IXYS

Not for New Designs

HiPerFET^{TM} Power MOSFETs

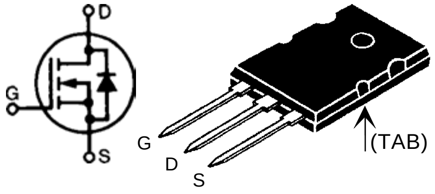
N-Channel Enhancement Mode
Avalanche Rated, High dv/dt, Low t_{rr}

	V_{DSS}	I_{D25}	$R_{DS(on)}$
IXFK 27N80	800 V	27 A	0.30 Ω
IXFK 25N80	800 V	25 A	0.35 Ω
IXFN 27N80	800 V	27 A	0.30 Ω
IXFN 25N80	800 V	25 A	0.35 Ω

Symbol	Test Conditions		Maximum Ratings IXFK	 IXFN	
V_{DSS}	T_J = 25°C to 150°C		800	800	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ		800	800	V
V_{GS}	Continuous		±20	±20	V
V_{GSM}	Transient		±30	±30	V
I_{D25}	T_C = 25°C, Chip capability	27N80	27	27	A
		25N80	25	25	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	27N80	108	108	A
	T_C = 25°C	25N80	100	100	A
I_{AR}		27N80	14	14	A
		25N80	13	13	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 = 3 mA		800			V
	V_{DSS} temperature coefficient			0.096		%/K
$V_{GH(th)}$	V_{DS} = V_{GS}, I_D = 8 mA		2		4.5	V
	$V_{GS(th)}$ temperature coefficient			-0.214		%/K
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0				±200	nA
I_{DSS}	V_{DS} = 0.8 • V_{DSS}	T_J = 25°C			500	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,	25N80			0.35	Ω
	duty cycle d ≤ 2 %	27N80			0.30	Ω

TO-264 AA (IXFK)



miniBLOC, SOT-227 B (IXFN)

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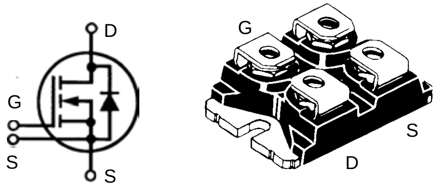


G = Gate D = Drain
S = Source TAB = Drain

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^{TM} process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- Fast intrinsic Rectifier

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls

Advantages

- Easy to mount
- Space savings
- High power density

Characteristic Values (T_J = 25°C, unless otherwise specified)

Symbol	Test Conditions	min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; I_D = 0.5 • I_{D25}, pulse test	16	28		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	7930	8400	9740	pF
C_{oss}		630	712	790	pF
C_{rss}		146	192	240	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			40		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}	320	350	400	nC
Q_{gs}		38	46	56	nC
Q_{gd}		120	130	142	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

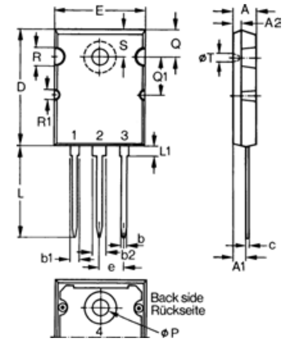
Source-Drain Diode

Characteristic Values (T_J = 25°C, unless otherwise specified)

Symbol	Test Conditions		min.	typ.	max.	
I_S	V_{GS} = 0 V	27N80			27	A
		25N80			25	A
I_{SM}	Repetitive;	27N80			108	A
	pulse width limited by T_{JM}	25N80			100	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 = I_S, -di/dt = 100 A/µs, V_R = 100 V	T_J = 25°C			250	ns
		T_J = 125°C			400	ns
Q_{RM}		T_J = 25°C		2		µC
I_{RM}				17		A

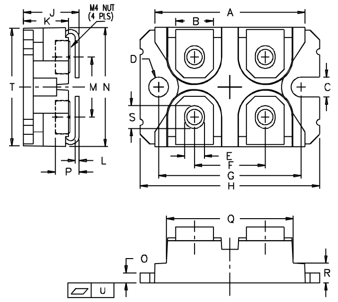
IXYS reserves the right to change limits, test conditions, and dimensions.

TO-264 AA Outline



Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches 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.	Millimeter Max.	Inches Min.	Inches 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 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 6,306,728B1 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

