

-20V P-Channel Enhancement Mode MOSFET

Description

The AP50P02CDF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = -20V$ $I_D = -50A$

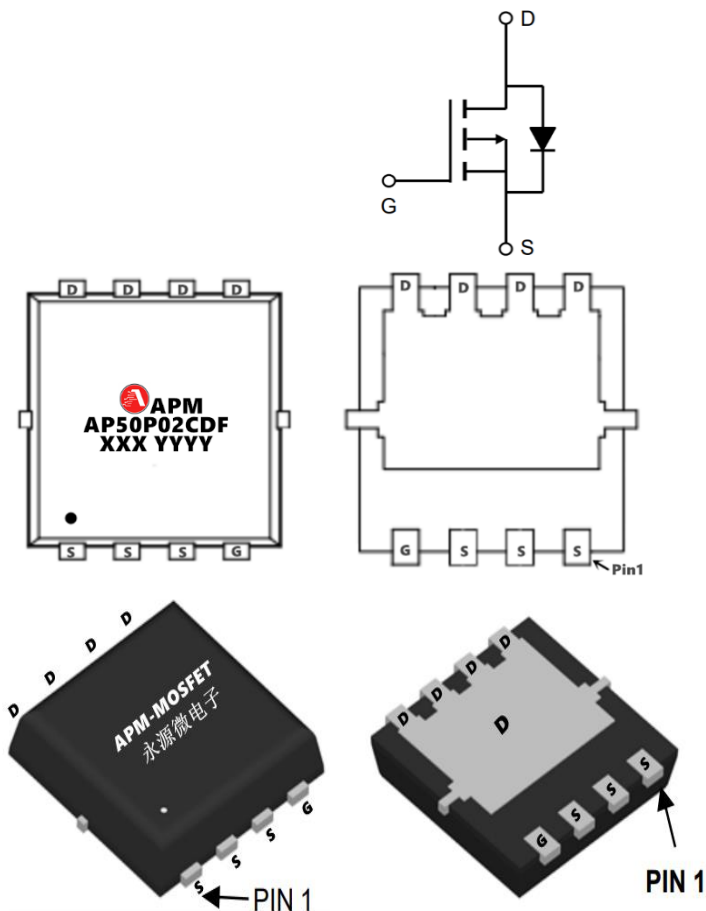
$R_{DS(ON)} < 9.0m\Omega$ @ $V_{GS}=4.5V$ (Type: 6.1m Ω)

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP50P02CDF	PDFN3*3-8L	AP50P02CDF XXX YYYY	5000

Absolute Maximum Ratings ($T_c=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_c=25^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-50	A
$I_D@T_c=70^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-35	A
I_{DM}	Pulsed Drain Current ²	-220	A
I_{AS}	Avalanche Current	-26.6	A
$P_D@T_c=25^\circ C$	Total Power Dissipation ³	70	W
TSTG	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	85	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	3.2	$^\circ C/W$

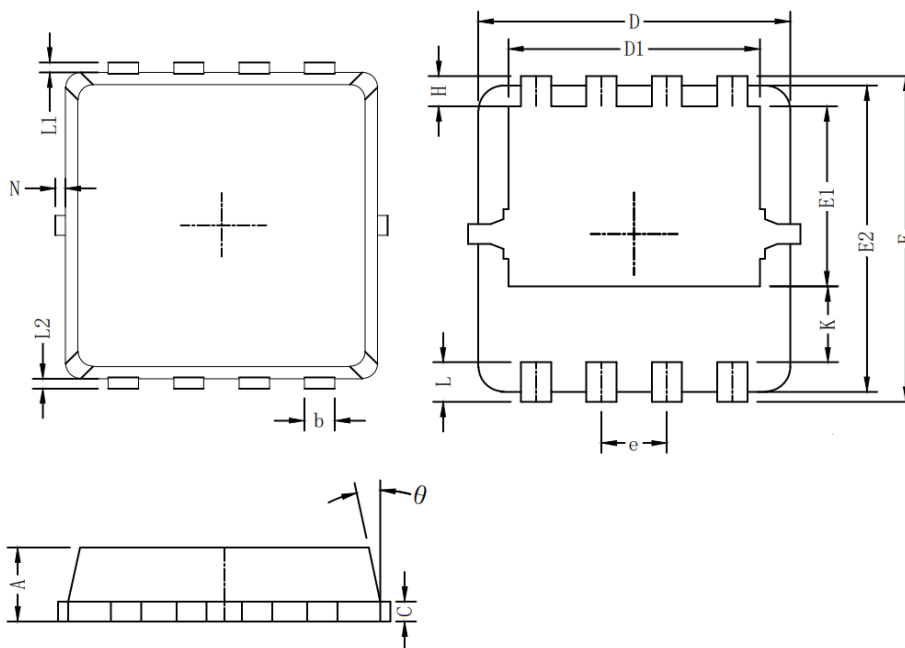
-20V P-Channel Enhancement Mode MOSFET
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	VGS=0V, ID= -250 μ A	-20	-22	-	V
IDSS	Zero Gate Voltage Drain Current	VDS=-20V, VGS=0V,	-	-	-1	μ A
IGSS	Gate to Body Leakage Current	VDS=0V, VGS= \pm 12V	-	-	\pm 100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=-250 μ A	-0.45	-0.65	-1.0	V
RDS(on)	Static Drain-Source on-Resistance note3	VGS=-4.5V, ID=-15A	-	6.1	9.0	m Ω
		VGS=-2.5V, ID=-12A	-	8.8	11	
Rg	Gate Resistance	VDS=0V, VGS=0V, f=1MHz	---	9	13	Ω
Ciss	Input Capacitance	VDS=-10V, VGS=0V, f=1.0MHz	-	2700	-	pF
Coss	Output Capacitance		-	450	-	pF
Crss	Reverse Transfer Capacitance		-	420	-	pF
Qg	Total Gate Charge	VDS=-10V, ID=-15A, VGS=-4.5V	-	43	-	nC
Qgs	Gate-Source Charge		-	7.9	-	nC
Qgd	Gate-Drain("Miller") Charge		-	11.2	-	nC
td(on)	Turn-on Delay Time	VDD=-10V, ID=-15A, RGEN=2.7 Ω , VGS=-10V	-	14.5	-	ns
tr	Turn-on Rise Time		-	20.2	-	ns
td(off)	Turn-off Delay Time		-	93	-	ns
tf	Turn-off Fall Time		-	161	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	-50	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-220	A
VSD	Drain to Source Diode Forward Voltage	VGS=0V, IS=-20A	-	0.85	-1.2	V
trr	Reverse Recovery Time	TJ=25 $^{\circ}$ C, ID=-15A, VGS=0V di/dt=-100A/ μ s	-	28	-	ns
Qrr	Reverse Recovery Charge		-	25.7	-	nC

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 \leq 300 μ s , duty cycle \leq 2%
- 3、The test condition is VDD=-16V, VGS=-10V, L=0.1mH, IAS=-26.6A RG=25 Ω
- 4、The power dissipation is limited by 150 $^{\circ}$ 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.

Package Mechanical Data-PDFN3X3-8L



Symbol	Dim in mm		
	Min	Typ	Max
A	0.6	0.75	0.9
b	0.2	0.3	0.4
C	0.15	0.2	0.25
D	3	3.1	3.2
D1	2.3	2.45	2.6
E	3.15	3.3	3.45
E1	1.43	1.73	1.93
E2	2.9	3.05	3.2
e	0.65BSC		
H	0.2	0.35	0.5
K	0.57	0.77	0.87
L	0.3	0.4	0.5
L1/L2	0.1REF		
θ	8°	10°	13°
N	0		0.15

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Edition	Date	Change
REV1.0	2024/12/5	Initial release

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