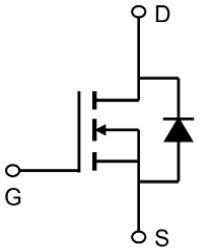
AP47N65MP

650V N-Channel Enhancement Mode MOSFET

Description

The APJ47N65MP is generation super junction MOSFET family that is utilizing charge balance technology for extremely low on-resistance and low gate charge performance.

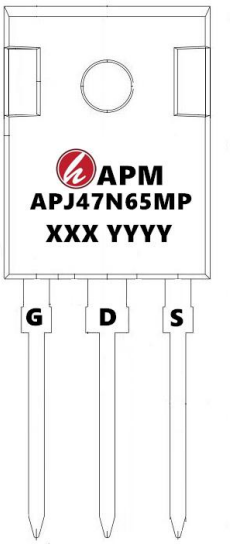
APJ47N65MP is suitable for applications which require superior power density and outstanding efficiency



General Features

V_{DS} = 650V I_D =47A

$R_{DS(ON)}$ < 72mΩ @ V_{GS}=10V （Type：60mΩ）



Application

Uninterruptible Power Supply(UPS)

Power Factor Correction (PFC)

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
APJ47N65MP	TO-247L	APJ47N65MP XXX YYYY	500

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

Symbol	Parameter	Value	Unit
VDSS	Drain-Source Voltage (V_{GS} = 0V)	650	V
ID	Continuous Drain Current	47	A
IDM	Pulsed Drain Current (note1)	138	A
VGS	Gate-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Energy (note2)	1210	mJ
Dv/dt	MOSFET dv/dt ruggedness (@V DS =0~400V)	25	V/ns
Dv/dt	Peak diode Recovery dv/dt (4)	15	V/ns
P_D	Power Dissipation (T_C = 25ºC)	3.34	W
TJ, Tstg	Operating Junction and Storage Temperature Range	-55~+150	ºC
RthJC	Thermal Resistance, Junction-to-Case	0.33	ºC/W
RthJA	Thermal Resistance, Junction-to-Ambient	40	ºC/W

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

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650	--	--	V
ΔBV_{DSS} / ΔTJ	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C	--	0.7	--	V/°C
IDSS	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V	--	--	1	uA
		V_{DS}=520V, T_C=125°C	--	--	50	uA
IGSS	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V	--	--	100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V	--	--	-100	nA
VGS(TH)	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	3	4	5	V
RDS(ON)	Drain to source on state resistance	V_{GS}=10V, I_D =24A	--	60	72	mΩ
Rg	Gate resistance		--	1	--	Ω
Ciss	Input capacitance	V_{GS}=0V, V_{DS}=100V, f=1MHz	--	4655	--	pF
Coss	Output capacitance		--	185	--	
Crss	Reverse transfer capacitance		--	5.1	--	
td(on)	Turn on delay time	V_{DS}=380V, I_D=15A, R_G=4.7Ω , V_{GS}=10V	--	34	--	ns
tr	Rising time		--	31	--	
td(off)	Turn off delay time		--	80	--	
t_f	Fall time		--	26	--	
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=24A	--	104	130	nC
Q_{gs}	Gate-source charge		--	30	--	
Q_{gd}	Gate-drain charge		--	34	--	
IS	Continuous source current	Integral reverse p-n Junction diode in the MOSFET	--	--	47	A
ISM	Pulsed source current		--	--	138	A
VSD	Diode forward voltage drop.	I_S=24A, V_{GS}=0V	--	0.9	1.2	V
T_{rr}	Reverse recovery time	I_S=24A, V_{GS}=0V, Vdd=25, dI_F/dt=60A/us,	--	633	--	ns
Qrr	Reverse recovery Charge		--	8	--	uC

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=20mH, IAS =11A, VDD =100, RG=25Ω
3、The test condition is Pulse Test: ISD ≤ ID, di/dt = 100A/us, VDD ≤ BVDSS, Starting at TJ =25oC
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

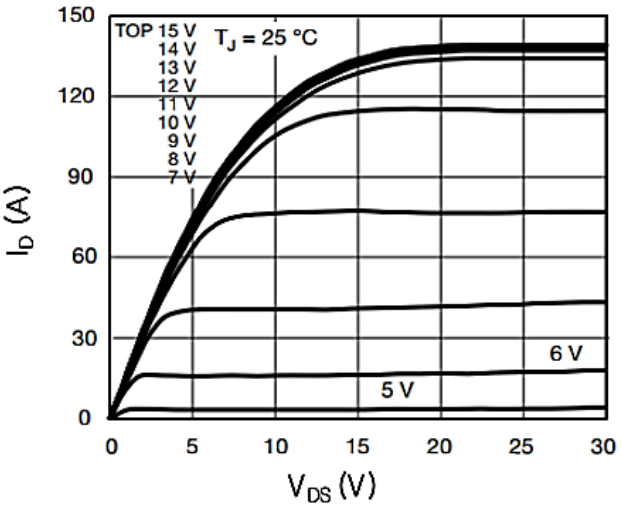


Fig1. Output characteristics

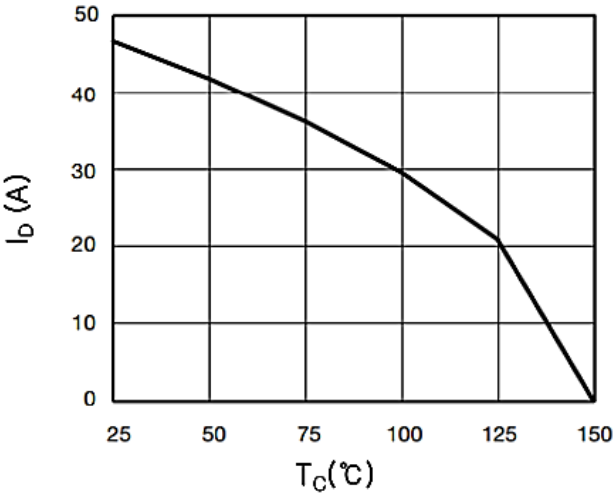


Fig2. - Maximum Drain Current vs. Case Temperature

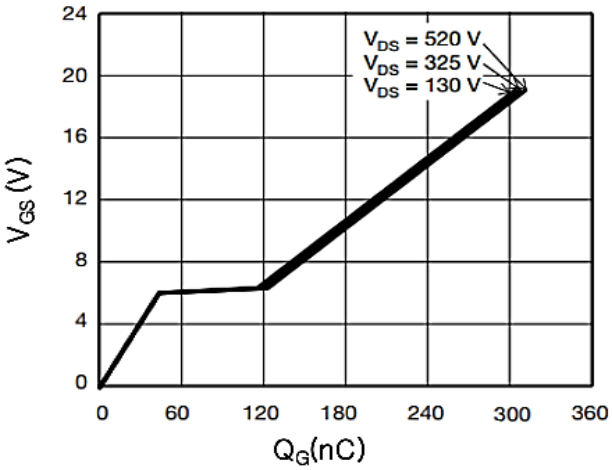


Fig3. Gate charge characteristics

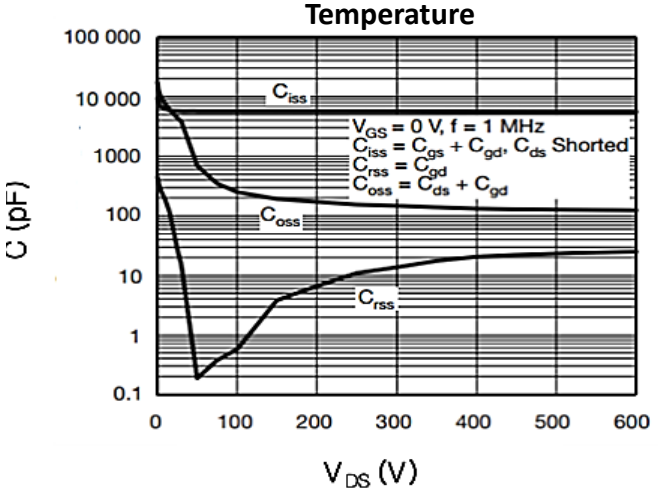


Fig 4. Capacitance Characteristics

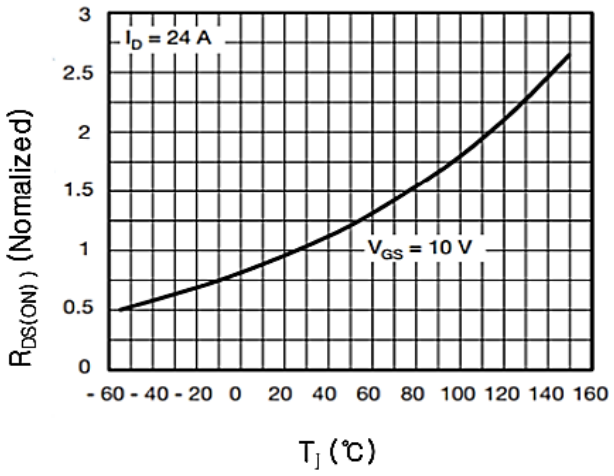


Fig 5. R DS (ON) vs junction temperature

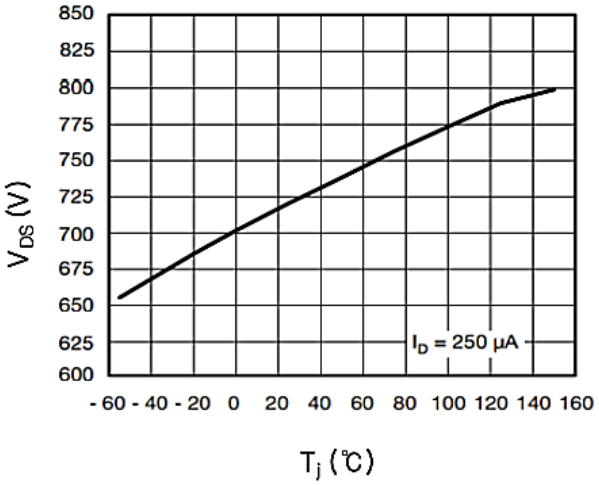


Fig 6. - Temperature vs. Drain-to-Source Voltage

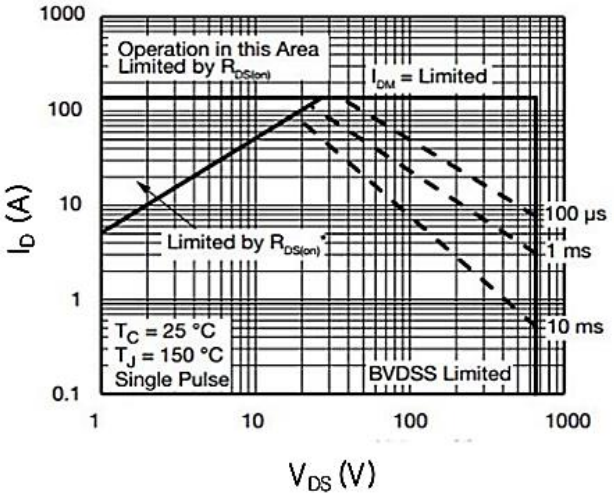


Fig 7 . Safe operating area

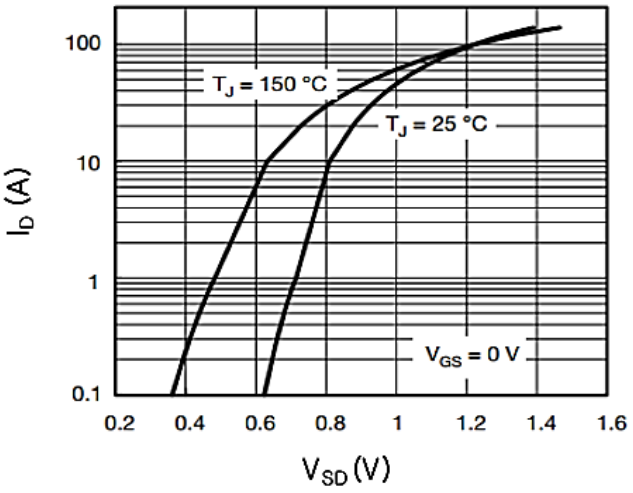


Fig 8. Forward characteristics of reverse diode

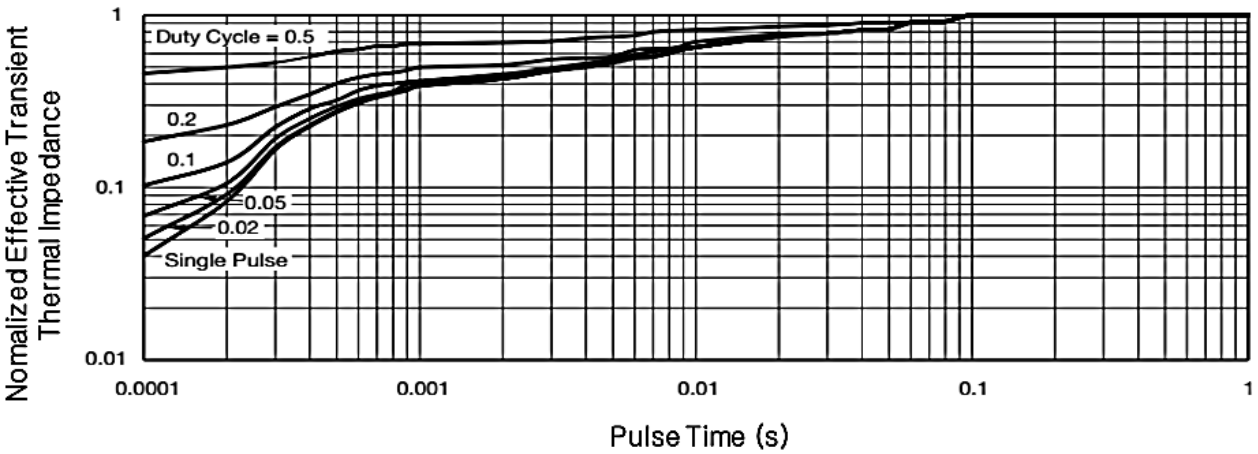
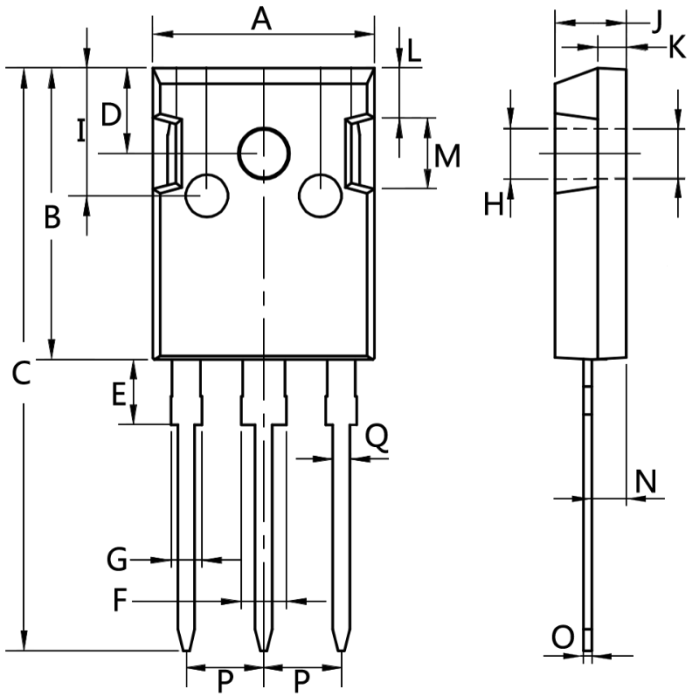


Fig 9 . Transient thermal impedance

Package Mechanical Data-TO-247-SLK



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

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Edition	Date	Change
Rve1.0	2018/1/31	Initial release