

# PolarHT™ Power MOSFET

**IXTA50N20P**  
**IXTP50N20P**  
**IXTQ50N20P**

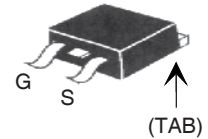
**$V_{DSS} = 200V$**   
 **$I_{D25} = 50A$**   
 **$R_{DS(on)} \leq 60m\Omega$**

N-Channel Enhancement Mode  
Avalanche Rated

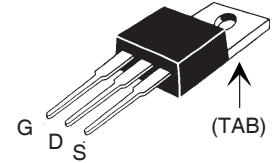


| Symbol        | Test Conditions  | Maximum Ratings |            |
|---------------|--|-----------------|------------|
| $V_{DSS}$     | $T_J = 25^\circ C$ to $175^\circ C$                                | 200             | V          |
| $V_{DGR}$     | $T_J = 25^\circ C$ to $175^\circ C$ , $R_{GS} = 1M\Omega$          | 200             | V          |
| $V_{GSS}$     | Continuous   | $\pm 20$        | V          |
| $V_{GSM}$     | Transient  | $\pm 30$        | V          |
| $I_{D25}$     | $T_C = 25^\circ C$   | 50              | A          |
| $I_{DM}$      | $T_C = 25^\circ C$ , pulse width limited by $T_{JM}$               | 120             | A          |
| $I_A$         | $T_C = 25^\circ C$   | 50              | A          |
| $E_{AS}$      | $T_C = 25^\circ C$   | 1               | J          |
| $dV/dt$       | $I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 175^\circ C$ | 10              | V/ns       |
| $P_D$         | $T_C = 25^\circ C$   | 360             | W          |
| $T_J$         |  | - 55 ... +175   | $^\circ C$ |
| $T_{JM}$      |  | 175             | $^\circ C$ |
| $T_{stg}$     |  | - 55 ... +175   | $^\circ C$ |
| $T_L$         | 1.6mm (0.062 in.) from case for 10s                                | 300             | $^\circ C$ |
| $T_{SOLD}$    | Plastic body for 10s   | 260             | $^\circ C$ |
| $M_d$         | Mounting torque (TO-3P, TO-220)                                    | 1.13/10         | Nm/lb.in.  |
| <b>Weight</b> | TO-263   | 2.5             | g          |
|               | TO-220   | 3.0             | g          |
|               | TO-3P  | 5.5             | g          |

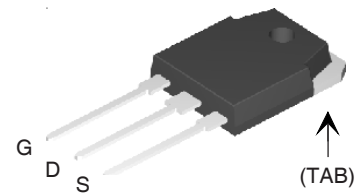
TO-263 (IXTA)



TO-220 (IXTP)



TO-3P (IXTQ)



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

| Symbol       | Test Conditions<br>( $T_J = 25^\circ C$ , unless otherwise specified) | Characteristic Values |      |               |
|--------------|---|-----------------------|------|---------------|
|              |   | Min.                  | Typ. | Max.          |
| $BV_{DSS}$   | $V_{GS} = 0V$ , $I_D = 250\mu A$                                      | 200                   |      | V             |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 250\mu A$                                  | 2.5                   |      | 5.0 V         |
| $I_{GSS}$    | $V_{GS} = \pm 20V$ , $V_{DS} = 0V$                                    |                       |      | $\pm 100$ nA  |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$  |                       |      | 25 $\mu A$    |
|              | $V_{GS} = 0V$ $T_J = 150^\circ C$                                     |                       |      | 250 $\mu A$   |
| $R_{DS(on)}$ | $V_{GS} = 10V$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1                   |                       |      | 60 m $\Omega$ |

