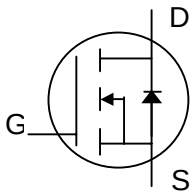
N-channel Enhancement-mode Power MOSFET

Low On-Resistance

Simple Drive Requirement

Fast Switching Characteristics

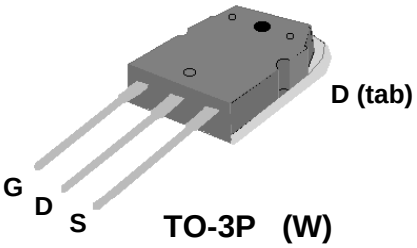


BV_{DSS}	300V
$R_{DS(ON)}$	66mΩ
I_D	36A

Description

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

The AP80N30W-HF-3 is in the TO-3P through-hole package which is widely used in higher power commercial and industrial applications where an attached heatsink is required.
This device is well suited for use in applications such as motor drives, inverteers and DC/DC converters.



TO-3P (W)

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	300	V
V_{GS}	Gate-Source Voltage	±30	
I_D at T_C=25°C	Continuous Drain Current	36	A
I_{DM}	Pulsed Drain Current[1]	144	A
I_{DR}	Body-Drain Diode Reverse Drain Current	36	A
$I_{DR(PULSE)}$	Body-Drain Diode Reverse Drain Peak Current[1]	144	A
P_D at T_C=25°C	Total Power Dissipation	208	W
	Linear Derating Factor	1.67	W/°C
I_{AR}	Avalanche Current	30	A
E_{AR}	Single Pulse Avalanche Energy[3]	45	mJ
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	0.6	°C/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	40	°C/W

Ordering Information

AP80N30W-HF-3TB : in RoHS-compliant, halogen-free TO-3P, shipped in tubes (1440 pcs/carton)

Electrical Specifications at 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	-	-	66	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	-	56	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=300V, V_{GS}=0V	-	-	10	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	-	117	180	nC
Q_{gs}	Gate-Source Charge	V_{DS}=240V	-	28	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=10V	-	42	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=150V	-	40	-	ns
t_r	Rise Time	I_D=30A	-	90	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=10Ω	-	165	-	ns
t_f	Fall Time	V_{GS}=10V	-	95	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	5700	9120	pF
C_{oss}	Output Capacitance	V_{DS}=15V	-	525	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	10	-	pF

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=12A, V_{GS}=0V	-	310	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	3.5	-	μC

Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse test
3. Starting Tj=25°C , V_{DD}=50V , L=1mH , R_G=25Ω , I_{AS}=30A.

