



IXTH 12N120

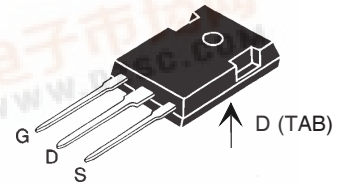
Power MOSFET, Avalanche Rated
High Voltage

Preliminary Data Sheet

$V_{DSS} = 1200\text{ V}$
 $I_{D(cont)} = 12\text{ A}$
 $R_{DS(on)} = 1.4\ \Omega$



Symbol	Test Conditions	Maximum Ratings	TO-247 AD
V_{DSS}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	1200 V	
V_{DGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GS} = 1\text{ M}\Omega$	1200 V	
V_{GS}	Continuous	± 30 V	
V_{GSM}	Transient	± 40 V	
I_{D25}	$T_C = 25^\circ\text{C}$	12 A	
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	48 A	
I_{AR}		12 A	
E_{AR}	$T_C = 25^\circ\text{C}$	30 mJ	
E_{AS}	$T_C = 25^\circ\text{C}$	1.0 J	
P_D	$T_C = 25^\circ\text{C}$	500 W	
T_J		$-55 \dots +150$ °C	
T_{JM}		150 °C	
T_{stg}		$-55 \dots +150$ °C	
M_d	Mounting torque	1.13/10 Nm/lb.in.	
Weight		6 g	
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300 °C	



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
- Fast switching times

Applications

- Switch-mode and resonant-mode power supplies
- Motor controls
- Uninterruptible Power Supplies (UPS)
- DC choppers

Advantages

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

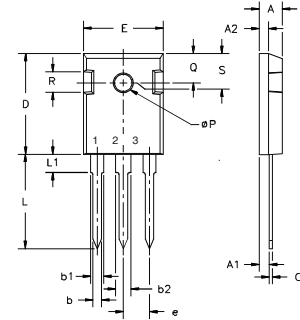
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
V_{DSS}	$V_{GS} = 0\text{ V}, I_D = 1\text{ mA}$	1200		V
$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	3		5 V
I_{GSS}	$V_{GS} = \pm 30\text{ V}_{DC}, V_{DS} = 0$			± 100 nA
I_{DSS}	$V_{DS} = V_{DSS}$			25 μA
	$V_{GS} = 0\text{ V}$			3 mA
$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 0.5 \cdot I_{D25}$ Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.4 Ω



Symbol	Test Conditions	Characteristic Values		
		(T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	V _{DS} = 20 V; I _D = 0.5 I _{D25} , pulse test	6	10	S
C_{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		3400	pF
C_{oss}			280	pF
C_{rss}			105	pF
t_{d(on)}	V _{GS} = 10 V, V _{DS} = 0.5 • V _{DSS} , 0.5 I _{D25} R _G = 1.5 Ω (External)		24	ns
t_r			25	ns
t_{d(off)}			35	ns
t_f			17	ns
Q_{g(on)}	V _{GS} = 10 V, V _{DS} = 0.5 • V _{DSS} , I _D = 0.5 I _{D25}		95	nC
Q_{gs}			22	nC
Q_{gd}			50	nC
R_{thJC}			0.25	K/W
R_{thCK}			0.25	K/W

Symbol	Test Conditions	Characteristic Values		
		(T _J = 25°C, unless otherwise specified)		
		min.	typ.	max.
I_S	V _{GS} = 0 V			12 A
I_{SM}	Repetitive; pulse width limited by T _{JM}			48 A
V_{SD}	I _F = I _S , V _{GS} = 0 V, Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			1.5 V
t_{rr}	I _F = I _S , -di/dt = 100 A/μs, V _R = 100 V		850	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 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
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

