Forward Voltage | V_{SD} | - | -0.92 | -1.2 | V | $V_{GS}=0V, I_{SD}=-5.5A$ |
| Body Diode Continuous Forward Current | I_S | - | - | -11 | A | $TC = 25^{\circ}C$ |
| Body Diode Pulsed Current | I_S pulse | - | - | -44 | A | $TC = 25^{\circ}C$ |
| Body Diode Reverse Recovery Time | t_{rr} | - | 43 | - | ns | $V_R=-18V, I_F=-10A,$ $dI/dt=100A/\mu s$ |
| Body Diode Reverse Recovery Charge | Q_{rr} | - | 38 | - | nC | |



Typical Performance Characteristics

Fig 1: Output Characteristics

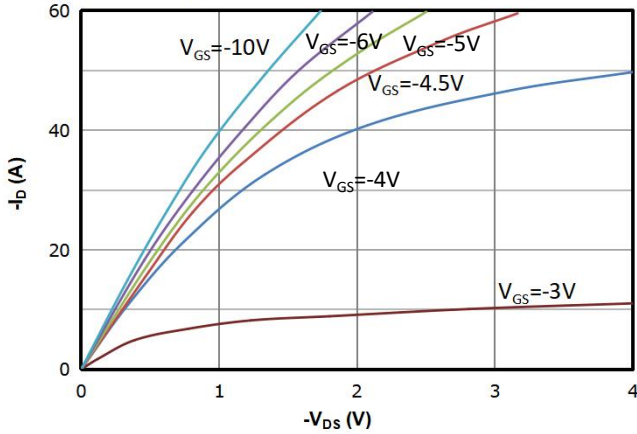


Fig 2: Transfer Characteristics

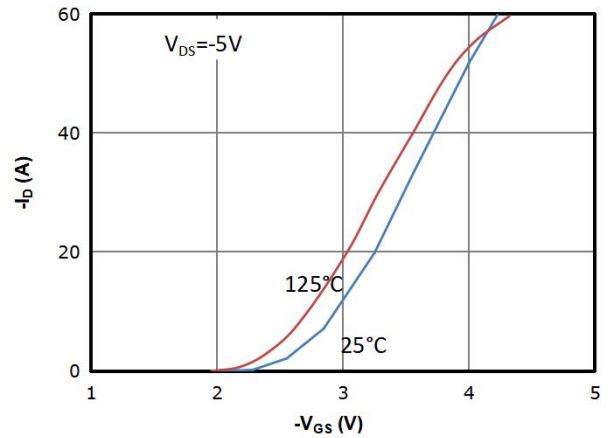


Fig 3: Rds(on) vs Drain Current and Gate Voltage

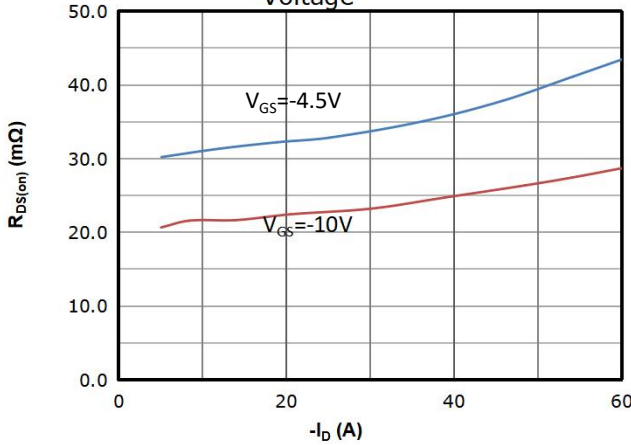


Fig 4: Rds(on) vs Gate Voltage

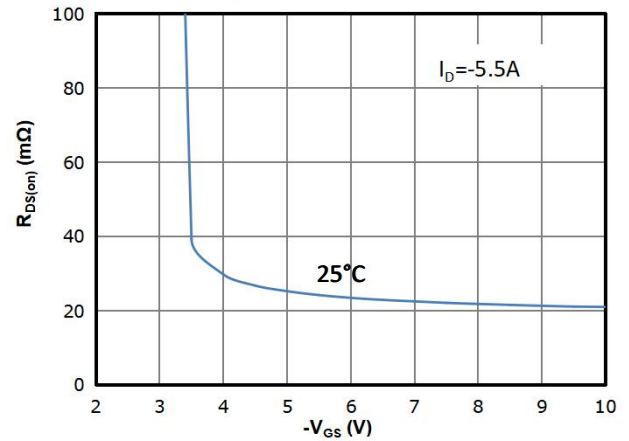


Fig 5: Rds(on) vs. Temperature

