

General Description

The UM9926 is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The UM9926 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Features

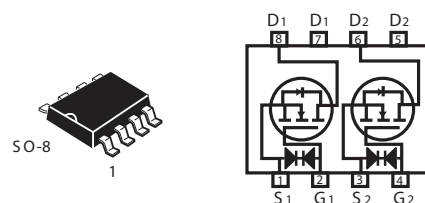
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summary

BV_{DSS}	R_{DS(ON)}	ID
20V	38mΩ	6.5A

Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

SOP8 Pin Configuration

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±10	V
Drain Current-Continuous ^a @ T _J =25°C -Pulsed ^b	I _D	6.5	A
	I _{DM}	30	A
Drain-Source Diode Forward Current ^a	I _S	1.7	A
Maximum Power Dissipation ^a	P _D	2	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

Thermal Data

Thermal Resistance, Junction-to-Ambient ^a	R _{θJA}	62.5	°C/W
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Electrical Characteristics ($T_J=25\text{ }^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=16V, V_{GS}=0V$			1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$			± 10	μA
ON CHARACTERISTICS^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	0.9	1.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=4.0V, I_D=6.5A$		23	28	m ohm
		$V_{GS}=2.5V, I_D=5A$		30	38	m ohm
Forward Transconductance	g_{FS}	$V_{DS}=5.0V, I_D=6.5A$		16		S
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C_{ISS}	$V_{DS}=8V, V_{GS}=0V$ $f=1.0MHz$		540		pF
Output Capacitance	C_{OSS}			160		pF
Reverse Transfer Capacitance	C_{RSS}			100		pF
SWITCHING CHARACTERISTICS^c						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD}=10V,$ $I_D=1A,$ $V_{GEN}=4.5V,$ $R_L=10\text{ ohm}$ $R_{GEN}=10\text{ ohm}$		15		ns
Rise Time	t_r			20		ns
Turn-Off Delay Time	$t_{D(OFF)}$			36		ns
Fall Time	t_f			11		ns
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=6.5A, V_{GS}=4V$		6.4		nC
		$V_{DS}=10V, I_D=6.5A, V_{GS}=2.5V$		4.6		nC
Gate-Source Charge	Q_{gs}	$V_{DS}=10V, I_D=6.5A$		1.1		nC
Gate-Drain Charge	Q_{gd}	$V_{GS}=4V$		2.8		nC
Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS^b						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1.7A$		0.72	1.2	V

Notes

a.Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.

b.Pulse Test:Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

c.Guaranteed by design, not subject to production testing.

Typical Characteristics

N-Ch 20V Fast Switching MOSFETs

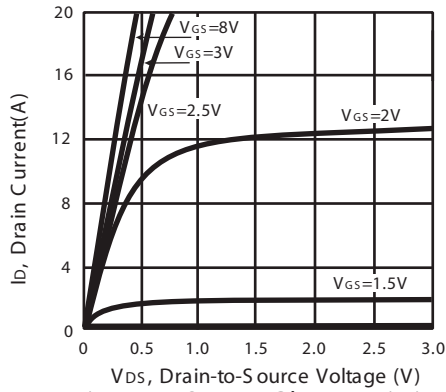


Figure 1. Output Characteristics

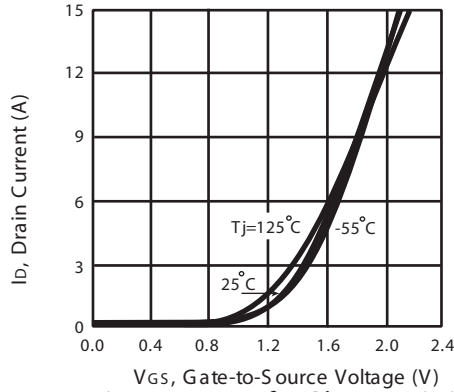


Figure 2. Transfer Characteristics

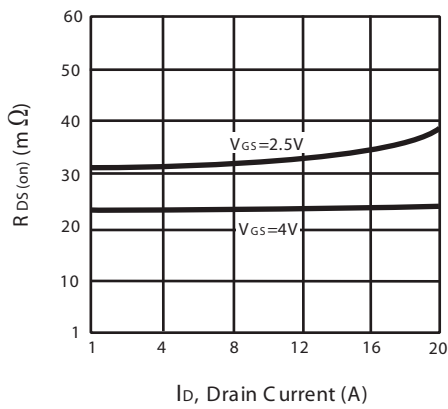


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

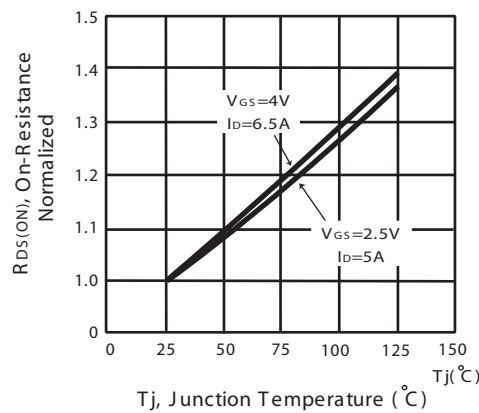


Figure 4. On-Resistance Variation with Drain Current and Temperature

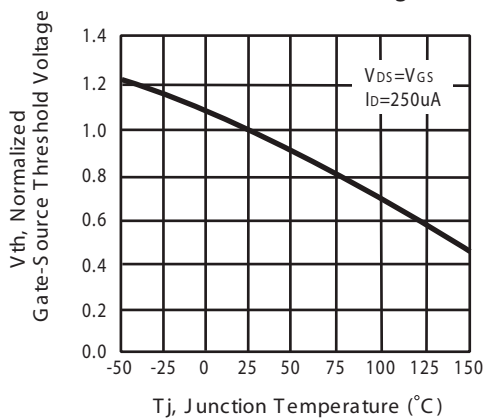


Figure 5. Gate Threshold Variation with Temperature

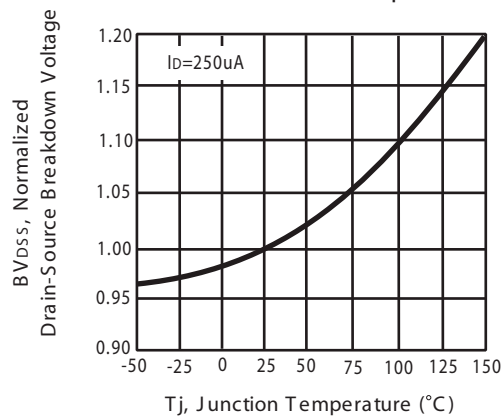


Figure 6. Breakdown Voltage Variation with Temperature

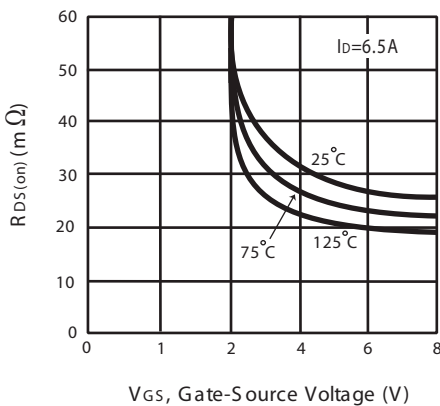


Figure 7. On-Resistance vs. Gate-Source Voltage

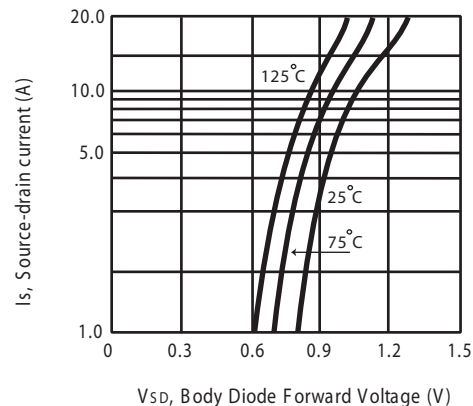


Figure 8. Body Diode Forward Voltage Variation with Source Current

Typical Characteristics

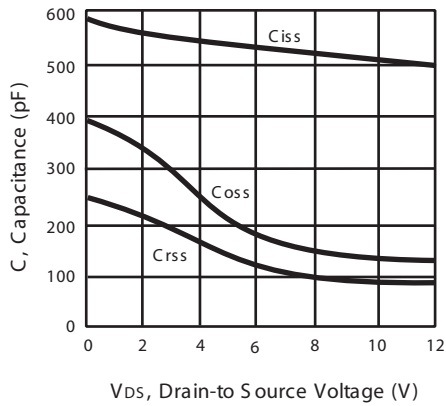


Figure 9. Capacitance

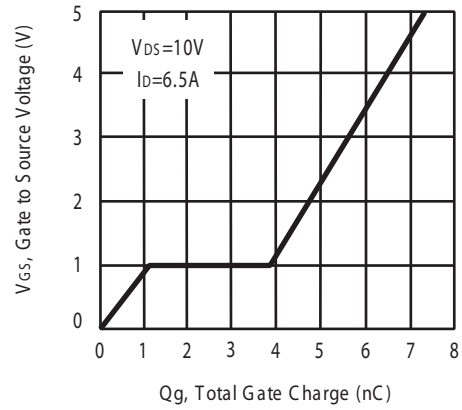


Figure 10. Gate Charge

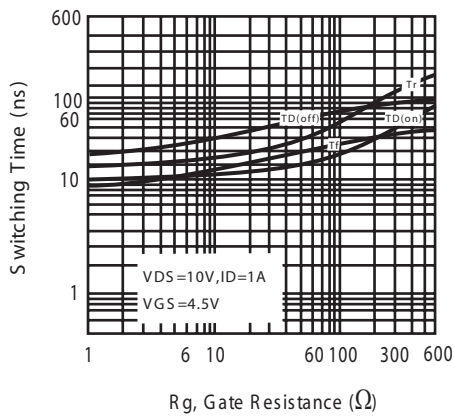


Figure 11. switching characteristics

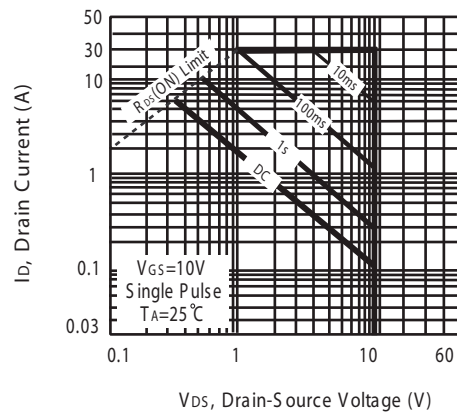


Figure 12. Maximum Safe Operating Area

