

## X3-Class Power MOSFET™

# IXTP90N20X3 IXTH90N20X3

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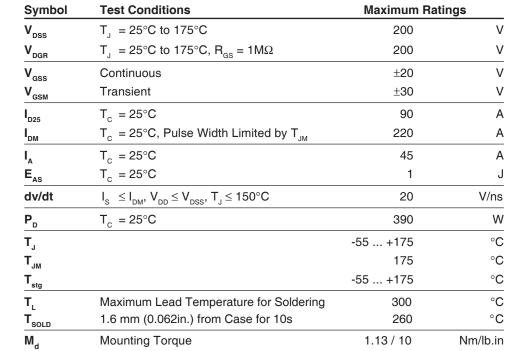
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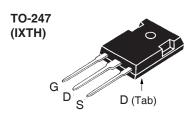
200V 90A  $12m\Omega$ 

N-Channel Enhancement Mode Avalanche Rated



	TO-220 (IXTP)	
6		
		D <sub>S</sub> D (Tab)





G = Gate	D	= Drain
S = Source	Tab	= Drain

### **Features**

- International Standard Packages
- Low R<sub>DS(ON)</sub> and Q<sub>G</sub>
   Avalanche Rated
- Low Package Inductance

## **Advantages**

g

g

- High Power Density
- Easy to Mount
- Space Savings

## **Applications**

- Switch-Mode and Resonant-Mode **Power Supplies**
- DC-DC Converters
- PFC Circuits
- · AC and DC Motor Drives
- · Robotics and Servo Controls

Symbol (T <sub>J</sub> = 25°C,	SymbolTest ConditionsCharacteristics $(T_J = 25^{\circ}C, Unless Otherwise Specified)$ Min.		teristic Values Typ. <sub> </sub> Max.		
BV <sub>DSS</sub>	$V_{GS} = 0V, I_{D} = 250\mu A$	200			V
V <sub>GS(th)</sub>	$V_{DS} = V_{GS}$ , $I_D = 250 \mu A$	2.5		4.5	V
I <sub>GSS</sub>	$V_{GS} = \pm 20V, V_{DS} = 0V$			±100	nA
I <sub>DSS</sub>	$V_{DS} = V_{DSS}$ , $V_{GS} = 0V$ $T_{J} = 125^{\circ}C$			5 100	μ <b>Α</b>
R <sub>DS(on)</sub>	$V_{GS} = 10V, I_{D} = 0.5 \bullet I_{D25}, Note 1$		10	12	mΩ

TO-220

TO-247

Weight



Symbol	Test Conditions C		haracteristic Values		
$(T_J = 25^{\circ}C, Unless Otherwise Specified)$ Min.		Min.	Тур.	Max	
g <sub>fs</sub>	V <sub>DS</sub> = 10V, I <sub>D</sub> = 0.5 • I <sub>D25</sub> , Note 1	60	100	S	
R <sub>Gi</sub>	Gate Input Resistance		1.4	Ω	
C <sub>iss</sub>			5420	pF	
C <sub>oss</sub>	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		930	pF	
C <sub>rss</sub>			4	pF	
	Effective Output Capacitance				
$C_{o(er)}$	Energy related $\int V_{GS} = 0V$		420	pF	
$C_{o(tr)}$	Time related $\int_{DS} V_{DS}^{GS} = 0.8 \cdot V_{DSS}$		1300	pF	
t <sub>d(on)</sub>	Resistive Switching Times		22	ns	
t, (	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 0.5 \cdot I_{D25}$		26	ns	
t <sub>d(off)</sub>	GC 20 200 2 220		62	ns	
t,	$R_{_{\rm G}} = 5\Omega$ (External)		13	ns	
$Q_{g(on)}$			78	nC	
Q <sub>gs</sub>	$V_{gs} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 0.5 \cdot I_{D25}$		23	nC	
Q <sub>gd</sub>			22	nC	
R <sub>thJC</sub>				0.32 °C/W	
R <sub>thCS</sub>	TO-220		0.50	°C/W	
	TO-247		0.21	°C/W	

### Source-Drain Diode

Symbol	Test Conditions	Characteristic Values			
$(T_{J} = 25^{\circ}C, T_{J})$	Unless Otherwise Specified)	Min.	Тур.	Max	
I <sub>s</sub>	$V_{GS} = 0V$			90	Α
SM	Repetitive, pulse Width Limited by $\mathrm{T}_{_{\mathrm{JM}}}$			360	Α
V <sub>SD</sub>	$I_F = I_S$ , $V_{GS} = 0V$ , Note 1			1.4	V
$\left. egin{array}{l} \mathbf{t}_{rr} & \\ \mathbf{Q}_{RM} & \\ \mathbf{I}_{RM} & \end{array}  ight.  ight.$	$I_F = 45A$ , -di/dt = 100A/ $\mu$ s $V_R = 100V$		124 650 10.5		ns nC A

Note 1. Pulse test,  $t \le 300\mu s$ , duty cycle,  $d \le 2\%$ .

## **ADVANCE TECHNICAL INFORMATION**

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.



