IXYS

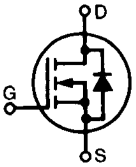
HiPerFET™ Power MOSFETs

	V_{DSS}	I_{D25}	$R_{DS(on)}$
IXFK72N20	**200 V**	**72 A**	**35 mΩ**
IXFK80N20	**200 V**	**80 A**	**30 mΩ**

$t_{rr} \le$ 200 ns

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

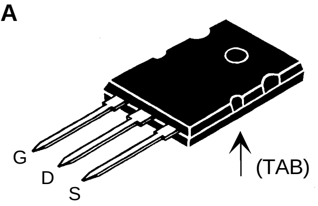
Preliminary data



Symbol	**Test Conditions**		**Maximum Ratings**	
V_{DSS}	T_J = 25°C to 150°C		200	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ		200	V
V_{GS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C	72N20	72	A
		80N20	80	A
I_{DM}	T_C = 25°C,	72N20	288	A
	pulse width limited by T_{JM}	80N20	320	A
I_{AR}	T_C = 25°C		74	A
E_{AR}	T_C = 25°C		45	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	V/ns
P_D	T_C = 25°C		360	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
M_d	Mounting torque		0.9/6	Nm/lb.in.
Weight			10	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
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 4 mA		2		4	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0				±100	nA
I_{DSS}	V_{DS} = 0.8 • V_{DSS}	T_J = 25°C			200	µA
	V_{GS} = 0 V	T_J = 125°C			1	mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 • I_{D25}	72N20			35	mΩ
		80N20			30	mΩ
	Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %					

TO-264 AA



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

Features

- International standard packages
- Molding epoxies meet UL 94 V-0 flammability classification
- Low $R_{DS\ (on)}$ HDMOS™ process
- Unclamped Inductive Switching (UIS) rated
- Fast intrinsic rectifier

Applications

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

Advantages

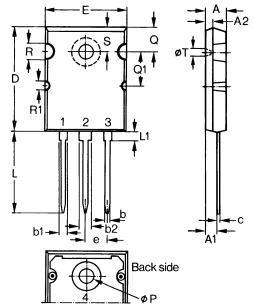
- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions (Characteristic Values, $T_J = 25°C$, unless otherwise specified)	min.	typ.	max.	
g_{fs}	$V_{DS} = 10$ V; $I_D = 0.5 \bullet I_{D25}$, pulse test	35	42		S
C_{iss}	$V_{GS} = 0$ V, $V_{DS} = 25$ V, f = 1 MHz		5900		pF
C_{oss}			1140		pF
C_{rss}			480		pF
$t_{d(on)}$	$V_{GS} = 10$ V, $V_{DS} = 0.5 \bullet V_{DSS}$, $I_D = 0.5 \bullet I_{D25}$ R_G = (External),		40		ns
t_r			55		ns
$t_{d(off)}$			120		ns
t_f			26		ns
$Q_{g(on)}$	$V_{GS} = 10$ V, $V_{DS} = 0.5 \bullet V_{DSS}$, $I_D = 0.5 \bullet I_{D25}$		280		nC
Q_{gs}			39		nC
Q_{gd}			120		nC
R_{thJC}				0.35	K/W
R_{thCK}			0.15		K/W

Source-Drain Diode

Symbol	Test Conditions (Characteristic Values, $T_J = 25°C$, unless otherwise specified)		min.	typ.	max.	
I_S	$V_{GS} = 0$ V	72N20			72	A
		80N20			80	A
I_{SM}	Repetitive; pulse width limited by T_{JM}	72N20			288	A
		80N20			320	A
V_{SD}	$I_F = I_S$, $V_{GS} = 0$ V, Pulse test, $t \leq 300$ µs, duty cycle $d \leq 2$ %				1.5	V
t_{rr}	$I_F = I_S$, -di/dt = 100 A/µs, $V_R = 100$ V				200	ns
Q_{RM}				1.2		µC
I_{RM}				10		A

