

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.

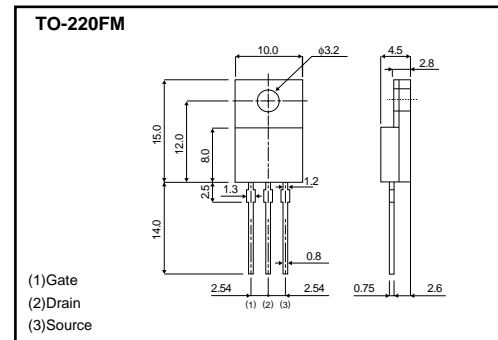
●Applications

Switching

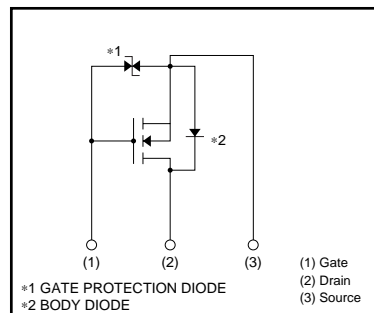
●Packaging specifications

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 $L = 3.1mH$ $V_{DD} = 90V$ $R_g = 25\Omega$ *4 $L = 3.1mH$ $V_{DD} = 90V$ $R_g = 25\Omega$ 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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