

100V N-Ch Power MOSFET

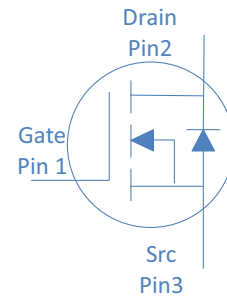
Feature

- ◇ High Speed Power Switching, Logic Level
- ◇ Enhanced Body diode dv/dt capability
- ◇ Enhanced Avalanche Ruggedness

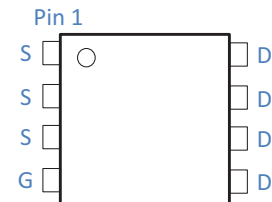
|                         |               |     |           |
|-------------------------|---------------|-----|-----------|
| $V_{DS}$                |               | 100 | V         |
| $R_{DS(on),typ}$        | $V_{GS}=10V$  | 4.4 | $m\Omega$ |
| $R_{DS(on),typ}$        | $V_{GS}=4.5V$ | 5.7 | $m\Omega$ |
| $I_D$ (Silicon Limited) |               | 103 | A         |

Application

- ◇ Synchronous Rectification in SMPS
- ◇ Hard Switching and High Speed Circuit
- ◇ Power Tools
- ◇ UPS
- ◇ Motor Control
- ◇ Halogen free



| Part Number | Package | Marking |
|-------------|---------|---------|
| RM050N100DF | DFN5x6  | 050N100 |



Absolute Maximum Ratings at  $T_j=25^\circ\text{C}$  (unless otherwise specified)

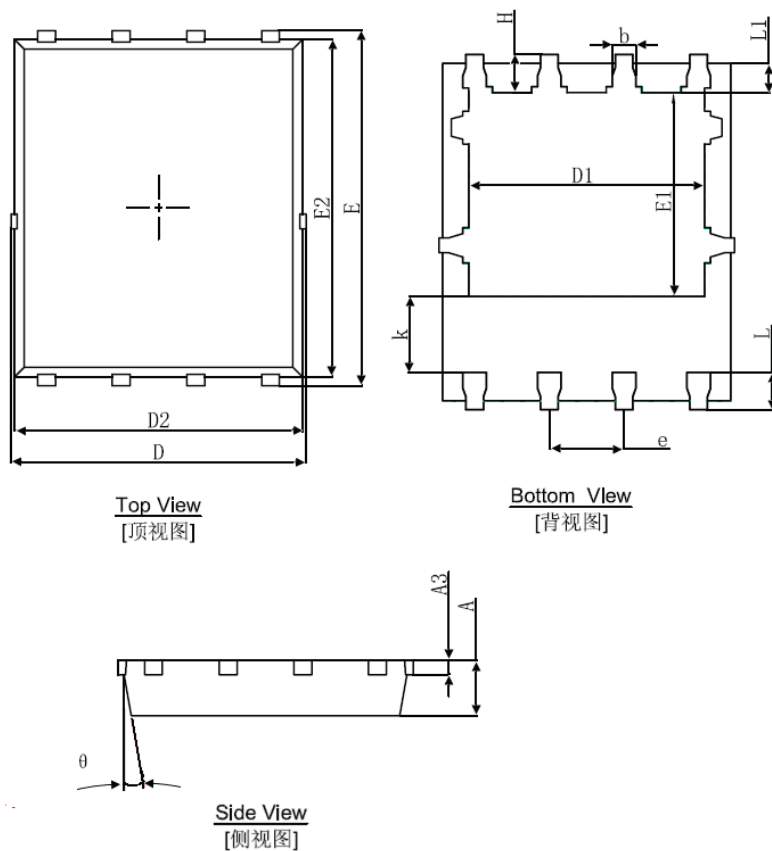
| Parameter                                  | Symbol   | Conditions                             | Value    | Unit |
|--|----------|--|----------|------|
| Continuous Drain Current (Silicon Limited) | $I_D$    | $T_C=25^\circ\text{C}$                 | 103      | A    |
|  |          | $T_C=100^\circ\text{C}$                | 65       |      |
| Drain to Source Voltage                    | $V_{DS}$ | -                                      | 100      | V    |
| Gate to Source Voltage                     | $V_{GS}$ | -                                      | $\pm 20$ | V    |
| Pulsed Drain Current                       | $I_{DM}$ | -                                      | 300      | A    |
| Avalanche Energy, Single Pulse             | $E_{AS}$ | $L=0.1\text{mH}, T_C=25^\circ\text{C}$ | 80       | mJ   |

