

# HiPerFET™ Power MOSFET

N-Channel Enhancement Mode

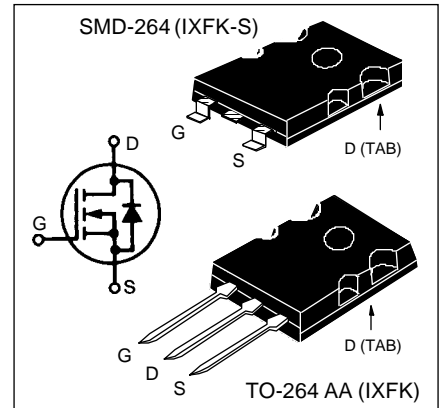
Avalanche Rated, High dv/dt, Low  $t_{rr}$  ( $t_{rr} \leq 250$ ) ns

	$V_{DSS}$	$I_{D25}$	$R_{DS(on)}$
IXFK/FN 44N50	500 V	44 A	0.12 $\Omega$
IXFK/FN 48N50	500 V	48 A	0.10 $\Omega$

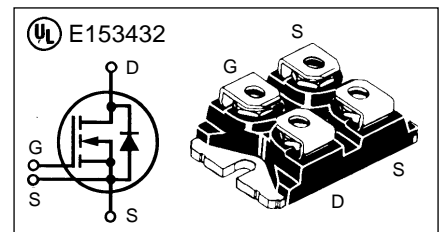
Symbol	Test Conditions	Maximum Ratings		
		IXFK	IXFN	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	500	500	V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$	500	500	V
$V_{GS}$	Continuous	$\pm 20$	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	44N50	44	A
		48N50	48	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$	44N50	176	A
		48N50	192	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	24	24	A
$E_{AR}$	$T_C = 25^\circ\text{C}$	30	30	mJ
dv/dt	$I_S \leq I_{DM}$ , $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ\text{C}$ , $R_G = 2 \Omega$	5	5	V/ns
$P_D$	$T_C = 25^\circ\text{C}$	500	520	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 (0.063 in) from case for 10 s	300	-	$^\circ\text{C}$
$V_{ISOL}$	50/60 Hz, RMS $I_{ISOL} \leq 1 \text{ mA}$	t = 1 min	-	2500 V~
		t = 1 s	-	3000 V~
$M_d$	Mounting torque	0.9/6	1.5/13	Nm/lb.in.
	Terminal connection torque	-	1.5/13	Nm/lb.in.
Weight		10	30	g

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
$V_{DSS}$	$V_{GS} = 0 \text{ V}$ , $I_D = 1 \text{ mA}$	500		V
$V_{GH(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8 \text{ mA}$	2		V
$I_{GSS}$	$V_{GS} = \pm 20 \text{ V}_{DC}$ , $V_{DS} = 0$			$\pm 200 \text{ nA}$
$I_{DSS}$	$V_{DS} = 0.8 V_{DSS}$ , $V_{GS} = 0 \text{ V}$	$T_J = 25^\circ\text{C}$		400 $\mu\text{A}$
		$T_J = 125^\circ\text{C}$		2 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$ , $I_D = 0.5 I_{D25}$ Pulse test, $t \leq 300 \mu\text{s}$ , duty cycle $\leq 2\%$	44N50		0.12 $\Omega$
		48N50		0.10 $\Omega$

## TO-264 Packages



## miniBLOC, SOT-227B (IXFN)



G = Gate      D = Drain  
 S = Source      TAB = Drain  
 Either Source terminal at miniBLOC can be used as Main or Kelvin Source

## Features

- International standard packages
- Molding epoxies meet UL 94 V-0 flammability classification
- SOT-227B miniBLOC with aluminium nitride isolation
- Unclamped Inductive Switching (UIS) rated
- Fast intrinsic rectifier

## Applications

- DC choppers
- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- Temperature and lighting controls

## Advantages

- Easy to mount
- Space savings
- High power density
- S version suitable for surface mounting

### Symbol Test Conditions Characteristic Values

( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

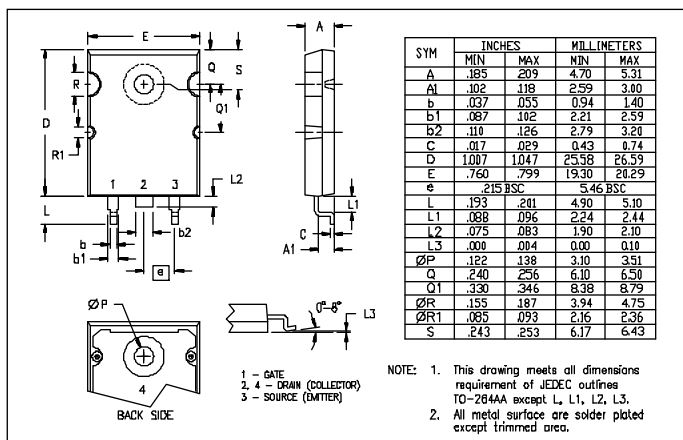
		Min.	Typ.	Max.	
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}$ , pulse test	30	42		S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		8400		pF
$C_{oss}$			900		pF
$C_{rss}$			280		pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$ $R_G = 1\ \Omega$ (External),		30		ns
$t_r$			60		ns
$t_{d(off)}$			100		ns
$t_f$			30		ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$		270		nC
$Q_{gs}$			60		nC
$Q_{gd}$			135		nC
$R_{thJC}$	TO-264 AA; SMD-264			0.25	K/W
$R_{thCK}$	TO-264 AA		0.15		K/W
$R_{thJC}$	miniBLOC, SOT-227 B			0.24	K/W
$R_{thCK}$	miniBLOC, SOT-227 B		0.05		K/W

### Source-Drain Diode Characteristic Values

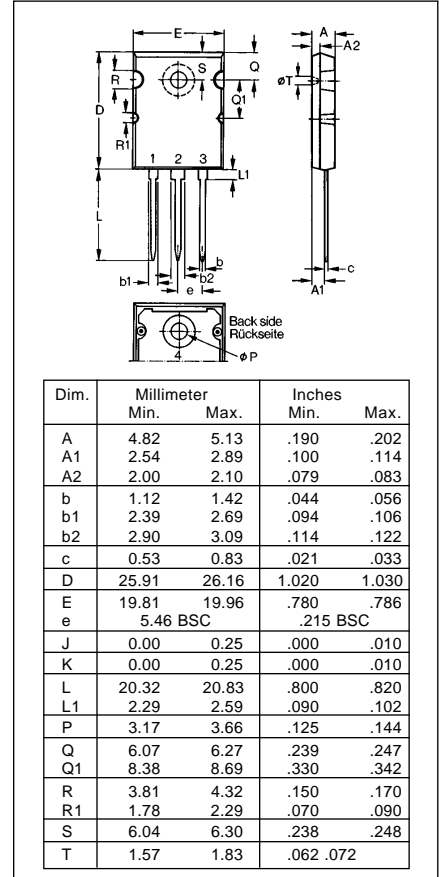
( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

Symbol	Test Conditions	Min.	Typ.	Max.	
$I_S$	$V_{GS} = 0$			48	A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$			192	A
$V_{SD}$	$I_F = 100\text{ A}, V_{GS} = 0\text{ V}$ , Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$			1.5	V
$t_{rr}$	$I_F = I_S, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$			250	ns
$I_{RM}$			20		A

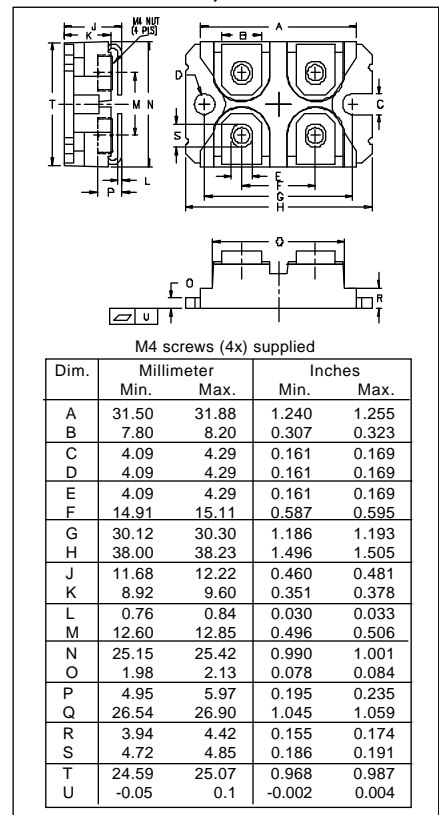
### SMD-264 Outline



### TO-264 AA Outline



### miniBLOC, SOT-227 B



IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:

4,835,592	4,881,106	5,017,508	5,049,961	5,187,117	5,486,715
4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025

Fig.1. Output Characteristics

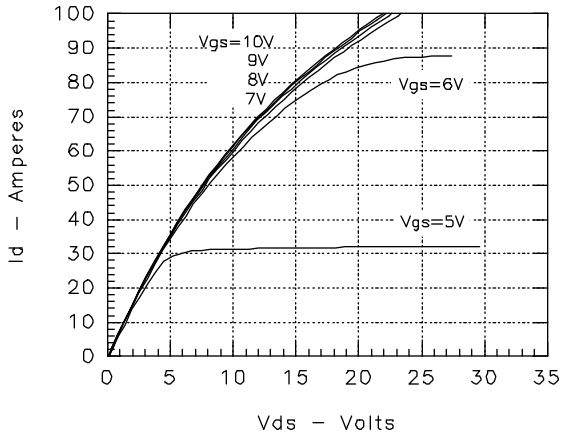


Fig. 2. Input Admittance

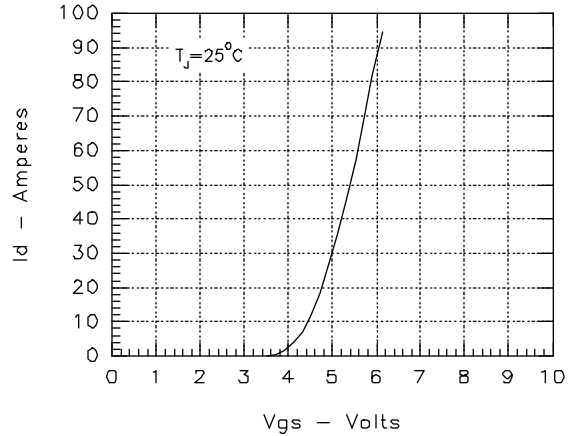


Fig. 3. Rds(on) vs. Drain Current

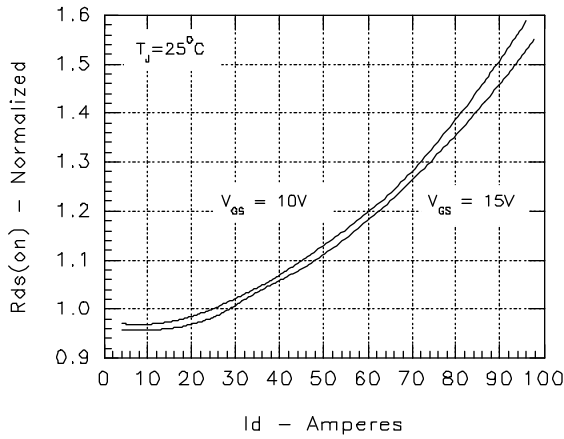


Fig. 4. Temperature Dependence of Drain to Source Resistance

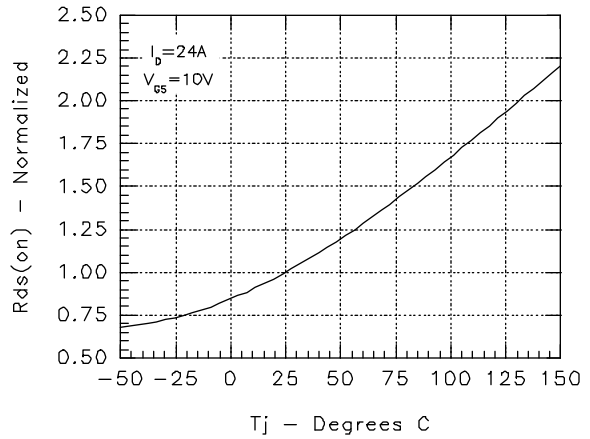


Fig. 5. Drain Current vs. Case Temperature

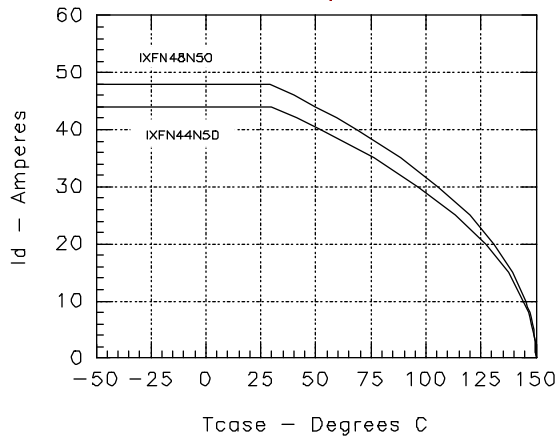
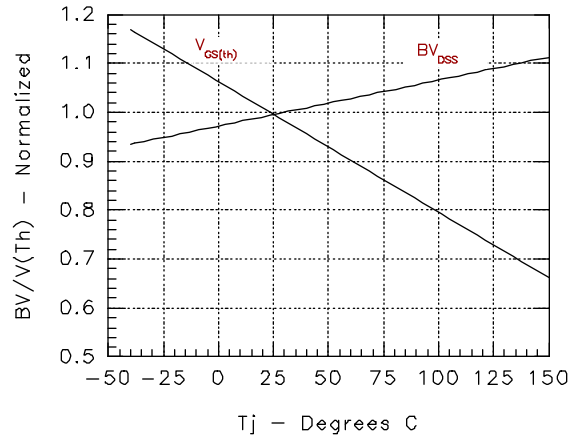