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

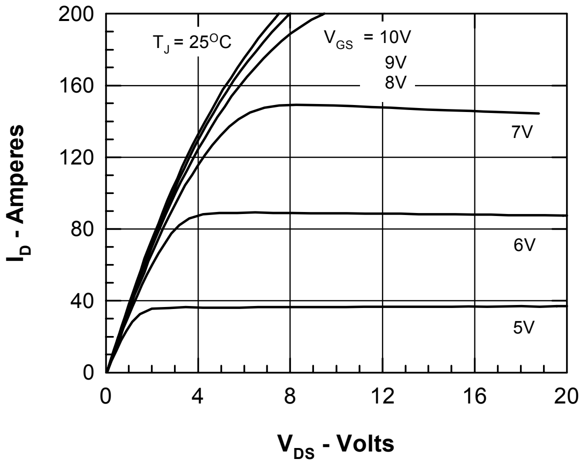


Figure 1. Output Characteristics at 25^{O}C

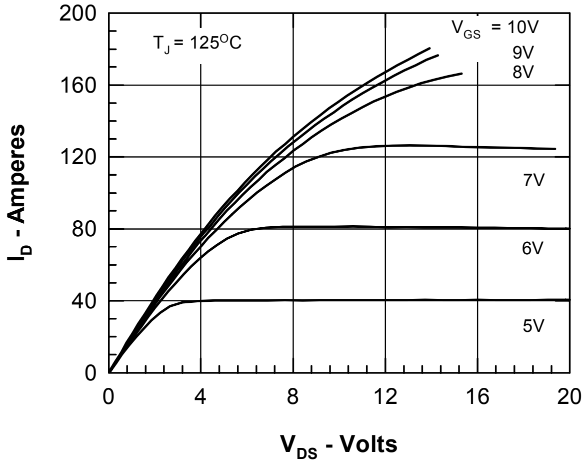


Figure 2. Output Characteristics at 125^{O}C

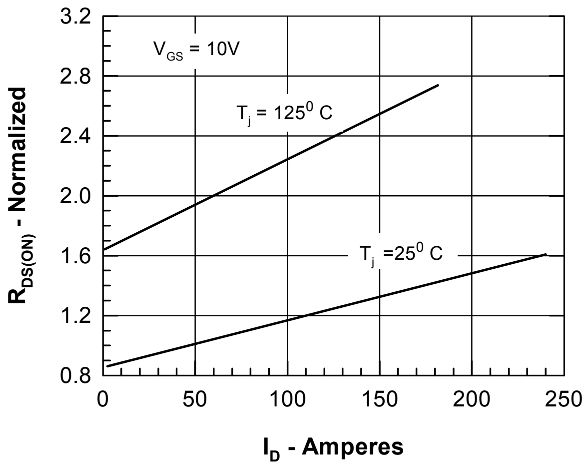


Figure 3. $R_{DS(on)}$ normalized to 0.5 I_{D25} value