## Features

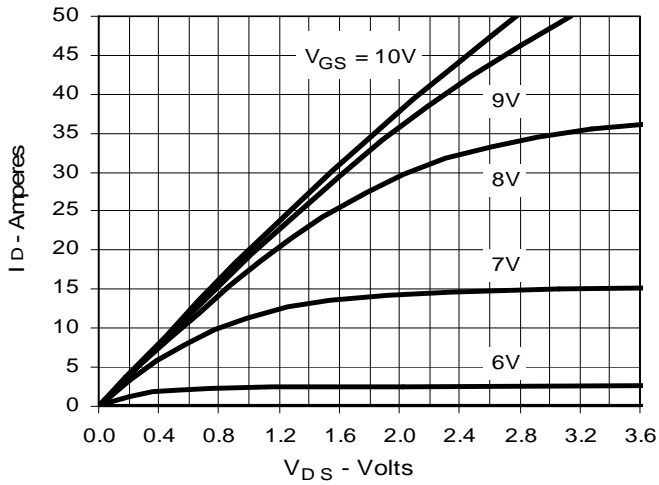
- International standard packages
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect

## Advantages

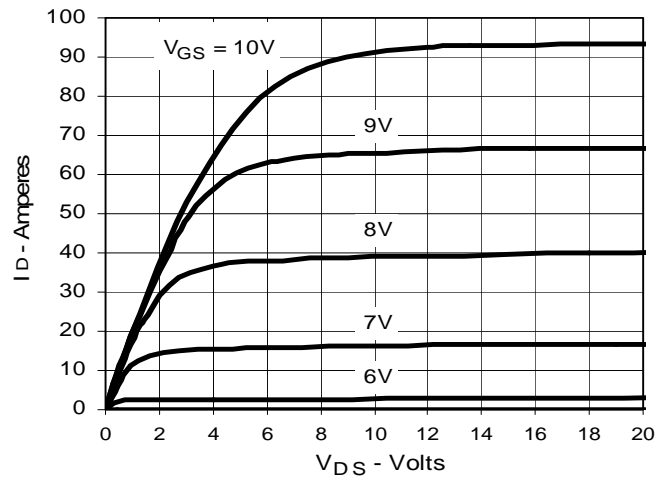
- Easy to mount
- Space savings
- High power density



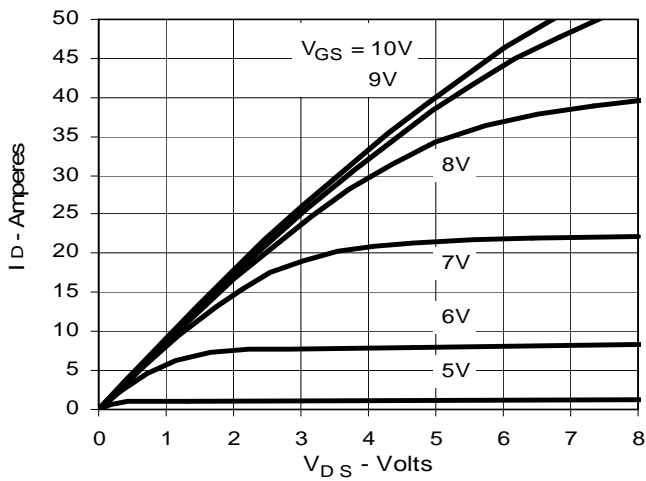
**Fig. 1. Output Characteristics  
@ 25°C**



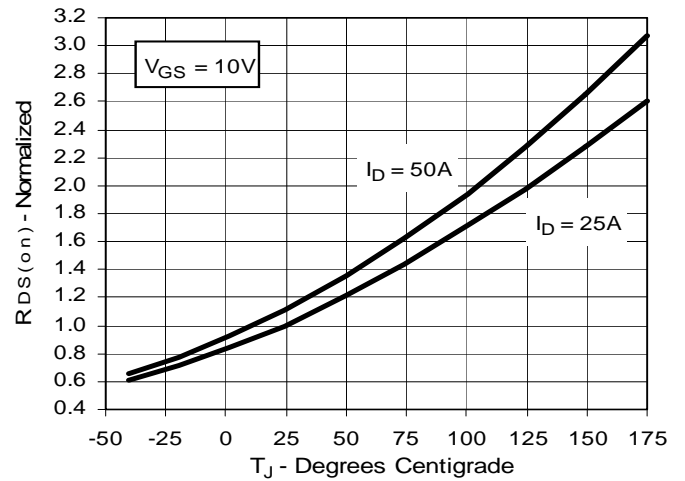
**Fig. 2. Extended Output Characteristics  
@ 25°C**



