## 12A, 80V and 100V, 0.300 Ohm, P-Channel Power MOSFETs

The RFP12P08, and RFP12P10 are P-Channel enhancement mode silicon gate power field effect transistors designed for applications such as switching regulators, switching convertors, 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.

Formerly developmental type TA17511.

## Ordering Information

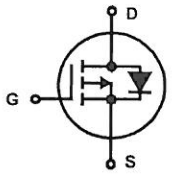
| PART NUMBER | PACKAGE | BRAND |
|---|---|---|
| RFP12P08 | TO-220AB | RFP12P08 |
| RFP12P10 | TO-220AB | RFP12P10 |

NOTE: When ordering, include the entire part number.

## Features

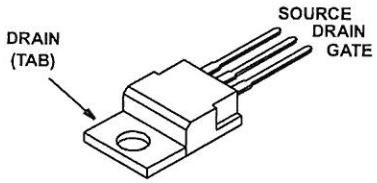
- 12A, 80V and 100V
- $r_{DS(ON)} = 0.300\Omega$
- SOA is Power Dissipation Limited
- Nanosecond Switching Speeds
- Linear Transfer Characteristics
- High Input Impedance
- Majority Carrier Device
- Related Literature
  - TB334 "Guidelines for Soldering Surface Mount Components to PC Boards"

## Symbol




## Packaging

TO-220AB



## Absolute Maximum Ratings $T_C = 25^oC$, Unless Otherwise Specified

| | | RFP12P08 | RFP12P10 | UNITS |
|---|---|---|---|---|
| Drain to Source Voltage (Note 1) | $V_{DS}$ | -80 | -100 | V |
| Drain to Gate Voltage ($R_{GS}$ = 20KΩ) (Note 1) | $V_{DGR}$ | -80 | -100 | V |
| Continuous Drain Current | | | | |
| RMS Continuous | $I_D$ | 12 | 12 | A |
| Pulsed Drain Current (Note 3) | $I_{DM}$ | 30 | 30 | A |
| Gate to Source Voltage | $V_{GS}$ | ±20 | ±20 | V |
| Maximum Power Dissipation | $P_D$ | 75 | 75 | W |
| Linear Derating Factor | | 0.6 | 0.6 | W/$^o$C |
| Operating and Storage Temperature | $T_J$, $T_{STG}$ | -55 to 150 | -55 to 150 | $^o$C |
| Maximum Temperature for Soldering | | | | |
| Leads at 0.063in (1.6mm) from Case for 10s | $T_L$ | 300 | 300 | $^o$C |
| Package Body for 10s, See Techbrief 334 | $T_{pkg}$ | 260 | 260 | $^o$C |

*CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.*

NOTE:

1. $T_J = 25^oC$ to $125^oC$.

## Electrical Specifications $T_C = 25^oC$, Unless Otherwise Specified

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|
| Drain to Source Breakdown Voltage | $BV_{DSS}$ | $I_D$ = 250μA, $V_{GS}$ = 0 | | | | |
| RFP12P08 | | | -80 | - | - | V |
| RFP12P10 | | | -100 | - | - | V |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{GS}$ = $V_{DS}$, $I_D$ = 250μA | -2 | - | -4 | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = Rated $BV_{DSS}$, $V_{GS}$ = 0V | - | - | 1 | μA |
| | | $V_{DS}$ = 0.8 x Rated $BV_{DSS}$, $V_{GS}$ = 0V, $T_C = 125^oC$ | - | - | 25 | μA |
| Gate to Source Leakage Current | $I_{GSS}$ | $V_{GS}$ = ±20V, $V_{DS}$ = 0 | - | - | ±100 | nA |
| Drain to Source On Voltage (Note 2) | $V_{DS(ON)}$ | $I_D$ = 12A, $V_{GS}$ = -10V | - | - | -3.6 | V |
| Drain to Source On Resistance (Note 2) | $r_{DS(ON)}$ | $I_D$ = 12A, $V_{GS}$ = -10V, (Figures 6, 7) | - | - | 0.300 | Ω |
| Turn-On Delay Time | $t_{d(ON)}$ | $I_D \approx$ 12A, $V_{DD}$ = 50V, $R_G$ = 50Ω, $R_L$ = 4.1Ω, $V_{GS}$ = -10V (Figure 10) | - | 18 | 60 | ns |
| Rise Time | $t_r$ | | - | 90 | 175 | ns |
| Turn-Off Delay Time | $t_{d(OFF)}$ | | - | 144 | 275 | ns |
| Fall Time | $t_f$ | | - | 94 | 175 | ns |
| Input Capacitance | $C_{ISS}$ | $V_{GS}$ = 0V, $V_{DS}$ = -25V, f = 1MHz (Figure 9) | - | - | 1500 | pF |
| Output Capacitance | $C_{OSS}$ | | - | - | 700 | pF |
| Reverse Transfer Capacitance | $C_{RSS}$ | | - | - | 300 | pF |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | RFP12P08, RFP12P10 | - | - | 1.67 | $^o$C/W |

## Source to Drain Diode Specifications

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|
| Source to Drain Diode Voltage (Note 2) | $V_{SD}$ | $I_{SD}$ = -12A | - | - | 1.4 | V |
| Diode Reverse Recovery Time | $t_{rr}$ | $I_{SD}$ = -12A, $dI_{SD}/dt$ = 100A/μs | - | 200 | - | ns |

NOTES:

2. Pulse Test: Pulse Width = ≤ 300μs Max, Duty Cycle ≤ 2%
3. Repetitive rating: pulse width limited by maximum junction temperature.