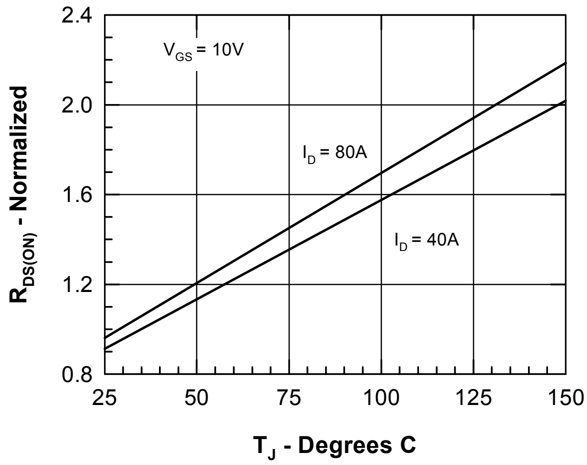


Figure 4. $R_{DS(on)}$ normalized to 0.5 I_{D25} value

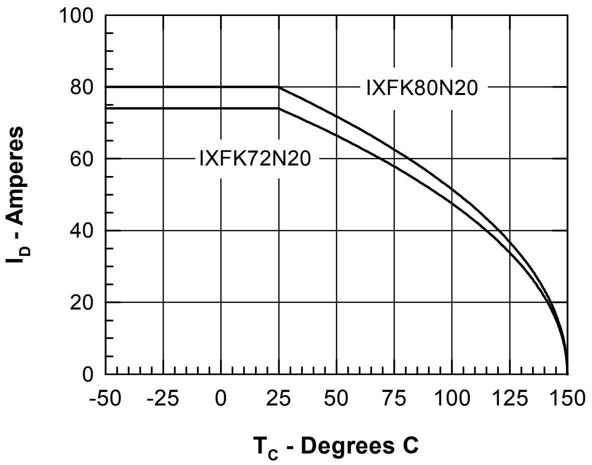


Figure 5. Drain Current vs. Case Temperature

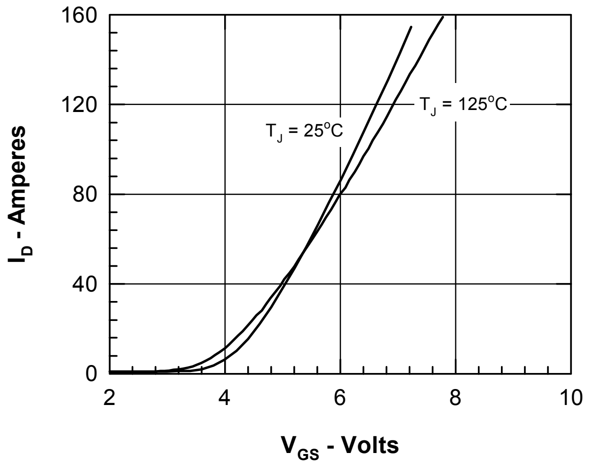


Figure 6. Admittance Curves

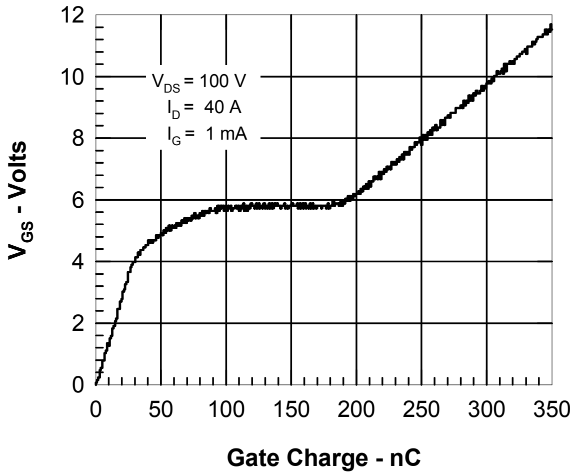


Figure 7. Gate Charge