Fig. 6. Temperature Dependence of Breakdown Voltage and Threshold Voltage



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Fig. 7. Gate Charge

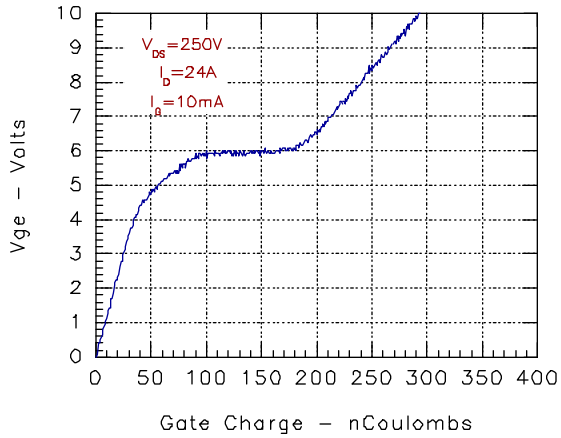


Fig. 8. Capacitance Curves

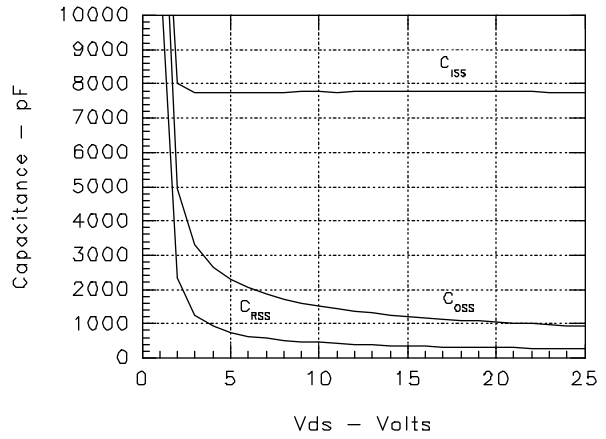


Fig. 9. Source Current vs. Source to Drain Voltage

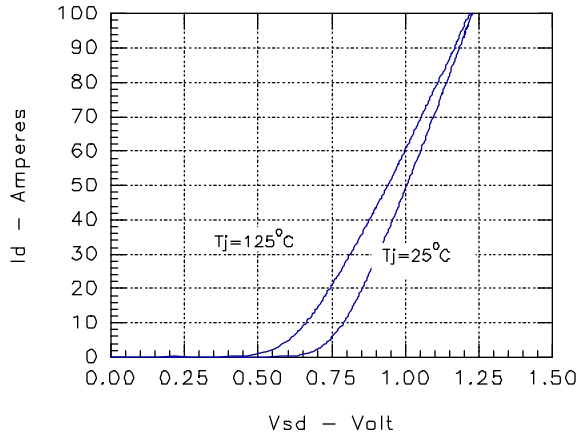
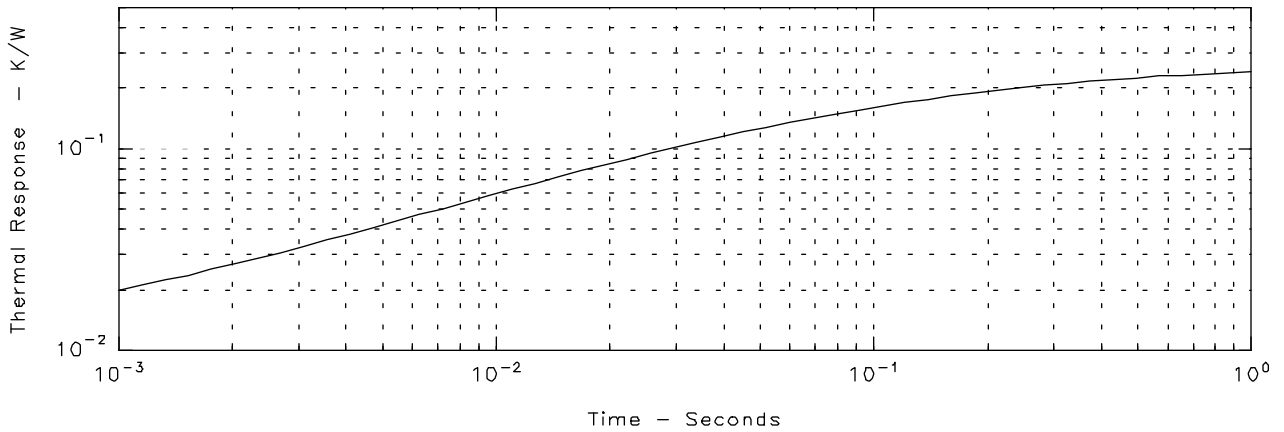


Fig. 10. Transient Thermal Impedance



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