# 10V Drive Nch MOS FET

## RDX080N50

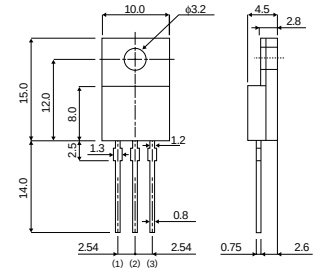
### ●Structure
Silicon N-channel MOS FET

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

### ●Applications
Switching

### ●External dimensions (Unit : mm)

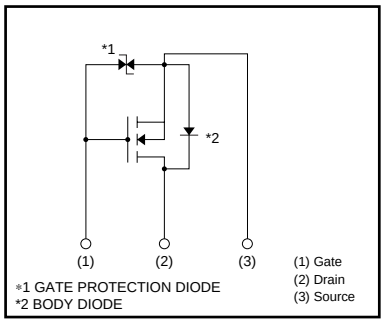
**TO-220FM**




### ●Packaging specifications

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

### ●Inner circuit




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

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Drain-source voltage | | $V_{DSS}$ | 500 | V |
| Gate-source voltage | | $V_{GSS}$ | ±30 | V |
| Drain current | Continuous | $I_D$ *1 | ±8 | A |
| | Pulsed | $I_{DP}$ *2 | ±32 | A |
| Source current (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 Pw ≤10μs, Duty cycle≤1%
*3 L ≒ 2.3mH $V_{DD}$=90V Rg=25Ω *4 L ≒ 2.3mH $V_{DD}$=90V Rg=25Ω starting Tch=25°C

### ●Thermal resistance

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Channel to case | Rth(ch-c) | 3.125 | °C/W |

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|---|---|---|---|---|---|---|
| Gate-source leakage | $I_{GSS}$ | – | – | ±10 | μA | $V_{GS}$= ±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 | $V_{DD}$≒ 150V<br>$I_D$= 4A<br>$V_{GS}$= 10V<br>$R_L$= 37.5Ω<br>$R_G$=10Ω |
| Rise time | $t_r$ * | – | 22 | – | ns | |
| Turn-off delay time | $t_{d\ (off)}$ * | – | 55 | – | ns | |
| Fall time | $t_f$ * | – | 30 | – | ns | |
| Total gate charge | $Q_g$ * | – | 28 | – | nC | $V_{DD}$≒ 250V, $V_{GS}$= 10V |
| Gate-source charge | $Q_{gs}$ * | – | 6.5 | – | nC | $I_D$= 8A |
| Gate-drain charge | $Q_{gd}$ * | – | 12 | – | nC | $R_L$= 31.3Ω, $R_G$= 10Ω |

*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 / μs |

* Pulsed

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