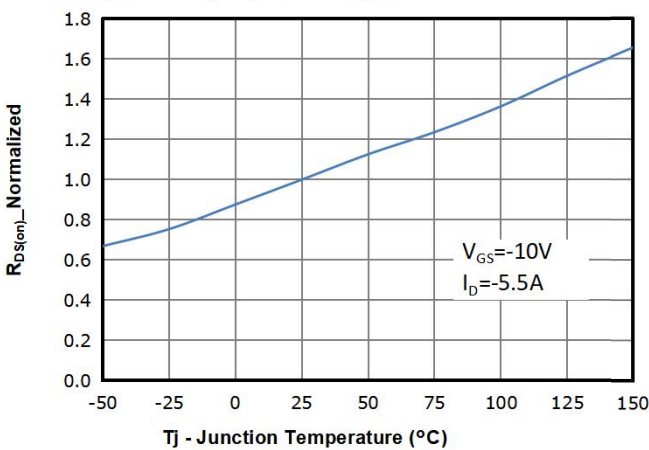


Fig 6: Vgs(th) vs. Temperature

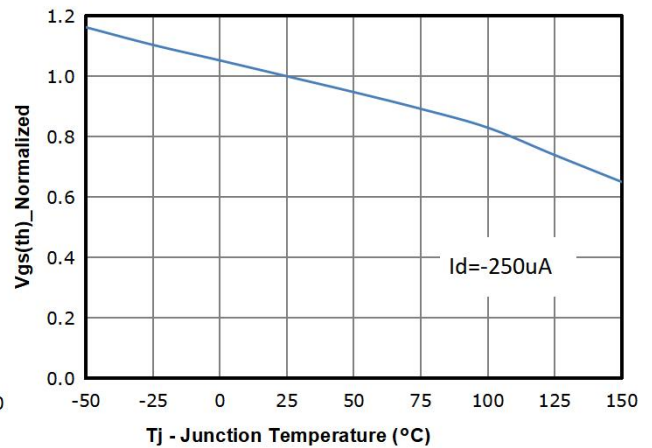




Fig 7: BVdss vs. Temperature

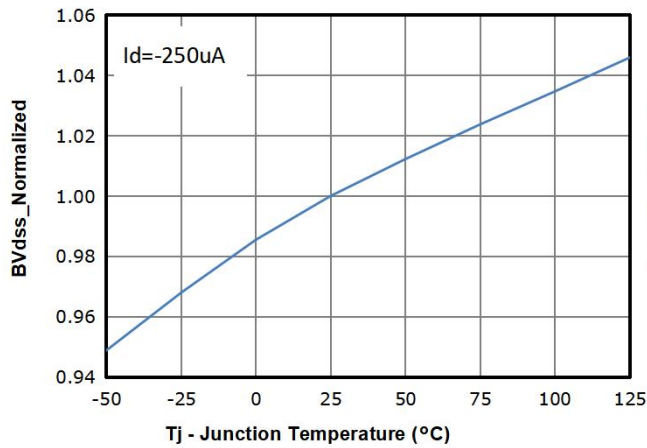


Fig 8: Capacitance Characteristics

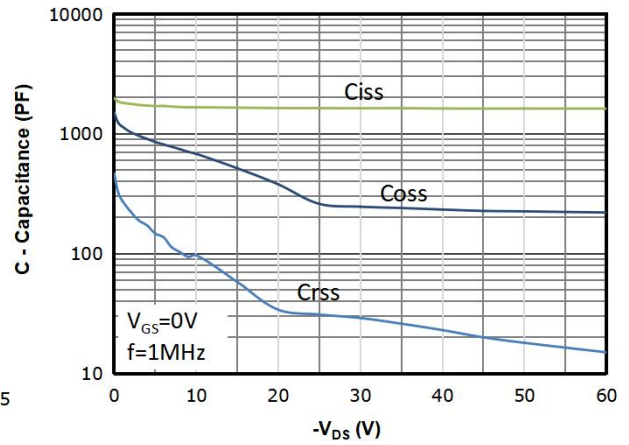


Fig 9: Gate Charge Characteristics

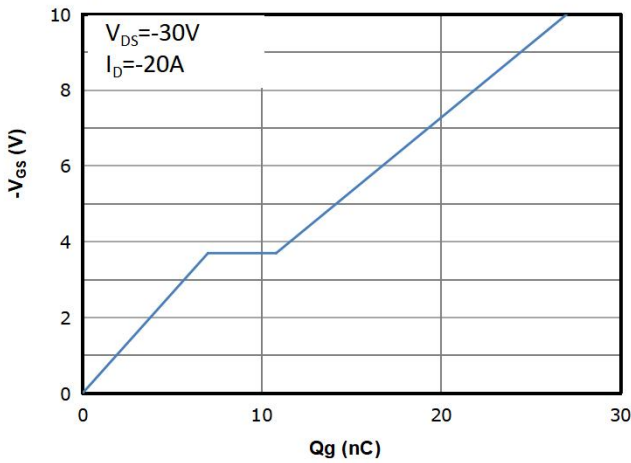


Fig 10: Body-diode Forward Characteristics

