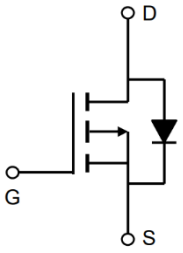
AP30P10BD

-100V P-Channel Enhancement Mode MOSFET

Description

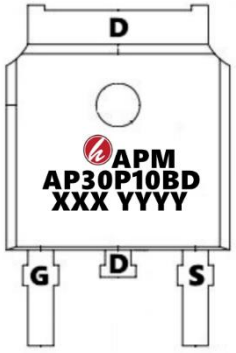
The AP30P10BD uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

V_{DS} = -100V I_D =-28A

$R_{DS(ON)}$ <100mΩ @ V_{GS}=10V **(Type：80mΩ)**

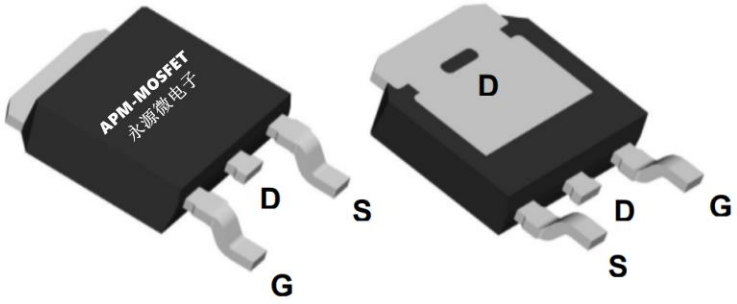


Application

Brushless motor

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP30P10BD	TO-252-3L	AP30P10BD XXX YYYY	2500

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ -10V[1]	-28	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ -10V[1]	-16	A
I_{DM}	Pulsed Drain Current[2]	-85	A
EAS	Single Pulse Avalanche Energy[3]	147.2	mJ
I_{AS}	Avalanche Current	-17	A
P_D@T_C=25℃	Total Power Dissipation[4]	260	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	2.6	℃/W

P-Channel Electrical Characteristics (TJ =25 ℃, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	VGS=0V, ID=-250μA	-100	-110	-	V
IGSS	Gate-body Leakage current	VDS=0V, VGS=±20V	-	-	±100	nA
IDSS TJ=25°C	Zero Gate Voltage Drain Current	VDS=-100V, VGS = 0V	-	-	-1	μA
IDSS TJ=100°C			-	-	-100	
VGS(th)	Gate-Threshold Voltage	VDS = VGS, ID = -250μA	-1.2	-1.6	-2.5	V
RDS(on)	Drain-Source On-Resistance4	VGS = -10V, ID = -10A	-	80	100	mΩ
		VGS = -4.5V, ID = -6A		88	120	
gfs	Forward Transconductance4	VDS = -10V, ID = -10A	-	30	-	S
Ciss	Input Capacitance	VDS = -50V, VGS = 0V, f = 1MHz	-	3985	-	pF
Coss	Output Capacitance		-	85	-	
Crss	Reverse Transfer Capacitance		-	71	-	
Rg	Gate Resistance	f = 1MHz	-	4	-	Ω
Qg	Total Gate Charge	VGS = -10V, VDS = -50V, ID= -10A	-	65	-	nC
Qgs	Gate-Source Charge		-	10.2	-	
Qgd	Gate-Drain Charge		-	13	-	
td(on)	Turn-On Delay Time	VGS = -10V, VDD = -50V, RG = 3Ω, ID= -10A	-	12.8	-	ns
tr	Rise Time		-	30	-	
td(off)	Turn-Off Delay Time		-	82	-	
tf	Fall Time		-	61	-	
trr	Body Diode Reverse Recovery Time	IF = -10A,dI/dt= 100A/μs	-	62	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	56	-	nC
VSD	Diode Forward Voltage4	IS = -10A, VGS = 0V	-	-	-1.2	V
IS	Continuous Source Current TC= 25°C	-	-	-	-18	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 =-72V,VGS =-10V,L=0.1mH,IAS =-17A

4、The power dissipation is limited by 150℃ 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.