Typical Electrical Characteristics

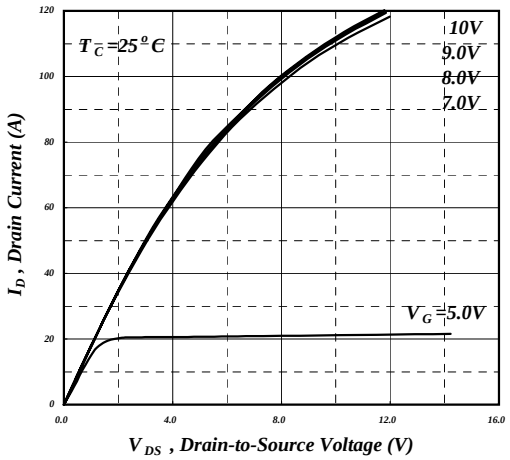


Fig 1. Typical Output Characteristics

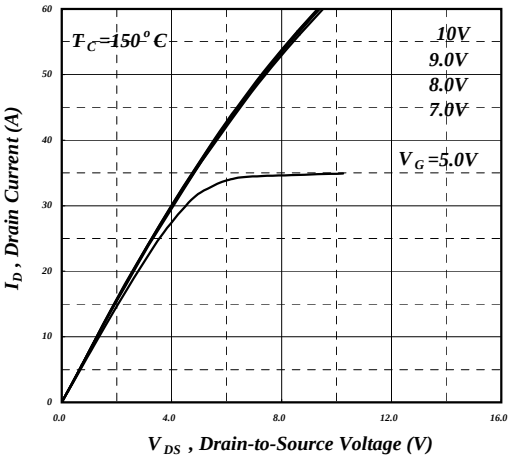


Fig 2. Typical Output Characteristics

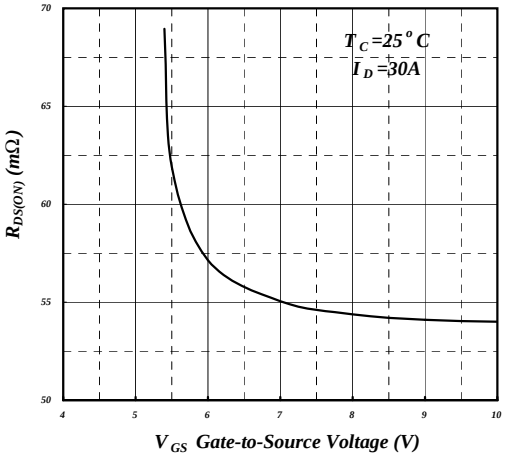


Fig 3. On-Resistance vs. Gate Voltage

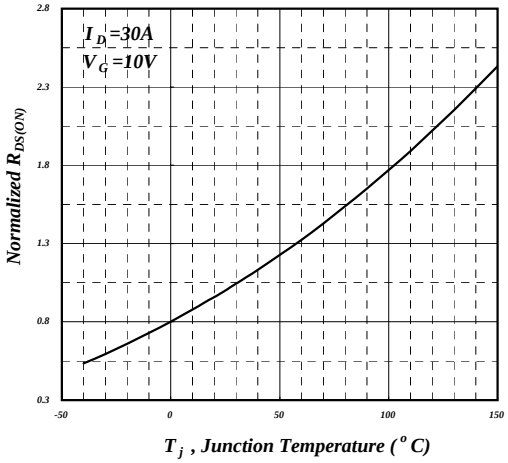


Fig 4. Normalized On-Resistance vs. Junction Temperature

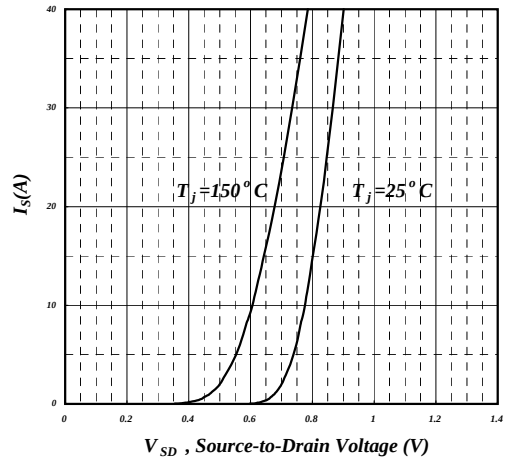


Fig 5. Forward Characteristic of Reverse Diode

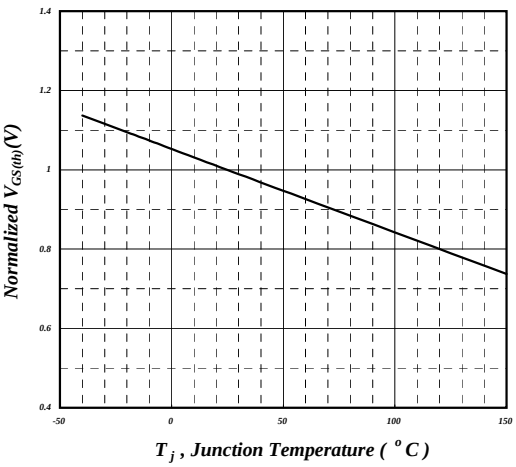


Fig 6. Gate Threshold Voltage vs. Junction Temperature

Typical Electrical Characteristics (cont.)

