

# HiPerFET™

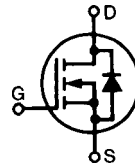
## Power MOSFETs

N-Channel Enhancement Mode  
High dv/dt, Low  $t_{rr}$ , HDMOS™ Family

IXFH 76 N06-11  
IXFH 76 N06-12  
IXFH 76 N07-11  
IXFH 76 N07-12

| $V_{DSS}$ | $I_{D25}$ | $R_{DS(on)}$ |
|-----------|-----------|--------------|
| 60 V      | 76 A      | 11 mΩ        |
| 60 V      | 76 A      | 12 mΩ        |
| 70 V      | 76 A      | 11 mΩ        |
| 70 V      | 76 A      | 12 mΩ        |

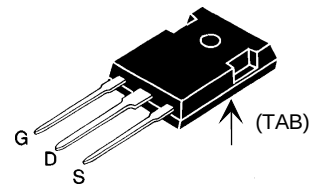
Preliminary data sheet



| Symbol     | Test Conditions                                                                                                   | Maximum Ratings |              |           |
|------------|-------------------------------------------------------------------------------------------------------------------|-----------------|--------------|-----------|
| $V_{DSS}$  | $T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$                                                                   | N06             | 60           | V         |
|            |                                                                                                                   | N07             | 70           | V         |
| $V_{DGR}$  | $T_J = 25^\circ\text{C}$ to $175^\circ\text{C}$ ; $R_{GS} = 10\text{ k}\Omega$                                    | N06             | 60           | V         |
|            |                                                                                                                   | N07             | 70           | V         |
| $V_{GS}$   | Continuous                                                                                                        |                 | ±20          | V         |
| $V_{GSM}$  | Transient                                                                                                         |                 | ±30          | V         |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$ (Chip capability = 125 A)                                                                |                 | 76           | A         |
| $I_{D119}$ | $T_C = 119^\circ\text{C}$ , limited by external leads                                                             |                 | 76           | A         |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$                                                        |                 | 304          | A         |
| $I_{AR}$   | $T_C = 25^\circ\text{C}$                                                                                          |                 | 100          | A         |
| $E_{AR}$   | $T_C = 25^\circ\text{C}$                                                                                          |                 | 30           | mJ        |
| $E_{AS}$   |                                                                                                                   |                 | 2            | J         |
| dv/dt      | $I_S \leq I_{DM}$ , di/dt ≤ 100 A/μs, $V_{DD} \leq V_{DSS}$ ,<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 2\ \Omega$ |                 | 5            | V/ns      |
| $P_D$      | $T_C = 25^\circ\text{C}$                                                                                          |                 | 360          | W         |
| $T_J$      |                                                                                                                   |                 | -55 ... +175 | °C        |
| $T_{JM}$   |                                                                                                                   |                 | 175          | °C        |
| $T_{stg}$  |                                                                                                                   |                 | -55 ... +150 | °C        |
| $T_L$      | 1.6 mm (0.062 in.) from case for 10 s                                                                             |                 | 300          | °C        |
| $M_d$      | Mounting torque                                                                                                   |                 | 1.15/10      | Nm/lb.in. |
| Weight     |                                                                                                                   |                 | 6            | g         |

| Symbol       | Test Conditions                                                                                                 | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |          |               |
|--------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------|---------------|
|              |                                                                                                                 | min.                                                                              | typ.     | max.          |
| $V_{DSS}$    | $V_{GS} = 0\text{ V}$ , $I_D = 250\ \mu\text{A}$                                                                | N06<br>N07                                                                        | 60<br>70 | V<br>V        |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 4\text{ mA}$                                                                         |                                                                                   | 2.0      | 3.4 V         |
| $I_{GSS}$    | $V_{GS} = \pm 20\text{ V}_{DC}$ , $V_{DS} = 0$                                                                  |                                                                                   |          | ±100 nA       |
| $I_{DSS}$    | $V_{DS} = 0.8 \cdot V_{DSS}$ ,<br>$V_{GS} = 0\text{ V}$                                                         | $T_J = 25^\circ\text{C}$<br>$T_J = 125^\circ\text{C}$                             |          | 100<br>500 μA |
| $R_{DS(on)}$ | $V_{GS} = 10\text{ V}$ , $I_D = 40\text{ A}$<br>Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$ | 76N06/N07-11<br>76N06/N07-12                                                      |          | 11<br>12 mΩ   |

TO-247 AD



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

### Features

- International standard package JEDEC TO-247 AD
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance  
- easy to drive and to protect
- Fast intrinsic Rectifier

### Applications

- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls
- Low voltage relays

### 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. |
| $g_{fs}$     | $V_{DS} = 10\text{ V}; I_D = 40\text{ A}$ , pulse test                                          | 30                                                                                | 40   | S    |
| $C_{iss}$    | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$                                   |                                                                                   | 4400 | pF   |
| $C_{oss}$    |                                                                                                 |                                                                                   | 2000 | pF   |
| $C_{rss}$    |                                                                                                 |                                                                                   | 1200 | pF   |
| $t_{d(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 50\text{ V}, I_D = 30\text{ A}$<br>$R_G = 1\ \Omega$ (External) |                                                                                   | 40   | ns   |
| $t_r$        |                                                                                                 |                                                                                   | 70   | ns   |
| $t_{d(off)}$ |                                                                                                 |                                                                                   | 130  | ns   |
| $t_f$        |                                                                                                 |                                                                                   | 55   | ns   |
| $Q_{g(on)}$  | $V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 40\text{ A}$                           |                                                                                   | 240  | nC   |
| $Q_{gs}$     |                                                                                                 |                                                                                   | 30   | nC   |
| $Q_{gd}$     |                                                                                                 |                                                                                   | 120  | nC   |
| $R_{thJC}$   |                                                                                                 |                                                                                   | 0.42 | K/W  |
| $R_{thCK}$   |                                                                                                 | 0.25                                                                              |      | K/W  |

| Source-Drain Diode |                                                                                                                                | Characteristic Values<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified) |      |              |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|--------------|
| Symbol             | Test Conditions                                                                                                                | min.                                                                              | typ. | max.         |
| $I_S$              | $V_{GS} = 0\text{ V}$                                                                                                          |                                                                                   |      | 76 A         |
| $I_{SM}$           | Repetitive; pulse width limited by $T_{JM}$                                                                                    |                                                                                   |      | 304 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        |
| $t_{rr}$           | $I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, T_J = 25^\circ\text{C}$<br>$V_R = 25\text{ V}, T_J = 125^\circ\text{C}$ |                                                                                   | 150  | ns<br>250 ns |

**TO-247 AD (IXFH) Outline**


| Dim. | Millimeter |       | Inches |       |
|------|------------|-------|--------|-------|
|      | Min.       | Max.  | Min.   | Max.  |
| A    | 19.81      | 20.32 | 0.780  | 0.800 |
| B    | 20.80      | 21.46 | 0.819  | 0.845 |
| C    | 15.75      | 16.26 | 0.610  | 0.640 |
| D    | 3.55       | 3.65  | 0.140  | 0.144 |
| E    | 4.32       | 5.49  | 0.170  | 0.216 |
| F    | 5.4        | 6.2   | 0.212  | 0.244 |
| G    | 1.65       | 2.13  | 0.065  | 0.084 |
| H    | -          | 4.5   | -      | 0.177 |
| J    | 1.0        | 1.4   | 0.040  | 0.055 |
| K    | 10.8       | 11.0  | 0.426  | 0.433 |
| L    | 4.7        | 5.3   | 0.185  | 0.209 |
| M    | 0.4        | 0.8   | 0.016  | 0.031 |
| N    | 1.5        | 2.49  | 0.087  | 0.102 |

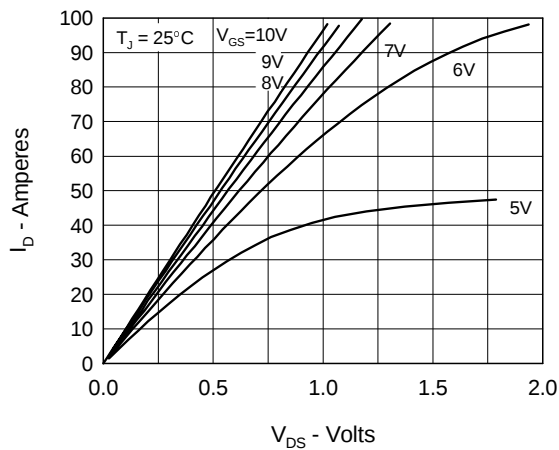
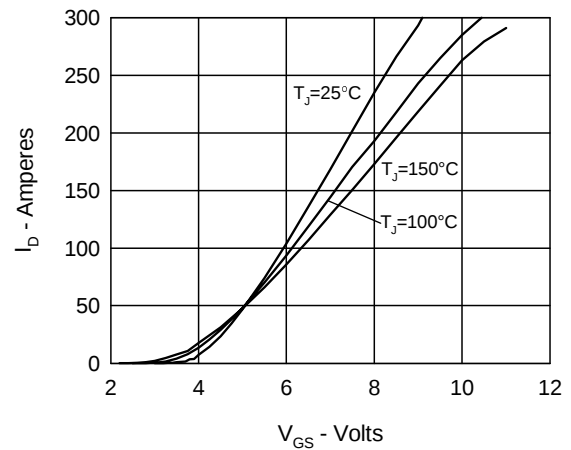
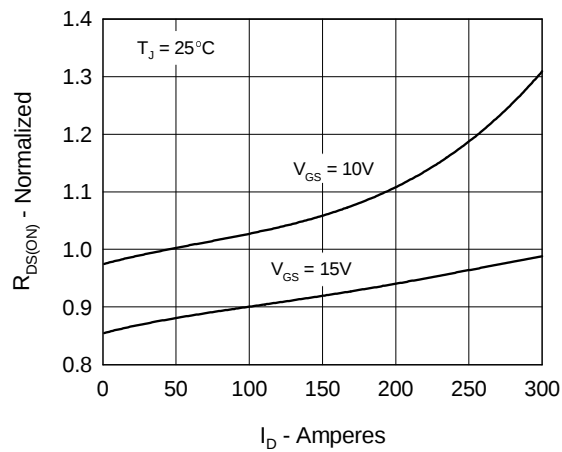
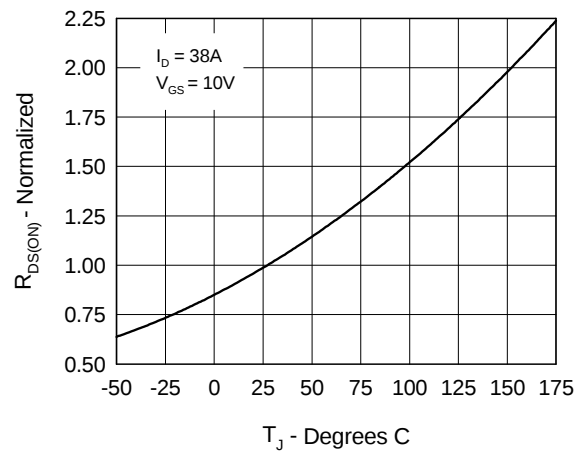
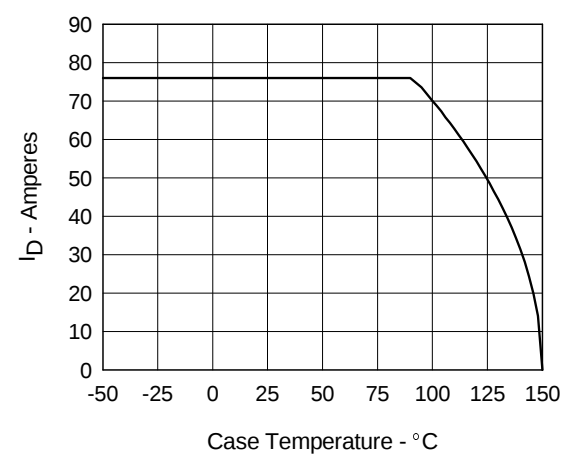
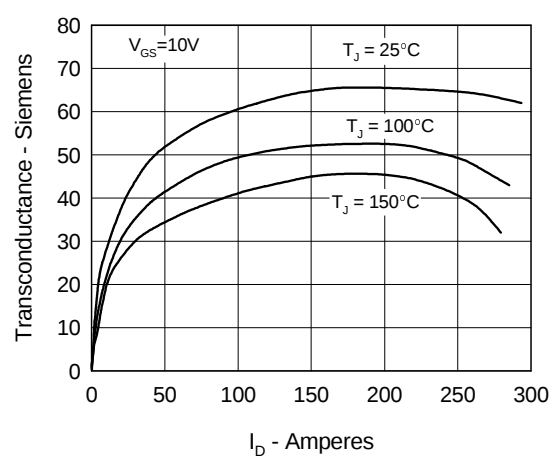
**Fig.1 Output Characteristics**

**Fig. 2 Input Admittance**

**Fig. 3  $R_{DS(on)}$  vs. Drain Current**

**Fig. 4  $R_{DS(on)}$  Temperature Dependence**

**Fig. 5  $I_D$  vs. Case Temperature**

**Fig. 6 Transconductance**


Fig. 7 Gate Charge

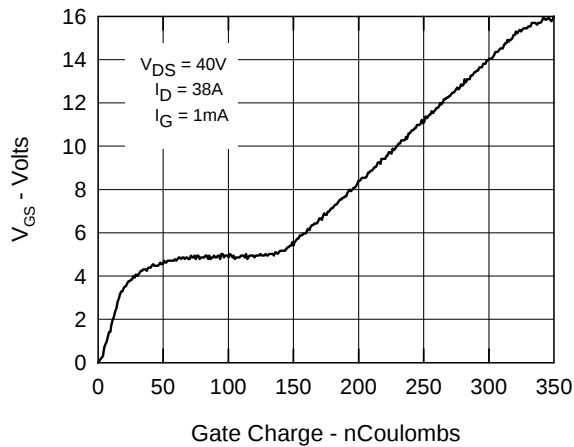


Fig. 8 Forward Bias Safe Operating Area

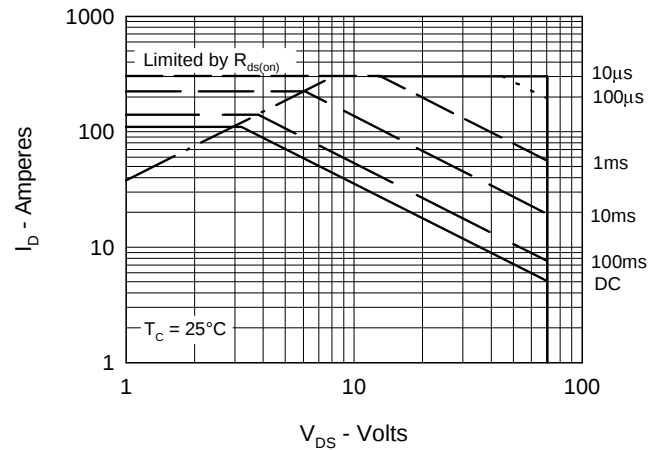


Fig. 9 Capacitance Curves

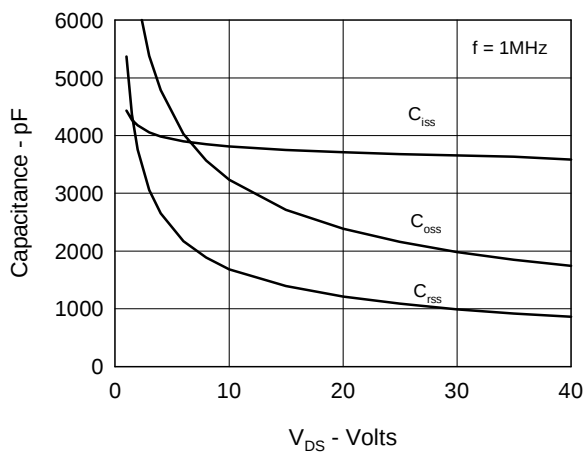


Fig. 10 Source Current vs. Source to Drain Voltage

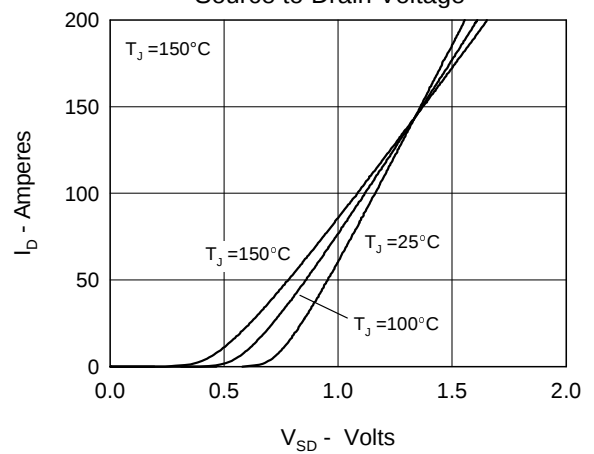
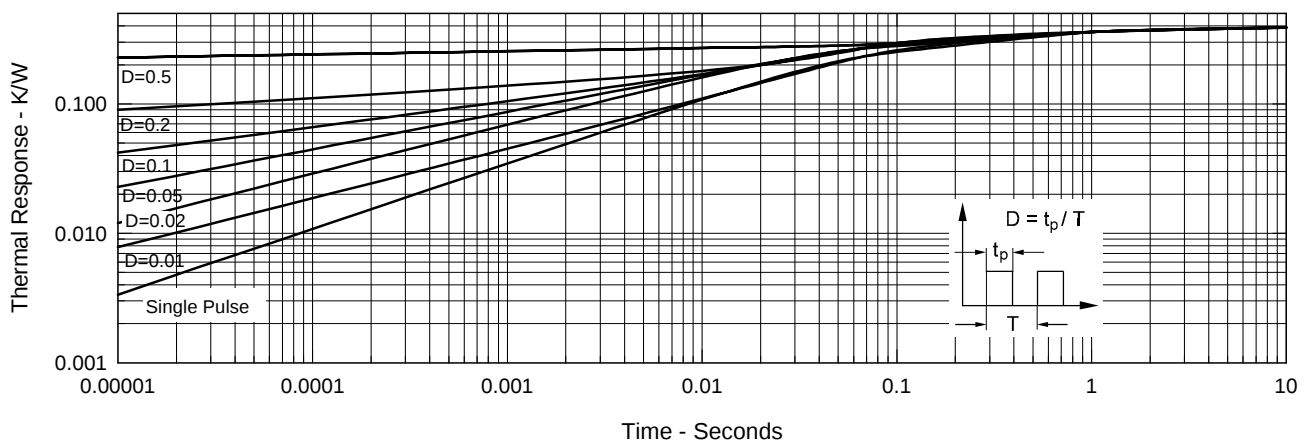


Fig. 11 Transient Thermal Impedance





---

Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).