Typical Characteristics

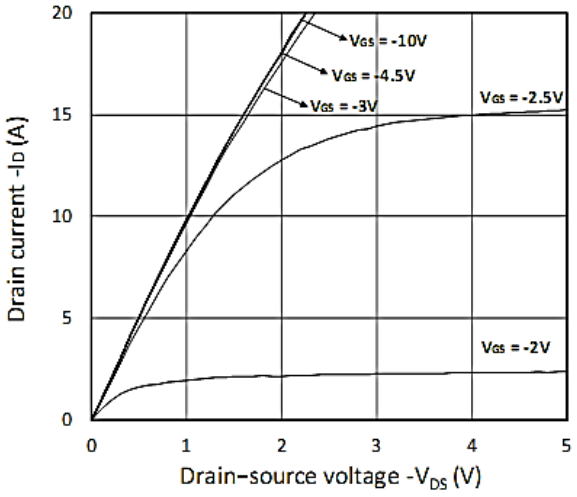


Figure 1. Output Characteristics

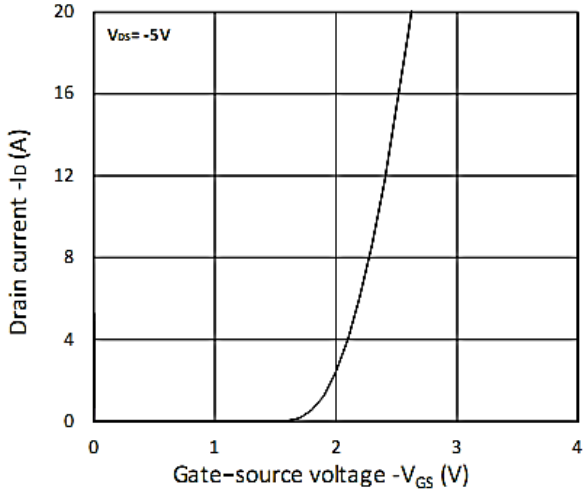


Figure 2. Transfer Characteristics

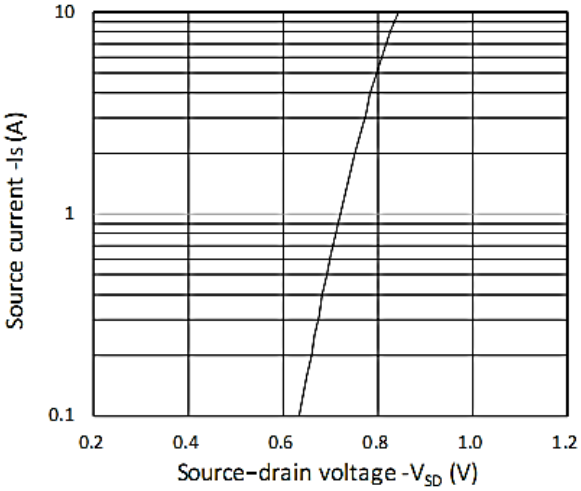


Figure 3. Forward Characteristics of Reverse

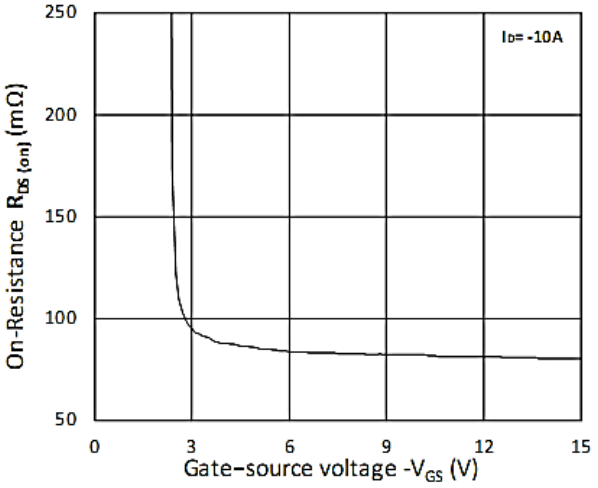


