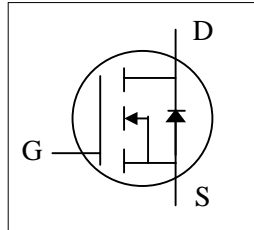




- ▼ 100% Avalanche Test
- ▼ Simple Drive Requirement
- ▼ Lower On-resistance
- ▼ RoHS Compliant

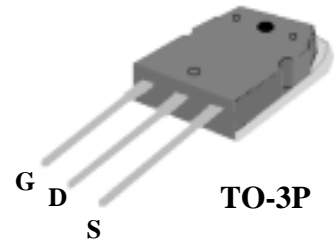


$BV_{DSS}$	250V
$R_{DS(ON)}$	68m $\Omega$
$I_D$	36A

## Description

AP30N30 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	250	V
$V_{GS}$	Gate-Source Voltage	$\pm 30$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS}$ @ 10V	36	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS}$ @ 10V	23	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	144	A
$P_D@T_C=25^\circ C$	Total Power Dissipation	208	W
	Linear Derating Factor	1.7	W/ $^\circ C$
$E_{AS}$	Single Pulse Avalanche Energy <sup>3</sup>	450	mJ
$I_{AR}$	Avalanche Current	30	A
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

## Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Thermal Resistance Junction-case	Max. 0.6	$^\circ C/W$
Rthj-a	Thermal Resistance Junction-ambient	Max. 40	$^\circ C/W$



# AP30N30W

## 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> =1mA	250	-	-	V
ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	-	0.24	-	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =15A	-	-	68	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.5	-	3.5	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =15A	-	23	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current (T <sub>j</sub> =25°C)	V <sub>DS</sub> =250V, V <sub>GS</sub> =0V	-	-	10	uA
	Drain-Source Leakage Current (T <sub>j</sub> =150°C)	V <sub>DS</sub> =200V, V <sub>GS</sub> =0V	-	-	100	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> = ±30V	-	-	±1	uA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =15A	-	63	100	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =200V	-	19	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =10V	-	14	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =125V	-	28	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =15A	-	36	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =10Ω, V <sub>GS</sub> =10V	-	84	-	ns
t <sub>f</sub>	Fall Time	R <sub>D</sub> =8.3Ω	-	45	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	4290	6900	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =25V	-	550	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	6	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	1.9	3	Ω

### 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> =36A, V <sub>GS</sub> =0V	-	-	1.5	V
t <sub>rr</sub>	Reverse Recovery Time <sup>2</sup>	I <sub>S</sub> =15A, V <sub>GS</sub> =0V	-	235	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	dI/dt=100A/μs	-	2.24	-	μC

### Notes:

- 1.Pulse width limited by safe operating area.
- 2.Pulse width ≤300us , duty cycle ≤2%.
- 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.

