

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

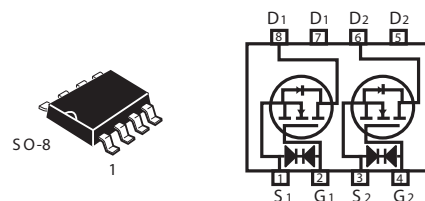
Product Summary

BV_{DS}	$R_{DS(ON)}$	I_D
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 @ $T_J=25^{\circ}C$ -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	$^{\circ}C$

Thermal Data

Thermal Resistance, Junction-to-Ambient ^a	$R_{\theta JA}$	62.5	$^{\circ}C/W$
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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 =250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V			1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} = ±10V, V _{DS} =0V			±10	uA
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D = 250uA	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 ohm R _{GEN} = 10 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 = 6.5 A V _{GS} =4V		1.1		nC
Gate-Drain Charge	Q _{gd}			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

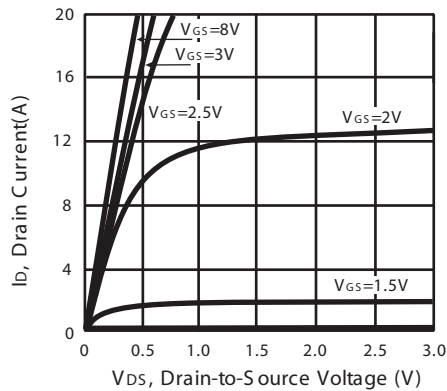


Figure 1. Output Characteristics

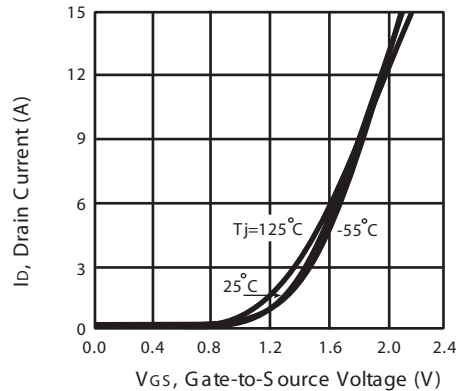


Figure 2. Transfer Characteristics

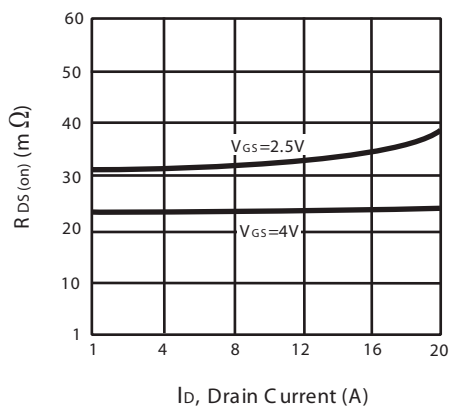


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

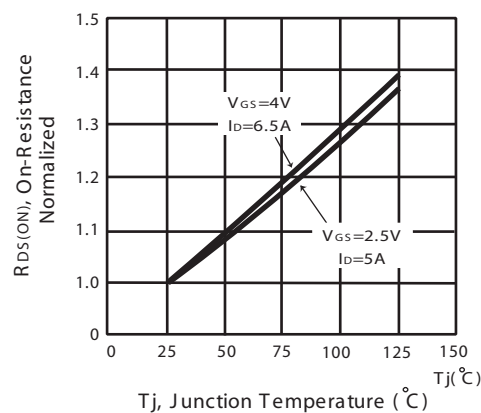


Figure 4. On-Resistance Variation with Drain Current and Temperature

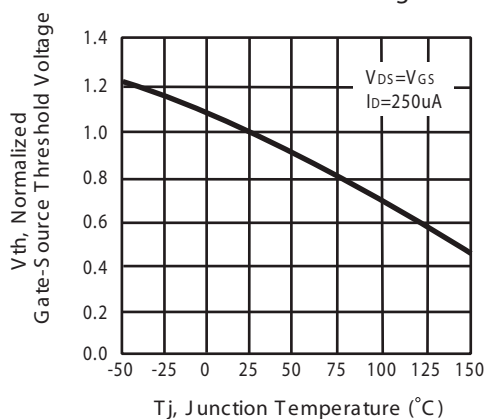


Figure 5. Gate Threshold Variation with Temperature

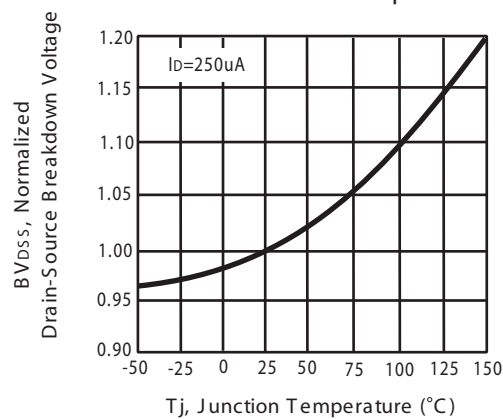


Figure 6. Breakdown Voltage Variation with Temperature

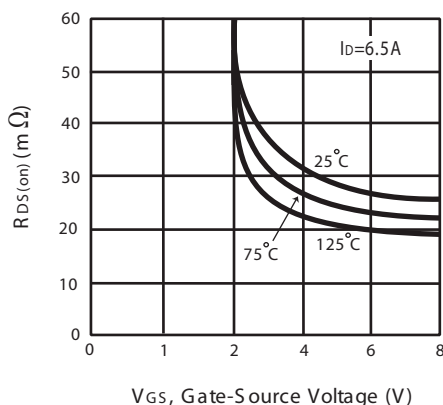


Figure 7. On-Resistance vs. Gate-Source Voltage

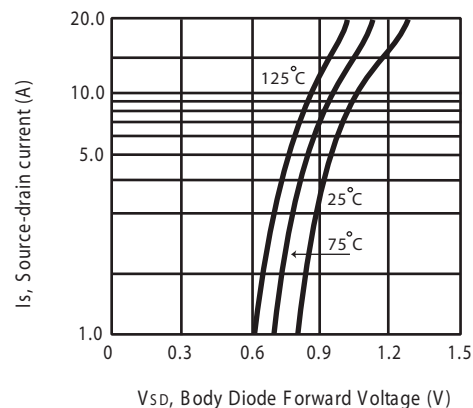
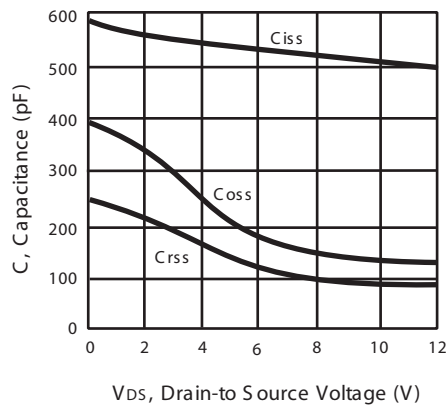
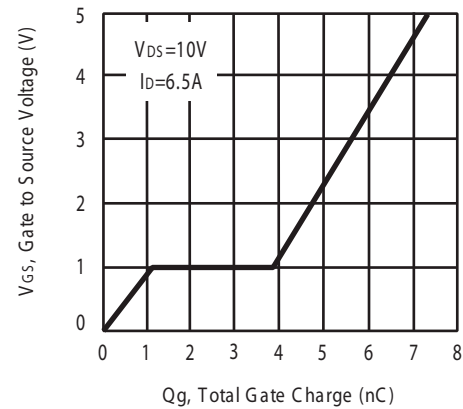
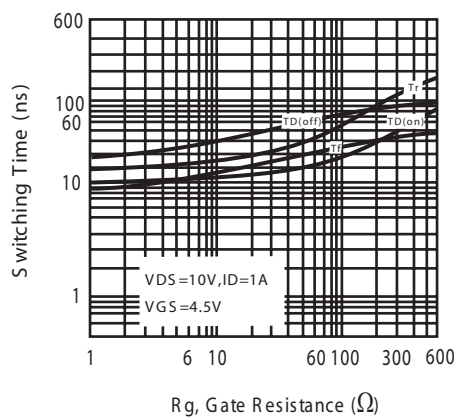
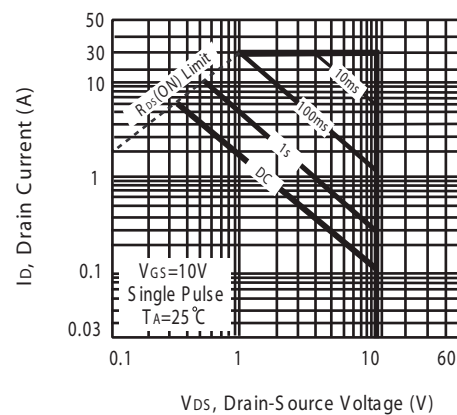


Figure 8. Body Diode Forward Voltage Variation with Source Current

Typical Characteristics

Figure 9. Capacitance

Figure 10. Gate Charge

Figure 11. switching characteristics

Figure 12. Maximum Safe Operating Area
