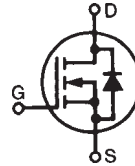


HiPerFET™ Power MOSFETs Q-Class

IXFK 32N50Q
IXFX 32N50Q

N-Channel Enhancement Mode
Avalanche Rated, Low Q_g , High dv/dt

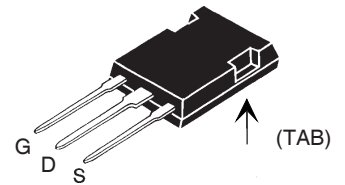


V_{DSS}	I_{D25}	$R_{DS(on)}$
500 V	32 A	0.16 Ω
500 V	32 A	0.16 Ω

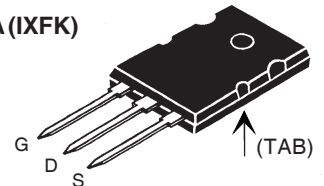
$$t_{rr} \leq 250 \text{ ns}$$

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 ; $R_{GS} = 1 \text{ M}\Omega$	500	V
V_{GS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	32	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	120	A
I_{AR}	$T_C = 25^\circ\text{C}$	32	A
E_{AR}	$T_C = 25^\circ\text{C}$	45	mJ
E_{AS}		1500	mJ
dv/dt	$I_S \leq I_{DM}$, $di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2 \Omega$	5	V/ns
P_D	$T_C = 25^\circ\text{C}$	416	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 (0.063 in) from case for 10 s	300	$^\circ\text{C}$
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight	TO-247	6	g
	TO-268	4	g

**PLUS 247™
(IXFX)**



TO-264 AA (IXFK)



G = Gate
S = Source

D = Drain
TAB = Drain

Features

- IXYS advanced low Q_g process
- Low gate charge and capacitances
 - easier to drive
 - faster switching
- International standard packages
- Low $R_{DS(on)}$
- Unclamped Inductive Switching (UIS) rated
- Molding epoxies meet UL 94 V-0 flammability classification

Advantages

- PLUS 247™ package for clip or spring mounting
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	500		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 4 \text{ mA}$	2.5		4.5 V
I_{GSS}	$V_{GS} = \pm 20 \text{ V}_{DC}$, $V_{DS} = 0$			$\pm 100 \text{ nA}$
I_{DSS}	$V_{DS} = V_{DSS}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		100 μA
	$V_{GS} = 0 \text{ V}$			1 mA
$R_{DS(on)}$	$V_{GS} = 10 \text{ V}$, $I_D = 0.5 I_{D25}$ Note 1			0.16 Ω

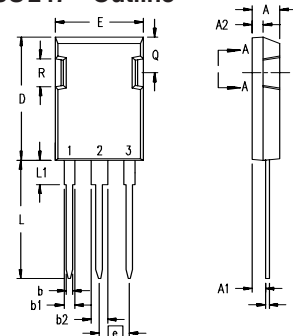
Symbol	Test Conditions	Characteristic Values		
		(T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	V _{DS} = 10 V; I _D = 0.5 • I _{D25} Note 1	18	28	S
C_{iss} C_{oss} C_{rss}	$\left. \begin{array}{l} \\ \\ \end{array} \right\} V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$		3950	pF
			640	pF
			210	pF
t_{d(on)} t_r t_{d(off)} t_f	$\left. \begin{array}{l} \\ \\ \\ \end{array} \right\} V_{GS} = 10 \text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 2 \Omega \text{ (External),}$		35	ns
			42	ns
			75	ns
			20	ns
Q_{g(on)} Q_{gs} Q_{gd}	$\left. \begin{array}{l} \\ \\ \end{array} \right\} V_{GS} = 10 \text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		150	nC
			26	nC
			85	nC
R_{thJC}			0.3	K/W
R_{thCK}			0.15	K/W

Source-Drain Diode

Source-Drain Diode		Characteristic Values	
		(T _J = 25°C, unless otherwise specified)	
Symbol	Test Conditions	min.	typ. max.
I _S	V _{GS} = 0 V		32 A
I _{SM}	Repetitive; pulse width limited by T _{JM}		128 A
V _{SD}	I _F = I _S , V _{GS} = 0 V, Note 1		1.5 V
t _{rr}	$I_F = 25A, -di/dt = 100 A/\mu s, V_R = 100 V$		250 ns
Q _{RM}		0.75	μC
I _{RM}		7.5	A

