

# X3-Class HiPerFET™ Power MOSFET

## IXFN240N25X3

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N-Channel Enhancement Mode Avalanche Rated Fast Intrinsic Diode

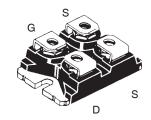


 $V_{DSS}$  = 250V  $I_{D25}$  = 240A  $R_{DS(on)} \le 4.5 \text{m}\Omega$ 

miniBLOC, SOT-227 E153432

Symbol	<b>Test Conditions</b>		Maximum Ratings		
V <sub>DSS</sub>	$T_J = 25^{\circ}\text{C to } 150^{\circ}\text{C}$		250	V	
V <sub>DGR</sub>	$T_J = 25^{\circ}\text{C to } 150^{\circ}\text{C}, R_{gs} = 1\text{M}\Omega$		250	V	
V <sub>GSS</sub>	Continuous		± 20	V	
V <sub>GSM</sub>	Transient		± 30		
I <sub>D25</sub> I <sub>L(RMS)</sub>	$T_{c} = 25^{\circ}C$ (Chip Capability)		240	A	
	External Lead Current Limit		200	A	
	$T_{c} = 25^{\circ}C$ , Pulse Width Limited by $T_{JM}$		600	A	
I <sub>A</sub>	$T_c = 25^{\circ}C$		200	A	
E <sub>AS</sub>	$T_c = 25^{\circ}C$		3	J	
$P_{D}$	T <sub>c</sub> = 25°C		695	W	
dv/dt	$I_{S} \le I_{DM}, V_{DD} \le V_{DSS}, T_{J} \le 150^{\circ}C$		50	V/ns	
T <sub>J</sub> T <sub>JM</sub> T <sub>stg</sub>			-55 +150 150 -55 +150	သ လ သ	
V <sub>ISOL</sub>	50/60 Hz, RMS	t = 1 minute	2500	V~	
	I <sub>ISOL</sub> ≤ 1mA	t = 1 second	3000	V~	
M <sub>d</sub>	Mounting Torque Terminal Connect		1.5/13 1.3/11.5	Nm/lb.in Nm/lb.in	

Symbol		Characteristic Values				
$T_{\rm J} = 25^{\circ}$ C	Unless Otherwise Specified)		Min.	Тур.	Max	
BV <sub>DSS</sub>	$V_{GS} = 0V, I_{D} = 3mA$		250			V
$V_{\rm GS(th)}$	$V_{DS} = V_{GS}, I_{D} = 8mA$		2.5		4.5	V
I <sub>GSS</sub>	$V_{GS} = \pm 20V, V_{DS} = 0V$				± 200	nA
I <sub>DSS</sub>	$V_{DS} = V_{DSS}, V_{GS} = 0V$				25	μΑ
		$T_J = 125^{\circ}C$			2.5	mA
R <sub>DS(on)</sub>	$V_{GS} = 10V, I_{D} = 120A, Note$	e 1		3.5	4.5	mΩ



G = Gate D = Drain S = Source

### **Features**

- International Standard Package
- miniBLOC, with Aluminium Nitride Isolation
- Isolation Voltage 2500V~
- High Current Handling Capability
- Fast Intrinsic Diode
- Avalanche Rated
- Low R<sub>DS(on)</sub>

### **Advantages**

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- 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

Weight



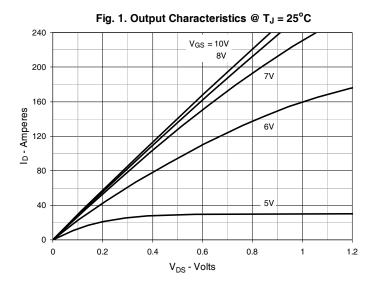
Symbol	•		Characteristic Values			
$(T_J = 25^{\circ}C, l)$	Unless Otherwise Specified)	Min.	Тур.	Max		
g <sub>fs</sub>	$V_{DS} = 10V, I_{D} = 60A, Note 1$	80	135	S		
$R_{Gi}$	Gate Input Resistance		1.8	Ω		
C <sub>iss</sub>			23.8	nF		
C <sub>oss</sub>	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		3.7	nF		
C <sub>rss</sub>			1.5	pF		
	Effective Output Capacitance					
$C_{o(er)}$	Energy related $\int V_{GS} = 0V$		1400	pF		
$C_{o(tr)}$	Time related $\int V_{DS}^{GS} = 0.8 \cdot V_{DSS}$		5480	pF		
t <sub>d(on)</sub>	Resistive Switching Times		36	ns		
t,	$V_{GS} = 10V$ , $V_{DS} = 0.5 \cdot V_{DSS}$ , $I_{D} = 120A$ $R_{G} = 1\Omega$ (External)		32	ns		
$t_{d(off)}$ $t_{f}$			180	ns		
	n <sub>G</sub> = 152 (External)		14	ns		
$Q_{g(on)}$			345	nC		
Q <sub>gs</sub>	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 120A$		112	nC		
Q <sub>gd</sub>	)		72	nC		
R <sub>thJC</sub>				0.18 °C/W		
R <sub>thCS</sub>			0.05	°C/W		

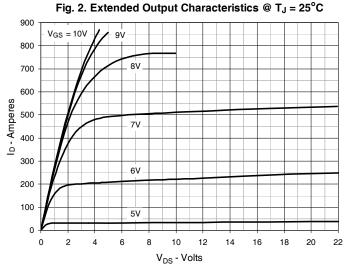
#### Source-Drain Diode

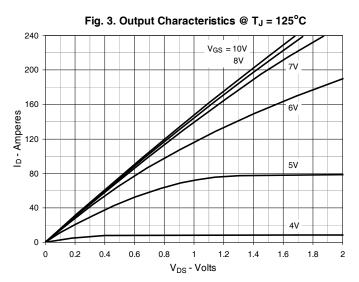
<b>Symbol Test Conditions</b> (T <sub>J</sub> = 25°C, Unless Otherwise Specified)		Chara Min.	acteristic Values   Typ.   Max		
I <sub>s</sub>	$V_{GS} = 0V$			240	Α
I <sub>SM</sub>	Repetitive, Pulse Width Limited by $\rm T_{_{\rm JM}}$			960	Α
V <sub>SD</sub>	$I_F = 100A$ , $V_{GS} = 0V$ , Note 1			1.4	V
$\left\{ egin{array}{ll} \mathbf{t}_{rr} & \\ \mathbf{Q}_{RM} & \\ \mathbf{I}_{RM} & \end{array}  ight\}$	$I_F = 120A$ , $-di/dt = 100A/\mu s$ $V_R = 100V$		165 3.7 45.6		ns μC A

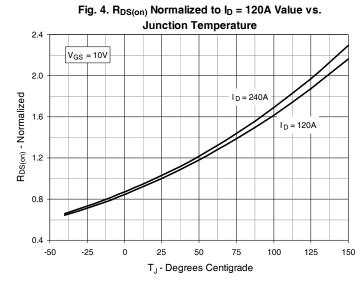
Note 1. Pulse test,  $t \le 300\mu s$ , duty cycle,  $d \le 2\%$ .

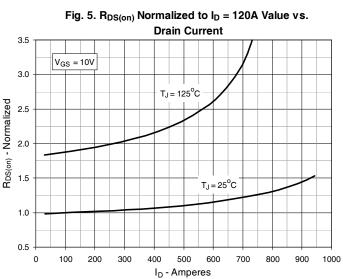


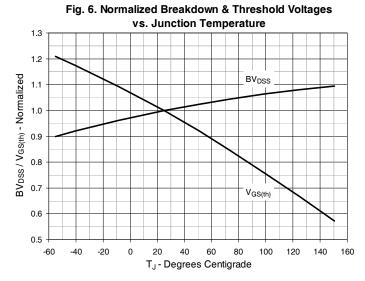






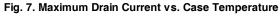






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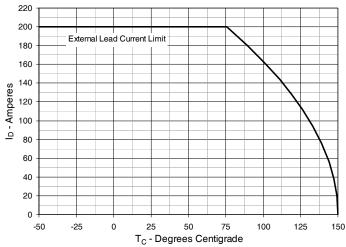


Fig. 8. Input Admittance

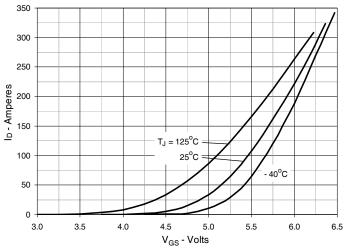


Fig. 9. Transconductance

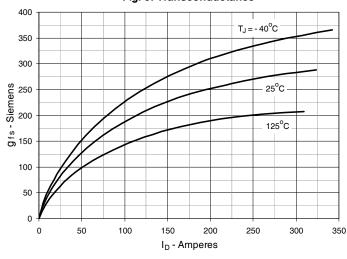


Fig. 10. Forward Voltage Drop of Intrinsic Diode

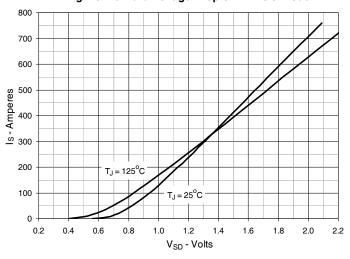


Fig. 11. Gate Charge

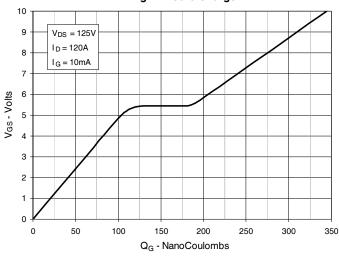
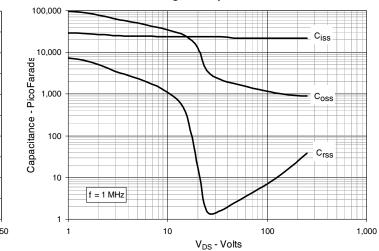


Fig. 12. Capacitance



 $\ensuremath{\mathsf{IXYS}}$  Reserves the Right to Change Limits, Test Conditions, and Dimensions.

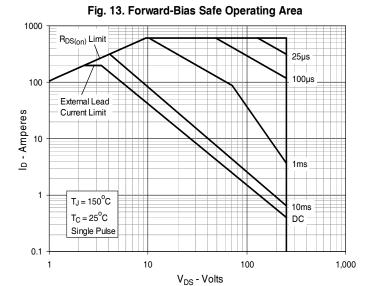
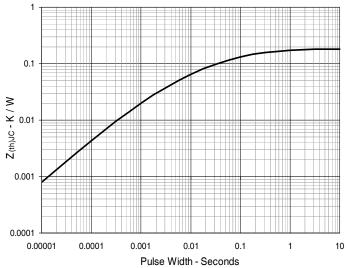
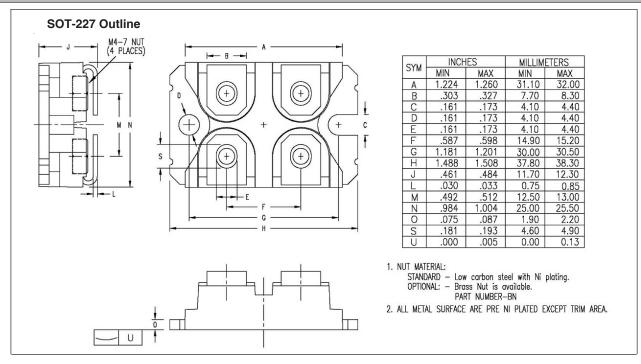


Fig. 14. Maximum Transient Thermal Impedance













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