

HiPerFET™ Power MOSFETs

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

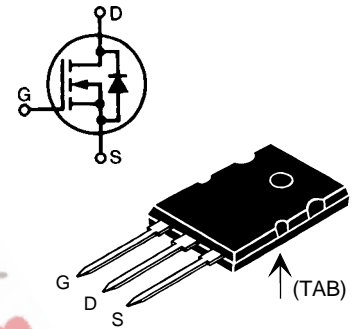
IXFK 110 N06
IXFK 105 N07
IXFK 110 N07

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

$t_{rr} \leq 250$ ns

Symbol	Test Conditions	Maximum Ratings		
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	N07	70	V
		N06	60	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GS} = 1$ MΩ	N07	70	V
		N06	60	V
V_{GS}	Continuous		±20	V
V_{GSM}	Transient		±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	$I_S \leq I_{DM}$, $di/dt \leq 100$ A/μs, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ\text{C}$, $R_G = 2$ Ω		5	V/ns
P_D	$T_C = 25^\circ\text{C}$		500	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.
	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

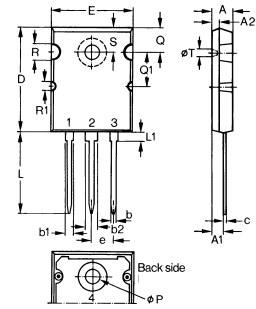
- DC-DC converters
- Synchronous rectification
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- Temperature and lighting controls
- Low voltage relays

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}	$V_{GS} = 0$ V, $I_D = 1$ mA	N06	60	V
		N07	70	V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 8$ mA		2	V
I_{GSS}	$V_{GS} = \pm 20$ V _{DC} , $V_{DS} = 0$			±200 nA
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0$ V	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$		400 μA 2 mA
$R_{DS(on)}$	$V_{GS} = 10$ 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

Source-Drain Diode
Characteristic Values
 ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Test Conditions	Characteristic Values		
		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 μC
I_{RM}				9 A

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

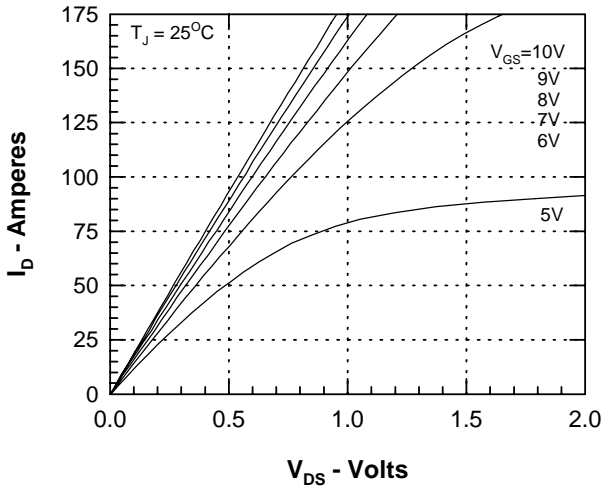


Figure 1. Output Characteristics at 25°C

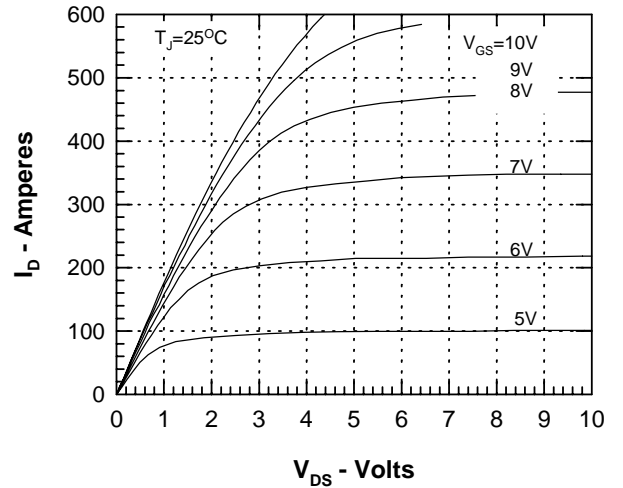


Figure 2. Extended Output Characteristics

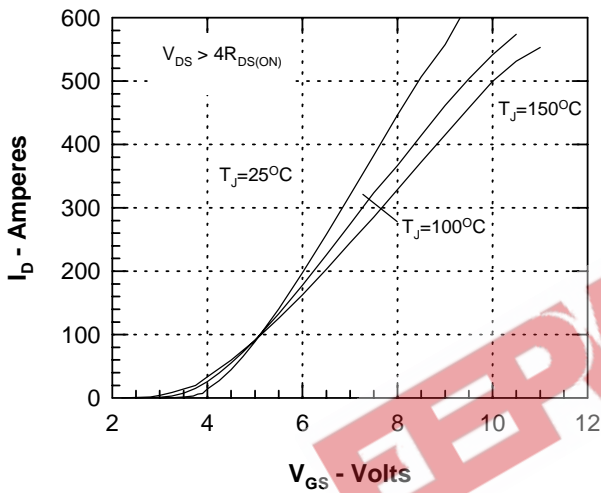


Figure 3. Admittance Curves

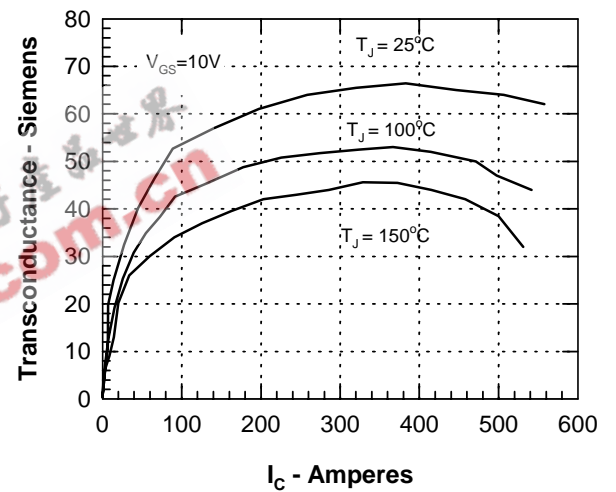
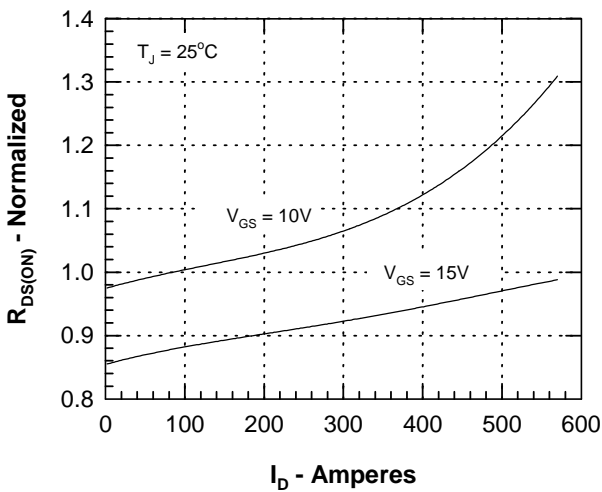
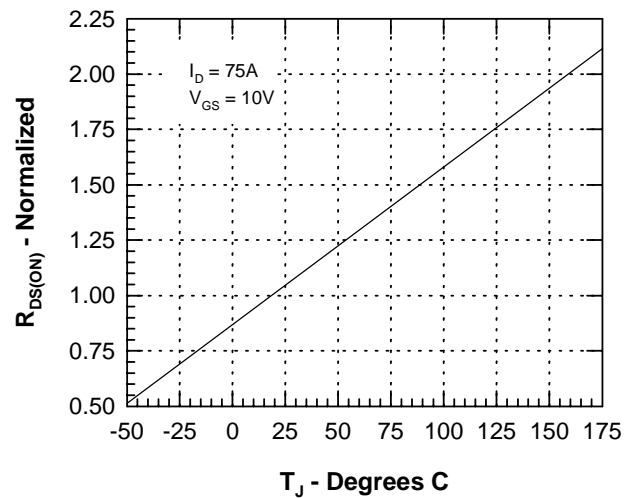


Figure 4. Transconductance vs. Drain Current


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

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

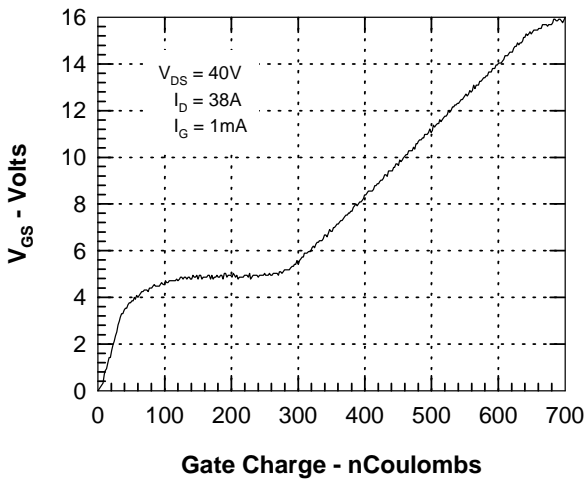


Figure 7. Gate Charge

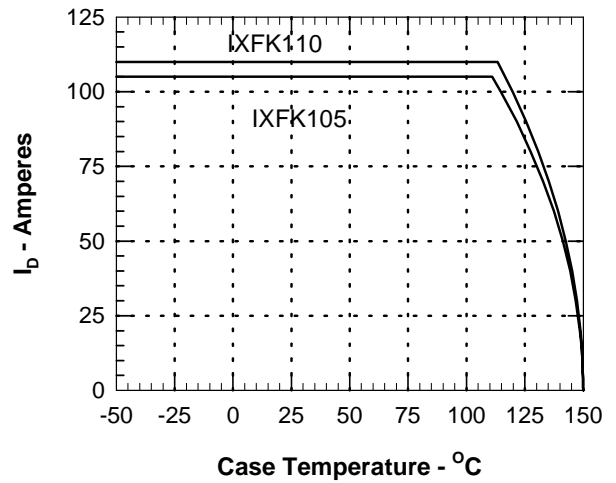


Figure 8. Drain Current vs. Case Temperature

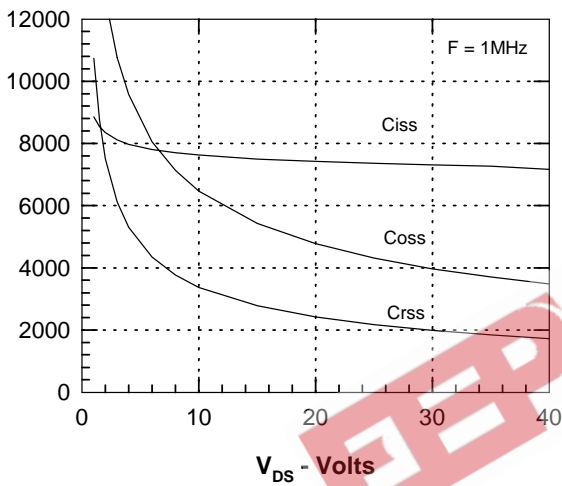


Figure 9. Capacitance Curves

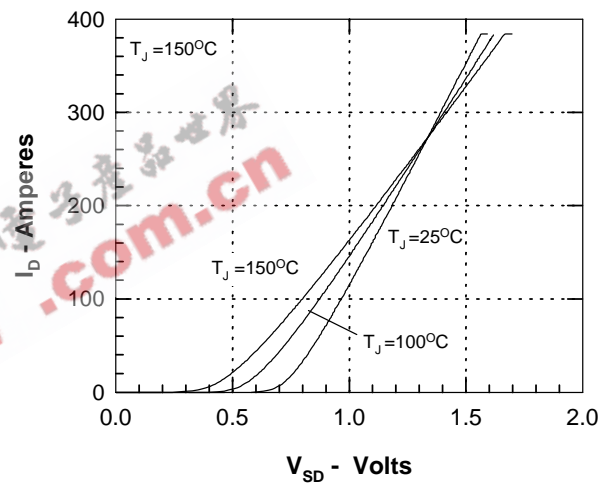


Figure 10. Source-Drain Voltage vs. Source Current

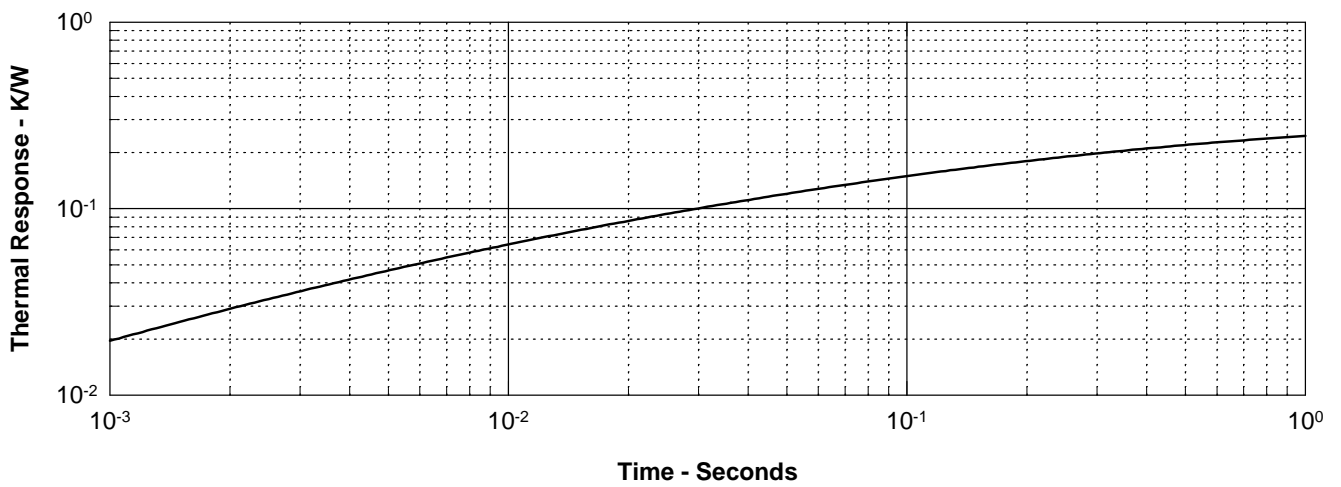


Figure 11. Transient Thermal Resistance