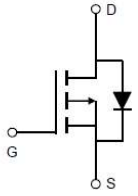
AP70P03

P-Channel Enhancement Mosfet

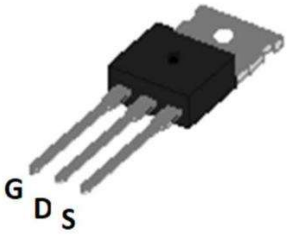
DATA SHEET

Features

- -30V, -70A
  $R_{DS(ON)}$ <10.0mΩ @V_{GS}=-10V TYP:7.0mΩ
  $R_{DS(ON)}$ <13.0mΩ @V_{GS}=-4.5V TYP:10.0mΩ
- Advanced Trench Technology
- High Power and current handing capability
- Lead free product is acquired



Schematic Diagram



TO-220

Applications

- Load Switch
- PWM Application
- Power management

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
70P03	AP70P03	TO-220	-	-	1000

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_C =25℃)	I_D	-70	A
Continuous Drain Current (T_C =100℃)	I_D	-50	A
Pulsed Drain Current (1)	I_{DM}	-260	A
Single Pulsed Avalanche Energy (2)	E_{AS}	576	mJ
Drain Power Dissipation	P_D	40	W
Thermal Resistance from Junction to Case(2)	$R_{\theta JC}$	3.15	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	55	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_a=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	-2.0	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =-10V, I_D =-30A	-	7.0	10.0	mΩ
		V_{GS} =-4.5V, I_D =-20A		10.0	13.0	mΩ
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =-20V, V_{GS} =0V, f =1.0MHz	-	2150	-	pF
Output Capacitance	C_{oss}		-	430	-	
Reverse Transfer Capacitance	C_{rss}		-	320	-	
Gate resistance	R_g	V_{DS} =0V, V_{GS} =0V, f =1.0MHz		2.2		Ω
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DS}=-15V, I_D=-1A, R_G=3Ω, V_G=-10V	-	11	-	ns
Turn-on rise time	t_r		-	13	-	
Turn-off delay time	$t_{d(off)}$		-	111	-	
Turn-off fall time	t_f		-	51	-	
Total Gate Charge	Qg	V_{DS}=-15V, I_D=-15A, V_{GS}=-10V	-	35	-	nC
Gate-Source Charge	Qgs		-	5	-	
Gate-Drain Charge	Qgd		-	10	-	
Source-Drain Diode characteristics						
Diode Forward voltage(a)	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=-2A	-	-	-1.2	V
Diode Forward current	I_S	T_C=25℃	-	-	-70	A
Body Diode Reverse Recovery Time	trr	T_J=25℃， IF=-2A,di/dt=100A/us		34		ns
Body Diode Reverse Recovery Charge	Qrr	T_J=25℃， IF=-2A,di/dt=100A/us		180		nc

Notes:

a) Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

b) EAS condition: TJ=25℃, VDD=-15V, VG=-10V, RG=25Ω, L=0.5mH

c) Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Performance Characteristics

