

RFM15N12, RFM15N15, RFP15N12, RFP15N15

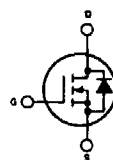
**N-Channel Enhancement-Mode
Power Field-Effect Transistors**

15 A, 120 V — 150 V

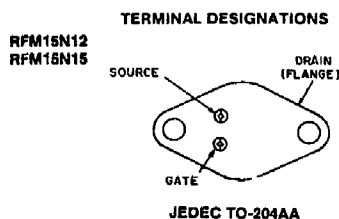
$r_{DS(on)}$: 0.15 Ω

Features:

- SOA is power-dissipation limited
- Nanosecond switching speeds
- Linear transfer characteristics
- High input impedance
- Majority carrier device

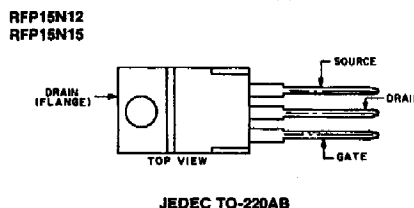


N-Channel Enhancement Mode



The RFM15N12 and RFM15N15 and the RFP15N12 and RFP15N15* are n-channel enhancement-mode silicon-gate power field-effect transistors designed for applications such as switching regulators, switching converters, motor drivers, relay drivers, and drivers for high-power bipolar switching transistors requiring high speed and low gate-drive power. These types can be operated directly from integrated circuits.

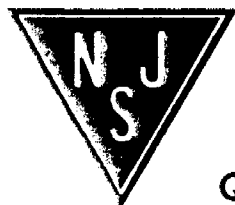
The RFM-types are supplied in the JEDEC TO-204AA steel package and the RFP-types in the JEDEC TO-220AB plastic package.



MAXIMUM RATINGS, Absolute-Maximum Values ($T_c=25^\circ\text{C}$):

		RFM15N12	RFM15N15	RFP15N12	RFP15N15	
DRAIN-SOURCE VOLTAGE	V_{DS}	120	150	120	150	V
DRAIN-GATE VOLTAGE ($R_{DS}=1\text{ M}\Omega$)	V_{DG}	120	150	120	150	V
GATE-SOURCE VOLTAGE	V_{GS}	± 20		± 20		V
DRAIN CURRENT RMS Continuous	I_D	15		15		A
Pulsed	I_{DM}	40		40		A
POWER DISSIPATION	P_T	100	100	75	75	W
@ $T_c=25^\circ\text{C}$		0.80	0.80	0.6	0.6	W/ $^\circ\text{C}$
Derate above $T_c=25^\circ\text{C}$						
OPERATING AND STORAGE TEMPERATURE	T_j, T_{stg}	-55 to +150		-55 to +150		$^\circ\text{C}$

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.



RFM15N12, RFM15N15, RFP15N12, RFP15N15

ELECTRICAL CHARACTERISTICS At Case Temperature (T_c) = 25°C unless otherwise specified

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFM15N12 RFP15N12		RFM15N15 RFP15N15		
			MIN.	MAX.	MIN.	MAX.	
Drain-Source Breakdown Voltage	BV_{DS}	$I_D = 1 \text{ mA}$ $V_{GS} = 0$	120	—	150	—	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}$ $I_D = 1 \text{ mA}$	2	4	2	4	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100 \text{ V}$ $V_{DS} = 120 \text{ V}$ $T_C = 125^\circ \text{C}$ $V_{DS} = 100 \text{ V}$ $V_{DS} = 120 \text{ V}$	— — — — —	1 — 50 — —	— — — — —	— 1 — — 50	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20 \text{ V}$ $V_{DS} = 0$	—	100	—	100	nA
Drain-Source On Voltage	$V_{DS(on)}^*$	$I_D = 7.5 \text{ A}$ $V_{GS} = 10 \text{ V}$	—	1.125	—	1.125	V
		$I_D = 15 \text{ A}$ $V_{GS} = 10 \text{ V}$	—	3	—	3	
Static Drain-Source On Resistance	$r_{DS(on)}^*$	$I_D = 7.5 \text{ A}$ $V_{GS} = 10 \text{ V}$	—	0.15	—	0.15	Ω
Forward Transconductance	g_{fs}^*	$V_{DS} = 10 \text{ V}$ $I_D = 7.5 \text{ A}$	5	—	5	—	mho
Input Capacitance	C_{iss}	$V_{DS} = 25 \text{ V}$	—	1700	—	1700	pF
Output Capacitance	C_{oss}	$V_{GS} = 0 \text{ V}$	—	750	—	750	
Reverse Transfer Capacitance	C_{rss}	$f = 1 \text{ MHz}$	—	350	—	350	
Turn-On Delay Time	$t_d(on)$	$V_{DD} = 75 \text{ V}$	50(typ.)	75	50(typ.)	75	ns
Rise Time	t_r	$I_D = 7.5 \text{ A}$	150(typ.)	225	150(typ.)	225	
Turn-Off Delay Time	$t_d(off)$	$R_{gen} = R_{gs} = 50 \Omega$	185(typ.)	280	185(typ.)	280	
Fall Time	t_f	$V_{GS} = 10 \text{ V}$	125(typ.)	190	125(typ.)	190	
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	RFM15N12, RFM15N15	—	1.25	—	1.25	°C/W
		RFP15N12, RFP15N15	—	1.67	—	1.67	

*Pulsed: Pulse duration = 300 μs max., duty cycle = 2%.

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFM15N12 RFP15N12		RFM15N15 RFP15N15		
			MIN.	MAX.	MIN.	MAX.	
Diode Forward Voltage	V_{SD}	$I_{SD}=7.5\text{ A}$	—	1.4	—	1.4	V
Reverse Recovery Time	t_r	$I_F=4\text{ A}$ $d_F/d_R=100\text{ A}/\mu\text{s}$	200(typ)		200(typ)		ns

*Pulse Test: Width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.