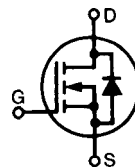


# MegaMOS™FET

**IXTH 14N80**

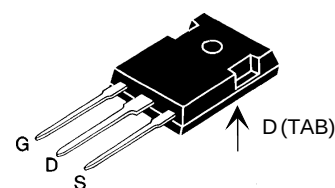
**$V_{DSS} = 800\text{ V}$**   
 **$I_{D25} = 14\text{ A}$**   
 **$R_{DS(on)} = 0.70\ \Omega$**

## N-Channel Enhancement Mode



| Symbol                                  | Test Conditions                                                           | Maximum Ratings  |                  |
|-----------------------------------------|---------------------------------------------------------------------------|------------------|------------------|
| $V_{DSS}$                               | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$                            | 800              | V                |
| $V_{DGR}$                               | $T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 1\text{ M}\Omega$ | 800              | V                |
| $V_{GS}$                                | Continuous                                                                | $\pm 20$         | V                |
| $V_{GSM}$                               | Transient                                                                 | $\pm 30$         | V                |
| $I_{D25}$                               | $T_C = 25^\circ\text{C}$                                                  | 14               | A                |
| $I_{DM}$                                | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$                | 56               | A                |
| $P_D$                                   | $T_C = 25^\circ\text{C}$                                                  | 300              | W                |
| $T_J$                                   |                                                                           | $-55 \dots +150$ | $^\circ\text{C}$ |
| $T_{JM}$                                |                                                                           | 150              | $^\circ\text{C}$ |
| $T_{stg}$                               |                                                                           | $-55 \dots +150$ | $^\circ\text{C}$ |
| Max. lead temperature for soldering 300 |                                                                           | $^\circ\text{C}$ |                  |
| 1.6 mm (0.063 in) from case for 10 s    |                                                                           |                  |                  |
| $M_d$                                   | Mounting torque                                                           | 1.13/10          | Nm/lb.in.        |
| Weight                                  |                                                                           | 6                | g                |

TO-247 AD



G = Gate,  
S = Source,  
D = Drain,  
TAB = Drain

### Features

- International standard package
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Low package inductance ( $< 5\text{ nH}$ )
  - easy to drive and to protect
- Fast switching times

### Applications

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

### Advantages

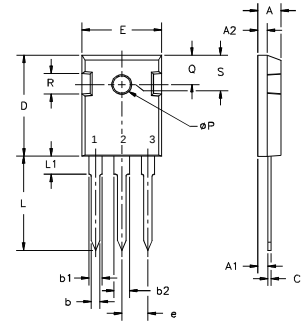
- Easy to mount with 1 screw (isolated mounting screw hole)
- Space savings
- High power density

| Symbol       | Test Conditions                                                                                                | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |                           |
|--------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|---------------------------|
|              |                                                                                                                | min.                                                                              | typ. | max.                      |
| $V_{DSS}$    | $V_{GS} = 0\text{ V}, I_D = 3\text{ mA}$                                                                       | 800                                                                               |      | V                         |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$                                                                      | 2                                                                                 |      | 4.5 V                     |
| $I_{GSS}$    | $V_{GS} = \pm 20\text{ V}_{DC}, V_{DS} = 0$                                                                    |                                                                                   |      | $\pm 100\text{ nA}$       |
| $I_{DSS}$    | $V_{DS} = 0.8 \cdot V_{DSS}$<br>$V_{GS} = 0\text{ V}$<br>$T_J = 25^\circ\text{C}$<br>$T_J = 125^\circ\text{C}$ |                                                                                   |      | 250 $\mu\text{A}$<br>1 mA |
| $R_{DS(on)}$ | $V_{GS} = 10\text{ V}, I_D = 0.5\ I_{D25}$<br>Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$  |                                                                                   |      | 0.7 $\Omega$              |