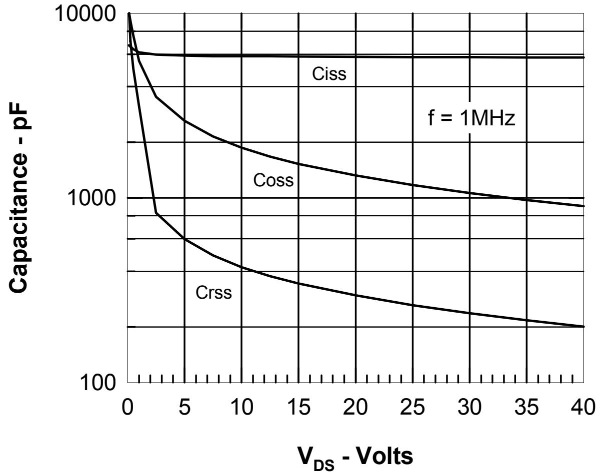


Figure 8. Capacitance Curves

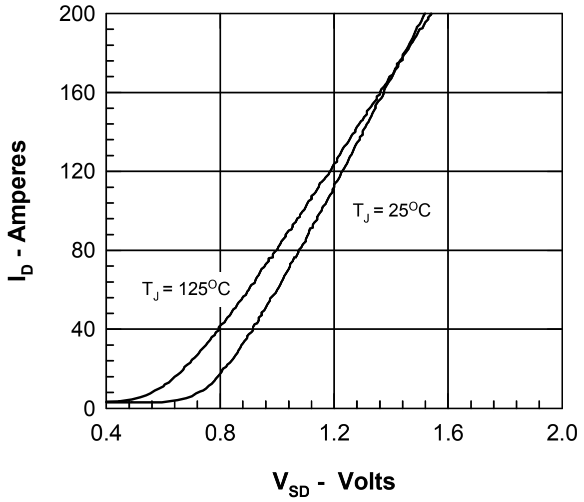


Figure 9. Source Current vs. Source to Drain Voltage

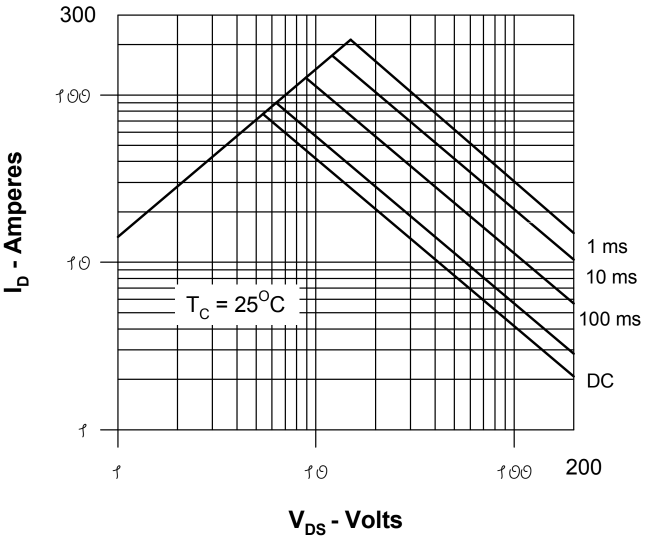


Figure10. Forward Bias Safe Operating Area

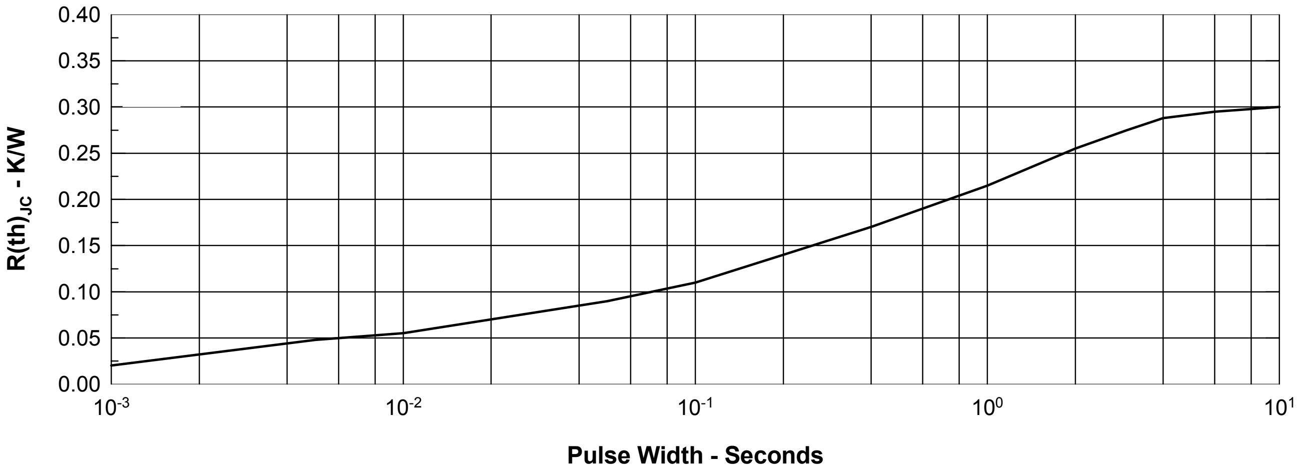


Figure 11. Transient Thermal Resistance