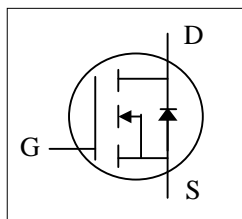


- ▼ Low Gate Charge
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic
- ▼ Halogen Free & RoHS Compliant Product

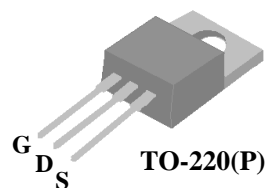


BV_{DSS}	75V
$R_{DS(ON)}$	11m Ω
I_D	80A

Description

AP75N07A series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The TO-220 package is widely preferred for all commercial-industrial through hole applications. The low thermal resistance and low package cost contribute to the worldwide popular package.



Absolute Maximum Ratings @ $T_J=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	75	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D @ T_C=25^\circ\text{C}$	Drain Current, $V_{GS} @ 10V^4$	80	A
$I_D @ T_C=100^\circ\text{C}$	Drain Current, $V_{GS} @ 10V$	70	A
I_{DM}	Pulsed Drain Current ¹	320	A
$P_D @ T_C=25^\circ\text{C}$	Total Power Dissipation	300	W
E_{AS}	Single Pulse Avalanche Energy ³	450	mJ
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	0.5	$^\circ\text{C}/\text{W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	62	$^\circ\text{C}/\text{W}$



AP75N07AGP-HF

Electrical Characteristics @ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	75	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=40A$	-	-	11	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
g_{fs}	Forward Transconductance	$V_{DS}=15V, I_D=40A$	-	78	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=75V, V_{GS}=0V$	-	-	10	μA
	Drain-Source Leakage Current ($T_j=125^\circ\text{C}$)	$V_{DS}=60V, V_{GS}=0V$	-	-	250	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 100	nA
Q_g	Total Gate Charge	$I_D=40A$	-	100	160	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=60V$	-	13	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=10V$	-	47	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=40V$	-	15	-	ns
t_r	Rise Time	$I_D=30A$	-	80	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega$	-	67	-	ns
t_f	Fall Time	$V_{GS}=10V$	-	86	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	3220	5150	pF
C_{oss}	Output Capacitance	$V_{DS}=25V$	-	650	-	pF
C_{riss}	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	220	-	pF
R_g	Gate Resistance	$f=1.0\text{MHz}$	-	3.5	7	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$T_j=25^\circ\text{C}, I_S=40A, V_{GS}=0V$	-	-	1.5	V
t_{rr}	Reverse Recovery Time	$I_S=40A, V_{GS}=0V$	-	80	-	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu s$	-	235	-	nC

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse test
3. Starting $T_j=25^\circ\text{C}$, $V_{DD}=50V$, $L=1\text{mH}$, $R_G=25\Omega$, $I_{AS}=30A$.
4. Package limitation current is 80A, calculated continuous current based on maximum allowable junction temperature is 108A.

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.

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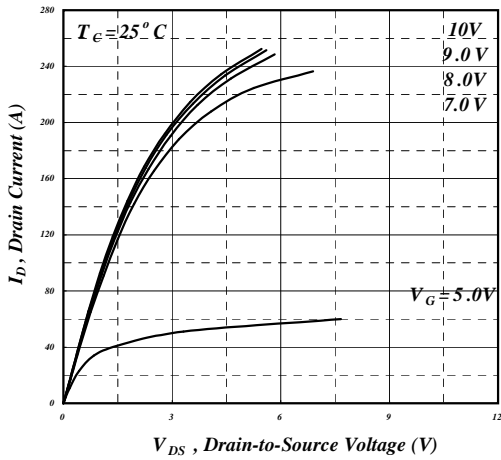


Fig 1. Typical Output Characteristics

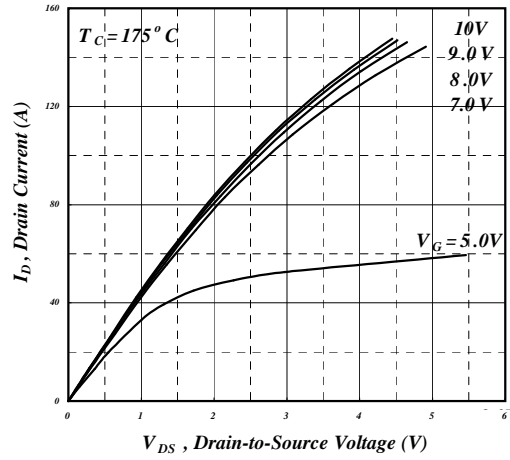


Fig 2. Typical Output Characteristics

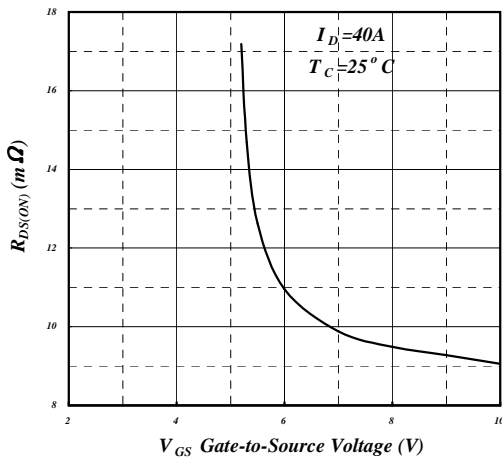


Fig 3. On-Resistance v.s. Gate Voltage

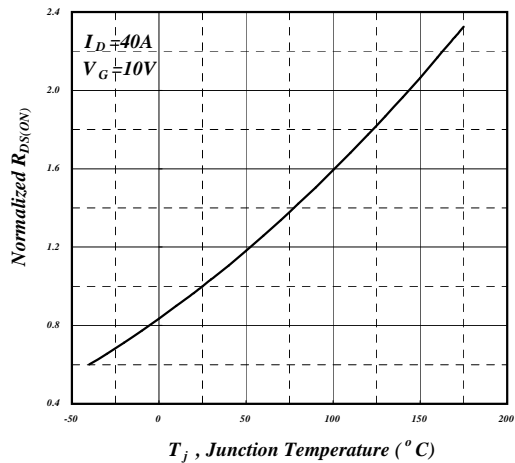


Fig 4. Normalized On-Resistance v.s. Junction Temperature

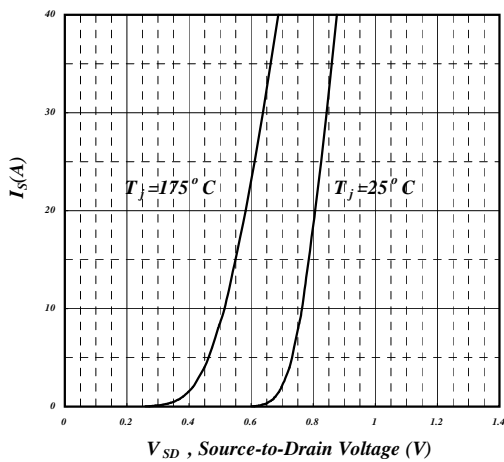


Fig 5. Forward Characteristic of Reverse Diode

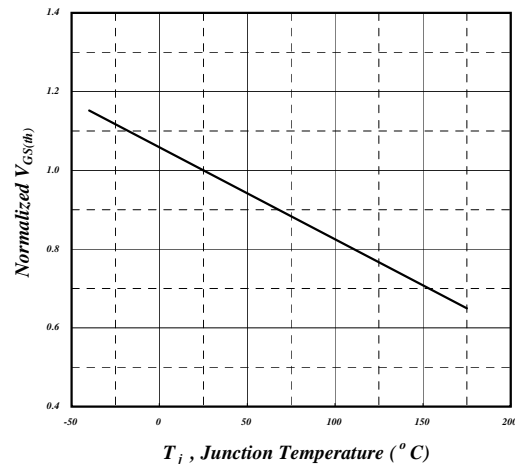


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



