


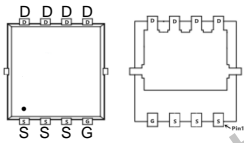
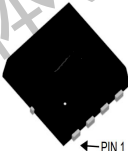
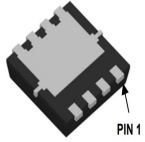
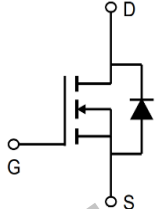


TM100N03DF

N-Channel Enhancement Mosfet

| | |
|---|---|
| <p>General Description</p> <ul style="list-style-type: none"> • Low R_{DS(ON)} • RoHS and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> • Load switch • PWM | <p>General Features</p> <p>V_{DS} = 30V I_D = 100A</p> <p>R_{DS(ON)} = 2.5 mΩ (Typ.) @ V_{GS} = 10V</p> <p>100% UIS Tested 100% R_g Tested</p>  |
|---|---|

DF:PDFN3x3-8L

Marking: 100N03 OR 003

Absolute Maximum Ratings (T_C = 25°C unless otherwise noted)

| Symbol | Parameter | Rating | Units |
|---------------------------------------|--|------------|-------|
| V _{DS} | Drain-Source Voltage | 30 | V |
| V _{GS} | Gate-Source Voltage | ±20 | V |
| I _D @T _C =25°C | Continuous Drain Current, -V _{GS} @ -10V ¹ | 100 | A |
| I _D @T _C =100°C | Continuous Drain Current, -V _{GS} @ -10V ¹ | 60 | A |
| I _{DM} | Pulsed Drain Current ² | 320 | A |
| E _{AS} | Single pulse avalanche energy ² | 156 | mJ |
| P _D @T _C =25°C | Total Power Dissipation ⁴ | 31.7 | W |
| T _{STG} | Storage Temperature Range | -55 to 150 | °C |
| T _J | Operating Junction Temperature Range | -55 to 150 | °C |

Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|------------------|--|------|------|------|
| R _{θJA} | Thermal Resistance Junction-Ambient ¹ | --- | 62 | °C/W |
| R _{θJC} | Thermal Resistance Junction-Case ¹ | --- | 3.6 | °C/W |



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

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|---|---|-----|------|-----------|---------------|
| Off Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\ \mu\text{A}$ | 30 | --- | --- | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{GS}=0V, V_{DS}=30V$ | --- | --- | 1 | μA |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0A$ | --- | --- | ± 100 | nA |
| On Characteristics | | | | | | |
| $V_{GS(th)}$ | GATE-Source Threshold Voltage | $V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$ | 1 | 1.6 | 2.5 | V |
| $R_{DS(on)}$ | Drain-Source On Resistance ³ | $V_{GS}=10V, I_D=30A$ | --- | 2.5 | 3 | m Ω |
| | | $V_{GS}=4.5V, I_D=20A$ | --- | 4.3 | 5.5 | |
| Dynamic Characteristics | | | | | | |
| C_{iss} | Input Capacitance | $V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$ | --- | 3499 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 499 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 430 | --- | |
| Switching Characteristics | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DS}=15V, I_D=30A,$ $R_G=3\ \Omega, V_{GS}=10V$ | --- | 12 | --- | ns |
| t_r | Rise Time | | --- | 119 | --- | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | --- | 59 | --- | ns |
| t_f | Fall Time | | --- | 109 | --- | ns |
| Q_g | Total Gate Charge | $V_{GS}=10V, V_{DS}=15V,$ $I_D=30A$ | --- | 69 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 10 | --- | nC |
| Q_{gd} | Gate-Drain "Miller" Charge | | --- | 17 | --- | nC |
| Drain-Source Diode Characteristics | | | | | | |
| V_{SD} | Diode Forward Voltage | $V_{GS}=0V, I_{SD}=30A$ | --- | --- | 1.2 | V |
| I_S | Continuous Drain Current | $V_D=V_G=0V$ | --- | --- | 100 | A |
| I_{SM} | Pulsed Drain Current | | --- | --- | 320 | A |
| T_{rr} | Reverse Recovery Time | $I_F=20A, T_J=25^\circ\text{C}$ | --- | 21 | --- | NS |
| Q_{rr} | Reverse Recovery Charge | $di/dt=100A/\mu\text{s}$ | --- | 9 | --- | NC |

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J=25^\circ\text{C}, V_{DD}=15V, V_G=10V, R_G=25\ \Omega, L=0.5\text{mH}, I_{AS}=25A$
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$



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Typical Characteristics

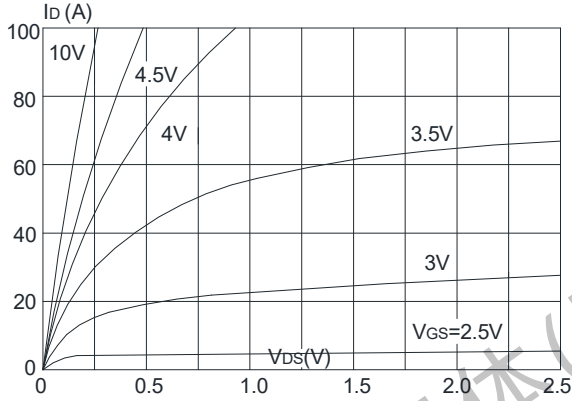


Figure 1: Output Characteristics

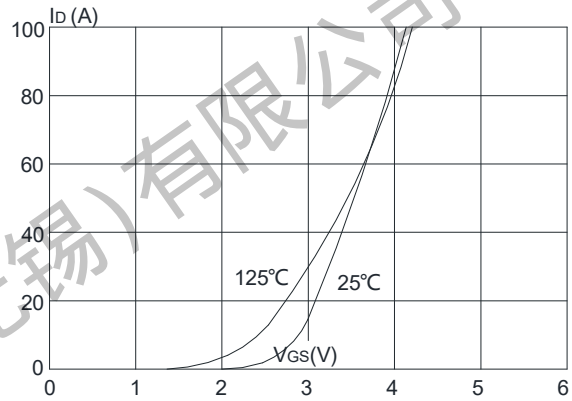


Figure 2: Typical Transfer Characteristics

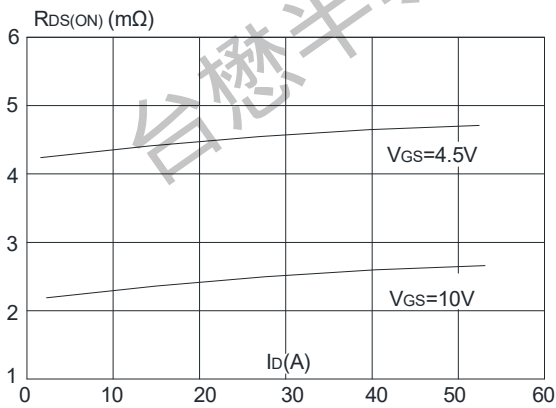


Figure 3: On-resistance vs. Drain Current

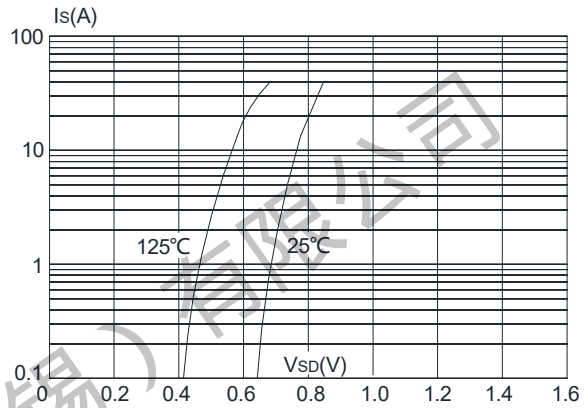


Figure 4: Body Diode Characteristics

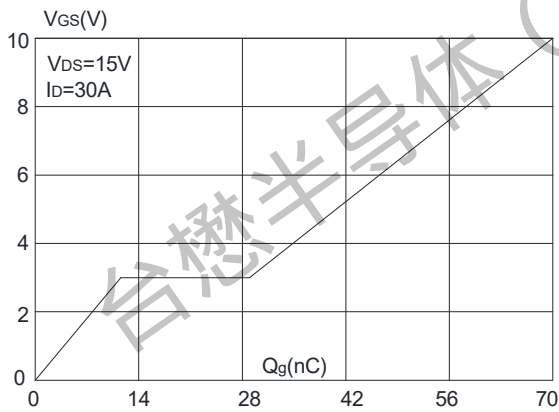


Figure 5: Gate Charge Characteristics

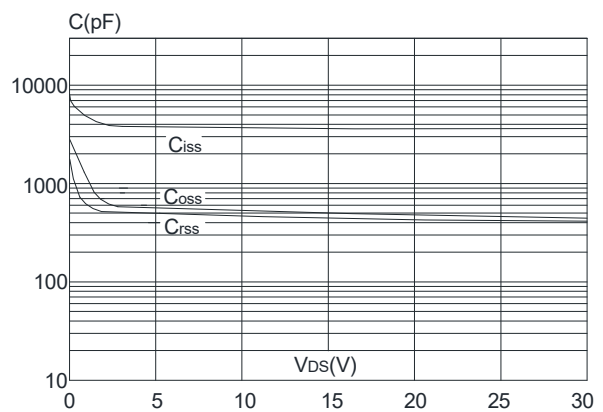


Figure 6: Capacitance Characteristics



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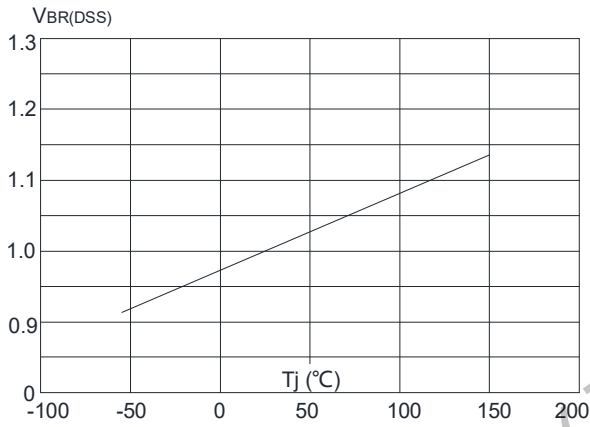


