

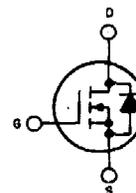
**RFM12N08L, RFM12N10L, RFP12N08L, RFP12N10L**

**N-Channel Logic Level  
 Power Field-Effect Transistors (L<sup>2</sup> FET)**

12 A, 80 V and 100 V  
 $r_{DS(on)}$ : 0.2  $\Omega$

**Features:**

- Design optimized for 5 volt gate drive
- Can be driven directly from Q-MOS, N-MOS, TTL Circuits
- Compatible with automotive drive requirements
- SOA is power-dissipation limited
- Nanosecond switching speeds
- Linear transfer characteristics
- High input impedance
- Majority carrier device



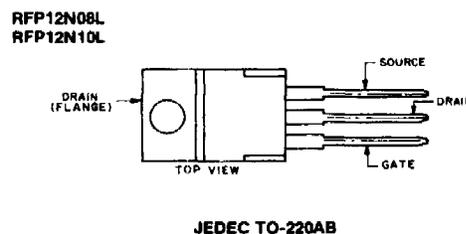
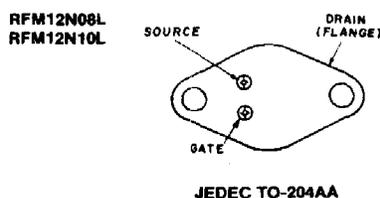
**N-CHANNEL ENHANCEMENT MODE**

The RFM12N08L and RFM12N10L and the RFP12N08L and RFP12N10L\* are n-channel enhancement-mode silicon-gate power field-effect transistors specifically designed for use with logic level (5 volt) driving sources in applications such as programmable controllers, automotive switching, and solenoid drivers. This performance is accomplished through a special gate oxide design which provides full rated conduction at gate biases in the 3-5 volt range, thereby facilitating true on-off power control directly from logic circuit supply voltages.

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

Because of space limitations branding (marking) on type RFP12N08L is F12N08L and on type RFP12N10L is F12N10L.

**TERMINAL DESIGNATIONS**



**MAXIMUM RATINGS, Absolute-Maximum Values (T<sub>c</sub>=25° C):**

	RFM12N08L	RFM12N10L		RFP12N08L	RFP12N10L	
DRAIN-SOURCE VOLTAGE ..... V <sub>DSS</sub>	80	100		80	100	V
DRAIN-GATE VOLTAGE (R <sub>th</sub> =1 M $\Omega$ ) ..... V <sub>DGN</sub>	80	100		80	100	V
GATE-SOURCE VOLTAGE ..... V <sub>GS</sub>			$\pm 10$			V
DRAIN CURRENT, RMS Continuous ..... I <sub>D</sub>			12			A
..... Pulsed ..... I <sub>DM</sub>			30			A
POWER DISSIPATION @ T <sub>c</sub> =25° C ..... P <sub>T</sub>	75	75		60	60	W
Derate above T <sub>c</sub> =25° C	0.6	0.6		0.48	0.48	W/°C
<b>OPERATING AND STORAGE</b>						
TEMPERATURE ..... T <sub>p</sub> , T <sub>stg</sub>			-55 to +150			°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.

## RFM12N08L, RFM12N10L, RFP12N08L, RFP12N10L

**ELECTRICAL CHARACTERISTICS, At Case Temperature ( $T_c$ )=25° C unless otherwise specified.**

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFM12N08L RFP12N08L		RFM12N10L RFP12N10L		
			MIN.	MAX.	MIN.	MAX.	
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=1\text{ mA}$ $V_{GS}=0$	80	—	100	—	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}$ $I_D=1\text{ mA}$	1	2	1	2	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=65\text{ V}$ $V_{GS}=80\text{ V}$	—	1	—	—	$\mu\text{A}$
		$T_c=125^\circ\text{ C}$ $V_{DS}=65\text{ V}$ $V_{GS}=80\text{ V}$	—	50	—	50	
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10\text{ V}$ $V_{DS}=0$	—	100	—	100	nA
Drain-Source On Voltage	$V_{DS(on)}^*$	$I_D=6\text{ A}$ $V_{GS}=5\text{ V}$	—	1.2	—	1.2	V
		$I_D=12\text{ A}$ $V_{GS}=5\text{ V}$	—	3.3	—	3.3	
Static Drain-Source On Resistance	$r_{DS(on)}^*$	$I_D=6\text{ A}$ $V_{GS}=5\text{ V}$	—	0.2	—	0.2	$\Omega$
Forward Transconductance	$g_s^*$	$V_{DS}=10\text{ V}$ $I_D=6\text{ A}$	4.0	—	4.0	—	mho
Input Capacitance	$C_{iss}$	$V_{DS}=25\text{ V}$	—	900	—	900	pF
Output Capacitance	$C_{oss}$	$V_{GS}=0\text{ V}$	—	325	—	325	
Reverse-Transfer Capacitance	$C_{rss}$	$f=1\text{ MHz}$	—	170	—	170	
Turn-On Delay Time	$t_d(on)$	$V_{DS}=50\text{ V}$ $I_D=6\text{ A}$ $R_{\theta_{gen}}=\infty$ $R_{\theta_{jc}}=6.25\ \Omega$ $V_{GS}=5\text{ V}$	15(typ)	50	15(typ)	50	ns
Rise Time	$t_r$		70(typ)	150	70(typ)	150	
Turn-Off Delay Time	$t_d(off)$		100(typ)	130	100(typ)	130	
Fall Time	$t_f$		80(typ)	150	80(typ)	150	
Thermal Resistance Junction-to-Case	$R_{\theta_{jc}}$	RFM12N08L, RFM12N10L	—	1.67	—	1.67	$^\circ\text{C/W}$
		RFP12N08L, RFP12N10L	—	2.083	—	2.083	

\*Pulsed: Pulse duration = 300  $\mu\text{s}$  max., duty cycle = 2%.

### SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFM12N08L RFP12N08L		RFM12N10L RFP12N10L		
			MIN.	MAX.	MIN.	MAX.	
Diode Forward Voltage	$V_{SD}$	$I_{SD}=6\text{ A}$	—	1.4	—	1.4	V
Reverse Recovery Time	$t_{rr}$	$I_F=4\text{ A}$ $d_{IF}/d_t=100\text{ A}/\mu\text{s}$	150(typ)		150(typ)		ns

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