Note: 1. Pulse test, $t \leq 300 \mu s$, duty cycle $d \leq 2 \%$

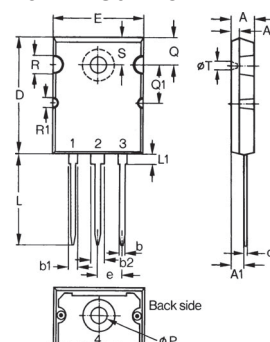
PLUS 247™ Outline



Terminals: 1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)
4 - Drain (Collector)

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A ₁	2.29	2.54	.090	.100
A ₂	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b ₁	1.91	2.13	.075	.080
b ₂	2.92	3.12	.115	.124
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	0.244
R	4.32	4.83	.170	.190

TO-264 AA Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.82	5.13	.190	.202
A1	2.54	2.89	.100	.111
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	5.46BSC		.215BSC	
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

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

IXYS MOSFETs and IGBTs are covered by one or more	4,835,592	4,881,106	5,017,508	5,049,961	5,187,117	5,486,715	6,306,728B1	6,259,123B1	6,306,728B1	
of the following U.S. patents:	4,850,072	4,931,844	5,034,796	5,063,307	5,237,481	5,381,025	6,404,065B1	6,162,665	6,534,343	6,583,505

Figure 1. Output Characteristics at 25°C

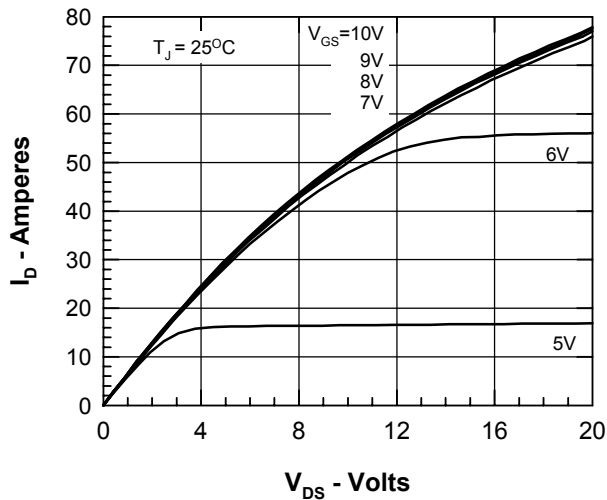


Figure 2. Output Characteristics at 125°C

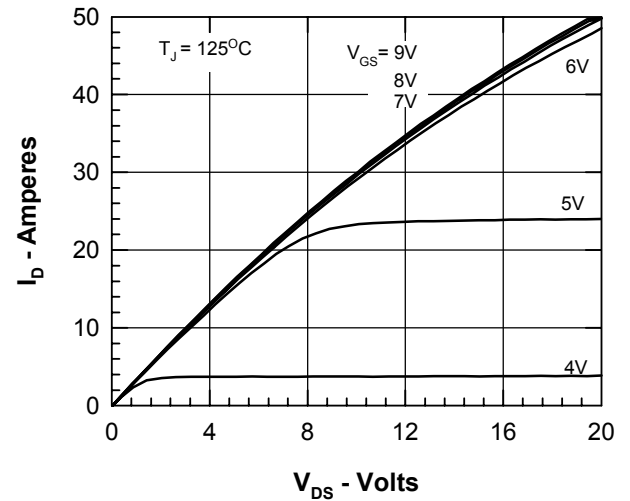
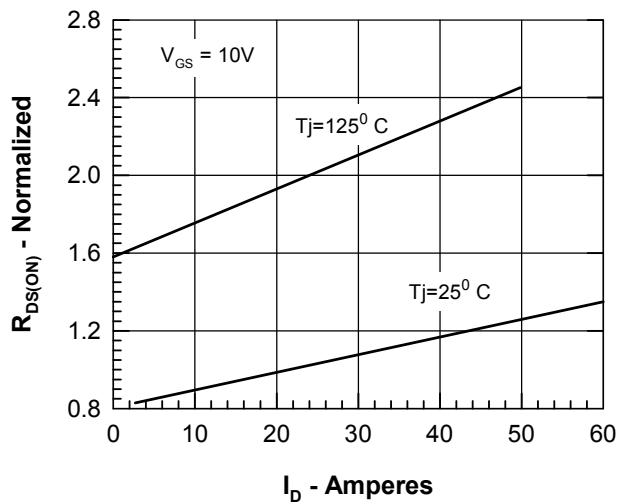
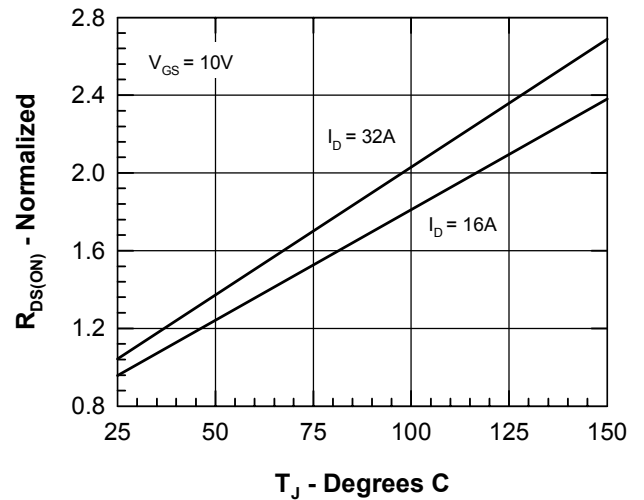