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

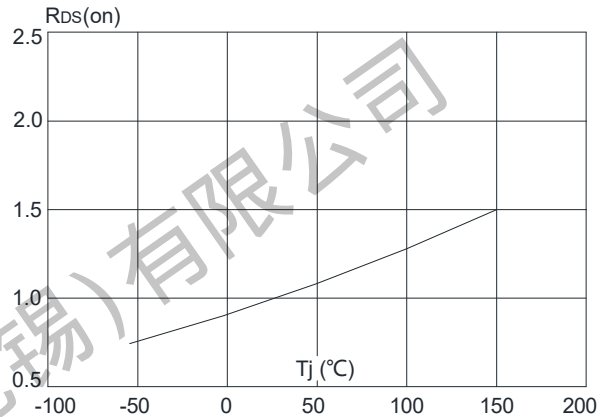


Figure 8: Normalized on Resistance vs. Junction Temperature

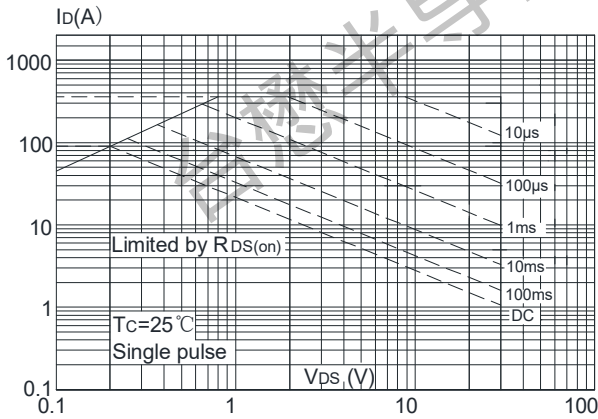


Figure 9: Maximum Safe Operating Area

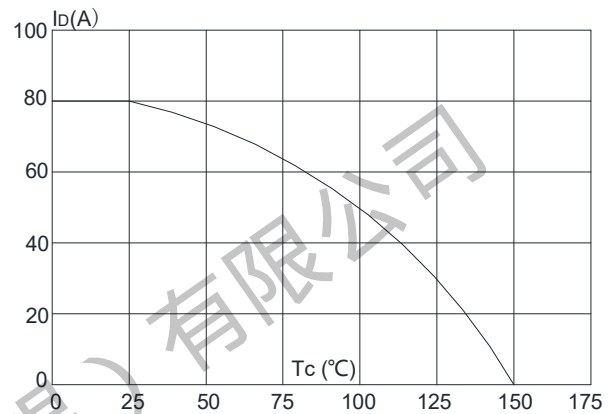


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

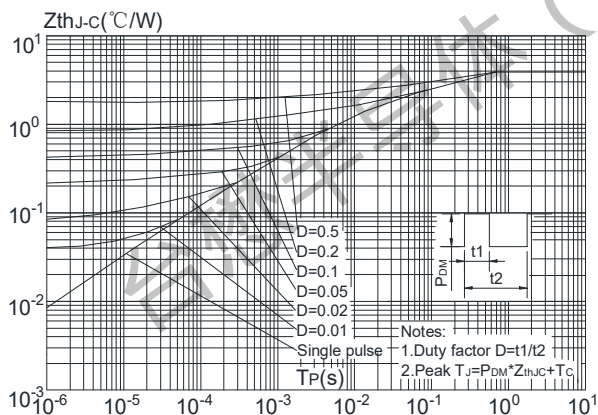


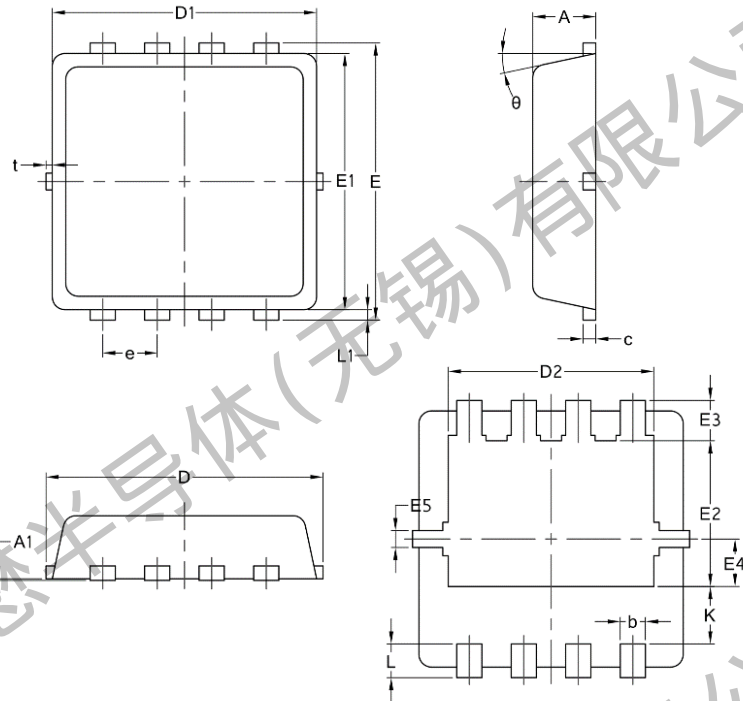
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



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N-Channel Enhancement Mosfet

Package Mechanical Data:DFN3x3-8L

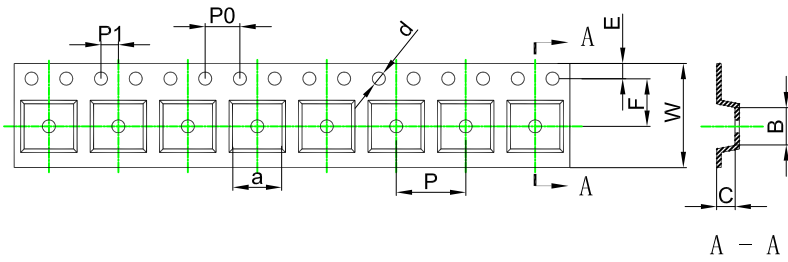


| Symbol | Common | | |
|--------|--------|-------|------|
| | mm | | |
| | Mim | Nom | Max |
| A | 0.70 | 0.75 | 0.85 |
| A1 | / | / | 0.05 |
| b | 0.20 | 0.30 | 0.40 |
| c | 0.10 | 0.152 | 0.25 |
| D | 3.15 | 3.30 | 3.45 |
| D1 | 3.00 | 3.15 | 3.25 |
| D2 | 2.29 | 2.45 | 2.65 |
| E | 3.15 | 3.30 | 3.45 |
| E1 | 2.90 | 3.05 | 3.20 |
| E2 | 1.54 | 1.74 | 1.94 |
| E3 | 0.28 | 0.48 | 0.65 |
| E4 | 0.37 | 0.57 | 0.77 |
| E5 | 0.10 | 0.20 | 0.30 |
| e | 0.60 | 0.65 | 0.70 |
| K | 0.59 | 0.69 | 0.89 |
| L | 0.30 | 0.40 | 0.50 |
| L1 | 0.06 | 0.125 | 0.20 |
| t | 0 | 0.075 | 0.13 |
| Φ | 10 | 12 | 14 |

