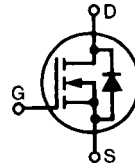


## MegaMOS™ FET

IRFP 470

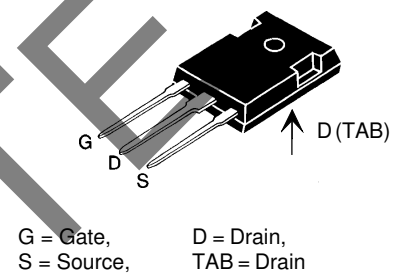
$$\begin{aligned} V_{DSS} &= 500 \text{ V} \\ I_{D(\text{cont})} &= 24 \text{ A} \\ R_{DS(\text{on})} &= 0.23 \Omega \end{aligned}$$

### N-Channel Enhancement Mode



| Symbol                                                                          | Test Conditions                                                                                                                         | Maximum Ratings  |                  |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|
| $V_{DSS}$                                                                       | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$                                                                                         | 500              | V                |
| $V_{DGR}$                                                                       | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$                                                          | 500              | V                |
| $V_{GS}$                                                                        | Continuous                                                                                                                              | $\pm 20$         | V                |
| $V_{GSM}$                                                                       | Transient                                                                                                                               | $\pm 30$         | V                |
| $I_{D25}$                                                                       | $T_C = 25^\circ\text{C}$                                                                                                                | 24               | A                |
| $I_{DM}$                                                                        | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$                                                                              | 96               | A                |
| $I_{AR}$                                                                        |                                                                                                                                         | 24               | A                |
| $E_{AR}$                                                                        | $T_C = 25^\circ\text{C}$                                                                                                                | 30               | mJ               |
| $dv/dt$                                                                         | $I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ ,<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 2 \Omega$ | 5                | V/ns             |
| $P_D$                                                                           | $T_C = 25^\circ\text{C}$                                                                                                                | 300              | W                |
| $T_J$                                                                           |                                                                                                                                         | $-55 \dots +150$ | $^\circ\text{C}$ |
| $T_{JM}$                                                                        |                                                                                                                                         | 150              | $^\circ\text{C}$ |
| $T_{stg}$                                                                       |                                                                                                                                         | $-55 \dots +150$ | $^\circ\text{C}$ |
| $M_d$                                                                           | Mounting torque                                                                                                                         | 1.13/10          | Nm/lb.in.        |
| Weight                                                                          |                                                                                                                                         | 6                | g                |
| Maximum lead temperature for soldering<br>1.6 mm (0.062 in.) from case for 10 s |                                                                                                                                         | 300              | $^\circ\text{C}$ |

TO-247 AD



### Features

- International standard packages
- Low  $R_{DS(\text{on})}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- High commutating  $dv/dt$  rating
- Fast switching times

### Applications

- Switch-mode and resonant-mode power supplies
- Motor controls
- Uninterruptible Power Supplies (UPS)
- DC choppers

### Advantages

- Easy to mount with 1 screw (isolated mounting screw hole)
- Space savings
- High power density

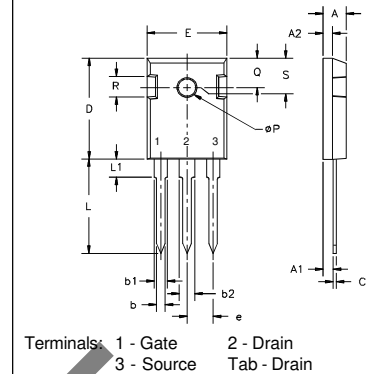
| Symbol              | Test Conditions                                                                                                        | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                                       |
|---------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|---------------------------------------|
|                     |                                                                                                                        | min.                                                                              | typ. | max.                                  |
| $V_{DSS}$           | $V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$                                                                       | 500                                                                               |      | V                                     |
| $V_{GS(\text{th})}$ | $V_{DS} = V_{GS}$ , $I_D = 250 \mu\text{A}$                                                                            | 2                                                                                 |      | V                                     |
| $I_{GSS}$           | $V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$                                                                        |                                                                                   |      | $\pm 100 \text{ nA}$                  |
| $I_{DSS}$           | $V_{DS} = 0.8 \cdot V_{DSS}$ , $T_J = 25^\circ\text{C}$<br>$V_{GS} = 0 \text{ V}$ , $T_J = 125^\circ\text{C}$          |                                                                                   |      | 25 $\mu\text{A}$<br>250 $\mu\text{A}$ |
| $R_{DS(\text{on})}$ | $V_{GS} = 10 \text{ V}$ , $I_D = 0.5 \cdot I_{D25}$<br>Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $d \leq 2 \%$ |                                                                                   |      | 0.23 $\Omega$                         |

| Symbol       | Test Conditions                                                                                         | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |        |
|--------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|--------|
|              |                                                                                                         | min.                                                                              | typ. | max.   |
| $g_{fs}$     | $V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}$ , pulse test                                                  | 11                                                                                | 21   | S      |
| $C_{iss}$    | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$                                           |                                                                                   | 4200 | pF     |
| $C_{oss}$    |                                                                                                         |                                                                                   | 450  | pF     |
| $C_{rss}$    |                                                                                                         |                                                                                   | 135  | pF     |
| $t_{d(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 I_{D25}$<br>$R_G = 2\ \Omega$ , (External) |                                                                                   | 24   | 30 ns  |
| $t_r$        |                                                                                                         |                                                                                   | 33   | 45 ns  |
| $t_{d(off)}$ |                                                                                                         |                                                                                   | 65   | 80 ns  |
| $t_f$        |                                                                                                         |                                                                                   | 30   | 40 ns  |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 I_{D25}$                                   |                                                                                   | 160  | 190 nC |
| $Q_{gs}$     |                                                                                                         |                                                                                   | 28   | 40 nC  |
| $Q_{gd}$     |                                                                                                         |                                                                                   | 75   | 85 nC  |
| $R_{thJC}$   |                                                                                                         |                                                                                   | 0.42 | K/W    |
| $R_{thCK}$   |                                                                                                         | 0.25                                                                              |      | K/W    |

## Source-Drain Diode

| Symbol   | Test Conditions                                                                                       | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |       |
|----------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------|
|          |                                                                                                       | min.                                                                              | typ. | max.  |
| $I_S$    | $V_{GS} = 0\text{ V}$                                                                                 |                                                                                   |      | 24 A  |
| $I_{SM}$ | Repetitive; pulse width limited by $T_{JM}$                                                           |                                                                                   |      | 96 A  |
| $V_{SD}$ | $I_F = I_S, V_{GS} = 0\text{ V}$ ,<br>Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$ |                                                                                   |      | 1.5 V |
| $t_{rr}$ | $I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$                                    |                                                                                   | 600  | ns    |

## TO-247 AD Outline



| Dim.           | Millimeter |       | Inches  |       |
|----------------|------------|-------|---------|-------|
|                | Min.       | Max.  | Min.    | Max.  |
| A              | 4.7        | 5.3   | .185    | .209  |
| A <sub>1</sub> | 2.2        | 2.54  | .087    | .102  |
| A <sub>2</sub> | 2.2        | 2.6   | .059    | .098  |
| b              | 1.0        | 1.4   | .040    | .055  |
| b <sub>1</sub> | 1.65       | 2.13  | .065    | .084  |
| b <sub>2</sub> | 2.87       | 3.12  | .113    | .123  |
| C              | .4         | .8    | .016    | .031  |
| D              | 20.80      | 21.46 | .819    | .845  |
| E              | 15.75      | 16.26 | .610    | .640  |
| e              | 5.20       | 5.72  | 0.205   | 0.225 |
| L              | 19.81      | 20.32 | .780    | .800  |
| L1             |            | 4.50  |         | .177  |
| ØP             | 3.55       | 3.65  | .140    | .144  |
| Q              | 5.89       | 6.40  | 0.232   | 0.252 |
| R              | 4.32       | 5.49  | .170    | .216  |
| S              | 6.15 BSC   |       | 242 BSC |       |