AP75N07AGP-HF

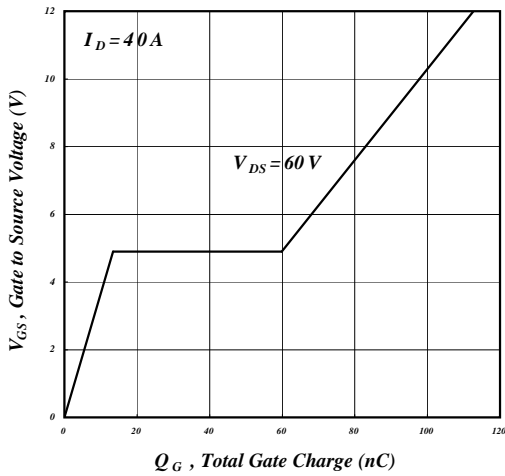


Fig 7. Gate Charge Characteristics

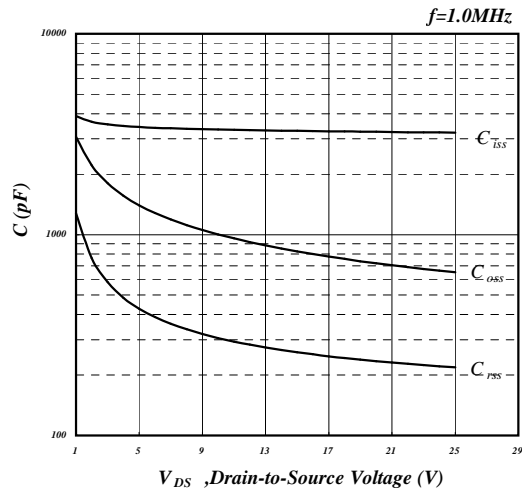


Fig 8. Typical Capacitance Characteristics

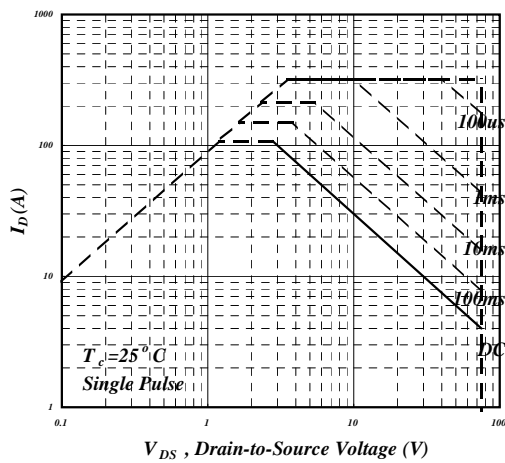


Fig 9. Maximum Safe Operating Area

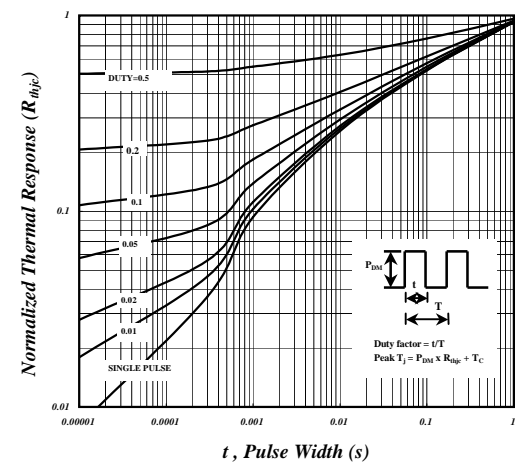


Fig 10. Effective Transient Thermal Impedance

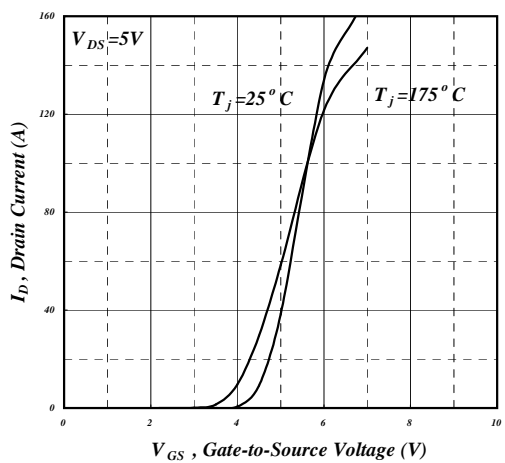


Fig 11. Transfer Characteristics

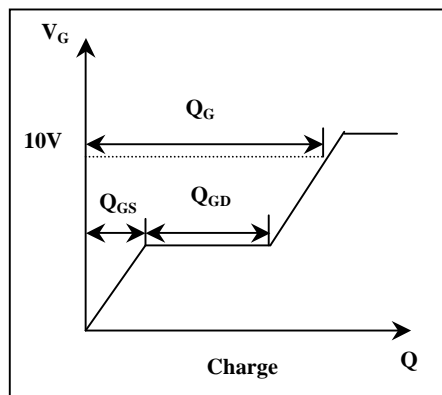
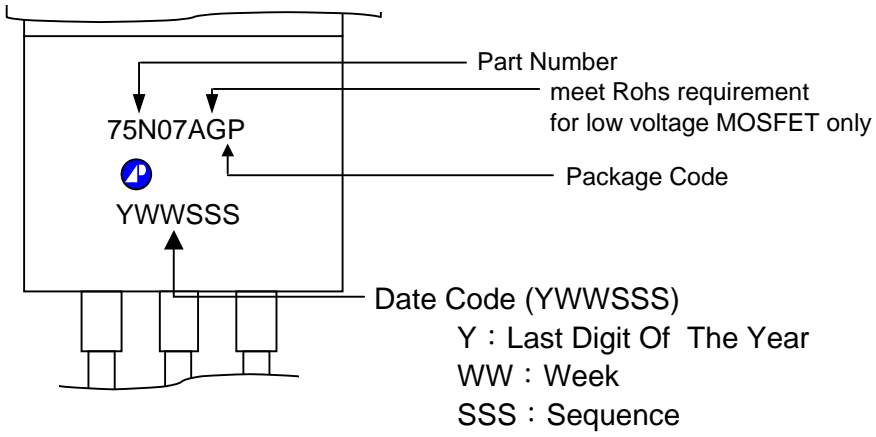


Fig 12. Gate Charge Waveform

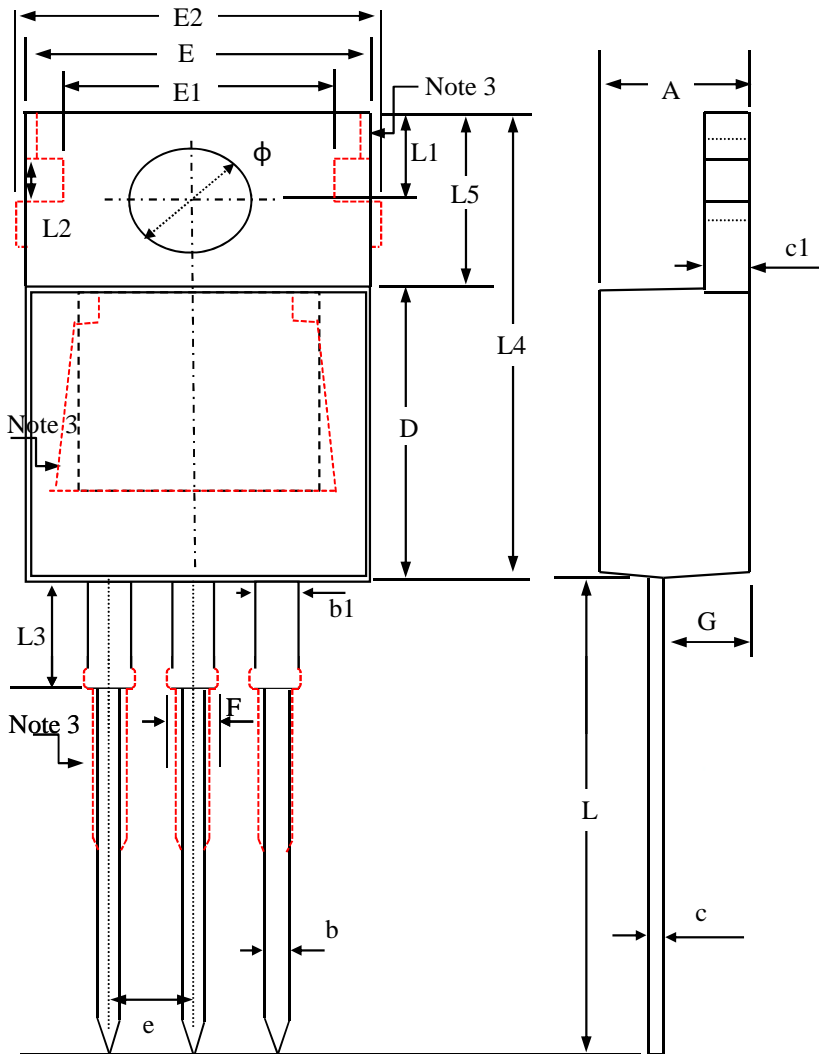


MARKING INFORMATION





Package Outline : TO-220



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.20	4.50	4.80
b	0.60	0.80	1.00
b1	1.10	1.38	1.80
c	0.30	0.48	0.65
c1	1.10	1.30	1.50
E	9.70	10.00	10.40
E1	7.40	8.30	9.20
e	2.54 (ref.)		
L	12.70	13.60	14.50
L1	2.50	2.75	3.00
L2	1.00	1.40	1.80
L3	2.60	3.35	4.10
L4	14.30	15.15	16.00
L5	6.00	6.40	6.80
ϕ	3.40	3.70	4.00
D	8.30	8.85	9.40
F	1.20	1.41	1.85
G	2.20	2.60	3.00
E2	—	—	11.50

Note:

1. All Dimensions Are in Millimeters.
2. Dimension Does Not Include Mold Protrusions.
3. Thermal PAD and Pin contour is for reference, it may has little difference by option.



TO-220 FOOTPRINT :

