

# HiPerFET™ Power MOSFETs

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

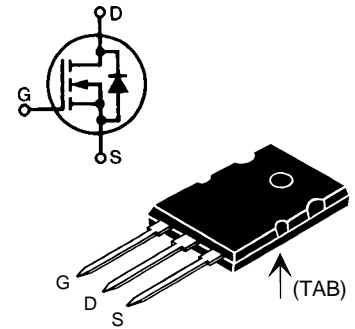
**IXFK 110 N06**  
**IXFK 105 N07**  
**IXFK 110 N07**

$V_{DSS}$	$I_{D25}$	$R_{DS(on)}$
<b>60 V</b>	<b>110 A</b>	<b>6 mΩ</b>
<b>70 V</b>	<b>105 A</b>	<b>7 mΩ</b>
<b>70 V</b>	<b>110 A</b>	<b>6 mΩ</b>

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

Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	N07	70 V
		N06	60 V
$V_{DGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1\text{ M}\Omega$	N07	70 V
		N06	60 V
$V_{GS}$	Continuous		$\pm 20$ V
$V_{GSM}$	Transient		$\pm 30$ V
$I_{D25}$	$T_C = 25^\circ\text{C}$ , die capability		110 A
$I_{D130}$	$T_C = 130^\circ\text{C}$ , limited by external leads		76 A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_{JM}$		600 A
$I_{AR}$	$T_C = 25^\circ\text{C}$		100 A
$E_{AR}$	$T_C = 25^\circ\text{C}$		30 mJ
$E_{AS}$	$T_C = 25^\circ\text{C}$		2 J
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
$P_D$	$T_C = 25^\circ\text{C}$		500 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	0.9/6	Nm/lb.in.
	Terminal connection torque	-	Nm/lb.in.
Weight		10	g

## TO-264 AA (IXFK)



## Features

- International standard packages
- JEDEC TO-264 AA, epoxy meet UL94 V-0, flammability classification
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
- Fast intrinsic Rectifier

## Applications

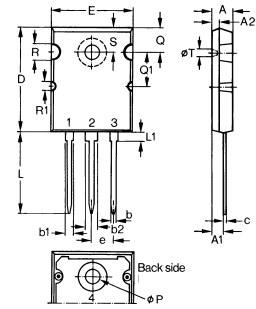
- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls
- Low voltage relays

## Advantages

- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_{DSS}$	$V_{GS} = 0\text{ V}$ , $I_D = 1\text{ mA}$	N06 N07	60 70	V V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 8\text{ mA}$		2	4 V
$I_{GSS}$	$V_{GS} = \pm 20\text{ V}_{DC}$ , $V_{DS} = 0$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = 0.8 \cdot V_{DSS}$ , $V_{GS} = 0\text{ V}$	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		400 $\mu\text{A}$ 2 mA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}$ , $I_D = 0.5 \cdot I_{D25}$ Note 2	110N06/110N07 105N07		6 mΩ 7 mΩ

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$g_{fs}$	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$ , Note 2	60	80	S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		9000	pF
$C_{oss}$			4000	pF
$C_{rss}$			2400	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),		30	ns
$t_r$			60	ns
$t_{d(off)}$			100	ns
$t_f$			60	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		480	nC
$Q_{gs}$			60	nC
$Q_{gd}$			240	nC
$R_{thJC}$	TO-264 AA		0.25	K/W
$R_{thCK}$	TO-264 AA		0.15	K/W

**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

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$I_S$	$V_{GS} = 0\text{ V}$	110N06/110N07 105N07		110 A 105 A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$	110N06/110N07 105N07		440 A 420 A
$V_{SD}$	$I_F = 100\text{ A}, V_{GS} = 0\text{ V}$ , Note 2			1.7 V
$t_{rr}$	$I_F = 25\text{ A}$ $-di/dt = 100\text{ A}/\mu\text{s}$ $V_R = 50\text{ V}$		150	250 ns
$Q_{RM}$				0.7 $\mu\text{C}$
$I_{RM}$				9 A

Note: 1. Pulse width limited by  $T_{JM}$   
2. Pulse test,  $t \leq 300\ \mu\text{s}$ , duty cycle  $d \leq 2\%$

