APJ150N60MP (AP60R070)

650V N-Channel Enhancement Mode MOSFET

Description

The APJ150N60MP is CoolFET II MOSFET family that is utilizing charge balance technology for extremely low on-resistance and low gate charge performance.

APJ150N60MP is suitable for applications which require superior power density and outstanding efficiency

General Features

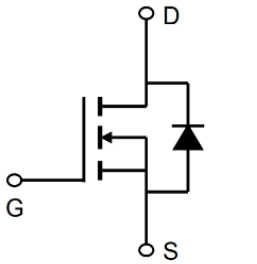
V_{DS} = 600V （Type：680V） IDM =150A

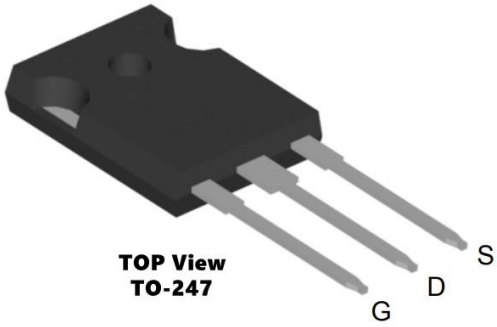
$R_{DS(ON)}$ < 70mΩ @ V_{GS}=10V （**Type：62mΩ**）

Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)





Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
APJ150N60MP	TO-247-3L	APJ150N60MP XXX YYYY	300

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

Symbol	Parameter	Value	Unit
VDSS	Drain-Source Voltage (V_{GS} = 0V)	600	V
ID	Continuous Drain Current	48	A
IDM	Pulsed Drain Current (note1)	150	A
VGS	Gate-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Energy (note2)	550	mJ
P_{tot}	Power Dissipation (T_C = 25ºC)	500	W
TJ, Tstg	Operating Junction and Storage Temperature Range	-55~+150	ºC
RthJC	Thermal Resistance, Junction-to-Case	0.25	ºC/W
RthJA	Thermal Resistance, Junction-to-Ambient	62	ºC/W

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-source breakdown voltage	V_{GS}=0V, I_D=1mA	600	680	-	V
V(GS)th	Gate threshold voltage	VDS=VGS, ID=1mA	3	4	5	V
IDSS	Zero gate voltage drain current	V_{DS}=600V, V_{GS}=0V, T_j=25°C	-	-	10	μA
IGSS	Gate-source leakage current	V_{GS}=±30V, V_{DS}=0V	-	-	±100	nA
RDS(on)	Drain-source on-state resistance	V_{GS}=10V, I_D=23.5A, T_j=25°C	-	62	70	mΩ
RG	Gate resistance	V_{DD}=0V,V_{GS}=0V,F=1MHz	-	3.6	-	Ω
Ciss	Input capacitance	V_{GS}=0V, V_{DS}=50V, f=250kHz	-	3750	-	pF
Coss	Output capacitance		-	110	-	pF
Crss	Reverse transfer capacitance		-	4	-	pF
td(on)	Turn-on delay time	V_{DD}=400V, V_{GS}=10V, I_D=23A	-	87	-	ns
tr	Rise time		-	66	-	ns
td(off)	Turn-off delay time		-	125	-	ns
t_f	Fall time		-	72	-	ns
Qgs	Gate to source charge	V_{DD}=400V, I_D=23A, V_{GS}=0 to 10V	-	20	-	nC
Qgd	Gate to drain charge		-	16	-	nC
Q_g	Gate charge total		-	70	-	nC
Vplateau	Gate plateau voltage	V_{DD}=400V, I_D=23A, V_{GS}=0 to 10V	-	5.3	-	V
VSD	Diode forward voltage	V_{GS}=0V, I_F=23A, T_f=25°C	-	0.88	-	V
trr	Reverse recovery time	V_R=100V, I_F=23A, di_F/dt=100A/μs	-	147	-	ns
Q_{rr}	Reverse recovery charge		-	1.32	-	μC
Irrm	Peak reverse recovery current		-	17	-	A

Note :

1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2、The EAS data shows Max. rating . L=0.5mH, IAS =7A, VDD =50V, RG=25Ω

3、The test condition is Pulse Test: ISD ≤ ID, di/dt = 100A/us, VDD≤ BVDSS, Starting at TJ =25℃

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

5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

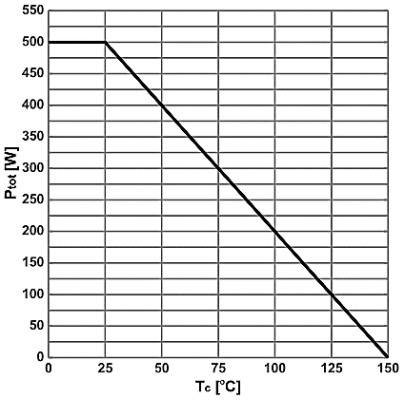


Figure1: Power dissipation (Non FullPAK)

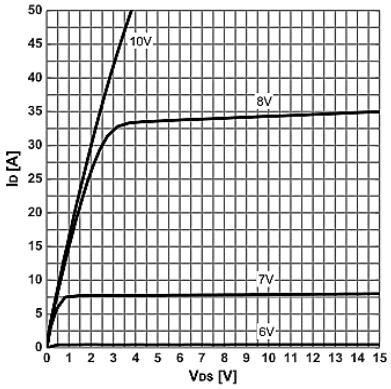


Figure2: output characteristics

ID=f(VDS); Tj=25°C; parameter: VGS

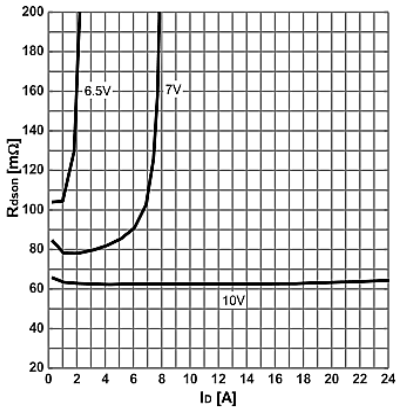


Figure3: Typ. drain-source on-state resistance

RDS (on)=f(ID); Tj=25°C; parameter: VGS

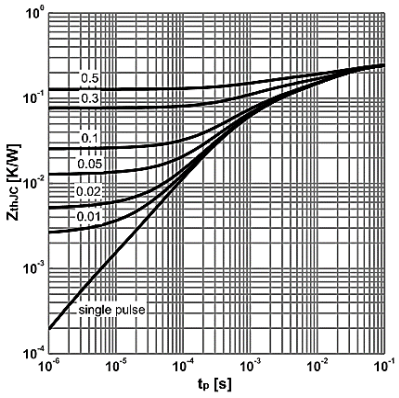


Figure4:Max. transient thermal impedance

Ptot=f(TC)

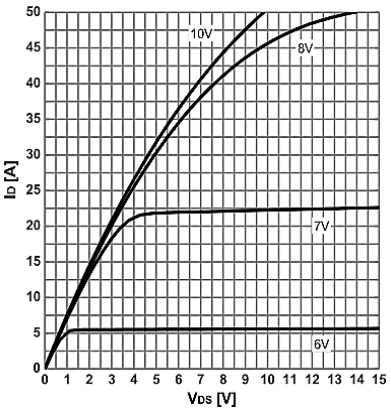


Figure5: Type. output characteristics

ID =f(VDS); Tj=125°C; parameter: VGS

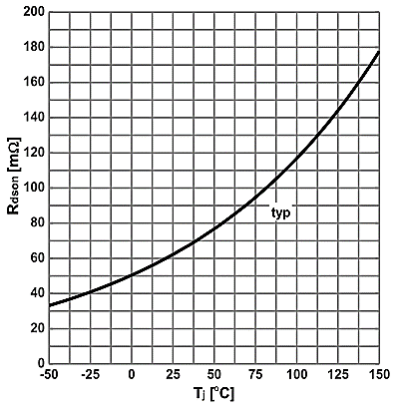


Figure6: Max. transient thermal impedance

RDS (on)=f(Tj); ID=23.5A; VGS =10V

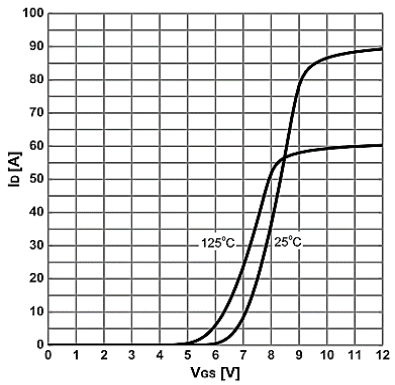


Figure 7: Typ. transfer characteristics

ID=f(VGS); VDS=20V; parameter: Tj

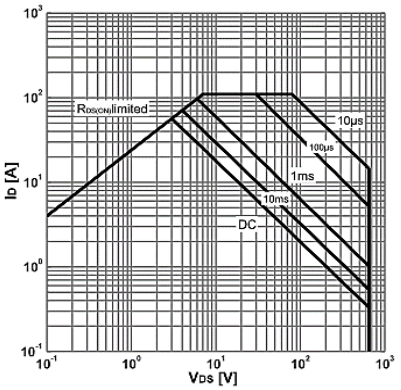


Figure8 : Safe operating area (Non FullPAK)

ID=f(VDS); Tj=25°C; D=0; parameter: tp

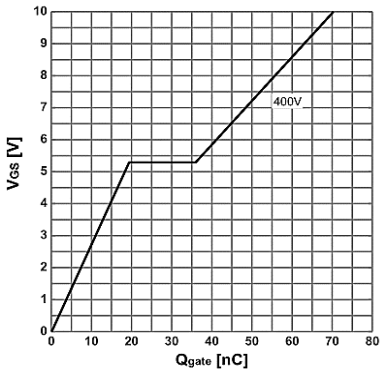


Figure9: Typ. gate charge

VGS =f(Qgate); ID=25A pulsed; VDS =400V

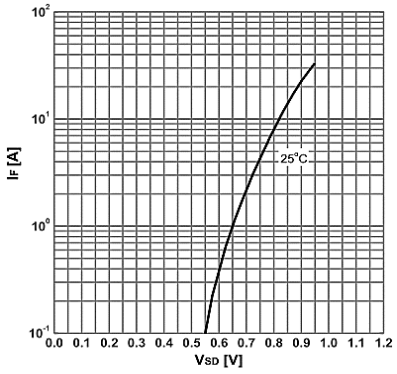


Figure 10: Forward characteristics of reverse diode

IF=f(VSD); parameter: Tj

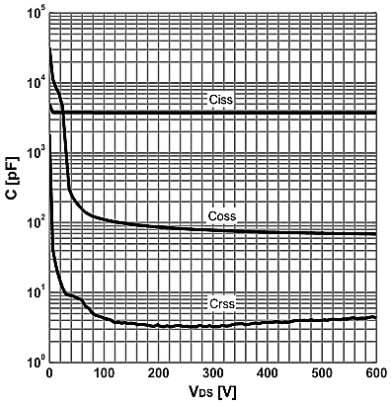


Figure 11: Typ. capacitances

C=f(VDS); VGS=0V; f=250kHz

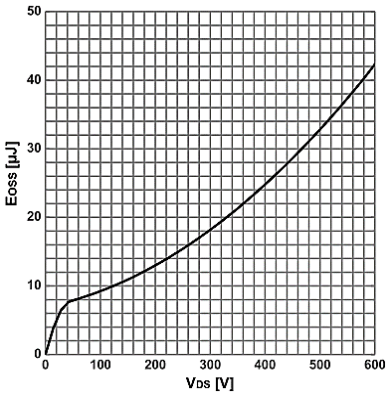
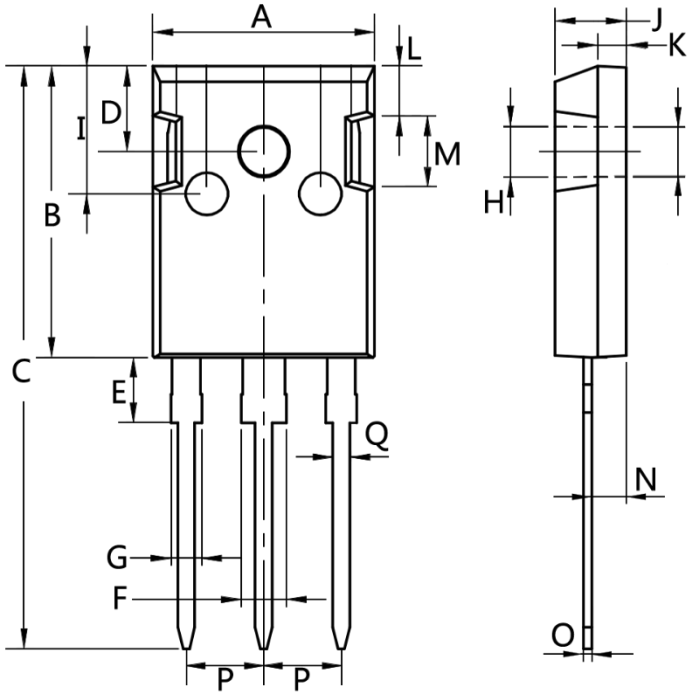


Figure 12: Typ. Coss stored energy

EOSS =f(VDS)

Package Mechanical Data-TO-247-3L



Dim.	Min.	Max.
A	15.0	16. 0
B	20.0	21.0
C	41.0	42.0
D	5.0	6.0
E	4.0	5.0
F	2.5	3.5
G	1.75	2.5
H	3.0	3.5
I	8.0	10.0
J	4.9	5.1
K	1.9	2.1
L	3.5	4.0
M	4.75	5.25
N	2.0	3.0
O	0.55	0.75
P	Typ 5.08	
Q	1.2	1.3