| Symbol       | Test Conditions                                                                                               | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |          |
|--------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|----------|
|              |                                                                                                               | min.                                                                              | typ. | max.     |
| $g_{fs}$     | $V_{DS} = 10\text{ V}$ ; $I_D = 0.5 \cdot I_{D25}$ , pulse test                                               | 8                                                                                 | 14   | S        |
| $C_{iss}$    | $V_{GS} = 0\text{ V}$ , $V_{DS} = 25\text{ V}$ , $f = 1\text{ MHz}$                                           |                                                                                   | 4500 | pF       |
| $C_{oss}$    |                                                                                                               |                                                                                   | 310  | pF       |
| $C_{rss}$    |                                                                                                               |                                                                                   | 65   | 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) |                                                                                   | 20   | 50 ns    |
| $t_r$        |                                                                                                               |                                                                                   | 33   | 50 ns    |
| $t_{d(off)}$ |                                                                                                               |                                                                                   | 63   | 100 ns   |
| $t_f$        |                                                                                                               |                                                                                   | 32   | 50 ns    |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_D = 0.5 I_{D25}$                                   |                                                                                   | 145  | 170 nC   |
| $Q_{gs}$     |                                                                                                               |                                                                                   | 30   | 45 nC    |
| $Q_{gd}$     |                                                                                                               |                                                                                   | 55   | 80 nC    |
| $R_{thJC}$   |                                                                                                               |                                                                                   | 0.25 | 0.42 K/W |
| $R_{thCK}$   |                                                                                                               |                                                                                   |      | K/W      |

| Source-Drain Diode |                                                                                                          | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |       |
|--------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------|
| Symbol             | Test Conditions                                                                                          | min.                                                                              | typ. | max.  |
| $I_S$              | $V_{GS} = 0\text{ V}$                                                                                    |                                                                                   |      | 14 A  |
| $I_{SM}$           | Repetitive; pulse width limited by $T_{JM}$                                                              |                                                                                   |      | 56 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 |
| $t_{rr}$           | $I_F = I_S$ , $-di/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 100\text{ V}$                                 |                                                                                   | 800  | ns    |

