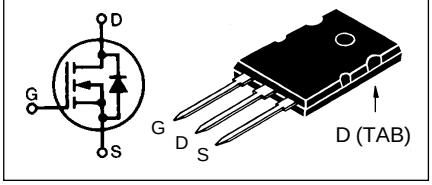
Preliminary Data

HiPerFET™ Power MOSFET

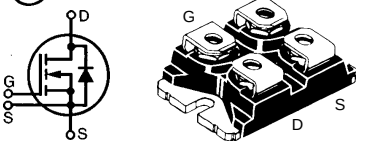
N-Channel Enhancement Mode
Avalanche Rated, High dv/dt, Low t_{rr}

	V_{DSS}	I_{D25}	$R_{DS(on)}$	t_{rr}
IXFK 90N20	200V	90A	23mΩ	200ns
IXFN 106N20	200V	106A	20mΩ	200ns

TO-264 AA (IXFK)



miniBLOC, SOT-227 B (IXFN)
UL E153432



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

Symbol	Test Conditions	Maximum Ratings IXFK	IXFN	
V_{DSS}	T_J = 25°C to 150°C	200	200	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	200	200	V
V_{GS}	Continuous	±20	±20	V
V_{GSM}	Transient	±30	±30	V
I_{D25}	T_C = 25°C, Chip capability	90 ①	106	A
I_{D75}	T_C = 75°C, limited by external leads	76	-	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	380	424	A
I_{AR}	T_C = 25°C	50	50	A
E_{AR}	T_C = 25°C	30	30	mJ
dv/dt	$I_S \le I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \le V_{DSS}$, $T_J \le$ 150°C, R_G = 2 Ω	5	5	V/ns
P_D	T_C = 25°C	500	520	W
T_J		-55 ... +150		°C
T_{JM}			150	°C
T_{stg}		-55 ... +150		°C
T_L	1.6 mm (0.063 in) from case for 10 s	300	-	°C
V_{ISOL}	50/60 Hz, RMS t = 1 min	-	2500	V~
	$I_{ISOL} \le$ 1 mA 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	Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
V_{DSS}	V_{GS} = 0 V, I_D = 1 mA	200			V
$V_{GH(th)}$	$V_{DS} = V_{GS}$, I_D = 8 mA	2		4	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0			±200	nA
I_{DSS}	V_{DS} = 0.8 V_{DSS} T_J = 25°C			400	µA
	V_{GS} = 0 V T_J = 125°C			2	mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 I_{D25}				
	Pulse test, t ≤ 300 µs,	IXFK		0.023	Ω
	duty cycle d ≤ 2 %	IXFN		0.020	Ω

① Chip capability I_{D25} = 99 A

Features

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

Applications

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

Advantages

- Easy to mount
- Space savings
- High power density

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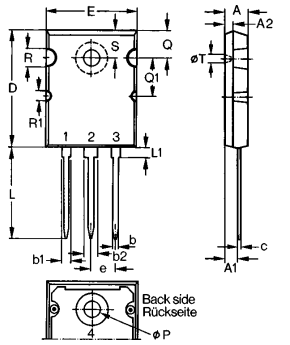
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10 V; I_D = 0.5 I_{D25}, pulse test		60		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		9000		pF
C_{oss}			1600		pF
C_{rss}			590		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25} R_G = 1 Ω (External),		30		ns
t_r			80		ns
$t_{d(off)}$			75		ns
t_f			30		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}		380		nC
Q_{gs}			70		nC
Q_{gd}			190		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

Source-Drain Diode

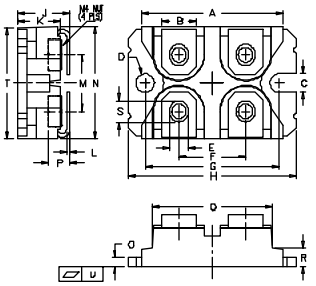
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
I_S	V_{GS} = 0	IXFK		90	A
		IXFN		106	A
I_{SM}	Repetitive; pulse width limited by T_{JM}	IXFK		360	A
		IXFN		424	A
V_{SD}	I_F = 100 A, V_{GS} = 0 V Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %			1.5	V
t_{rr}	I_F = 50 A, -di/dt = 100 A/µs, V_R = 100 V			200	ns
Q_{RM}			3		µC
I_{RM}			38		A

