

RFM8N18L, RFM8N20L, RFP8N18L, RFP8N20L

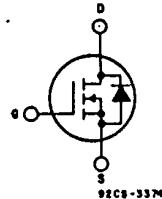


N-Channel Logic Level Power Field-Effect Transistors (L² FET)

12 A, 80 V and 100 V
 $r_{ds(on)}$: 0.5Ω

Features:

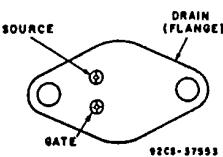
- Design optimized for 5 volt gate drive
- Can be driven directly from Q-MOS, N-MOS, TTL Circuits
- Compatible with automotive drive requirements
- SOA is power-dissipation limited
- Nanosecond switching speeds
- Linear transfer characteristics
- High input impedance
- Majority carrier device



N-CHANNEL ENHANCEMENT MODE

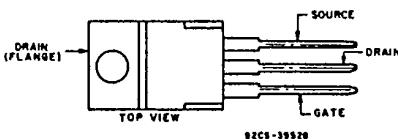
TERMINAL DESIGNATIONS

RFM8N18L
RFM8N20L



JEDEC TO-204AA

RFP8N18L
RFP8N20L



JEDEC TO-220AB

The RFM8N18L and RFM8N20L and the RFP8N18L and RFP8N20L 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.

The RFM and RFP series were formerly RCA developmental numbers TA9534 and TA9535.

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

	RFM8N18L	RFM8N20L	RFP8N18L	RFP8N20L	
DRAIN-SOURCE VOLTAGE	V_{DSS}	180	200	180	200
DRAIN-GATE VOLTAGE ($R_{gs}=1 M\Omega$)	V_{DGA}	180	200	180	200
GATE-SOURCE VOLTAGE	V_{GS}		± 10		V
DRAIN CURRENT, RMS Continuous	I_D		8		V
Pulsed	I_{DM}		20		A
POWER DISSIPATION @ $T_c=25^\circ C$	P_f	75	75	60	60
Derate above $T_c=25^\circ C$		0.6	0.6	0.48	0.48
OPERATING AND STORAGE TEMPERATURE	T_o, T_{stg}		-55 to +150		W/C
					°C

RFM8N18L, RFM8N20L, RFP8N18L, RFP8N20L

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

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS				UNITS	
			RFM8N18L RFP8N18L		RFM8N20L RFP8N20L			
			MIN.	MAX.	MIN.	MAX.		
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=1\text{ mA}$ $V_{GS}=0$	180	—	200	—	V	
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{GS}=V_{DS}$ $I_D=1\text{ mA}$	1	2	1	2	V	
Zero Gate Voltage Drain Current	I_{DS}	$V_{DS}=145\text{ V}$ $V_{DS}=160\text{ V}$	—	1	—	—	μA	
		$T_c=125^\circ\text{C}$ $V_{DS}=145\text{ V}$ $V_{DS}=160\text{ V}$	—	50	—	—		
Gate-Source Leakage Current	I_{GS}	$V_{GS}=\pm 10\text{ V}$ $V_{DS}=0$	—	100	—	100	nA	
Drain-Source On Voltage	$V_{DS(\text{on})^*}$	$I_D=4\text{ A}$ $V_{GS}=5\text{ V}$	—	2.0	—	2.0	V	
		$I_D=8\text{ A}$ $V_{GS}=5\text{ V}$	—	4.6	—	4.6		
Static Drain-Source On Resistance	$r_{DS(\text{on})^*}$	$I_D=4\text{ A}$ $V_{GS}=5\text{ V}$	—	0.5	—	0.5	Ω	
Forward Transconductance	g_{fs}^*	$V_{GS}=10\text{ V}$ $I_D=4\text{ A}$	3.0	—	3.0	—	mho	
Input Capacitance	C_{iss}	$V_{GS}=25\text{ V}$	—	900	—	900	pF	
Output Capacitance	C_{oss}	$V_{GS}=0\text{ V}$ $f=1\text{ MHz}$	—	250	—	250		
Reverse-Transfer Capacitance	C_{res}	—	100	—	100	—		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=50\text{ V}$ $I_D=4\text{ A}$	15(typ)	45	15(typ)	45	ns	
Rise Time	t_r	$R_{gen}=\infty$	45(typ)	150	45(typ)	150		
Turn-Off Delay Time	$t_{d(off)}$	$R_{gen}=6.25\text{ }\Omega$ $V_{GS}=5\text{ V}$	100(typ)	135	100(typ)	135		
Fall Time	t_f	—	60(typ)	105	60(typ)	105		
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	RFM8N18L, RFM8N20L	—	1.67	—	1.67	$^\circ\text{C/W}$	
		RFP8N18L, RFP8N20L	—	2.083	—	2.083		

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

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS				UNITS	
			RFM8N18L RFP8N18L		RFM8N20L RFP8N20L			
			MIN.	MAX.	MIN.	MAX.		
Diode Forward Voltage	V_{SD}	$I_{SD}=4\text{ A}$	—	1.4	—	1.4	V	
Reverse Recovery Time	t_r	$I_F=4\text{ A}$ $d_I/dt=100\text{ A}/\mu\text{s}$	250(typ)	—	250(typ)	—	ns	

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