

# 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.

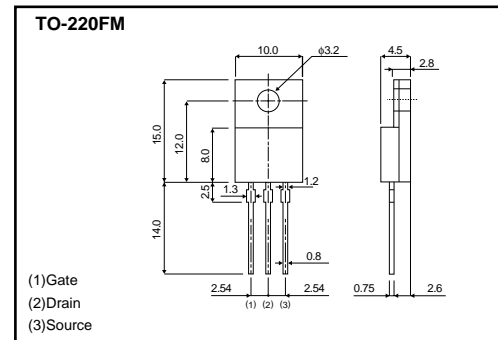
### ●Applications

Switching

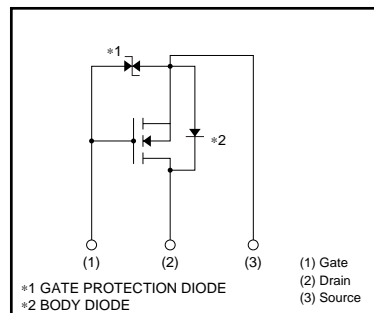
### ●Packaging specifications

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 <sub>DSS</sub>	500	V	
Gate-source voltage	V <sub>GSS</sub>	±30	V	
Drain current	Continuous	I <sub>D</sub> *1	±12	A
	Pulsed	I <sub>DP</sub> *2	±48	A
Source current (Body diode)	Continuous	I <sub>S</sub>	12	A
	Pulsed	I <sub>SP</sub> *2	48	A
Avalanche current	I <sub>AS</sub> *3	12	A	
Avalanche energy	E <sub>AS</sub> *4	260	mJ	
Total power dissipation (Tc=25°C)	P <sub>D</sub>	45	W	
Channel temperature	T <sub>ch</sub>	150	°C	
Range of storage temperature	T <sub>stg</sub>	-55 to +150	°C	

\*1 Limited only by maximum temperature allowed \*2 P<sub>w</sub> ≤ 10μs, Duty cycle ≤ 1%  
\*3 L ≒ 3.1mH V<sub>DD</sub>=90V R<sub>g</sub>=25Ω \*4 L ≒ 3.1mH V<sub>DD</sub>=90V R<sub>g</sub>=25Ω starting T<sub>ch</sub>=25°C

### ●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to case	R <sub>th(ch-c)</sub>	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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