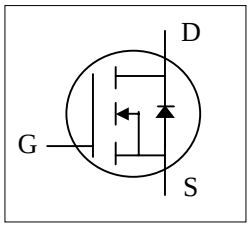
AP75N07GS/P

RoHS-compliant Product

Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ **Low Gate Charge**
- ▼ **Simple Drive Requirement**
- ▼ **Fast Switching Characteristic**

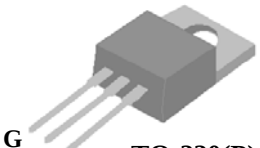


BV_{DSS}	75V
$R_{DS(ON)}$	11mΩ
I_D	80A

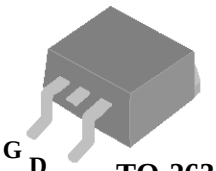
Description

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

The TO-263 package is widely preferred for commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters. The through-hole version (AP75N07GP) are available for low-profile applications.



TO-220(P)



TO-263(S)

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	75	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[4]	80	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	70	A
I_{DM}	Pulsed Drain Current[1]	320	A
P_D@T_C=25℃	Total Power Dissipation	300	W
	Linear Derating Factor	2	W/℃
E_{AS}	Single Pulse Avalanche Energy[3]	450	mJ
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	0.5	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[5]	40	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	62	℃/W

Electrical Characteristics@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
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I_D=1mA	-	0.08	-	V/℃
$R_{DS(ON)}$	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	-	-	1	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℃, 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 Max. junction temperature.

2.Pulse test

3.Starting T_j=25°C , V_{DD}=50V , L=1mH , R_G=25Ω , I_{AS}=30A.

4.Package limitation current is 80A .

5.Surface mounted on 1 in^2 copper pad of FR4 board

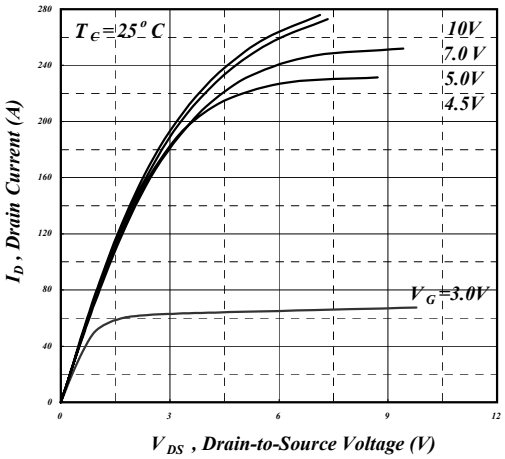


Fig 1. Typical Output Characteristics

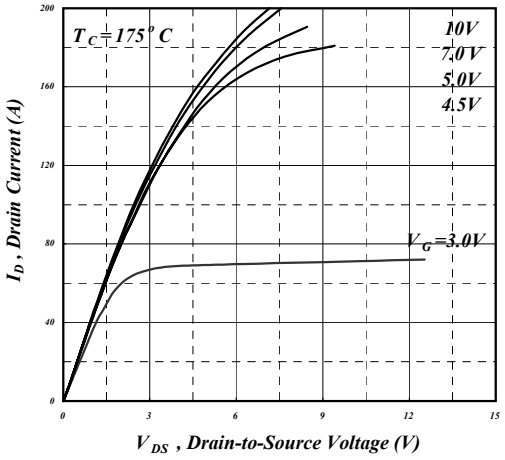


Fig 2. Typical Output Characteristics

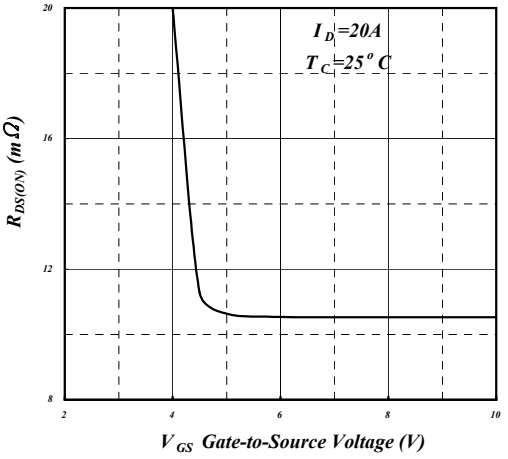


Fig 3. On-Resistance v.s. Gate Voltage

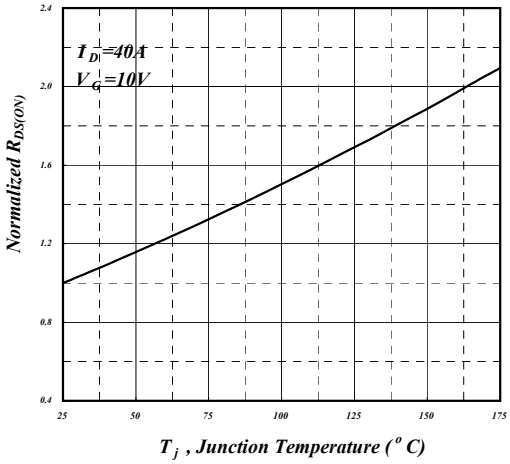


Fig 4. Normalized On-Resistance v.s. Junction Temperature

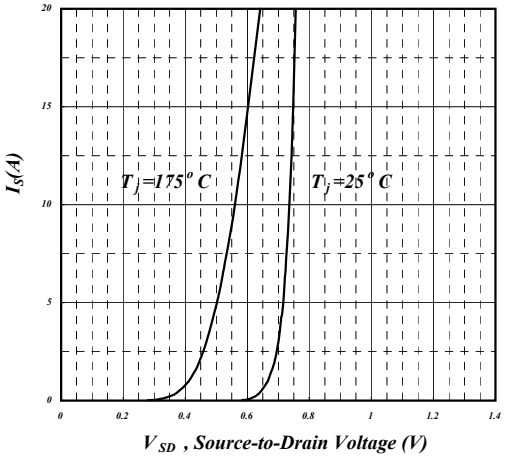


Fig 5. Forward Characteristic of Reverse Diode

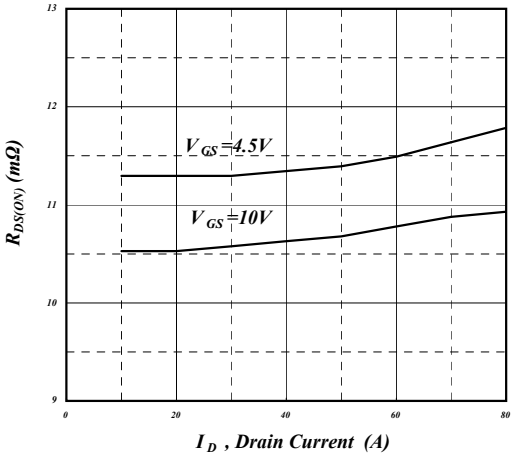


Fig 6. On-Resistance vs. Drain Current

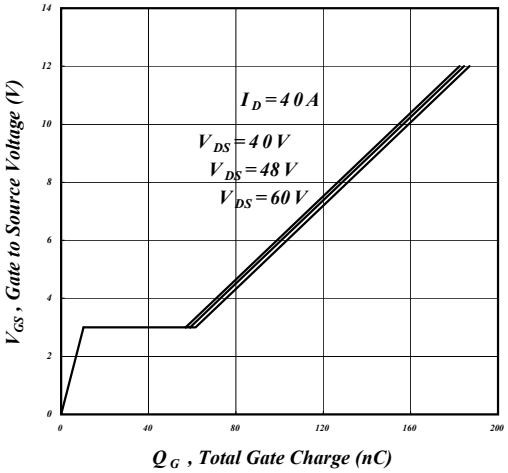


Fig 7. Gate Charge Characteristics

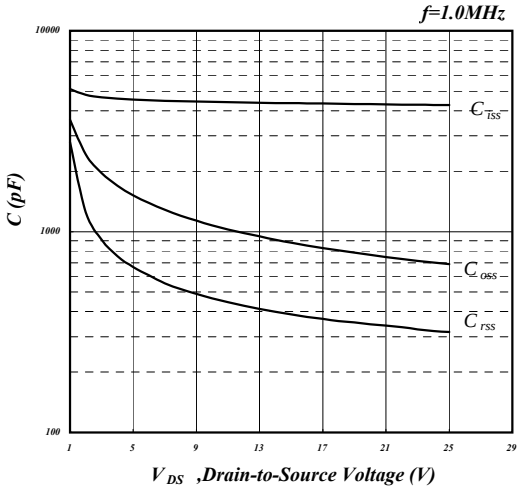


Fig 8. Typical Capacitance Characteristics

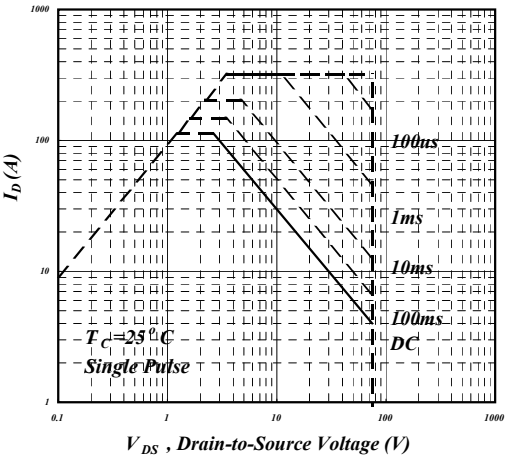


Fig 9. Maximum Safe Operating Area

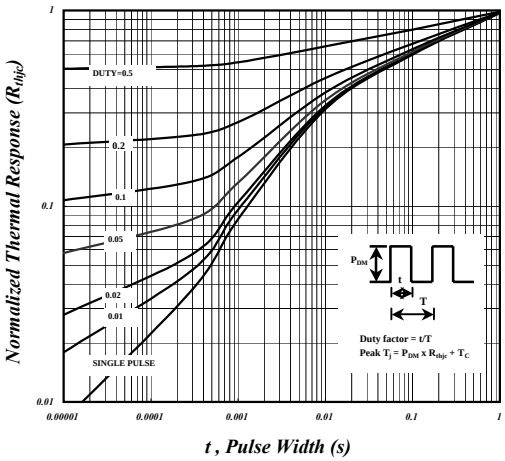


Fig 10. Effective Transient Thermal Impedance

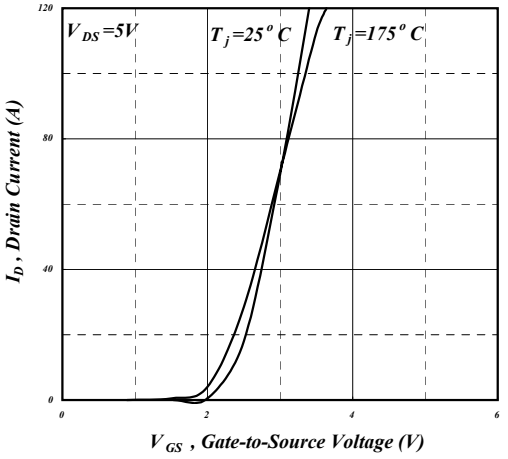


Fig 11. Transfer Characteristics

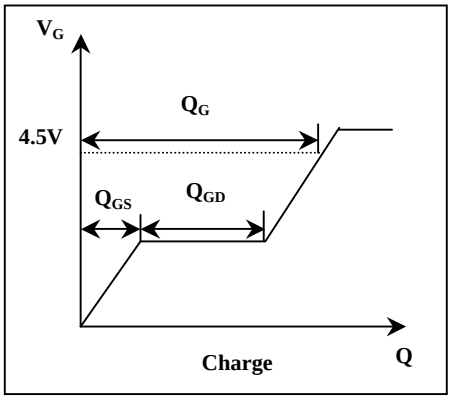


Fig 12. Gate Charge Waveform