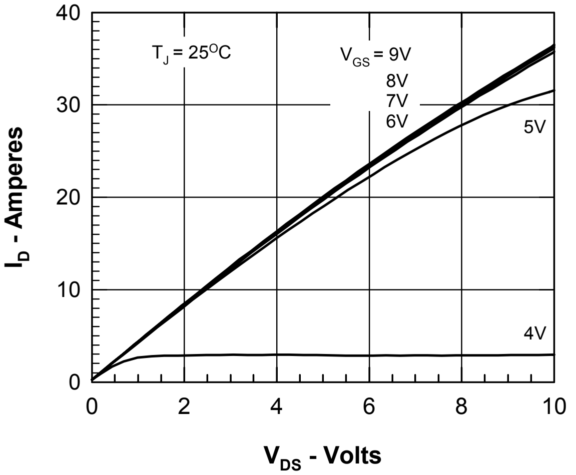


Figure 1. Output Characteristics at 25°C

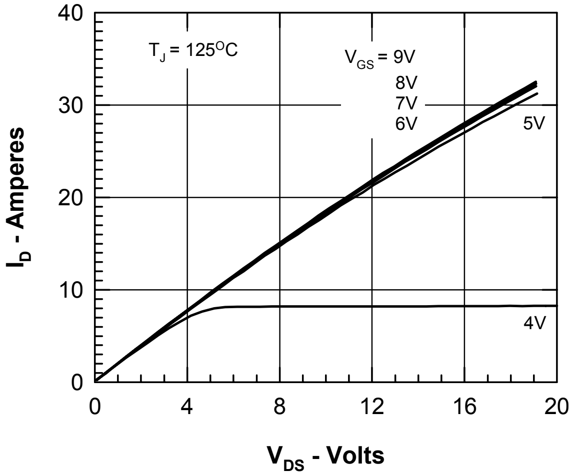


Figure 2. Output Characteristics at 125°C

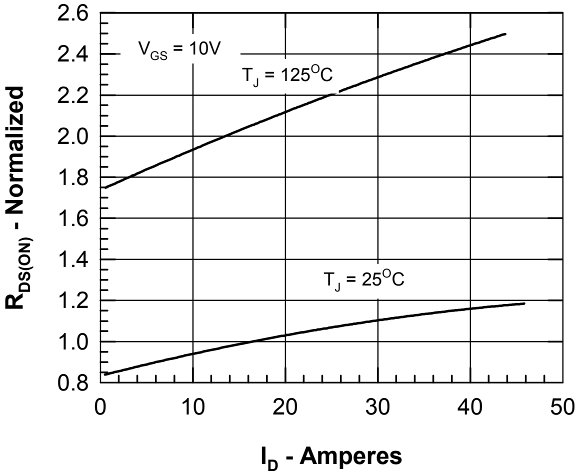


Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. I_D

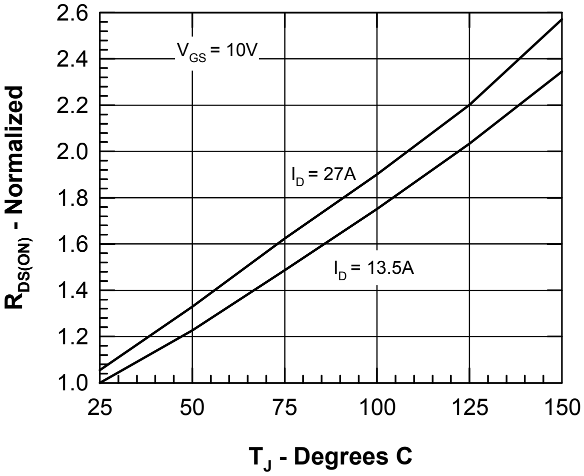


Figure 4. $R_{DS(on)}$ normalized to 0.5 I_{D25} value vs. T_J

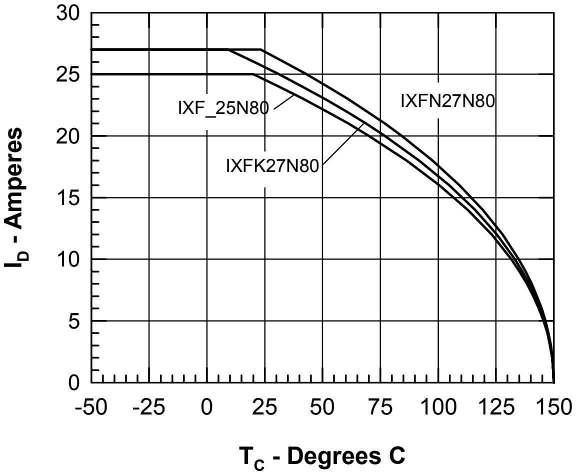


Figure 5. Drain Current vs. Case Temperature

