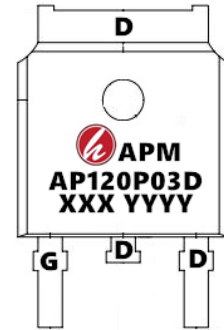
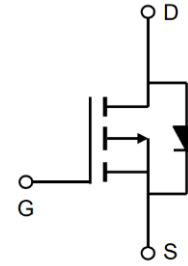


-30V P-Channel Enhancement Mode MOSFET

Description

The AP120P03D uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

$V_{DS} = -30V$ $I_D = -120A$

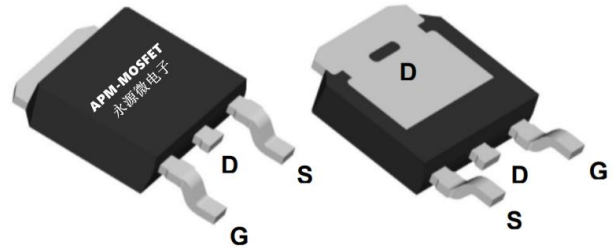
$R_{DS(ON)} < 5.5m\Omega$ @ $V_{GS} = -10V$ (Type: $3.8m\Omega$)

Application

Lithium battery protection

Wireless impact

Mobile phone fast charging



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP120P03D	TO-252-3L	AP120P03D XXX YYYY	2500

Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	-30	V
VGSS	Gate-Source Voltage	±20	V
ID	Continuous Drain Current $T_C = 25^\circ C$	-120	A
ID	Continuous Drain Current $T_C = 100^\circ C$	-65	A
IDM	Pulsed Drain Current ^{note1}	-400	A
EAS	Single Pulsed Avalanche Energy ^{note2}	225	mJ
PD	Power Dissipation $T_C = 25^\circ C$	103	W
RθJC	Thermal Resistance, Junction to Case	1.46	°C/W
TJ, TSTG	Operating and Storage Temperature Range	-55 to +175	°C



-30V P-Channel Enhancement Mode MOSFET

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	VGS=0V, ID= -250μA	-30	-33	-	V
IDSS	Zero Gate Voltage Drain Current	VDS= -30V, VGS=0V,	-	-	-1	μA
IGSS	Gate to Body Leakage Current	VDS=0V, VGS= ±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID= -250μA	-1.0	-1.6	-2.5	V
RDS(on)	Static Drain-Source on-Resistance	VGS= -10V, ID= -30A	-	3.8	5.5	mΩ
		VGS= -4.5V, ID= -20A	-	5.8	8.2	
Ciss	Input Capacitance	VDS= -15V, VGS=0V, f=1.0MHz	-	9400	-	pF
Coss	Output Capacitance		-	1000	-	pF
Crss	Reverse Transfer Capacitance		-	767	-	pF
Qg	Total Gate Charge	VDS= -15V, ID= -30A, VGS= -10V	-	42	-	nC
Qgs	Gate-Source Charge		-	8.4	-	nC
Qgd	Gate-Drain("Miller") Charge		-	11.2	-	nC
td(on)	Turn-on Delay Time	VDD= -15V, ID= -30A, VGS= -10V, RGEN=2.5Ω	-	15	-	ns
tr	Turn-on Rise Time		-	16	-	ns
td(off)	Turn-off Delay Time		-	69	-	ns
tf	Turn-off Fall Time		-	27	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-90	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-360	A
VSD	Drain to Source Diode Forward Voltage	VGS=0V, IS= -30 A		-0.8	-1.2	V

Notes:

- 1、 The data tested by surface mounted on a 1 inch² 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 T_J =25°C , V_{DD} = -15V, V_G = -10V, R_G =25Ω, L=0.5mH, I_{AS} = -30A
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