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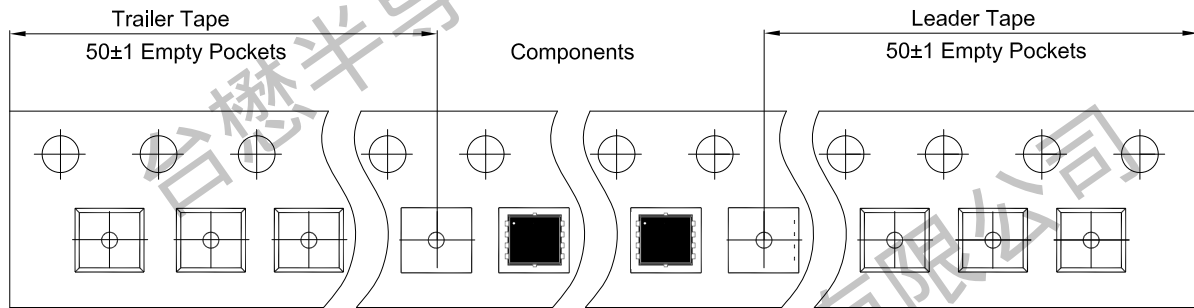
PDFN3x3-8L Embossed Carrier Tape



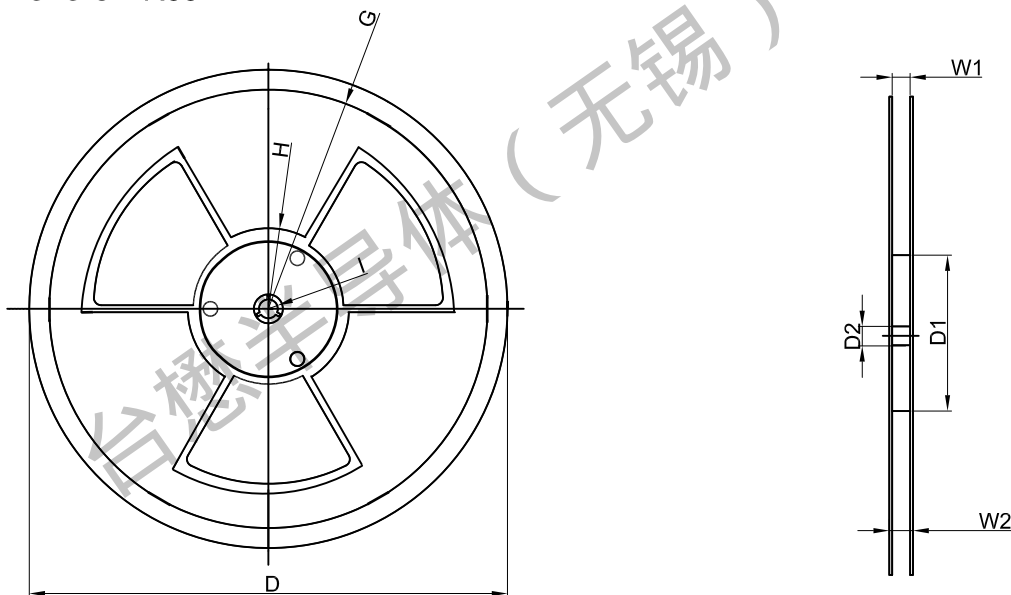
Packaging Description:
SOP-8L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2,500 units per 13" or 33cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).
ALL DIM IN mm

| Dimensions are in millimeter | | | | | | | | | | |
|------------------------------|------|------|------|-------|------|------|------|------|------|-------|
| Pkg type | a | B | C | d | E | F | P0 | P | P1 | W |
| PDFN3x3-8L | 6.40 | 5.40 | 2.10 | Ø1.50 | 1.75 | 5.50 | 4.00 | 8.00 | 2.00 | 12.00 |

PDFN3x3-8L Tape Leader and Trailer



PDFN3x3-8L Reel



| Dimensions are in millimeter | | | | | | | | |
|------------------------------|---------|--------|-------|---------|--------|-------|-------|-------|
| Reel Option | D | D1 | D2 | G | H | I | W1 | W2 |
| 13"Dia | Ø330.00 | 100.00 | 13.00 | R135.00 | R55.00 | R6.50 | 12.00 | 14.00 |

| REEL | Reel Size | Box | Box Size(mm) | Carton | Carton Size(mm) | G.W.(kg) |
|-----------|-----------|------------|--------------|------------|-----------------|----------|
| 5,000 pcs | 13 inch | 10,000 pcs | 370×355×52 | 50,000 pcs | 400×360×368 | |

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Revision history:

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|------------|-------|-------------|------|
| 2023.07.01 | 23.07 | Original | |