

## DESCRIPTION

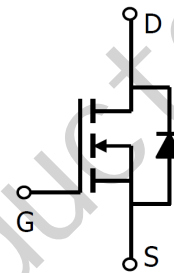
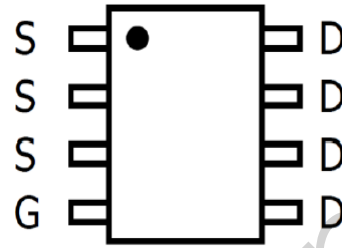
The DMN2009LSS is the N-Channel logic enhancement mode power field effect transistor is produced using high cell density advanced trench technology..

This high density process is especially tailored to minimize on-state resistance.

This device is suitable for use as a load switch or in PWM and gate charge for most of the synchronous buck converter applications

## FEATURE

- ◆ 30V/15A,  $R_{DS(ON)} = 6.5m\Omega$  (typ.)@ $V_{GS}=10V$
- ◆ 30V/8 A,  $R_{DS(ON)}=10m\Omega$  (typ.)@ $V_{GS}=4.5V$
- ◆ Super high design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and Maximum DC current capability
- ◆ Full RoHS compliance
- ◆ SOP8 package design



## APPLICATIONS

- ◆ High Frequency Point-of-Load Synchronous
- ◆ Newworking DC-DC Power System
- ◆ Load Switch

## ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ Unless otherwise noted )

Symbol	Parameter		Typical	Unit
$V_{DSS}$	Drain-Source Voltage		30	V
$V_{GSS}$	Gate-Source Voltage		$\pm 20$	V
$I_D$	Continuous Drain Current ( $T_A=25^\circ C$ )	$V_{GS}=10V$	15	A
	Continuous Drain Current ( $T_A=70^\circ C$ )		12	a
$I_{DM}$	Pulsed Drain Current		40	A
$I_S$	Continuous Source Current (Diode Conduction)		2.0	A
$P_D$	Power Dissipation	$T_A=25^\circ C$	3.0	W
		$T_A=70^\circ C$	2.1	
$T_J$	Operation Junction Temperature		150	$^\circ C$
$T_{STG}$	Storage Temperature Range		-55~+150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient		85	$^\circ C/W$

**Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.**

**Absolute maximum ratings are stress rating only and functional device operation is not implied**

**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Parameters</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	3.0	V
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0$			1	uA
		$V_{DS}=20V, V_{GS}=0$ $T_J=55^\circ\text{C}$			5	
$R_{DS(ON)}$	Drain-Source On-Resistance	$V_{GS}=10V, I_D=10A$		6.5	8	m $\Omega$
		$V_{GS}=4.5V, I_D=8\text{ A}$		10	18	
<b>Source-Drain Diode</b>						
$V_{SD}$	Diode Forward Voltage	$I_S=1.0A, V_{GS}=0V$		0.71	1.0	V
<b>Dynamic Parameters</b>						
$Q_g$	Total Gate Charge	$V_{DS}=15V$ $V_{GS}=4.5V$ $I_D=14A$		16	20.8	nC
$Q_{gs}$	Gate-Source Charge			5	6.5	
$Q_{gd}$	Gate-Drain Charge			3	3.9	
$C_{iss}$	Input Capacitance	$V_{DS}=15V$		986		pF
$C_{oss}$	Output Capacitance	$V_{GS}=0V$		325		
$C_{rss}$	Reverse Transfer Capacitance	$f=1\text{MHz}$		185		
$T_{d(on)}$	Turn-On Time	$V_{DS}=15V$ $I_D=14A$		17	34	nS
$T_r$				5	10	
$T_{d(off)}$	Turn-Off Time	$V_{GEN}=10V$ $R_G=6\Omega$		50	100	
$T_f$				10	20	

