AP4813K

N and P-Channel Enhancement Mosfet

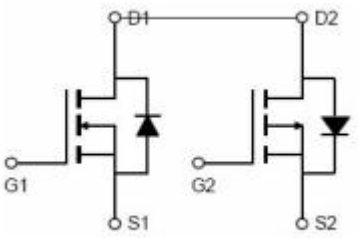
DATA SHEET

Features

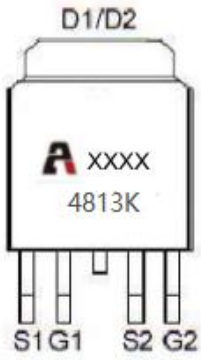
- N-Channel
  30V,18A
  $R_{DS(ON)}$ <25mΩ @V_{GS}=10V TYP:16mΩ
  $R_{DS(ON)}$ <37mΩ @V_{GS}=4.5V TYP:22mΩ

- P-Channel
  -30V,-13A
  $R_{DS(ON)}$ <52mΩ @V_{GS}=-10V TYP:36mΩ
  $R_{DS(ON)}$ <62mΩ @V_{GS}=-4.5V TYP:50mΩ

- High density cell design for ultra low $R_{DS(ON)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability



Schematic diagram



Marking and pin assignment

Applications

- H-bridge
- Load switch

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
AP4813K	4813K	TO-252-4	-	-	-

ABSOLUTE MAXIMUM RATINGS (T_J=25℃ unless otherwise noted)

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	30	-30	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current (Tc=25℃)(1)	I_D	18	-13	A
Continuous Drain Current (Tc=100℃)(1)		12.2	-9.6	A
Pulsed Drain Current (2,3)	I_{DM}	36	-26	A
Drain Power Dissipation(1)	P_D	21		W
Thermal Resistance- Junction to Ambient(1)	$R_{\theta JA}$	6		℃/W
Junction Temperature	T_J	-55~ +150		℃
Storage Temperature	T_{STG}	-55~ +150		℃

N-CH ELECTRICAL CHARACTERISTICS(T_j=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	30	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =30V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.0	1.6	2.5	V
Drain-source on-resistance(4)	$R_{DS(on)}$	V_{GS} =10V, I_D =4A	-	16	25	mΩ
		V_{GS} =4.5V, I_D =3A	-	22	37	
Dynamic characteristics(5)						
Input Capacitance	C_{iss}	V_{DS} =15V, VGS=0V, f=1MHz	-	345	-	pF
Output Capacitance	C_{oss}		-	55	-	
Reverse Transfer Capacitance	C_{rss}		-	32	-	
Switching characteristics(5)						
Turn-on delay time	$t_{d(on)}$	V_{DS}=15V, I_D=6A, R_G=3Ω, V_{GS}=10V	-	2.8	-	nS
Turn-on rise time	t_r		-	7.2	-	
Turn-off delay time	$t_{d(off)}$		-	15.8	-	
Turn-off fall time	t_f		-	4.6	-	
Total Gate Charge	Qg	V_{DS}=15V, I_D=6A, V_{GS}=10V	-	9.5	-	nC
Gate-Source Charge	Qgs		-	2.0	-	
Gate-Drain Charge	Qgd		-	1.9	-	
Source-Drain Diode characteristics						
Diode Forward voltage(4)	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=6A	-	-	1.2	V
Diode Forward current	I_S	T_C=25℃	-	-	18	A

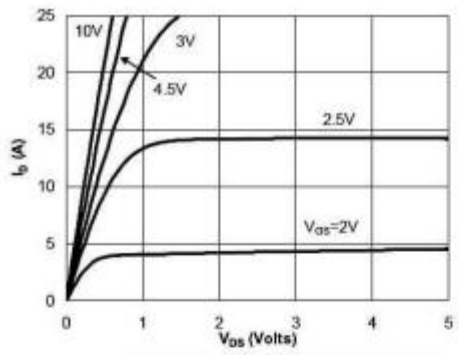
P-CH ELECTRICAL CHARACTERISTICS(T_j=25℃ unless otherwise noted)

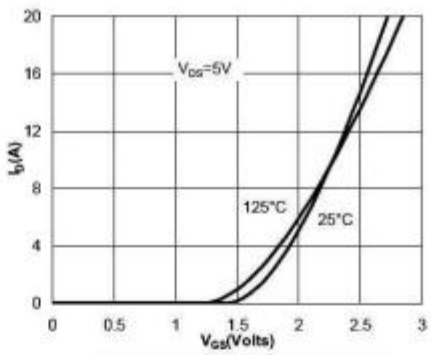
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-30	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-30V, V_{GS} = 0V	-	-	-1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.0	-1.4	-2.5	V
Drain-source on-resistance(4)	$R_{DS(on)}$	V_{GS} =-10V, I_D =-4A	-	36	52	mΩ
		V_{GS} =-4.5V, I_D =-3A	-	50	62	
Dynamic characteristics(5)						
Input Capacitance	C_{iss}	V_{DS} =-30V, VGS=0V, f=1MHz	-	700	-	pF
Output Capacitance	C_{oss}		-	120	-	
Reverse Transfer Capacitance	C_{rss}		-	75	-	
Switching characteristics(5)						
Turn-on delay time	$t_{d(on)}$	V_{DS}=-15V, I_D=-6A, R_G=3Ω, V_{GS}=-10V	-	8.6	-	nS
Turn-on rise time	t_r		-	5	-	
Turn-off delay time	$t_{d(off)}$		-	28.2	-	
Turn-off fall time	t_f		-	13.5	-	
Total Gate Charge	Qg	V_{DS}=-15V, I_D=-6A, V_{GS}=-10V	-	16.2	-	nC
Gate-Source Charge	Qgs		-	2.9	-	
Gate-Drain Charge	Qgd		-	3.6	-	
Source-Drain Diode characteristics						
Diode Forward voltage(4)	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=-6A	-	-	-1.2	V
Diode Forward current	I_S	T_C=25℃	-	-	-13	A

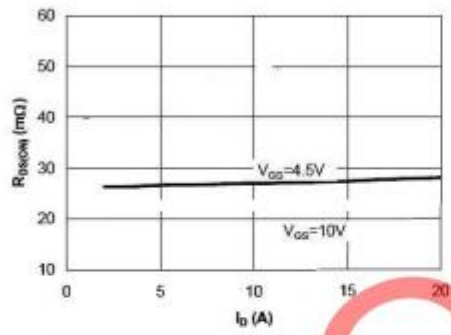
Notes:

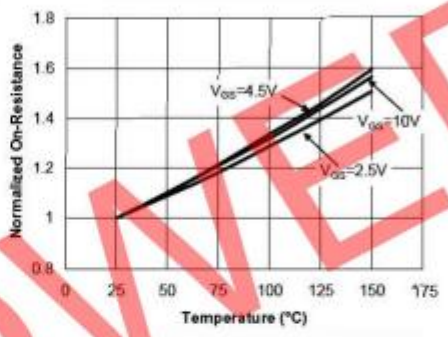
1) Surface Mounted on 1 in² pad area, t ≤ 10 sec
2) Pulse width ≤ 10μs, duty cycle ≤ 1 %
3) Limited by bonding wire
4) Pulse width ≤ 300 μs, duty cycle ≤ 2%
5) Guaranteed by design, not subject to production testing

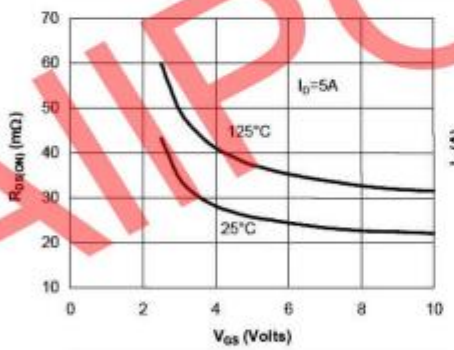
Typical Characteristics：N-Channel

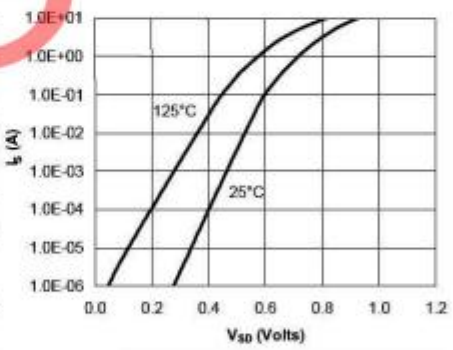


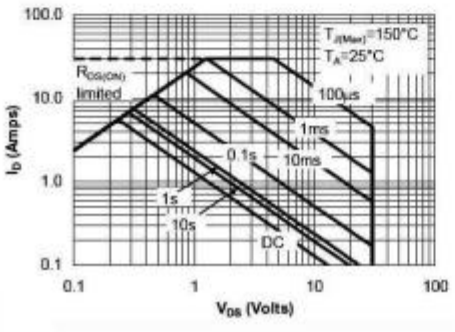


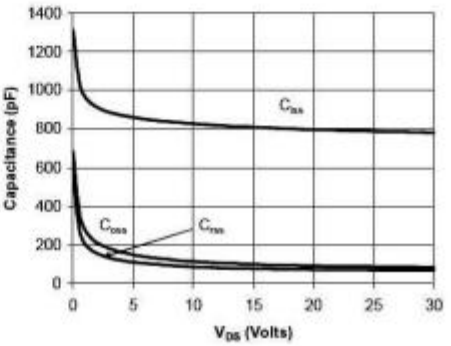






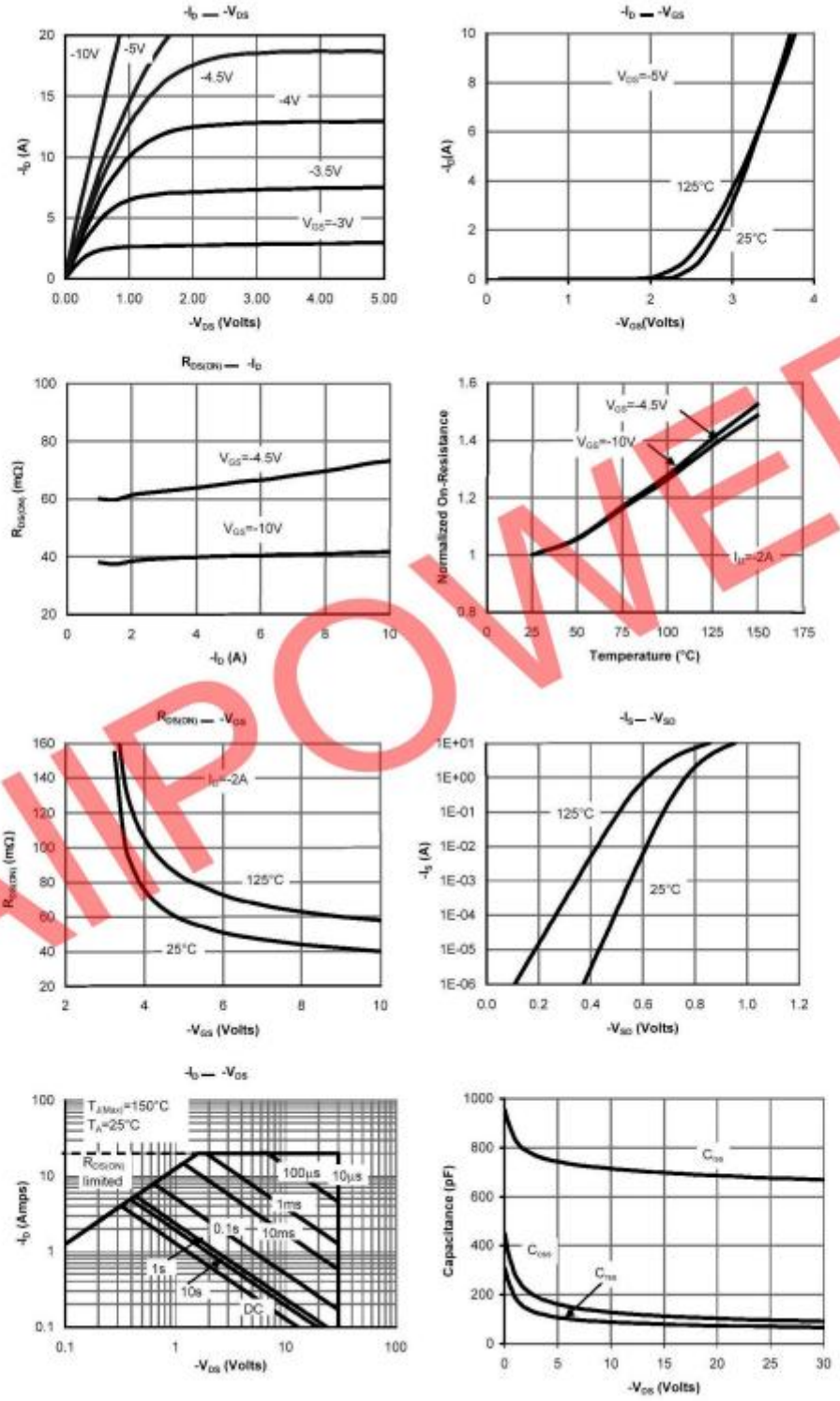






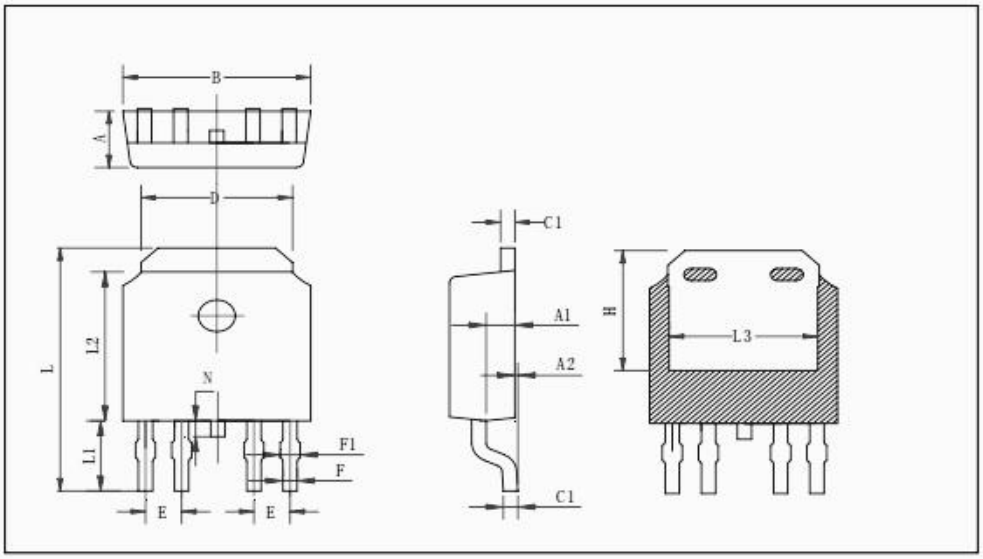
AIPOWER

Typical Characteristic：P-Channel



AIPOWER

Package Dimensions of TO-252-4 Package



Symbol	Min	Typ	Max
A	2.20	2.30	2.40
A1	0.91	1.01	1.11
A2	0.05	0.15	0.25
B	6.45	6.60	6.75
C	0.45	0.50	0.58
C1	0.45	0.50	0.58
D	5.12	5.32	5.52
E		1.27 TYP	
F1	0.45	0.60	0.75
F	0.40	0.50	0.60
H	4.70	4.90	5.10
L	9.70	10.00	10.20
L1	2.6	2.8	3.0
L2	5.95	6.10	6.25
L3	5.00	5.20	5.40`
N	0.45	0.65	0.85

Revision History

Revision	Release	Remark
V1.0	2023/06/01	Initial Release

Disclaimer

The information given in this document describes the independent performance of the product,but similar performance is not guaranteed under other working conditions,and cannot be guaranteed when installed with other products or equipment.To achieve the required performance of the product in actual scenarios,the customer should conduct a complete application test to assess the functionality of the product.

Allpower assumes no responsibility for equipment failures result from using products at values that exceed the ratings,operating conditions,or other parameters listed in the product specifications.

The product described in this specification is not applicable for aerospace or other applications which
requires high reliability.Customers using or selling these products for use in medical,life-saving,or life-sustaining applications do so at their own risk and agree to fully indemnify.

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