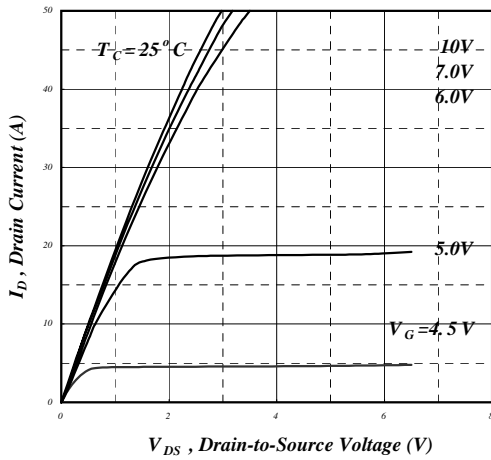


Fig 1. Typical Output Characteristics

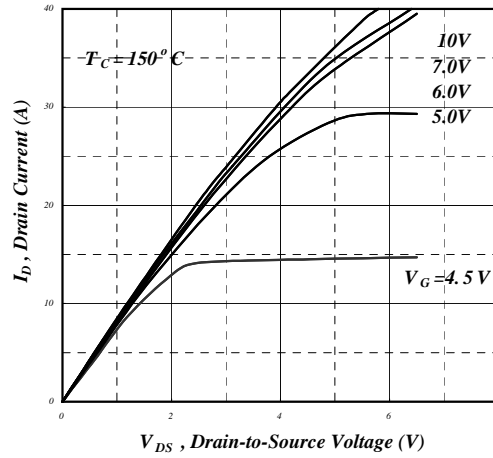


Fig 2. Typical Output Characteristics

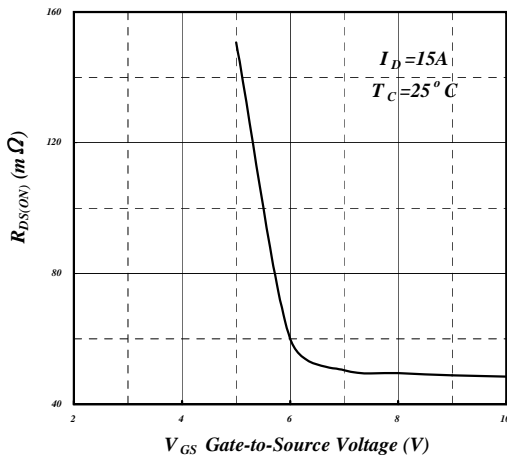


Fig 3. On-Resistance v.s. Gate Voltage

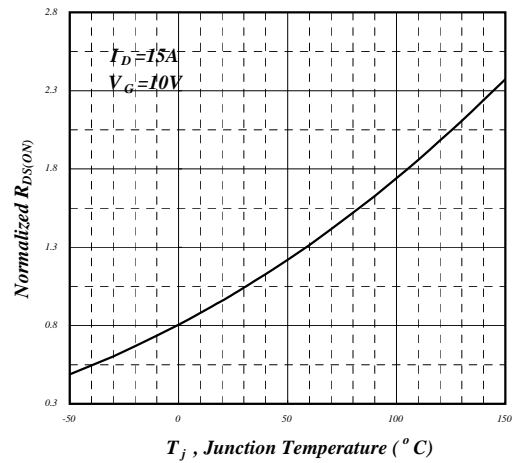


Fig 4. Normalized On-Resistance v.s. Junction Temperature

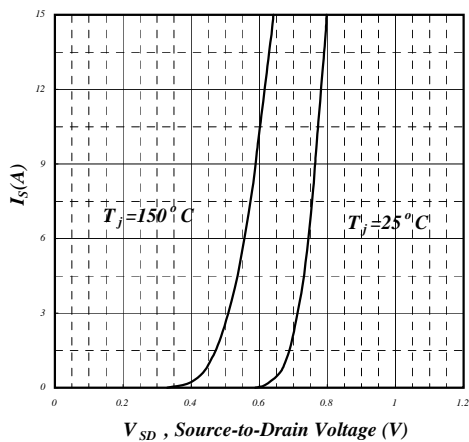


Fig 5. Forward Characteristic of Reverse Diode

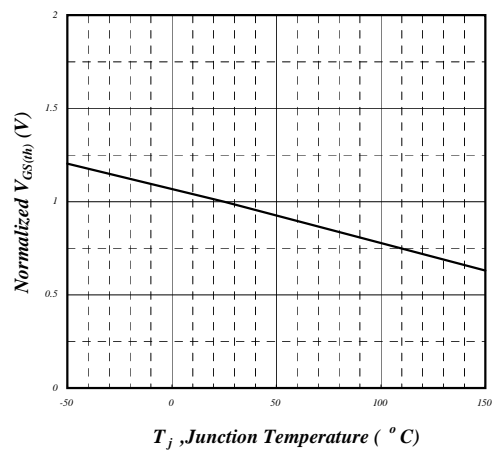


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

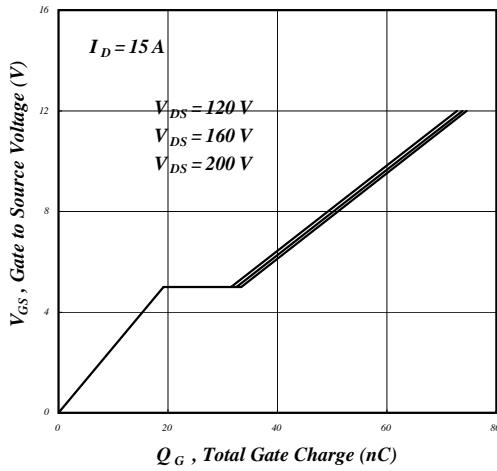


Fig 7. Gate Charge Characteristics

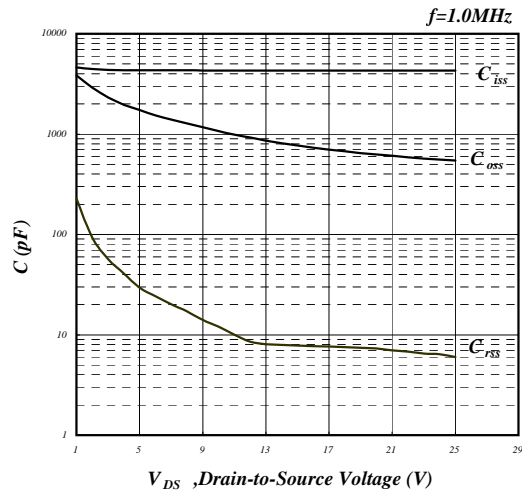


Fig 8. Typical Capacitance Characteristics

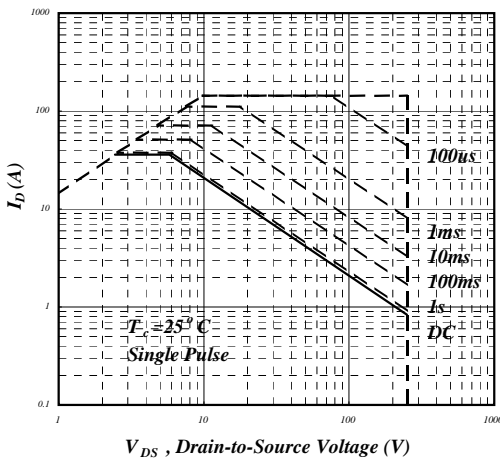


Fig 9. Maximum Safe Operating Area

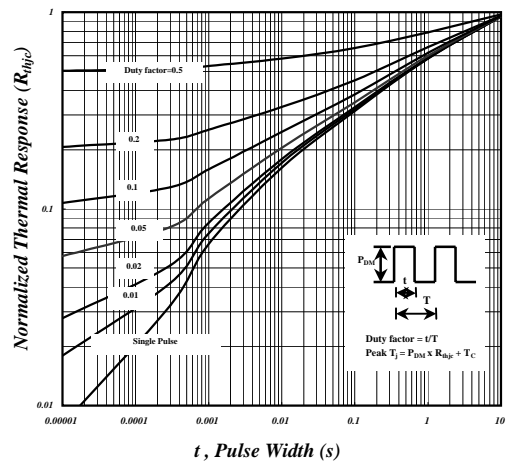


Fig 10. Effective Transient Thermal Impedance

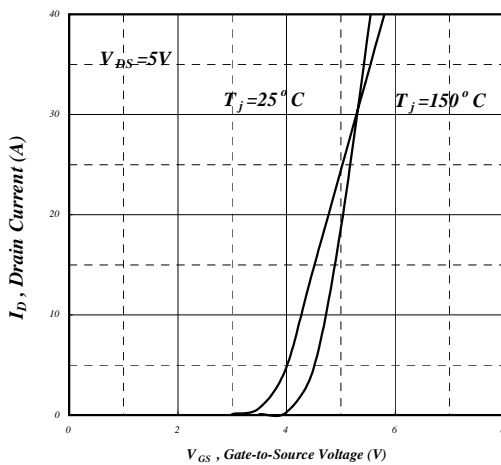


Fig 11. Transfer Characteristics

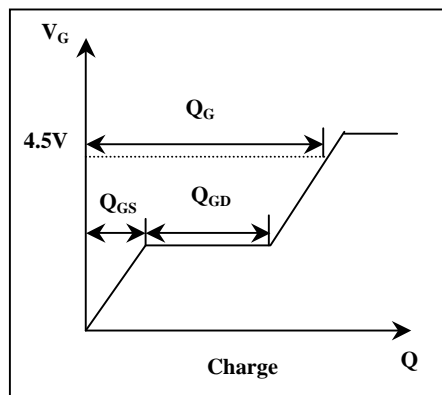


Fig 12. Gate Charge Waveform