

Features

- Uses PingWei advanced PerfectMOS5 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)

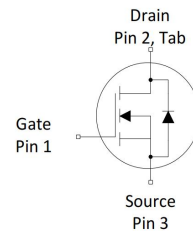
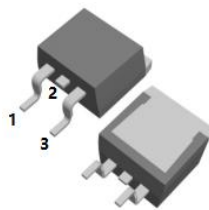


100% DVDS Tested
100% Avalanche Tested

Product Summary

| | |
|----------------------|--------|
| V_{DS} | 150V |
| $R_{DS(on)@10V}$ typ | 3.88mΩ |
| I_D | 180A |

TO-263CB-2L



Package Marking and Ordering Information

| Part # | Marking | Package | Packing | Reel Size | Tape Width | Qty |
|-------------|-------------|-------------|-----------|-----------|------------|--------|
| PW045N15CBS | PW045N15CBS | TO-263CB-2L | Tape&Reel | 13 inches | 24mm | 800pcs |

Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|----------------|------------|------------------|
| Drain-source voltage | V_{DS} | 150 | V |
| Continuous drain current | I_D | 182 | A |
| $T_C = 25^\circ\text{C}$ (Silicon limit) | | 180 | |
| $T_C = 25^\circ\text{C}$ (Package limit) | | 115 | |
| $T_C = 100^\circ\text{C}$ (Silicon limit) | | 12 | |
| $T_a = 25^\circ\text{C}$ | | | |
| Pulsed drain current ($T_C = 25^\circ\text{C}$, $t_p = 100\mu\text{s}$) | $I_{D\ pulse}$ | 720 | A |
| Avalanche energy, single pulse ($L=0.5\text{mH}$, $V_{ds}=100\text{V}$) | E_{AS} | 441 | mJ |
| Gate-Source voltage | V_{GS} | ± 20 | V |
| Power dissipation | P_{tot} | 334 | W |
| $T_C = 25^\circ\text{C}$ | | 1.5 | |
| $T_a = 25^\circ\text{C}$ | | | |
| 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 | - | - | 0.37 | °C/W | - |
| Thermal resistance, junction - ambient(min. footprint) | RthJA | - | - | 81 | °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} | 150 | - | - | V | $V_{GS}=0V, I_D=250\mu A$ |
| Gate threshold voltage | $V_{GS(th)}$ | 2.0 | - | 4.0 | V | $V_{DS}=V_{GS}, I_D=250\mu A$ |
| Zero gate voltage drain current | I_{DSS} | - | 0.05 | 1 | μA | $V_{DS}=150V, V_{GS}=0V$ $T_j=25^\circ C$ $T_j=150^\circ C$ |
| Gate-source leakage current | I_{GSS} | - | ± 10 | ± 100 | nA | $V_{GS}=\pm 20V, V_{DS}=0V$ |
| Drain-source on-state resistance | $R_{DS(on)}$ | - | 3.9 | 4.5 | mΩ | $V_{GS}=10V, I_D=20A$ |
| Transconductance | g_{fs} | - | 65 | - | S | $V_{DS}=5V, I_D=20A$ |

Dynamic Characteristic

| | | | | | | |
|------------------------------|--------------|---|------|---|----|--|
| Input Capacitance | C_{iss} | - | 6193 | - | pF | $V_{GS}=0V, V_{DS}=75V,$ $f=1MHz$ |
| Output Capacitance | C_{oss} | - | 906 | - | | |
| Reverse Transfer Capacitance | C_{rss} | - | 47 | - | | |
| Gate Total Charge | Q_G | - | 88 | - | nC | $V_{DS}=75V, I_D=20A,$ $V_{GS}=10V$ |
| Gate-Source charge | Q_{gs} | - | 32 | - | | |
| Gate-Drain charge | Q_{gd} | - | 16 | - | | |
| Turn-on delay time | $t_{d(on)}$ | - | 48 | - | ns | $V_{GS}=10V, V_{DD}=75V,$ $R_{G_ext}=6\Omega, I_D=20A$ |
| Rise time | t_r | - | 90 | - | | |
| Turn-off delay time | $t_{d(off)}$ | - | 94 | - | | |
| Fall time | t_f | - | 60 | - | | |
| Gate resistance | R_G | - | 2 | - | 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} | - | - | 1.2 | V | $V_{GS}=0V, I_{SD}=20A$ |
| Body Diode Continuous Forward Current | I_S | - | - | 180 | A | $TC = 25^{\circ}C$ |
| Body Diode Pulsed Current | I_S pulse | - | - | 720 | A | $TC = 25^{\circ}C$ |
| Body Diode Reverse Recovery Time | t_{rr} | - | 122 | - | ns | $I_F=15A, dI/dt=100A/\mu s$ |
| Body Diode Reverse Recovery Charge | Q_{rr} | - | 279 | - | nC | |



