

GigaMOS™ Power MOSFET

IXFK180N25T IXFX180N25T

N-Channel Enhancement Mode Avalanche Rated Fast Intrinsic Diode

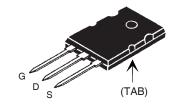


Symbol	Test Conditions	Maximum F	aximum Ratings	
V _{DSS}	$T_J = 25^{\circ}\text{C} \text{ to } 150^{\circ}\text{C}$	250	V	
V _{DGR}	$T_J = 25^{\circ}\text{C to } 150^{\circ}\text{C}, R_{GS} = 1\text{M}\Omega$	250		
V _{GSS}	Continuous	± 20	V	
V _{GSM}	Transient	± 30		
I _{D25} I _{L(RMS)}	$T_{c} = 25^{\circ}\text{C}$ External Lead Current Limit $T_{c} = 25^{\circ}\text{C}$, Pulse Width Limited by T_{JM}	180 160 500	A A A	
I _A	$T_{c} = 25^{\circ}C$	40	A	
E _{AS}	$T_{c} = 25^{\circ}C$	3	J	
dV/dt	$I_{_{S}}$ $\leq I_{_{DM}}, V_{_{DD}} \leq V_{_{DSS}}, T_{_{J}} \leq 150^{\circ}C$	20	V/ns	
P _D	T _C = 25°C	1390	W	
T _J		-55 +150	°C	
T _{JM}		150	°C	
T _{stg}		-55 +150	°C	
T _L	1.6mm (0.062 in.) from Case for 10s	300	°C	
T _{SOLD}	Plastic Body for 10s	260	°C	
M _d	Mounting Torque (TO-264)	1.13/10	Nm/lb.in.	
F _c	Mounting Force (PLUS247)	20120 /4.527	N/lb.	
Weight	TO-264	10	g	
	PLUS247	6	g	

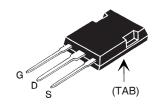
Symbol Test Conditions (T _J = 25°C Unless Otherwise Specified)		Chara Min.	Characteristic Values Min. Typ. Max.		
BV _{DSS}	$V_{GS} = 0V, I_D = 3mA$	250			V
$V_{\rm GS(th)}$	$V_{DS} = V_{GS}, I_{D} = 8mA$	2.5		5.0	V
l _{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 200	nA
I _{DSS}	$V_{DS} = V_{DSS}, V_{GS} = 0V$	_		50	μΑ
	1	Γ _J = 125°C		3	mΑ
R _{DS(on)}	$V_{GS} = 10V, I_{D} = 60A, Note 1$			12.9	mΩ

 $\begin{array}{lll} V_{_{DSS}} & = & 250 V \\ I_{_{D25}} & = & 180 A \\ R_{_{DS(on)}} & \leq & 12.9 m \Omega \\ t_{_{rr}} & \leq & 200 ns \end{array}$

TO-264 (IXFK)



PLUS247 (IXFX)



G = Gate D = DrainS = Source TAB = Drain

Features

- International Standard Packages
- High Current Handling Capability
- Fast Intrinsic Diode
- Avalanche Rated
- Low R_{DS(on)}

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- DC-DC Converters
- Battery Chargers
- Switched-Mode and Resonant-Mode Power Supplies
- DC Choppers
- AC Motor Drives
- Uninterruptible Power Supplies
- High Speed Power Switching Applications



•	Symbol Test Conditions Chara T = 25°C Unless Otherwise Specified) Min.		racteristic Values Typ. Max.		5	
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g _{fs}		$V_{DS} = 10V, I_{D} = 60A, Note 1$	100	160		S
\mathbf{C}_{iss})			28		nF
\mathbf{C}_{oss}	}	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		2050		pF
\mathbf{C}_{rss}	J			158		pF
t _{d(on)})			37		ns
t _r		Resistive Switching Times		33		ns
$\mathbf{t}_{d(off)}$		$V_{GS} = 15V$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_{D} = 0.5 \cdot I_{D25}$ $R_{G} = 1\Omega$ (External)		100		ns
t _f	J	G , ,		28		ns
$\mathbf{Q}_{g(on)}$)			345		nC
Q_{gs}	}	$V_{GS} = 10V, V_{DS} = 0.5 \cdot V_{DSS}, I_{D} = 0.5 \cdot I_{D25}$		122		nC
\mathbf{Q}_{gd}	J			70		nC
R _{thJC}					0.09	°C/W
$\mathbf{R}_{\mathrm{thCS}}$				0.15		°C/W

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values			
$(T_{J} = 25^{\circ}C,$	Unless Otherwise Specified)	Min.	Тур.	Max.	
I _s	$V_{GS} = 0V$			180	Α
I _{SM}	Repetitive, Pulse Width Limited by $T_{_{JM}}$			720	Α
V _{SD}	$I_F = 60A$, $V_{GS} = 0V$, Note 1			1.3	V
t _{rr} Q _{RM}	$I_{_{\rm F}} = 90 {\rm A}, \; -{\rm di}/{\rm dt} = 100 {\rm A}/{\rm \mu s}$ $V_{_{\rm R}} = 75 {\rm V}, \; V_{_{\rm GS}} = 0 {\rm V}$		0.77	200	ns μC Α
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Note 1: Pulse Test, $t \le 300\mu s$; Duty Cycle, $d \le 2\%$.

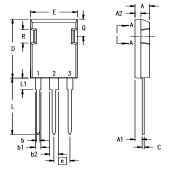
ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

TO-264 (IXFK) Outline

Dim.	Milli	meter	Inc	hes
Diiii.	Min.	Max.	Min.	Max.
Α	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
С	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
Е	19.81	19.96	.780	.786
е	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
Р	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
Т	1.57	1.83	.062	.072

PLUS 247™ (IXFX) Outline



- Terminals:
 - 1 Gate 2 - Drain (Collector)

 - 3 Source (Emitter) 4 Drain (Collector)

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Dim.	Millimeter		Inches		
	Min.	Max.	Min.	Max.	
Α	4.83	5.21	.190	.205	
A,	2.29	2.54	.090	.100	
A ₂	1.91	2.16	.075	.085	
b	1.14	1.40	.045	.055	
b,	1.91	2.13	.075	.084	
b ₂	2.92	3.12	.115	.123	
С	0.61	0.80	.024	.031	
D	20.80	21.34	.819	.840	
Е	15.75	16.13	.620	.635	
е	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	

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.



0

0.0 0.2 0.4 0.6

@ 25°C

180

160

140

120

80

60

40

20

5V

0.8 1.0 1.2

V_{DS} - Volts

1.4 1.6 1.8 2.0

Fig. 1. Output Characteristics

@ 25°C 350 $V_{GS} = 10V$ 300 250 ID - Amperes 200 6V 100 50 5V 0 0 2 4 10 12 16 V_{DS} - Volts

Fig. 2. Extended Output Characteristics

Fig. 3. Output Characteristics @ 125°C 180 $V_{GS} = 10V$ 160 140 6V 120 I_D - Amperes 100 80 60 40 20 0 0.8 1.2 1.6 2.4 2.8 3.2 3.6 0.0 0.4 2.0 4.0

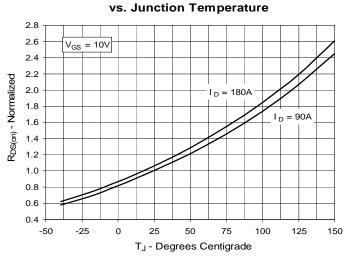
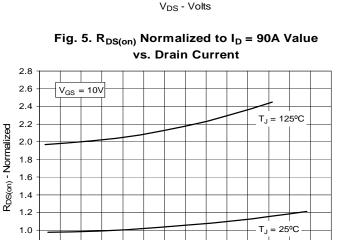


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 90A$ Value



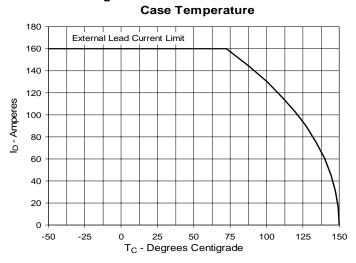


Fig. 6. Maximum Drain Current vs.

100

150

I_D - Amperes

200

250

300

350

0.8

0

50



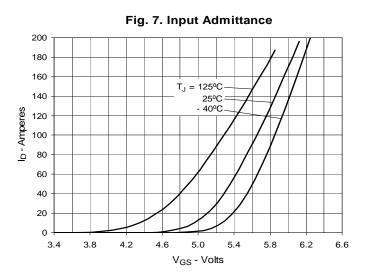
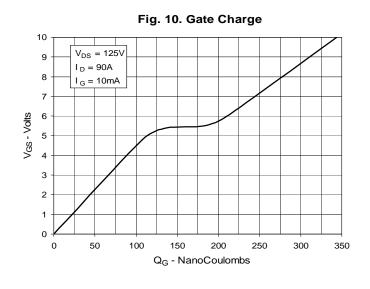
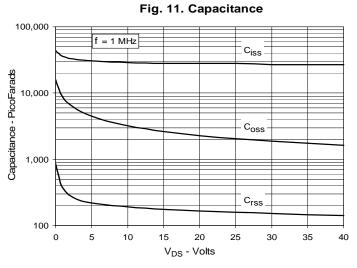


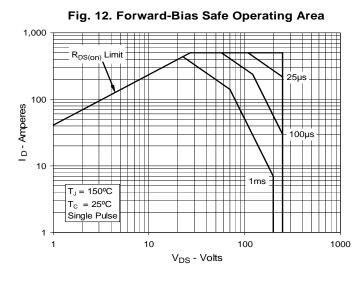
Fig. 8. Transconductance 280 $T_{J} = -40^{\circ}C$ 240 200 160 Jes - Siemens 25°C 125°C 80 40 0 0 20 40 60 100 120 140 160 180 I_D - Amperes

Intrinsic Diode 350 300 250 Is - Amperes 200 150 $T_{J} = 125^{\circ}C$ 100 $T_J = 25^{\circ}C$ 50 0 0.4 0.2 0.6 0.8 1.0 1.2 0.0 1.4 V_{SD} - Volts

Fig. 9. Forward Voltage Drop of







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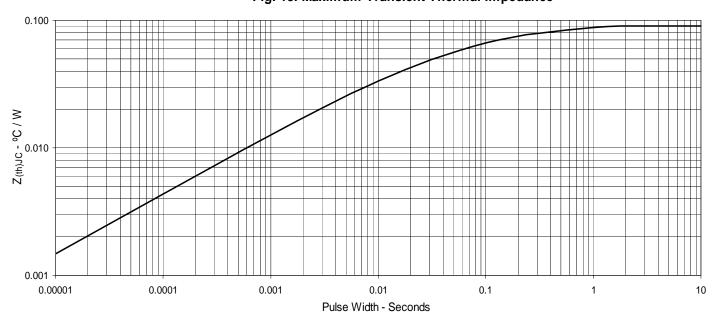


Fig. 13. Maximum Transient Thermal Impedance