

10V Drive Nch MOS FET

RDX120N50

●Structure

Silicon N-channel MOS FET

●Features

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

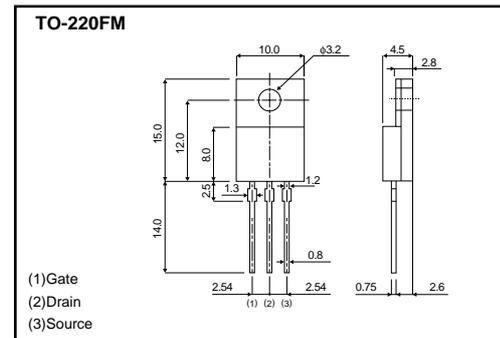
●Applications

Switching

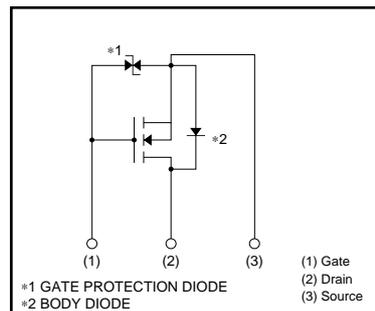
●Packaging specifications

| Type | Package | Bulk |
|-----------|------------------------------|------|
| | Code | — |
| | Basic ordering unit (pieces) | 500 |
| RDX120N50 | | ○ |

●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} | ± 30 | V | |
| Drain current | Continuous | I_D *1 | ± 12 | A |
| | Pulsed | I_{DP} *2 | ± 48 | A |
| Source current (Body diode) | Continuous | I_S | 12 | A |
| | Pulsed | I_{SP} *2 | 48 | A |
| Avalanche current | I_{AS} *3 | 12 | A | |
| Avalanche energy | E_{AS} *4 | 260 | mJ | |
| Total power dissipation (Tc=25°C) | P_D | 45 | 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 $L \leq 3.1mH$ $V_{DS}=90V$ $R_g=25\Omega$ *4 $L \leq 3.1mH$ $V_{DS}=90V$ $R_g=25\Omega$ starting Tch=25°C

●Thermal resistance

| Parameter | Symbol | Limits | Unit |
|-----------------|-----------|--------|------|
| Channel to case | Rth(ch-c) | 2.78 | °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 | $R_{DS(on)}^*$ | – | 0.38 | 0.5 | Ω | $I_D = 6A, V_{GS} = 10V$ |
| Forward transfer admittance | $ Y_{fs} ^*$ | 5.0 | 8.0 | – | S | $V_{DS} = 10V, I_D = 6A$ |
| Input capacitance | C_{iss} | – | 1600 | – | pF | $V_{DS} = 25V$ |
| Output capacitance | C_{oss} | – | 200 | – | pF | $V_{GS} = 0V$ |
| Reverse transfer capacitance | C_{rss} | – | 35 | – | pF | $f = 1MHz$ |
| Turn-on delay time | $t_{d(on)}^*$ | – | 25 | – | ns | $V_{DD} = 150V$ |
| Rise time | t_r^* | – | 17 | – | ns | $I_D = 6A$ |
| Turn-off delay time | $t_{d(off)}^*$ | – | 80 | – | ns | $V_{GS} = 10V$ |
| Fall time | t_f^* | – | 44 | – | ns | $R_L = 25\Omega$ $R_G = 10\Omega$ |
| Total gate charge | Q_g^* | – | 45 | – | nC | $V_{DD} = 250V$ |
| Gate-source charge | Q_{gs}^* | – | 8 | – | nC | $V_{GS} = 10V$ |
| Gate-drain charge | Q_{gd}^* | – | 15 | – | nC | $I_D = 12A$ |

* Pulsed

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|-------------------------|------------|------|------|------|------|-----------------------------|
| Forward voltage | V_{SD}^* | – | – | 1.5 | V | $I_S = 12A, V_{GS} = 0V$ |
| Reverse recovery time | t_{rr} | – | 550 | – | ns | $I_{DR} = 12A, V_{GS} = 0V$ |
| Reverse recovery charge | Q_{rr} | – | 4.7 | – | μC | $di/dt = 100A / \mu s$ |

* Pulsed

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