

HiPerFET™ Power MOSFET

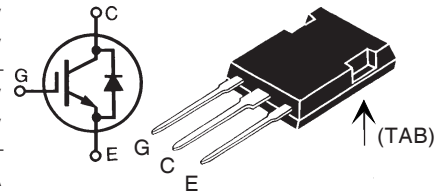
IXFK 55N50
IXFX 55N50
IXFN 55N50

$V_{DSS} = 500 \text{ V}$
 $I_{D25} = 55 \text{ A}$
 $R_{DS(on)} = 90 \text{ m}\Omega$
 $t_{rr} \leq 250 \text{ ns}$

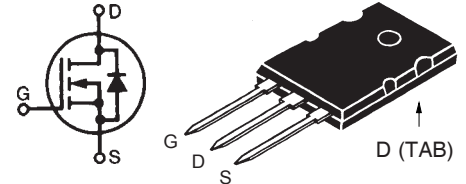
Single Die MOSFET

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	500	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C	500	V
V_{GSS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	55	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	220	A
I_{AR}	$T_C = 25^\circ\text{C}$	55	A
E_{AR}	$T_C = 25^\circ\text{C}$	60	mJ
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$ $T_J \leq 150^\circ\text{C}$, $R_G = 4 \Omega$	10	V/ns
P_D	$T_C = 25^\circ\text{C}$	625	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 (0.062 in.) from case for 10 s (IXFK, IXFX)	300	$^\circ\text{C}$
M_d	Mounting torque (IXFK, IXFX) Terminal leads (IXFN)	1.13/10 1.13/10	Nm/lb.in. Nm/lb.in.
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1 \text{ mA}$	(IXFN) $t = 1 \text{ minute}$ $t = 1 \text{ s}$	2500 3000 V~ V~
Weight	PLUS247	5	g
	TO-264	10	g
	SOT-227B	30	g

PLUS247(IXFX)

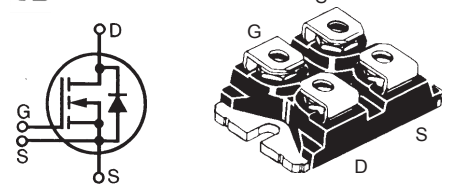


TO-264 AA (IXFK)



miniBLOC, SOT-227 B (IXFN)

E153432



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
- Encapsulating epoxy meets 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

Advantages

- PLUS247 package for clip or spring bar mounting
- 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.
V_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 1 \text{ mA}$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 8 \text{ mA}$	2.5		4.5 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}_{DC}$, $V_{DS} = 0$			$\pm 200 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0 \text{ V}$ $T_J = 125^\circ\text{C}$			25 μA 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 $d \leq 2\%$			90 m Ω

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ Note 1		45	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		9400	pF
C_{oss}		1280	pF	
C_{rss}		460	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),		45	ns
t_r			60	ns
$t_{d(off)}$			120	ns
t_f			45	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		330	nC
Q_{gs}			55	nC
Q_{gd}			155	nC
R_{thJC}	IXFK, IXFX		0.20	K/W
R_{thCK}		0.15	K/W	
R_{thCK}		0.05	K/W	

Source-Drain Diode

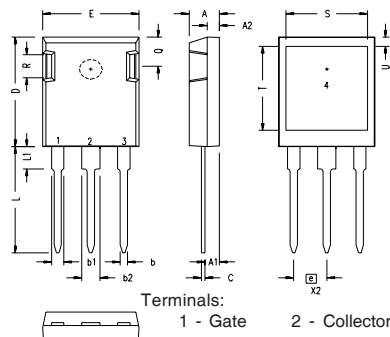
($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
I_s	$V_{GS} = 0$			55 A
I_{SM}	Repetitive; pulse width limited by T_{JM}			220 A
V_{SD}	$I_F = 100\text{ A}, V_{GS} = 0\text{ V}$ Note 1			1.5 V
t_{rr}	$I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$			250 ns
Q_{RM}		1.0		μC
I_{RM}		10		A

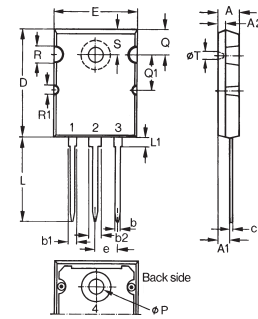
Notes: 1. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$

PLUS247 Outline

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.084	1.91	2.13
b2	.115	.123	2.92	3.12
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03

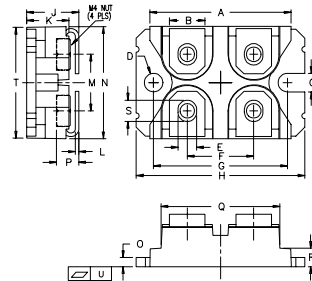


TO-264 AA Outline



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-227B) Outline



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

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	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065B1
4,850,072	5,017,508	5,063,307	5,381,025	6,259,123B1	6,534,343
4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505

6,683,344	6,727,585
6,710,405B2	6,759,692
6,710,463	

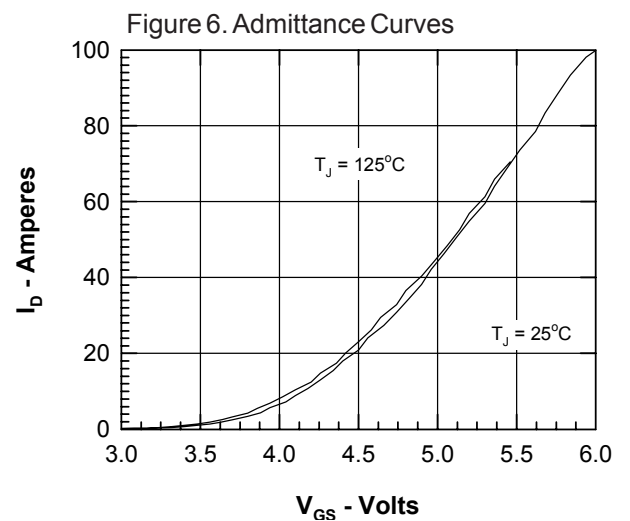
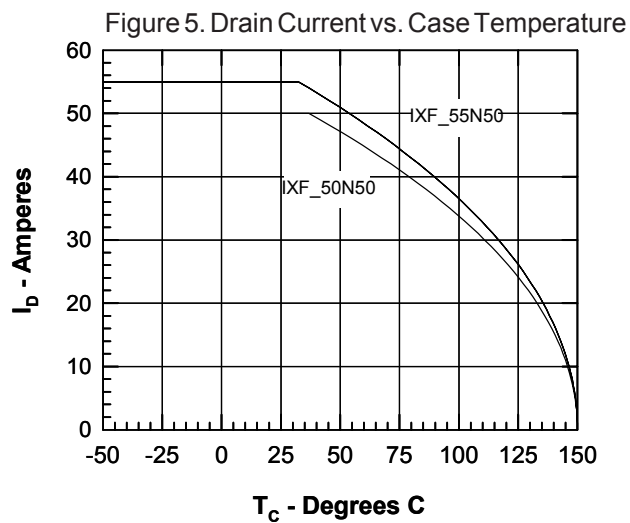
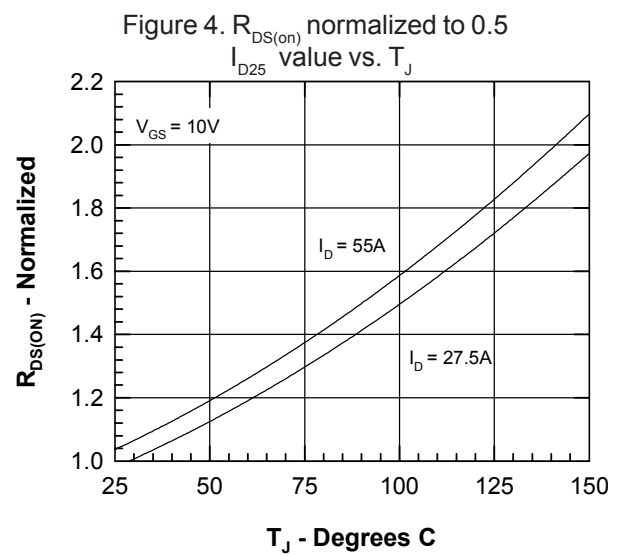
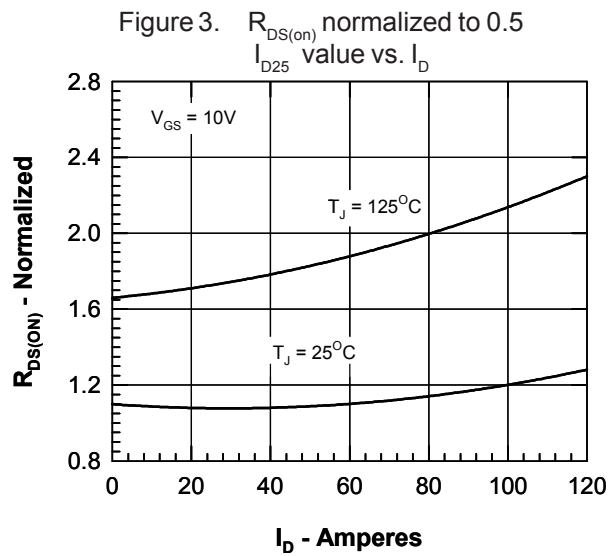
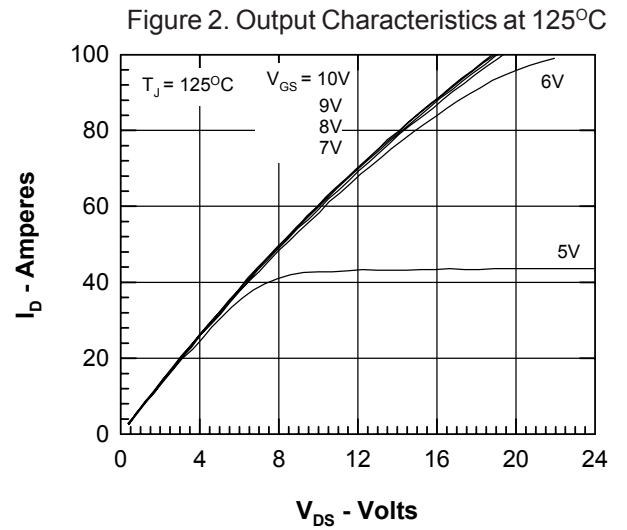
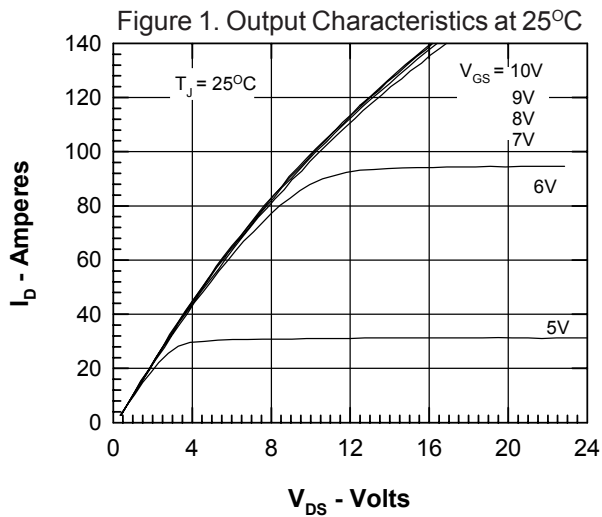


Figure 7. Gate Charge

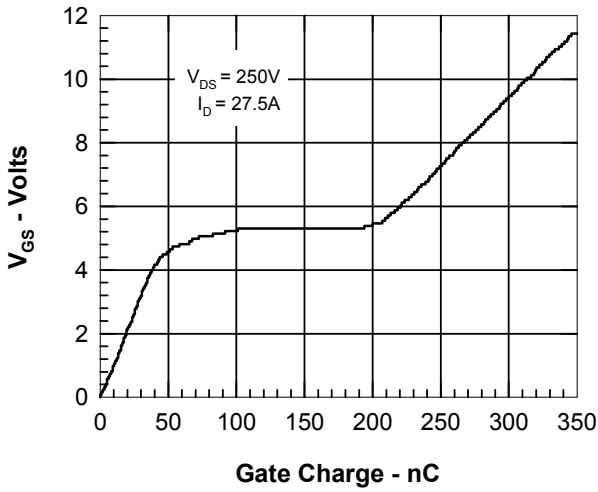


Figure 8. Capacitance Curves

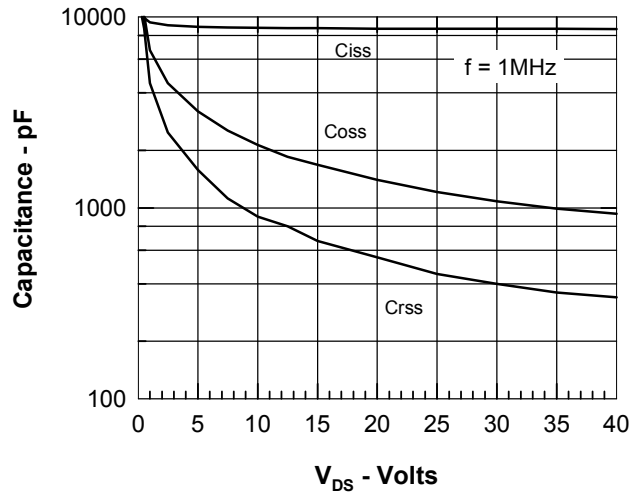


Figure 9. Forward Voltage Drop of the Intrinsic Diode

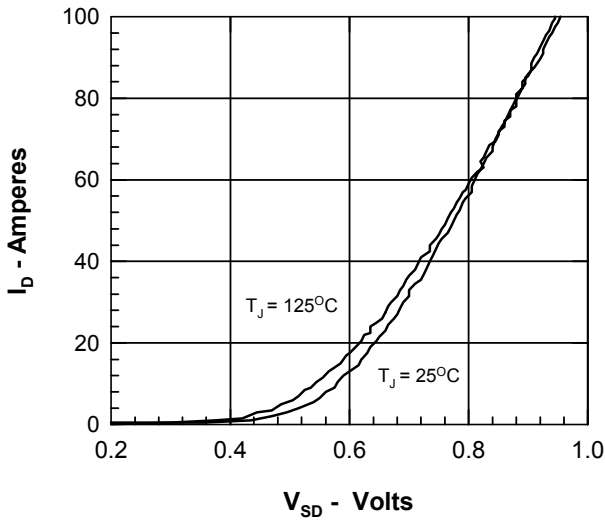
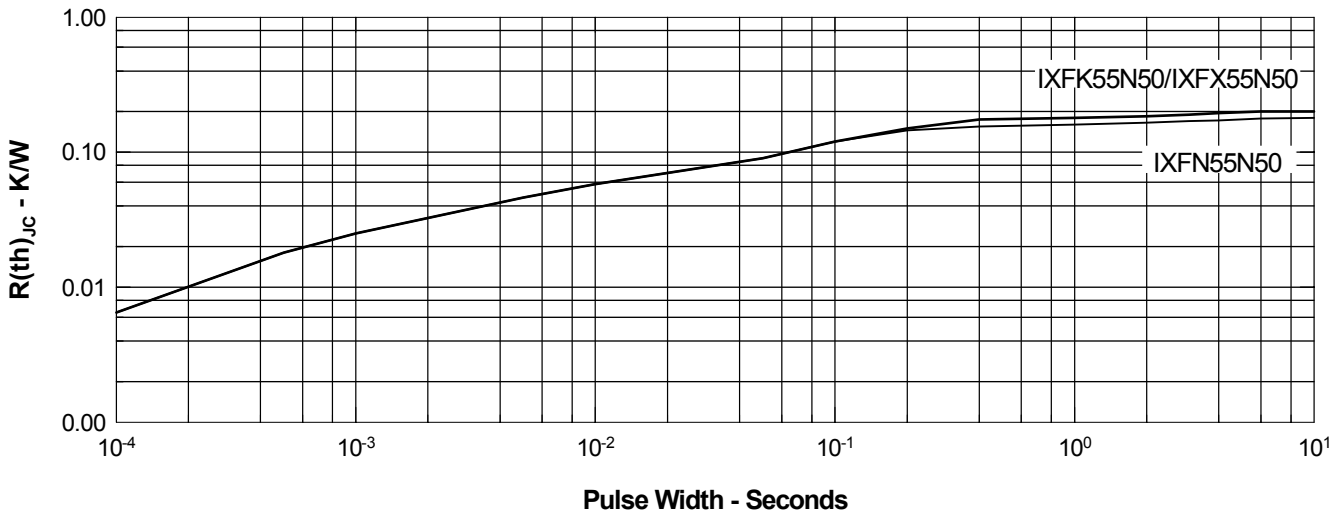


Figure 10. Transient Thermal Resistance





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