AF9926N

N-Channel Enhancement Mode Power MOSFET

■ Features

- Capable of 2.5V Gate Drive
- Low On-resistance
- Low Drive Current
- Surface Mount Package

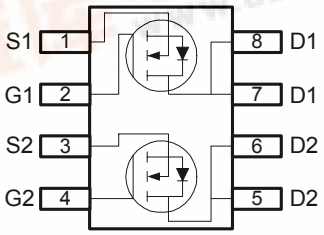
■ General Description

The advanced power MOSFET provides the designer with the best combination of fast switching, ruggedized device design, ultra low on-resistance and cost-effectiveness.

■ Product Summary

BV_{DSS} (V)	$R_{DS(ON)}$ (mΩ)	I_D (A)
20	30	6

■ Pin Assignments



SO-8

■ Pin Descriptions

Pin Name	Description
S1/2	Source
G1/2	Gate
D1/2	Drain

■ Ordering information

A X 9926N X X X

Feature	PN	Package	Lead Free	Packing
F :MOSFET		S: SO-8	Blank : Normal L : Lead Free Package	Blank : Tube or Bulk A : Tape & Reel

■ Absolute Maximum Ratings

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current **(Note 1)**	T_A=25ºC	6	A
		T_A=70ºC	4.8	
I_{DM}	Pulsed Drain Current **(Note 2)**		26	A
P_D	Total Power Dissipation	T_A=25ºC	2	W
	Linear Derating Factor		0.016	W/ºC
T_{STG}	Storage Temperature Range		-55 to 150	ºC
T_J	Operating Junction Temperature Range		-55 to 150	ºC

■ Thermal Data

Symbol	Parameter		Maximum	Units
Rthj-amb	Thermal Resistance Junction-ambient **(Note 1)**	Max.	62.5	ºC/W

■ Electrical Characteristics at T_J=25ºC unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	20	-	-	V
ΔBV_{DSS} / ΔT_J	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I_D=1mA	-	0.03	-	V/°C
$R_{DS(ON)}$	Static Drain-Source On-Resistance **(Note 3)**	V_{GS}=4.5V, I_D=6A	-	-	30	mΩ
		V_{GS}=2.5V, I_D=5.2A			45	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	-	-	1.2	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=6A	-	20	-	S
I_{DSS}	Drain-Source Leakage Current (T_J=25°C)	V_{DS}=20V, V_{GS}=0V	-	-	25	uA
	Drain-Source Leakage Current (T_J=70°C)	V_{DS}=20V, V_{GS}=0V	-	-	250	
I_{GSS}	Gate-Source Forward Leakage	V_{GS}=12V	-	-	100	nA
	Gate-Source Reverse Leakage	V_{GS}=-12V	-	-	-100	
Q_g	Total Gate Charge **(Note 3)**	I_D=6A, V_{DS}=20V, V_{GS}=5V	-	23	35	nC
Q_{gs}	Gate-Source Charge		-	4.5	7	
Q_{gd}	Gate-Drain ("Miller") Charge		-	7	11	
$t_{d(on)}$	Turn-On Delay Time **(Note 3)**	V_{DS}=10V, I_D=1A, R_G=6Ω, V_{GS}=5V R_D=10Ω	-	30	60	ns
t_r	Rise Time		-	70	140	
$t_{d(off)}$	Turn-Off Delay Time		-	40	80	
t_f	Fall-Time		-	65	130	
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=20V, f=1.0MHz	-	1035	-	pF
C_{oss}	Output Capacitance		-	320	-	
C_{rss}	Reverse Transfer Capacitance		-	150	-	

■ Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current (Body Diode)	V_D=V_G=0V, V_S=1.3V	-	-	1.54	V
V_{SD}	Forward On Voltage **(Note 3)**	T_J=25ºC, I_S=1.7A, V_{GS}=0V	-	0.78	1.2	V

Note 1: Surface mounted on 1 in^2 copper pad of FR4 board, 135°C/W when mounted on Min. copper pad.
Note 2: Pulse width limited by Max. junction temperature.
Note 3: Pulse width ≤ 300us, duty cycle ≤ 2%.

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■ Typical Performance Characteristics

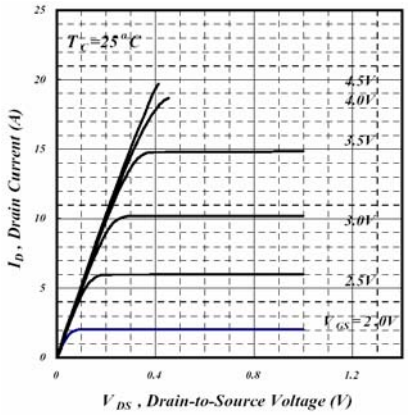

Fig 1. Typical Output Characteristics

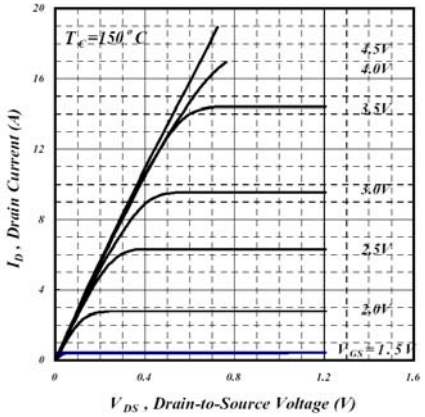

Fig 2. Typical Output Characteristics

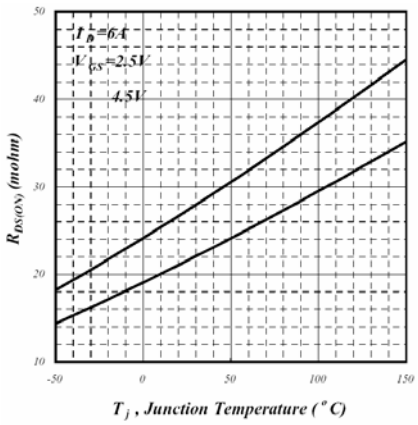

Fig 3. R_{DSON} v.s. Junction Temperature

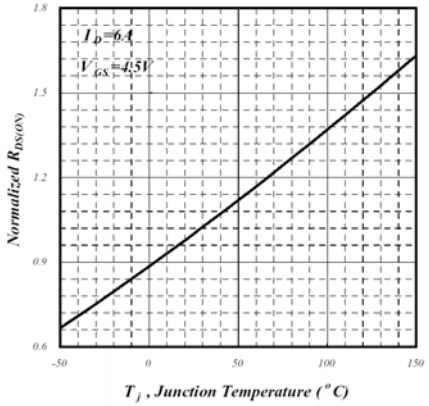

Fig 4. Normalized On-Resistance v.s. Junction Temperature

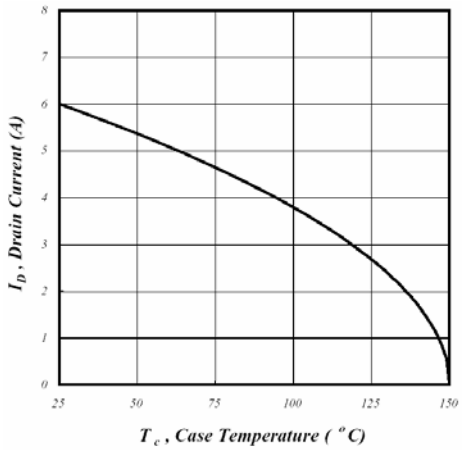

Fig 5. Maximum Drain Current v.s. Case Temperature

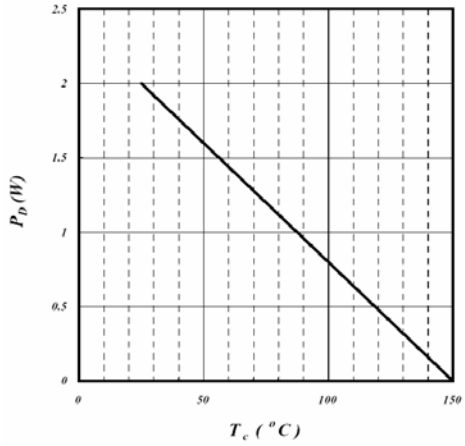

Fig 6. Typical Power Dissipation

■ Typical Performance Characteristics (Continued)

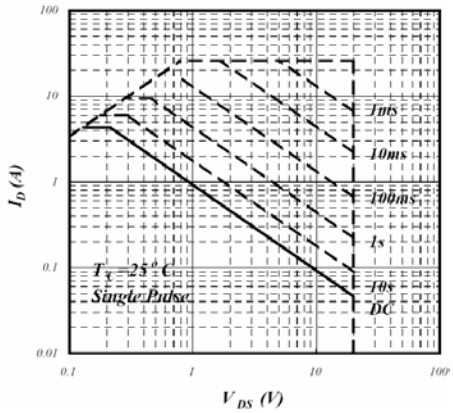

Fig 7. Maximum Safe Operating Area

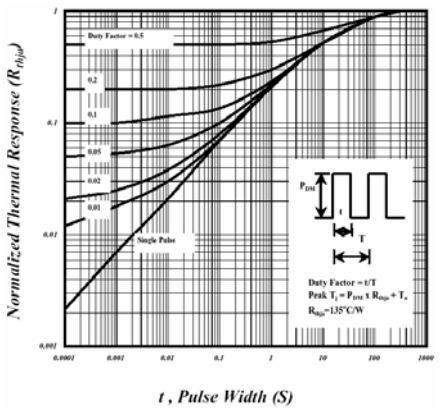

Fig 8. Effective Transient Thermal Impedance

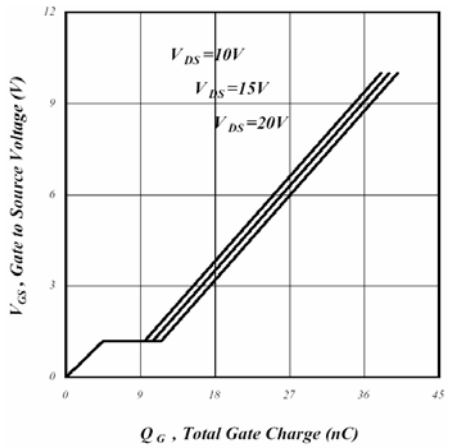

Fig 9. Typical Gate Charge v.s. V_{GS}

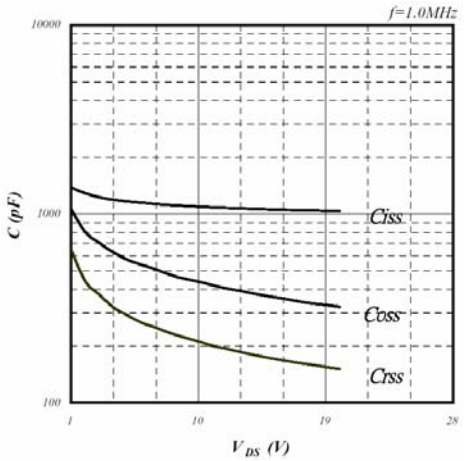

Fig 10. Typical Capacitance v.s. V_{DS}

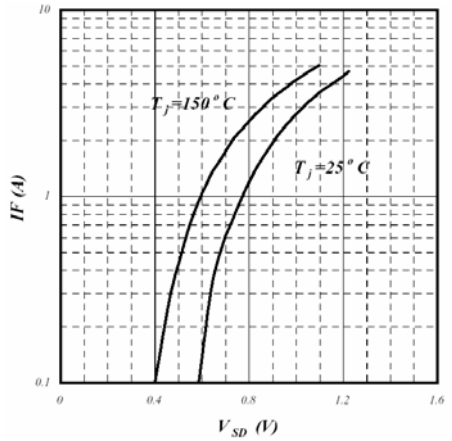

Fig 11. Forward Characteristic of Reverse Diode

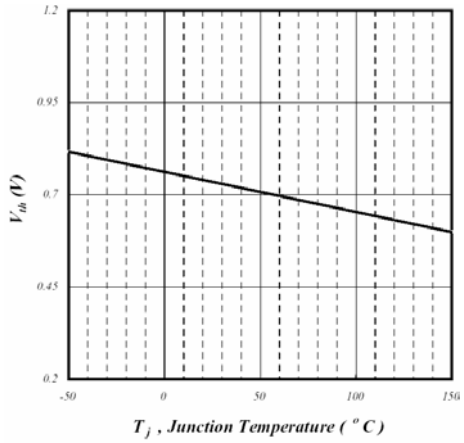

Fig 12. Gate Threshold Voltage v.s. Junction Temperature

■ Typical Performance Characteristics (Continued)

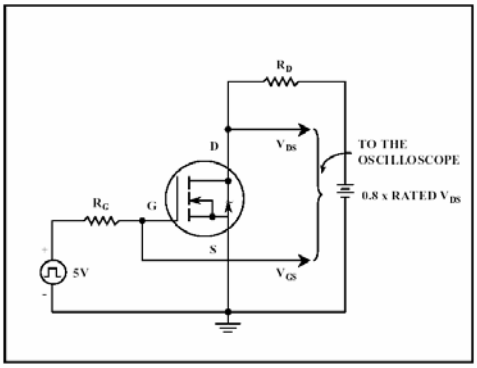

Fig 13. Switching Time Circuit

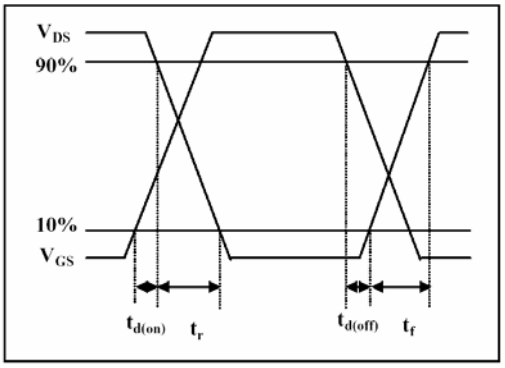

Fig 14. Switching Time Waveform

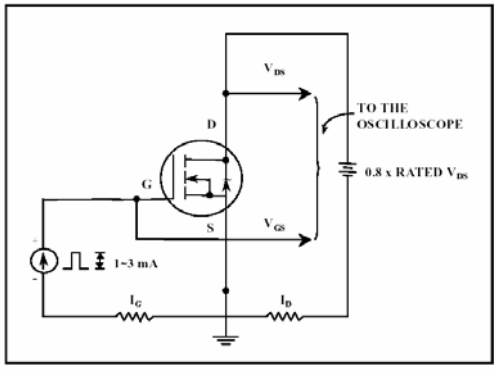

Fig 15. Gate Charge Circuit

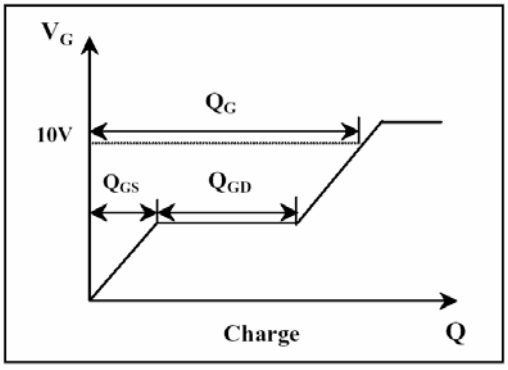

Fig 16. Gate Charge Waveform

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■ Marking Information

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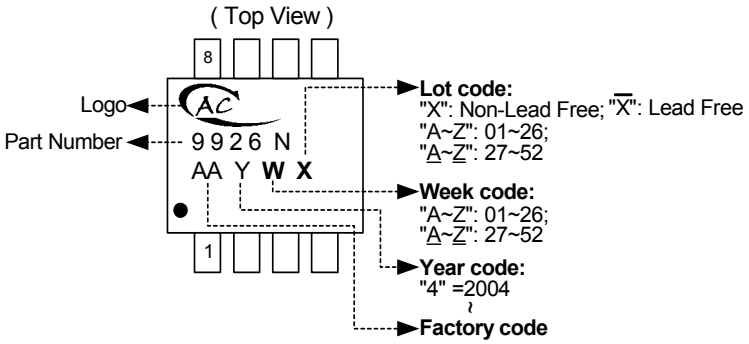
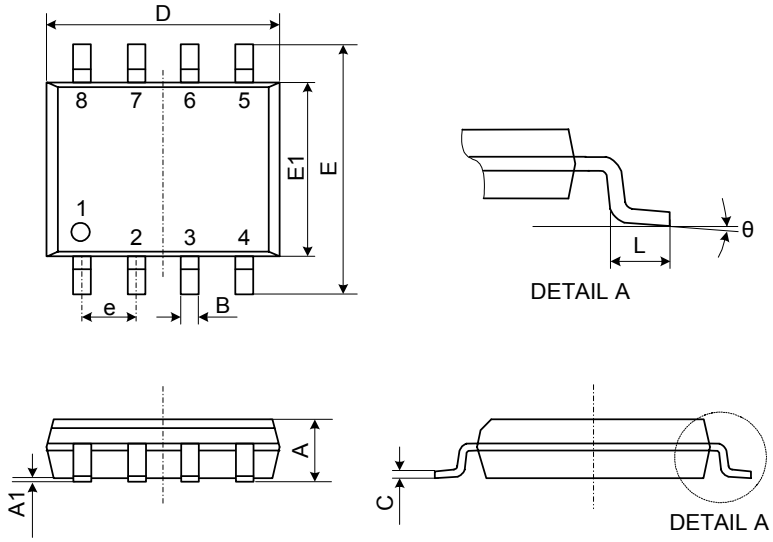


■ Package Information

Package Type: SO-8



1. All Dimensions Are in Millimeters.
2. Dimension Does Not Include Mold Protrusions.

Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	1.35	1.55	1.75
A1	0.10	0.18	0.25
B	0.33	0.41	0.51
C	0.19	0.22	0.25
D	4.80	4.90	5.00
E	5.80	6.15	6.50
E1	3.80	3.90	4.00
L	0.38	0.71	1.27
θ	0^o	4^o	8^o
e	1.27 TYP.		