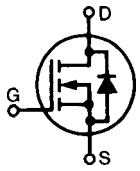
IXYS

MegaMOS™ Power MOSFET

IRFP 460

V_{DSS} = 500 V
$I_{D(cont)}$ = 20 A
$R_{DS(on)}$ = 0.27Ω

N-Channel Enhancement Mode, HDMOS™ Family



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	500	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	500	V
V_{GS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	20	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	80	A
I_{AR}		20	A
E_{AR}	T_C = 25°C	28	mJ
dv/dt	$I_S \le I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$, R_G = 2 Ω	3.5	V/ns
P_D	T_C = 25°C	260	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
M_d	Mounting torque	1.15/10	Nm/lb.in.
Weight		6	g
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C

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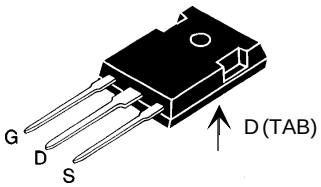


G = Gate, D = Drain,
S = Source, TAB = Drain

Features

- Repetitive avalanche energy rated
- Fast switching times
- Low $R_{DS(on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- High Commutating dv/dt Rating

Applications

- Switching Power Supplies
- Motor controls

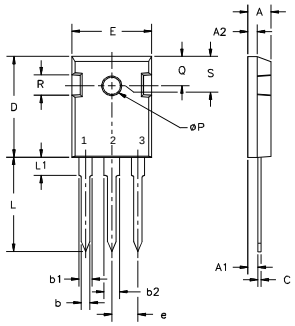
Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_{DSS}	V_{GS} = 0 V, I_D = 250 µA		500			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250 µA		2		4	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0				±100	nA
I_{DSS}	$V_{DS} = 0.8 \cdot V_{DSS}$	T_J = 25°C			25	µA
	V_{GS} = 0 V	T_J = 125°C			250	µA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 12 A Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %			0.25	0.27	Ω

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	min.	typ.	max.	
Characteristic Values					
g_{fs}	V_{DS} = 10 V; I_D = 12 A, pulse test	13	21		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		4200		pF
C_{oss}			450		pF
C_{rss}			135		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 250 V, I_D = 20 A R_G = 4.3 Ω, (External)		23	35	ns
t_r			81	120	ns
$t_{d(off)}$			85	130	ns
t_f			65	98	ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 200 V, I_D = 20 A		135	210	nC
Q_{gs}			28	40	nC
Q_{gd}			62	110	nC
R_{thJC}				0.45	K/W
R_{thCK}			0.25		K/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	min.	typ.	max.	
Characteristic Values					
I_S	V_{GS} = 0 V			20	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			80	A
V_{SD}	I_F = 20 A, V_{GS} = 0 V, Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %			1.8	V
t_{rr}	I_F = 20 A, -di/dt = 100 A/µs, V_R = 100 V		570	860	ns
Q_{rr}			5.7		µC

TO-247 AD Outline



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

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	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
∅P	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	

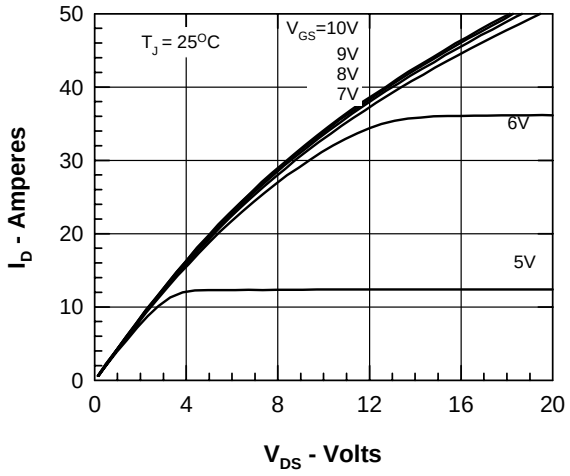


Figure 1. Output Characteristics at 25°C

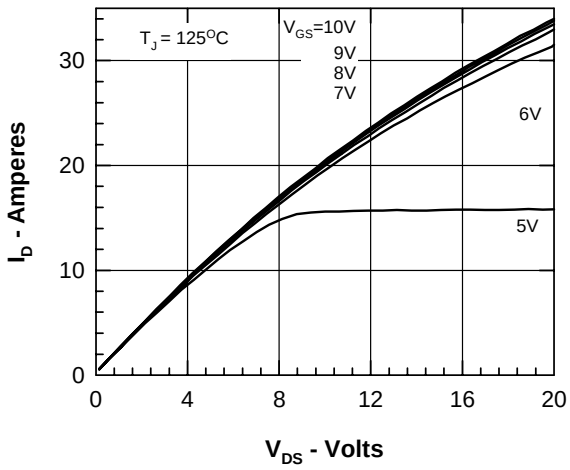


Figure 2. Output Characteristics at 125°C

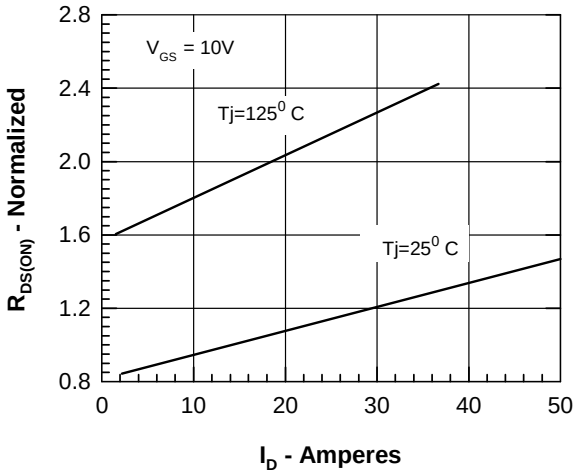


Figure 3. $R_{DS(on)}$ normalized to value at I_D = 12A

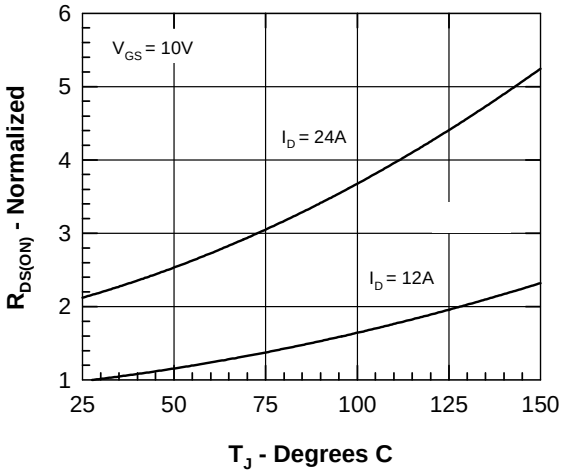


Figure 4. $R_{DS(on)}$ normalized to value at I_D = 12A

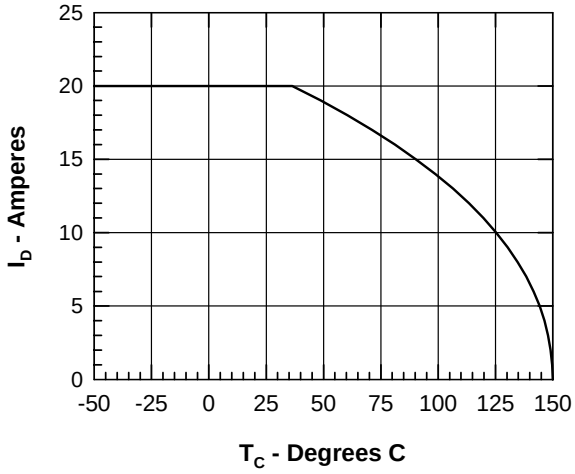


Figure 5. Drain Current vs. Case Temperature

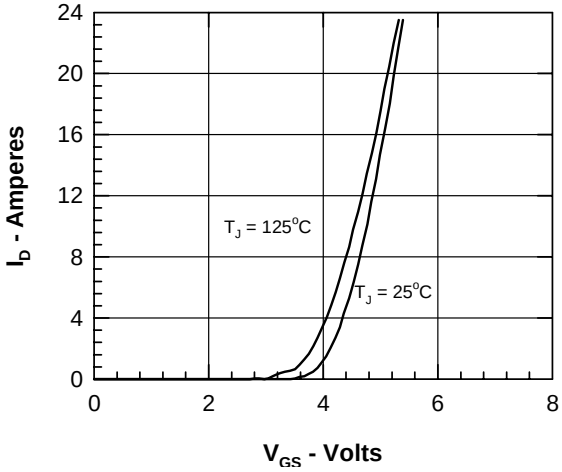
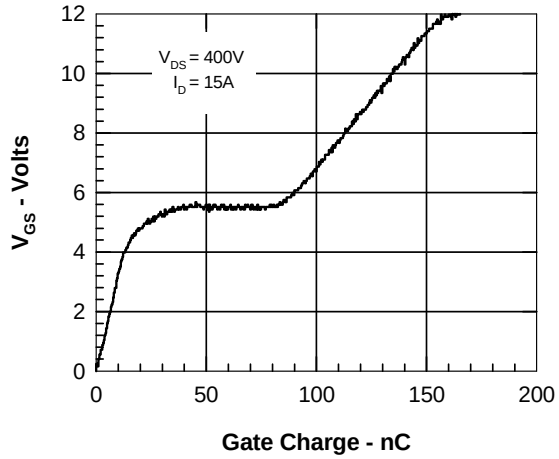
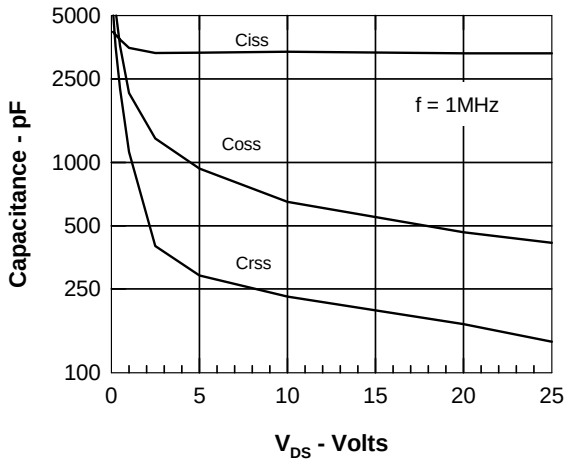
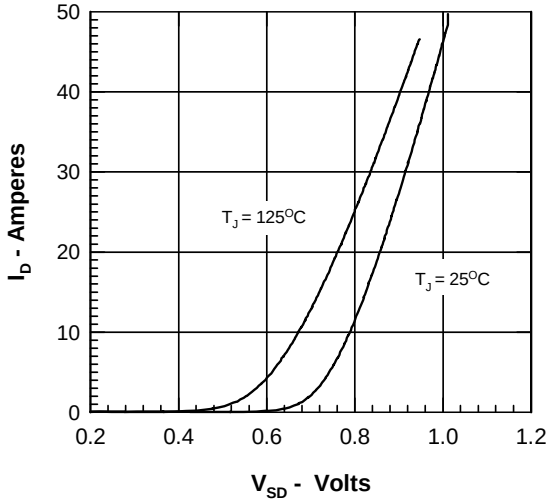
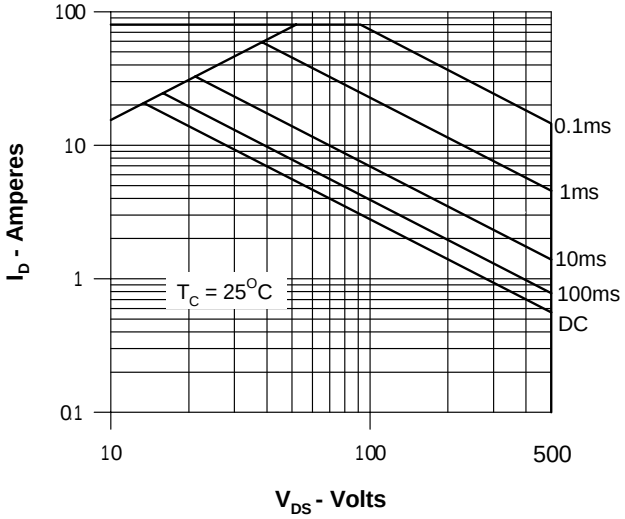


Figure 6. Admittance Curves









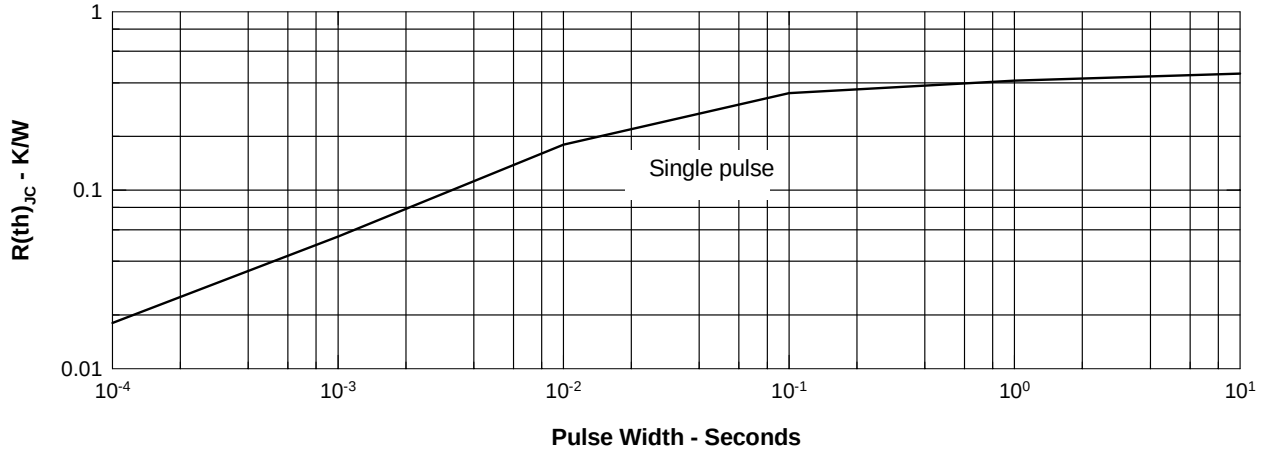


Figure 11. Transient Thermal Resistance