-30V P-Channel Enhancement Mode MOSFET

Typical Characteristics

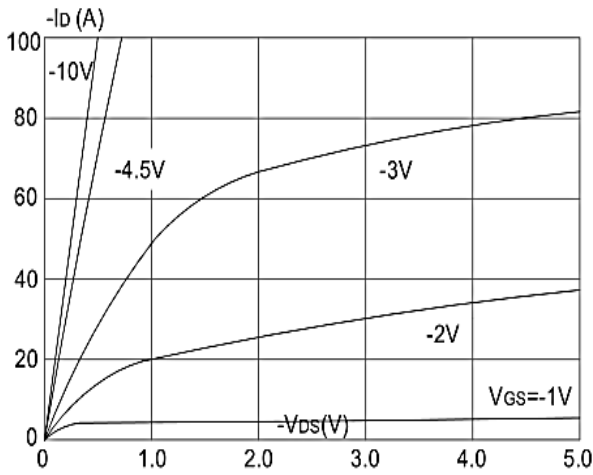


Figure 1: Output Characteristics

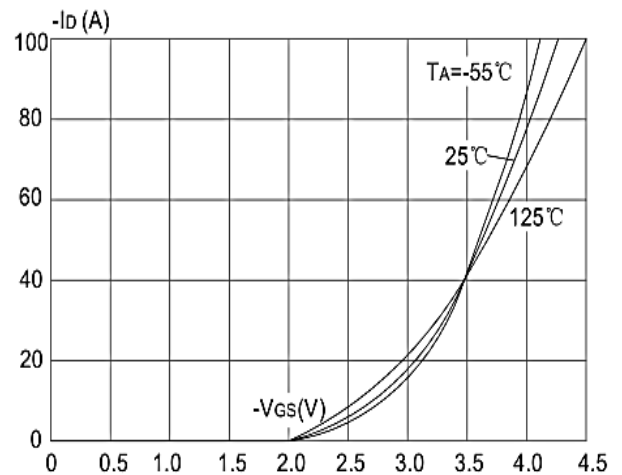


Figure 2: Typical Transfer Characteristics

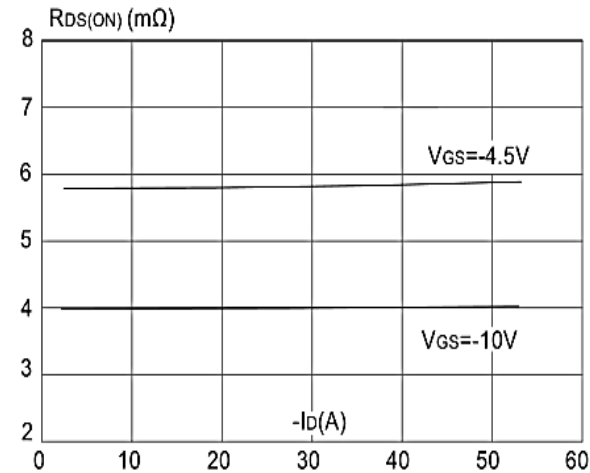


Figure 3: On-resistance vs. Drain Current

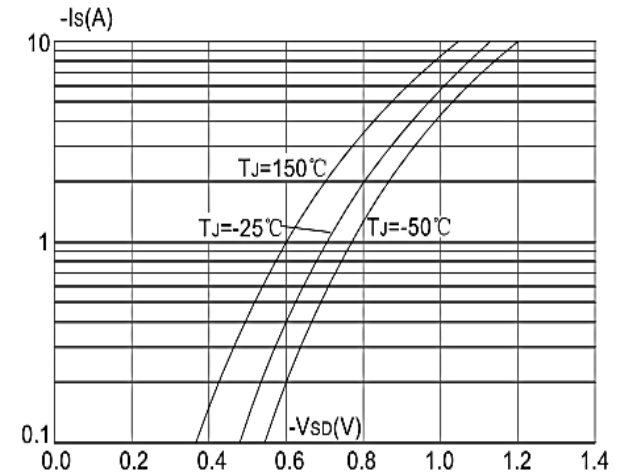


Figure 4: Body Diode Characteristics

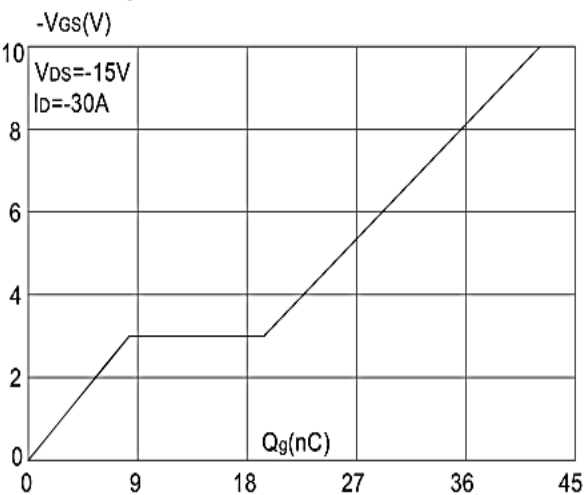


Figure 5: Gate Charge Characteristics

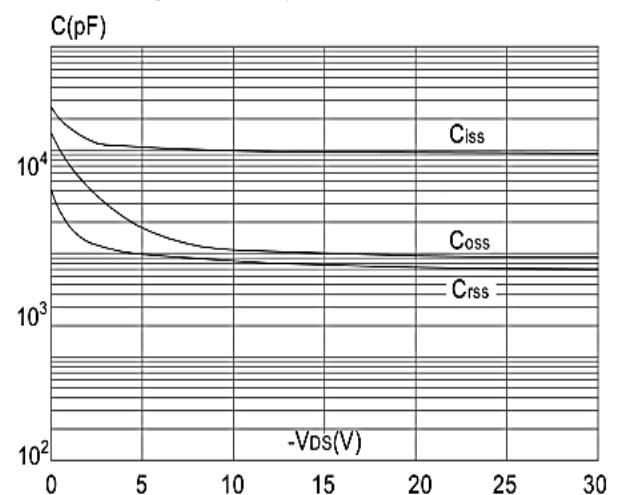


Figure 6: Capacitance Characteristics

-30V P-Channel Enhancement Mode MOSFET

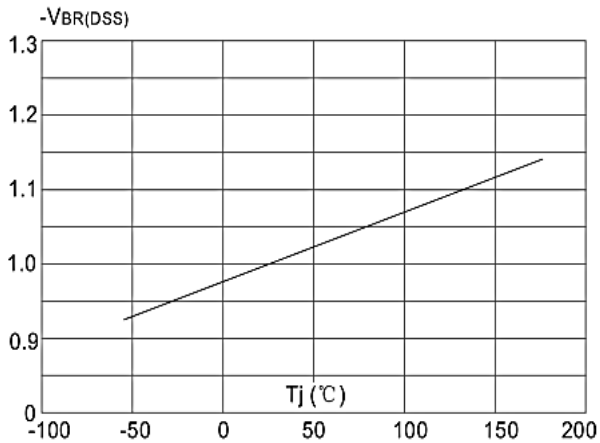