Note: 1. Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$

2. Static parameters are based on package level with recommended wire bonding

■ **TYPICAL CHARACTERISTICS (25°C Unless Note)**

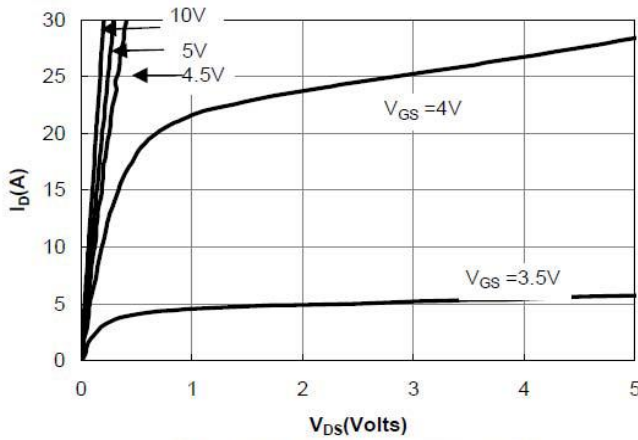


Figure 1: On-Regions Characteristics

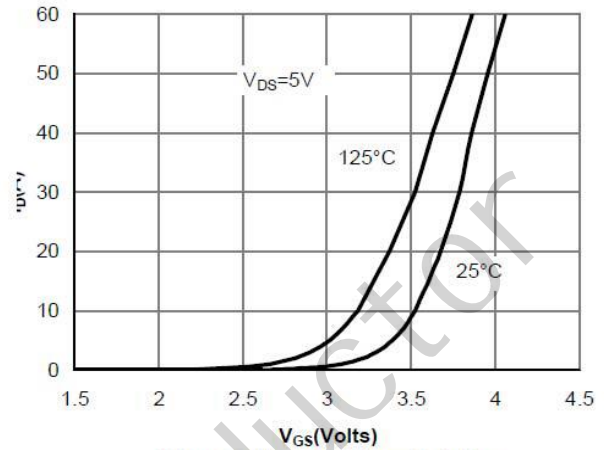


Figure 2: Transfer Characteristics

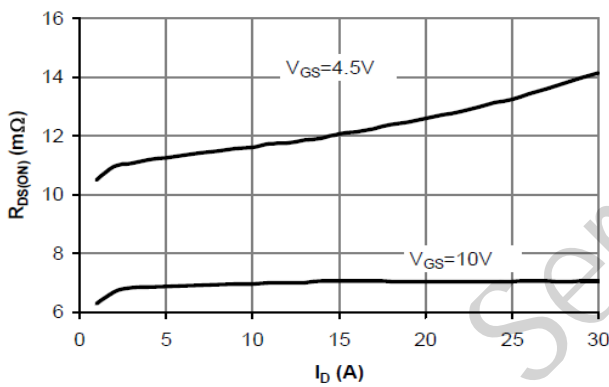


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

