AP88N30W

Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

▼ **Simple Drive Requirement**

▼ **Lower On-resistance**

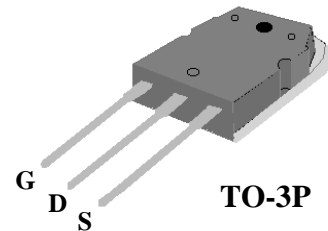▼ **High Speed Switching**
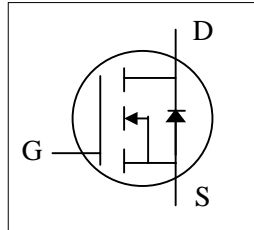
BV_{DSS}	300V
$R_{DS(ON)}$	48mΩ
I_D	48A

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	$\pm$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

Data and specifications subject to change without notice

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
	Drain-Source Leakage Current	V_{DS}=300V, V_{GS}=0V	-	-	1	uA
I_{DSS}	Drain-Source Leakage Current (T_j=125°C)	V_{DS}=240V, V_{GS}=0V	-	-	200	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=$\pm$30V, V_{DS}=0V	-	-	$\pm$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

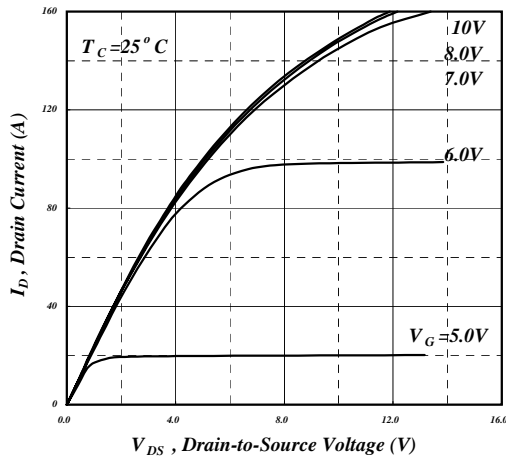3.Starting T_j=25°C , V_{DD}=50V , L=1mH , R_G=25Ω , I_{AS}=30A.

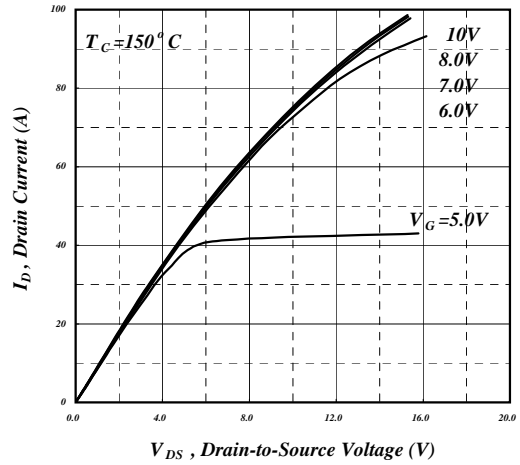**Fig 1. Typical Output Characteristics**
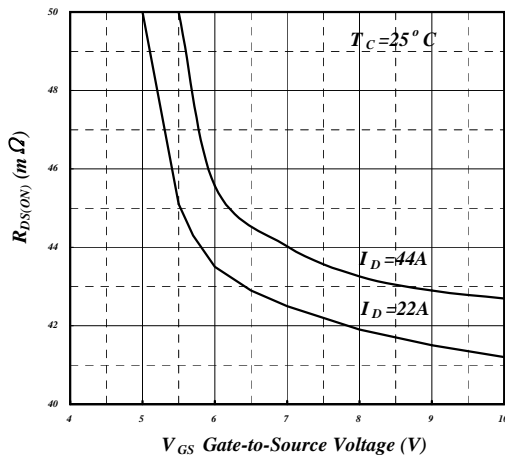

Fig 2. Typical Output Characteristics

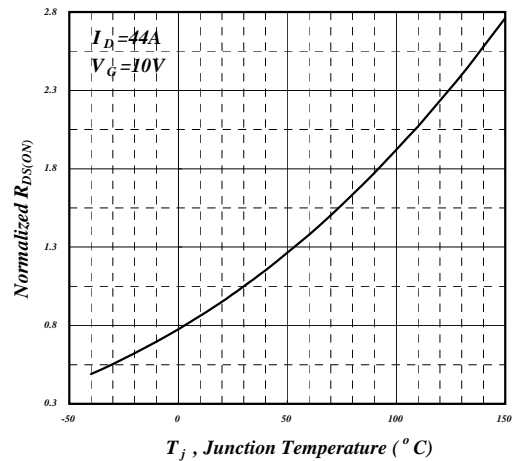**Fig 3. On-Resistance v.s. Gate Voltage**

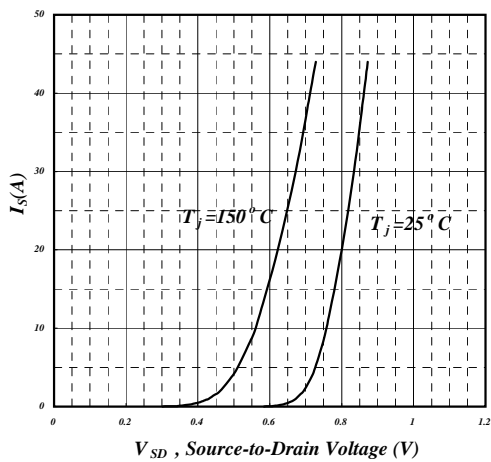**Fig 4. Normalized On-Resistance v.s. Junction Temperature**
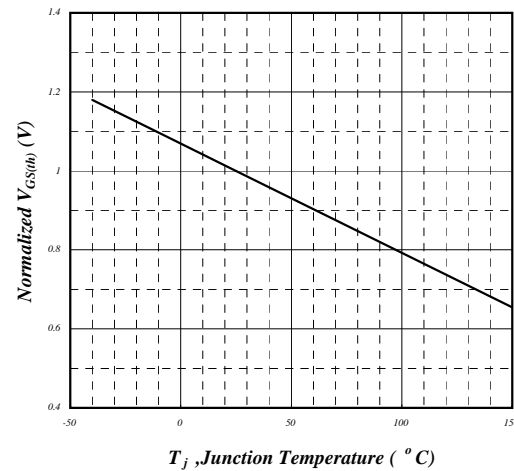

Fig 5. Forward Characteristic of Reverse Diode
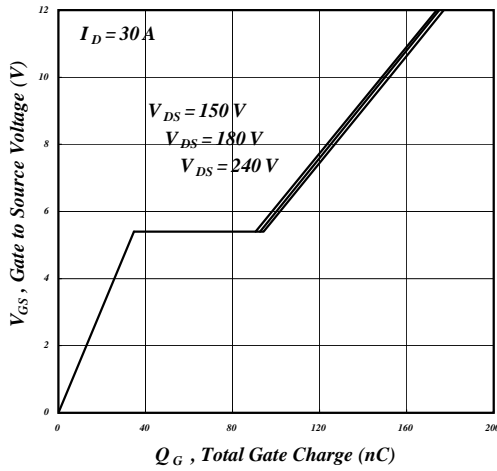

Fig 6. Gate Threshold Voltage v.s. Junction Temperature
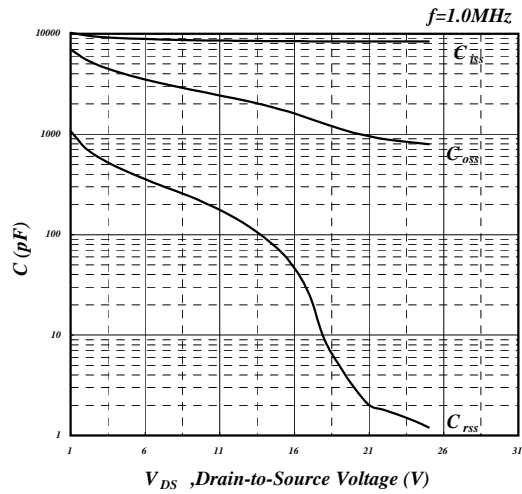
Fig 7. Gate Charge Characteristics

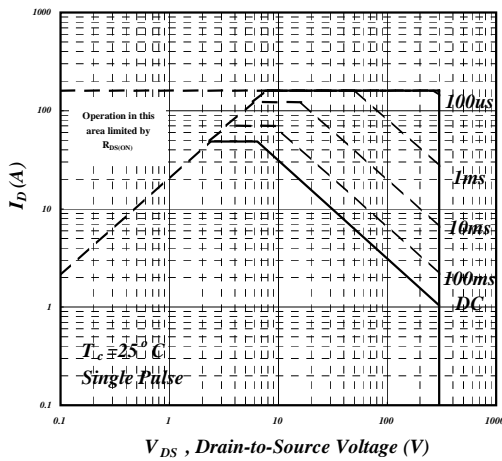**Fig 8. Typical Capacitance Characteristics**

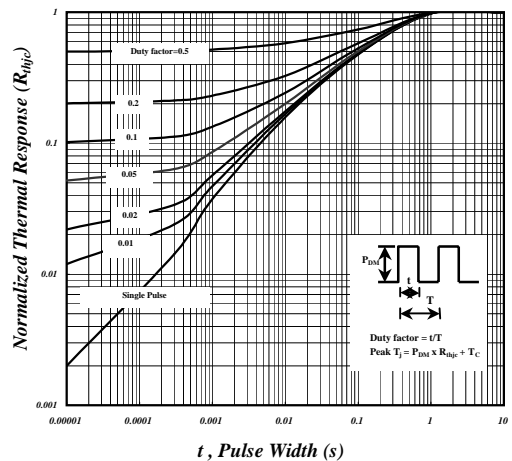**Fig 9. Maximum Safe Operating Area**

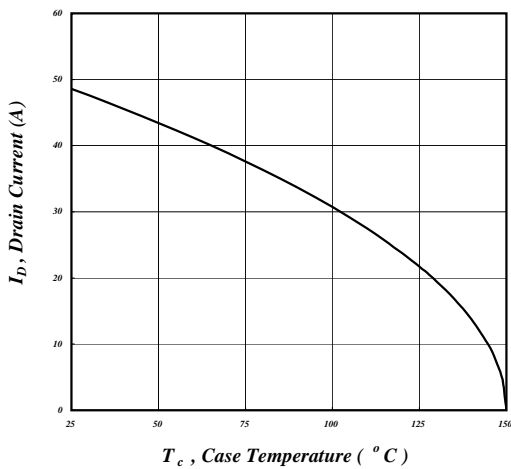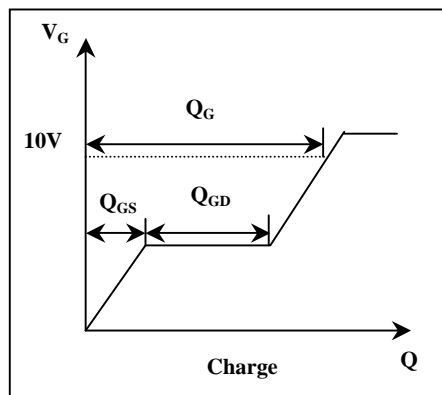**Fig 10. Effective Transient Thermal Impedance**

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

Fig 12. Gate Charge Waveform