AP03122IK

30V P-Channel MOSFET

Features

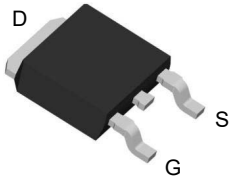
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summary

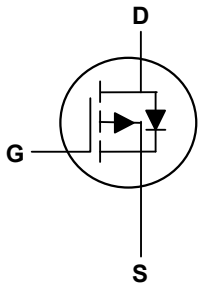
V_{DS}	-30	V
I_D	-122	A
$R_{DS(ON)}$ (at V_{GS}=-10V)	4.3	mΩ
$R_{DS(ON)}$ (at V_{GS}=-4.5V)	6.3	mΩ

Applications

- High Frequency Point-of-Load,Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch



TO-252 Top View



Absolute Maximum Ratings(T_C=25℃, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1]	I_D	-122	A
Pulsed Drain Current[2]	I_{DM}	-427	A
Single Pulse Avalanche Energy[3]	E_{AS}	196	mJ
Total Power Dissipation[4]	P_D	117	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient[1]	$R_{\theta JA}$	---	62	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	---	1.07	℃/W

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=-250uA	-30	---	---	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V , I_D=-20A	---	3.3	4.3	mΩ
		V_{GS}=-4.5V , I_D=-20A	---	4.7	6.3	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =-250uA	-1.0	---	-2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-30V, V_{GS}=0V	---	---	-1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	7	---	Ω
Total Gate Charge	Q_g	V_{DS}=-25V , V_{GS}=-10V , I_D=-50A	---	128	---	nC
Gate-Source Charge	Q_{gs}		---	10.6	---	
Gate-Drain Charge	Q_{gd}		---	34.7	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=-25V , V_{GS}=-10V , R_G=3Ω, I_D=-50A	---	10	---	ns
Rise Time	T_r		---	50	---	
Turn-Off Delay Time	$T_{d(off)}$		---	234	---	
Fall Time	T_f		---	155	---	
Input Capacitance	C_{iss}	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	5326	---	pF
Output Capacitance	C_{oss}		---	643	---	
Reverse Transfer Capacitance	C_{rss}		---	563	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1]	I_S		---	---	-122	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=-20A	---	---	-1.1	V
Reverse Recovery Time	t_{rr}	I_F=-50A ,di/dt=460A/μs	---	27	---	nS
Reverse Recovery Charge	Q_{rr}		---	0.07	---	nC
Peak Reverse Recovery Current	Irrm		---	7	---	A

Note:

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}=-50V,V_{GS}=-10V， L = 0.5mH

4.The power dissipation is limited by 150℃ junction temperature

Typical Characteristics

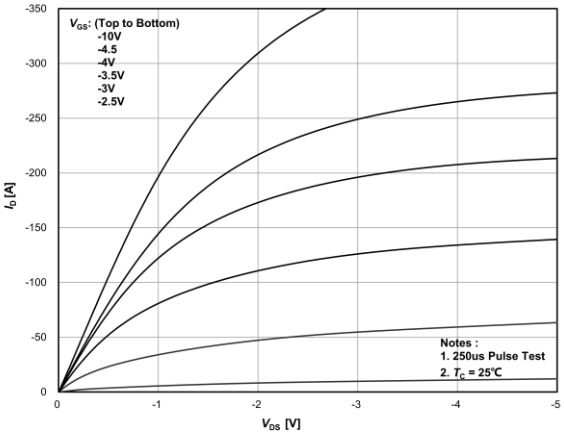


Figure 1. On-Region Characteristics

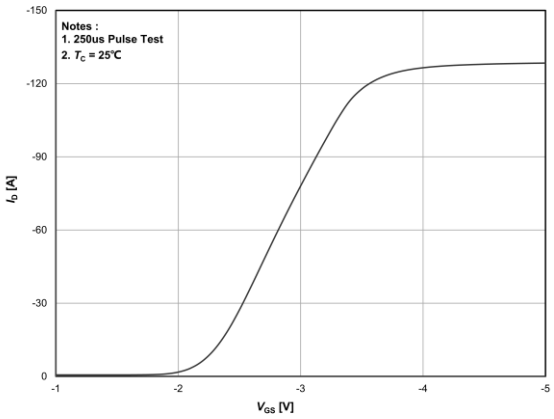


Figure 2. Transfer Characteristics

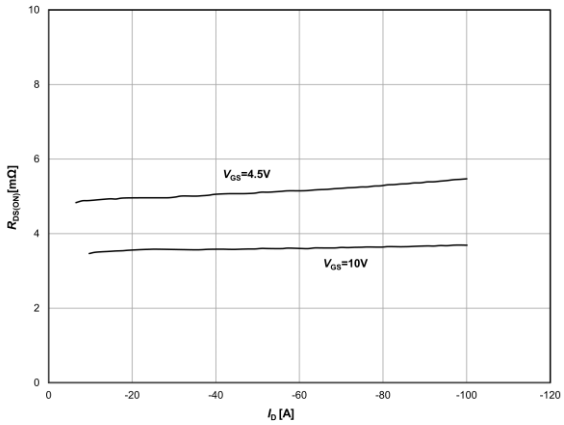


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

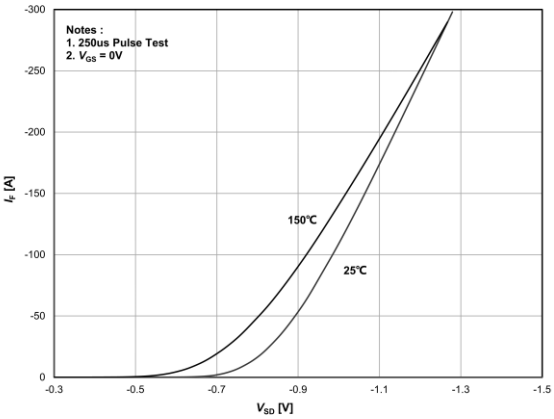


Figure 4. Body Diode Forward Voltage Variation with Current

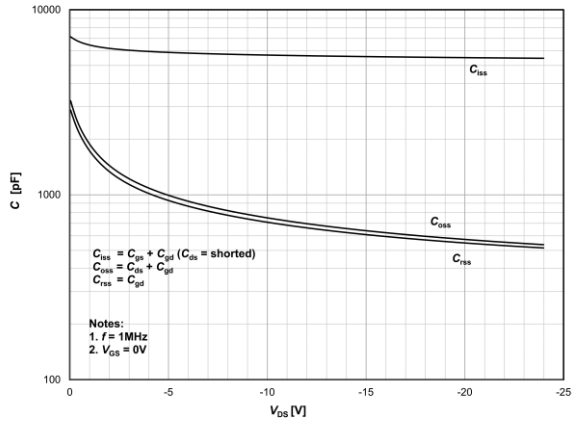


Figure 5. Capacitance Characteristics

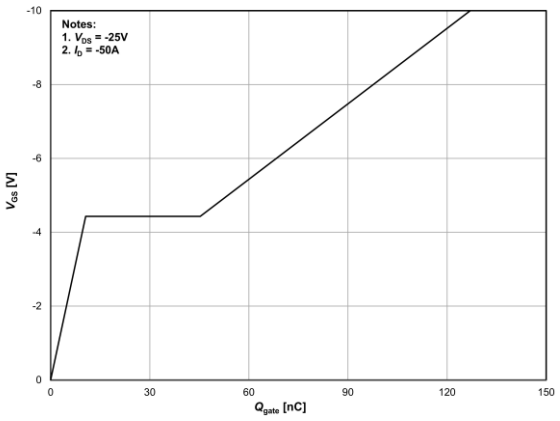


Figure 6. Gate Charge Characteristics

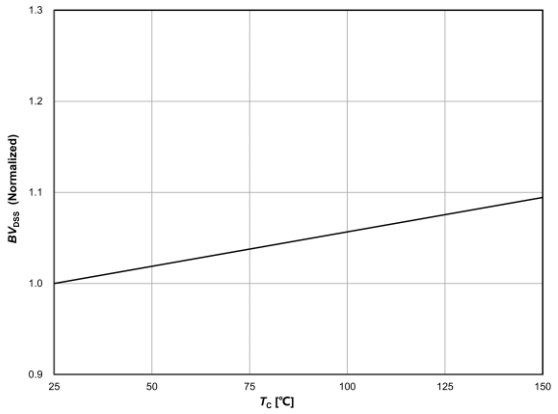


Figure 7. Breakdown Voltage Variation vs Temperature

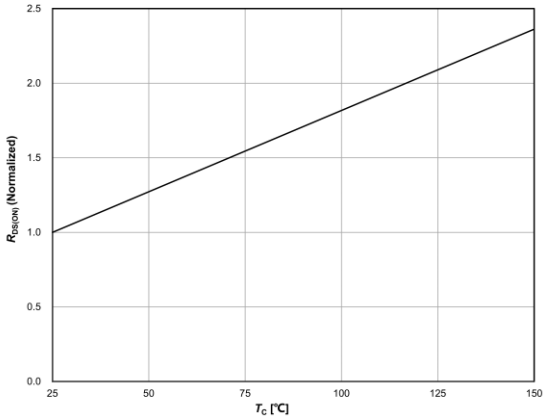


Figure 8. On-Resistance Variation vs Temperature

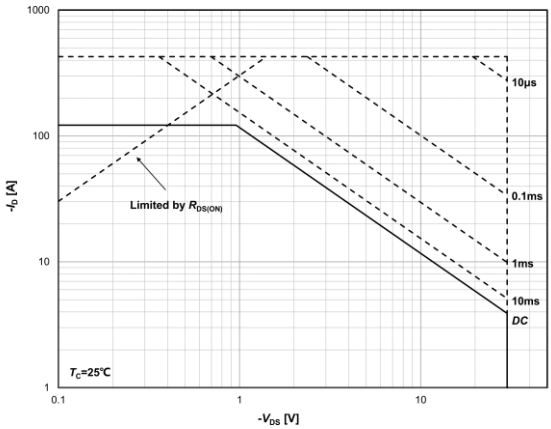


Figure 9. Maximum Safe Operating Area[3)]

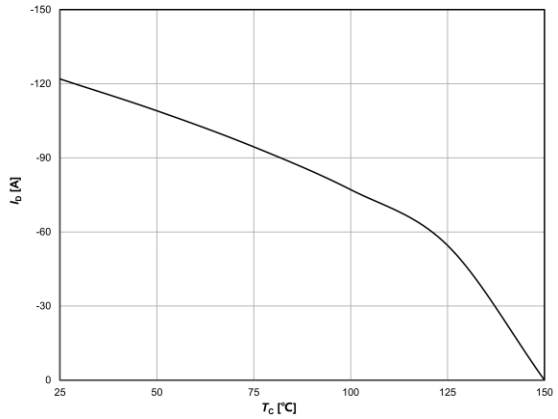


Figure 10. Maximum Drain Current vs Case Temperature

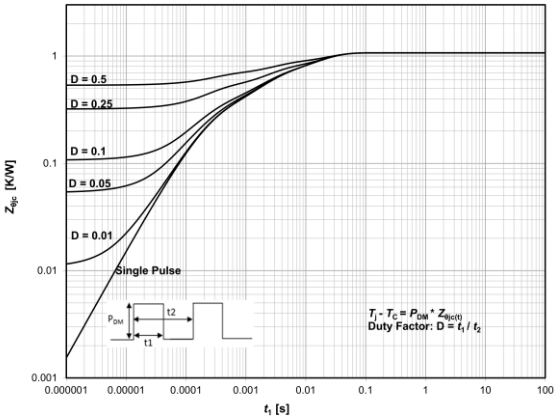
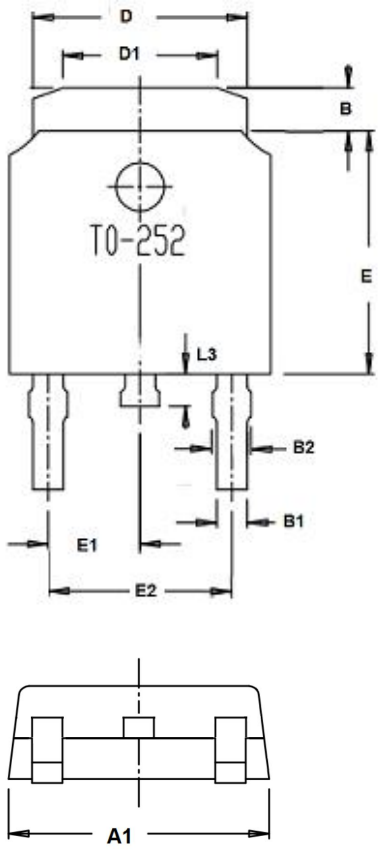
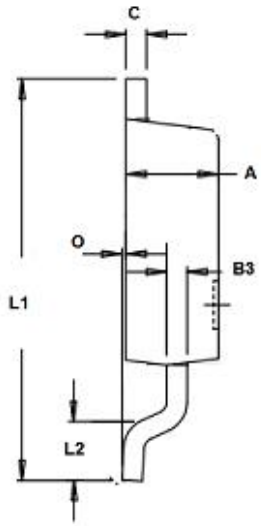


Figure 11. Transient Thermal Response Curve

TO-252 Package Outline Dimensions





Dim.	Min.	Max.
A	2.1	2.5
A1	6.3	6.9
B	0.96	1.42
B1	0.74	0.86
B2	0.74	0.94
C	Typ0.5	
D	5.33	5.53
D1	3.65	4.05
E	6.0	6.2
E1	Typ2.29	
E2	Typ4.58	
O	0	0.15
L1	9.9	10.5
L2	Typ1.65	
L3	0.6	1.0
All Dimensions in millimeter		