

# 10V Drive Nch MOS FET

## RDX050N50

### ●Structure

Silicon N-channel MOS FET

### ●Features

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

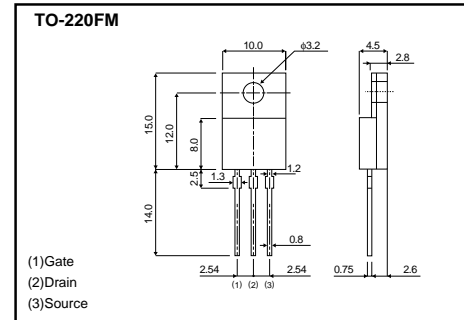
### ●Applications

Switching

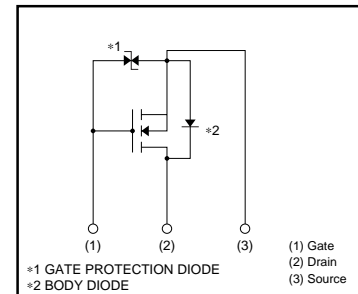
### ●Packaging specifications

Type	Package	Bulk
	Code	—
	Basic ordering unit (pieces)	500
RDX050N50		○

### ●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	$\pm 5$	A
	Pulsed	$I_{DP}$ *2	$\pm 20$	A
Source current (Body diode)	Continuous	$I_S$	5	A
	Pulsed	$I_{SP}$ *2	20	A
Avalanche current	$I_{AS}$ *3	5	A	
Avalanche energy	$E_{AS}$ *4	46	mJ	
Total power dissipation (Tc=25°C)	$P_D$	35	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  $L \leq 3.2mH$   $V_{DD}=90V$   $R_g=25\Omega$  \*4  $L \leq 3.2mH$   $V_{DD}=90V$   $R_g=25\Omega$  starting Tch=25°C

### ●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to case	$R_{th}(ch-c)$	3.57	°C/W

## Transistors

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I <sub>GSS</sub>	–	–	±10	μA	V <sub>GS</sub> = ±25V, V <sub>DS</sub> =0V
Drain-source breakdown voltage	V <sub>(BR) DSS</sub>	500	–	–	V	I <sub>D</sub> = 1mA, V <sub>GS</sub> =0V
Zero gate voltage drain current	I <sub>DSS</sub>	–	–	25	μA	V <sub>DS</sub> = 500V, V <sub>GS</sub> =0V
Gate threshold voltage	V <sub>GS (th)</sub>	2.0	–	4.0	V	V <sub>DS</sub> = 10V, I <sub>D</sub> = 1mA
Static drain-source on-state resistance	R <sub>DS (on)</sub> *	–	1.1	1.5	Ω	I <sub>D</sub> = 2.5A, V <sub>GS</sub> = 10V
Forward transfer admittance	Y <sub>fs</sub>   *	2.0	3.0	–	S	V <sub>DS</sub> = 10V, I <sub>D</sub> = 2.5A
Input capacitance	C <sub>iss</sub>	–	500	–	pF	V <sub>DS</sub> = 25V
Output capacitance	C <sub>oss</sub>	–	100	–	pF	V <sub>GS</sub> =0V
Reverse transfer capacitance	C <sub>rss</sub>	–	25	–	pF	f=1MHz
Turn-on delay time	t <sub>d (on)</sub> *	–	15	–	ns	V <sub>DD</sub> ≐ 150V I <sub>D</sub> = 2.5A
Rise time	t <sub>r</sub> *	–	20	–	ns	V <sub>GS</sub> = 10V
Turn-off delay time	t <sub>d (off)</sub> *	–	40	–	ns	R <sub>L</sub> = 60Ω
Fall time	t <sub>f</sub> *	–	28	–	ns	R <sub>G</sub> =10Ω
Total gate charge	Q <sub>g</sub> *	–	16	–	nC	V <sub>DD</sub> ≐ 250V, V <sub>GS</sub> = 10V
Gate-source charge	Q <sub>gs</sub> *	–	4	–	nC	I <sub>D</sub> = 5A
Gate-drain charge	Q <sub>gd</sub> *	–	8.5	–	nC	R <sub>L</sub> = 50Ω, R <sub>G</sub> = 10Ω

\* Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V <sub>SD</sub> *	–	–	1.5	V	I <sub>S</sub> = 5A, V <sub>GS</sub> =0V
Reverse recovery time	t <sub>rr</sub>	–	340	–	ns	I <sub>DR</sub> = 5A, V <sub>GS</sub> =0V
Reverse recovery charge	Q <sub>rr</sub>	–	2.2	–	μC	di/dt= 100A / μs

\* Pulsed

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