Typical Performance Characteristics

Fig 1: Output Characteristics

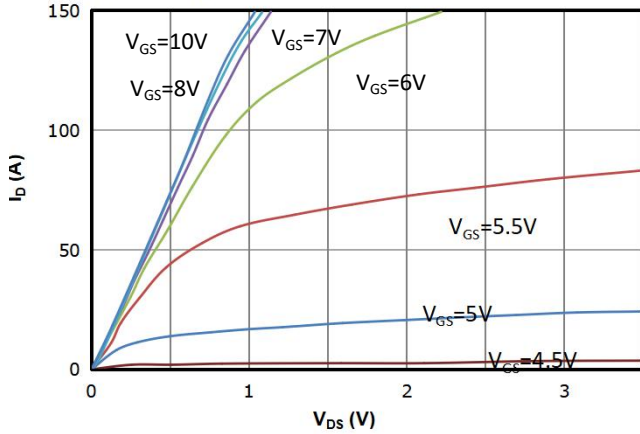


Fig 2: Transfer Characteristics

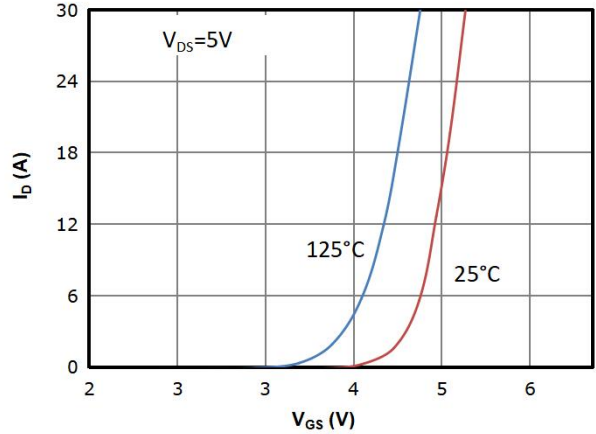


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

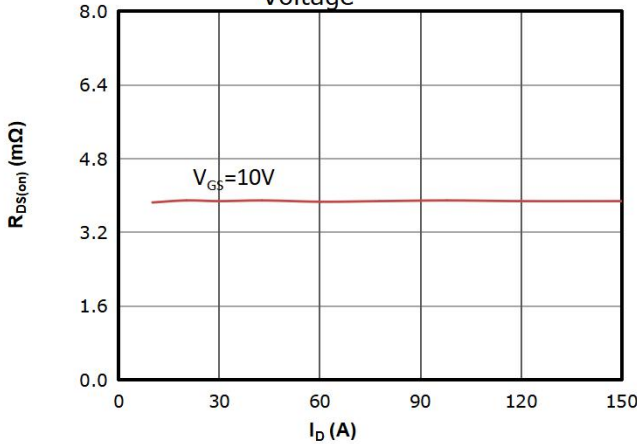


