

HiPerFET™ Power MOSFET

N-Channel Enhancement Mode
 Avalanche Rated, High dv/dt, Low t_{rr}

$$V_{DSS} = 300V$$

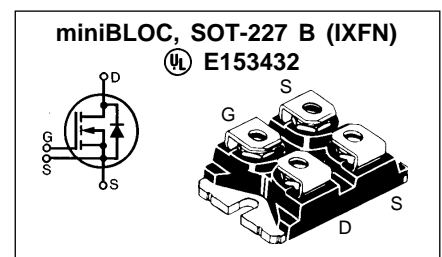
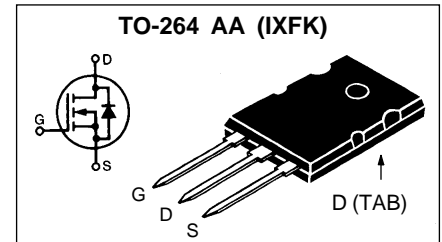
$$I_{D25} = 73A$$

$$R_{DS(on)} = 45m\Omega$$

$$t_{rr} \leq 200ns$$

Symbol	Test Conditions	Maximum Ratings		
		IXFK	IXFN	
V_{DSS}	$T_J = 25^\circ C$ to $150^\circ C$	300	300	V
V_{DGR}	$T_J = 25^\circ C$ to $150^\circ C$; $R_{GS} = 1 M\Omega$	300	300	V
V_{GS}	Continuous	± 20	± 20	V
V_{GSM}	Transient	± 30	± 30	V
I_{D25}	$T_C = 25^\circ C$	73	73	A
I_{DM}	$T_C = 25^\circ C$, pulse width limited by T_{JM}	292	292	A
I_{AR}	$T_C = 25^\circ C$	40	40	A
E_{AR}	$T_C = 25^\circ C$	30	30	mJ
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 A/\mu s$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ C$, $R_G = 2 \Omega$	5	5	V/ns
P_D	$T_C = 25^\circ C$	500	520	W
T_J		-55 ... +150		$^\circ C$
T_{JM}		150		$^\circ C$
T_{stg}		-55 ... +150		$^\circ C$
T_L	1.6 mm (0.063 in) from case for 10 s	300	-	$^\circ C$
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1 mA$	$t = 1 min$ $t = 1 s$	- 2500 3000	V~ V~
M_d	Mounting torque Terminal connection torque	0.9/6 -	1.5/13 1.5/13	Nm/lb.in. Nm/lb.in.
Weight		10	30	g

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ C$, unless otherwise specified)		
		Min.	Typ.	Max.
V_{DSS}	$V_{GS} = 0 V$, $I_D = 1 mA$	300		V
$V_{GH(th)}$	$V_{DS} = V_{GS}$, $I_D = 8 mA$	2		V
I_{GSS}	$V_{GS} = \pm 20 V_{DC}$, $V_{DS} = 0$			$\pm 200 nA$
I_{DSS}	$V_{DS} = 0.8 V_{DSS}$, $T_J = 25^\circ C$ $V_{GS} = 0 V$, $T_J = 125^\circ C$			400 μA 2 mA
$R_{DS(on)}$	$V_{GS} = 10 V$, $I_D = 0.5 I_{D25}$ Pulse test, $t \leq 300 \mu s$, duty cycle $d \leq 2 \%$			0.045 Ω



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
- JEDEC TO-264 AA, epoxy meet UL 94 V-0, flammability classification
- miniBLOC with Aluminium nitride isolation
- Low $R_{DS(on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- Fast intrinsic Rectifier

Applications

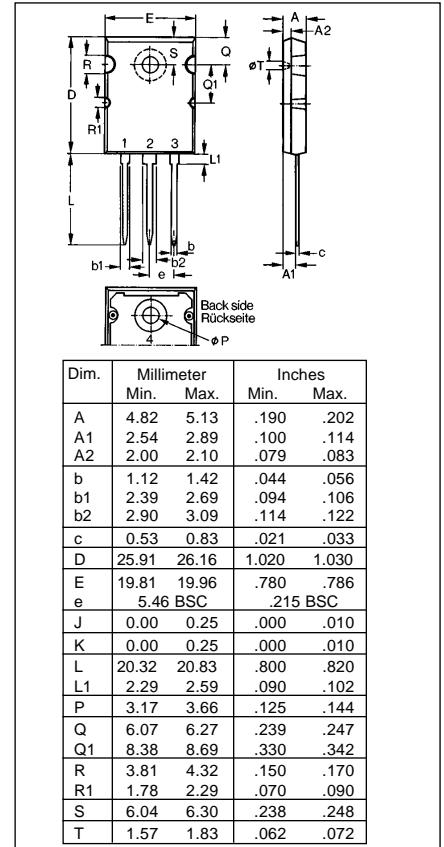
- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls
- Low voltage relays

