
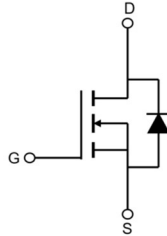


Description

Features <ul style="list-style-type: none"> ● 1000V, 2A $R_{DS(ON)} < 7.2\Omega @ V_{GS} = 10V$ ● Fast Switching ● Improved dv/dt Capability 	Application <ul style="list-style-type: none"> ● Load Switch ● PWM Application ● Power management <p>100% UIS 100% ΔV_{ds}</p>
 TO-251	 Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	TUBE (PCS)	Inner Box (PCS)	Per Carton (PCS)
VSM2N100-T1	VSM2N100	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		1000	V
V _{GSS}	Gate-Source Voltage		±30	V
I _D	Continuous Drain Current	T _C = 25°C	2	A
		T _C = 100°C	1.3	A
I _{DM}	Pulsed Drain Current ^{note1}		8	A
E _{AS}	Single Pulsed Avalanche Energy ^{note2}		16.2	mJ
P _D	Power Dissipation	T _C = 25°C	75	W
R _{θJC}	Thermal Resistance, Junction to Case		1.67	°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 ($T_J=25^{\circ}\text{C}$ 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	1000	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =1000V, 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	3	3.5	4	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =1A	-	6	7.2	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	419	-	pF
C _{oss}	Output Capacitance		-	45	-	pF
C _{rss}	Reverse Transfer Capacitance		-	9	-	pF
Q _g	Total Gate Charge	V _{DD} =800V, I _D =2A, V _{GS} =15V	-	16	-	nC
Q _{gs}	Gate-Source Charge		-	2	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	8	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =500V, I _D =2A, R _G =25Ω	-	36	-	ns
t _r	Turn-on Rise Time		-	12	-	ns
t _{d(off)}	Turn-off Delay Time		-	100	-	ns
t _f	Turn-off Fall Time		-	43	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	2	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	8	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _{SD} =1A	-	-	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =2A,	-	432.5	-	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	-	424	-	μC

