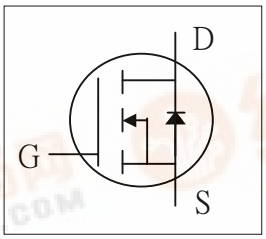
AP09N90CW

Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ Minimize On-resistance
- ▼ Fast Switching
- ▼ Simple Drive Requirement

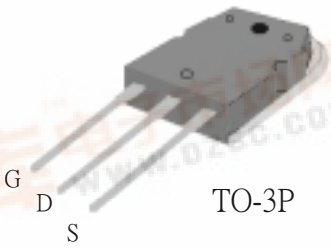


BV_{DSS}	900V
$R_{DS(ON)}$	1.4Ω
I_D	7.6A

Description

AP09N90C provides minimize on-state resistance , superior switching performance and high efficiency switching power supply applications.

TO-3P package is preferred for commercial-industrial applications and provides greater distance between pins to meet the requirements of most safety specifications.



TO-3P

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	900	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	7.6	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	4.8	A
I_{DM}	Pulsed Drain Current[1]	25	A
P_D@T_C=25℃	Total Power Dissipation	208	W
	Linear Derating Factor	1.6	W/℃
E_{AS}	Single Pulse Avalanche Energy[2]	120	mJ
I_{AR}	Avalanche Current	6	A
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter		Value	Unit
Rthj-c	Thermal Resistance Junction-case	Max.	0.60	℃/W
Rthj-a	Thermal Resistance Junction-ambient	Max.	40	℃/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	900	-	-	V
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I_D=1mA	-	0.74	-	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=3.6A	-	1.25	1.4	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	2	-	4	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=3.6A	-	3.6	-	S
I_{DSS}	Drain-Source Leakage Current (T_j=25°C)	V_{DS}=900V, V_{GS}=0V	-	-	10	uA
	Drain-Source Leakage Current (T_j=125°C)	V_{DS}=720V, V_{GS}=0V	-	-	100	uA
I_{GSS}	Gate-Source Leakage	V_{GS}= ± 30V	-	-	±100	nA
Q_g	Total Gate Charge[3]	I_D=7.2A	-	50.7	80	nC
Q_{gs}	Gate-Source Charge	V_{DS}=540V	-	12	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=10V	-	16	-	nC
$t_{d(on)}$	Turn-on Delay Time[3]	V_{DD}=450V	-	20	-	ns
t_r	Rise Time	I_D=7.2A	-	16	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=6.8Ω,V_{GS}=10V	-	65	-	ns
t_f	Fall Time	R_D=62.5Ω	-	27	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	3097	5000	pF
C_{oss}	Output Capacitance	V_{DS}=15V	-	516	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	19	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[3]	I_S=7.2A, V_{GS}=0V	-	-	1.5	A
trr	Reverse Recovery Time	I_S=7.2A, V_{GS}=0V,	-	673	-	ns
Qrr	Reverse Recovery Charge	dI/dt=100A/μs	-	9.6	-	μC

Notes:

1.Pulse width limited by safe operating area.

2.Starting T_j=25°C , V_{DD}=50V , L=6.8mH , R_G=25Ω , I_{AS}=6A.

3.Pulse width ≤300us , duty cycle ≤2%.