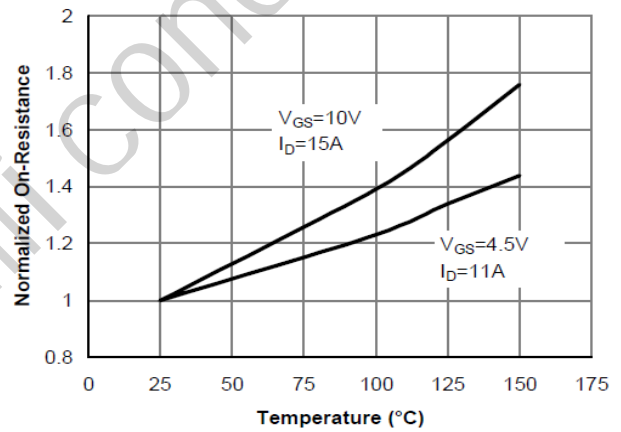


Figure 4: On-Resistance vs. Junction Temperature

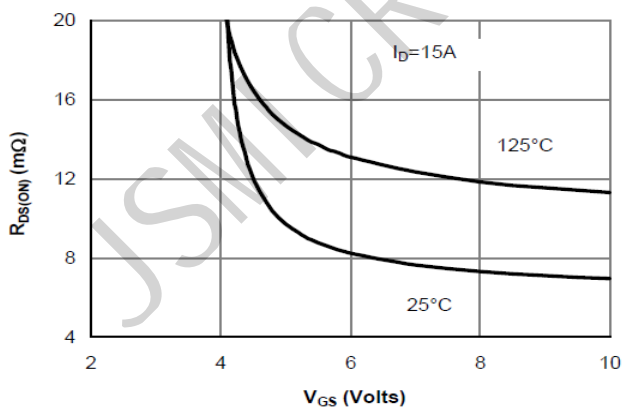


Figure 5: On-Resistance vs. Gate-Source Voltage

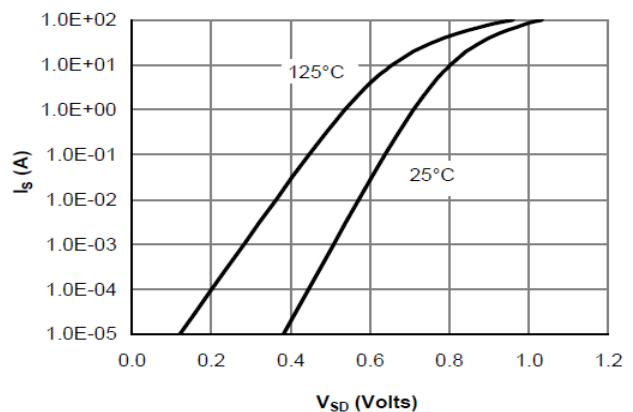


Figure 6: Body-Diode Characteristics

### ■ TYPICAL CHARACTERISTICS (continuous)

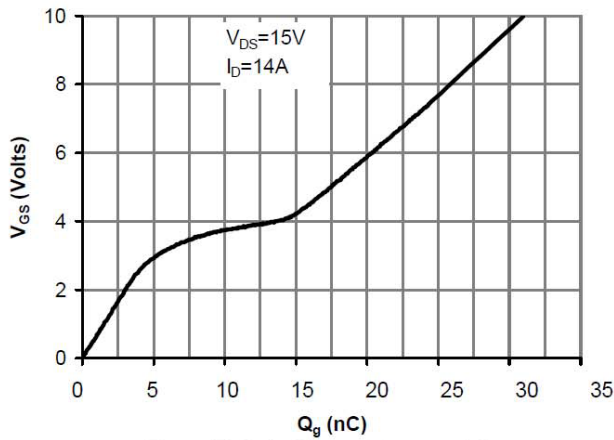


Figure 7: Gate-Charge Characteristics

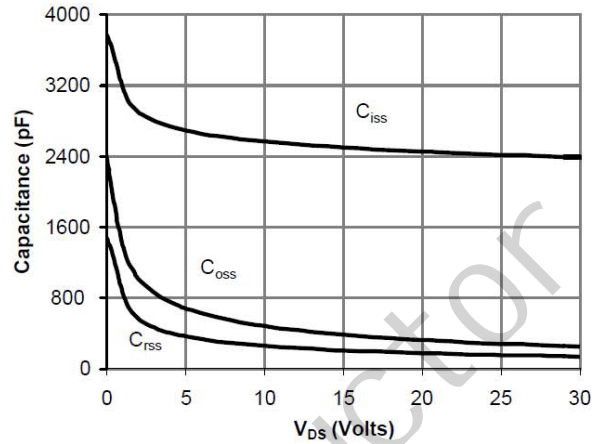