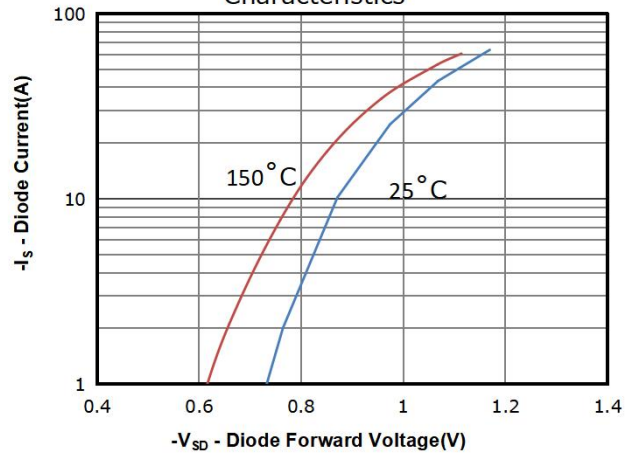


Fig 11: Power Dissipation

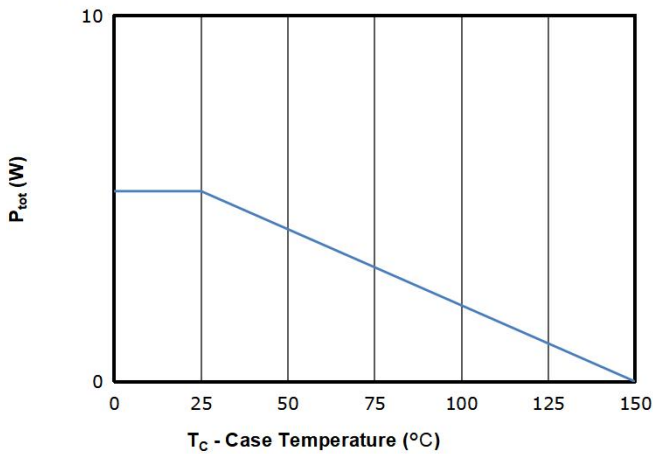


Fig 12: Drain Current Derating

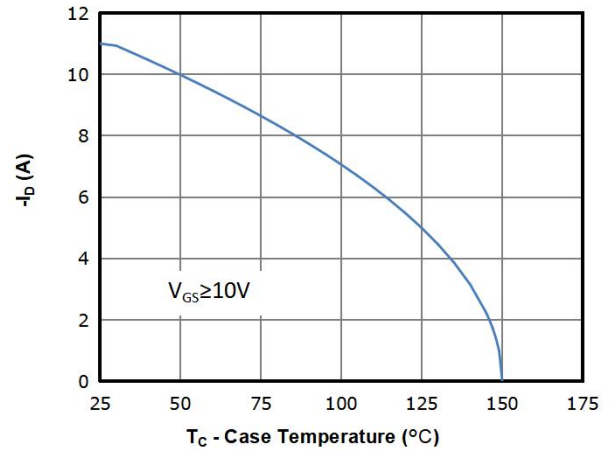




Fig 13: Safe Operating Area

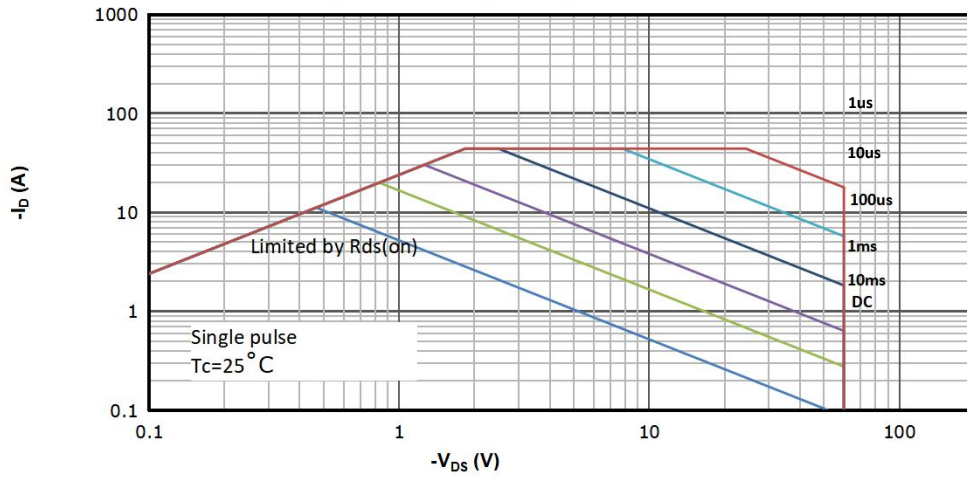
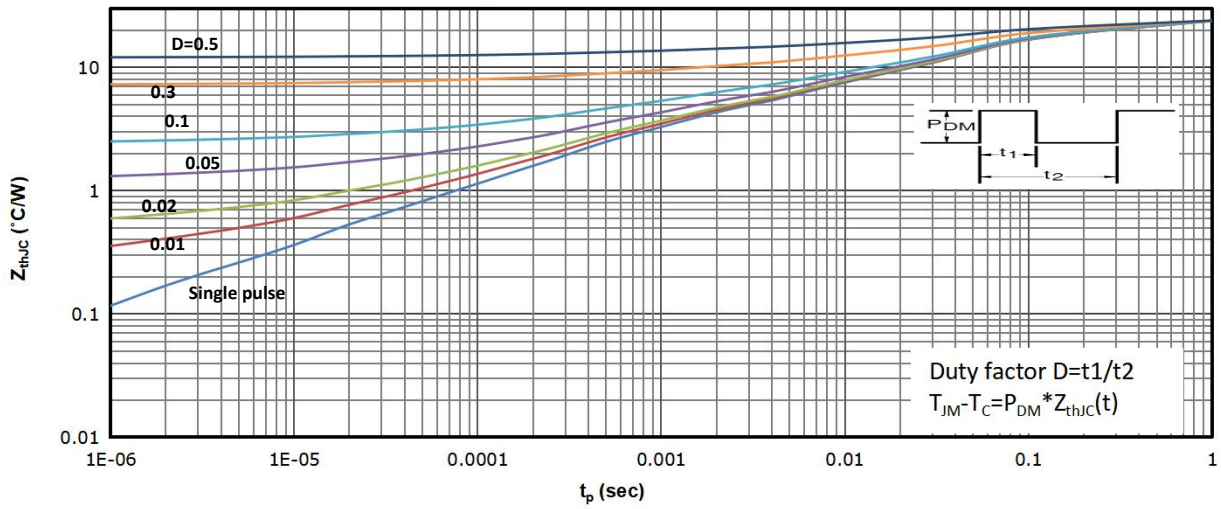
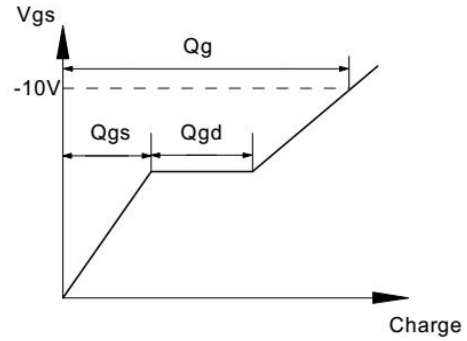
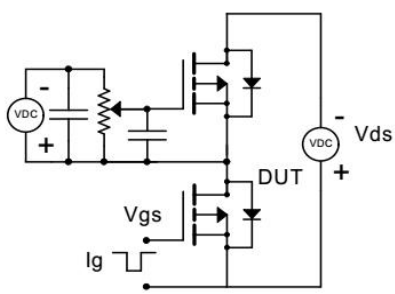