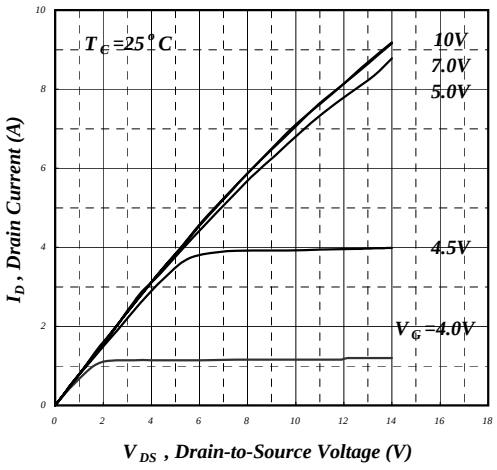


Fig 1. Typical Output Characteristics

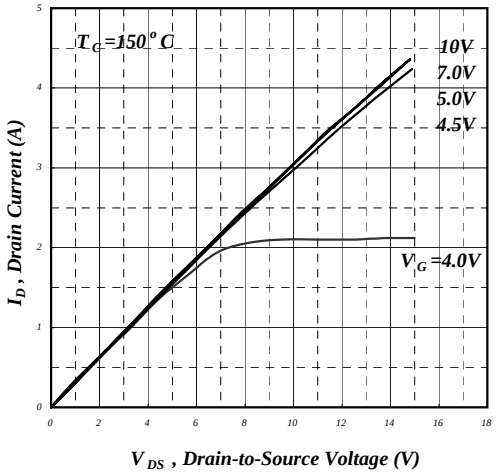


Fig 2. Typical Output Characteristics

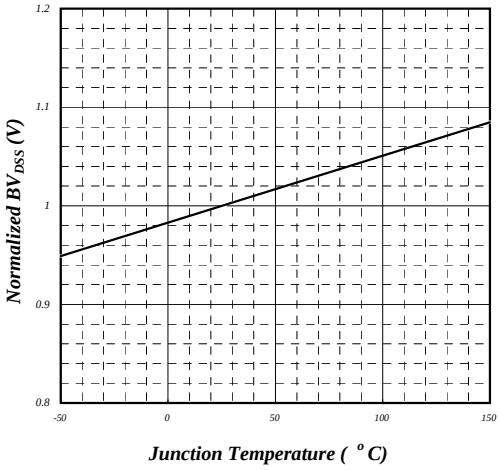


Fig 3. Normalized BV_{DSS} v.s. Junction

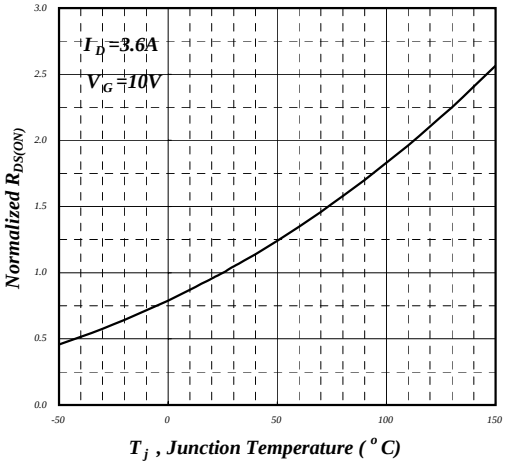


Fig 4. Normalized On-Resistance

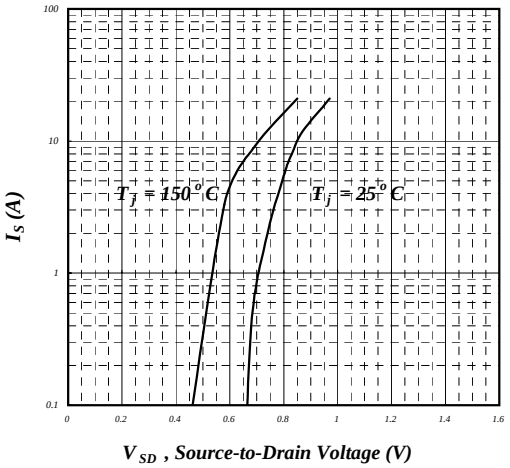


Fig 5. Forward Characteristic of Reverse Diode

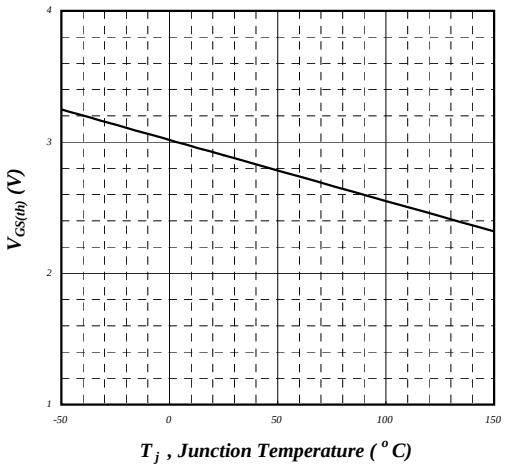


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