Figure 8: Capacitance Characteristics

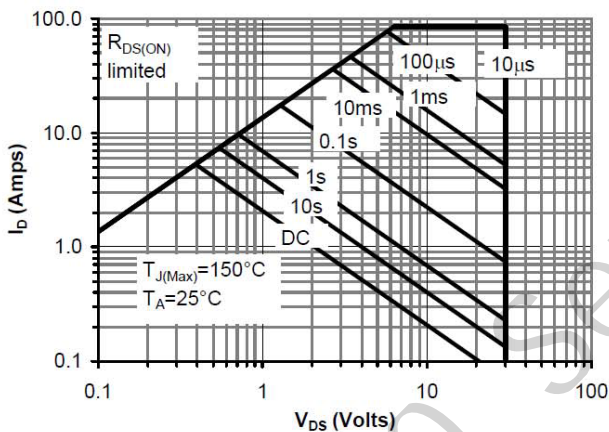


Figure 9: Maximum Forward Biased Safe Operating Area

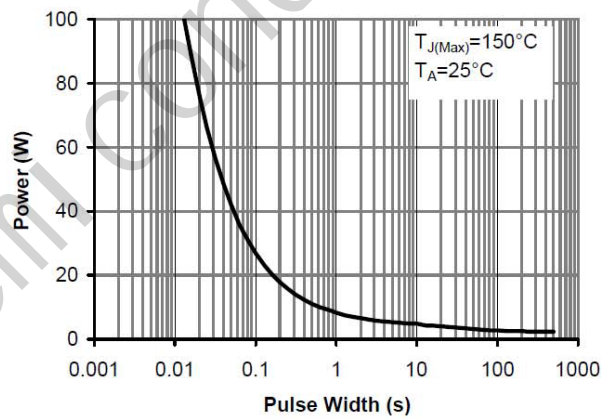


Figure 10: Single Pulse Power Rating Junction-to-Ambient

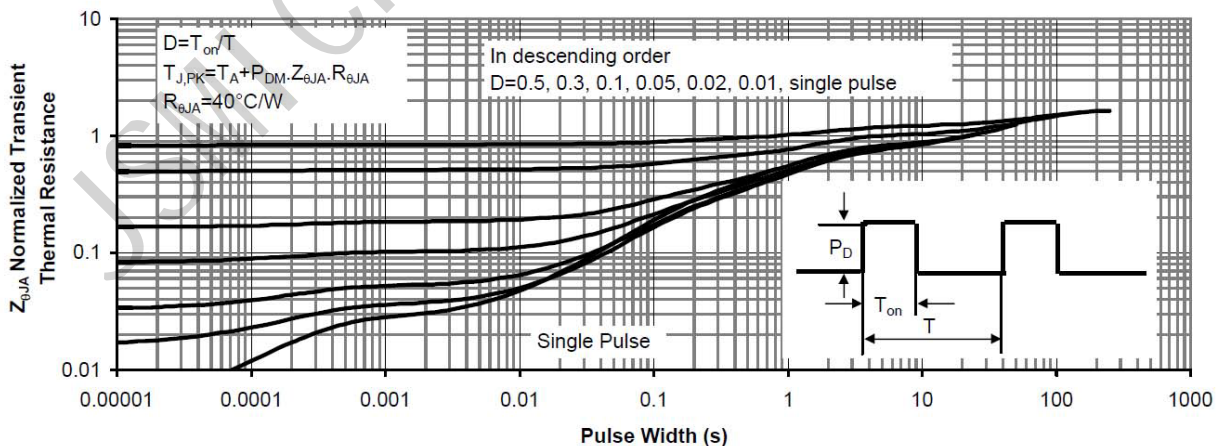
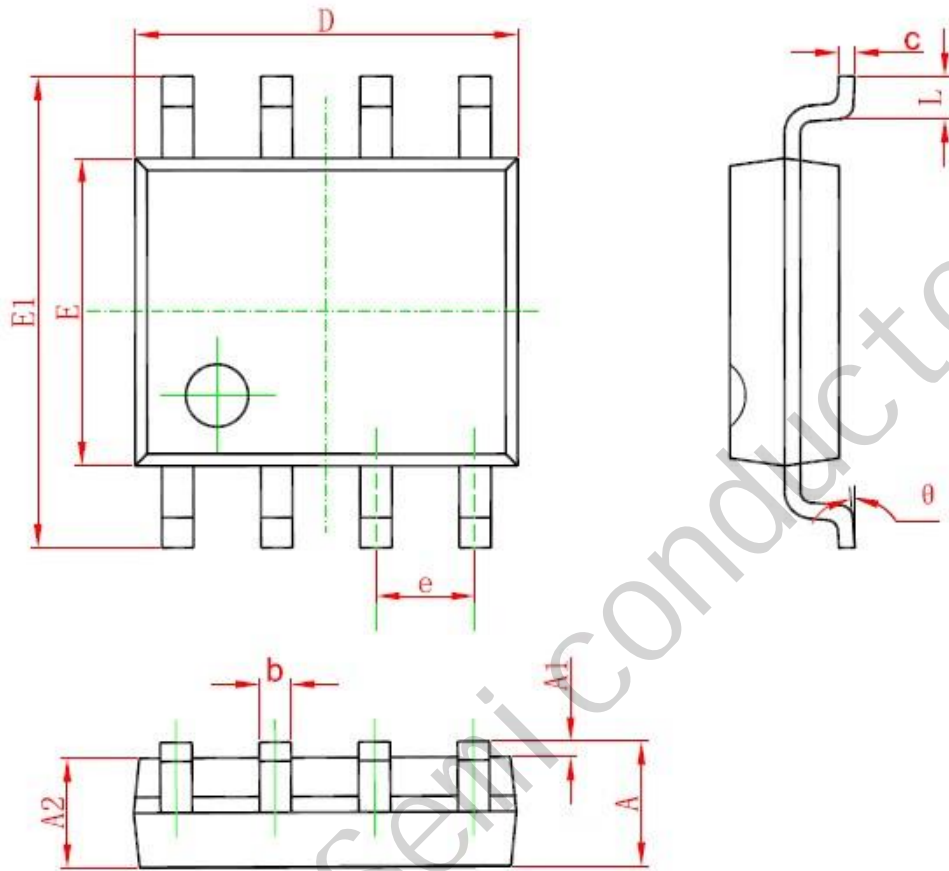


Figure 11: Normalized Maximum Transient Thermal Impedance

**■ SOP8 PACKAGE OUTLINE DIMENSIONS**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°