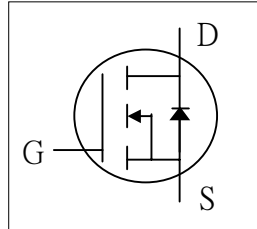




- ▼ Minimize On-resistance
- ▼ Fast Switching
- ▼ Simple Drive Requirement
- ▼ RoHS Compliant & Halogen-Free

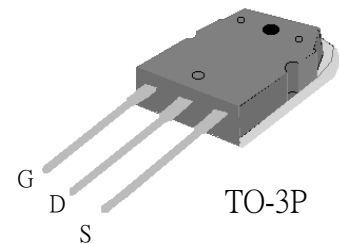


$BV_{DSS}$	900V
$R_{DS(ON)}$	1.4 $\Omega$
$I_D$	7.6A

## 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.



## Absolute Maximum Ratings

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

## Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Maximum Thermal Resistance, Junction-case	0.6	$^\circ C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	40	$^\circ C/W$



**Electrical Characteristics @T<sub>j</sub>=25°C(unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =1mA	900	-	-	V
ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	-	0.74	-	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>3</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =3.6A	-	1.25	1.4	Ω
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2	-	4	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =3.6A	-	3.6	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =900V, V <sub>GS</sub> =0V	-	-	10	uA
	Drain-Source Leakage Current (T <sub>j</sub> =125°C)	V <sub>DS</sub> =720V, V <sub>GS</sub> =0V	-	-	500	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =±30V, V <sub>DS</sub> =0V	-	-	±100	nA
Q <sub>g</sub>	Total Gate Charge <sup>3</sup>	I <sub>D</sub> =7.2A	-	50.7	80	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =540V	-	12	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =10V	-	16	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>3</sup>	V <sub>DD</sub> =450V	-	20	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =7.2A	-	16	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =6.8Ω, V <sub>GS</sub> =10V	-	65	-	ns
t <sub>f</sub>	Fall Time	R <sub>D</sub> =62.5Ω	-	27	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	3097	5000	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =15V	-	516	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	19	-	pF

**Source-Drain Diode**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>3</sup>	I <sub>S</sub> =7.2A, V <sub>GS</sub> =0V	-	-	1.5	A
trr	Reverse Recovery Time <sup>3</sup>	I <sub>S</sub> =7.2A, V <sub>GS</sub> =0V,	-	673	-	ns
Qrr	Reverse Recovery Charge	di/dt=100A/μs	-	9.6	-	μC

**Notes:**

- 1.Pulse width limited by Max. junction temperature.
- 2.Starting T<sub>j</sub>=25°C , V<sub>DD</sub>=50V , L=6.8mH , R<sub>G</sub>=25Ω , I<sub>AS</sub>=6A.
- 3.Pulse test

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.

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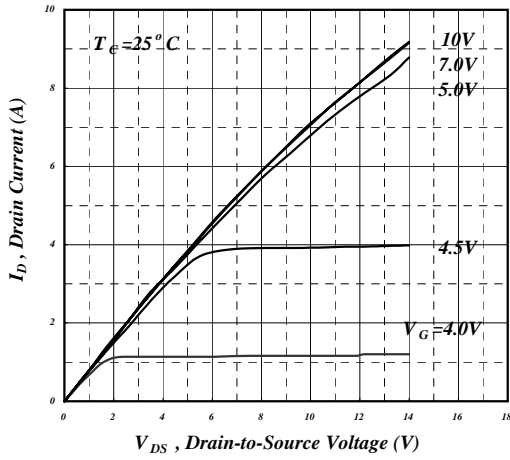


Fig 1. Typical Output Characteristics

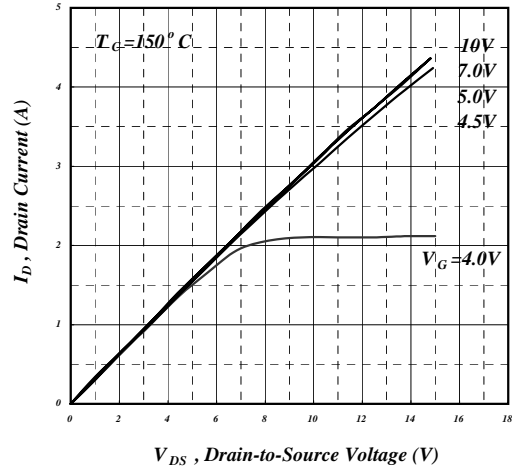


Fig 2. Typical Output Characteristics

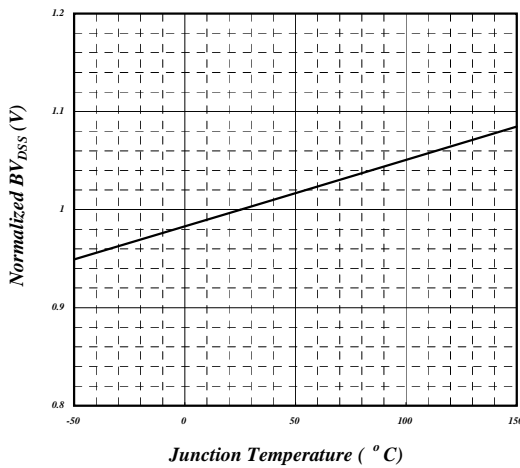


Fig 3. Normalized  $BV_{DSS}$  v.s. Junction

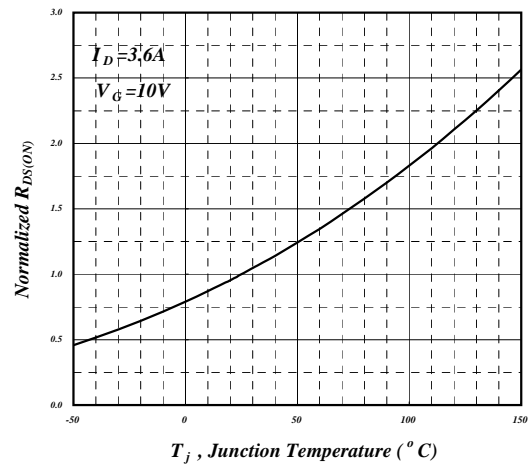


Fig 4. Normalized On-Resistance

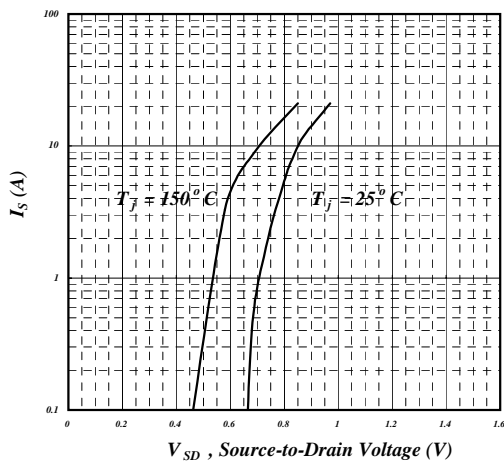


Fig 5. Forward Characteristic of Reverse Diode

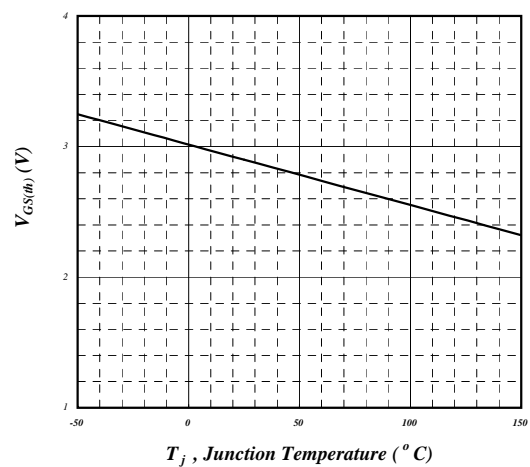


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

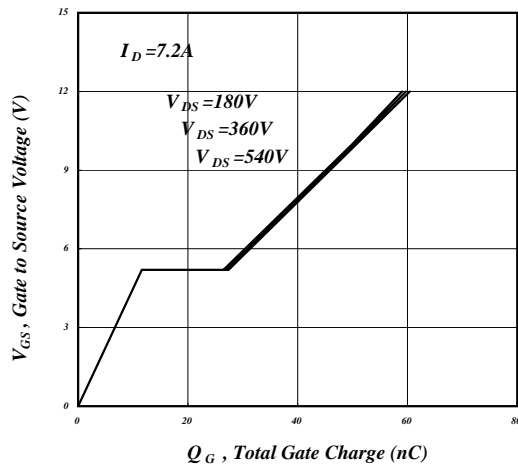


Fig 7. Gate Charge Characteristics

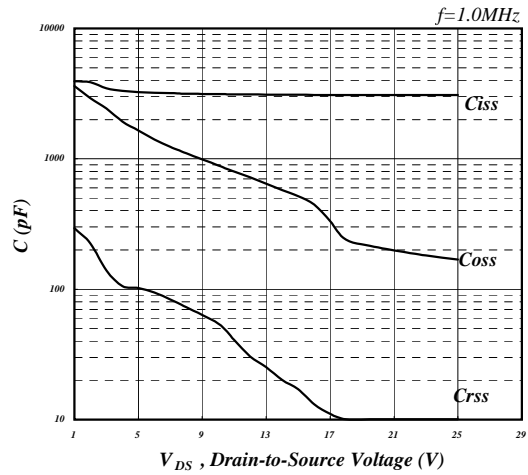


Fig 8. Typical Capacitance Characteristics

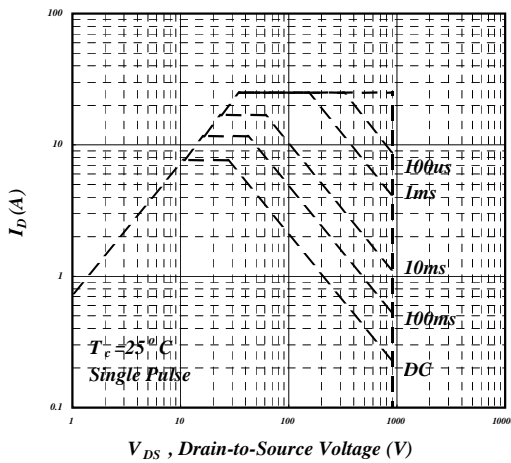


Fig 9. Maximum Safe Operating Area

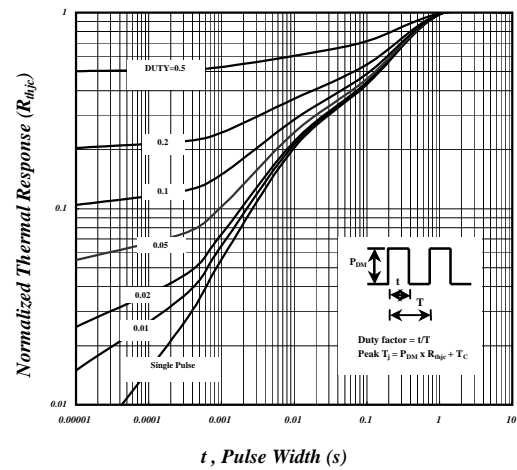


Fig 10. Effective Transient Thermal Impedance

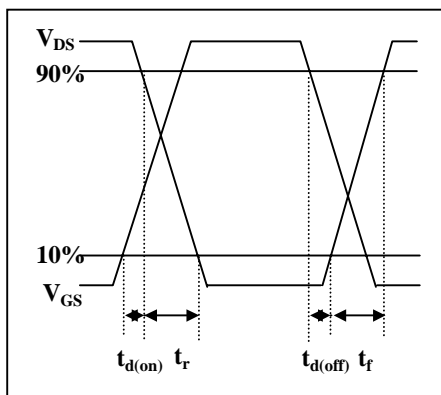


Fig 11. Switching Time Waveform

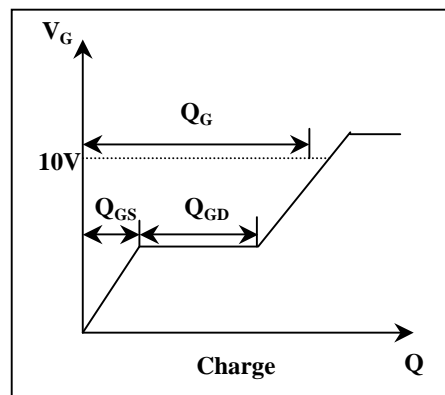


Fig 12. Gate Charge Waveform