TO-264 AA Outline



Dim.	Millimeter Min.	Max.	Inches 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 Min.	Max.	Inches 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

Fig.1. Output Characteristics

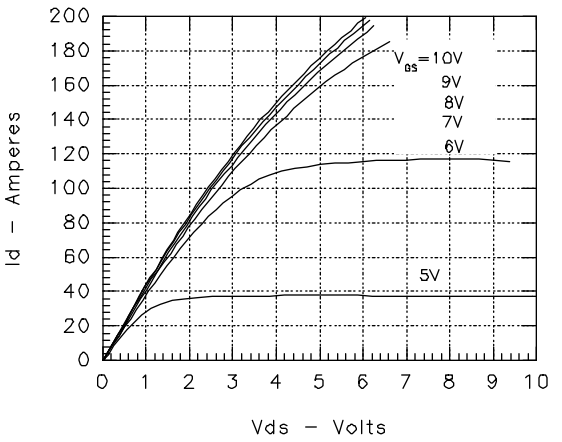


Fig. 2. Input Admittance

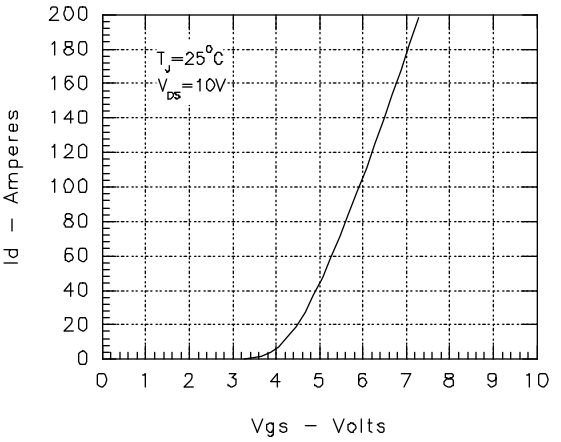


Fig. 3. Rds(on) vs. Drain Current

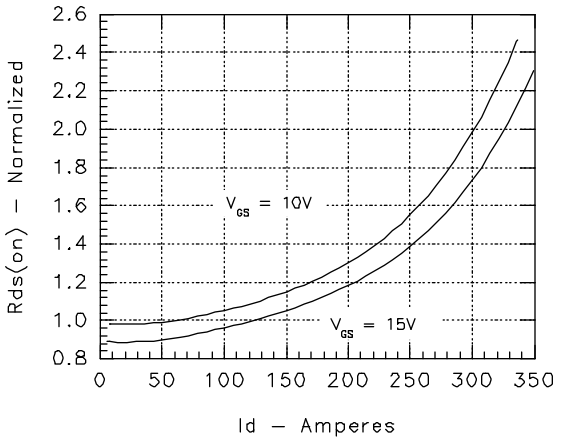


Fig. 4. Temperature Dependence of Drain to Source Resistance

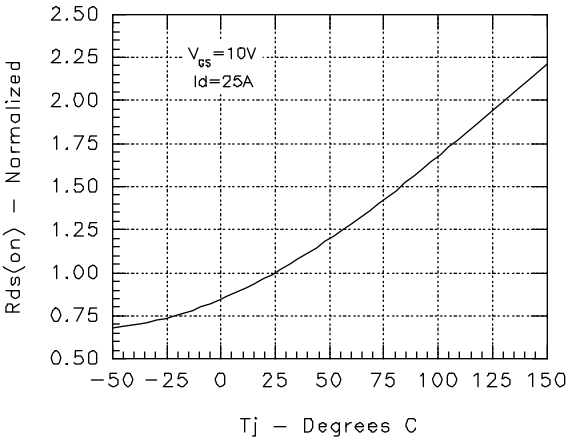


