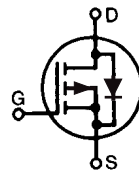


# Standard Power MOSFET

# IXTH 24P20

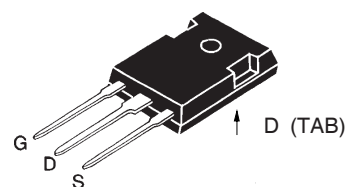
P-Channel Enhancement Mode  
Avalanche Rated

$V_{DSS} = -200 \text{ V}$   
 $I_{D25} = -24 \text{ A}$   
 $R_{DS(on)} \leq 0.11 \text{ } \Omega$



Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	-200	V
$V_{DGR}$	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 1 \text{ M}\Omega$	-200	V
$V_{GS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ\text{C}$	-24	A
$I_{DM}$	$T_C = 25^\circ\text{C}$ , pulse width limited by $T_J$	-96	A
$I_{AR}$	$T_C = 25^\circ\text{C}$	-24	A
$E_{AR}$	$T_C = 25^\circ\text{C}$	30	mJ
$P_D$	$T_C = 25^\circ\text{C}$	300	W
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
$T_L$	Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s	400	$^\circ\text{C}$
$M_d$	Mounting torque	1.13/10	Nm/lb.in.
<b>Weight</b>		6	g

TO-247 AD



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

### Features

- International standard package JEDEC TO-247 AD
- Low  $R_{DS(on)}$  HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- Low package inductance (<5 nH)  
- easy to drive and to protect

### Applications

- High side switching
- Push-pull amplifiers
- DC choppers
- Automatic test equipment

### Advantages

- Easy to mount with 1 screw (isolated mounting screw hole)
- Space savings
- High power density

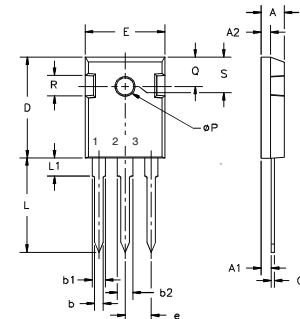
Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$V_{DSS}$	$V_{GS} = 0 \text{ V}, I_D = -250 \text{ } \mu\text{A}$	-200		V
$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \text{ } \mu\text{A}$	-3.0		-5.0 V
$I_{GSS}$	$V_{GS} = \pm 20 \text{ V}_{DC}, V_{DS} = 0$			$\pm 100 \text{ nA}$
$I_{DSS}$	$V_{DS} = 0.8 \cdot V_{DSS}$ $V_{GS} = 0 \text{ V}$	$T_J = 25^\circ\text{C}$		-25 $\mu\text{A}$
		$T_J = 125^\circ\text{C}$		-1 mA
$R_{DS(on)}$	$V_{GS} = -10 \text{ V}, I_D = 0.5 \cdot I_{D25}$			0.11 $\Omega$

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$g_{fs}$	$V_{DS} = -10\text{ V}; I_D = I_{D25}$ , pulse test	10	15	S
$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$		4200	pF
$C_{oss}$			830	pF
$C_{rss}$			350	pF
$t_{d(on)}$	$V_{GS} = -10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$ $R_G = 4.7\ \Omega$ (External)		36	ns
$t_r$			29	ns
$t_{d(off)}$			68	ns
$t_f$			28	ns
$Q_{g(on)}$	$V_{GS} = -10\text{ V}, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}$		150	nC
$Q_{gs}$			40	nC
$Q_{gd}$			70	nC
$R_{thJC}$			0.42	K/W
$R_{thCS}$		0.25		K/W

### Source-Drain Diode

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$I_S$	$V_{GS} = 0$			-24 A
$I_{SM}$	Repetitive; pulse width limited by $T_{JM}$			-96 A
$V_{SD}$	$I_F = I_S, V_{GS} = 0\text{ V}$ , Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $d \leq 2\%$			-3 V
$t_{rr}$	$I_F = I_S, di/dt = 100\text{ A}/\mu\text{s}, V_R = -50\text{ V}$	250		ns

### TO-247 AD Outline



Terminals: 1 - Gate      2 - Drain  
3 - Source      Tab - Drain

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
A <sub>1</sub>	2.2	2.54	.087	.102
A <sub>2</sub>	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b <sub>1</sub>	1.65	2.13	.065	.084
b <sub>2</sub>	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15	BSC	.242	BSC

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

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065B1	6,683,344	6,727,585
	4,850,072	5,017,508	5,063,307	5,381,025	6,259,123B1	6,534,343	6,710,405B2	6,759,692
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505		6,710,463

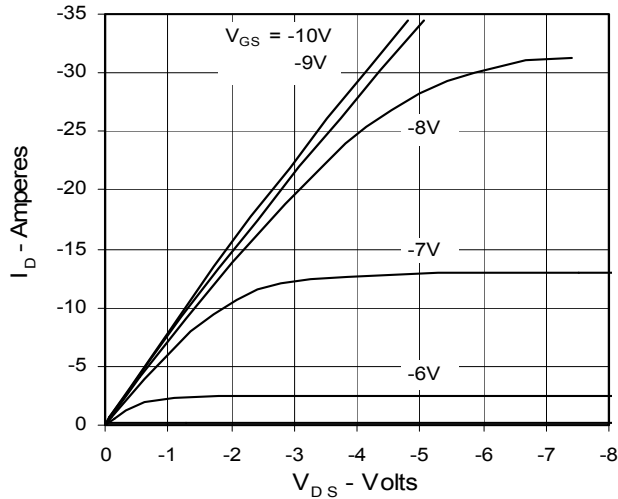
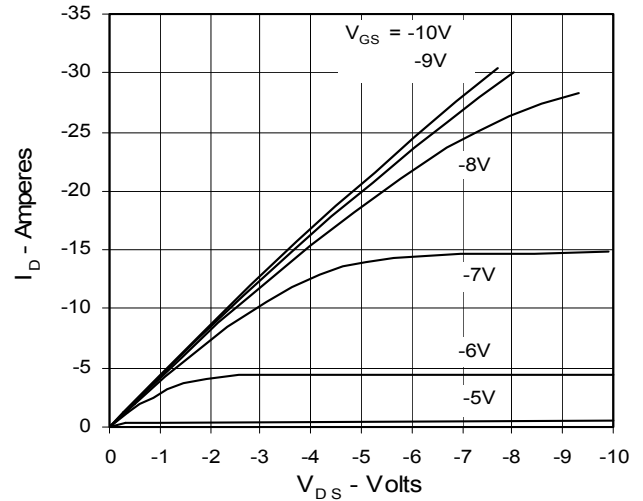
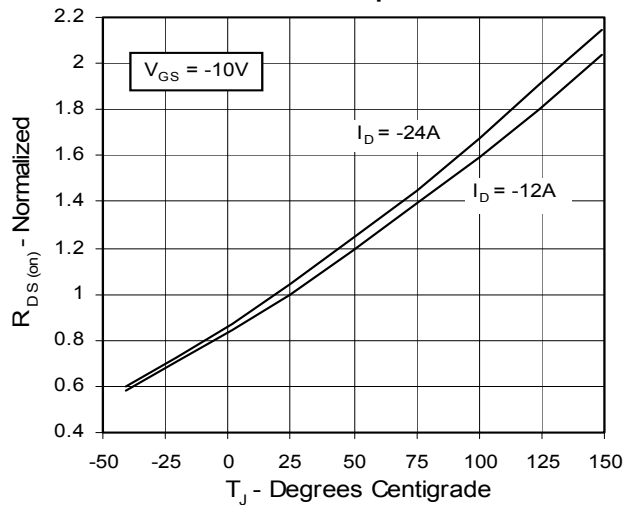
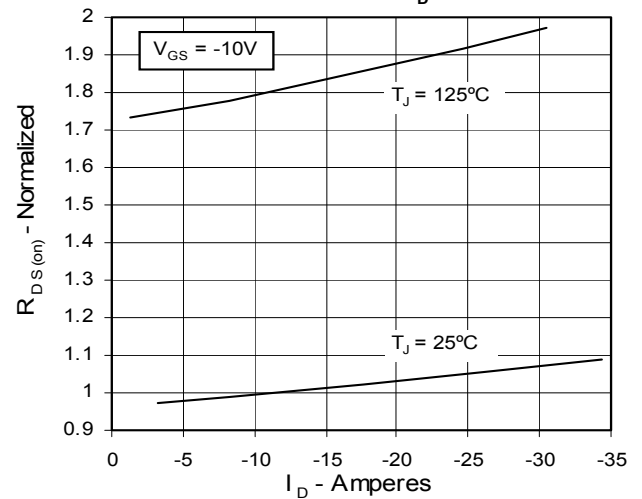
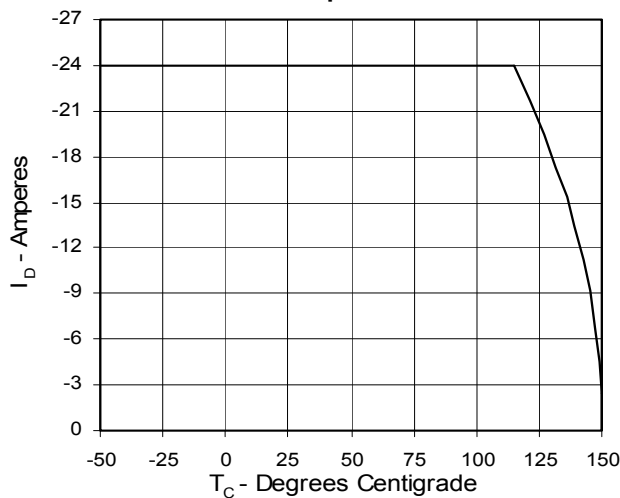
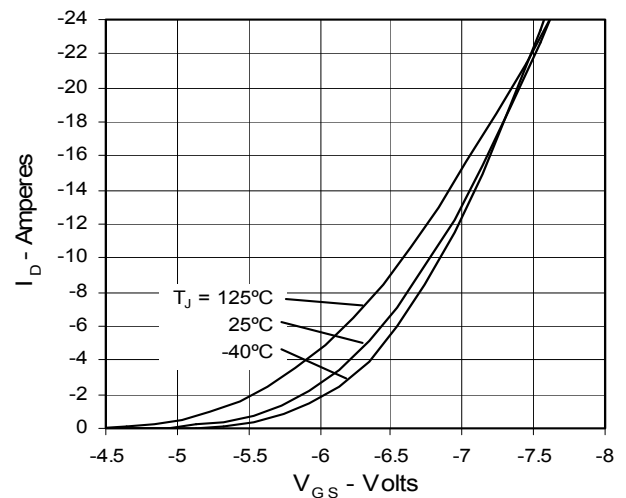
**Fig. 1. Output Characteristics @ 25°C**

**Fig. 2. Output Characteristics @ 125°C**

**Fig. 3.  $R_{DS(on)}$  Normalized to  $I_{D25}$  Value vs. Junction Temperature**

**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_{D25}$  Value vs.  $I_D$** 

**Fig. 5. Drain Current vs. Case Temperature**

**Fig. 6. Input Admittance**


Fig. 7. Transconductance

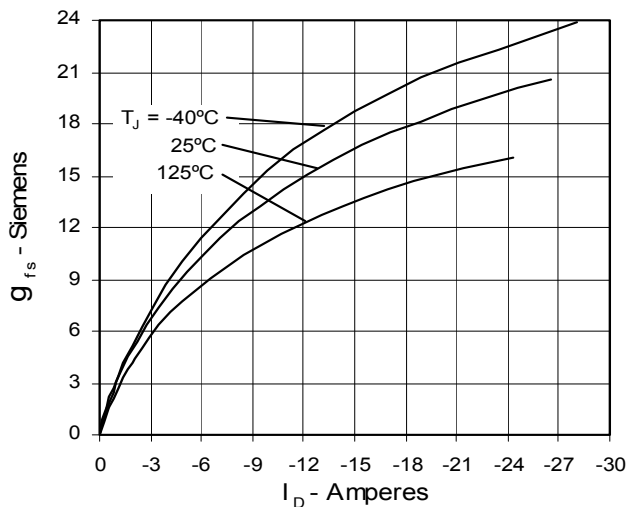


Fig. 8. Source Current vs. Source-To-Drain Voltage

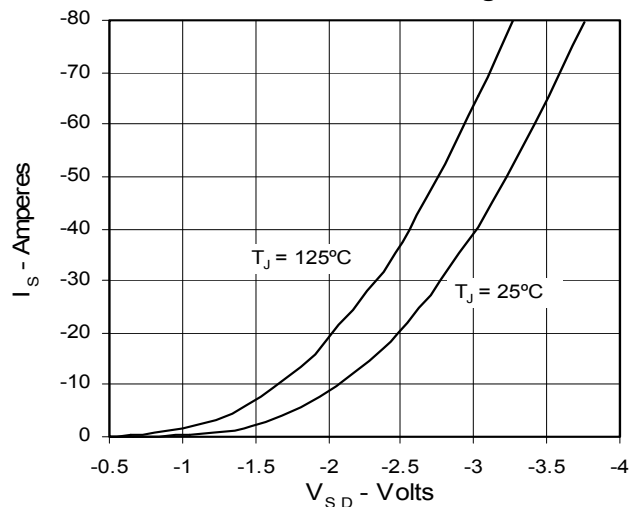


Fig. 9. Gate Charge

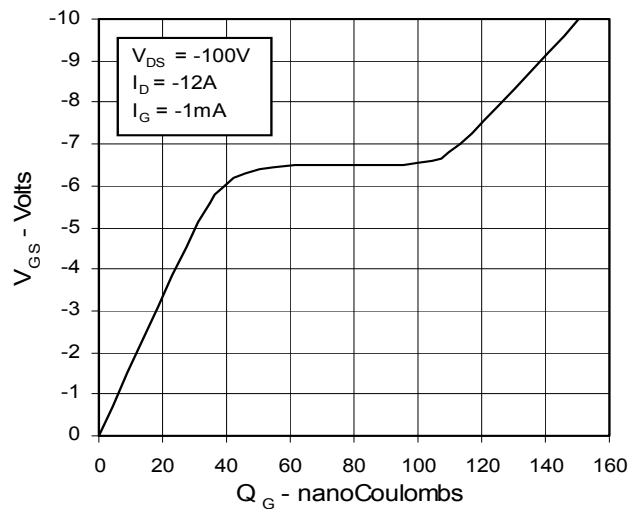


Fig. 10. Temperature dependence of Breakdown and Threshold Voltage

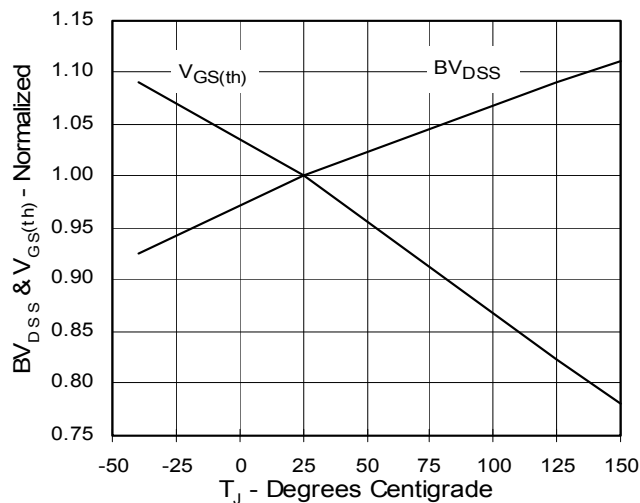


Fig. 11. Capacitance

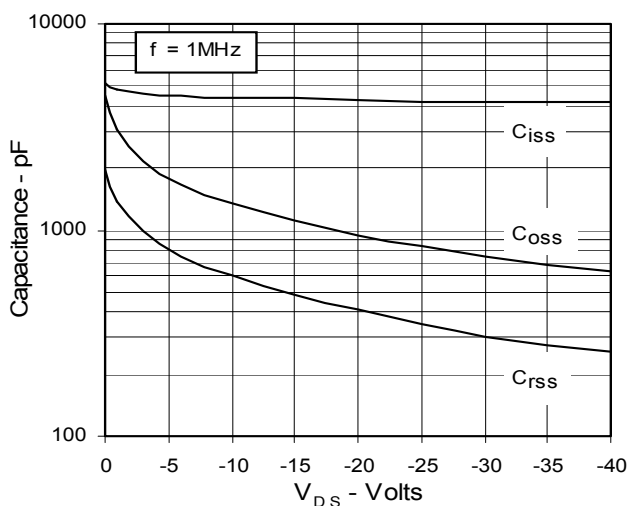


Fig. 12. Forward-Bias Safe Operating Area

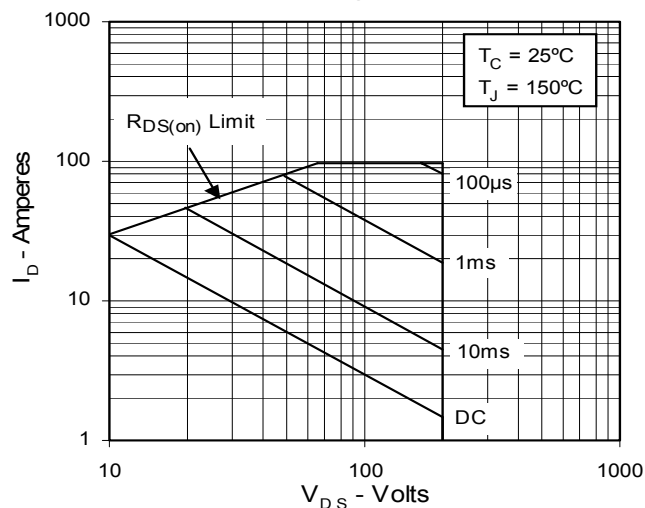


Fig. 13. Maximum Transient Thermal Resistance

