



ADVANCE INFORMATION

# HiPerFET™ Power MOSFET

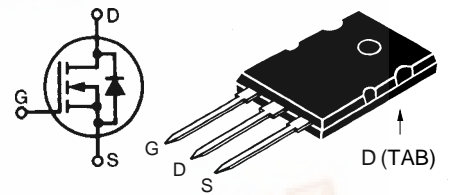
Single MOSFET Die

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

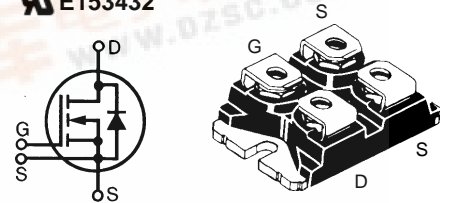
V <sub>DSS</sub>	I <sub>D25</sub>	R <sub>DS(on)</sub>	t <sub>rr</sub>
600V	43A	0.13Ω	200ns
600V	40A	0.15Ω	200ns
600V	43A	0.13Ω	200ns
600V	40A	0.15Ω	200ns

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 3000	V~ V~	
M <sub>d</sub>	Mounting torque Terminal connection torque	0.9/6 N/A		1.5/13 1.5/13	Nm/lb.in. Nm/lb.in.	
Weight		10		30	g	

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	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 <sub>GS</sub> = 0 V	T <sub>J</sub> = 25 °C T <sub>J</sub> = 125 °C	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 40N60	0.13 Ω 0.15 Ω

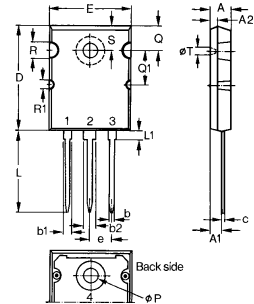


Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
$(T_j = 25^\circ\text{C}, \text{ unless otherwise specified})$				
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ , pulse test		TBD	S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		TBD	pF
$C_{oss}$			TBD	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

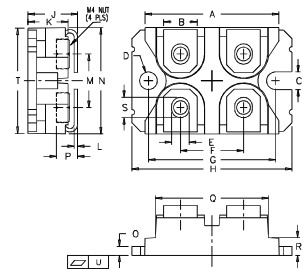
**Source-Drain Diode**
 $(T_j = 25^\circ\text{C}, \text{ unless otherwise specified})$ 

Symbol	Test Conditions	Characteristic Values			
		Min.	Typ.	Max.	
$I_s$	$V_{GS} = 0$	43N60 40N60		43 40	A A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$	43N60 40N60		172 160	A 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