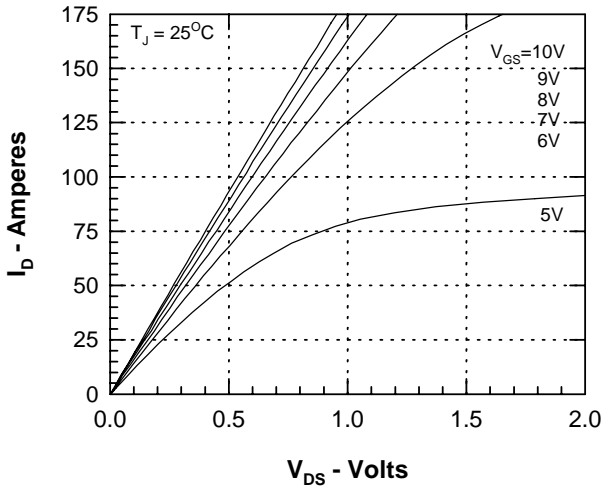


Figure 1. Output Characteristics at 25°C

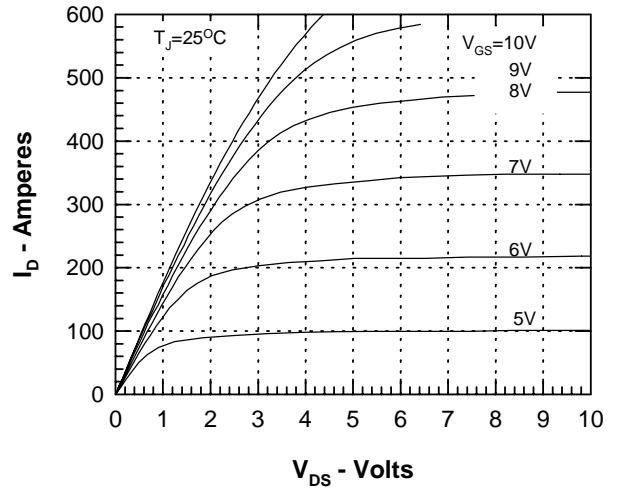


Figure 2. Extended Output Characteristics

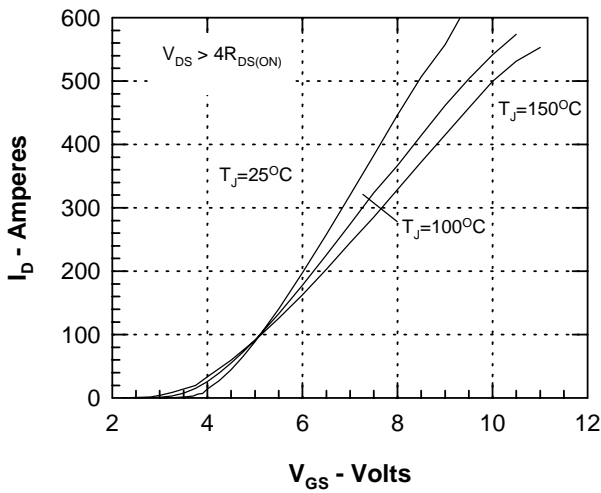


Figure 3. Admittance Curves

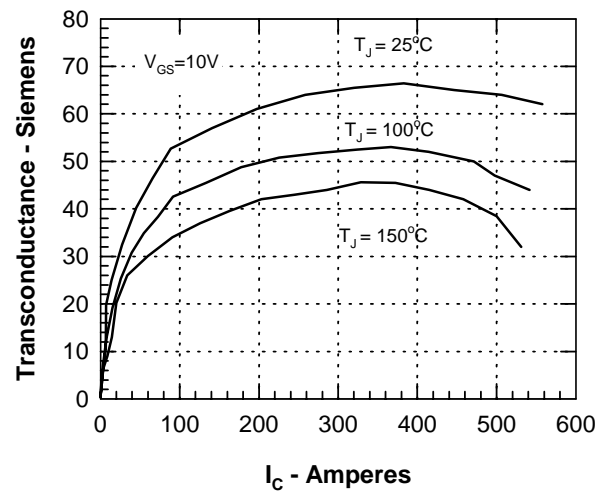
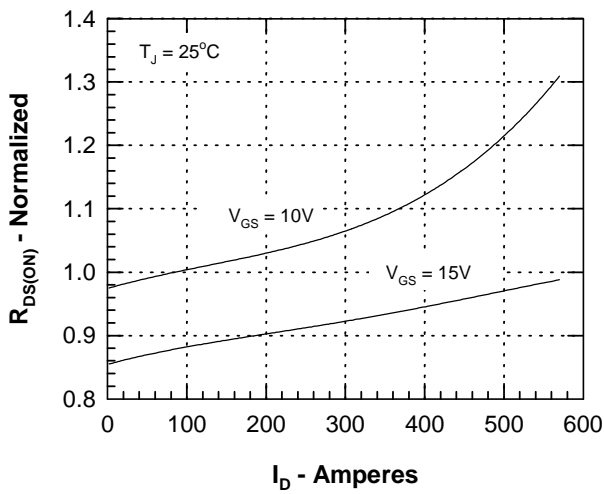
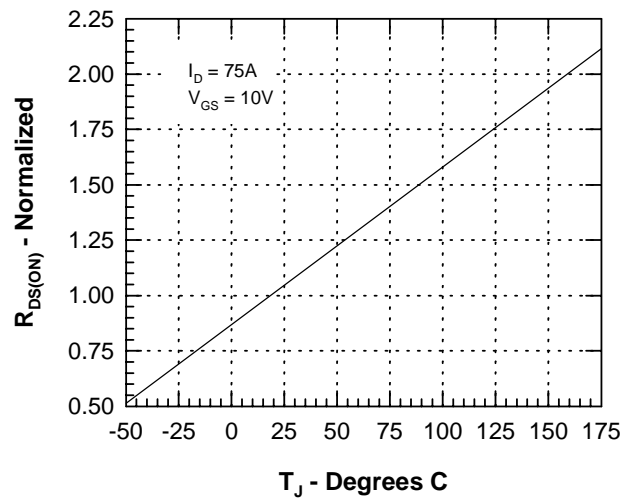


Figure 4. Transconductance vs. Drain Current


 Figure 5.  $R_{DS(on)}$  normalized to  $0.5 I_{D25}$  value

 Figure 6. Normalized  $R_{DS(on)}$  vs. Junction Temperature

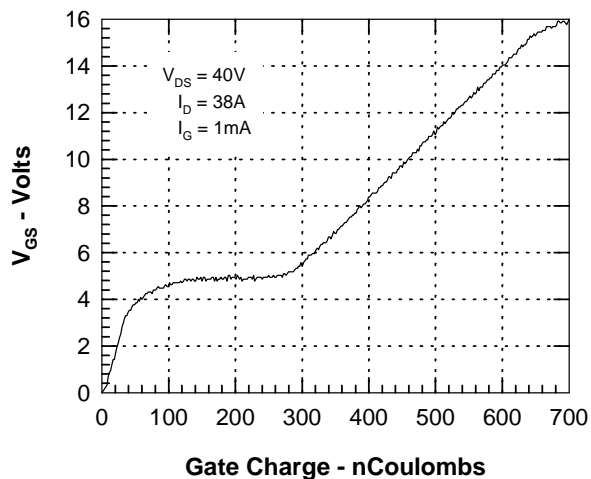


Figure 7. Gate Charge

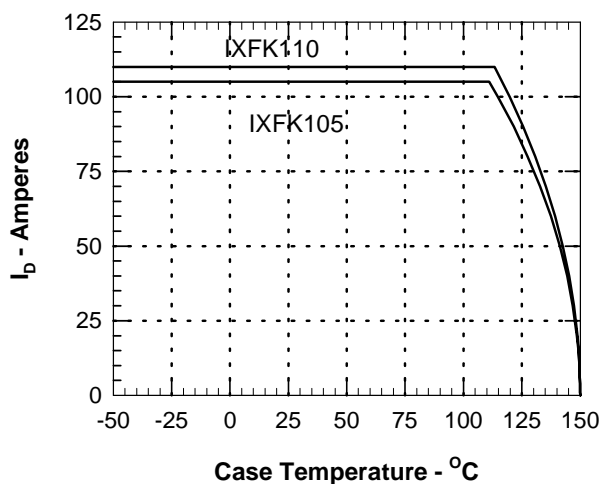


Figure 8. Drain Current vs. Case Temperature

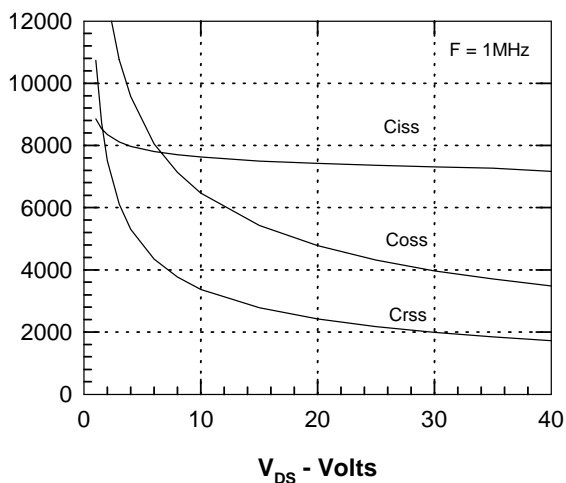


Figure 9. Capacitance Curves

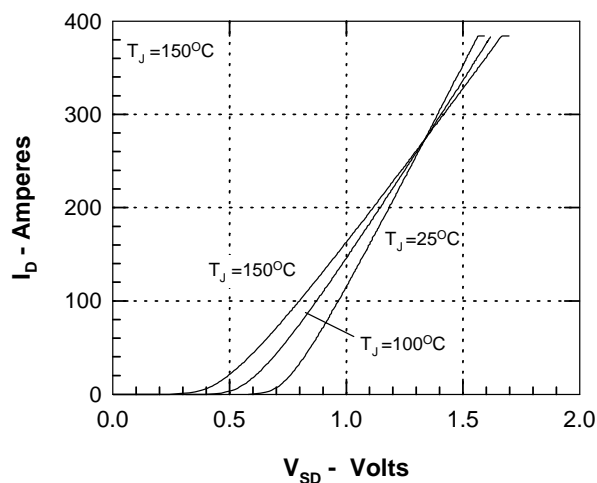


Figure 10. Source-Drain Voltage vs. Source Current

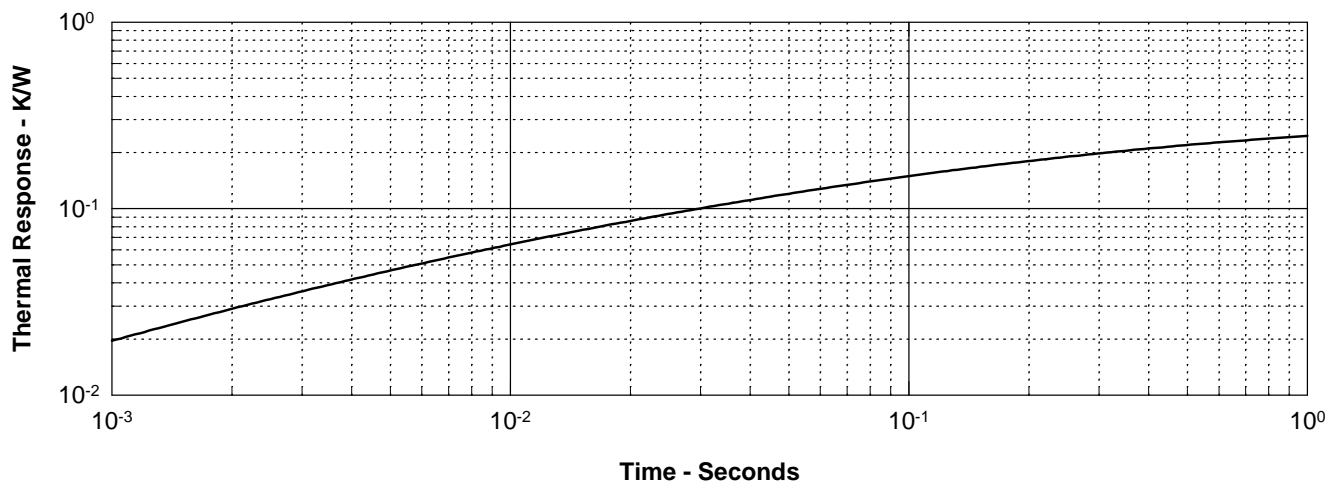


Figure 11. Transient Thermal Resistance



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