## Electrical Characteristics at T<sub>j</sub>=25°C (unless otherwise specified)

| Static Characteristics            |                       |  |       |      |      |      |
|-----------------------------------|-----------------------|--|-------|------|------|------|
| Parameter                         | Symbol                | Conditions   | Value |      |      | Unit |
|                                   |                       |  | min   | typ  | max  |      |
| Drain to Source Breakdown Voltage | V <sub>(BR)DSS</sub>  | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA   | 100   | -    | -    | V    |
| Gate Threshold Voltage            | V <sub>GS(th)</sub>   | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA                                 | 1.4   | 1.6  | 2.4  |      |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>      | V <sub>GS</sub> =0V, V <sub>DS</sub> =100V, T <sub>j</sub> =25°C                         | -     | -    | 1    | μA   |
|                                   |                       | V <sub>GS</sub> =0V, V <sub>DS</sub> =100V, T <sub>j</sub> =100°C                        | -     | -    | 100  |      |
| Gate to Source Leakage Current    | I <sub>GSS</sub>      | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V   | -     | -    | ±100 | nA   |
| Drain to Source on Resistance     | R <sub>DS(on)</sub>   | V <sub>GS</sub> =10V, I <sub>D</sub> =20A  | -     | 4.4  | 5    | mΩ   |
| Drain to Source on Resistance     | R <sub>DS(on)</sub>   | V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A   | -     | 5.7  | 7    | mΩ   |
| Transconductance                  | g <sub>fs</sub>       | V <sub>DS</sub> =5V, I <sub>D</sub> =20A   | -     | 65   | -    | S    |
| Gate Resistance                   | R <sub>G</sub>        | V <sub>GS</sub> =0V, V <sub>DS</sub> Open, f=1MHz  | -     | 1.2  | -    | Ω    |
| Dynamic Characteristics           |                       |  |       |      |      |      |
| Input Capacitance                 | C <sub>iss</sub>      | V <sub>GS</sub> =0V, V <sub>DS</sub> =50V, f=1MHz  | -     | 2990 | -    | pF   |
| Output Capacitance                | C <sub>oss</sub>      |  | -     | 562  | -    |      |
| Reverse Transfer Capacitance      | C <sub>rss</sub>      |  | -     | 18   | -    |      |
| Total Gate Charge                 | Q <sub>g</sub>        | V <sub>DD</sub> =50V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V                          | -     | 50   | -    | nC   |
| Total Gate Charge                 | Q <sub>g</sub> (4.5V) |  | -     | 27   | -    |      |
| Gate to Source Charge             | Q <sub>gs</sub>       |  | -     | 9    | -    |      |
| Gate to Drain (Miller) Charge     | Q <sub>gd</sub>       |  | -     | 10   | -    |      |
| Turn on Delay Time                | t <sub>d(on)</sub>    | V <sub>DD</sub> =50V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V,<br>R <sub>G</sub> =10Ω, | -     | 12   | -    | ns   |
| Rise time                         | t <sub>r</sub>        |  | -     | 8    | -    |      |
| Turn off Delay Time               | t <sub>d(off)</sub>   |  | -     | 27   | -    |      |
| Fall Time                         | t <sub>f</sub>        |  | -     | 6    | -    |      |
| Reverse Diode Characteristics     |                       |  |       |      |      |      |
| Diode Forward Voltage             | V <sub>SD</sub>       | V <sub>GS</sub> =0V, I <sub>F</sub> =20A   | -     | 0.9  | 1.2  | V    |
| Reverse Recovery Time             | t <sub>rr</sub>       | V <sub>R</sub> =50V, I <sub>F</sub> =20A, dI <sub>F</sub> /dt=500A/μs                    | -     | 40   | -    | ns   |
| Reverse Recovery Charge           | Q <sub>rr</sub>       |  | -     | 200  | -    | nC   |

\*Rdson limit limited by wafer test equipment, Rdson Typ & other data base on DFN5\*6 package

## DFN5X6-8L Package Information



| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min.                      | Max.  | Min.                 | Max.  |
| A        | 0.900                     | 1.000 | 0.035                | 0.039 |
| A3       | 0.254REF.                 |       | 0.010REF.            |       |
| D        | 4.944                     | 5.096 | 0.195                | 0.201 |
| E        | 5.974                     | 6.126 | 0.235                | 0.241 |
| D1       | 3.910                     | 4.110 | 0.154                | 0.162 |
| E1       | 3.375                     | 3.575 | 0.133                | 0.141 |
| D2       | 4.824                     | 4.976 | 0.190                | 0.196 |
| E2       | 5.674                     | 5.826 | 0.223                | 0.229 |
| k        | 1.190                     | 1.390 | 0.047                | 0.055 |
| b        | 0.350                     | 0.450 | 0.014                | 0.018 |
| e        | 1.270TYP.                 |       | 0.050TYP.            |       |
| L        | 0.559                     | 0.711 | 0.022                | 0.028 |
| L1       | 0.424                     | 0.576 | 0.017                | 0.023 |
| H        | 0.574                     | 0.726 | 0.023                | 0.029 |
| $\theta$ | 8°                        | 12°   | 8°                   | 12°   |

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