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

2. EAS condition: $T_J=25^{\circ}\text{C}$, $V_{DD}=50V$, $V_G=10V$, $L=10mH$, $I_{AS}=1.8A$

3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 1\%$

Typical Performance Characteristics

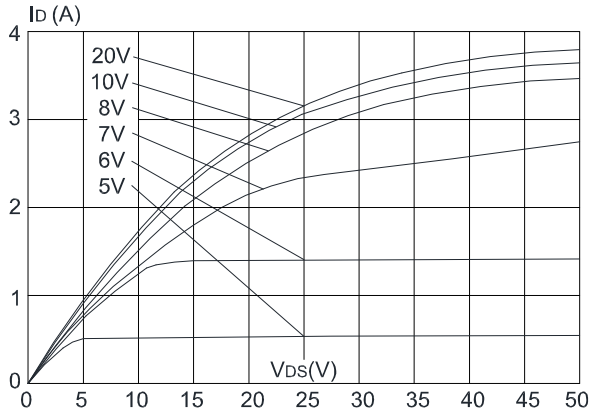
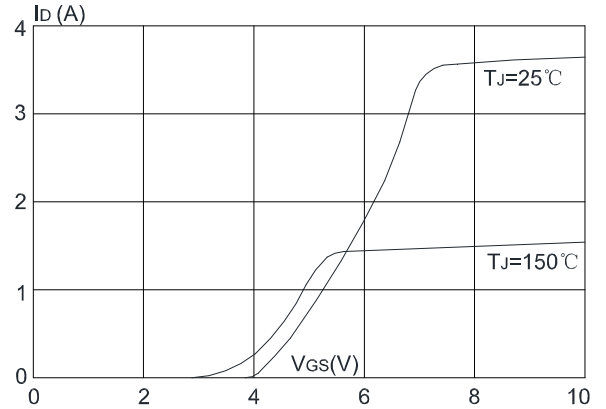
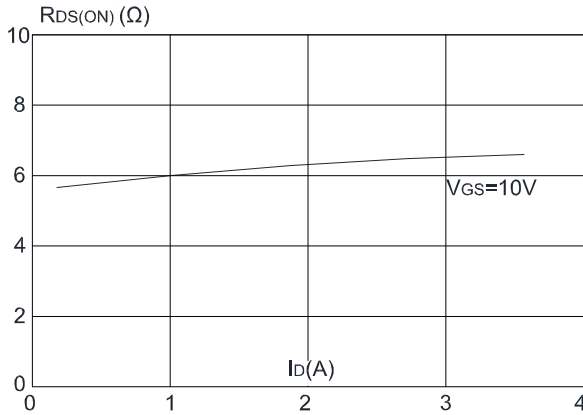
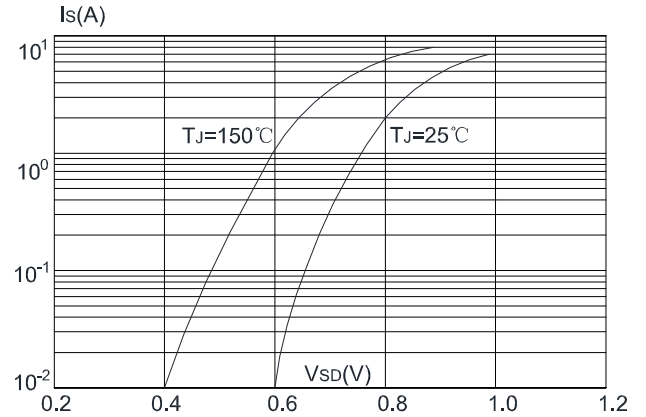
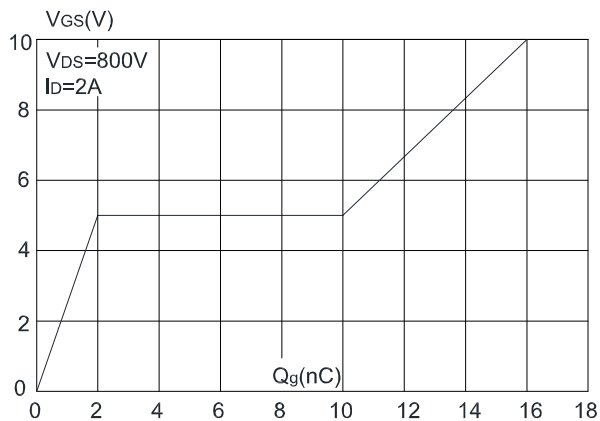
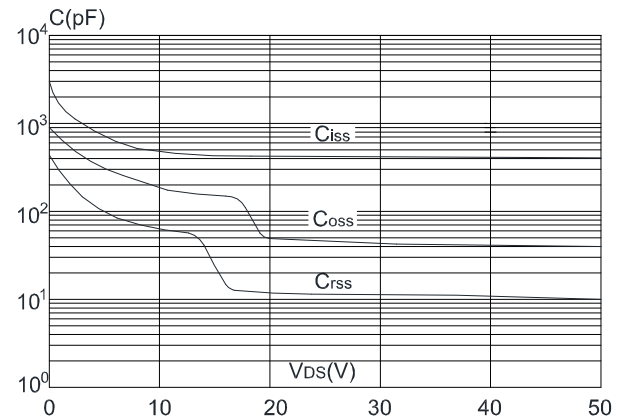
Figure1: Output Characteristics