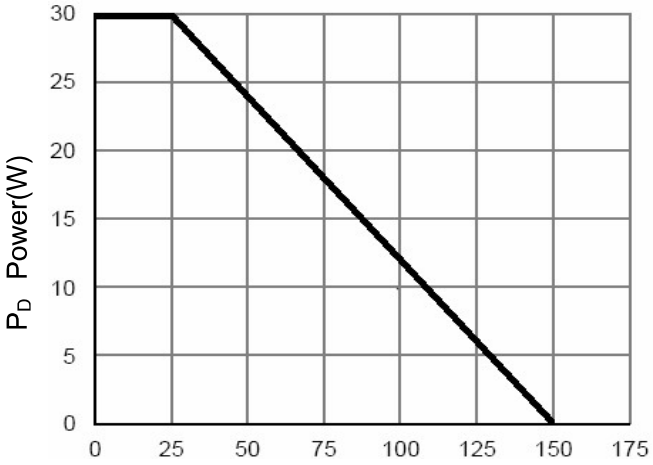


Figure 1 Power Dissipation

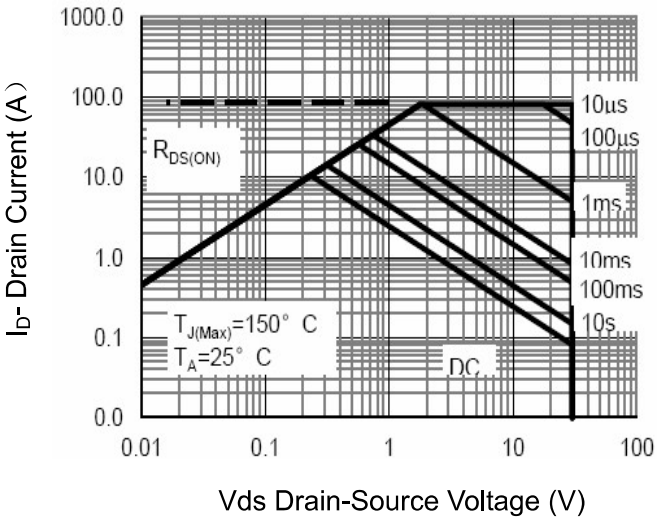


Figure 2 Safe Operation Area

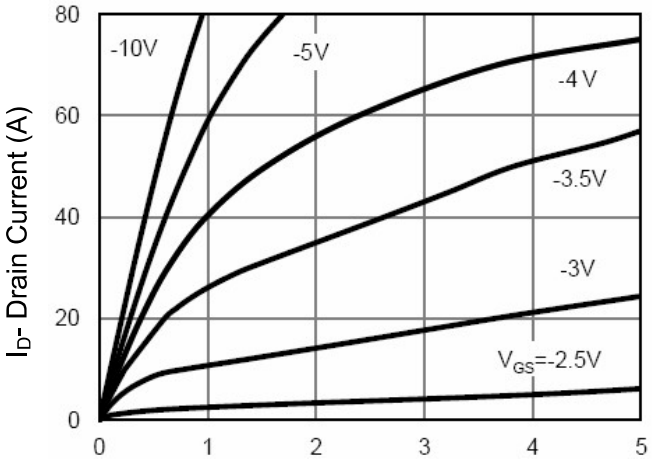


Figure 3 Output Characteristics

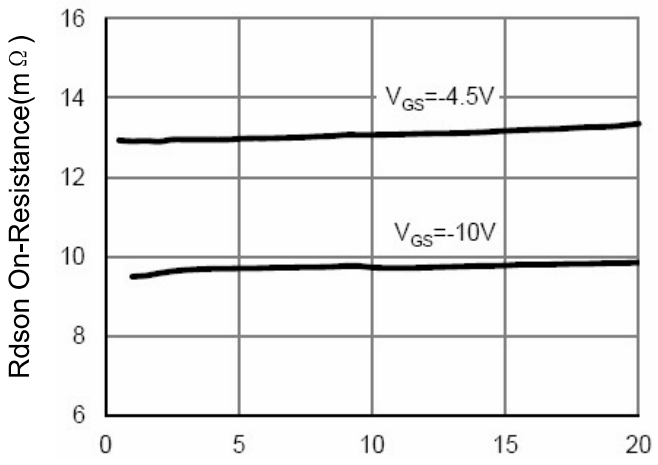


Figure 4 Drain-Source On-Resistance

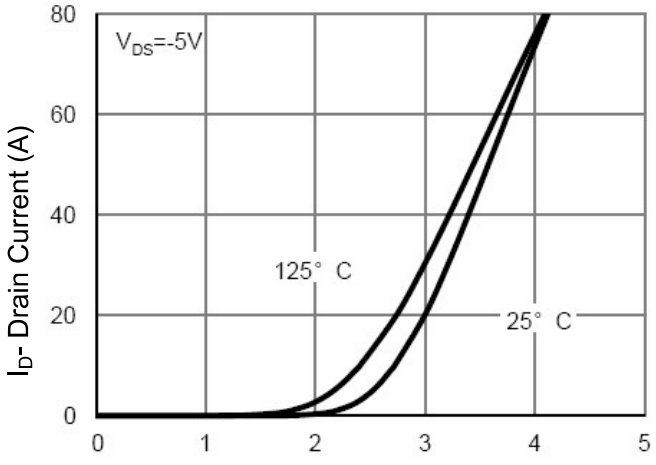


Figure 5 Transfer Characteristics

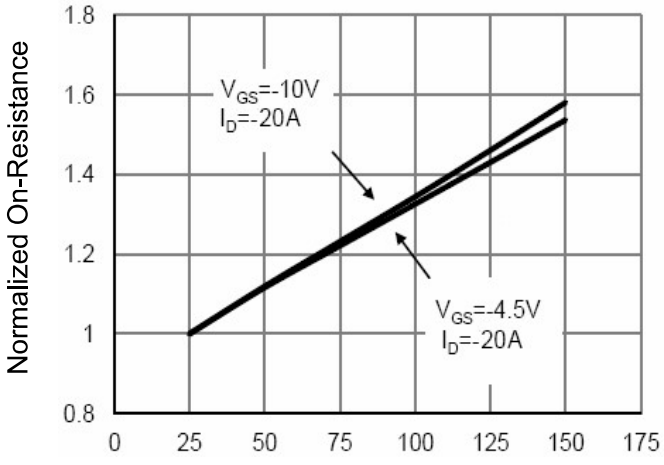