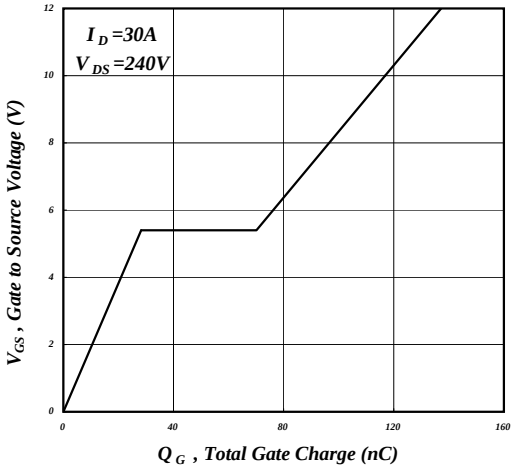


Fig 7. Gate Charge Characteristics

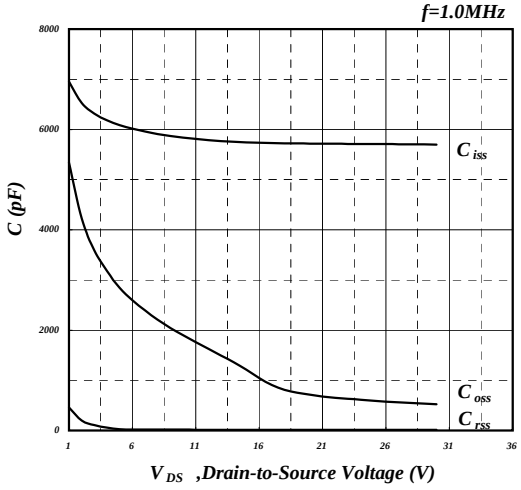


Fig 8. Typical Capacitance Characteristics

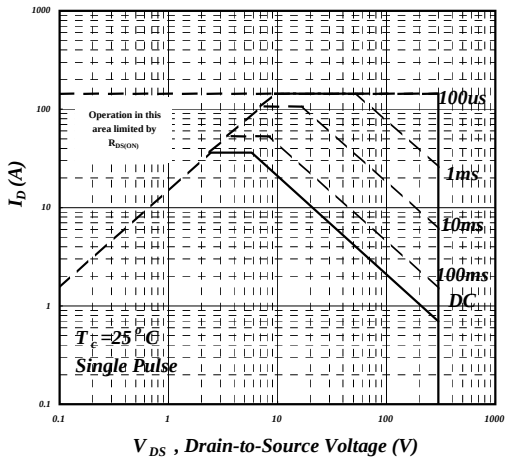


Fig 9. Maximum Safe Operating Area

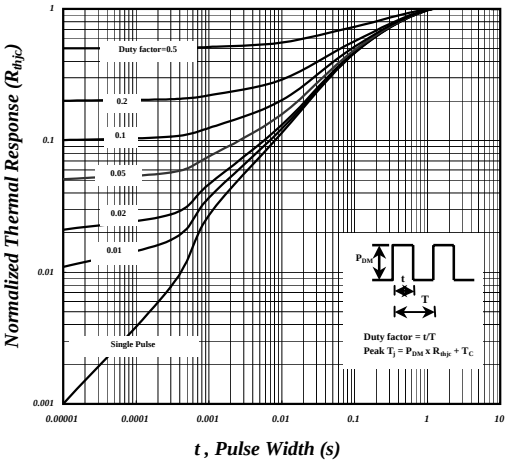


Fig 10. Effective Transient Thermal Impedance

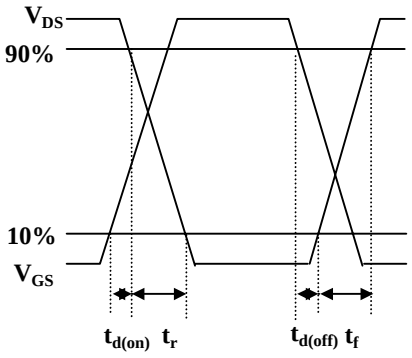


Fig 11. Switching Time Waveform

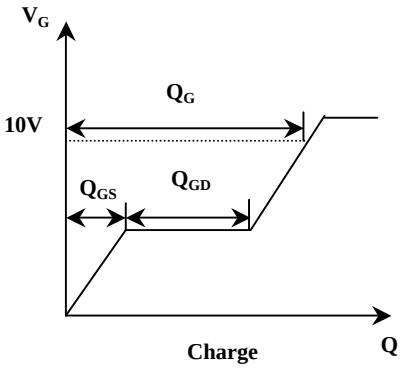
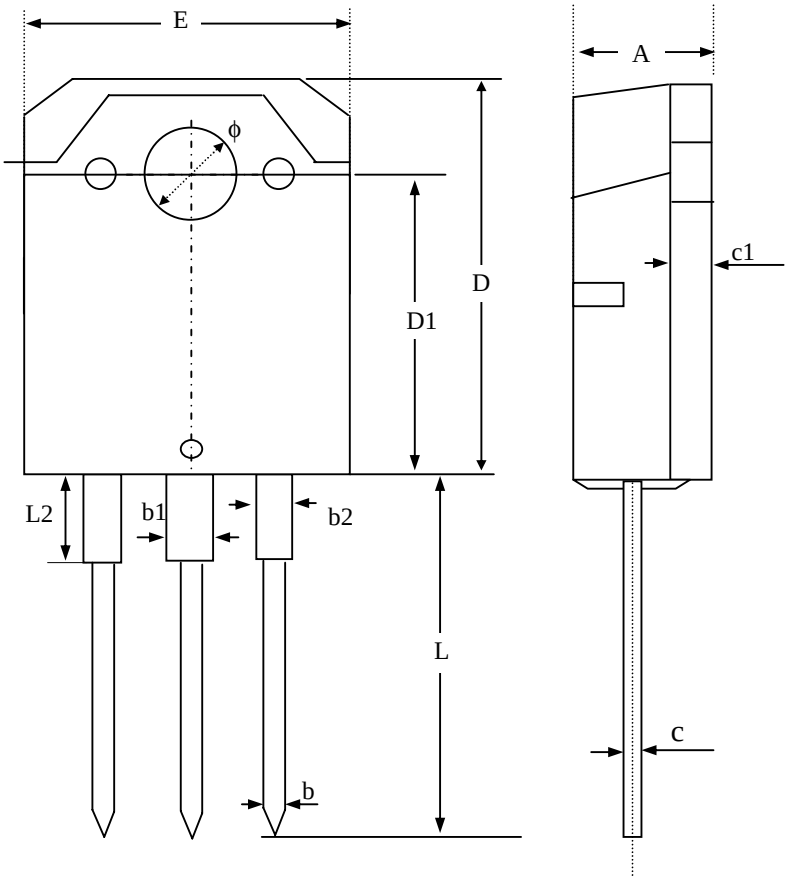


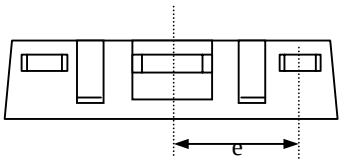
Fig 12. Gate Charge Waveform

Package Dimensions: TO-3P



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.50	4.80	5.10
b	0.80	1.00	1.30
b1	1.80	2.50	3.20
b2	1.30	--	2.30
c	0.40	0.60	0.90
c1	1.40	--	2.20
D	19.70	20.00	20.30
D1	14.70	15.00	15.30
E	15.30	--	16.10
e	4.45	5.45	6.45
L	17.50	--	20.50
L2	1.00	--	3.70
ϕ	3.00	3.20	3.40

1. All dimensions are in millimeters.
2. Dimensions do not include mold protrusions.



Marking Information: