

## Transistors

# 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.

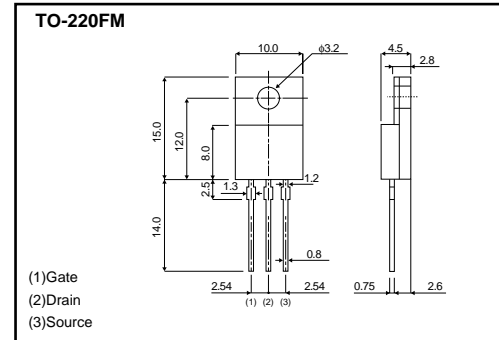
### ●Applications

Switching

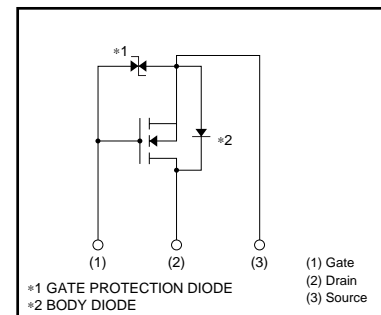
### ●Packaging specifications

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	$V_{DSS}$	500	V	
Gate-source voltage	$V_{GSS}$	$\pm 30$	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  $L = 3.2mH$   $V_{DD} = 90V$   $R_g = 25\Omega$  \*4  $L = 3.2mH$   $V_{DD} = 90V$   $R_g = 25\Omega$  starting Tch=25°C

### ●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to case	Rth(ch-c)	3.57	°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	$R_{DS(on)}^*$	–	1.1	1.5	Ω	$I_D = 2.5A, V_{GS} = 10V$
Forward transfer admittance	$ Y_{fs} ^*$	2.0	3.0	–	S	$V_{DS} = 10V, I_D = 2.5A$
Input capacitance	$C_{iss}$	–	500	–	pF	$V_{DS} = 25V$
Output capacitance	$C_{oss}$	–	100	–	pF	$V_{GS} = 0V$
Reverse transfer capacitance	$C_{rss}$	–	25	–	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}^*$	–	15	–	ns	$V_{DD} = 150V$
Rise time	$t_r^*$	–	20	–	ns	$I_D = 2.5A$
Turn-off delay time	$t_{d(off)}^*$	–	40	–	ns	$V_{GS} = 10V$
Fall time	$t_f^*$	–	28	–	ns	$R_L = 60\Omega$
Total gate charge	$Q_g^*$	–	16	–	nC	$V_{DD} = 250V, V_{GS} = 10V$
Gate-source charge	$Q_{gs}^*$	–	4	–	nC	$I_D = 5A$
Gate-drain charge	$Q_{gd}^*$	–	8.5	–	nC	$R_L = 50\Omega, R_G = 10\Omega$

\* Pulsed

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	$V_{SD}^*$	–	–	1.5	V	$I_S = 5A, V_{GS} = 0V$
Reverse recovery time	$t_{rr}$	–	340	–	ns	$I_{DR} = 5A, V_{GS} = 0V$
Reverse recovery charge	$Q_{rr}$	–	2.2	–	μC	$di/dt = 100A / \mu s$

\* Pulsed

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