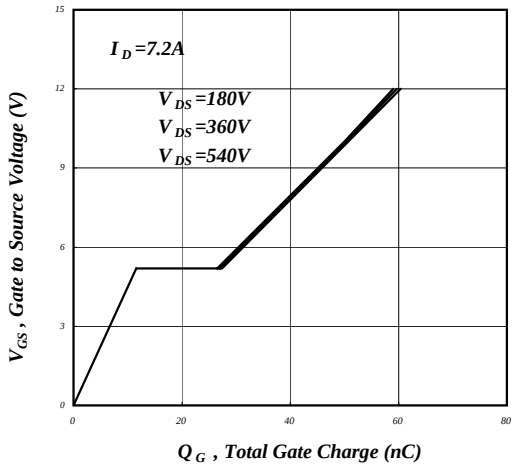


Fig 7. Gate Charge Characteristics

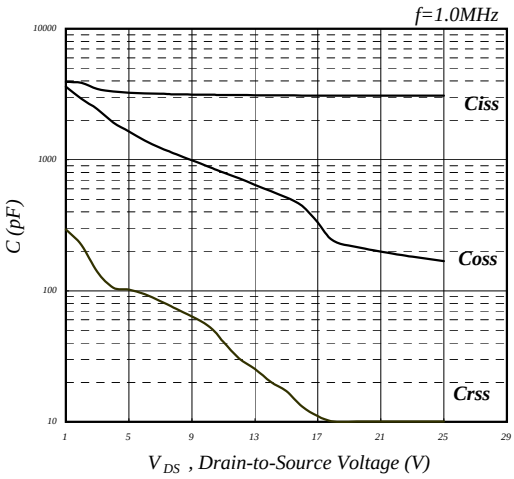


Fig 8. Typical Capacitance Characteristics

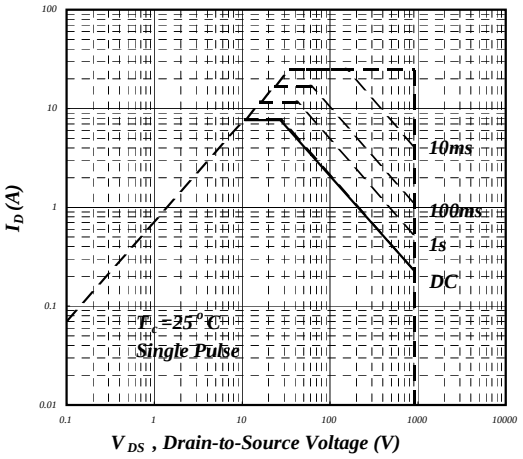


Fig 9. Maximum Safe Operating Area

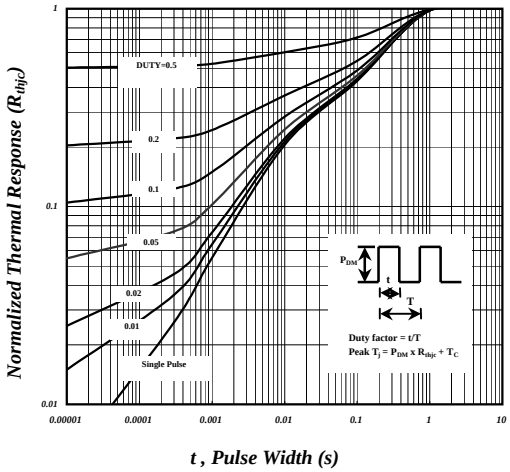


Fig 10. Effective Transient Thermal Impedance

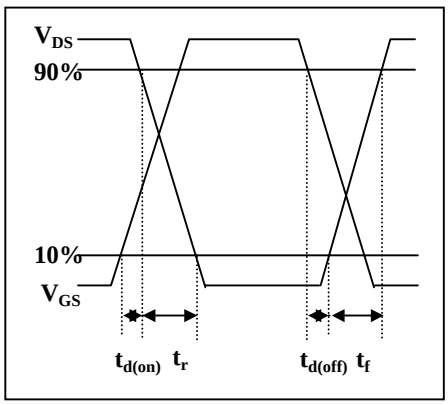


Fig 11. Switching Time Waveform

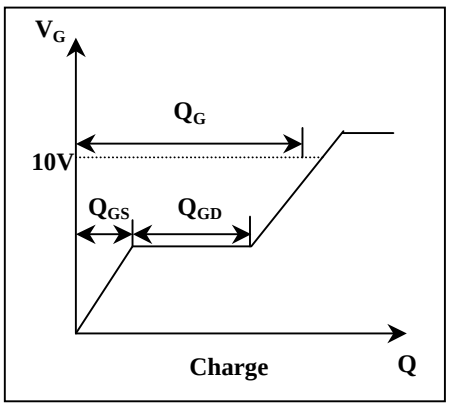


Fig 12. Gate Charge Waveform