AP009SN900MTP

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
900V	1.2Ω@10V	9A

Feature

- Self-aligned planar Technology
- Low conduction loss

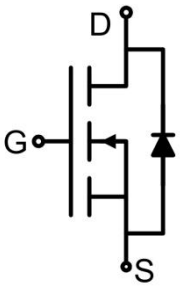
Application

- Uninterruptible power supply (UPS)
- Power factor correction (PFC)

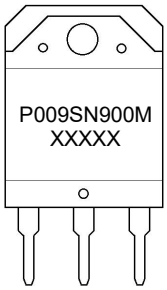
Package

TO-3P

Circuit diagram



Marking



Absolute maximum ratings (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	900	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current[1] (V_{GS}=10V)	I_D	9	A
Continuous Drain Current[1] (V_{GS}=10V,T_C=100℃)	I_D (100℃)	5.8	A
Pulsed Drain Current	I_{DM}	36	A
Single Pulse Avalanche Energy[2]	E_{AS}	576	mJ
Power Dissipation[3]	P_D	31.2	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	4	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} =0V, I_D =250μA	900			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =900V, V_{GS} =0V			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±30V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2		4	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =4.5A		0.92	1.2	Ω
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =25V, V_{GS} =0V, f =1MHz		2752		pF
Output Capacitance	C_{oss}			206		
Reverse Transfer Capacitance	C_{rss}			36		
Total Gate Charge	Q_g	V_{DS} =450V, V_{GS} =10V, I_D =9A		80		nC
Gate-Source Charge	Q_{gs}			12		
Gate-Drain Charge	Q_{gd}			38		
Turn-on delay time	$t_{d(on)}$	V_{DS} =450V, I_D =9A, R_G =25Ω		33		nS
Turn-on rise time	t_r			57		
Turn-off delay time	$t_{d(off)}$			270		
Turn-off fall time	t_f			91		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				9	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =9A			1.4	V
Reverse Recovery Time	T_{rr}	V_{GS} =0V, I_S =9A di/dt = 100A/μs		533		nS
Reverse Recovery Charge	Q_{rr}			6.2		μC

Notes:

1) The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2) The EAS data shows Max. rating .L=4.1mH, I_{AS}=18A, V_{DD} =50V, R_G =25Ω, Starting T_J =25ºC.

3) The power dissipation is limited by 150℃ junction temperature.

4) Guaranteed by design, not subject to production testing.

