

X3-Class HiPerFET™ **Power MOSFET**

IXFT150N30X3HV IXFH150N30X3 IXFK150N30X3

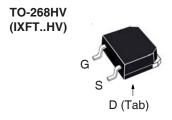
N-Channel Enhancement Mode Avalanche Rated

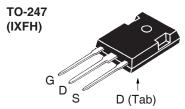


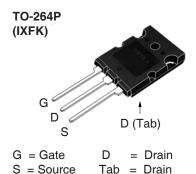
Symbol	Test Conditions	Maximum Ratings		
V _{DSS}	$T_J = 25^{\circ}C \text{ to } 150^{\circ}C$	300	V	
V _{DGR}	$T_{_{ m J}}$ = 25°C to 150°C, $R_{_{ m GS}}$ = 1M Ω	300	V	
V _{gss}	Continuous	±20	V	
V _{GSM}	Transient	±30	V	
I _{D25}	T _C = 25°C	150	A	
I _{DM}	$T_{\rm C} = 25^{\circ}$ C, Pulse Width Limited by $T_{\rm JM}$	400	Α	
I _A	T _C = 25°C	75	А	
E _{AS}	$T_{c} = 25^{\circ}C$	2	J	
dv/dt	$I_{_{S}} \le I_{_{DM}}, V_{_{DD}} \le V_{_{DSS}}, T_{_{J}} \le 150^{\circ}C$	20	V/ns	
$\overline{\mathbf{P}_{\scriptscriptstyle \mathrm{D}}}$	T _C = 25°C	890	W	
T		-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-264)	1.13 / 10	Nm/lb.in	
Weight	TO-268HV	4	g	
	TO-247 TO-264P	6 10	g g	

Symbol (T _J = 25°C, U	Test Conditions Unless Otherwise Specified)	Charac Min.	cteristic Typ.	Values Ma	
BV _{DSS}	$V_{GS} = 0V, I_{D} = 1mA$	300			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
l _{DSS}	$V_{DS} = V_{DSS}, V_{GS} = 0V$ $T_{J} = 125^{\circ}C$			25 1	μA mA
R _{DS(on)}	$V_{GS} = 10V, I_{D} = 0.5 \bullet I_{D25}, Note 1$		6.6	8.3	mΩ

300V 150A I_{D25} $8.3m\Omega$ \leq R_{DS(on)}







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 Char		racteristic Values		
$(T_{J} = 25^{\circ}C, U)$	Inless Otherwise Specified)	Min.	Тур.	Max
g _{fs}	V _{DS} = 10V, I _D = 60A, Note 1	70	120	S
R_{Gi}	Gate Input Resistance		1.2	Ω
C _{iss}			13.1	nF
C _{oss}	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		2.0	nF
C _{rss}			1.7	pF
	Effective Output Capacitance			
$C_{o(er)}$	Energy related $\int V_{GS} = 0V$		700	pF
$\mathbf{C}_{o(tr)}$	Time related $\int V_{DS}^{GS} = 0.8 \cdot V_{DSS}$		2700	pF
t _{d(on)}	Resistive Switching Times		40	ns
t _r	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 0.5 \cdot I_{D25}$		32	ns
t _{d(off)}	$R_{\rm G} = 5\Omega$ (External)		187	ns
t,	n _g = 352 (External)		14	ns
$Q_{g(on)}$			177	nC
Q _{gs}	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 0.5 \cdot I_{D25}$		63	nC
Q _{gd}			49	nC
R _{thJC}				0.14 °C/W
R _{thCS}	TO-247		0.21	°C/W
	TO-264P		0.15	°C/W

Source-Drain Diode

Symbol	Test Conditions	Chara	cteristic	Values	
$(T_{J} = 25^{\circ}C, L)$	Inless Otherwise Specified)	Min.	Тур.	Max	
Is	$V_{GS} = 0V$			150	Α
I _{SM}	Repetitive, pulse Width Limited by $T_{_{JM}}$			600	Α
V _{SD}	$I_F = I_S$, $V_{GS} = 0V$, Note 1			1.4	V
$\left. egin{array}{c} \mathbf{t}_{rr} & \\ \mathbf{Q}_{RM} & \\ \mathbf{I}_{RM} & \end{array} ight. ight.$	$I_F = 75A$, -di/dt = 100A/ μ s $V_R = 100V$		167 1100 13		ns nC A

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

6,727,585 6,710,405B2 6,759,692 6,771,478B2 7,071,537

7,005,734B2 7,157,338B2 7,063,975B2



0

0

0.2

0.4

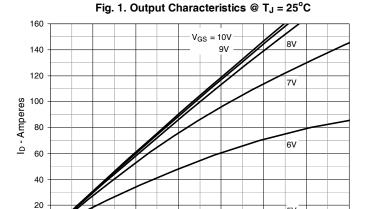


Fig. 2. Extended Output Characteristics @ T_J = 25°C

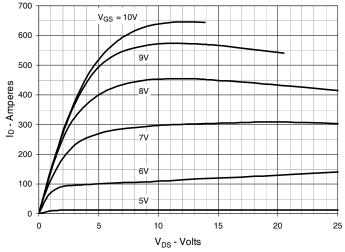


Fig. 3. Output Characteristics @ T_J = 125°C

V_{DS} - Volts

0.8

5V

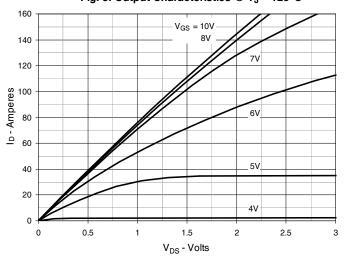


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 75A$ Value vs.

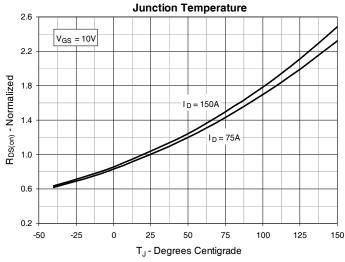


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 75A Value vs.

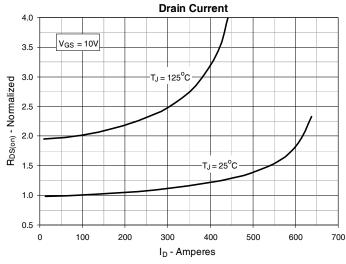
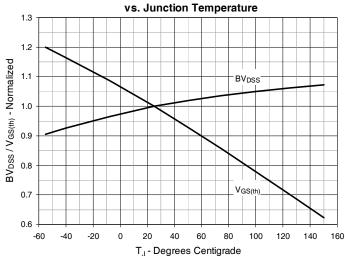


Fig. 6. Normalized Breakdown & Threshold Voltages







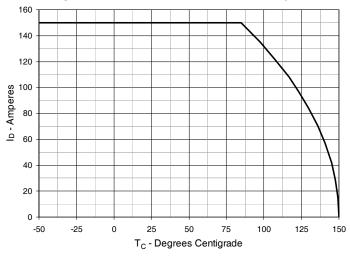


Fig. 8. Input Admittance

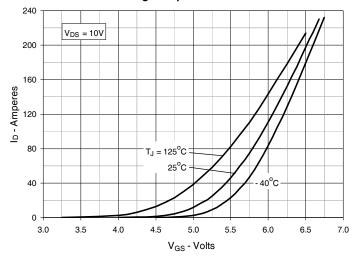


Fig. 9. Transconductance

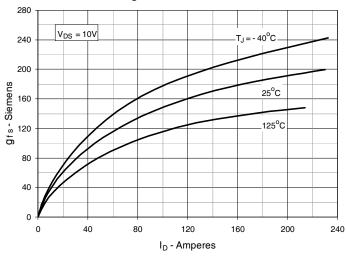


Fig. 10. Forward Voltage Drop of Intrinsic Diode

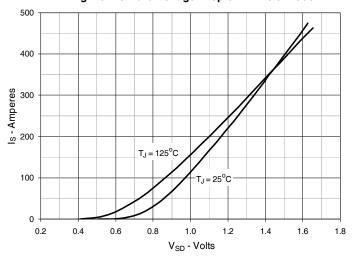


Fig. 11. Gate Charge

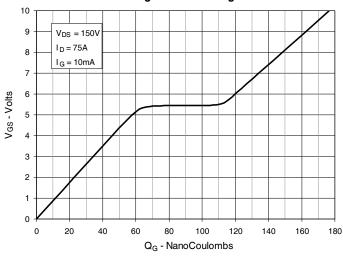
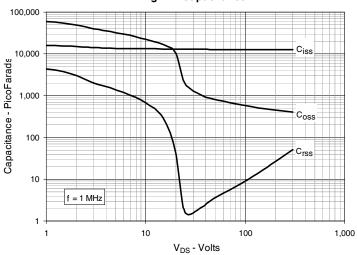
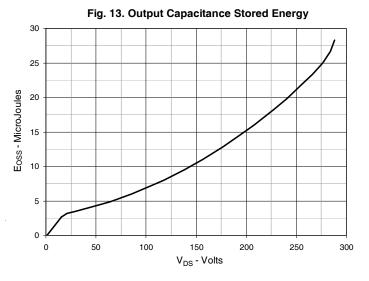


Fig. 12. Capacitance



IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.





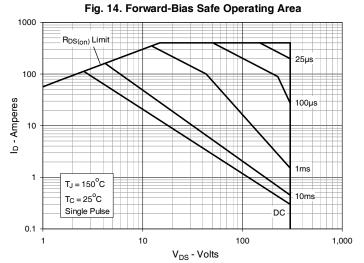
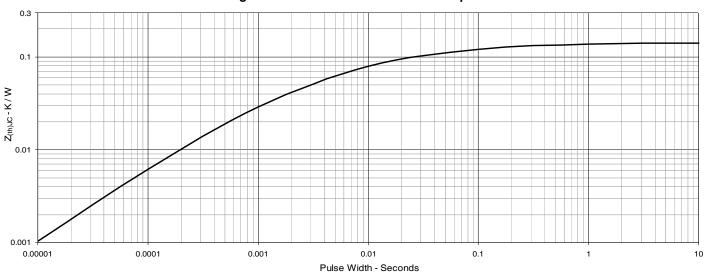
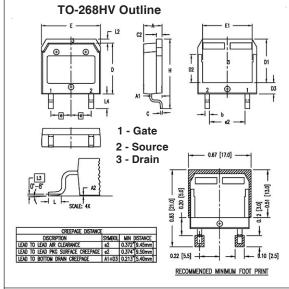


Fig. 15. Maximum Transient Thermal Impedance







SYM	INCHES		MILLIMETER	
SIM	MIN	MAX	MIN	MAX
Α	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
С	.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	5.45	BSC
(e2)	.374	.386	9.50	9.80
Н	.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

- NOTE:

 1. This drawing meets all dimensions requirement of JEDEC outlines TO-268AA except L dimension.

 2. All metal surface are matte pure tin plated except trimed area.

 3. [3] is Gauge plane to measure L.

 4. These dimension do not include mold flash and they will not exceed 0.005[0.13] per side.

TO-247 Outline -D-—A— Φ | ØK (M) | D | B (M) R L1 -Cb2 1 - Gate е 2,4 - Drain Ф J Ø С A Ø 3 - Source

SYM	INCHES		MILLIMETERS	
STM	MIN	MAX	MIN	MAX
Α	.190	.205	4.83	5.21
A1	.090	.100	2,29	2.54
A2	.075	.085	1.91	2.16
ь	.045	.055	1.14	1.40
b2	.075	.087	1.91	2.20
b4	.115	.126	2.92	3.20
С	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
D1	.650	.690	16.51	17.53
D2	.035	.050	0.89	1.27
E	.620	.635	15.75	16.13
E1	.545	.565	13.84	14.35
е	.215	BSC	5.45	
J		.010		0.25
K		.025		0.64
L	.780	.810	19.81	20.57
L1	.150	.170	3.81	4.32
ØΡ	.140	.144	3.55	3.65
ØP1	.275	.290	6.99	7.37
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.242BSC 6.15 BSC		BSC	

NOTE: This drawing will meet all dimensions requirement of JEDEC outlines TO-247 AD (R-PSIP-F3)

TO-264P Outline R 0 (+) 0 Ď E₁, 9 D2 1 - Gate 2,4 - Drain 3 - Source NOTE: Leads and back heatsink are Matte Pure Tin plated.

SYM	INCHES		MILLIMETERS	
SIM	MIN	MAX	MIN	MAX
Α	.185	.209	4.70	5.30
A1	.102	.118	2.60	3.00
b	.035	.049	0.90	1.25
ь1	.091	.106	2.30	2.70
b2	.110	.126	2.80	3.20
С	.020	.033	0.50	0.85
D	1.012	1.035	25.70	26.30
D1	.783	.799	19.90	20.30
D2	.185	.205	4.70	5.20
E	.776	.799	19.70	20.30
E1	.661	.677	16.80	17.20
е	.215	BSC	5.46 BSC	
L	.768	.807	19.50	20.50
L1	.091	.106	2.30	2.70
Q	.228	.244	5.80	6.20
Q1	.346	.362	8.80	9.20
ØR	.150	.165	3.80	4.20
ØR1	.071	.087	1.80	2.20





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