

AD100N75D5

Nch 100V 75A Power MOSFET

datasheet

V_{DSS}	100V
$R_{DS(on)}(typ.)$	6.4mΩ
b	75A
P_D	125W

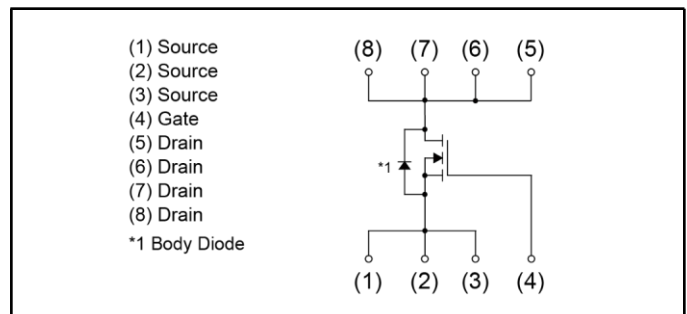
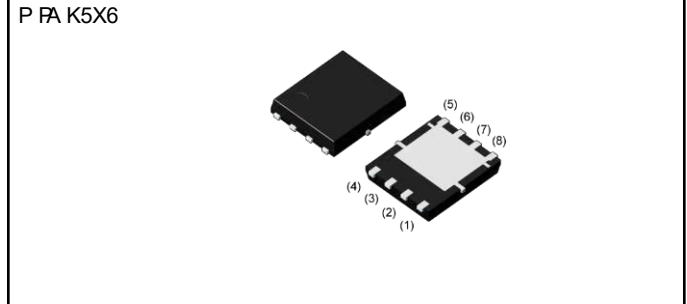
Features

- 100V, 75A, $R_{DS(ON)} = 6.4m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

Applications

- Network ing
- Load Switch
- LED applications
- Quick Charger

Outline



Type	Reel size (mm)	330
	Tape width (mm)	12
	Basic ordering unit (pcs)	5000
	Taping code	D5
	Marking	AD100N75D5

Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_c=25^\circ\text{C}$) (Chip Limitation)	75	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$) (Chip Limitation)	47.4	A
I_{DM}	Drain Current – Pulsed ¹	300	A
EAS	Single Pulse Avalanche Energy	174	mJ
IAS	Single Pulse Avalanche Current ²	59	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	125	W
	Power Dissipation – Derate above 25°C	1	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-50 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	1	$^\circ\text{C}/\text{W}$

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Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	100	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =80V, V _{GS} =0V, T _J =25°C	---	---	1	μA
		V _{DS} =80V, V _{GS} =0V, T _J =85°C	---	---	10	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =15A	---	6.4	7.6	mΩ
		V _{GS} =4.5V, I _D =8A	---	8	10.4	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	1.2	1.6	2.5	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =3A	---	15	---	S

Dynamic Characteristics

Q _g	Total Gate Charge ^{3,4}	V _{DS} =50V, V _{GS} =10V, I _D =30A	---	39.1	58	nC
Q _{gs}	Gate-Source Charge ^{3,4}		---	4.4	6.6	
Q _{gd}	Gate-Drain Charge ^{3,4}		---	12.3	18	
T _{d(on)}	Turn-On Delay Time ^{3,4}	V _{DD} =50V, V _{GS} =10V, R _G =6Ω I _D =10A	---	14.6	30	ns
T _r	Rise Time ^{3,4}		---	21.5	44	
T _{d(off)}	Turn-Off Delay Time ^{3,4}		---	54	108	
T _f	Fall Time ^{3,4}		---	84.3	168	
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, F=1MHz	---	1990	2980	pF
C _{oss}	Output Capacitance		---	370	560	
C _{rss}	Reverse Transfer Capacitance		---	10	15	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	1.2	---	Ω

Drain-Source Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _{GS} =V _D =0V, Force Current	---	---	75	A
I _{SM}	Pulsed Source Current		---	---	150	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V
t _{rr}	Reverse Recovery Time	V _R =50V, I _R =10A	---	67	---	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs, T _J =25°C	---	153	---	nC

- Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
 2. V_{DD}=25V, V_{GS}=10V, L=0.1nH, I_{AS}=39A., Starting T_J=25°C
 3. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%.
 4. Essentially independent of operating temperature.

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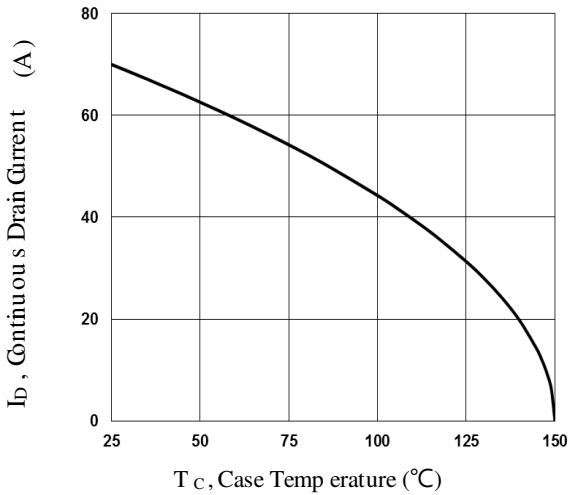


Fig.1 Continuous Drain Current vs. T_c

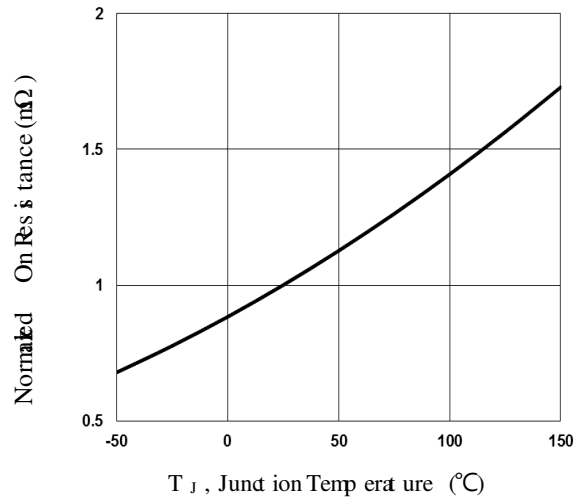


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

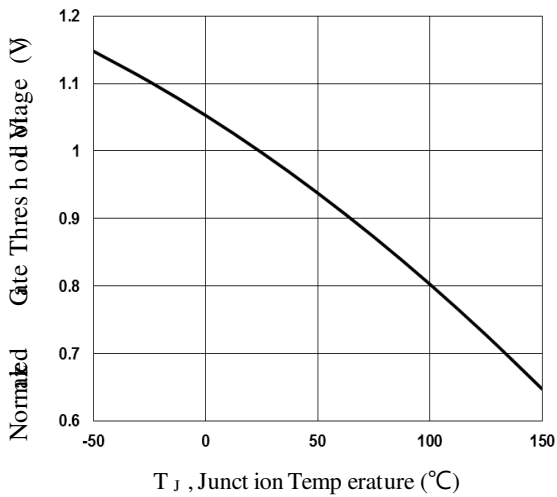


Fig.3 Normalized V_{th} vs. T_j

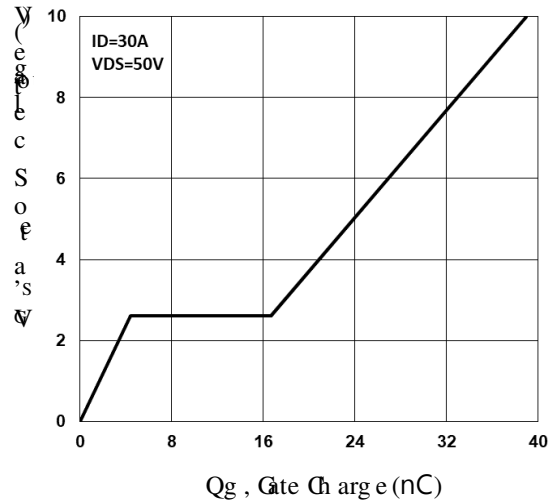


Fig.4 Gate Charge Waveform

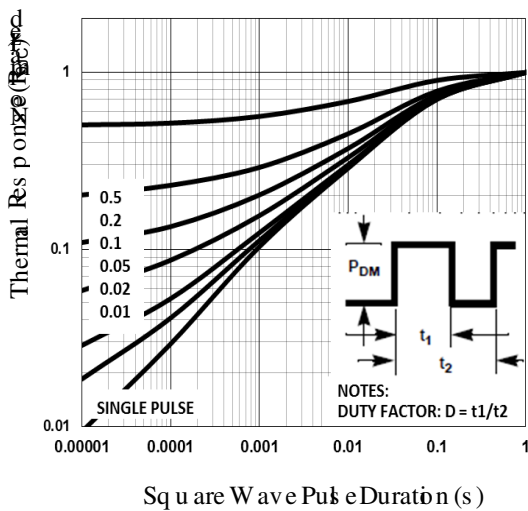


Fig.5 Normalized Transient Impedance

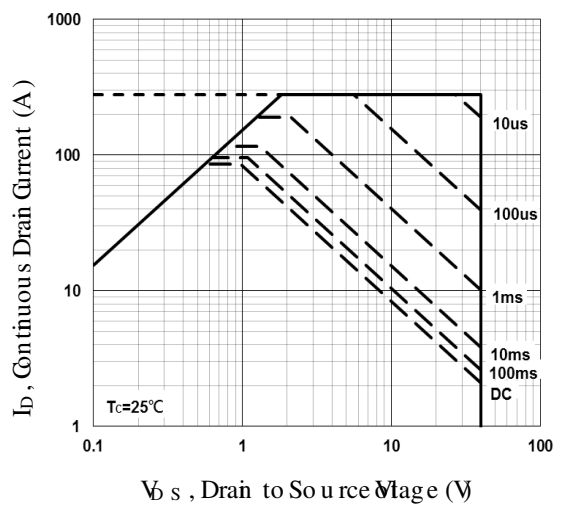


Fig.6 Maximum Safe Operation Area

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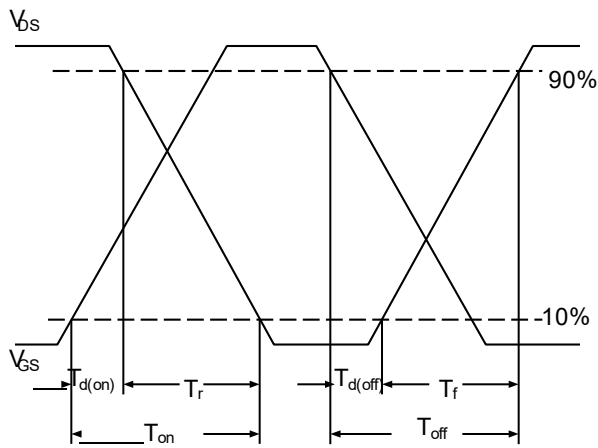


Fig.7 Switching Time Waveform

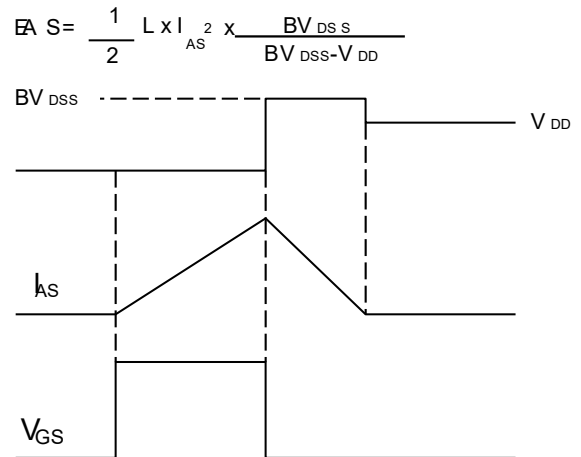


Fig.8 EAS Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

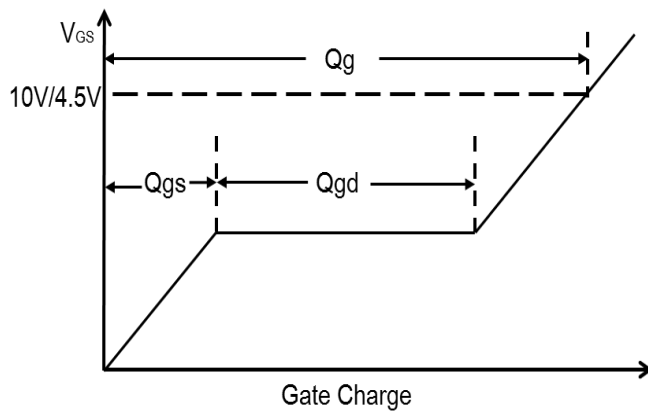
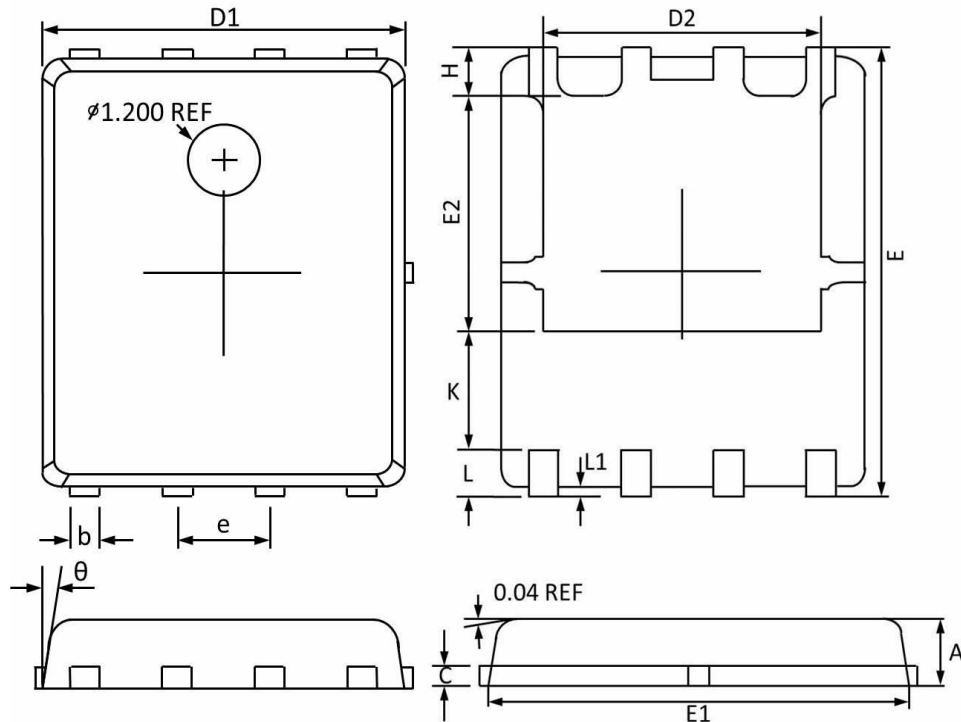


Fig.9 Gate Charge Waveform

PAK5x6 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
b	0.510	0.330	0.020	0.013
C	0.300	0.200	0.012	0.008
D1	5.100	4.800	0.201	0.189
D2	4.100	3.610	0.161	0.142
E	6.200	5.900	0.244	0.232
E1	5.900	5.700	0.232	0.224
E2	3.780	3.350	0.149	0.132
e	1.27 BSC		0.05 BSC	
H	0.700	0.410	0.028	0.016
K	1.500	1.100	0.059	0.043
L	0.710	0.510	0.028	0.020
L1	0.200	0.060	0.008	0.002
θ	12°	0°	12°	0°