Advantages

- Easy to mount
- Space savings
- High power density

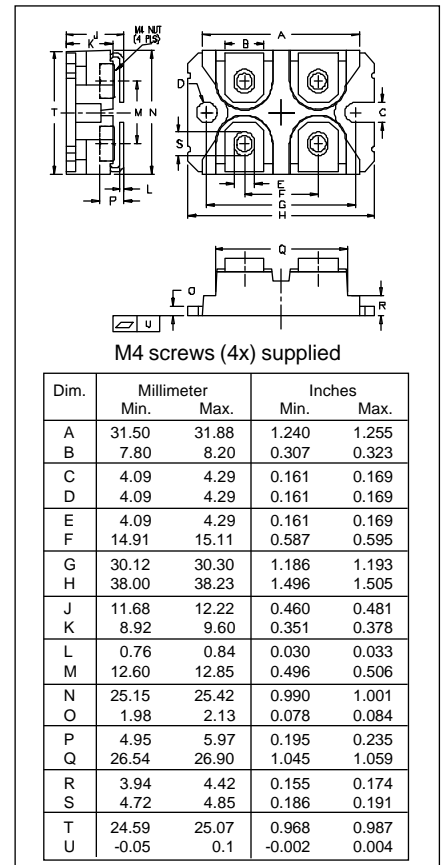
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 0.5 I_{D25}$, pulse test		50	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		9000	pF
C_{oss}			1500	pF
C_{rss}			580	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$ $R_G = 1\ \Omega$ (External),		30	ns
t_r			80	ns
$t_{d(off)}$			100	ns
t_f			50	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$		360	nC
Q_{gs}			60	nC
Q_{gd}			180	nC
R_{thJC}	TO-264 AA		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

TO-264 AA Outline



Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0$			73 A
I_{SM}	Repetitive; pulse width limited by T_{JM}			292 A
V_{SD}	$I_F = I_S$ A, $V_{GS} = 0$ V, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5 V
t_{tr}	$I_F = I_S$, $-di/dt = 100\text{ A}/\mu\text{s}$, $V_R = 100\text{ V}$		40	200 ns
I_{RM}				A

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

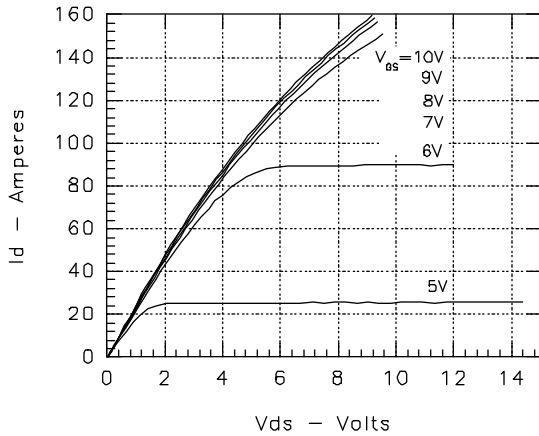


Fig. 2. Input Admittance

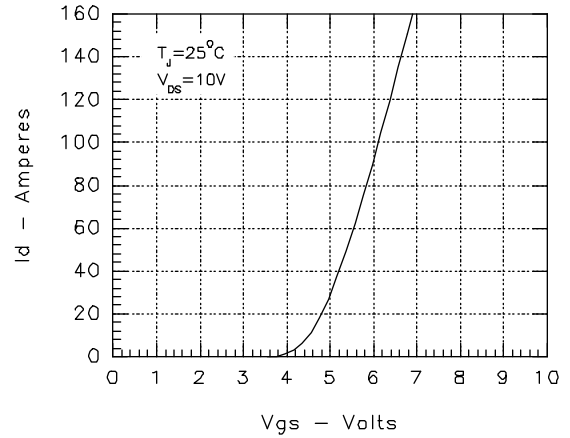


Fig. 3. Rds(on) vs. Drain Current

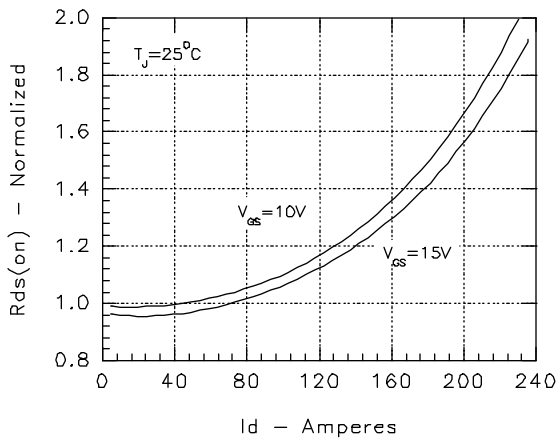


Fig. 4. Temperature Dependence of Drain to Source Resistance

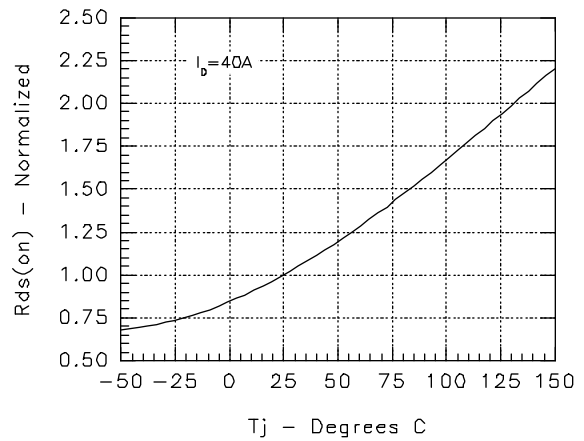


Fig. 5. Drain Current vs. Case Temperature

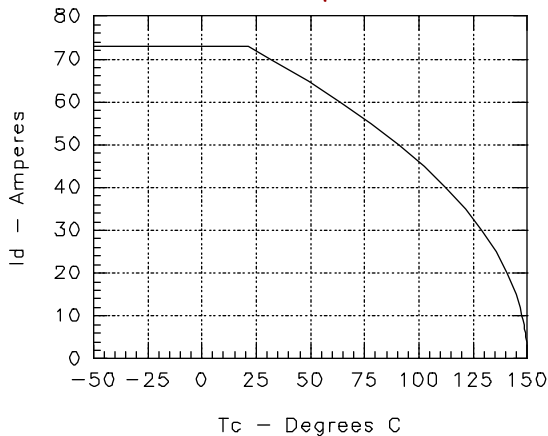
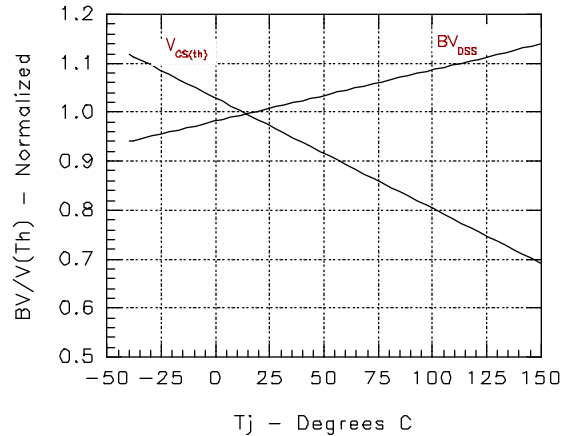


Fig. 6. Temperature Dependence of Breakdown Voltage and Threshold Voltage



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Fig. 7. Gate Charge

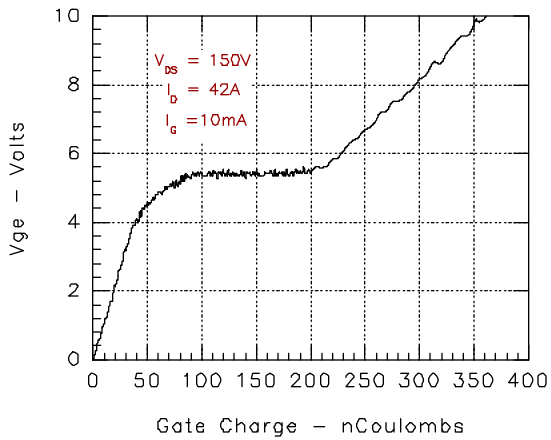


Fig. 8. Capacitance Curves

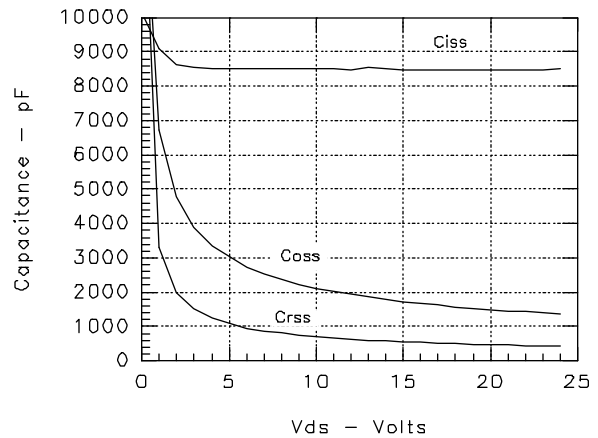


Fig. 9. Source Current vs. Source to Drain Voltage

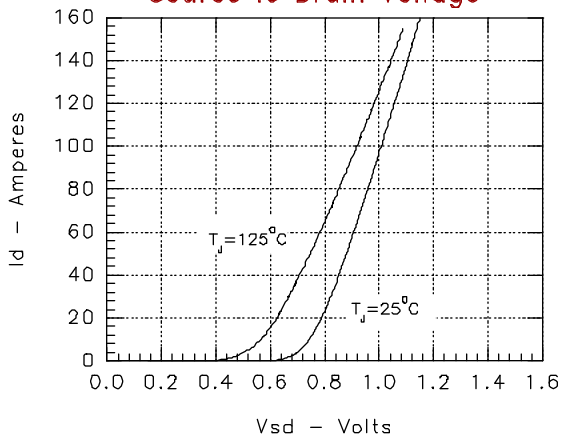
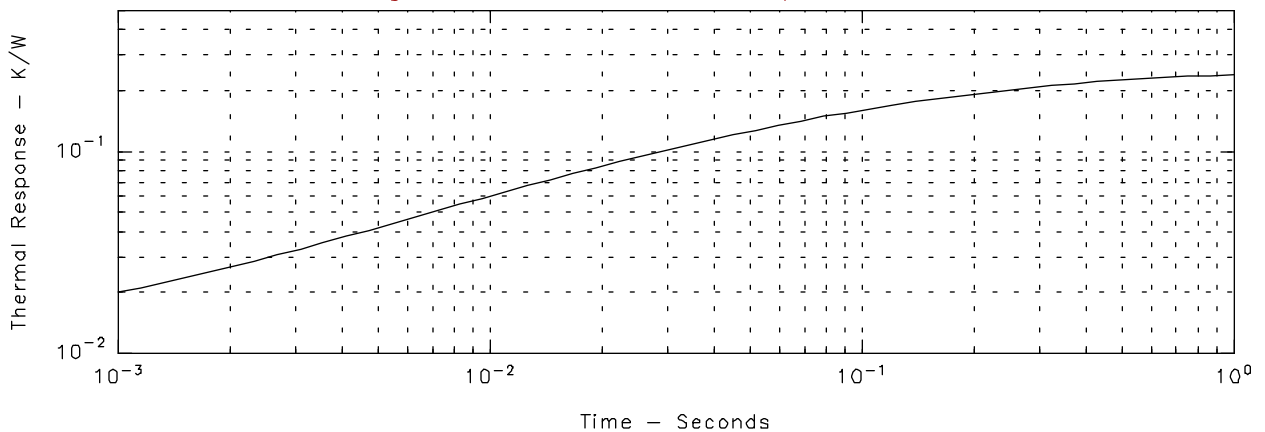


Fig. 10. Transient Thermal Impedance



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