Fig 4: $R_{DS(on)}$ vs Gate Voltage

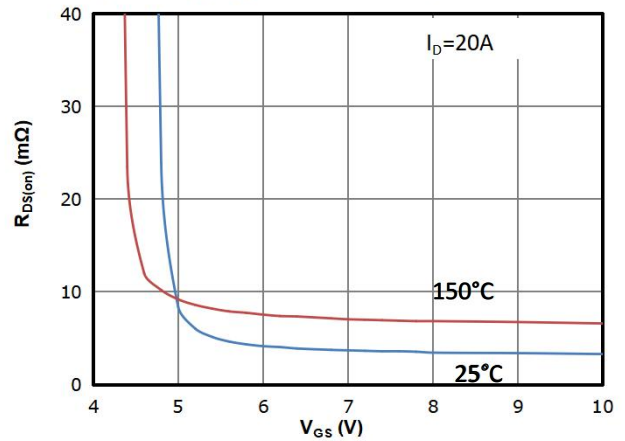


Fig 5: $R_{DS(on)}$ vs. Temperature

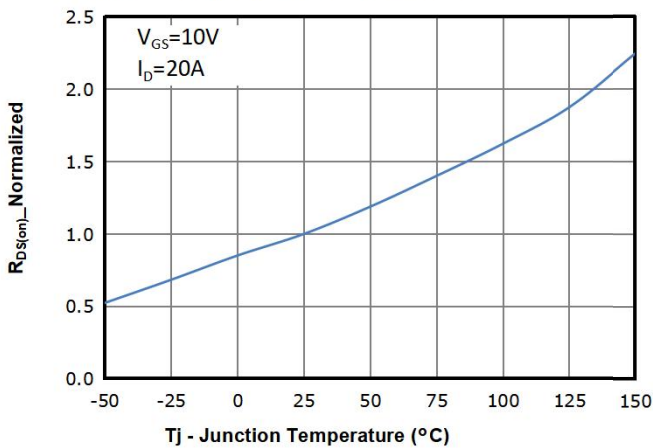


Fig 6: $V_{GS(th)}$ vs. Temperature

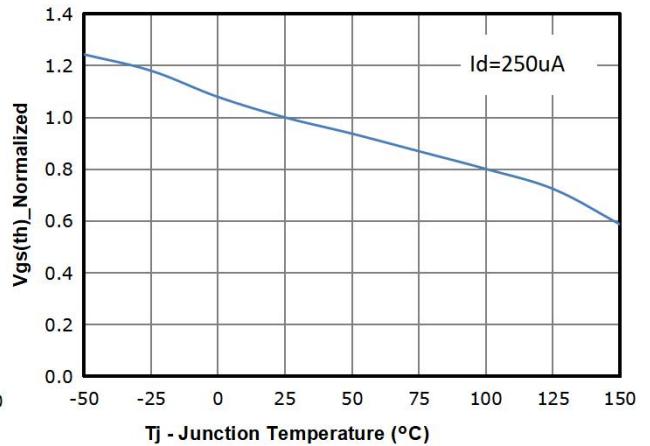




Fig 7: BVdss vs. Temperature

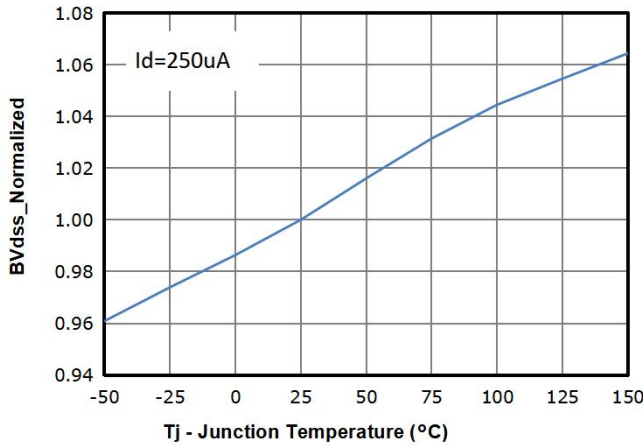