Fig. 1. Output Characteristics
@ 25°C

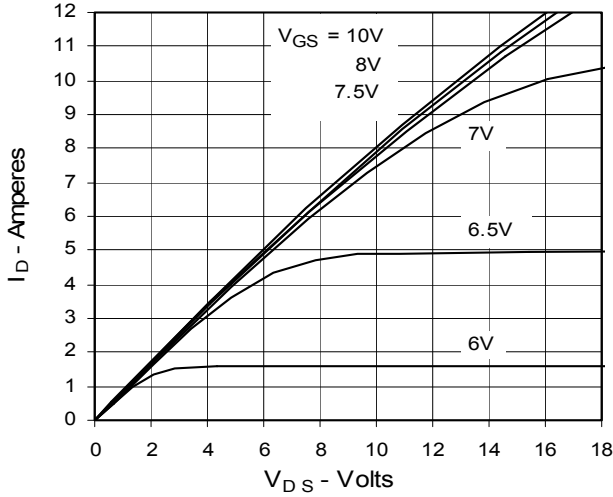


Fig. 2. Extended Output Characteristics
@ 25°C

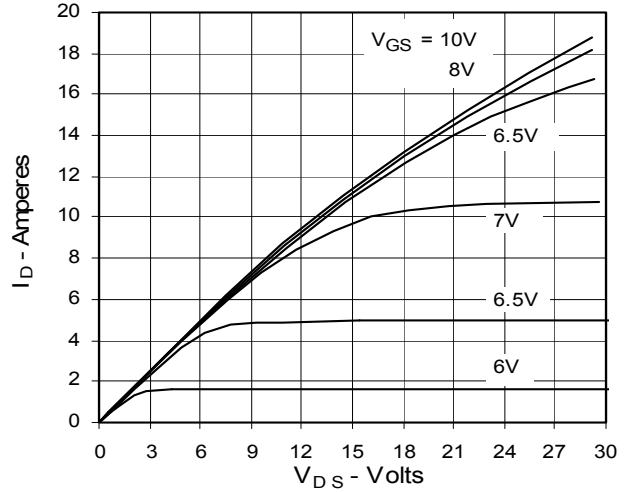


Fig. 3. Output Characteristics
@ 125°C

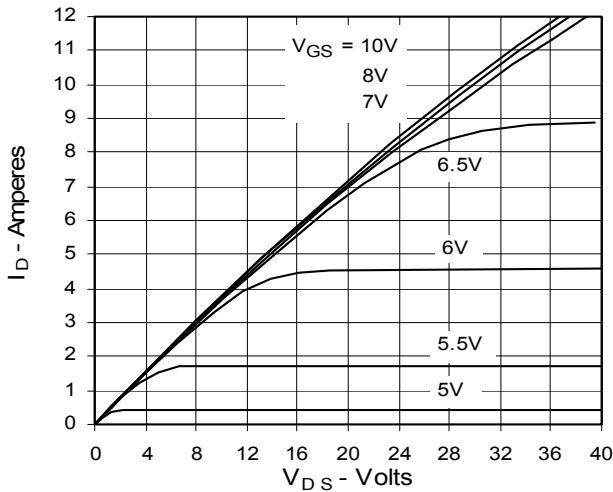


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

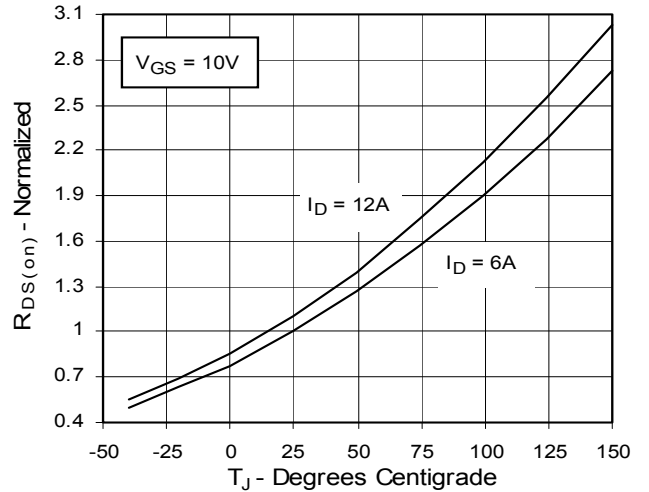


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

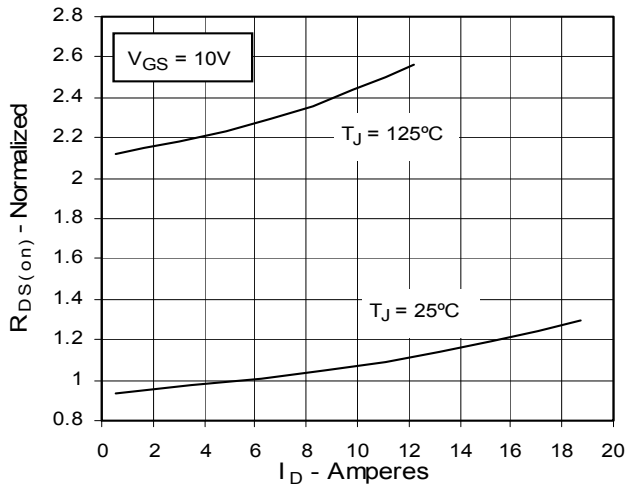


Fig. 6. Drain Current vs. Case Temperature

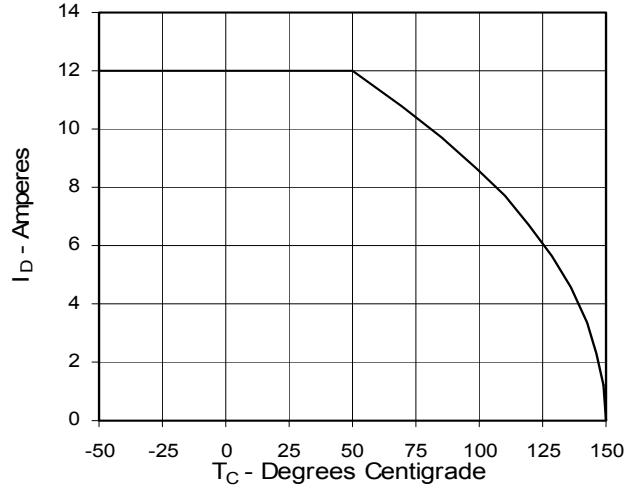


Fig. 7. Input Admittance

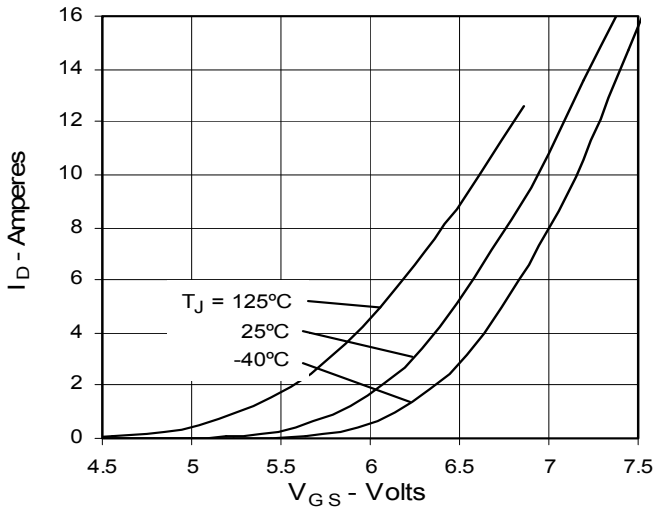


Fig. 8. Transconductance

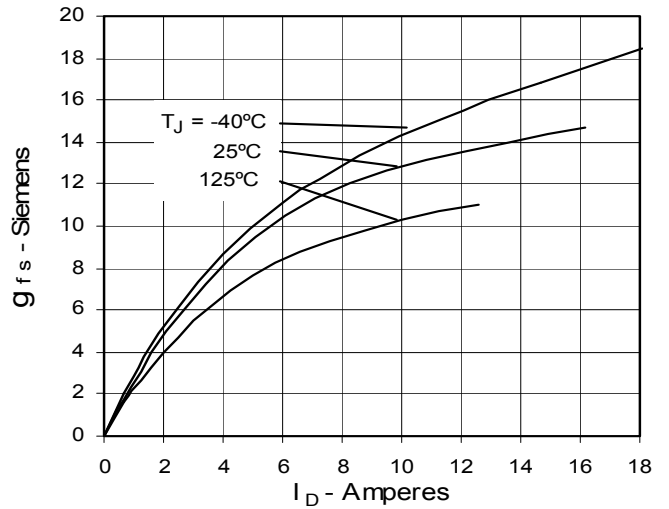


Fig. 9. Source Current vs. Source-To-Drain Voltage

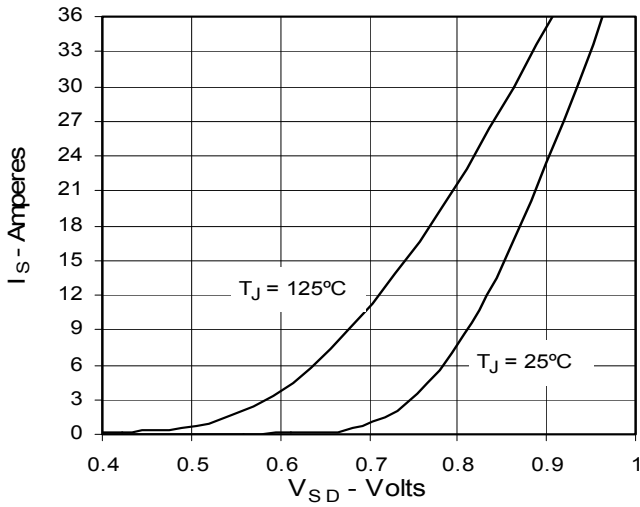


Fig. 10. Gate Charge

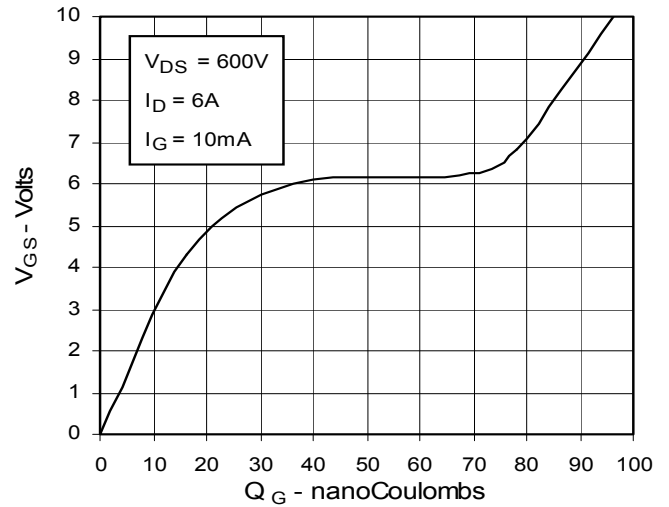


Fig. 11. Capacitance

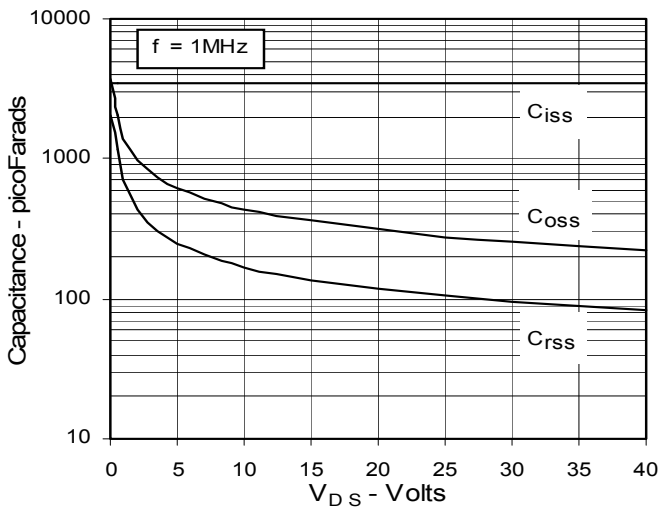


Fig. 12. Maximum Transient Thermal Resistance