Fig 14: Max. Transient Thermal Impedance

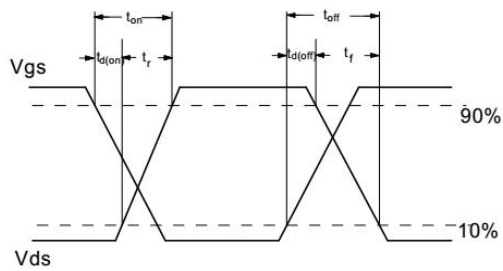
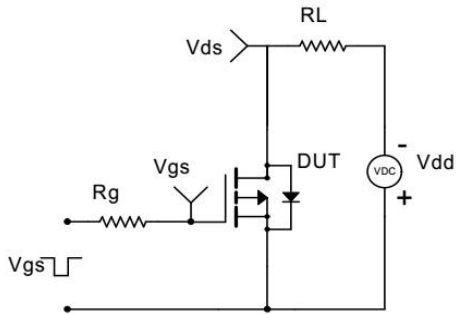


Test Circuit & Waveform

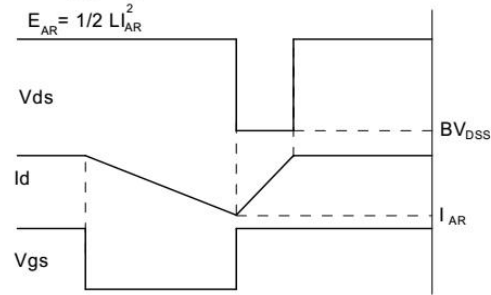
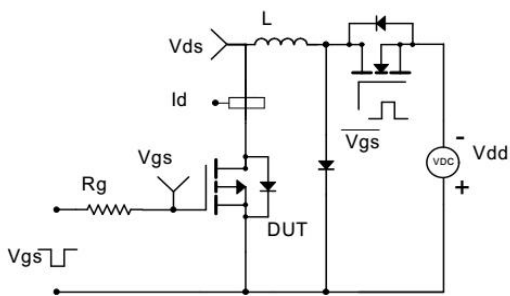
Gate Charge Test Circuit & Waveform



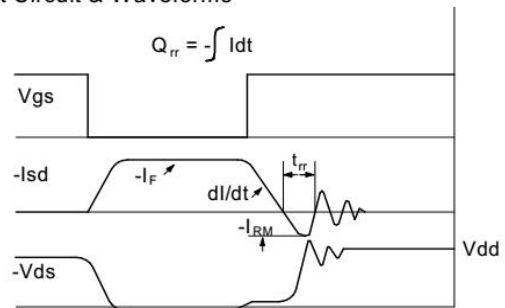
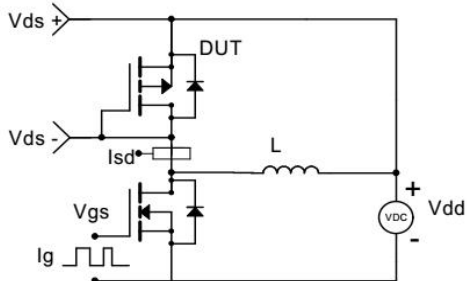
Resistive Switching Test Circuit & Waveforms



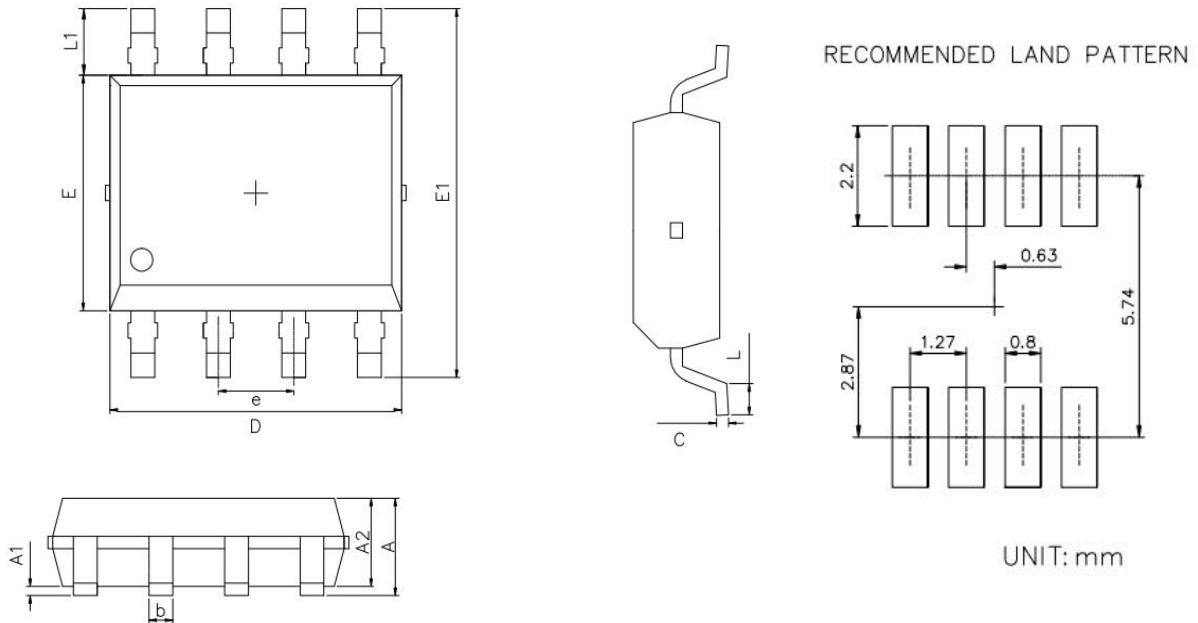
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: SOP-8



| SYMBOL | MILLIMETERS | | INCHES | |
|--------|-------------|------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.35 | 1.75 | 0.053 | 0.069 |
| A1 | 0.10 | 0.25 | 0.004 | 0.010 |
| A2 | 1.25 | 1.65 | 0.049 | 0.065 |
| b | 0.30 | 0.50 | 0.012 | 0.020 |
| c | 0.17 | 0.25 | 0.007 | 0.010 |
| D | 4.80 | 5.10 | 0.189 | 0.201 |
| E | 3.72 | 4.02 | 0.146 | 0.158 |
| E1 | 5.95 | 6.25 | 0.234 | 0.246 |
| e | 1.27 | | 0.050 | |
| L | 0.40 | 0.90 | 0.016 | 0.035 |
| L1 | 0.92 | 1.22 | 0.036 | 0.048 |



Revision History

| Revision | Date | Major changes |
|----------|------------|----------------------------|
| 1.0 | 2022/12/18 | Release of Formal Version. |

Disclaimer

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