Fig 8: Capacitance Characteristics

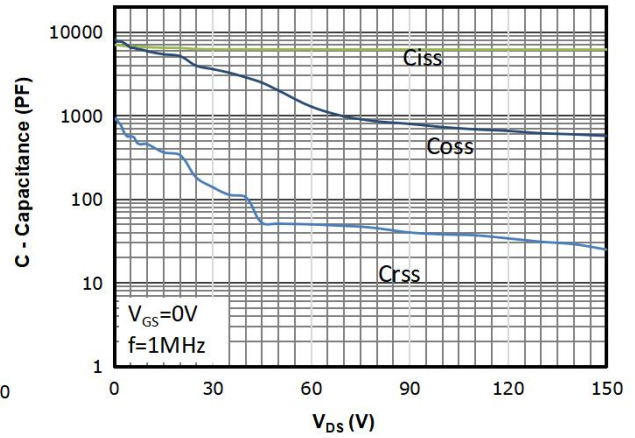


Fig 9: Gate Charge Characteristics

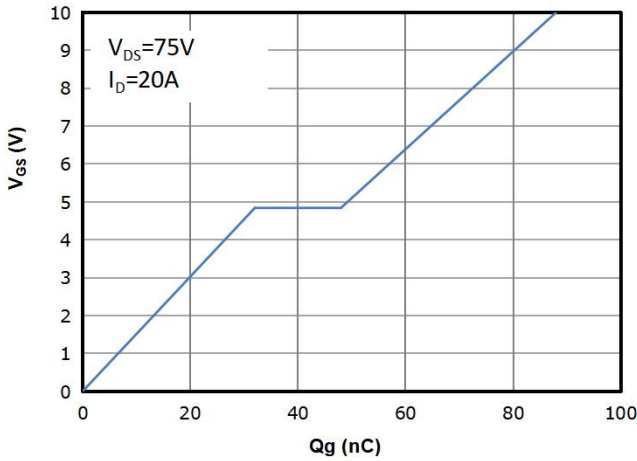


Fig 10: Body-diode Forward Characteristics

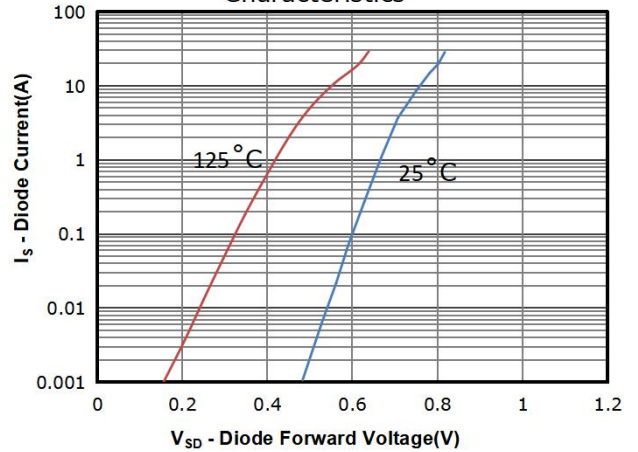


Fig 11: Power Dissipation

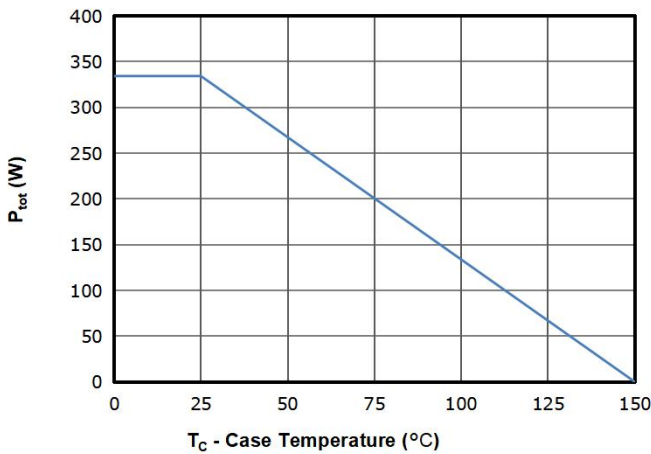


Fig 12: Drain Current Derating

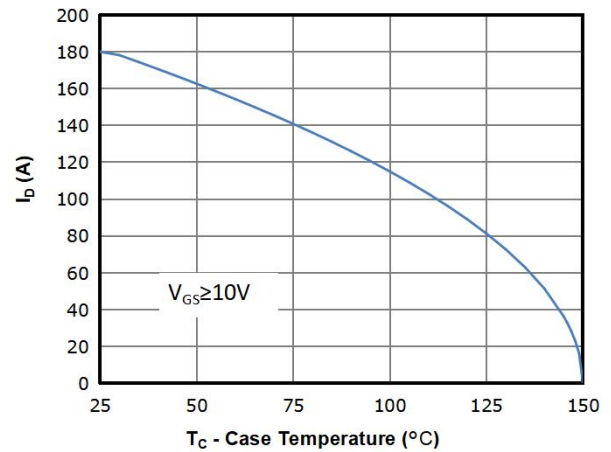




Fig 13: Safe Operating Area

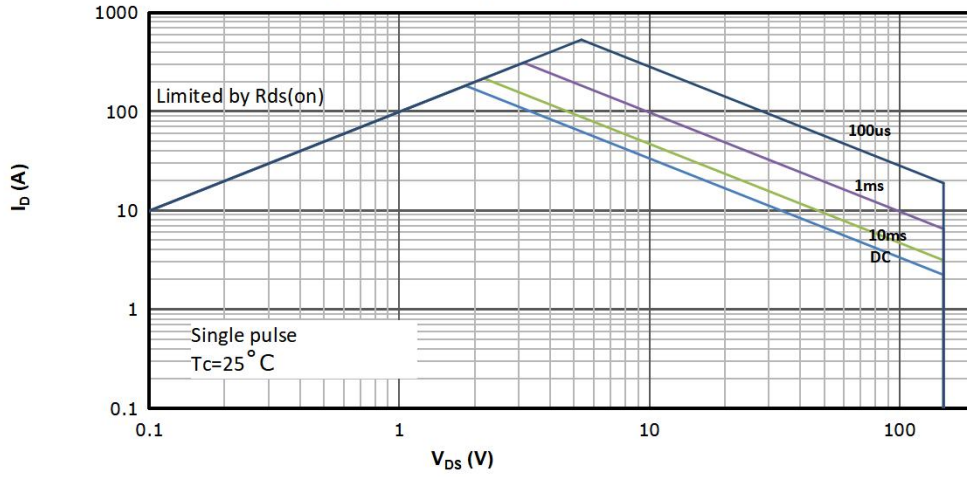
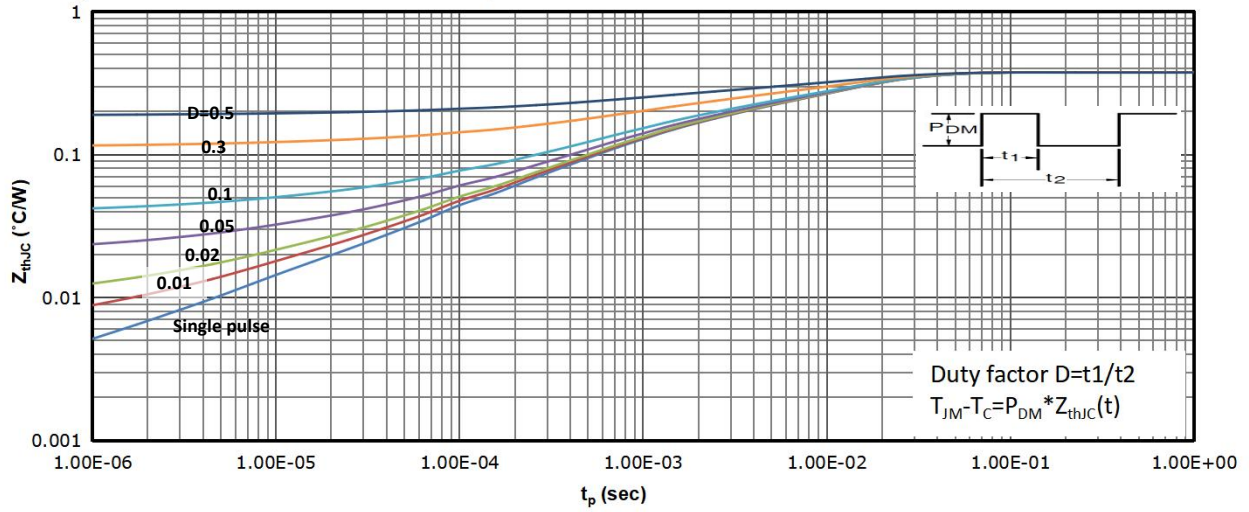
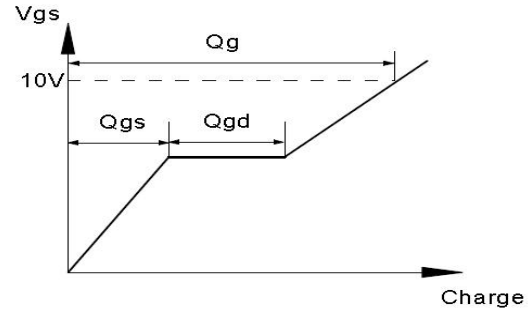
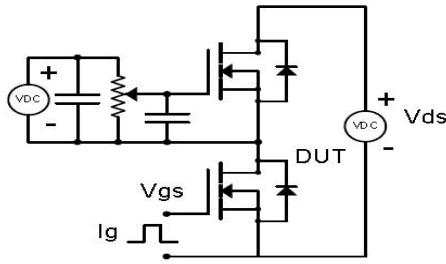


Fig 14: Max. Transient Thermal Impedance

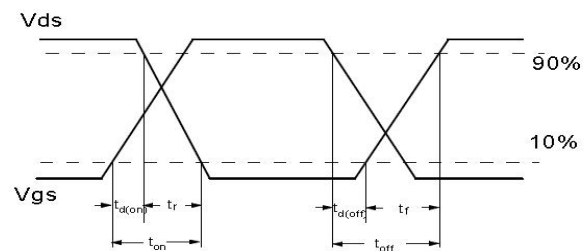
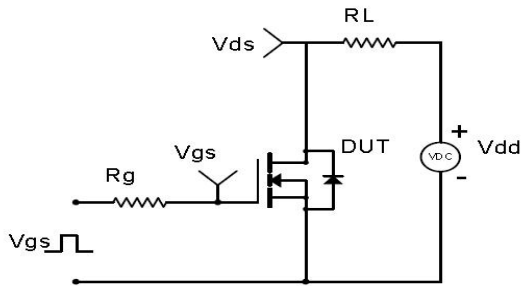


Test Circuit & Waveform

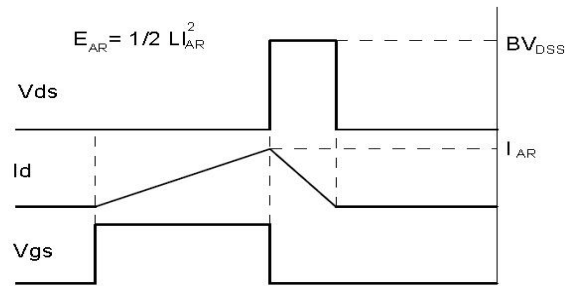
Gate Charge Test Circuit & Waveform



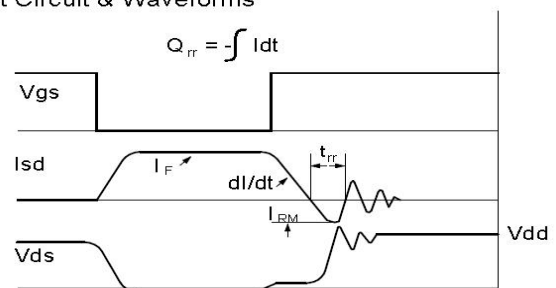
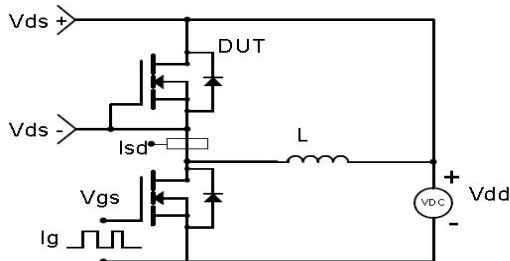
Resistive Switching Test Circuit & Waveforms