## TO-247 AD Outline



Terminals: 1 - Gate 2 - Drain  
3 - Source Tab - Drain

| 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   |

Figure 1. Output Characteristics at 25°C

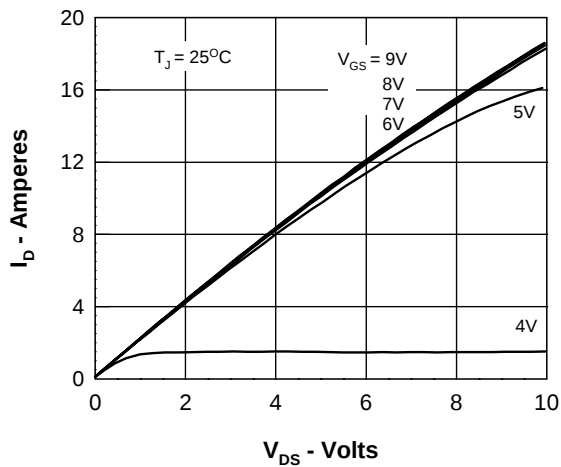


Figure 2. Output Characteristics at 125°C

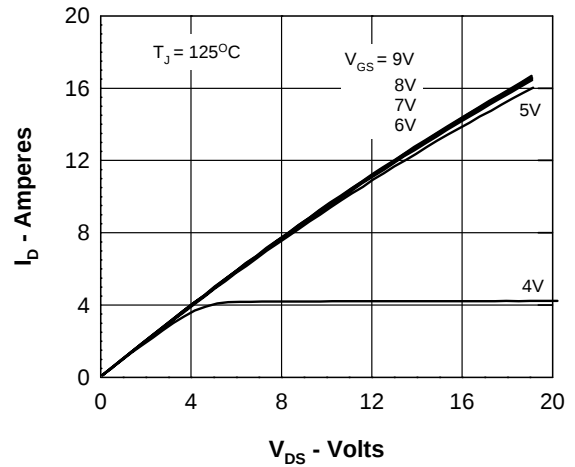


Figure 3.  $R_{DS(on)}$  normalized to 0.5  $I_{D25}$  value vs.  $I_D$

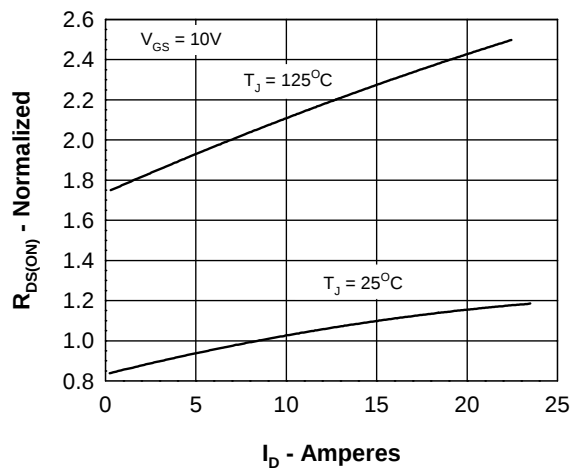


Figure 4.  $R_{DS(on)}$  normalized to 0.5  $I_{D25}$  value vs.  $T_J$

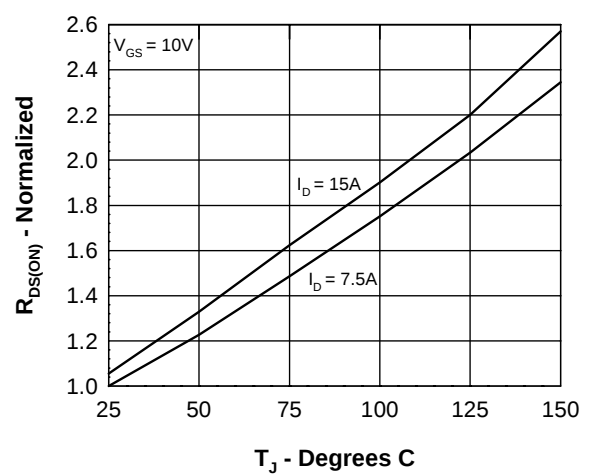


