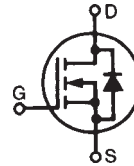


# PolarHT™ Power MOSFET

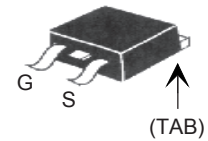
**IXTA 42N25P**  
**IXTP 42N25P**  
**IXTQ 42N25P**

$V_{DSS} = 250 \text{ V}$   
 $I_{D25} = 42 \text{ A}$   
 $R_{DS(on)} \leq 84 \text{ m}\Omega$

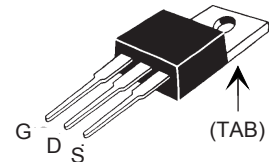
N-Channel Enhancement Mode  
Avalanche Rated



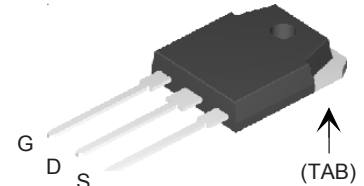
TO-263 (IXTA)



TO-220 (IXTP)



TO-3P (IXTQ)



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

| Symbol     | Test Conditions  | Maximum Ratings |                  |
|------------|--|-----------------|------------------|
| $V_{DSS}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$  | 250             | V                |
| $V_{DGR}$  | $T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$   | 250             | V                |
| $V_{GS}$   | Continuous   | $\pm 20$        | V                |
| $V_{GSM}$  | Transient  | $\pm 30$        | V                |
| $I_{D25}$  | $T_C = 25^\circ\text{C}$   | 42              | A                |
| $I_{DM}$   | $T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$   | 110             | A                |
| $I_{AR}$   | $T_C = 25^\circ\text{C}$   | 42              | A                |
| $E_{AR}$   | $T_C = 25^\circ\text{C}$   | 30              | mJ               |
| $E_{AS}$   | $T_C = 25^\circ\text{C}$   | 1.0             | J                |
| $dv/dt$    | $I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ ,<br>$T_J \leq 150^\circ\text{C}$ , $R_G = 10 \Omega$ | 10              | V/ns             |
| $P_D$      | $T_C = 25^\circ\text{C}$   | 300             | W                |
| $T_J$      |  | -55 ... +150    | $^\circ\text{C}$ |
| $T_{JM}$   |  | 150             | $^\circ\text{C}$ |
| $T_{stg}$  |  | -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 10 s  | 260             | $^\circ\text{C}$ |
| $M_d$      | Mounting torque (TO-3P / TO-220)   | 1.13/10         | Nm/lb.in.        |
| Weight     | TO-3P  | 5.5             | g                |
|            | TO-220   | 4               | g                |
|            | TO-263   | 3               | g                |

| Symbol       | Test Conditions<br>( $T_J = 25^\circ\text{C}$ , unless otherwise specified)                                     | Characteristic Values |      |                      |
|--------------|---|-----------------------|------|----------------------|
|              |   | Min.                  | Typ. | Max.                 |
| $BV_{DSS}$   | $V_{GS} = 0 \text{ V}$ , $I_D = 250 \mu\text{A}$  | 250                   |      | V                    |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 250 \mu\text{A}$   | 3.0                   |      | 5.5 V                |
| $I_{GSS}$    | $V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$   |                       |      | $\pm 100 \text{ nA}$ |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$<br>$V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$  |                       |      | 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 $d \leq 2\%$ |                       |      | 84 $\text{m}\Omega$  |

## Features

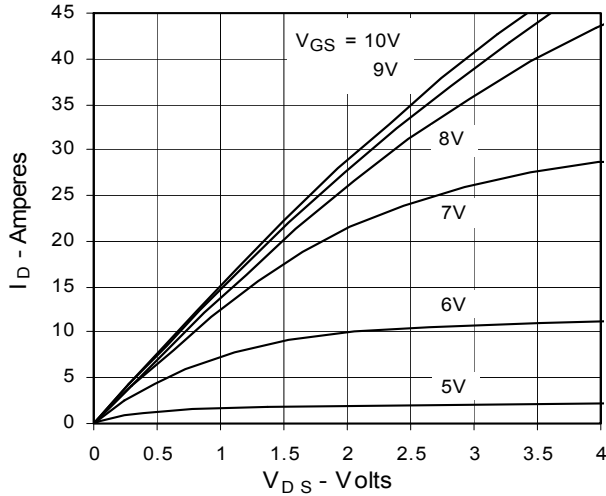
- <sup>1</sup> International standard packages
- <sup>1</sup> Unclamped Inductive Switching (UIS) rated
- <sup>1</sup> Low package inductance
- easy to drive and to protect

## Advantages

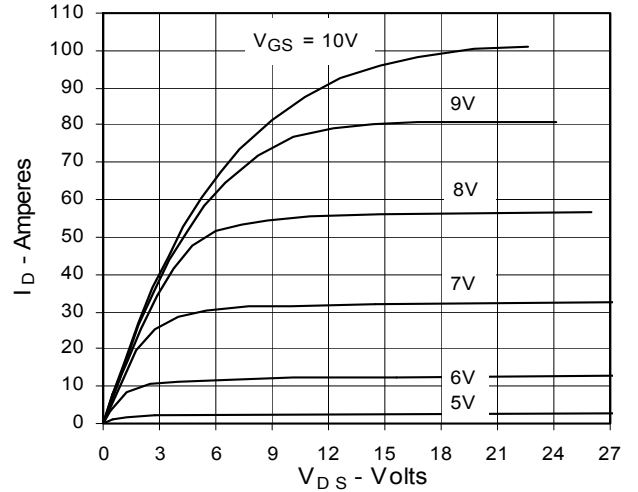
- <sup>1</sup> Easy to mount
- <sup>1</sup> Space savings
- <sup>1</sup> High power density



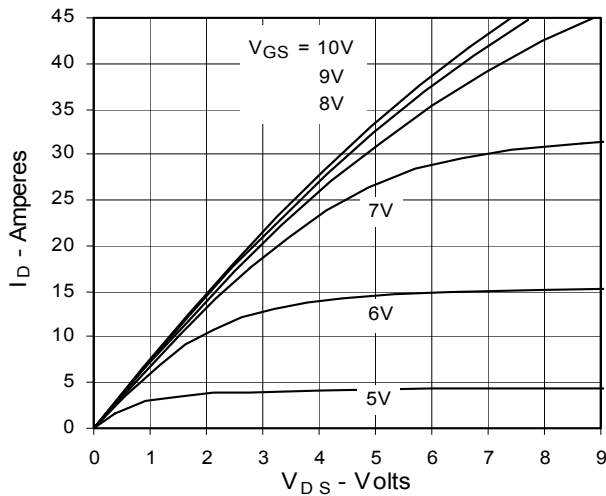
**Fig. 1. Output Characteristics**  
@ 25°C



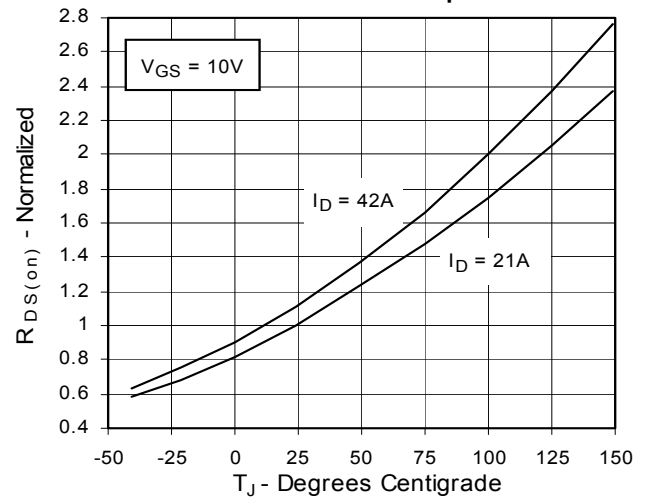
**Fig. 2. Extended Output Characteristics**  
@ 25°C



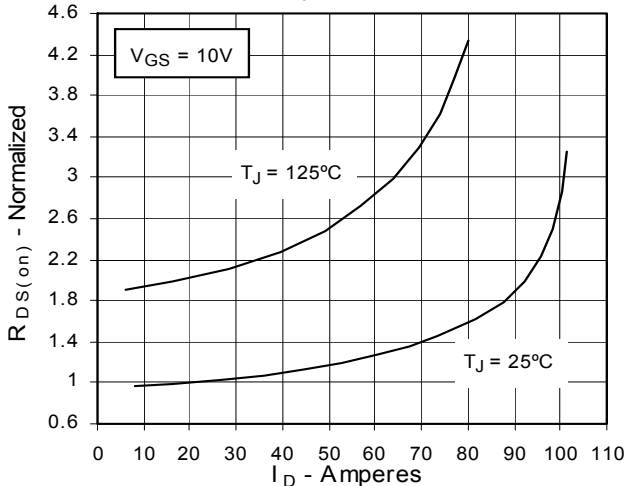
**Fig. 3. Output Characteristics**  
@ 125°C



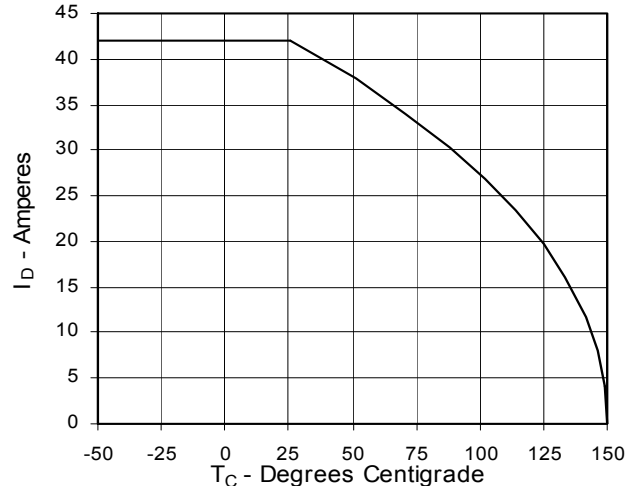
**Fig. 4.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs. Junction Temperature**



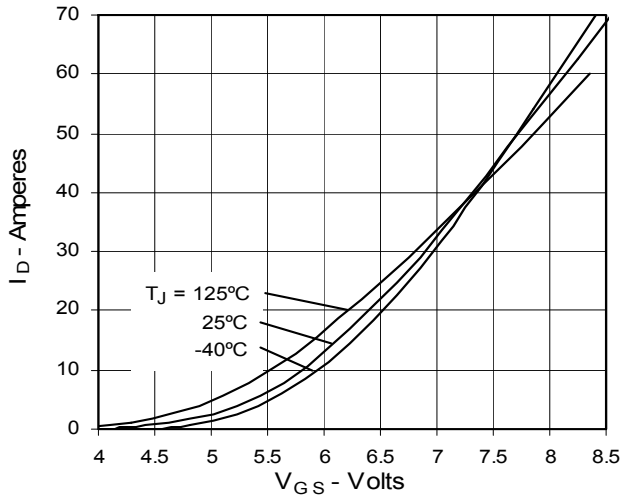
**Fig. 5.  $R_{DS(on)}$  Normalized to 0.5  $I_{D25}$  Value vs.  $I_D$**



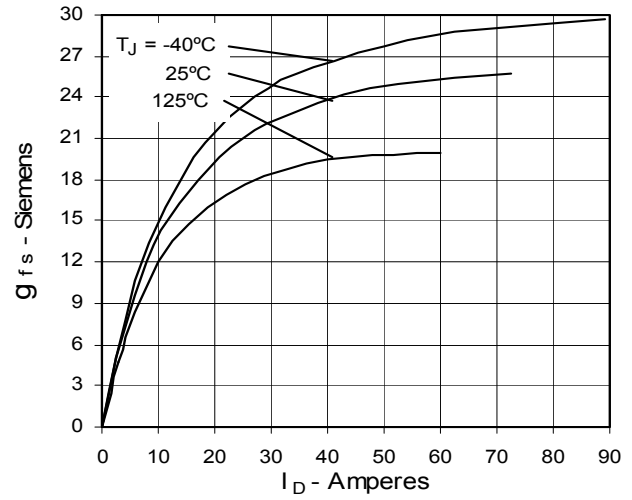
**Fig. 6. Drain Current vs. Case Temperature**



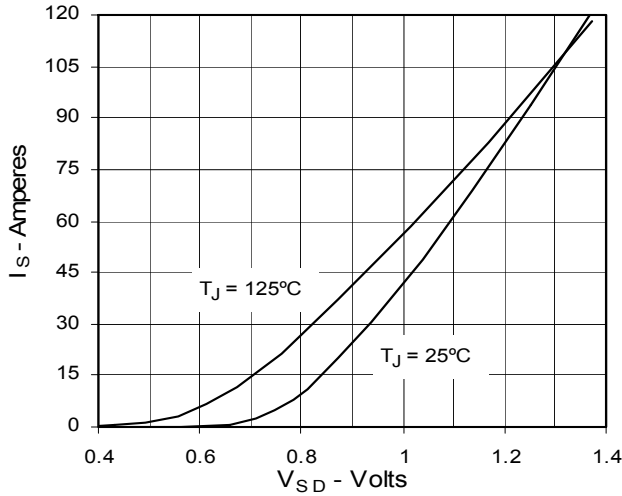
**Fig. 7. Input Admittance**



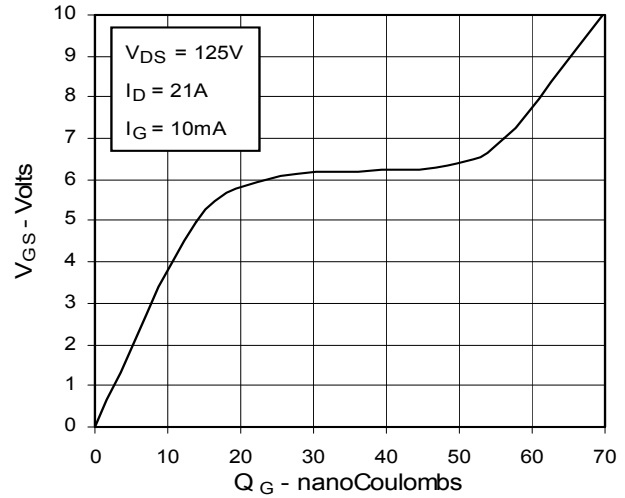
**Fig. 8. Transconductance**



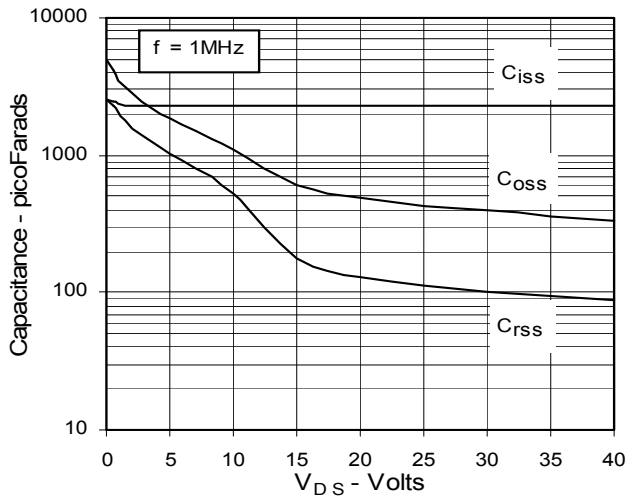
**Fig. 9. Source Current vs. Source-To-Drain Voltage**



**Fig. 10. Gate Charge**



**Fig. 11. Capacitance**



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

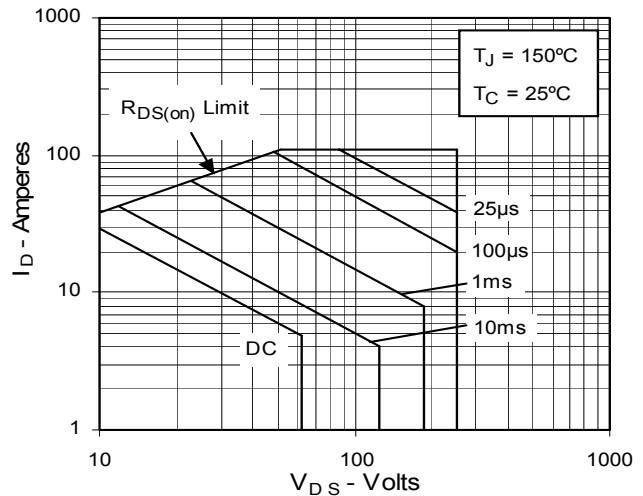


Fig. 13. Maximum Transient Thermal Resistance

