

X3-Class HiPerFET™ **Power MOSFET**

IXFT170N15X3HV IXFQ170N15X3 IXFH170N15X3

N-Channel Enhancement Mode Avalanche Rated

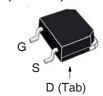


Symbol	Test Conditions	Maximum Ra	ntings
V _{DSS}	$T_{_{\rm J}} = 25^{\circ}\text{C to } 150^{\circ}\text{C}$	150	V
$V_{\scriptscriptstyle DGR}$	$T_J = 25^{\circ}C$ to 150°C, $R_{gs} = 1M\Omega$	150	V
V _{GSS}	Continuous	±20	V
V _{GSM}	Transient	±30	V
I _{D25}	T _c = 25°C	170	Α
I _{L(RMS)}	External Lead Current Limit	160	Α
I _{DM}	$T_{\rm C} = 25^{\circ}$ C, Pulse Width Limited by $T_{\rm JM}$	340	Α
I _A	T _c = 25°C	85	А
E _{as}	$T_{c} = 25^{\circ}C$	1.7	J
dv/dt	$I_{S} \leq I_{DM}, V_{DD} \leq V_{DSS}, T_{J} \leq 150^{\circ}C$	20	V/ns
P_{D}	T _c = 25°C	520	W
T _J		-55 +150	°C
T _{JM}		150	°C
T _{stg}		-55 +150	°C
T _L	Maximum Lead Temperature for Soldering	300	°C
T _{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
M _d	Mounting Torque (TO-247 & TO-3P)	1.13 / 10	Nm/lb.in
Weight	TO-268HV	4.0	g
	TO-3P	5.5	g
	TO-247	6.0	<u>g</u>

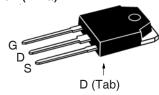
Symbol (T _J = 25°C, U	Test Conditions Unless Otherwise Specified)	Charac Min.	cteristic ' Typ.	Values Max	.
BV _{DSS}	$V_{GS} = 0V, I_{D} = 1mA$	150			V
V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 4mA$	2.5		4.5	V
I _{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			±100	nA
I _{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_{J} = 125$ °C			10 300	μ Α μ Α
R _{DS(on)}	$V_{GS} = 10V, I_{D} = 0.5 \bullet I_{D2S}, Note 1$		5.7	6.7	mΩ

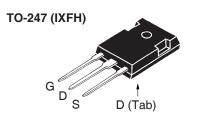
150V 170A D25 $6.7 m\Omega$ $\mathbf{R}_{\mathrm{DS(on)}}$

TO-268HV (IXFT..HV)



TO-3P (IXFQ)





G = Gate= Drain D S = SourceTab = Drain

Features

- International Standard Packages
- Low $R_{DS(ON)}$ and Q_G Avalanche Rated
- Low Package Inductance

Advantages

- 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 Test Conditions Chara			acteristic Values		
$(T_J = 25^{\circ}C, Unless Otherwise Specified)$ Min.		Тур.	Max		
g _{fs}	V _{DS} = 10V, I _D = 60A, Note 1	54	90	S	
R_{gi}	Gate Input Resistance		1.5	Ω	
C _{iss}			7620	pF	
C _{oss}	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		1240	pF	
C _{rss}			40	pF	
	Effective Output Capacitance				
$C_{o(er)}$	Energy related $V_{GS} = 0V$		730	pF	
C _{o(tr)}	Time related $V_{DS}^{GS} = 0.8 \cdot V_{DSS}$		1700	pF	
t _{d(on)}	Resistive Switching Times		30	ns	
t,	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 0.5 \cdot I_{D25}$		30	ns	
t _{d(off)}	20 20 2		90	ns	
t, J	$R_{\rm G} = 5\Omega$ (External)		14	ns	
Q _{g(on)}			122	nC	
Q _{gs}	$V_{gs} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 0.5 \cdot I_{D25}$		35	nC	
Q _{gd}			40	nC	
R _{thJC}				0.24 °C/W	
R _{thCS}	TO-247& TO-3P		0.21	°C/W	

Source-Drain Diode

• • • • • • • • • • • • • • • • • • • •		cteristic Values			
$(1_{J} = 25^{\circ}C, 1_{J}$	Jnless Otherwise Specified)	Min.	Тур.	Max	
Is	$V_{GS} = 0V$			170	Α
SM	Repetitive, pulse Width Limited by $T_{_{JM}}$			680	Α
V _{SD}	$I_{\rm F} = 100 {\rm A}, V_{\rm GS} = 0 {\rm V}, {\rm Note} 1$			1.4	V
$\left. egin{array}{c} \mathbf{t}_{rr} & \\ \mathbf{Q}_{RM} & \\ \mathbf{I}_{RM} & \end{array} ight. \right\}$	$I_F = 85A$, -di/dt = 100A/ μ s $V_R = 100V$		90 320 7		ns nC A

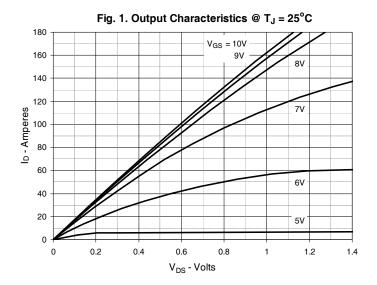
Note 1. Pulse test, $t \le 300\mu s$, duty cycle, $d \le 2\%$.

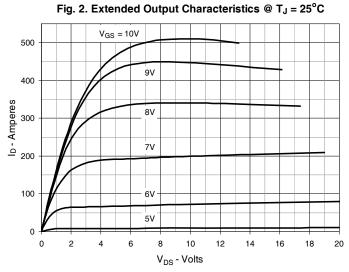
ADVANCE TECHNICAL INFORMATION

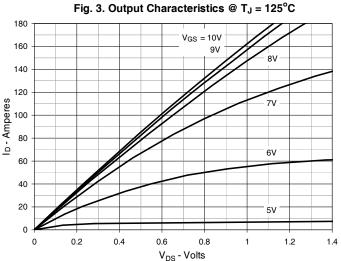
The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test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

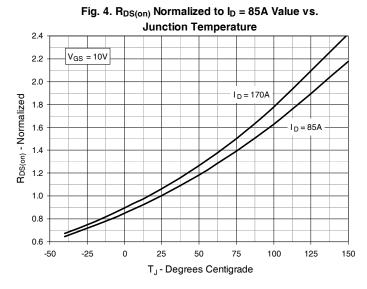
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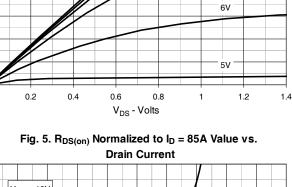


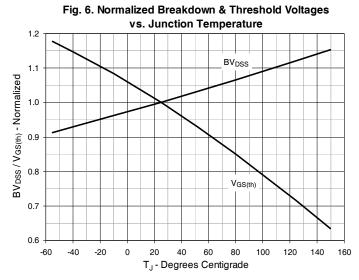


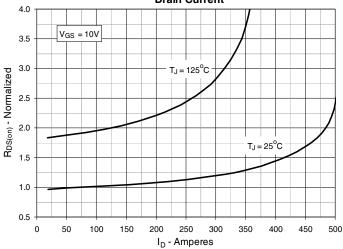














ID - Amperes

60

40

20

0 -50

-25

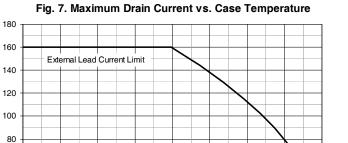
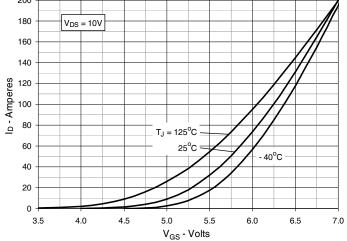


Fig. 8. Input Admittance 200





T_C - Degrees Centigrade

75

125

150

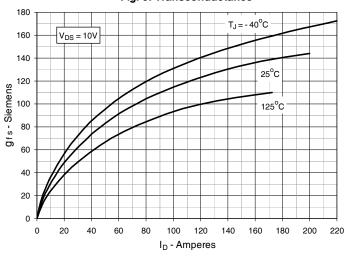


Fig. 10. Forward Voltage Drop of Intrinsic Diode

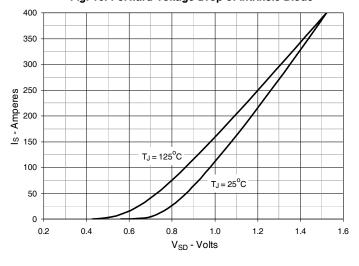


Fig. 11. Gate Charge

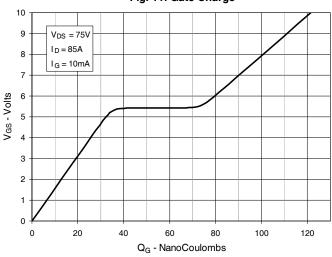
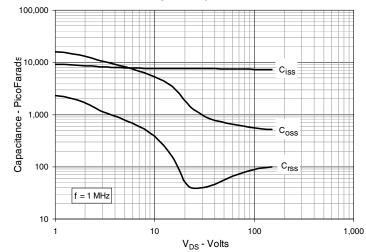


Fig. 12. Capacitance



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Fig. 13. Output Capacitance Stored Energy

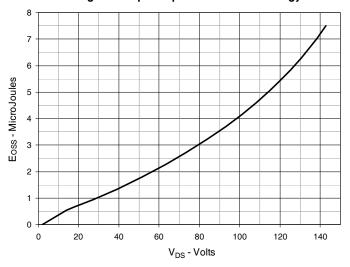


Fig. 14. Forward-Bias Safe Operating Area

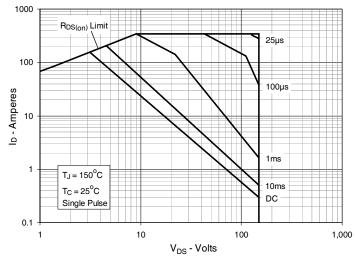
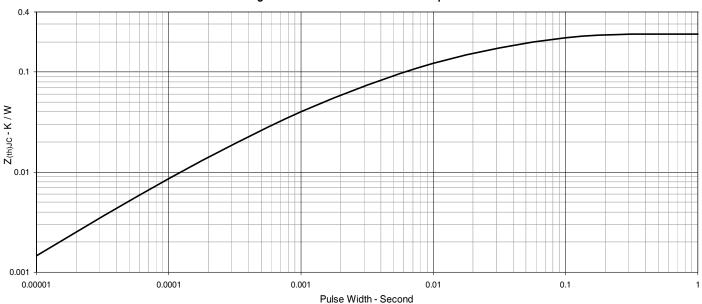
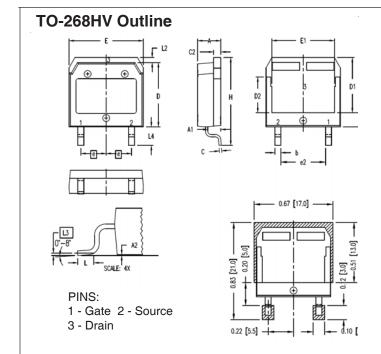


Fig. 15. Maximum Transient Thermal Impedance







0.44	INCHES		MILLIMETER		
SYM	MIN	MAX	MIN	MAX	
Α	.193	.201	4.90	5.10	
Α1	.106	.114	2.70	2.90	
A1 A2 b	.001	.010	0.02	0.25	
Ь	.045	.057	1.15	1.45	
C C2 D	.016	.026	0.40	0.65	
C2	.057	.063	1.45	1.60	
D	.543	.551	13.80	14.00	
D1	.465	.476	11.80	12.10	
D2	.295	.307	7.50	7.80	
D3	.114	.126	2.90	3.20	
E	.624	.632	15.85	16.05	
E1	.524	.535	13.30	13.60	
е	.215 BSC		5. 4 5 BSC		
(e2)	.374	.386	9.50	9.80	
H	.736	.752	18.70	19.10	
L	.067	.079	1.70	2.00	
L2	.039	.045	1.00	1.15	
L3	.010	BSC	0.25	BSC	
L4	.150	.161	3.80	4 .10	