 Figure 3. $R_{DS(on)}$ normalized to 15A/25°C vs. I_D

 Figure 4. $R_{DS(on)}$ normalized to 15A/25°C vs. T_J


Figure 5. Drain Current vs. Case Temperature

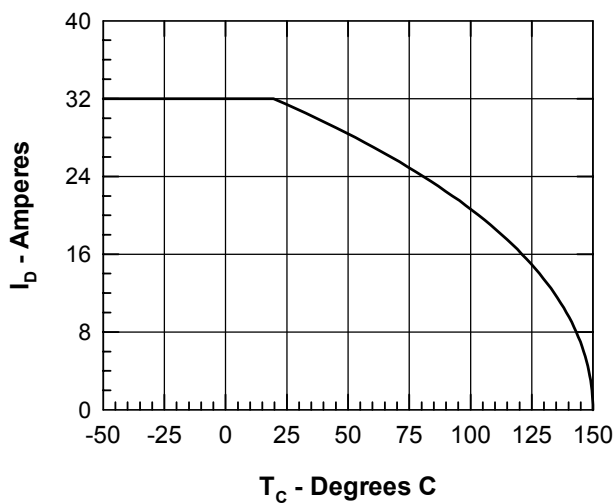


Figure 6. Admittance Curves

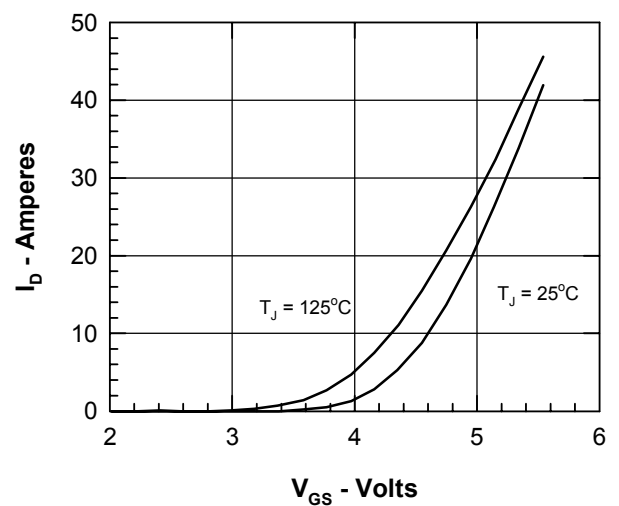


Figure 7. Gate Charge

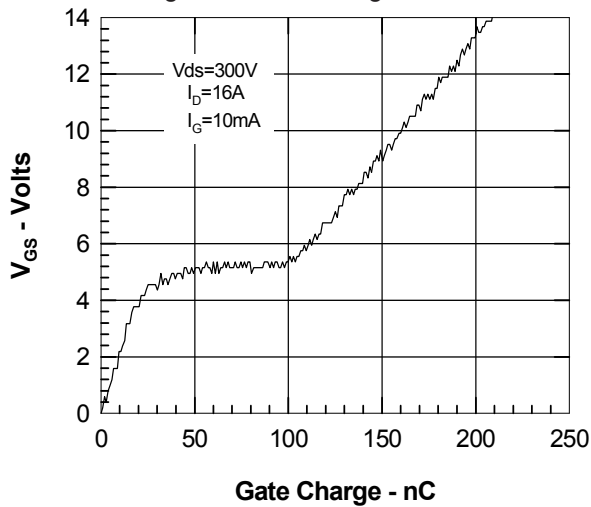


Figure 8. Capacitance Curves

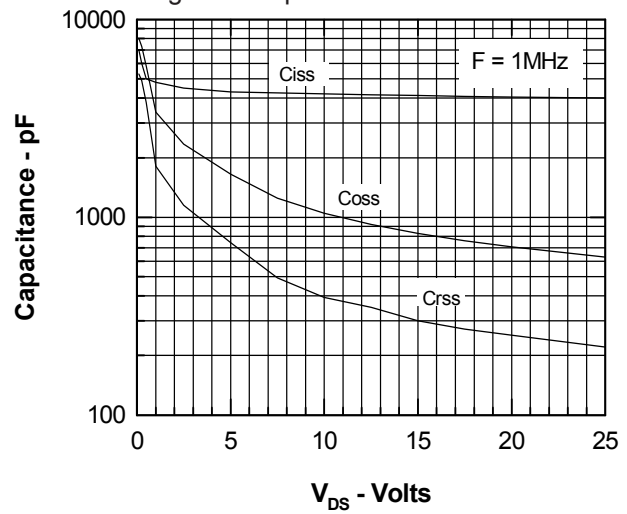


Figure 9. Forward Voltage Drop of the Intrinsic Diode

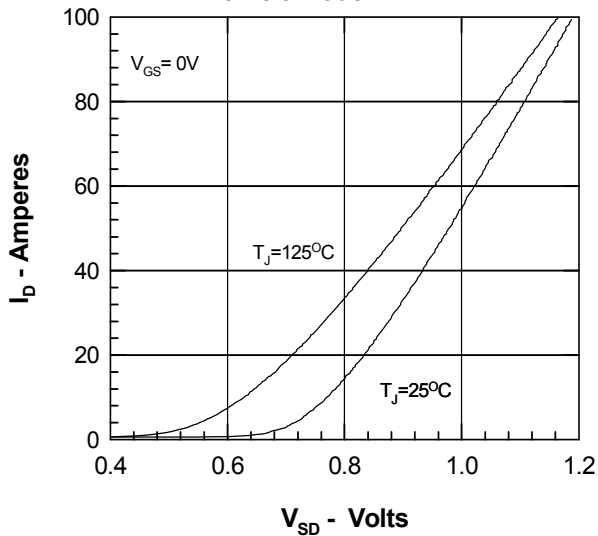
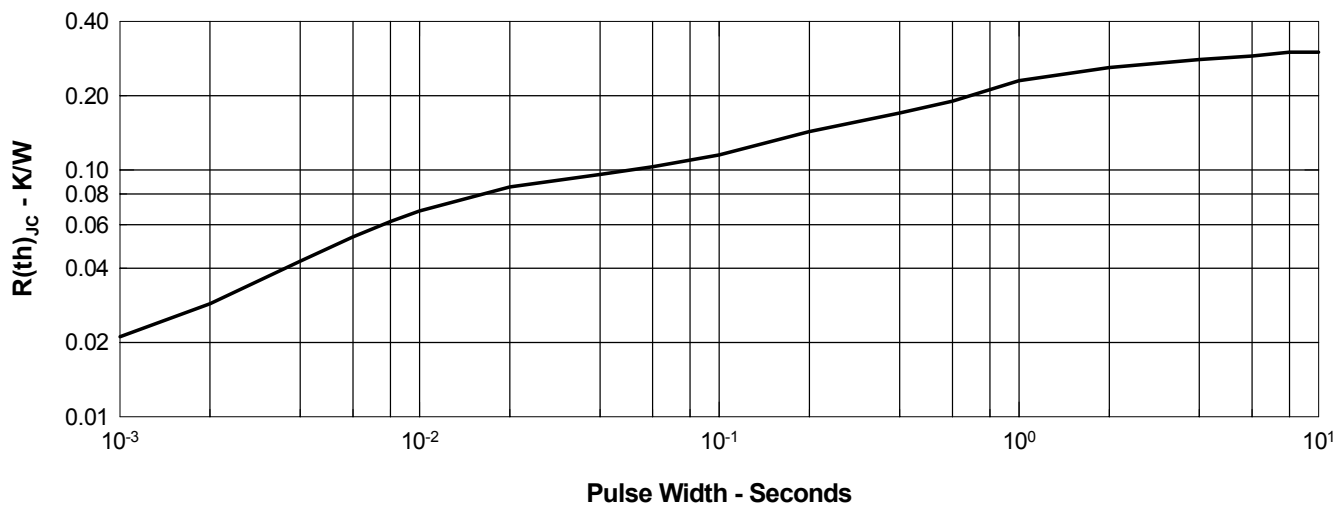


Figure 10. Transient Thermal Resistance





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