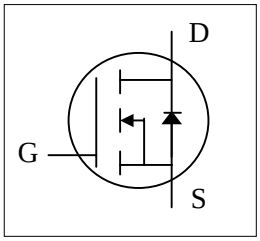
AP88N30W

RoHS-compliant Product

Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ **Simple Drive Requirement**
- ▼ **Lower On-resistance**
- ▼ **High Speed Switching**

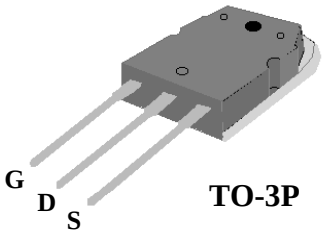


BV_{DSS}	300V
$R_{DS(ON)}$	48mΩ
I_D	48A

Description

AP88N30 from APEC provide the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

The TO-3P package is preferred for commercial & industrial applications with higher power level preclusion than TO-220 device.



TO-3P

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	300	V
V_{GS}	Gate-Source Voltage	±30	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	48	A
I_{DM}	Pulsed Drain Current[1]	160	A
I_{DR}	Body-Drain Diode Reverse Drain Current	48	A
$I_{DR(PULSE)}$	Body-Drain Diode Reverse Drain Peak Current[1]	160	A
P_D@T_C=25℃	Total Power Dissipation	312	W
	Linear Derating Factor	1.2	W/℃
I_{AR}	Avalanche Current	30	A
E_{AR}	Single Pulse Avalanche Energy[3]	45	mJ
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	0.4	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	40	℃/W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	300	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=30A	-	-	48	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	3	-	4.5	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=30A	-	62	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=300V, V_{GS}=0V	-	-	1	uA
	Drain-Source Leakage Current (T_j=125°C)	V_{DS}=240V, V_{GS}=0V	-	-	200	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±30V, V_{DS}=0V	-	-	±0.1	uA
Q_g	Total Gate Charge[2]	I_D=30A	-	150	250	nC
Q_{gs}	Gate-Source Charge	V_{DS}=240V	-	35	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=10V	-	60	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=150V	-	50	-	ns
t_r	Rise Time	I_D=30A	-	105	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=10Ω	-	220	-	ns
t_f	Fall Time	V_{GS}=10V	-	110	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	8440	13500	pF
C_{oss}	Output Capacitance	V_{DS}=15V	-	1775	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	70	-	pF
R_g	Gate Resistance	f=1.0MHz	-	2.2	3.3	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=30A, V_{GS}=0V	-	-	1.5	V
t_{rr}	Reverse Recovery Time[2]	I_S=10A, V_{GS}=0V	-	300	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	3.8	-	μC

Notes:

1.Pulse width limited by max. junction temperature

2.Pulse test

3.Starting T_j=25°C , V_{DD}=50V , L=1mH , R_G=25Ω , I_{AS}=30A.

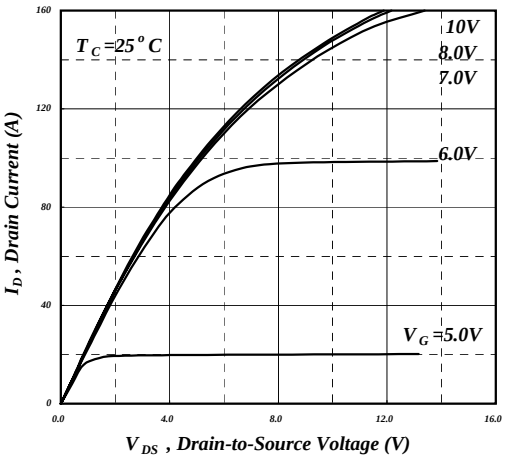


Fig 1. Typical Output Characteristics

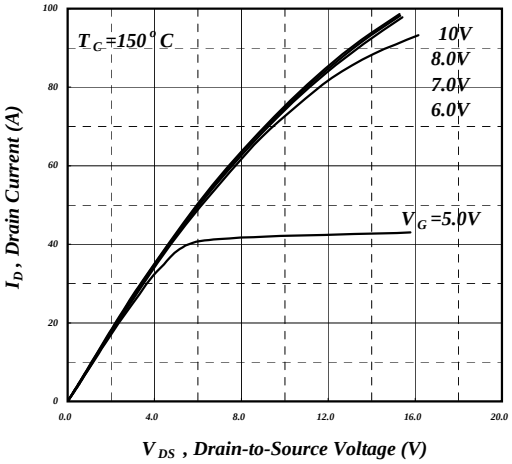


Fig 2. Typical Output Characteristics

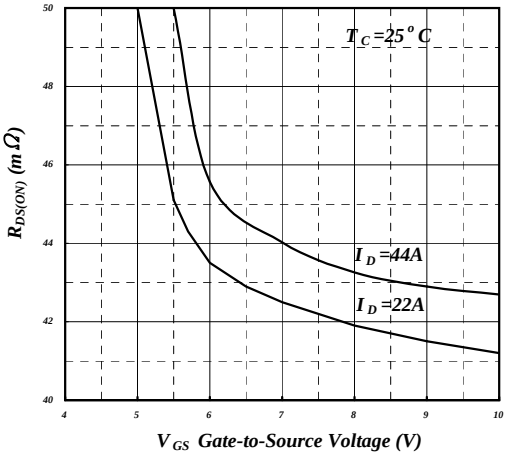


Fig 3. On-Resistance v.s. Gate Voltage

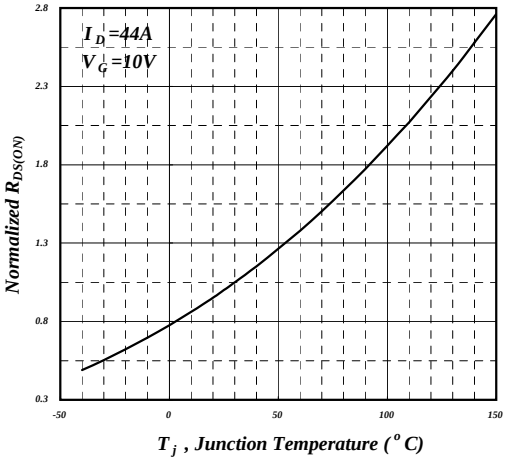


Fig 4. Normalized On-Resistance v.s. Junction Temperature

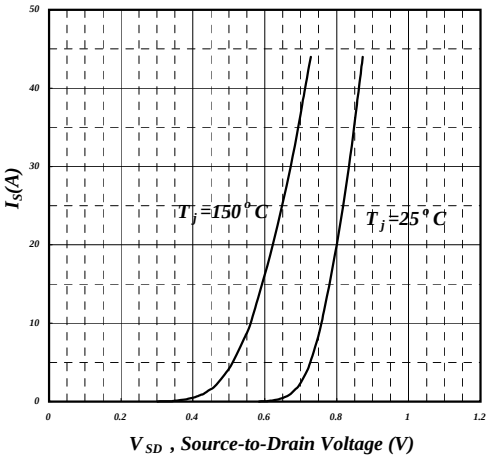


Fig 5. Forward Characteristic of Reverse Diode

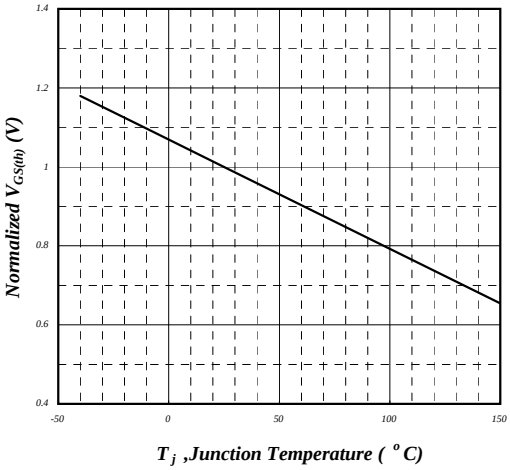


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

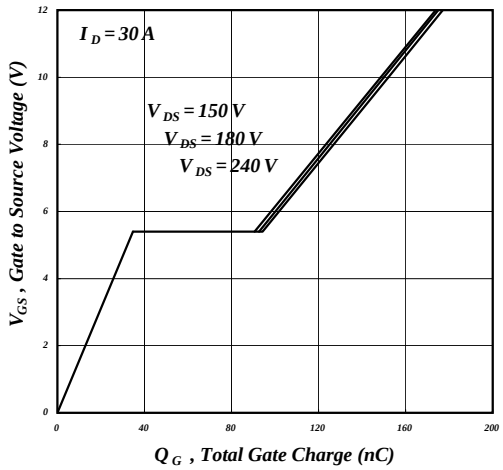


Fig 7. Gate Charge Characteristics

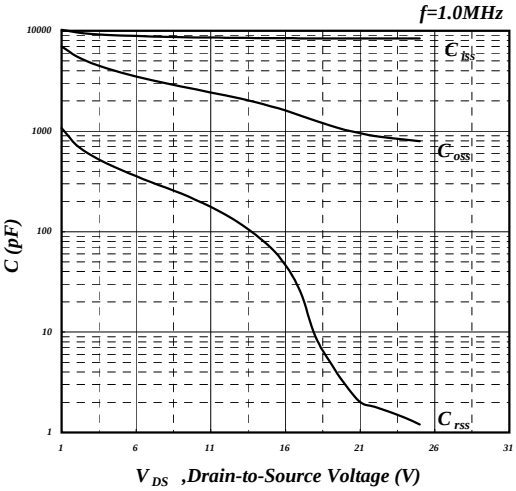


Fig 8. Typical Capacitance Characteristics

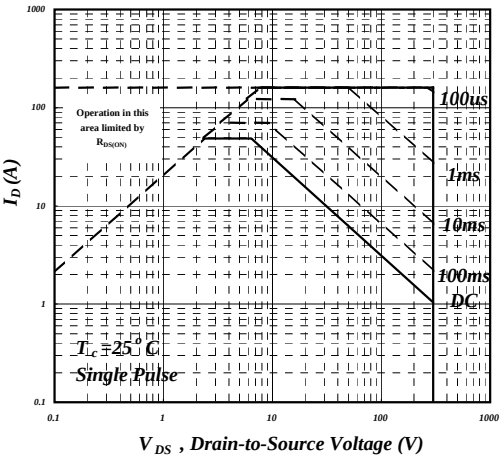


Fig 9. Maximum Safe Operating Area

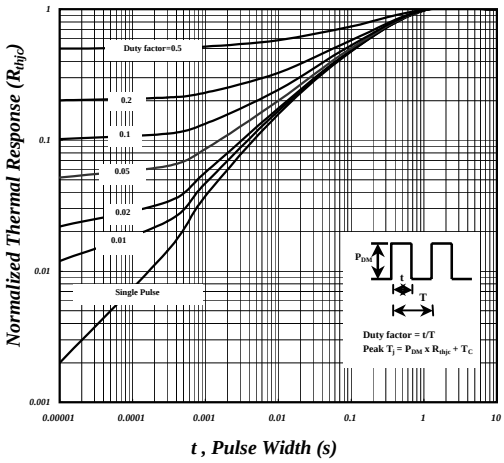


Fig 10. Effective Transient Thermal Impedance

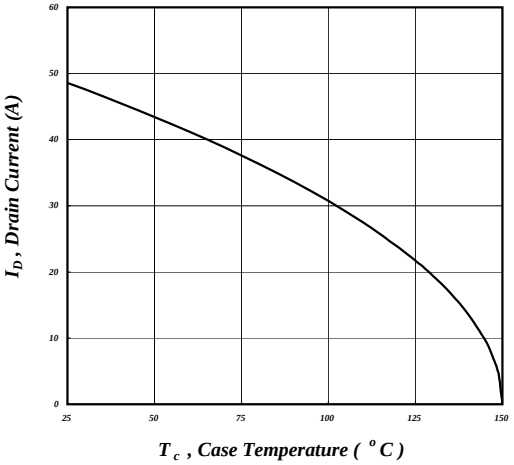


Fig 11. Maximum Drain Current v.s. Case Temperature

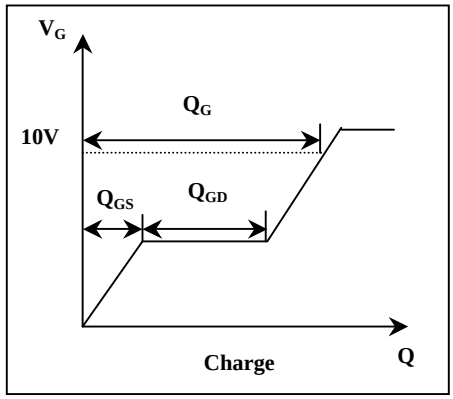


Fig 12. Gate Charge Waveform