

# 10V Drive Nch MOS FET

## RDX080N50

### ●Structure

Silicon N-channel MOS FET

### ●Features

- 1) Low on-resistance.
- 2) Low input capacitance.
- 3) Excellent resistance to damage from static electricity.

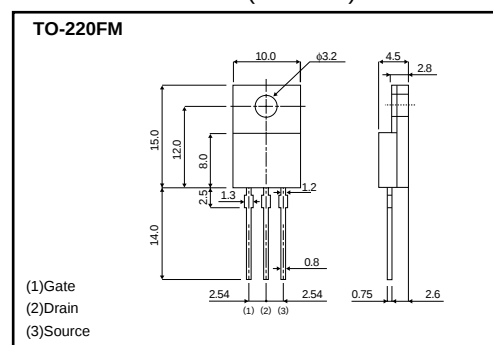
### ●Applications

Switching

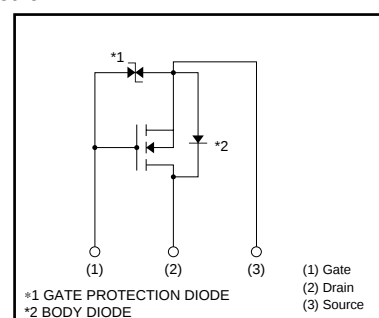
### ●Packaging specifications

| Type      | Package                      | Bulk |
|-----------|------------------------------|------|
|           | Code                         | —    |
|           | Basic ordering unit (pieces) | 500  |
| RDX080N50 |                              | ○    |

### ●External dimensions (Unit : mm)



### ●Inner circuit



### ●Absolute maximum ratings (Ta=25°C)

| Parameter                         |            | Symbol      | Limits      | Unit |
|-----------------------------------|------------|-------------|-------------|------|
| Drain-source voltage              |            | $V_{DS}$    | 500         | V    |
| Gate-source voltage               |            | $V_{GS}$    | $\pm 30$    | V    |
| Drain current                     | Continuous | $I_D$ *1    | $\pm 8$     | A    |
|                                   | Pulsed     | $I_{DP}$ *2 | $\pm 32$    | A    |
| Source current<br>(Body diode)    | Continuous | $I_S$       | 8           | A    |
|                                   | Pulsed     | $I_{SP}$ *2 | 32          | A    |
| Avalanche current                 |            | $I_{AS}$ *3 | 8           | A    |
| Avalanche energy                  |            | $E_{AS}$ *4 | 85          | mJ   |
| Total power dissipation (Tc=25°C) |            | $P_D$       | 40          | W    |
| Channel temperature               |            | Tch         | 150         | °C   |
| Range of storage temperature      |            | Tstg        | -55 to +150 | °C   |

\*1 Limited only by maximum temperature allowed \*2  $P_w \leq 10\mu s$ , Duty cycle  $\leq 1\%$   
 \*3  $L \leq 2.3mH$   $V_{DD}=90V$   $R_g=25\Omega$  \*4  $L \leq 2.3mH$   $V_{DD}=90V$   $R_g=25\Omega$  starting Tch=25°C

### ●Thermal resistance

| Parameter       | Symbol         | Limits | Unit |
|-----------------|----------------|--------|------|
| Channel to case | $R_{th(ch-c)}$ | 3.125  | °C/W |

## Transistors

## ●Electrical characteristics (Ta=25°C)

| Parameter                               | Symbol         | Min. | Typ. | Max. | Unit | Conditions                         |
|-----------------------------------------|----------------|------|------|------|------|------------------------------------|
| Gate-source leakage                     | $I_{GSS}$      | —    | —    | ±10  | μA   | $V_{GS} = \pm 25V, V_{DS} = 0V$    |
| Drain-source breakdown voltage          | $V_{(BR) DSS}$ | 500  | —    | —    | V    | $I_D = 1mA, V_{GS} = 0V$           |
| Zero gate voltage drain current         | $I_{DSS}$      | —    | —    | 25   | μA   | $V_{DS} = 500V, V_{GS} = 0V$       |
| Gate threshold voltage                  | $V_{GS(th)}$   | 2.0  | —    | 4.0  | V    | $V_{DS} = 10V, I_D = 1mA$          |
| Static drain-source on-state resistance | $R_{DS(on)}^*$ | —    | 0.65 | 0.85 | Ω    | $I_D = 4A, V_{GS} = 10V$           |
| Forward transfer admittance             | $ Y_{fs} ^*$   | 3    | 5    | —    | S    | $V_{DS} = 10V, I_D = 4A$           |
| Input capacitance                       | $C_{iss}$      | —    | 920  | —    | pF   | $V_{DS} = 25V$                     |
| Output capacitance                      | $C_{oss}$      | —    | 125  | —    | pF   | $V_{GS} = 0V$                      |
| Reverse transfer capacitance            | $C_{rss}$      | —    | 27   | —    | pF   | $f = 1MHz$                         |
| Turn-on delay time                      | $t_{d(on)}^*$  | —    | 20   | —    | ns   | $V_{DD} \doteq 150V$               |
| Rise time                               | $t_r^*$        | —    | 22   | —    | ns   | $I_D = 4A$                         |
| Turn-off delay time                     | $t_{d(off)}^*$ | —    | 55   | —    | ns   | $V_{GS} = 10V$                     |
| Fall time                               | $t_f^*$        | —    | 30   | —    | ns   | $R_L = 37.5\Omega$                 |
| Total gate charge                       | $Q_g^*$        | —    | 28   | —    | nC   | $V_{DD} \doteq 250V, V_{GS} = 10V$ |
| Gate-source charge                      | $Q_{gs}^*$     | —    | 6.5  | —    | nC   | $I_D = 8A$                         |
| Gate-drain charge                       | $Q_{gd}^*$     | —    | 12   | —    | nC   | $R_L = 31.3\Omega, R_G = 10\Omega$ |

\* Pulsed

## ●Body diode characteristics (Source-drain) (Ta=25°C)

| Parameter               | Symbol     | Min. | Typ. | Max. | Unit | Conditions                 |
|-------------------------|------------|------|------|------|------|----------------------------|
| Forward voltage         | $V_{SD}^*$ | —    | —    | 1.5  | V    | $I_S = 8A, V_{GS} = 0V$    |
| Reverse recovery time   | $t_{rr}$   | —    | 375  | —    | ns   | $I_{DR} = 8A, V_{GS} = 0V$ |
| Reverse recovery charge | $Q_{rr}$   | —    | 2.5  | —    | μC   | $di/dt = 100A / \mu s$     |

\* Pulsed

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