Typical Characteristics

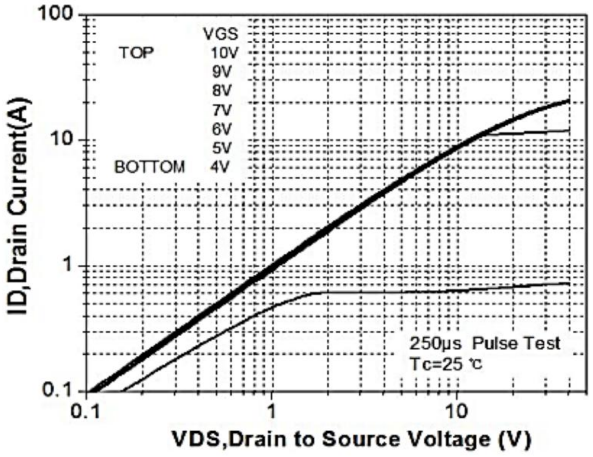


Figure 1. On-Region Characteristics

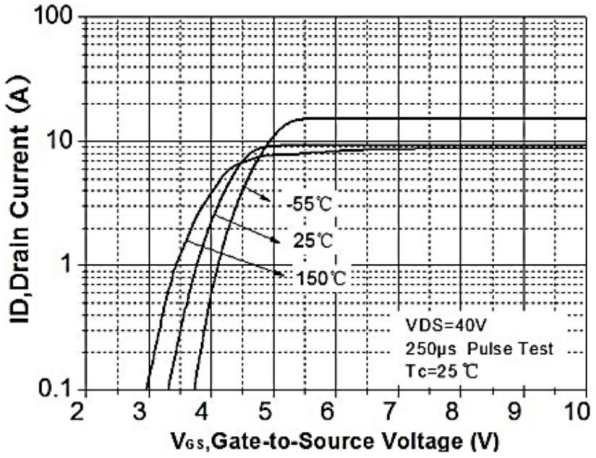


Figure 2. Transfer Characteristics

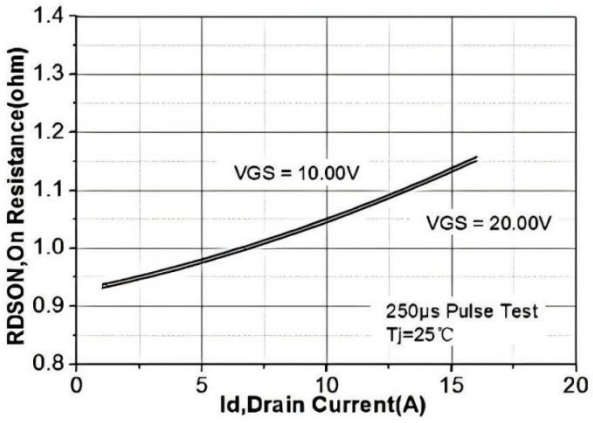


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

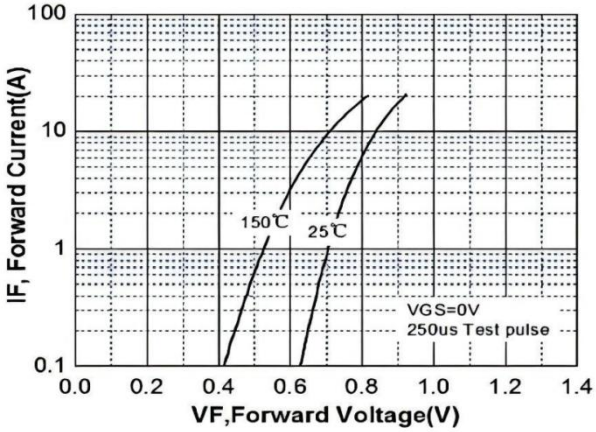


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

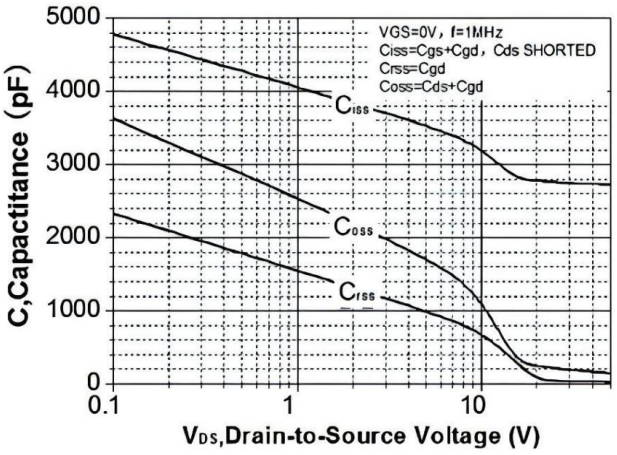


Figure 5. Capacitance Characteristics

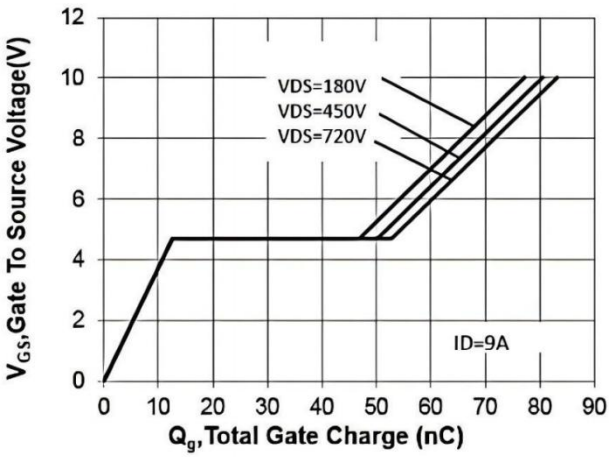


Figure 6. Gate Charge Characteristics

Typical Characteristics

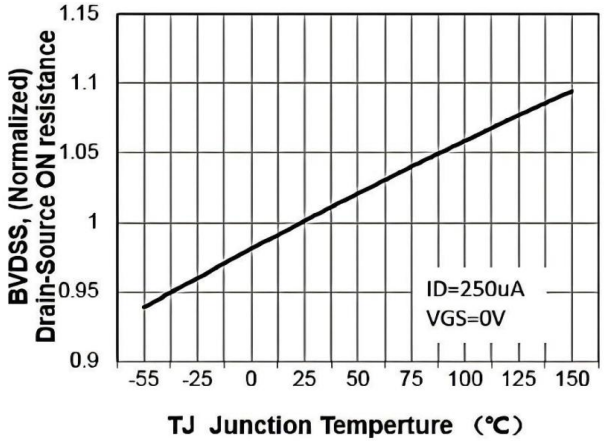


Figure 7. Breakdown Voltage Variation vs Temperature

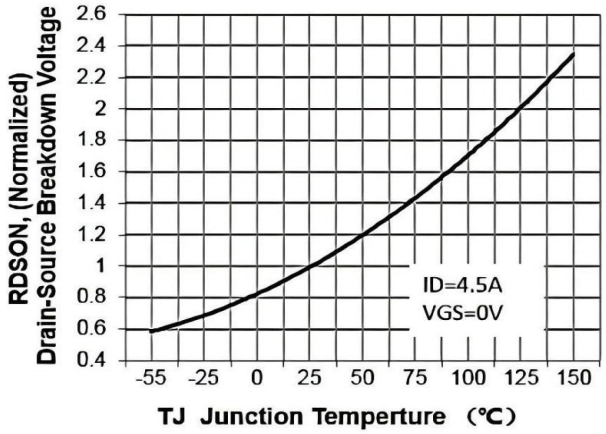


Figure 8. On-Resistance Variation vs Temperature

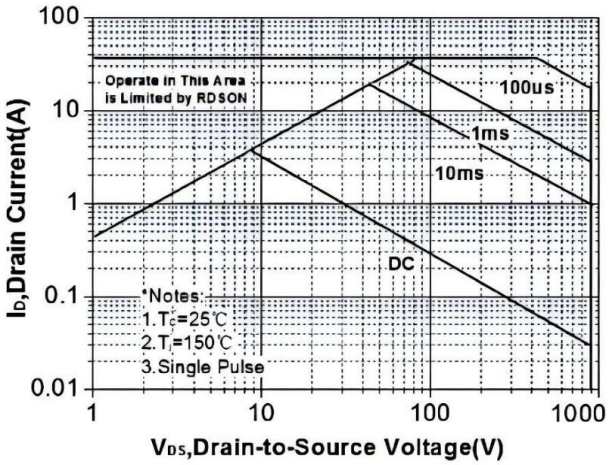


Figure 9. Maximum Safe Operating Area

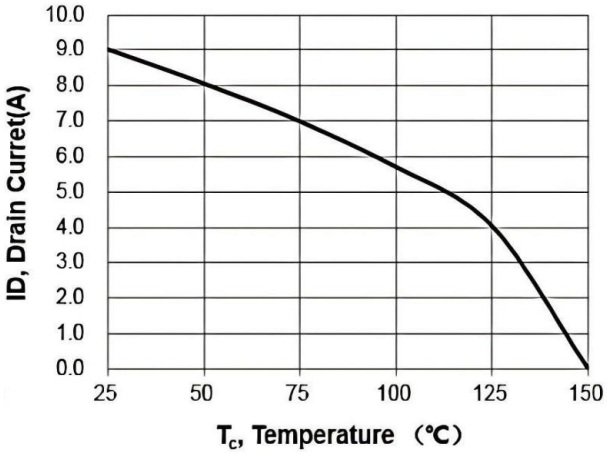


Figure 10. Maximum Drain Current vs Case Temperature

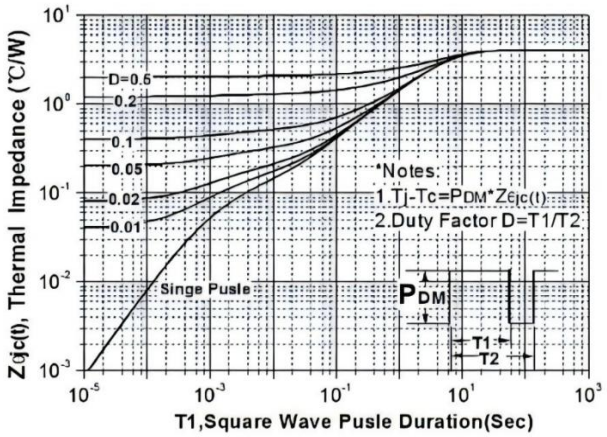
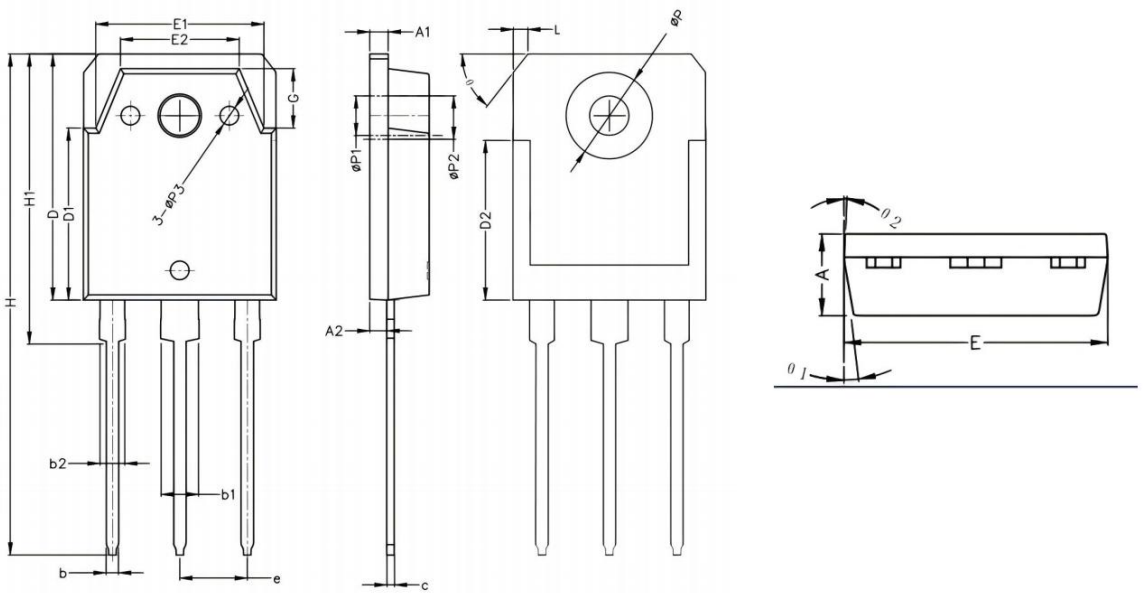


Figure 11. Transient Thermal Response Curve

TO-3P Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.600	5.000	0.181	0.197
A1	1.400	1.600	0.055	0.063
A2	1.330	1.430	0.052	0.056
b	0.800	1.200	0.031	0.047
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
C	0.500	0.700	0.020	0.028
D	19.750	20.050	0.778	0.789
D1	13.700	14.100	0.539	0.555
D2	12.900 REF.		0.508 REF.	
E	15.400	15.800	0.606	0.622
E1	13.400	15.800	0.528	0.622
E2	9.400	9.800	0.370	0.386
e	5.450 BSC.		0.215 BSC.	
G	4.600	5.000	0.181	0.197
H	40.200	40.700	1.583	1.602
H1	23.250	23.650	0.915	0.931
L	1.000 REF.		0.039 REF.	
ϕP	6.900	7.100	0.272	0.280
ϕP1	3.200 REF.		0.126 REF.	
ϕP2	3.500 REF.		0.138 REF.	
ϕP3	1.400	1.600	0.055	0.063
θ	60° REF.		60° REF.	
θ1	5°	9°	5°	9°
θ2	1°	5°	1°	5°