Fig. 5. Drain Current vs. Case Temperature

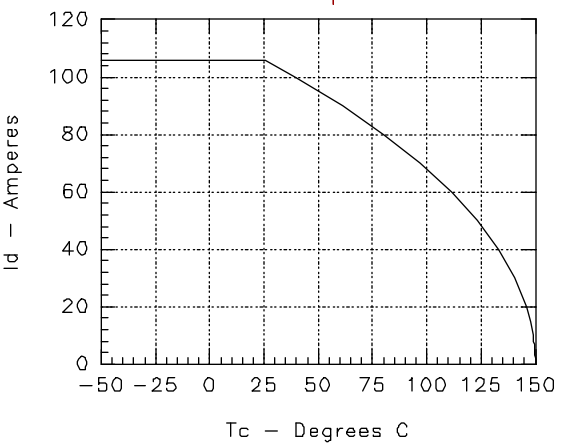


Fig. 6. Temperature Dependence of Breakdown Voltage and Threshold Voltage

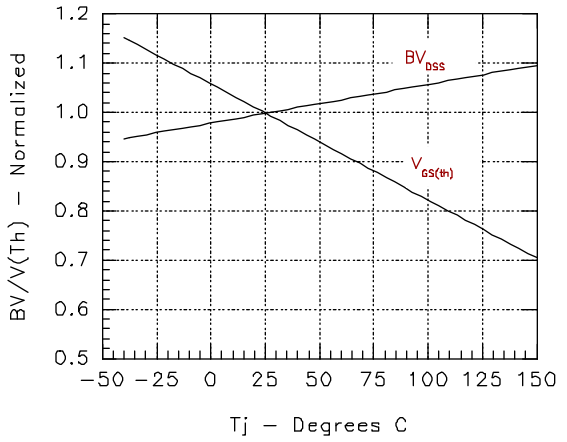


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Fig. 7. Gate Charge

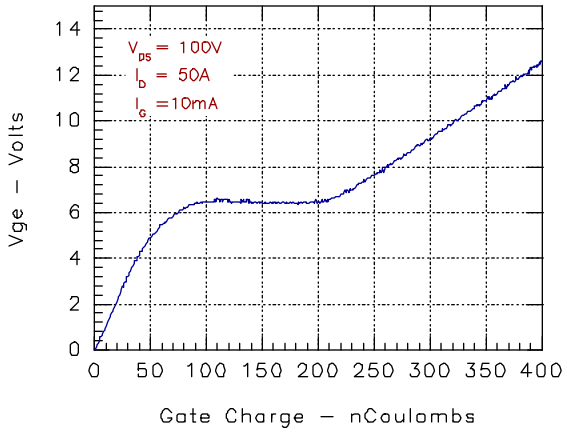

Fig. 8. Capacitance Curves

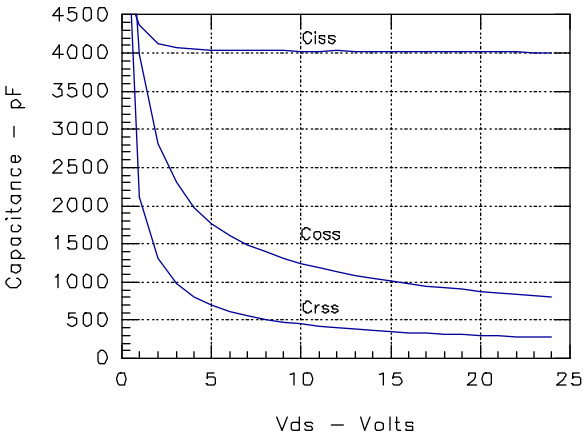

Fig. 9. Source Current vs. Source to Drain Voltage

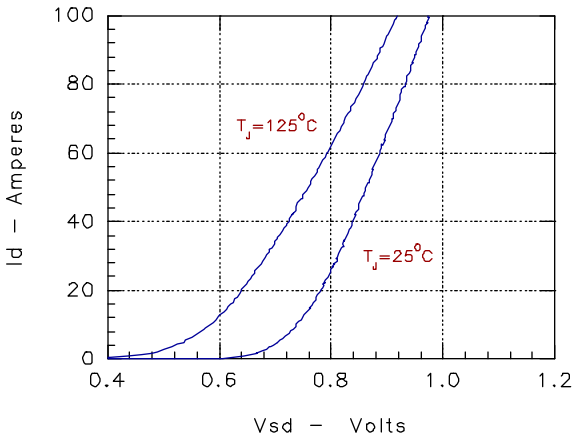

Fig. 10. Transient Thermal Impedance