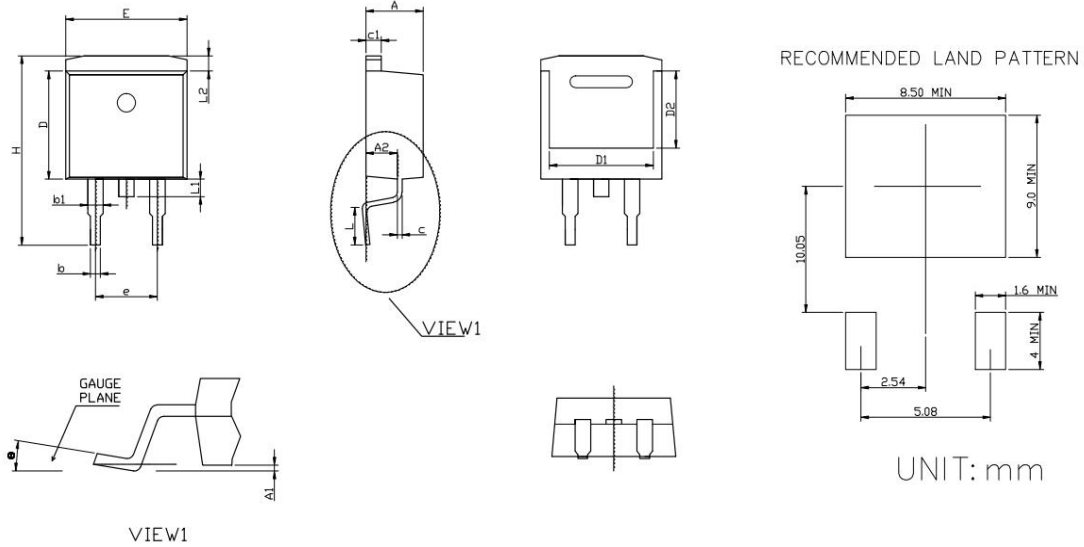
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: TO-263CB-2L



| SYMBOL | MILLIMETERS | | INCHES | |
|--------|-------------|-------|--------|-------|
| | MIN | MAX | MIN | MAX |
| A | 4.40 | 4.80 | 0.173 | 0.189 |
| A1 | 0.05 | 0.30 | 0.002 | 0.012 |
| A2 | 2.25 | 2.55 | 0.089 | 0.100 |
| b | 0.72 | 0.92 | 0.028 | 0.036 |
| b1 | 1.12 | 1.42 | 0.044 | 0.056 |
| c | 0.40 | 0.60 | 0.016 | 0.024 |
| c1 | 1.20 | 1.40 | 0.047 | 0.055 |
| D | 8.80 | 9.40 | 0.346 | 0.370 |
| D1 | 7.75 | 8.15 | 0.305 | 0.321 |
| D2 | 6.55 | 6.95 | 0.258 | 0.274 |
| E | 9.65 | 10.35 | 0.380 | 0.407 |
| e | 5.08 | | 0.200 | |
| H | 14.70 | 15.60 | 0.579 | 0.614 |
| L | 2.30 | 2.60 | 0.091 | 0.102 |
| L1 | 1.20 | 1.60 | 0.047 | 0.063 |
| L2 | 0.95 | 1.30 | 0.037 | 0.051 |
| θ | 0° | 8° | 0° | 8° |



Revision History

| Revision | Date | Major changes |
|----------|-----------|----------------------------|
| 1.0 | 2023/5/17 | Release of Formal Version. |

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