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

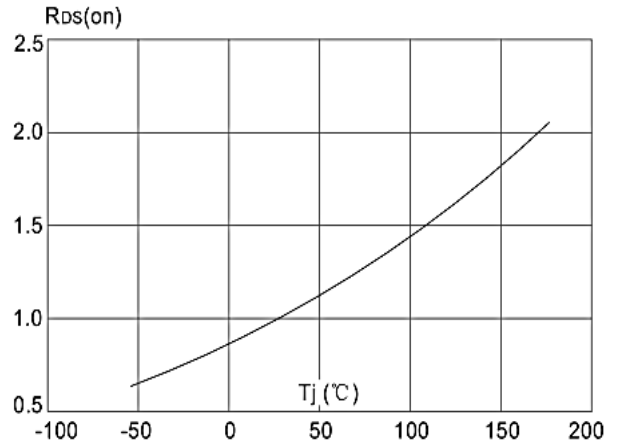


Figure 8: Normalized on Resistance vs. Junction Temperature

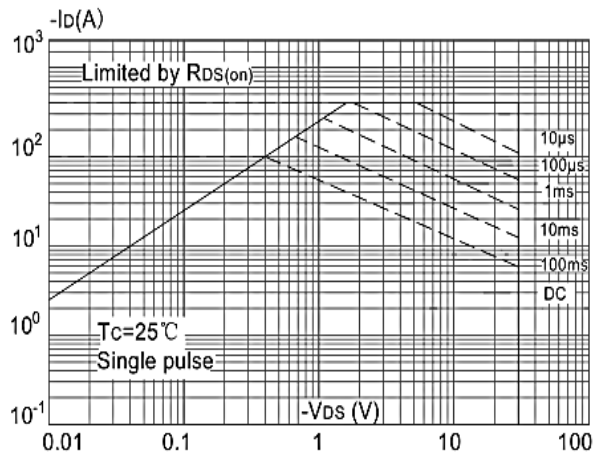


Figure 9: Maximum Safe Operating Area

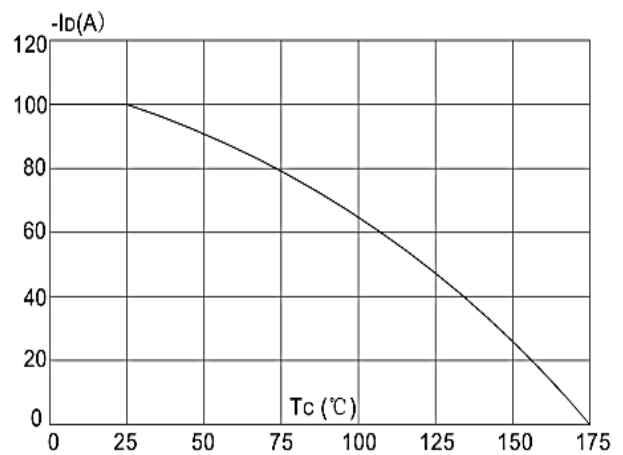


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

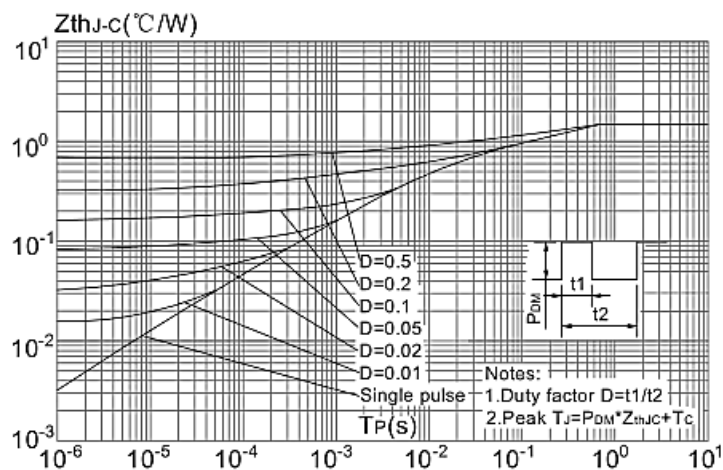


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

-30V P-Channel Enhancement Mode MOSFET**Attention**

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-30V P-Channel Enhancement Mode MOSFET

Edition	Date	Change
Rve1.0	2020/4/10	Initial release

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