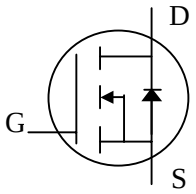
N-channel Enhancement-mode Power MOSFET

Low Gate Charge

Simple Drive Requirement

Fast Switching Characteristics

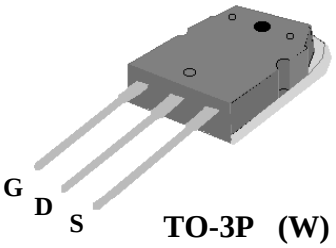


BV_{DSS}	75V
$R_{DS(ON)}$	11mΩ
I_D	90A

Description

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

The AP75N07GW-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	75	V
V_{GS}	Gate-Source Voltage	±20	V
I_D at T_C=25°C	Continuous Drain Current [4]	90	A
I_D at T_C=100°C	Continuous Drain Current	70	A
I_{DM}	Pulsed Drain Current[1]	360	A
P_D at T_C=25°C	Total Power Dissipation	250	W
	Linear Derating Factor	2	W/°C
E_{AS}	Single Pulse Avalanche Energy[3]	450	mJ
T_{STG}	Storage Temperature Range	-55 to 150	°C/W
T_J	Operating Junction Temperature Range	-55 to 150	°C/W

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	0.5	°C/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	40	°C/W

Ordering Information

AP75N07GW-HF-3TB **RoHS-compliant, halogen-free TO-3P, shipped in tubes**

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=1mA	75	-	-	V
$\Delta BV_{DSS}/\Delta Tj$	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I_D=1mA	-	0.08	-	V/°C
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=40A	-	-	11	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	-	3	V
g_{fs}	Forward Transconductance	V_{DS}=15V, I_D=40A	-	120	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=75V, V_{GS}=0V	-	-	10	uA
	Drain-Source Leakage Current (T_j=125°C)	V_{DS}=60V, V_{GS}=0V	-	-	250	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=40A	-	83	130	nC
Q_{gs}	Gate-Source Charge	V_{DS}=60V	-	10	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	51	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DD}=40V	-	15	-	ns
t_r	Rise Time	I_D=30A	-	73	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=10Ω , V_{GS}=10V	-	340	-	ns
t_f	Fall Time	R_D=1.33Ω	-	200	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	4270	6830	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	690	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	320	-	pF
R_g	Gate Resistance	f=1.0MHz	-	1.8	2.7	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	T_j=25°C, I_S=40A, V_{GS}=0V	-	-	1.5	V
t_{rr}	Reverse Recovery Time	I_S=40A, V_{GS}=0V	-	90	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	235	-	nC

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.
4. Package-limited current is 90A .

Typical Electrical Characteristics

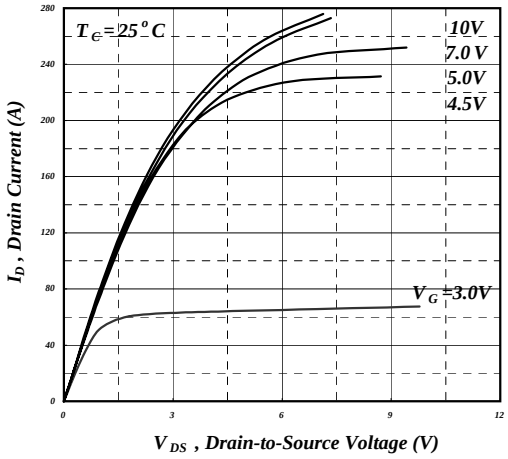


Fig 1. Typical Output Characteristics

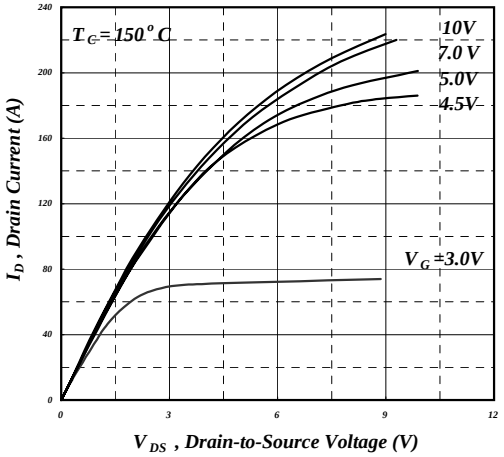


Fig 2. Typical Output Characteristics

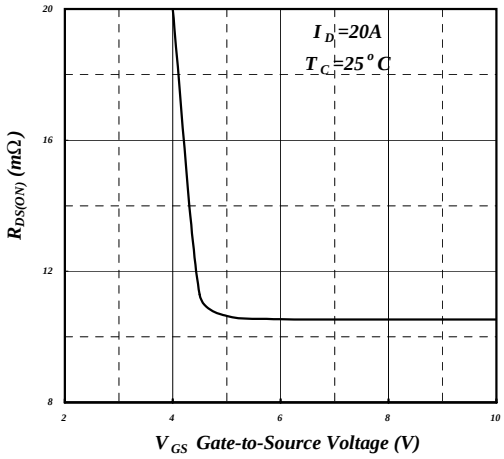


Fig 3. Normalized BV_{DSS} vs. Junction Temperature

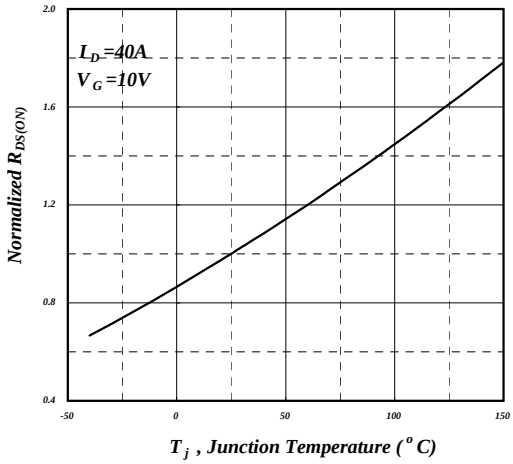


Fig 4. Normalized On-Resistance vs. Junction Temperature

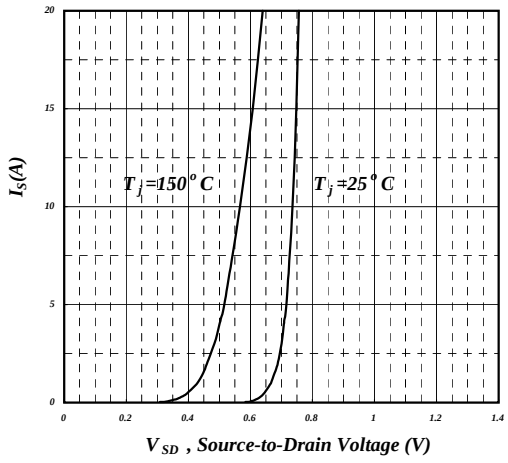


Fig 5. Forward Characteristic of Reverse Diode

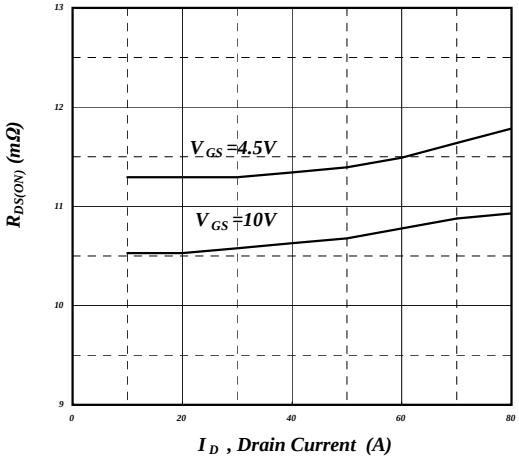


Fig 6. Gate Threshold Voltage vs. Junction Temperature

Typical Electrical Characteristics (cont.)

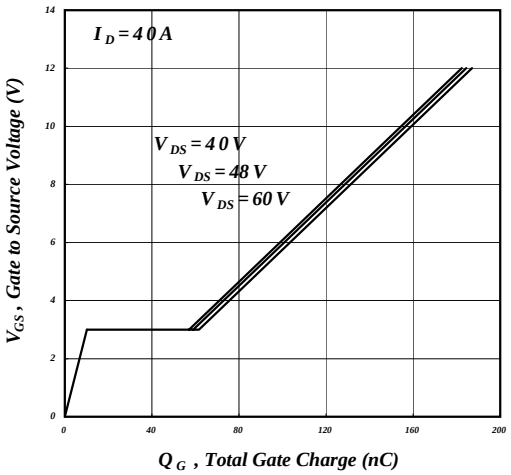


Fig 7. Gate Charge Characteristics

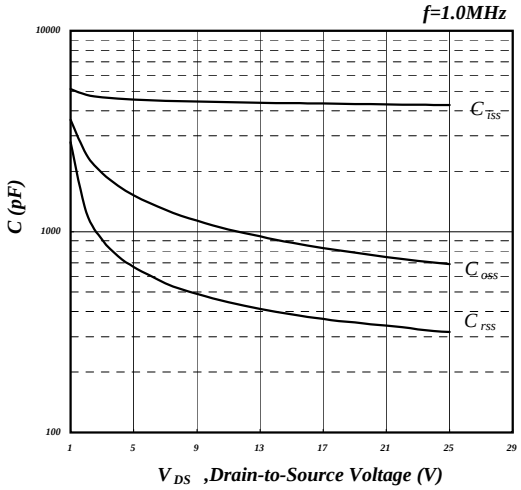


Fig 8. Typical Capacitance Characteristics

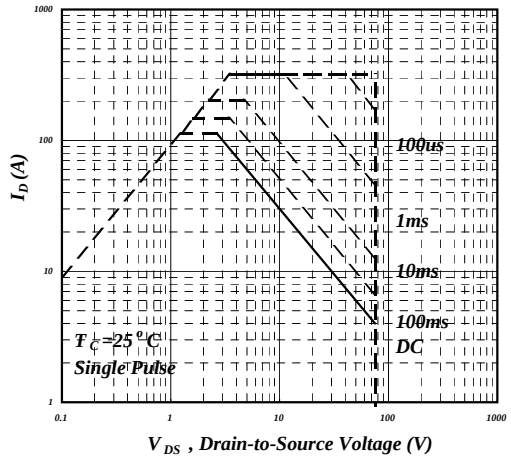


Fig 9. Maximum Safe Operating Area

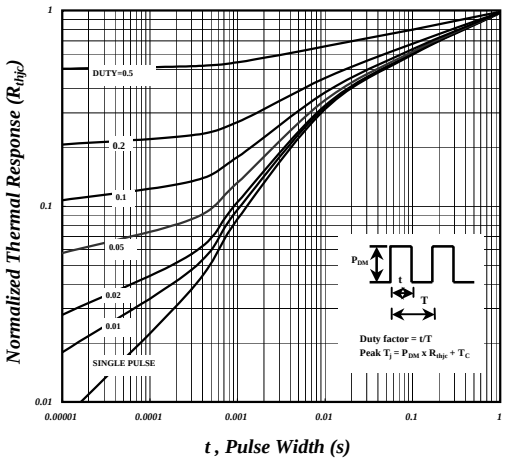


Fig 10. Effective Transient Thermal Impedance

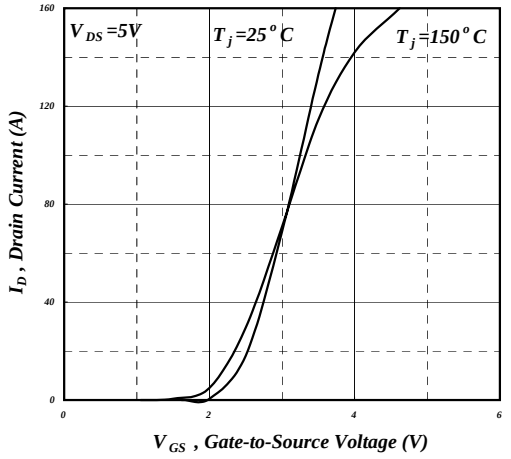


Fig 11. Transfer Characteristics

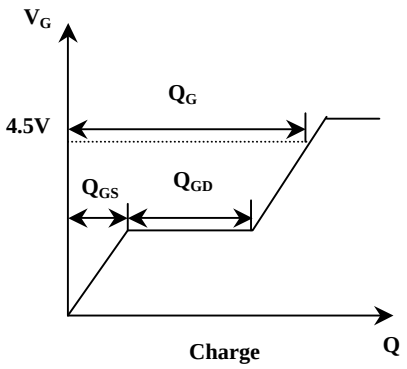
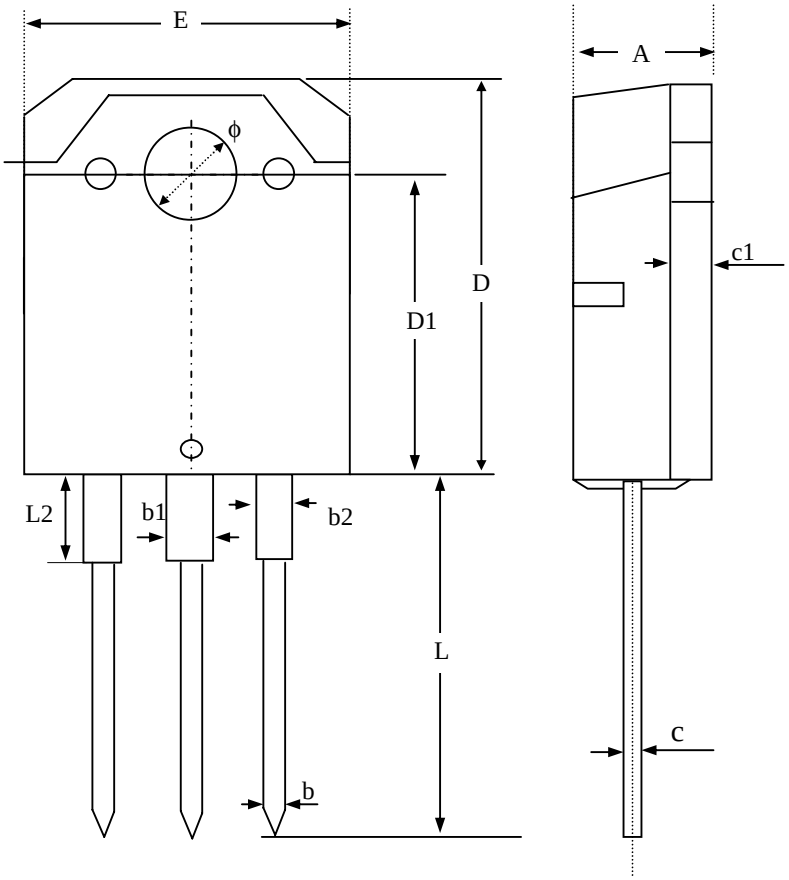


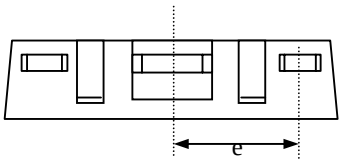
Fig 12. Gate Charge Waveform

Package Dimensions: TO-3P

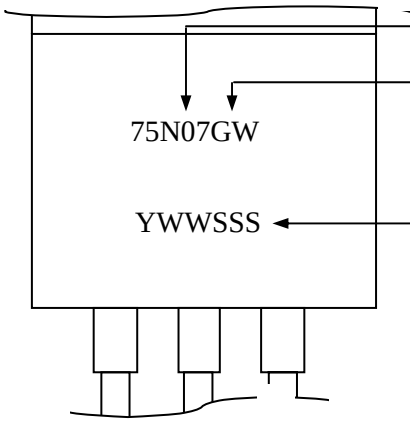


SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.50	4.80	5.10
b	0.80	1.00	1.30
b1	1.80	2.50	3.20
b2	1.30	--	2.30
c	0.40	0.60	0.90
c1	1.40	--	2.20
D	19.70	20.00	20.30
D1	14.70	15.00	15.30
E	15.30	--	16.10
e	4.45	5.45	6.45
L	17.50	--	20.50
L2	1.00	--	3.70
ϕ	3.00	3.20	3.40

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



Marking Information: TO-3P



Product: AP75N07

Package code
GW = RoHS-compliant, halogen free TO-3P

Date/lot code (YWWSSS)
Y: Last digit of the year
WW: Work week
SSS: Lot code sequence