

Description

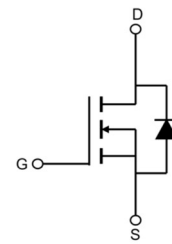
Features

- 600V, 8A
 $R_{DS(ON)} < 1.18\Omega @ V_{GS} = 10V$
- Fast Switching
- Improved dv/dt Capability

Application

- Load Switch
- PWM Application
- Power management

100% UIS
100% ΔV_{ds}



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	TUBE (PCS)	Inner Box (PCS)	Per Carton (PCS)
VSM8N60-T1	VSM8N60	TUBE	TO-251	80	4,000	32,000

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter		Max.	Units
V _{DSS}	Drain-Source Voltage		600	V
V _{GSS}	Gate-Source Voltage		±30	V
I _D	Continuous Drain Current	T _C = 25°C	8	A
		T _C = 100°C	5.2	A
I _{DM}	Pulsed Drain Current ^{note1}		32	A
E _{AS}	Single Pulsed Avalanche Energy ^{note2}		145.8	mJ
P _D	Power Dissipation	T _C = 25°C	100	W
R _{θJC}	Thermal Resistance, Junction to Case		1.25	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient		60	°C/W
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to +150	°C

Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	600	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =600V, V _{GS} =0V, T _J =25℃	-	-	1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±30V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =4A	-	1	1.18	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	1160	-	pF
C _{oss}	Output Capacitance		-	109	-	pF
C _{rss}	Reverse Transfer Capacitance		-	12	-	pF
Q _g	Total Gate Charge	V _{DD} =480V, I _D =8A, V _{GS} =10V	-	26	-	nC
Q _{gs}	Gate-Source Charge		-	4.5	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	14	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =300V, I _D =8A, R _G =25Ω	-	15	-	ns
t _r	Turn-on Rise Time		-	18	-	ns
t _{d(off)}	Turn-off Delay Time		-	80	-	ns
t _f	Turn-off Fall Time		-	35	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	8	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	32	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _{SD} =8A	-	-	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =8A, di/dt=100A/μs	-	300	-	ns
Q _{rr}	Reverse Recovery Charge		-	4.1	-	μC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J = 25°C, V_{DD} = 50V, V_G = 10V, L = 10mH, I_{AS} = 5.4A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤1%

Typical Performance Characteristics

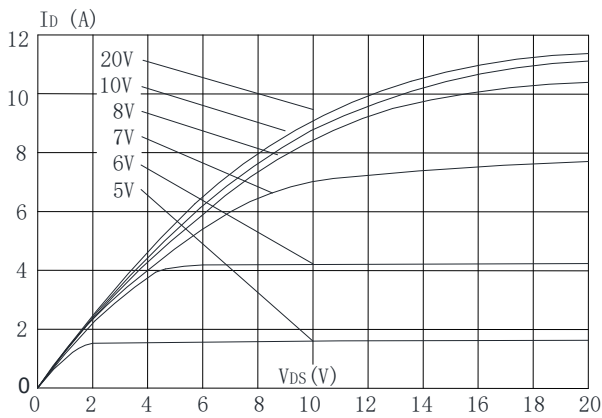
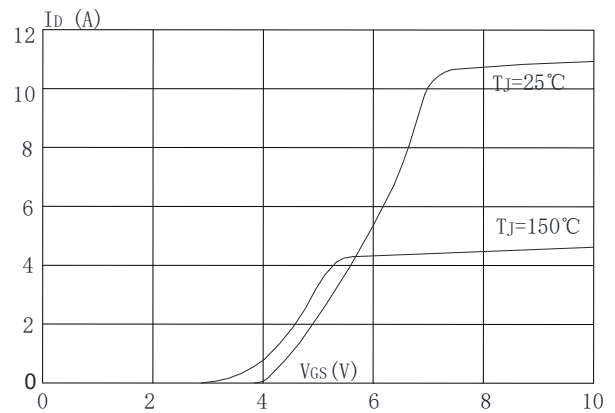
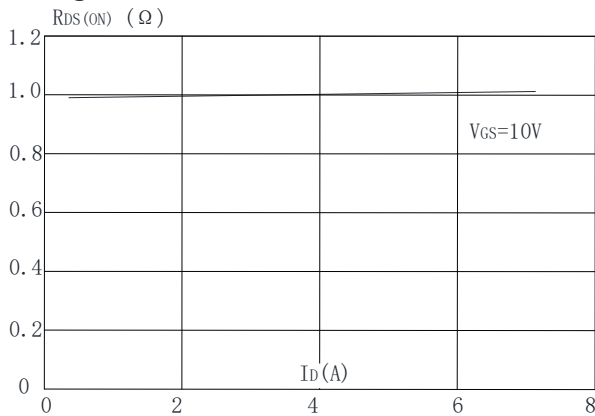
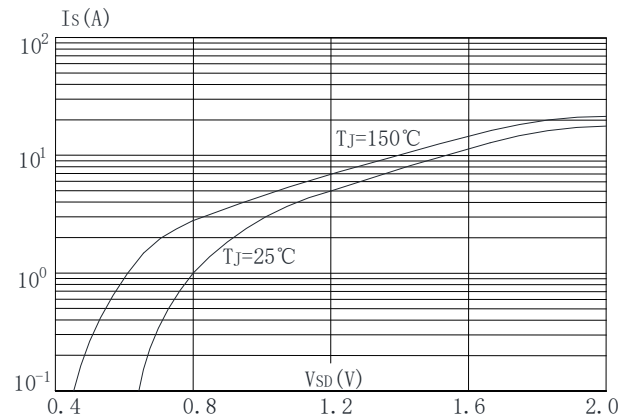
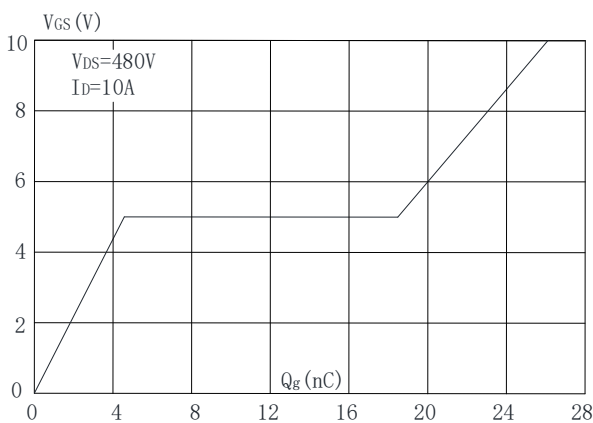
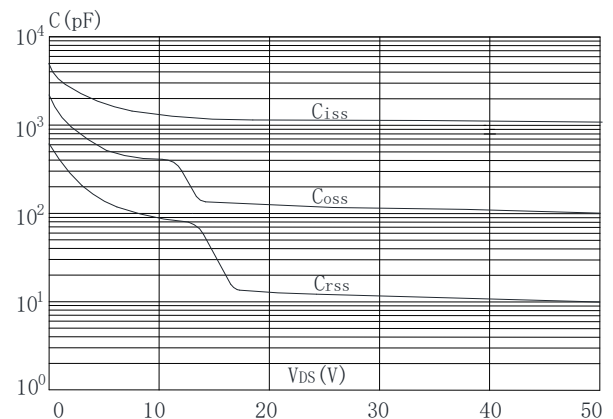
Figure1: Output Characteristics

Figure 2: Typical Transfer Characteristics

Figure 3: On-resistance vs. Drain Current

Figure 4: Body Diode Characteristics

Figure 5: Gate Charge Characteristics

Figure 6: Capacitance Characteristics


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

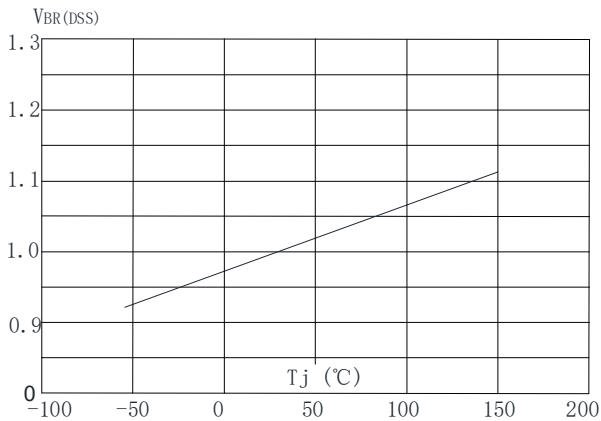


Figure 8: Normalized on Resistance vs. Junction Temperature

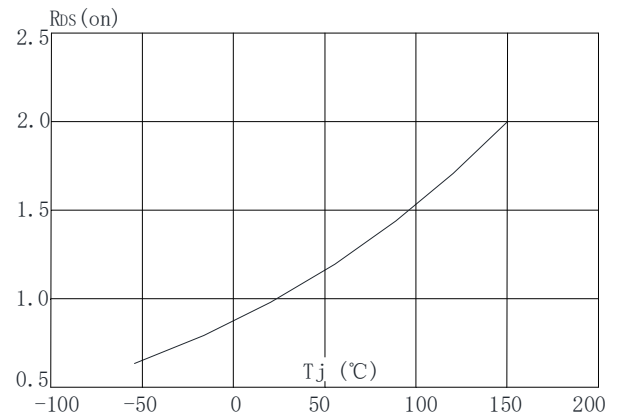


Figure 9: Maximum Safe Operating Area

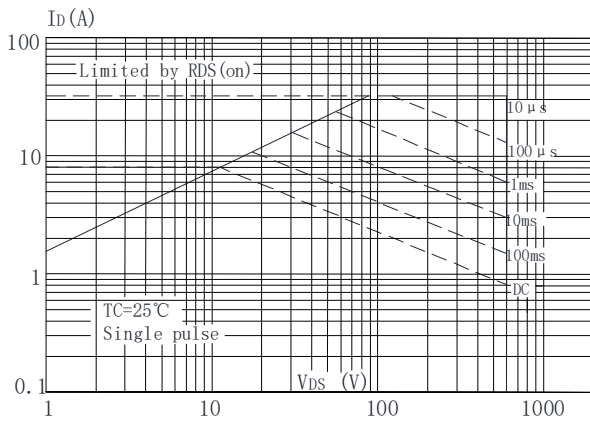


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

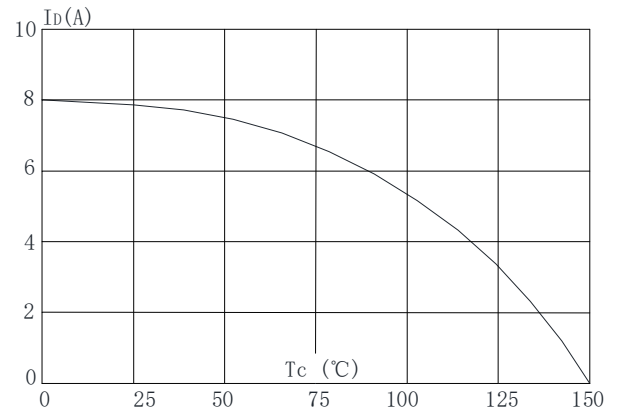
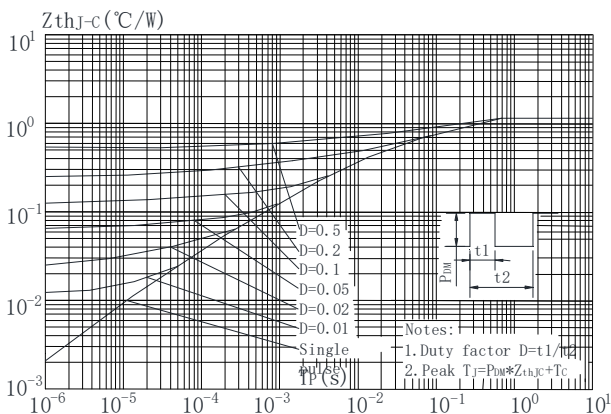


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

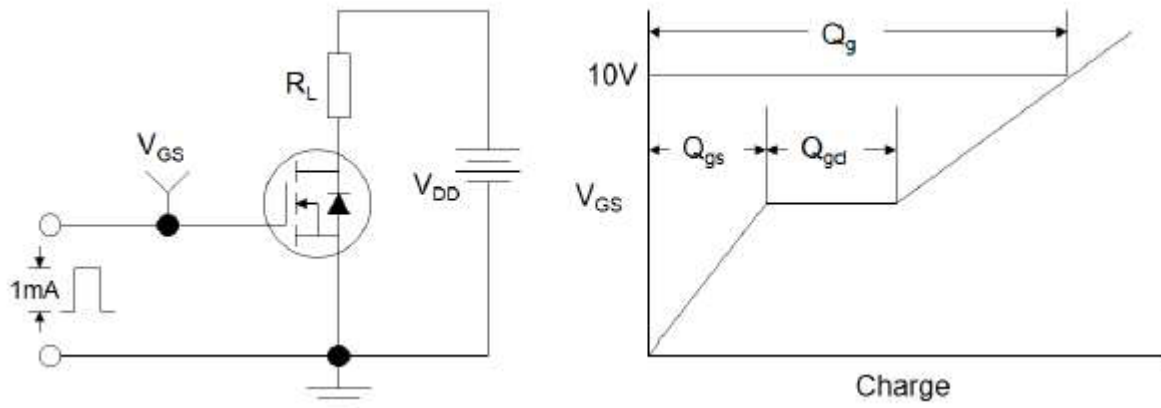


Figure1:Gate Charge Test Circuit & Waveform

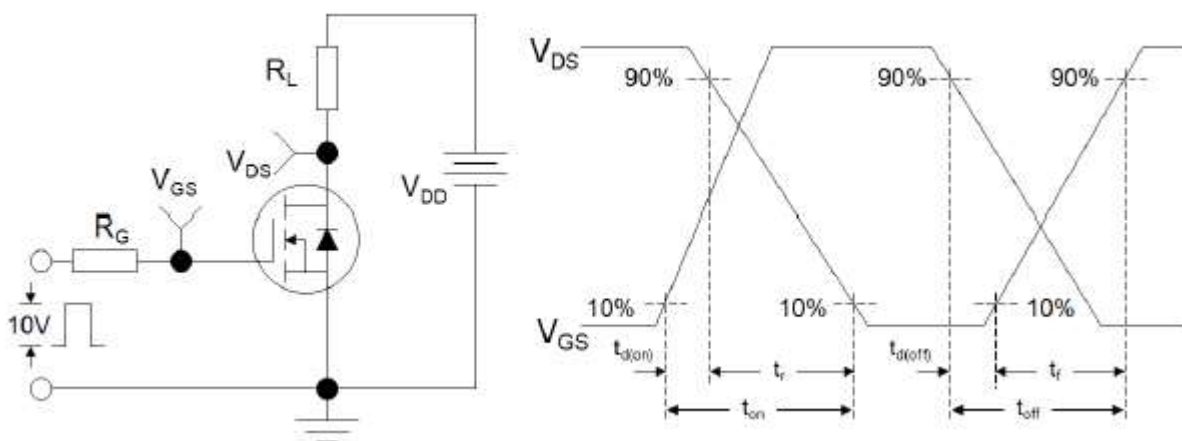


Figure 2: Resistive Switching Test Circuit & Waveforms

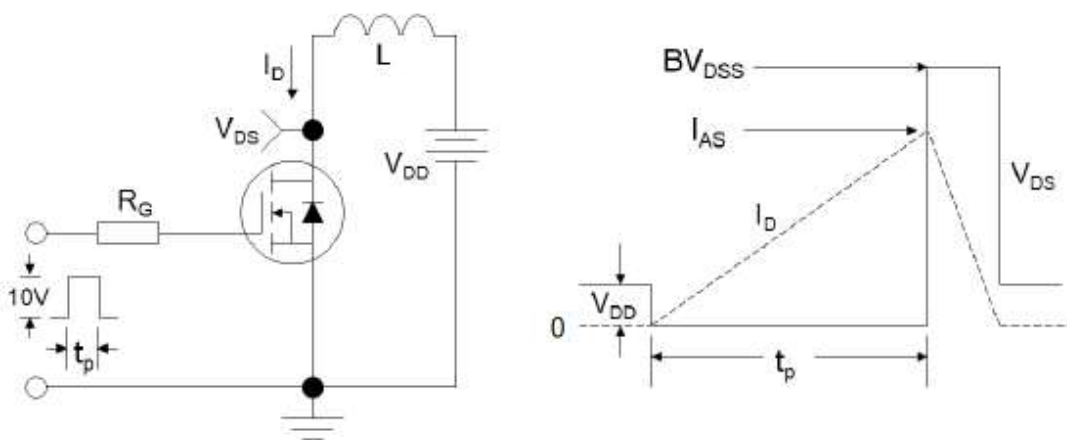


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms