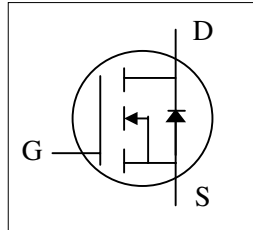




- ▼ Simple Drive Requirement
- ▼ Lower On-resistance
- ▼ High Speed Switching

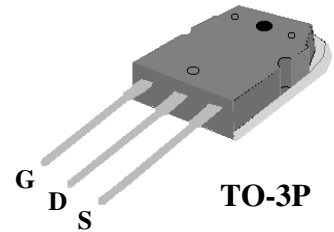


$BV_{DSS}$	300V
$R_{DS(ON)}$	66m $\Omega$
$I_D$	36A

## Description

AP80N30 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.



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	300	V
$V_{GS}$	Gate-Source Voltage	+30	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS}$ @ 10V	36	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	144	A
$I_{DR}$	Body-Drain Diode Reverse Drain Current	36	A
$I_{DR(PULSE)}$	Body-Drain Diode Reverse Drain Peak Current <sup>1</sup>	144	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	208	W
$I_{AR}$	Avalanche Current <sup>3</sup>	30	A
$E_{AR}$	Single Pulse Avalanche Energy <sup>3</sup>	45	mJ
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature	150	$^\circ\text{C}$

## Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	0.6	$^\circ\text{C}/\text{W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	40	$^\circ\text{C}/\text{W}$



# AP80N30W

## Electrical Characteristics@T<sub>j</sub>=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	300	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	-	-	66	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	3	-	4.5	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =30A	-	56	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =300V, V <sub>GS</sub> =0V	-	-	10	uA
	Drain-Source Leakage Current (T <sub>j</sub> =125°C)	V <sub>DS</sub> =240V, V <sub>GS</sub> =0V	-	-	200	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> = ±30V, V <sub>DS</sub> =0V	-	-	±0.1	uA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =30A	-	117	180	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =240V	-	28	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =10V	-	42	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =150V	-	40	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =30A	-	90	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =10Ω	-	165	-	ns
t <sub>f</sub>	Fall Time	V <sub>GS</sub> =10V	-	95	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	5700	9120	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =30V	-	525	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	10	-	pF

### Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =30A, V <sub>GS</sub> =0V	-	-	1.5	V
t <sub>rr</sub>	Reverse Recovery Time <sup>2</sup>	I <sub>S</sub> =12A, V <sub>GS</sub> =0V	-	310	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs	-	3.5	-	μC

### Notes:

- 1.Pulse width limited by max. junction temperature
- 2.Pulse test
- 3.Starting T<sub>j</sub>=25°C , V<sub>DD</sub>=50V , L=1mH , R<sub>G</sub>=25Ω , I<sub>AS</sub>=30A.

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

APEC DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

APEC RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.

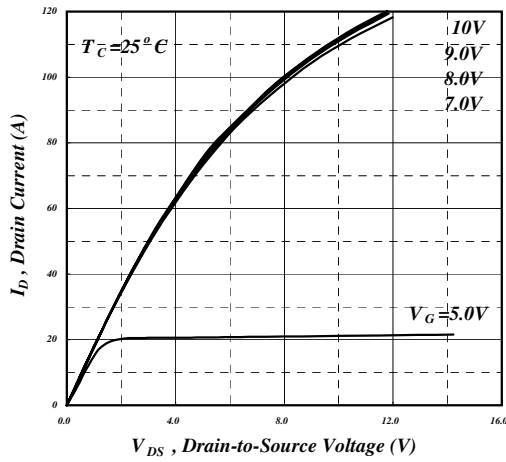


Fig 1. Typical Output Characteristics

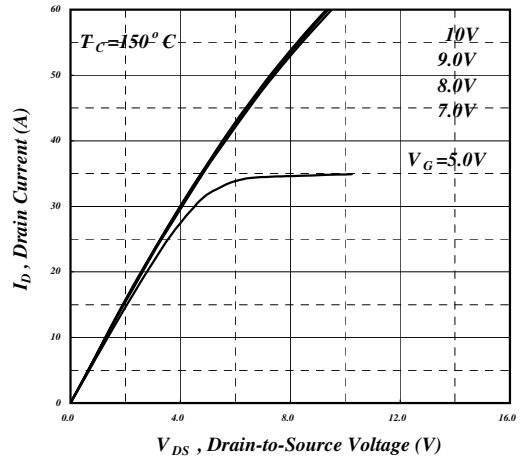


Fig 2. Typical Output Characteristics

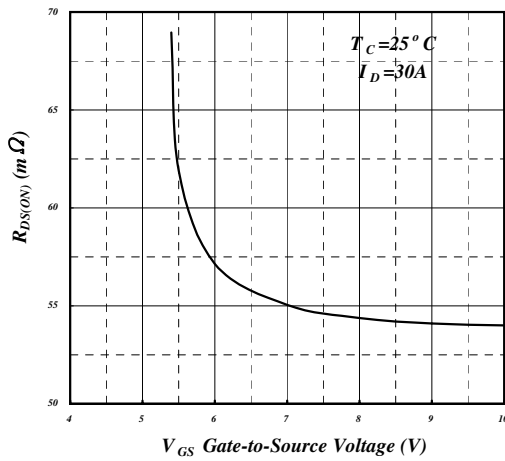


Fig 3. On-Resistance v.s. Gate Voltage

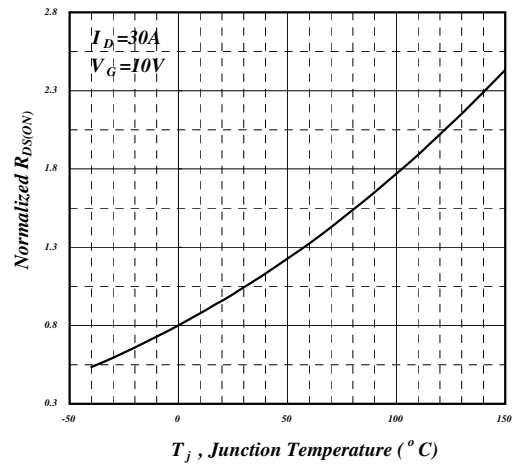


Fig 4. Normalized On-Resistance v.s. Junction Temperature

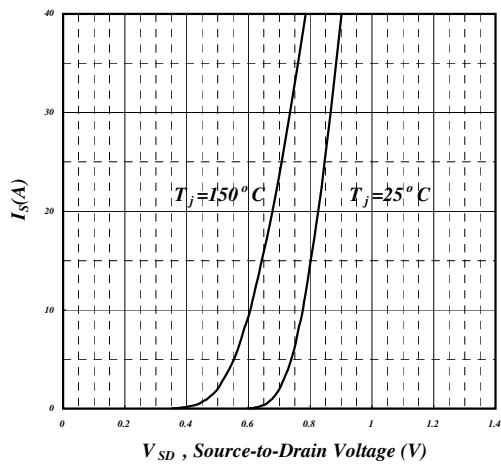


Fig 5. Forward Characteristic of Reverse Diode

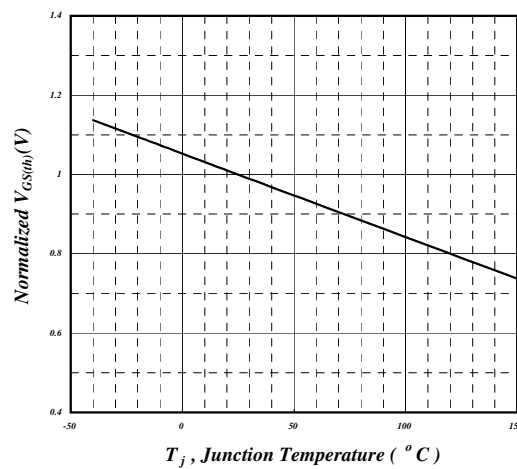


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

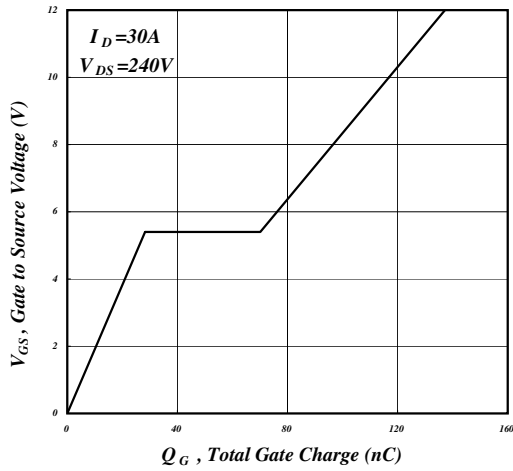


Fig 7. Gate Charge Characteristics

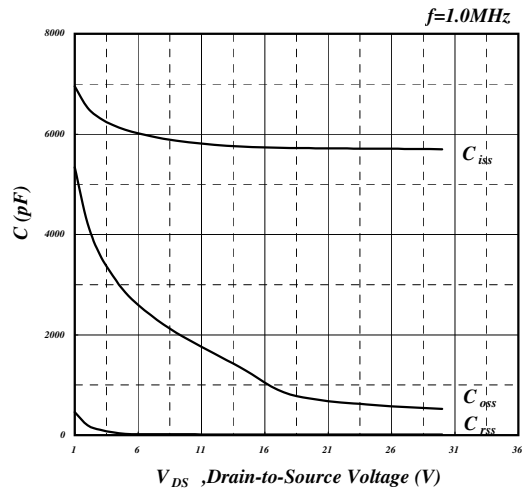


Fig 8. Typical Capacitance Characteristics

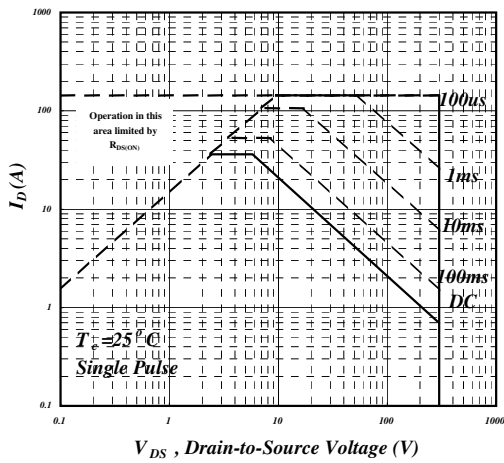


Fig 9. Maximum Safe Operating Area

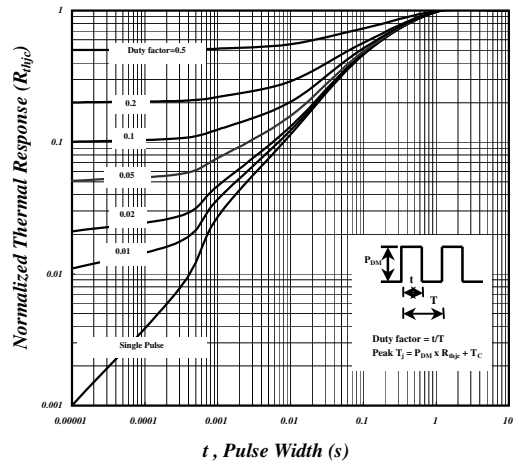


Fig 10. Effective Transient Thermal Impedance

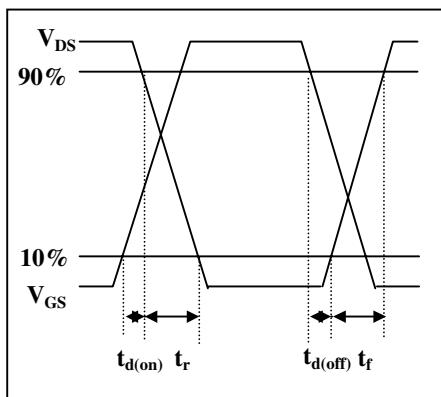


Fig 11. Switching Time Waveform

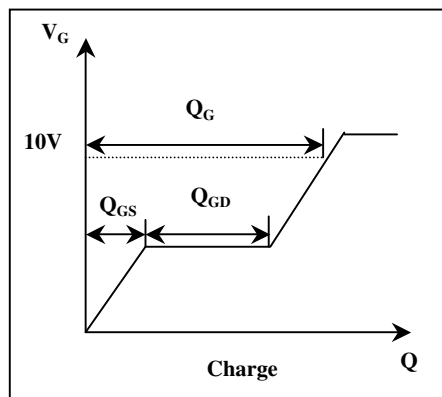


Fig 12. Gate Charge Waveform