

# HiPerFET™ Power MOSFET

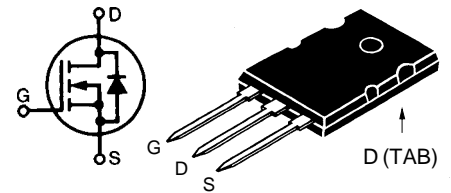
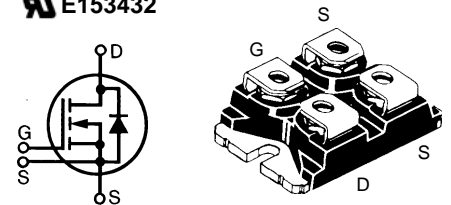
Single MOSFET Die

**IXFN 43N60**  
**IXFN 40N60**  
**IXFK 43N60**  
**IXFK 40N60**

V <sub>DSS</sub>	I <sub>D25</sub>	R <sub>DS(on)</sub>	t <sub>rr</sub>
600V	43A	0.13Ω	200ns
600V	40A	0.15Ω	200ns
600V	43A	0.13Ω	200ns
600V	40A	0.15Ω	200ns

Symbol	Test Conditions	Maximum Ratings				
		IXFK 43N60	IXFK 40N60	IXFN 43N60	IXFN 40N60	
V <sub>DSS</sub>	T <sub>J</sub> = 25°C to 150°C	600		600		V
V <sub>DGR</sub> ①	T <sub>J</sub> = 25°C to 150°C	600		600		V
V <sub>GS</sub>	Continuous	±20		±20		V
V <sub>GSM</sub>	Transient	±30		±30		V
I <sub>D25</sub>	T <sub>C</sub> = 25°C	43	40	43	40	A
I <sub>DM</sub> ②	T <sub>C</sub> = 25°C	172	160	172	160	A
I <sub>AR</sub>	T <sub>C</sub> = 25°C	43	40	43	40	A
E <sub>AR</sub>	T <sub>C</sub> = 25°C	60		60		mJ
dv/dt	I <sub>S</sub> ≤ I <sub>DM</sub> , di/dt ≤ 100 A/μs, V <sub>DD</sub> ≤ V <sub>DSS</sub> T <sub>J</sub> ≤ 150°C, R <sub>G</sub> = 2 Ω	5		5		V/ns
P <sub>D</sub>	T <sub>C</sub> = 25°C	560		600		W
T <sub>J</sub>			-55 ... +150			°C
T <sub>JM</sub>			150			°C
T <sub>stg</sub>			-55 ... +150			°C
T <sub>L</sub>	1.6 mm (0.063 in) from case for 10 s	300		N/A		°C
V <sub>ISOL</sub>	50/60 Hz, RMS      t = 1 min I <sub>ISOL</sub> ≤ 1 mA      t = 1 s		N/A	2500		V~
			N/A	3000		V~
M <sub>d</sub>	Mounting torque	0.9/6		1.5/13		Nm/lb.in.
	Terminal connection torque	N/A		1.5/13		Nm/lb.in.
Weight		10		30		g

Symbol	Test Conditions	Characteristic Values		
		Min.	Max.	
V <sub>DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 3mA	600		V
V <sub>GH(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 8mA	2	4	V
I <sub>GSS</sub>	V <sub>GS</sub> = ±20 V, V <sub>GE</sub> = 0		±200	nA
I <sub>DSS</sub>	V <sub>DS</sub> = 0.8 • V <sub>DSS</sub> V V <sub>GS</sub> = 0 V		400	μA
			2	mA
R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 0.5 • I <sub>D25</sub> Pulse test, t ≤ 300 ms, duty cycle d ≤ 2 %	43N60	0.13	Ω
		40N60	0.15	Ω

**TO-264 AA (IXFK)**

**miniBLOC, SOT-227 B (IXFN)**  
**E153432**

 G = Gate  
 S = Source

 D = Drain  
 TAB = Drain

Either Source terminal at miniBLOC can be used as Main or Kelvin Source

**Features**

- International standard packages
- Encapsulating epoxy meets UL94 V-0, flammability classification
- miniBLOC with Aluminium nitride isolation
- Low R<sub>DS(on)</sub> 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**

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

**Characteristic Values**

Min. Typ. Max.

$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ , pulse test	TBD	S
$C_{iss}$		TBD	pF
$C_{oss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	TBD	pF
$C_{rss}$		TBD	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\ \Omega$ (External),	TBD	ns
$t_r$		TBD	ns
$t_{d(off)}$		TBD	ns
$t_f$		TBD	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$	TBD	nC
$Q_{gs}$		TBD	nC
$Q_{gd}$		TBD	nC
$R_{thJC}$	TO-264 AA		0.22 K/W
$R_{thCK}$	TO-264 AA	0.15	K/W
$R_{thJC}$	miniBLOC, SOT-227 B		0.21 K/W
$R_{thCK}$	miniBLOC, SOT-227 B	0.05	K/W

**Source-Drain Diode**

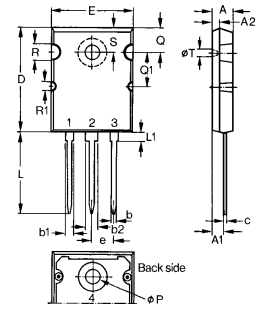
( $T_J = 25^\circ\text{C}$ , unless otherwise specified)

**Characteristic Values**

Symbol	Test Conditions	Min.	Typ.	Max.	
$I_S$	$V_{GS} = 0$			43	A
				40	A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$			172	A
				160	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
$t_{rr}$	$I_F = 50\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$	TBD			ns
$Q_{RM}$		TBD			$\mu\text{C}$
$I_{RM}$		TBD			A

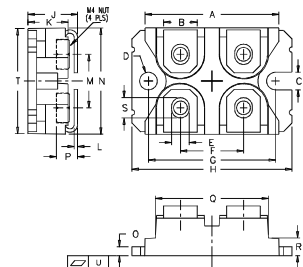
- Notes: 1.  $R_{GS} = 1\ \text{M}\Omega$   
2. Pulse width limited by  $T_{JM}$ .

**TO-264 AA Outline**



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.82	5.13	.190	.202
A1	2.54	2.89	.100	.114
A2	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b1	2.39	2.69	.094	.106
b2	2.90	3.09	.114	.122
c	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
E	19.81	19.96	.780	.786
e	5.46	BSC	.215	BSC
J	0.00	0.25	.000	.010
K	0.00	0.25	.000	.010
L	20.32	20.83	.800	.820
L1	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
Q	6.07	6.27	.239	.247
Q1	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R1	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072

**miniBLOC, SOT-227 B**



M4 screws (4x) supplied

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	38.00	38.23	1.496	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.76	0.84	0.030	0.033
M	12.60	12.85	0.496	0.506
N	25.15	25.42	0.990	1.001
O	1.98	2.13	0.078	0.084
P	4.95	5.97	0.195	0.235
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.174
S	4.72	4.85	0.186	0.191
T	24.59	25.07	0.968	0.987
U	-0.05	0.1	-0.002	0.004