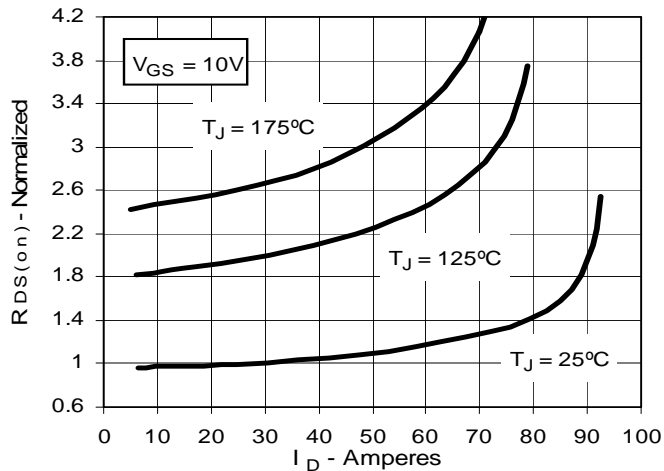
**Fig. 3. Output Characteristics  
@ 150°C**



**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 25A$  Value  
vs. Junction Temperature**



**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 25A$  Value  
vs. Drain Current**



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

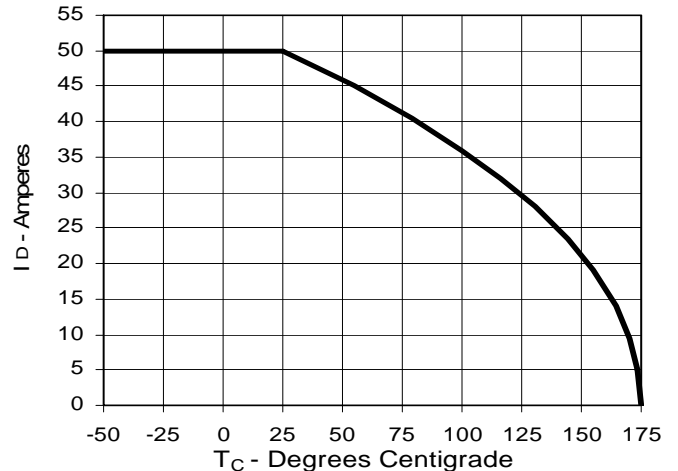


Fig. 7. Input Admittance

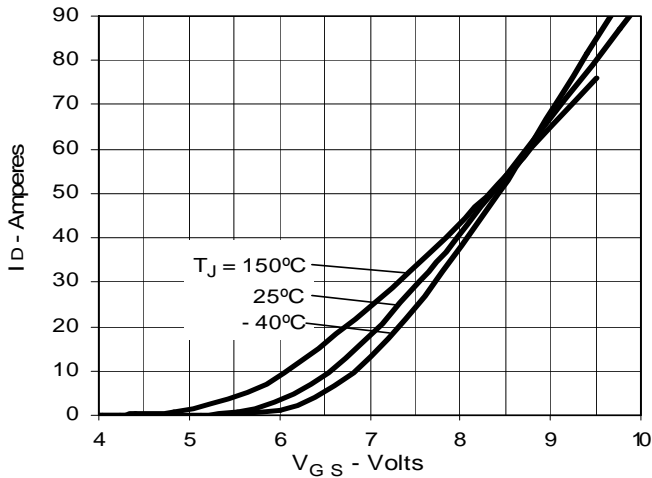


Fig. 8. Transconductance

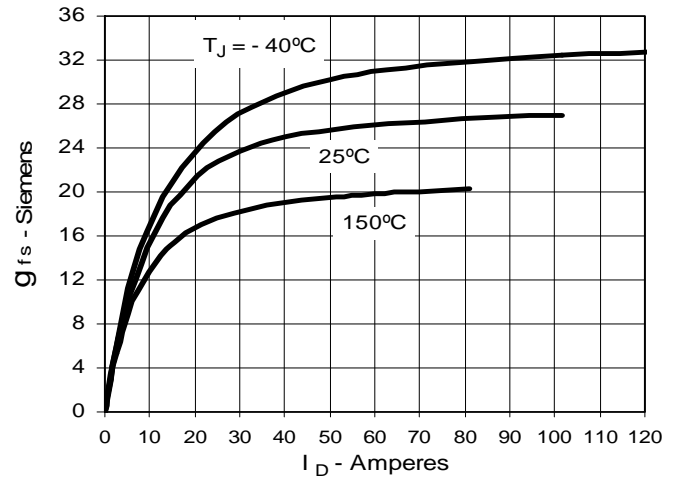


Fig. 9. Source Current vs. Source-To-Drain Voltage

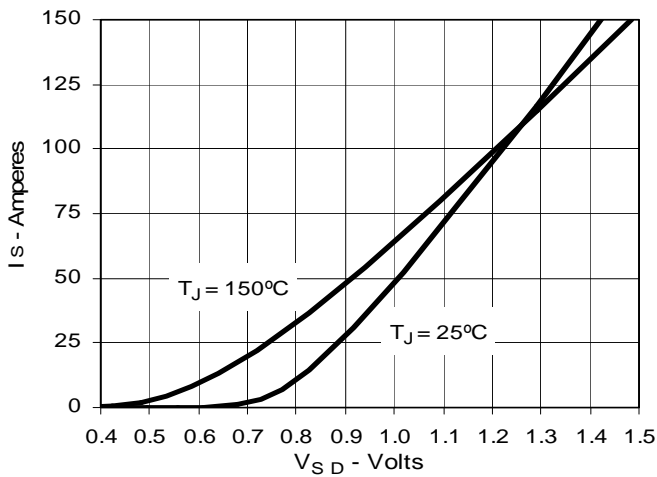


Fig. 10. Gate Charge

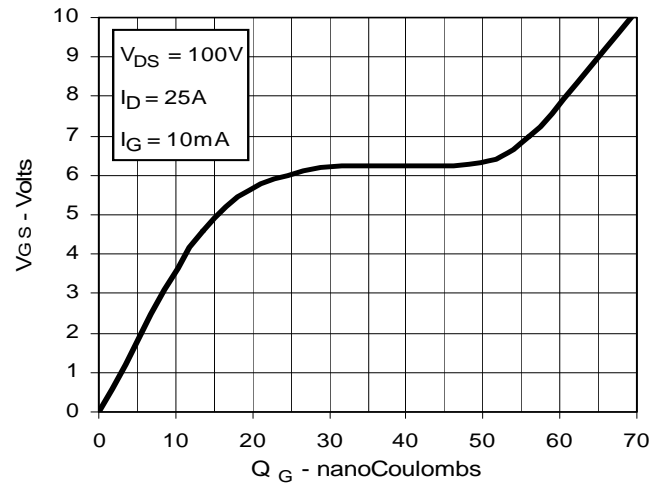


Fig. 11. Capacitance

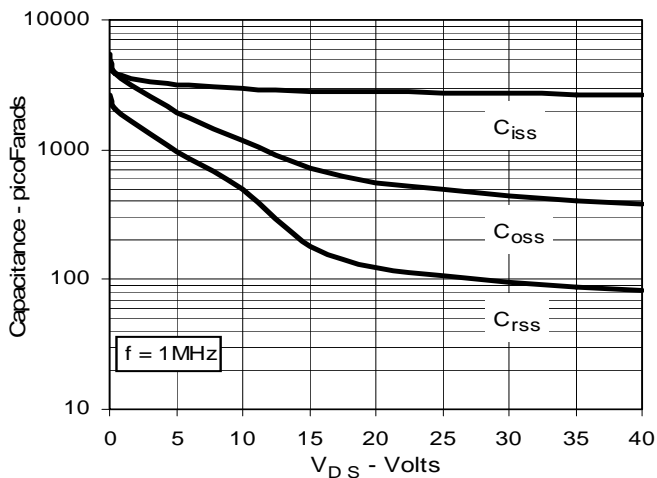


Fig. 12. Forward-Bias Safe Operating Area

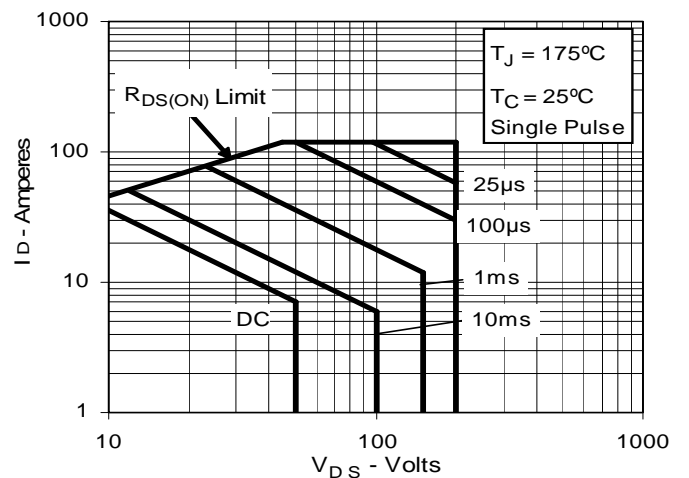
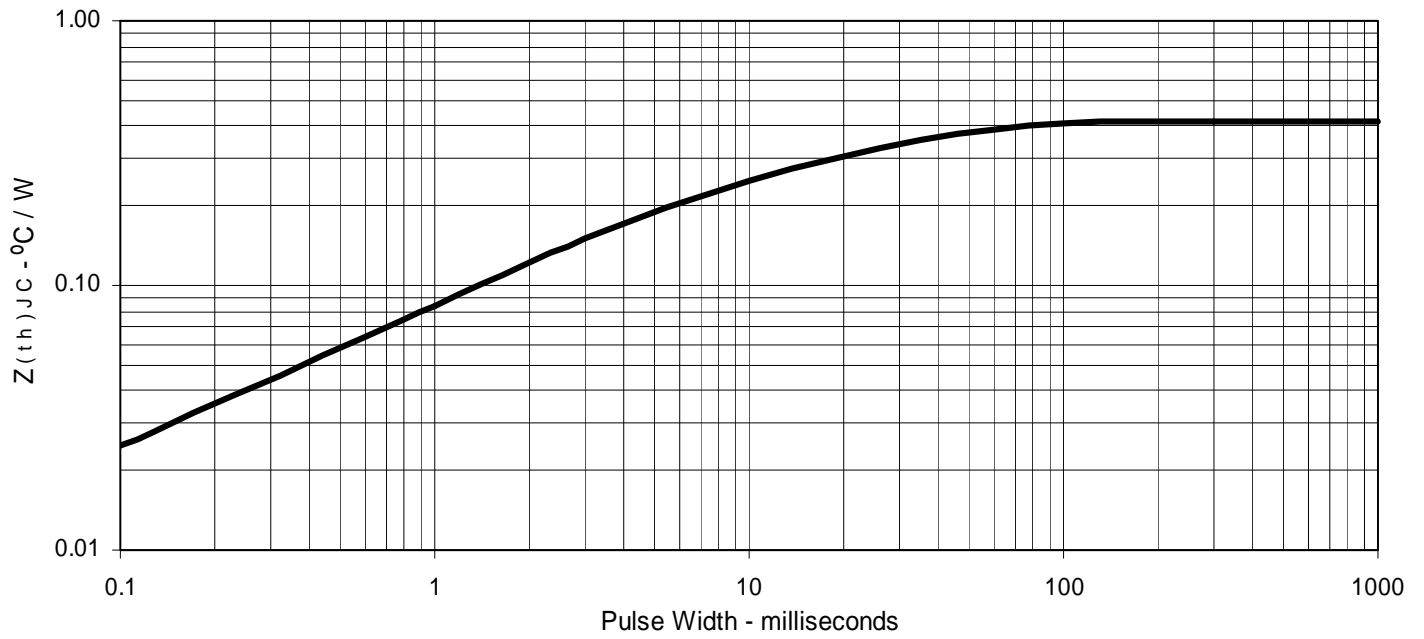


Fig. 13. Maximum Transient Thermal Impedance



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