Figure 4. RDS(ON) vs. VGS

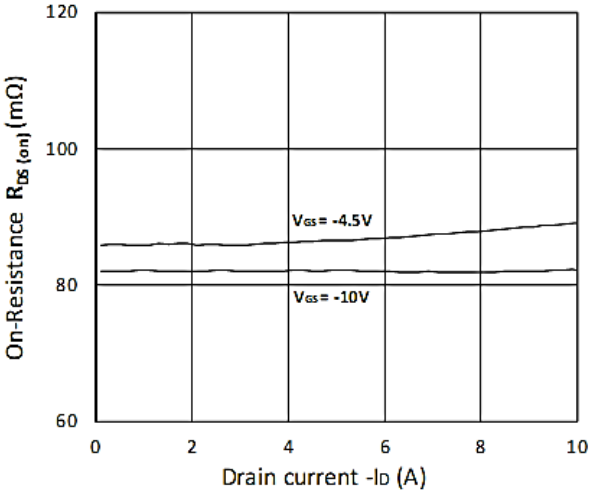


Figure 5. RDS(ON) vs. ID

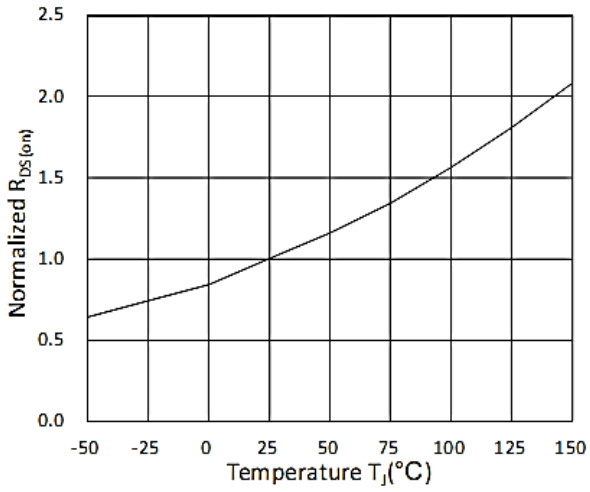


Figure 6. Normalized RDS(on) vs. Temperature

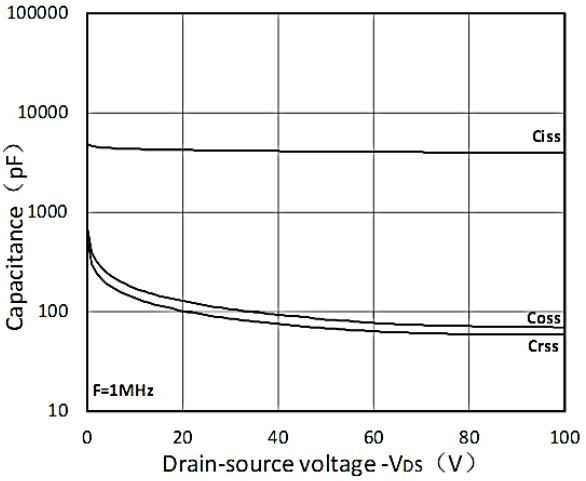


Figure 7. Capacitance Characteristics

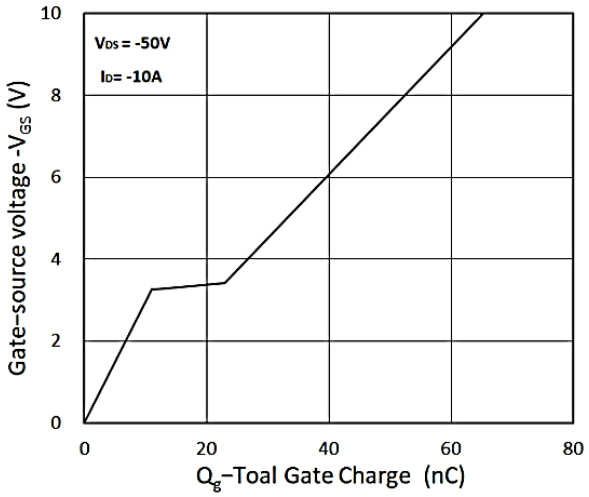


Figure 8. Gate Charge Characteristics

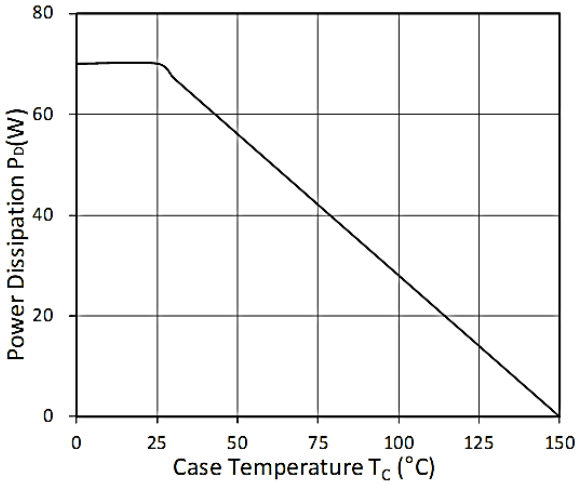


Figure 9. Power Dissipation

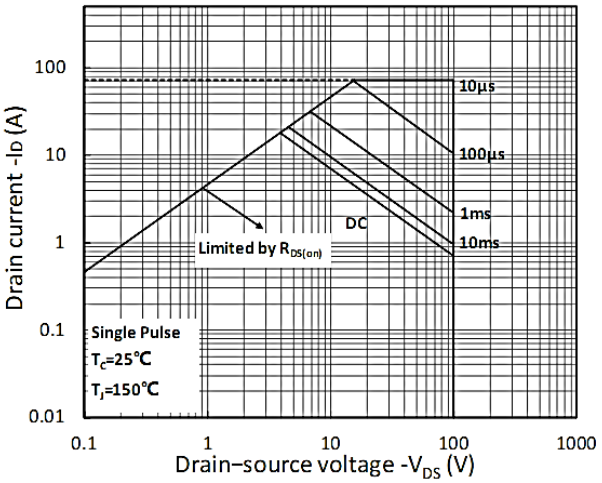


Figure10. Safe Operating Area

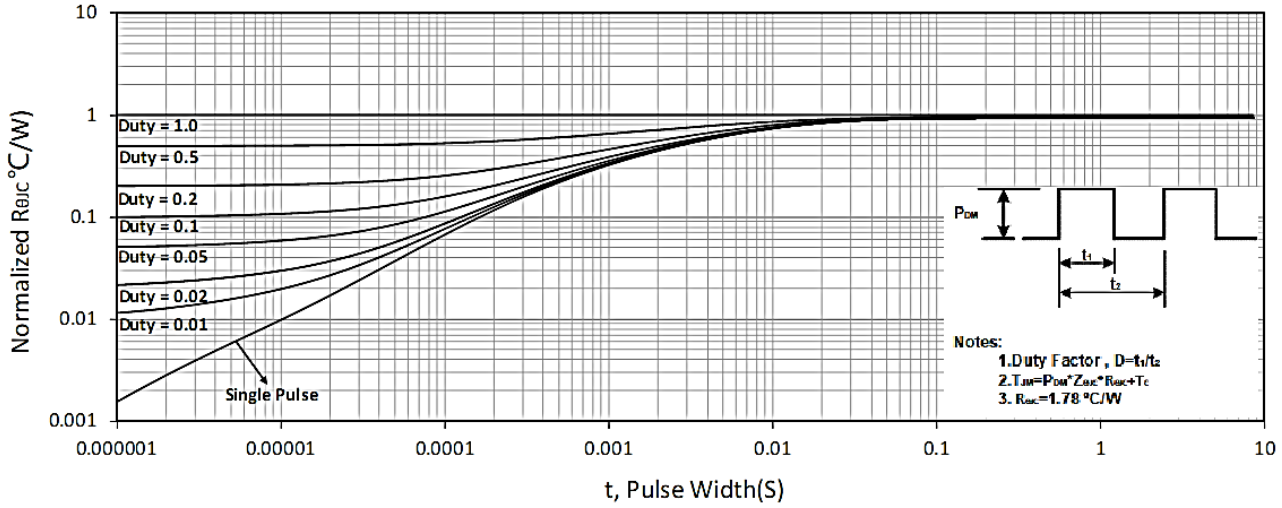
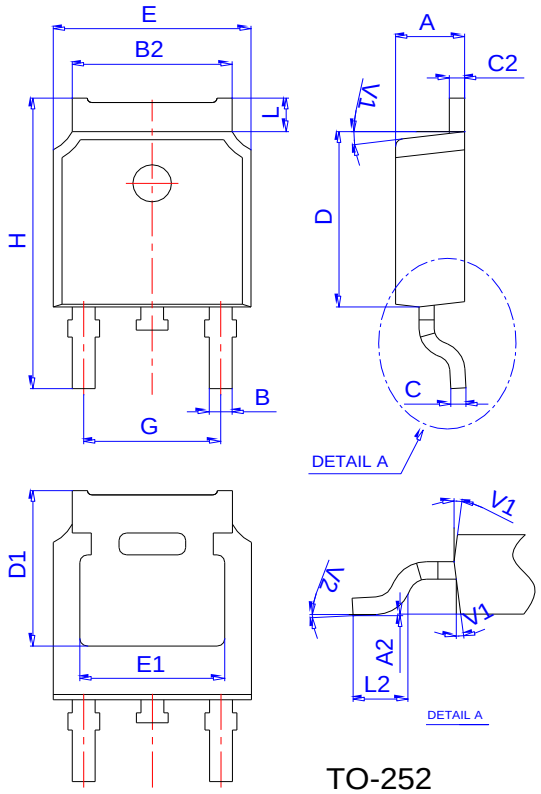


Figure 11. Normalized Maximum Transient Thermal Impedance

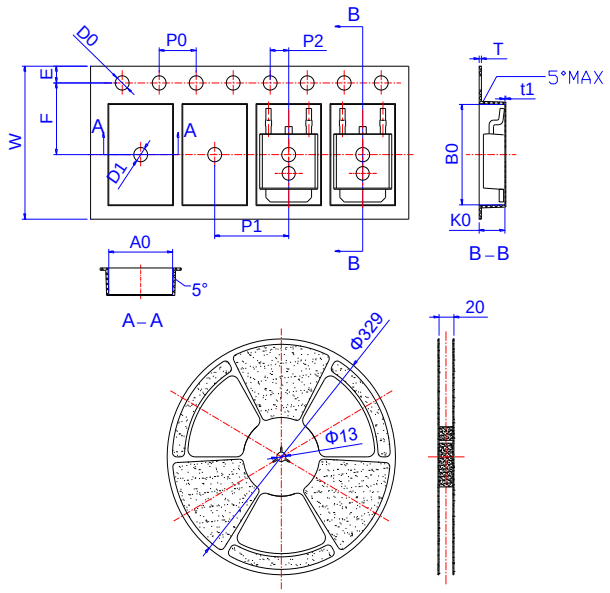
Package Mechanical Data:TO-252-3L



TO-252

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

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-100V P-Channel Enhancement Mode MOSFET

Edition	Date	Change
Rve1.0	2022/10/13	Initial release