Figure 5. Drain Current vs. Case Temperature

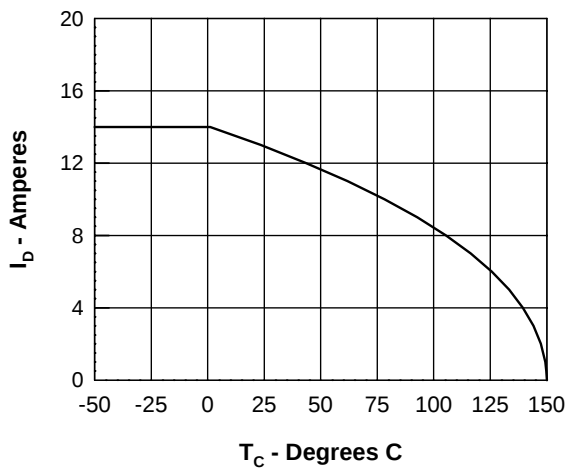


Figure 6. Admittance Curves

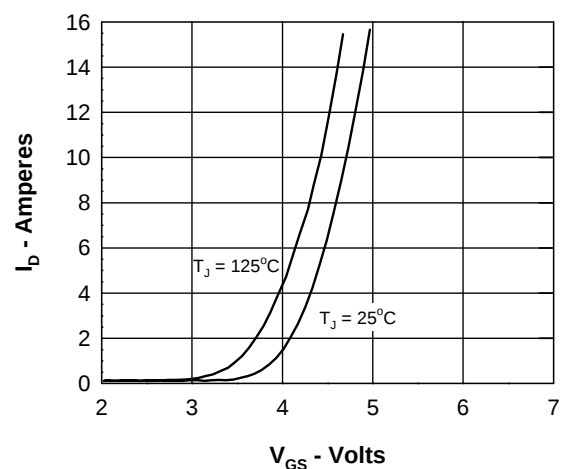


Figure 7. Gate Charge

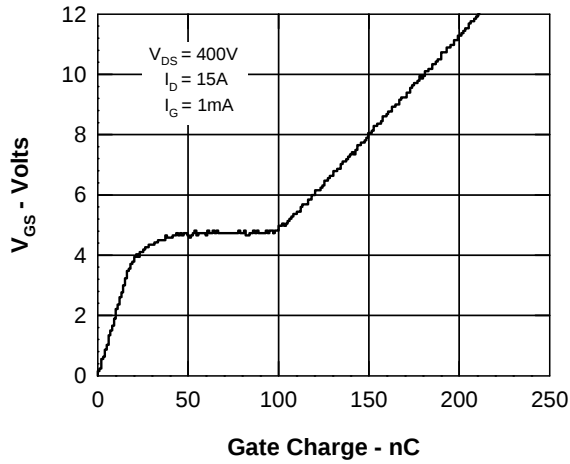


Figure 8. Capacitance Curves

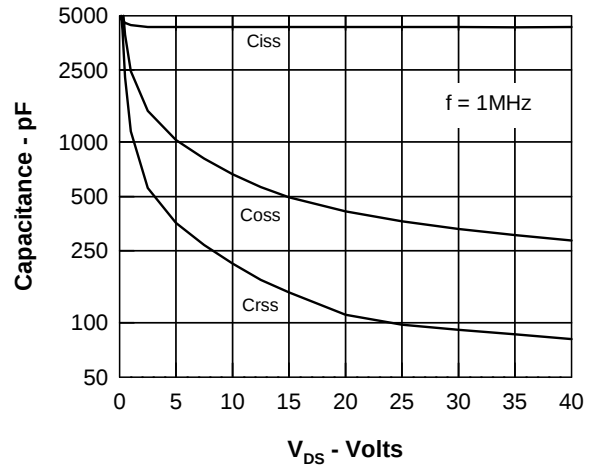


Figure 9. Source Current vs. Source to Drain Voltage

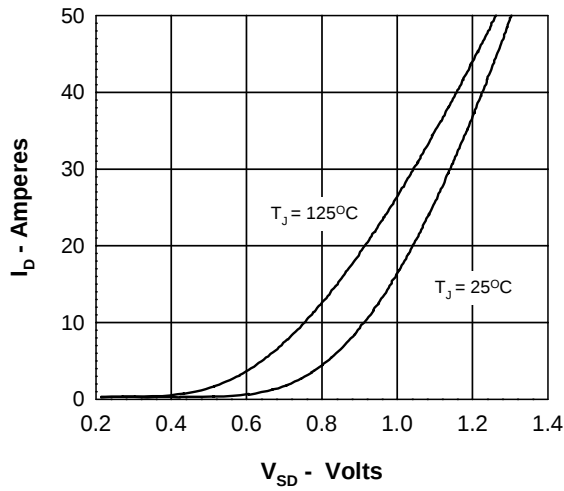


Figure 10. Forward Bias Safe Operating Area

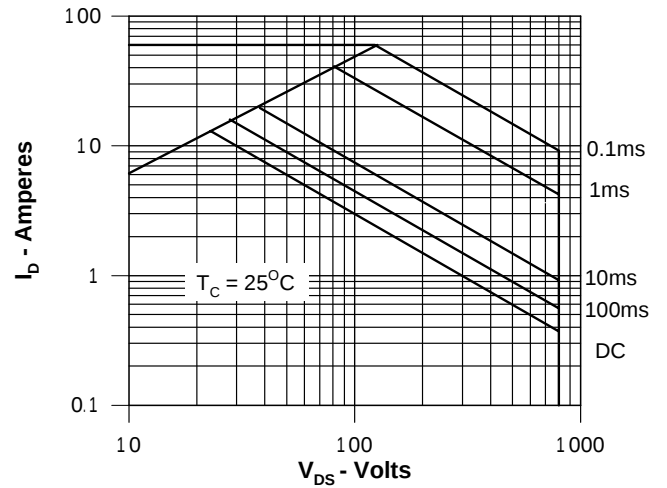


Figure 11. Transient Thermal Resistance

