

RFM10N12, RFM10N15, RFP10N12, RFP10N15

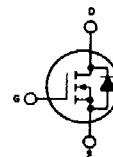
**N-Channel Enhancement-Mode
 Power Field-Effect Transistors**

10 A, 120 V — 150 V

$r_{DS(on)}$: 0.3 Ω

Features:

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

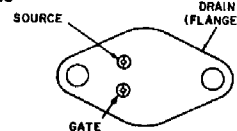


N-Channel Enhancement Mode

The RFM10N12 and RFM10N15 and the RFP10N12 and RFP10N15* 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.

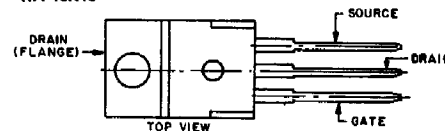
The RFM-types are supplied in the JEDEC TO-204AA steel package and the RFP-types in the JEDEC TO-220AB plastic package.

TERMINAL DESIGNATIONS
 RFM10N12
 RFM10N15



JEDEC TO-204AA

RFP10N12
 RFP10N15



JEDEC TO-220AB

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

| | RFM10N12 | RFM10N15 | | RFP10N12 | RFP10N15 | |
|---|----------|----------|-------------|----------|----------|---------------------|
| DRAIN-SOURCE VOLTAGE V_{DS} | 120 | 150 | | 120 | 150 | V |
| DRAIN-GATE VOLTAGE ($R_{gs}=1\text{ M}\Omega$) V_{DG} | 120 | 150 | | 120 | 150 | V |
| GATE-SOURCE VOLTAGE V_{GS} | | | ± 20 | | | V |
| DRAIN CURRENT, RMS Continuous I_D | | | 10 | | | A |
| Pulsed I_{DM} | | | 25 | | | A |
| POWER DISSIPATION @ $T_C=25^\circ\text{C}$ P_T | 75 | 75 | | 60 | 60 | W |
| Derate above $T_C=25^\circ\text{C}$ | 0.6 | 0.6 | | 0.48 | 0.48 | W/ $^\circ\text{C}$ |
| OPERATING AND STORAGE TEMPERATURE T_j, T_{stg} | | | -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.

RFM10N12, RFM10N15, RFP10N12, RFP10N15

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

| CHARACTERISTICS | SYMBOL | TEST CONDITIONS | LIMITS | | | | UNITS |
|--|-----------------|--|----------------------|-------|----------------------|-------|--------------------|
| | | | RFM10N12 RFP10N12 | | RFM10N15 RFP10N15 | | |
| | | | MIN. | MAX. | MIN. | MAX. | |
| Drain-Source Breakdown Voltage | BV_{DS} | $I_D = 1 \text{ mA}$ $V_{GS} = 0$ | 120 | — | 150 | — | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS} = V_{DS}$ $I_D = 2 \text{ mA}$ | 2 | 4 | 2 | 4 | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 100 \text{ V}$ | — | 1 | — | — | μA |
| | | $V_{DS} = 120 \text{ V}$ | — | — | — | 1 | |
| | | $T_c = 125^\circ\text{C}$ | — | 50 | — | — | |
| | | $V_{DS} = 100 \text{ V}$ $V_{DS} = 120 \text{ V}$ | — | — | — | 50 | |
| Gate-Source Leakage Current | I_{GSS} | $V_{GS} = \pm 20 \text{ V}$ $V_{DS} = 0$ | — | 100 | — | 100 | nA |
| Drain-Source On Voltage | $V_{DS(on)}^*$ | $I_D = 5 \text{ A}$ $V_{GS} = 10 \text{ V}$ | — | 1.5 | — | 1.5 | V |
| | | $I_D = 10 \text{ A}$ $V_{GS} = 10 \text{ V}$ | — | 4 | — | 4 | |
| Static Drain-Source On Resistance | $r_{DS(on)}^*$ | $I_D = 5 \text{ A}$ $V_{GS} = 10 \text{ V}$ | — | 0.3 | — | 0.3 | Ω |
| Forward Transconductance | g_{fs}^* | $V_{DS} = 10 \text{ V}$ $I_D = 5 \text{ A}$ | 2 | — | 2 | — | mho |
| Input Capacitance | C_{iss} | $V_{DS} = 25 \text{ V}$ | — | 650 | — | 650 | pF |
| Output Capacitance | C_{oss} | $V_{GS} = 0 \text{ V}$ | — | 230 | — | 230 | |
| Reverse Transfer Capacitance | C_{rss} | $f = 1 \text{ MHz}$ | — | 60 | — | 60 | |
| Turn-On Delay Time | $t_d(on)$ | $V_{DD} = 75 \text{ V}$ | 40(typ.) | 60 | 40(typ.) | 60 | ns |
| Rise Time | t_r | $I_D = 5 \text{ A}$ | 165(typ.) | 250 | 165(typ.) | 250 | |
| Turn-Off Delay Time | $t_d(off)$ | $R_{\theta sn} = R_{\theta ss} = 50 \Omega$ | 90(typ.) | 135 | 90(typ.) | 135 | |
| Fall Time | t_f | $V_{GS} = 10 \text{ V}$ | 90(typ.) | 135 | 90(typ.) | 135 | |
| Thermal Resistance Junction-to-Case | $R_{\theta JC}$ | RFM10N12, RFM10N15 | — | 1.67 | — | 1.67 | $^\circ\text{C/W}$ |
| | | RFP10N12, RFP10N15 | — | 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 |
|-----------------------|----------|--|----------------------|------|----------------------|------|-------|
| | | | RFM10N12 RFP10N12 | | RFM10N15 RFP10N15 | | |
| | | | MIN. | MAX. | MIN. | MAX. | |
| Diode Forward Voltage | V_{SD} | $I_{SD} = 5 \text{ A}$ | — | 1.4 | — | 1.4 | V |
| Reverse Recovery Time | t_r | $I_F = 4 \text{ A}$ $d_I/d_t = 100 \text{ A}/\mu\text{s}$ | 200(typ) | | 200(typ) | | ns |

This datasheet has been downloaded from:

www.DatasheetCatalog.com

Datasheets for electronic components.