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

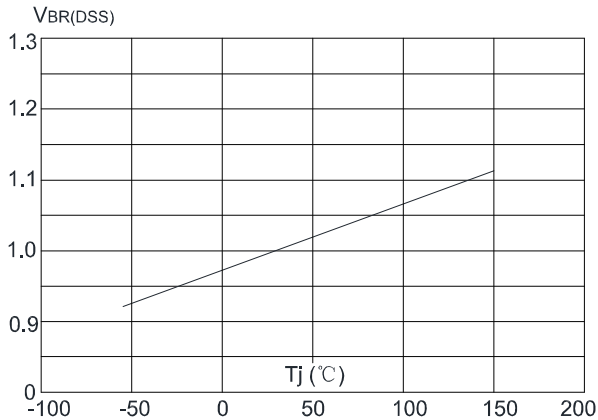


Figure 8: Normalized on Resistance vs. Junction Temperature

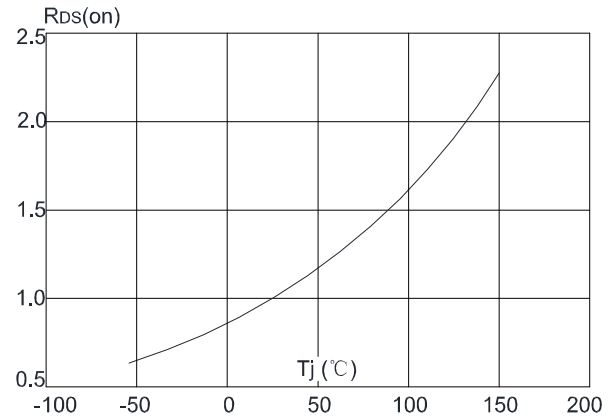


Figure 9: Maximum Safe Operating Area

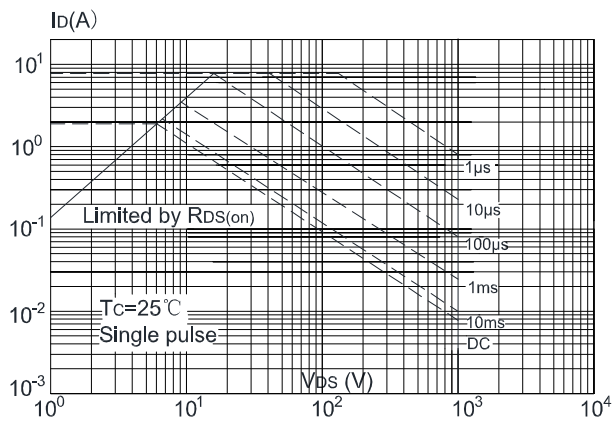


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

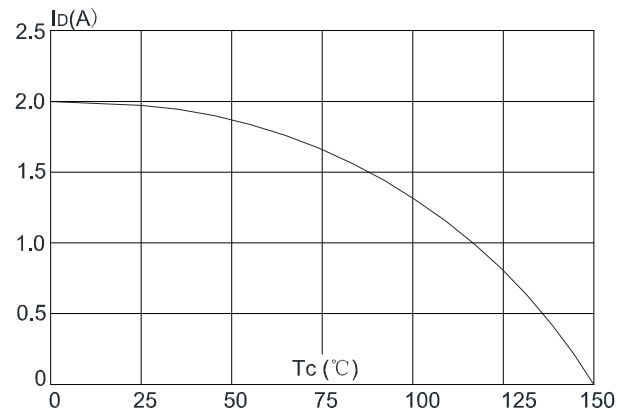
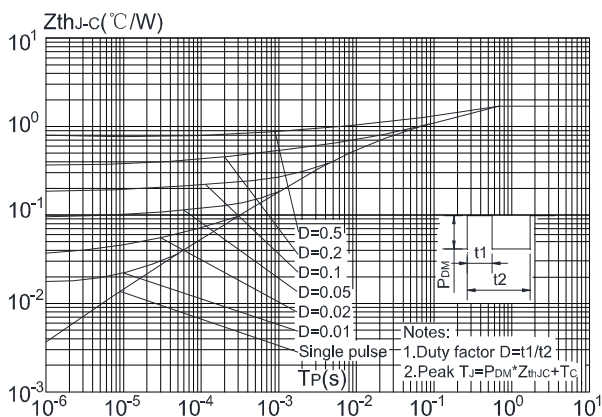


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

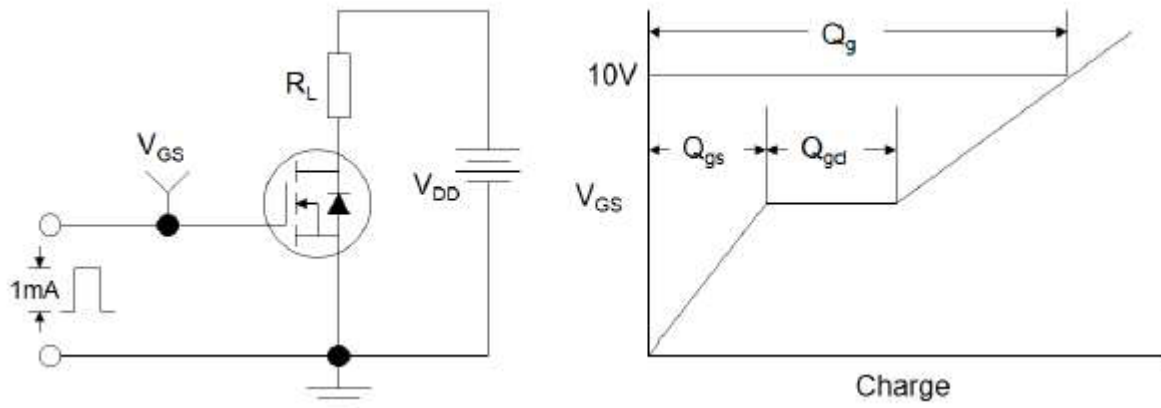


Figure1:Gate Charge Test Circuit & Waveform

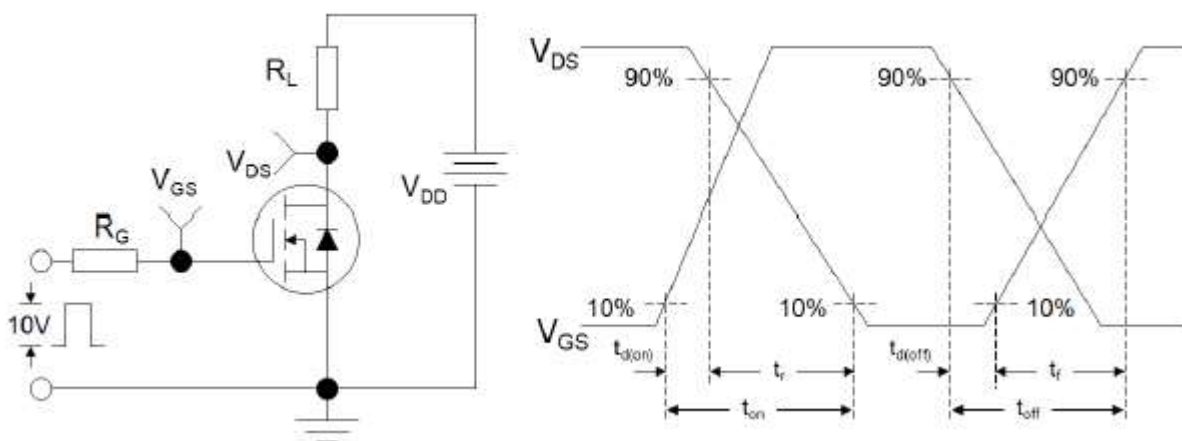


Figure 2: Resistive Switching Test Circuit & Waveforms

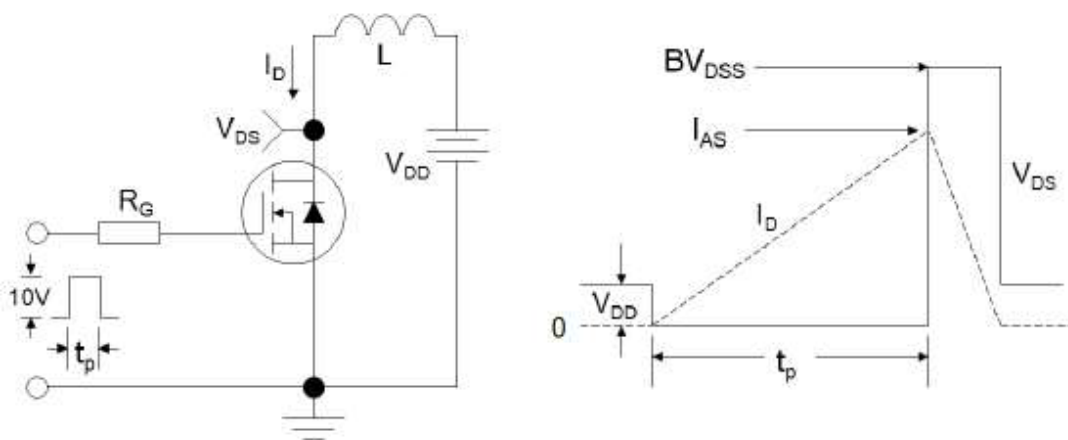


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms