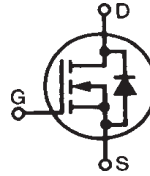


# PolarHT™ HiPerFET Power MOSFET

IXFH 96N20P  
IXFT 96N20P  
IXFV 96N20P

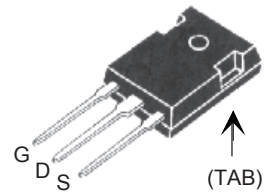
$V_{DSS} = 200 \text{ V}$   
 $I_{D25} = 96 \text{ A}$   
 $R_{DS(on)} \leq 24 \text{ m}\Omega$   
 $t_{rr} \leq 200 \text{ ns}$

N-Channel Enhancement Mode  
Avalanche Rated  
Fast Intrinsic Diode

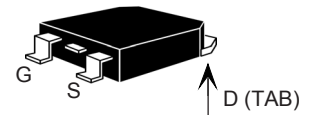


| Symbol       | Test Conditions   | Maximum Ratings |                  |
|--------------|---|-----------------|------------------|
|              |   | Value           | Unit             |
| $V_{DSS}$    | $T_J = 25^\circ\text{C to } 150^\circ\text{C}$  | 200             | V                |
| $V_{DGR}$    | $T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 1 \text{ M}\Omega$  | 200             | V                |
| $V_{GS}$     | Continuous  | $\pm 20$        | V                |
| $V_{GSM}$    | Transient   | $\pm 30$        | V                |
| $I_{D25}$    | $T_C = 25^\circ\text{C}$  | 96              | A                |
| $I_{D(RMS)}$ | External lead current limit   | 75              | A                |
| $I_{DM}$     | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$  | 225             | A                |
| $I_{AR}$     | $T_C = 25^\circ\text{C}$  | 60              | A                |
| $E_{AR}$     | $T_C = 25^\circ\text{C}$  | 50              | mJ               |
| $E_{AS}$     | $T_C = 25^\circ\text{C}$  | 1.5             | J                |
| $dv/dt$      | $I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ ,<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 4 \Omega$ | 10              | V/ns             |
| $P_D$        | $T_C = 25^\circ\text{C}$  | 600             | W                |
| $T_J$        |   | -55 ... +175    | $^\circ\text{C}$ |
| $T_{JM}$     |   | 175             | $^\circ\text{C}$ |
| $T_{stg}$    |   | -55 ... +150    | $^\circ\text{C}$ |
| $T_L$        | 1.6 mm (0.062 in.) from case for 10 s   | 300             | $^\circ\text{C}$ |
| $T_{SOLD}$   | Plastic body for 10s  | 260             | $^\circ\text{C}$ |
| $M_d$        | Mounting torque (TO-247)  | 1.13/10         | Nm/lb.in.        |
| Weight       | TO-220  | 4               | g                |
|              | TO-247  | 6               | g                |
|              | TO-268  | 5               | g                |

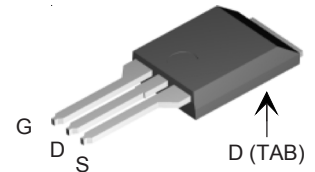
TO-247 (IXFH)



TO-268 (IXFT)



PLUS220 (IXFV)



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

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified)                                     | Characteristic Values |      |                      |
|--------------|---|-----------------------|------|----------------------|
|              |   | Min.                  | Typ. | Max.                 |
| $BV_{DSS}$   | $V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$  | 200                   |      | V                    |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 4 \text{ mA}$  | 2.5                   |      | 5.0 V                |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$   |                       |      | $\pm 100 \text{ nA}$ |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$<br>$V_{GS} = 0 \text{ V}$<br>$T_J = 150^\circ\text{C}$                                       |                       |      | 25 $\mu\text{A}$     |
|              |   |                       |      | 250 $\mu\text{A}$    |
| $R_{DS(on)}$ | $V_{GS} = 10 \text{ V}$ , $I_D = 0.5 I_{D25}$<br>Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $d \leq 2\%$ |                       |      | 24 $\text{m}\Omega$  |

## Features

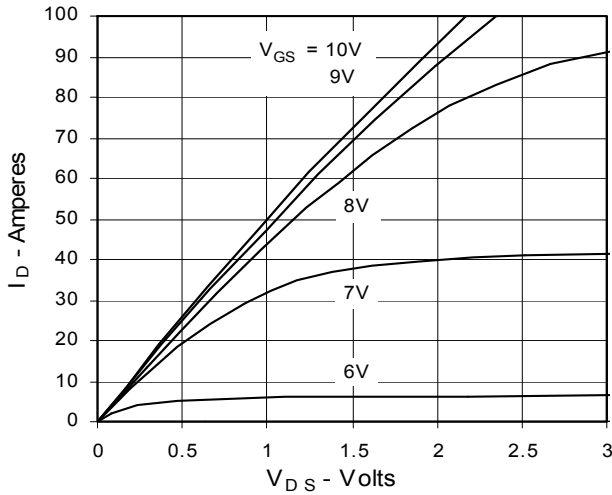
- † Fast Intrinsic Diode
- † International standard packages
- † Unclamped Inductive Switching (UIS) rated
- † Low package inductance
- easy to drive and to protect

## Advantages

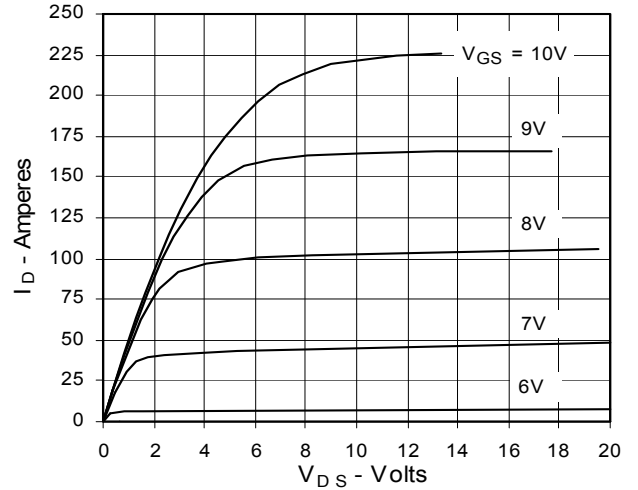
- † Easy to mount
- † Space savings
- † High power density



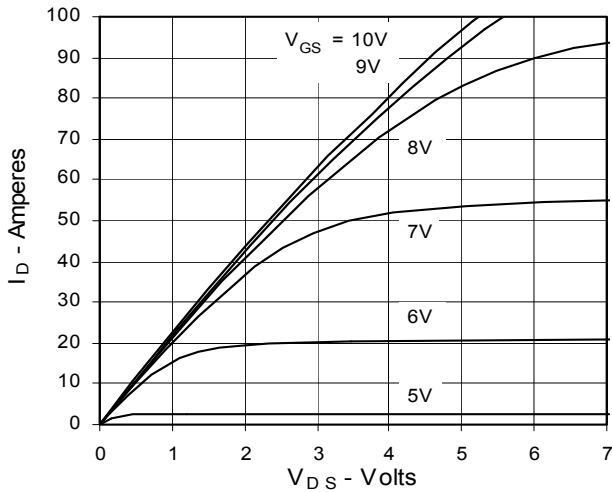
**Fig. 1. Output Characteristics @ 25°C**



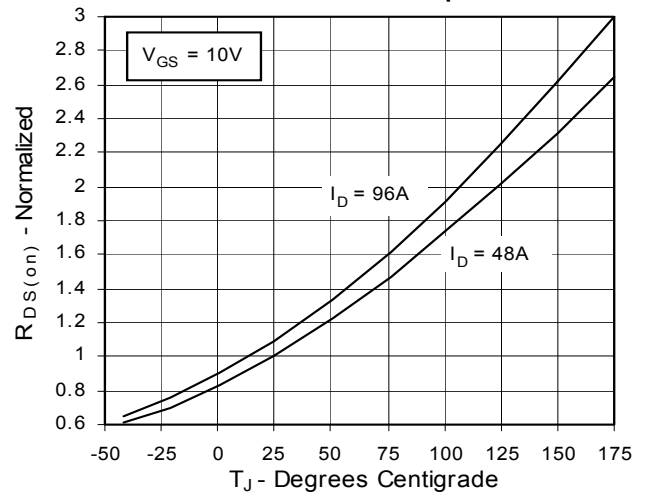
**Fig. 2. Extended Output Characteristics @ 25°C**



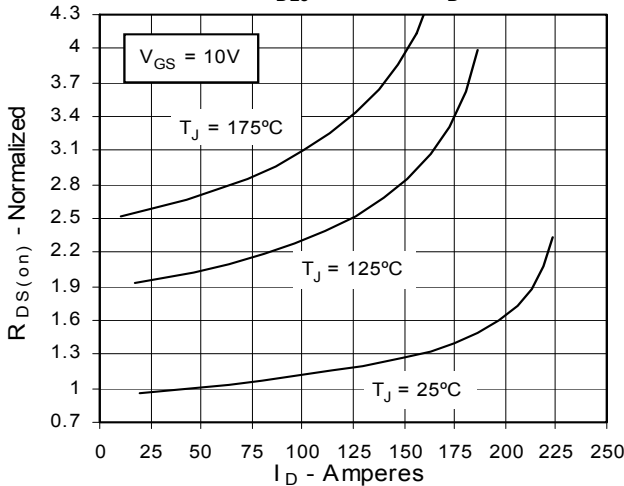
**Fig. 3. Output Characteristics @ 150°C**



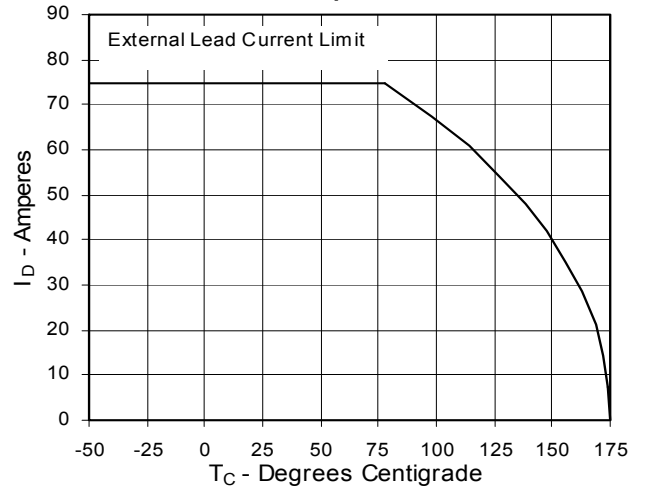
**Fig. 4.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Junction Temperature**



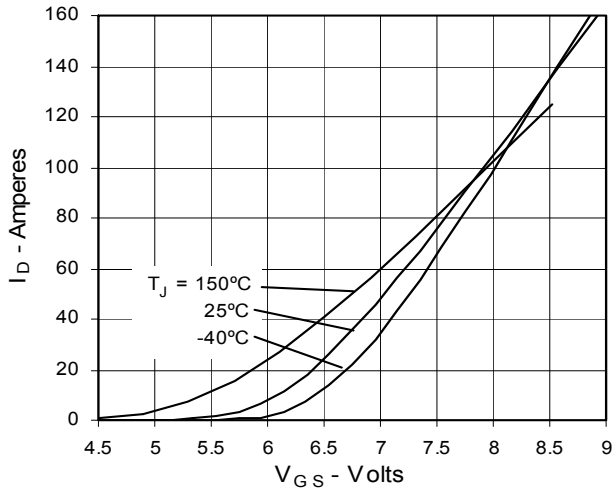
**Fig. 5.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs.  $I_D$**



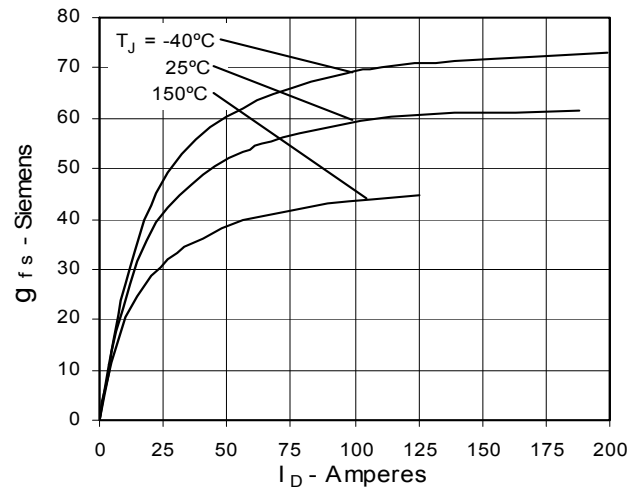
**Fig. 6. Drain Current vs. Case Temperature**



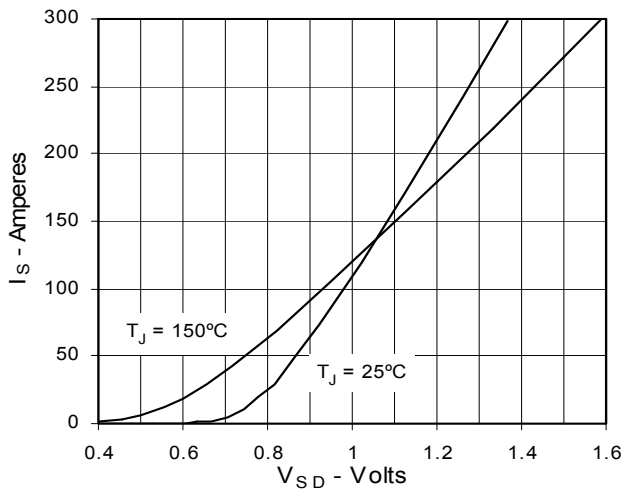
**Fig. 7. Input Admittance**



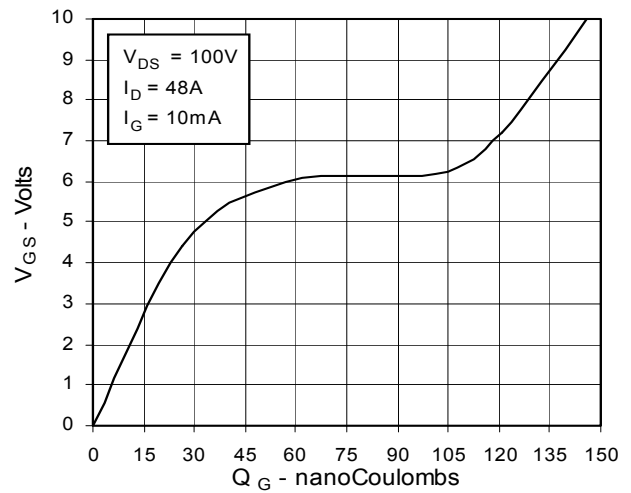
**Fig. 8. Transconductance**



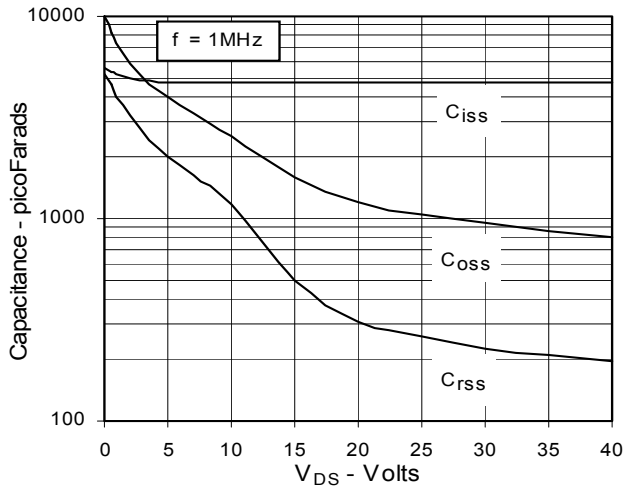
**Fig. 9. Source Current vs. Source-To-Drain Voltage**



**Fig. 10. Gate Charge**



**Fig. 11. Capacitance**



**Fig. 12. Forward-Bias Safe Operating Area**

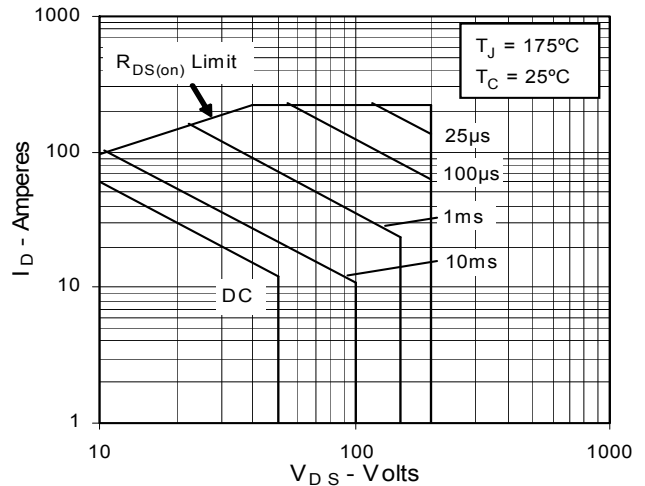
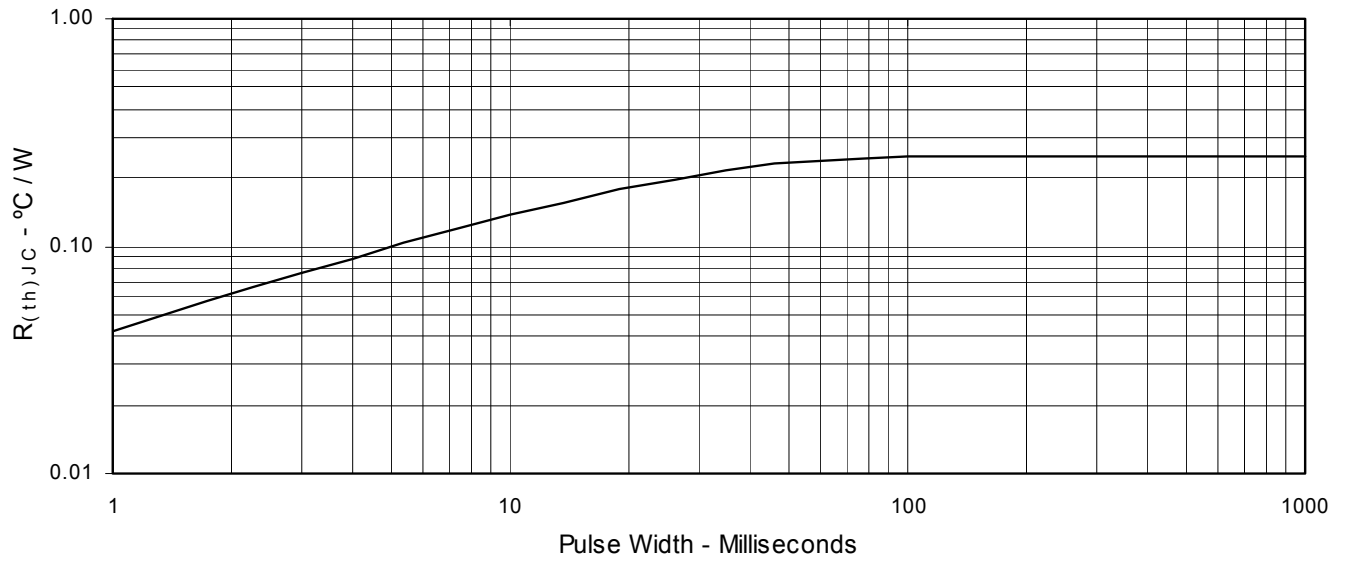


Fig. 13. Maximum Transient Thermal Resistance





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