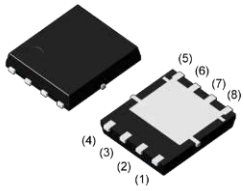
AD100N70D5

Nch 100V 70A Power MOSFET **datasheet**

V_{DSS}	100V
$R_{DS(on)}$(typ.)	4.6mΩ
I_D	70A
P_D	142W

Outline

P PAK 5X6



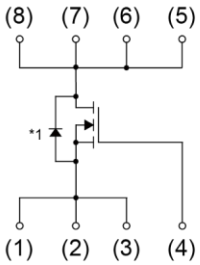
Features

- *100V, 70A, RDS(ON) =4.6mΩ@VGS = 10V*
- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*

Applications

- *MB / VGA / Vcore*
- *POL Applications*
- *SMPS 2nd SR*

(1) Source
(2) Source
(3) Source
(4) Gate
(5) Drain
(6) Drain
(7) Drain
(8) Drain
*1 Body Diode



Type		
	Reel size (mm)	330
	Tape width (mm)	12
	Basic ordering unit (pcs)	5000
	Taping code	D3
	Marking	AD100N70D5

Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	20/-12	V
I_D	Drain Current – Continuous (T_C=25°C)	70	A
	Drain Current – Continuous (T_C=100°C)	44	A
I_{DM}	Drain Current – Pulsed[1]	280	A
E_{AS}	Single Pulse Avalanche Energy[2]	320	mJ
I_{AS}	Single Pulse Avalanche Current[2]	80	A
P_D	Power Dissipation (T_C=25°C)	142	W
	Power Dissipation – Derate above 25°C	1.14	W/°C
T_{STG}	Storage Temperature Range	-50 to 150	°C
T_J	Operating Junction Temperature Range	-50 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.88	°C/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=85℃	---	---	10	uA
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=20A	---	4.6	5.5	mΩ
		V_{GS}=10V , I_D=20A (T_J=125℃)	---	8.1	---	mΩ
		V_{GS}=4.5V , I_D=10A	---	6.2	7.8	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1	1.6	2.5	V
gfs	Forward Transconductance	V_{DS}=10V , I_D=5A	---	18	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[3,4]	V_{DS}=80V , V_{GS}=10V , I_D=10A	---	58.2	100	nC
Q_{gs}	Gate-Source Charge[3,4]		---	9.2	18	
Q_{gd}	Gate-Drain Charge[3,4]		---	20.8	30	
$T_{d(on)}$	Turn-On Delay Time[3,4]	V_{DD}=50V , V_{GS}=10V , R_G=6Ω	---	24	48	ns
T_r	Rise Time[3,4]	I_D=1A	---	19.8	39	
$T_{d(off)}$	Turn-Off Delay Time[3,4]		---	46	92	
T_f	Fall Time[3,4]		---	26	52	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	4570	9100	pF
C_{oss}	Output Capacitance		---	1180	2300	
C_{rss}	Reverse Transfer Capacitance		---	49	98	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	2	4	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	70	A
I_{SM}	Pulsed Source Current		---	---	140	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V,I_S=10A , di/dt=100A/μs	---	61.6	---	ns
Q_{rr}	Reverse Recovery Charge	T_J=25℃	---	120	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=80A.,R_G=25Ω Starting T_J=25℃
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

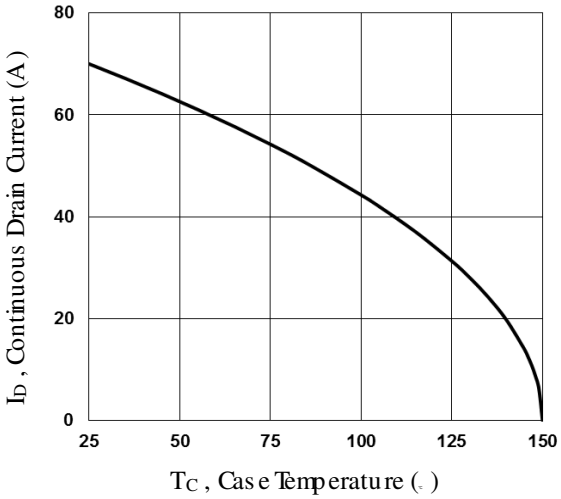


Fig.1 Continuous Drain Current vs. T_C

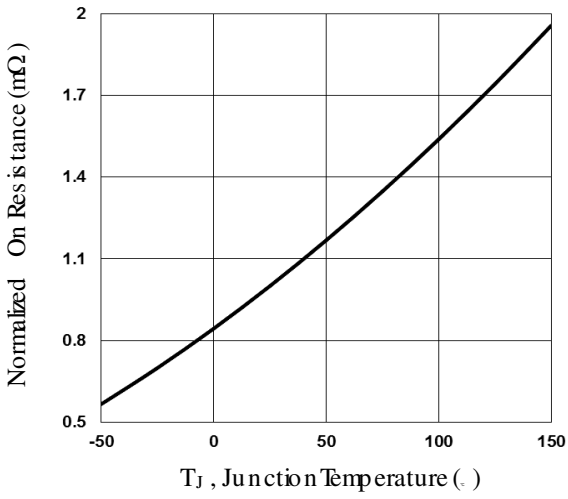


Fig.2 Normalized RDSON vs. T_J

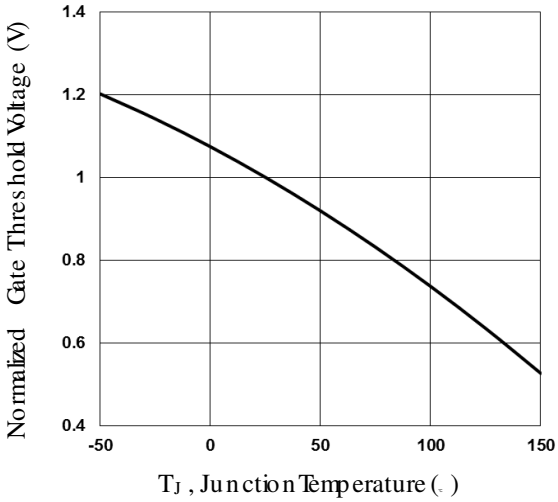


Fig.3 Normalized Vth vs. T_J

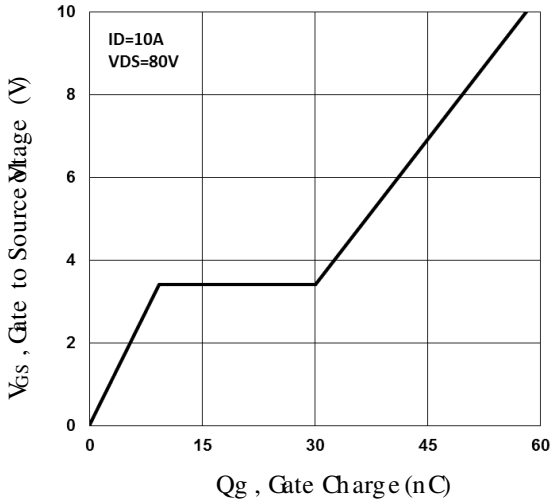


Fig.4 Gate Charge Characteristics

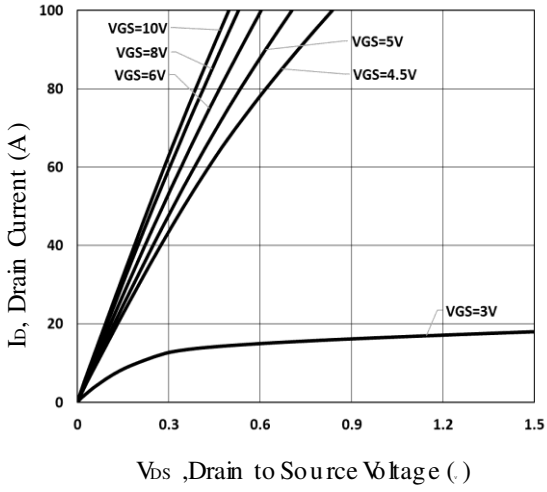


Fig.5 Typical Output Characteristics

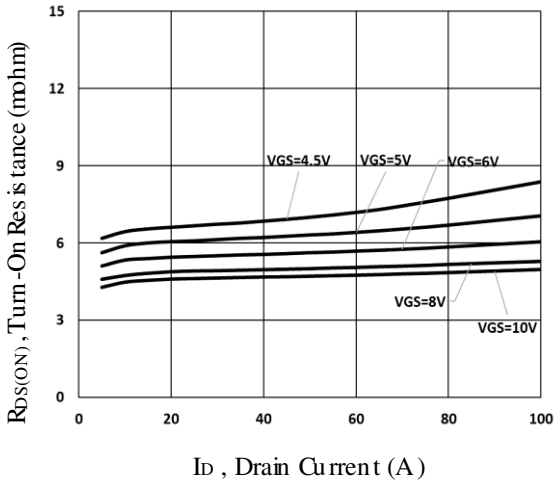


Fig.6 Turn-On Resistance vs. I_D

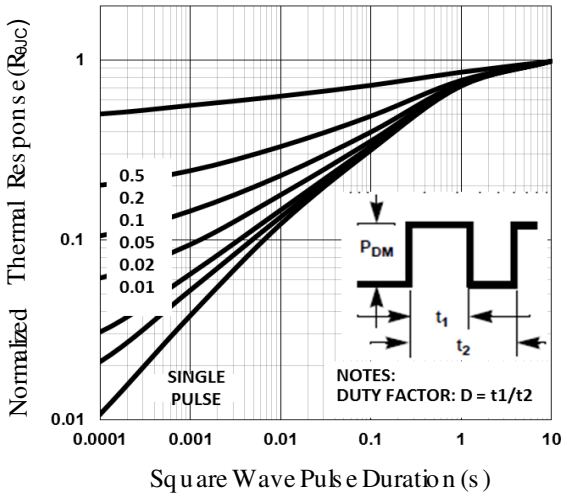


Fig.7 Normalized Transient Impedance

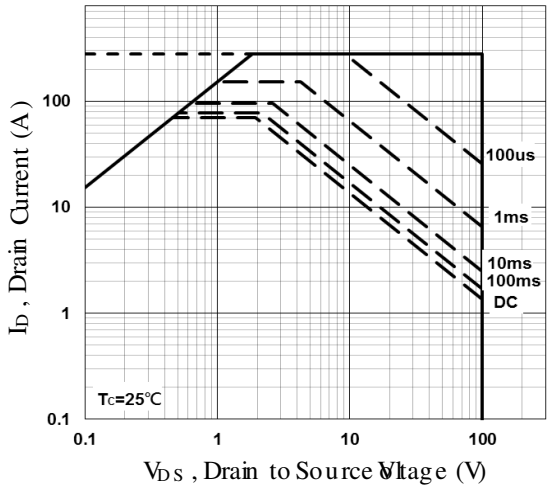


Fig.8 Maximum Safe Operation Area

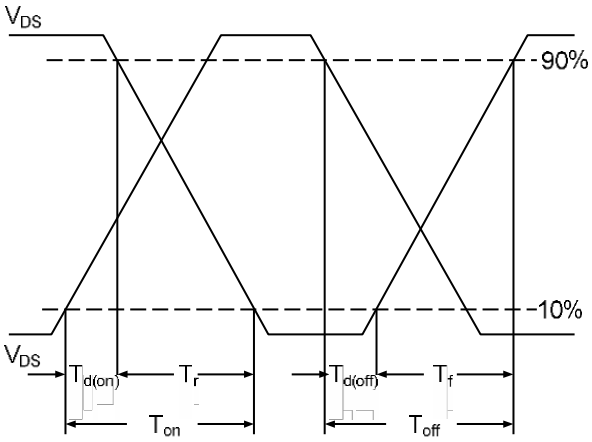


Fig.9 Switching Time Waveform

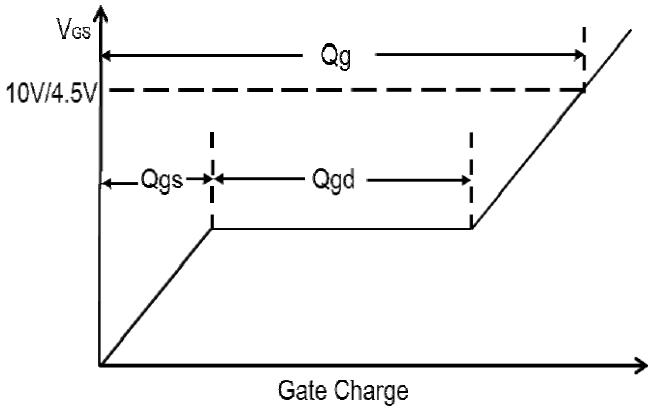
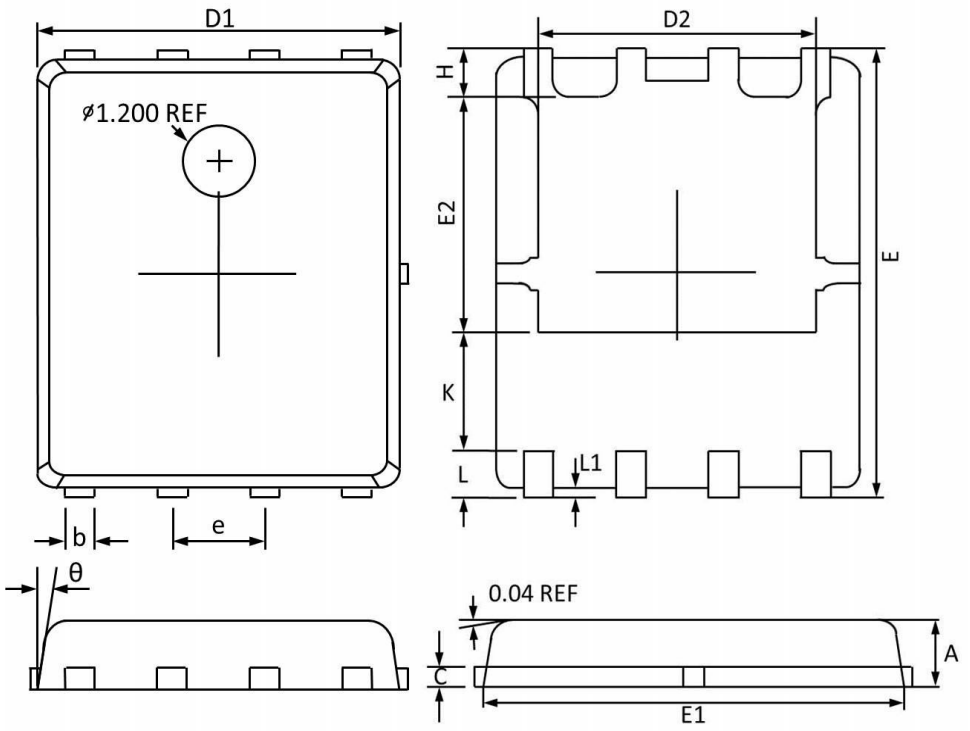


Fig.10 Gate Charge Waveform

PPAK5x6 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	1.27BSC		0.05BSC	
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°