Figure 6 Drain-Source On-Resistance

Typical Performance Characteristics

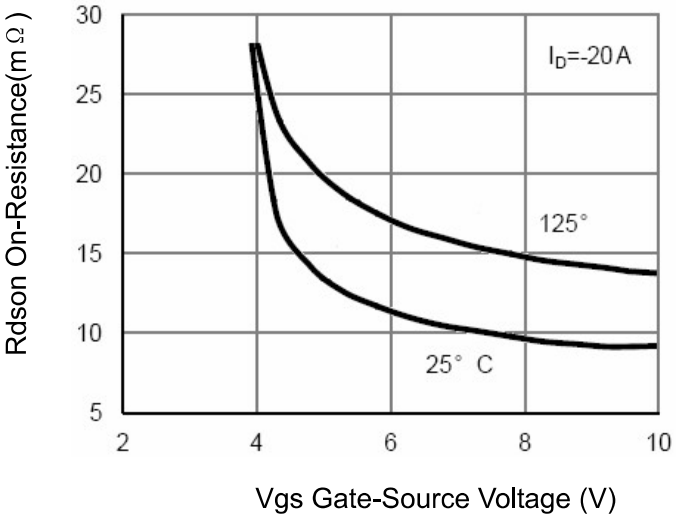


Figure 7 Rdson vs Vgs

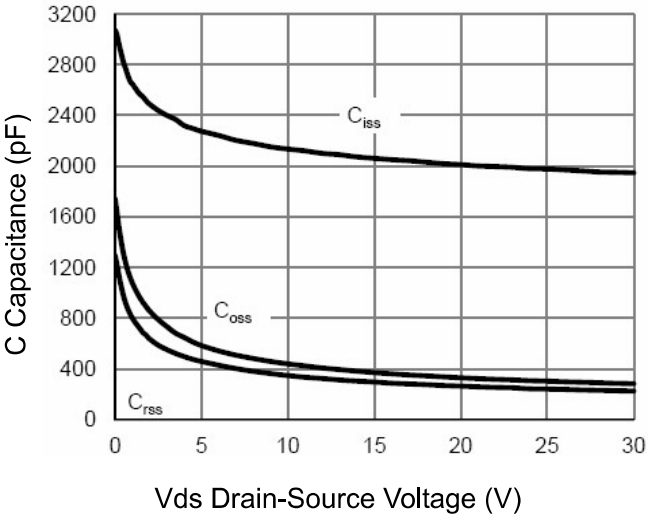


Figure 8 Capacitance vs Vds

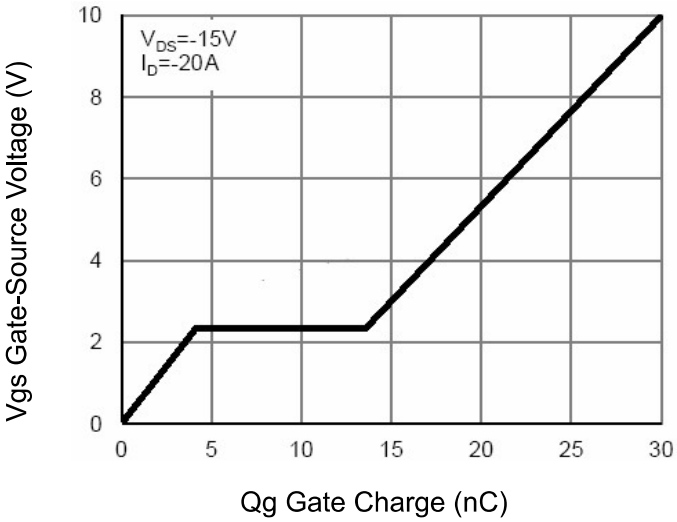


Figure 9 Gate Charge

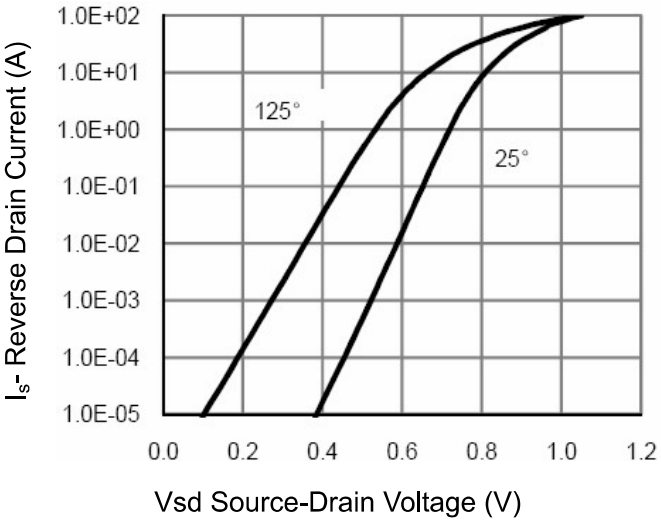


Figure 10 Source- Drain Diode Forward

Test Circuit

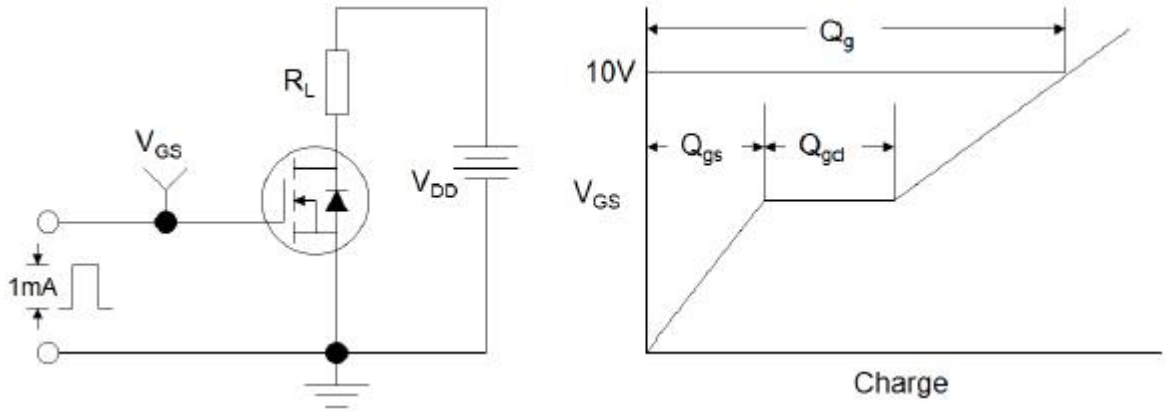


Figure1:Gate Charge Test Circuit & Waveform

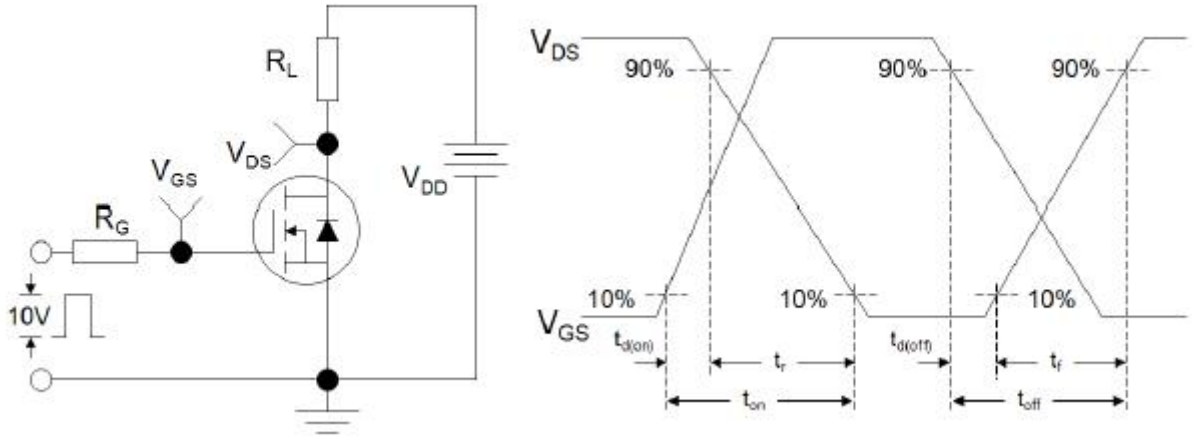


Figure 2: Resistive Switching Test Circuit & Waveforms

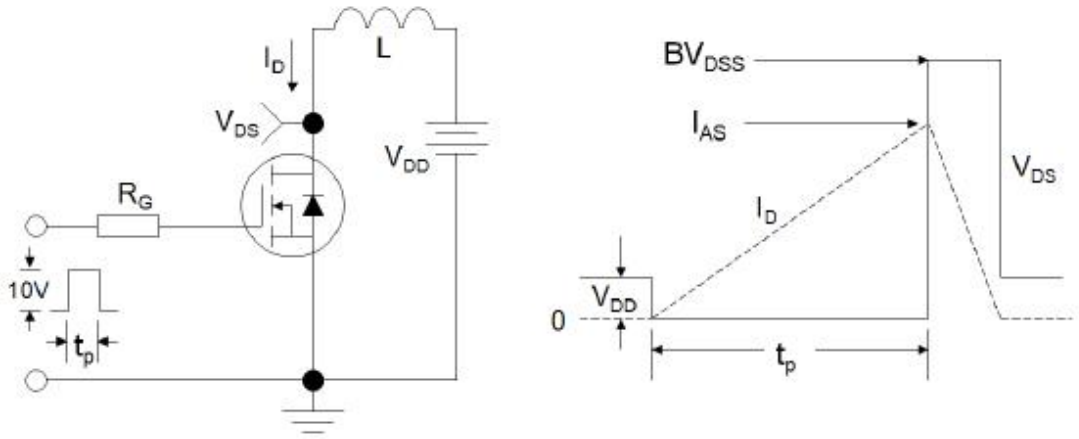
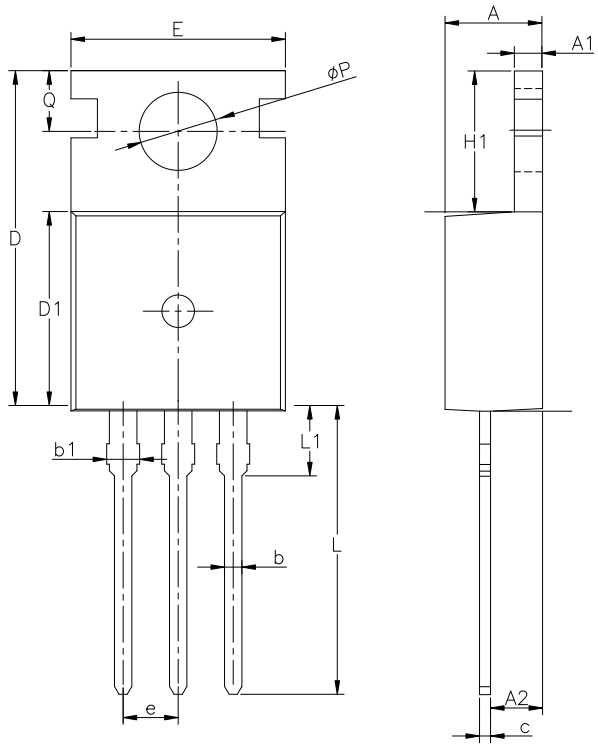


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

TO-220 Package Information



SYMBOL	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	1.00	1.30	1.50
A2	1.80	2.40	2.80
b	0.60	0.80	1.00
b1	1.00	—	1.60
c	0.30	—	0.70
D	15.10	15.70	16.10
D1	8.10	9.20	10.00
E	9.60	9.90	10.40
e	2.54BSC		
H1	6.10	6.50	7.00
L	12.60	13.08	13.60
L1	—	—	3.95
ϕP	3.40	3.70	3.90
Q	2.60	—	3.20

Revision History

Revision	Release	Remark
V1.0	2023/02/20	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.

Due to product or technical improvements,the information described or contained herein may be changed without prior notice.