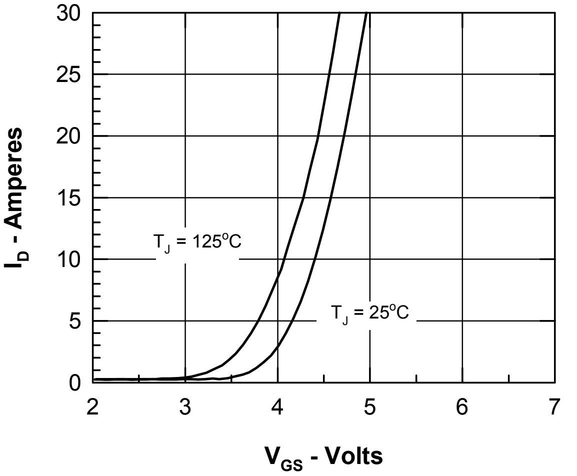


Figure 6. Admittance Curves

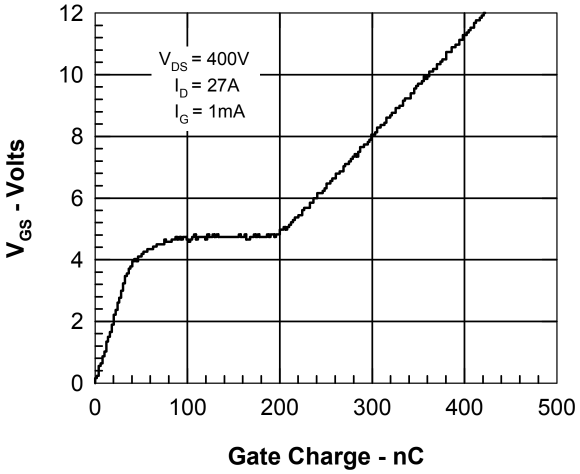


Figure 7. Gate Charge

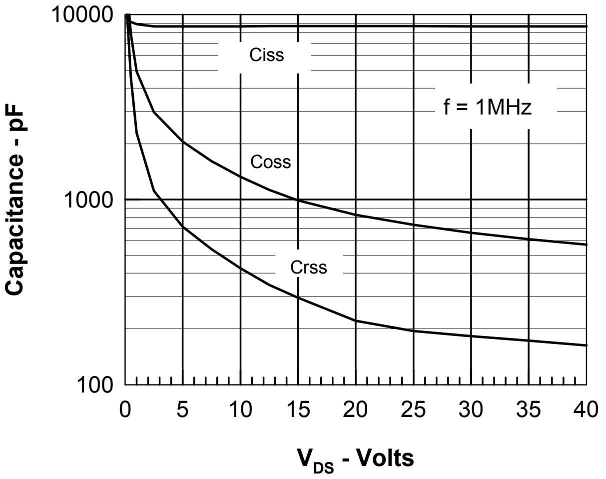


Figure 8. Capacitance Curves

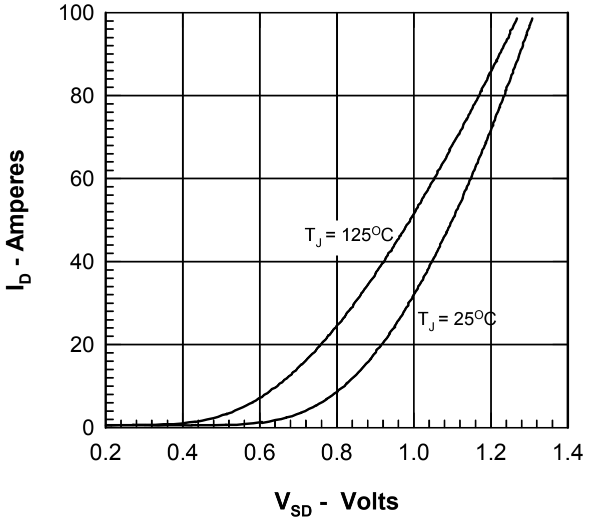


Figure 9. Forward Voltage Drop of the Intrinsic Diode

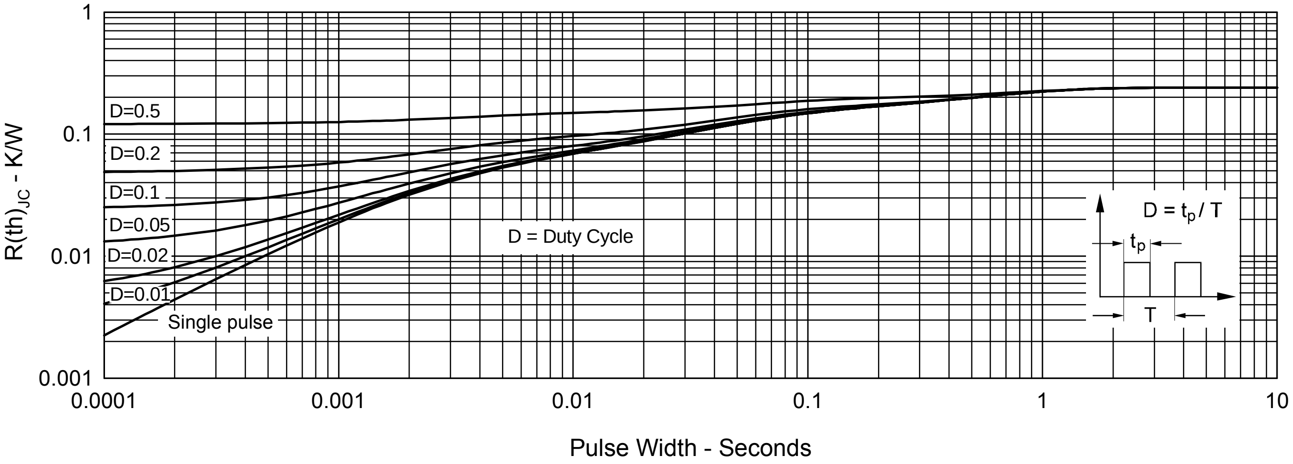


Figure 10. Transient Thermal Resistance

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