Description

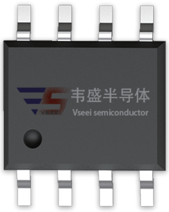
Features

- V_{DS}= -30V, I_D= -11A
  $R_{DS(ON)}$ <16.5mΩ @ V_{GS} = -10V
  $R_{DS(ON)}$ < 26.5mΩ @ V_{GS} = -4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

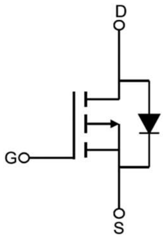
Application

- PWM Applications
- Load Switch
- Power Management

100% UIS
100% ΔVds



SOP-8



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
VSM11P03-S8	VSM11P03	TAPING	SOP-8	13inch	4000	48000

Absolute Maximum Ratings (T_A=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		-30	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A = 25℃	-11	A
		T_A = 100℃	-7	A
I_{DM}	Pulsed Drain Current note1		-44	A
E_{AS}	Single Pulsed Avalanche Energy note2		68	mJ
P_D	Power Dissipation	T_A = 25℃	3.6	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		34.7	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics (T_J=25℃ 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	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}= -30V, V_{GS}=0V,	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D= -250μA	-1.0	-1.5	-2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}= -10V, I_D= -10A	-	12.7	16.5	mΩ
		V_{GS}= -4.5V, I_D= -5A	-	19	26.5	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}= -15V, V_{GS}=0V, f=1.0MHz	-	2130	-	pF
C_{oss}	Output Capacitance		-	280	-	pF
C_{rss}	Reverse Transfer Capacitance		-	252	-	pF
Q_g	Total Gate Charge	V_{DS}= -15V, I_D= -5A, V_{GS}= -10V	-	22	-	nC
Q_{gs}	Gate-Source Charge		-	4	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	5.8	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}= -15V, I_D= -10A, V_{GS}= -10V, R_{GEN}=2.5Ω	-	9	-	ns
t_r	Turn-on Rise Time		-	13	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	48	-	ns
t_f	Turn-off Fall Time		-	20	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-11	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-44	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S= -11A	-	-0.8	-1.2	V

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

2. E_{AS} condition: T_J=25℃, V_{DD}= -15V, V_G= -10V, R_G=25Ω, L=0.5mH, I_{AS}= -16.5A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Performance Characteristics

Figure1: Output Characteristics

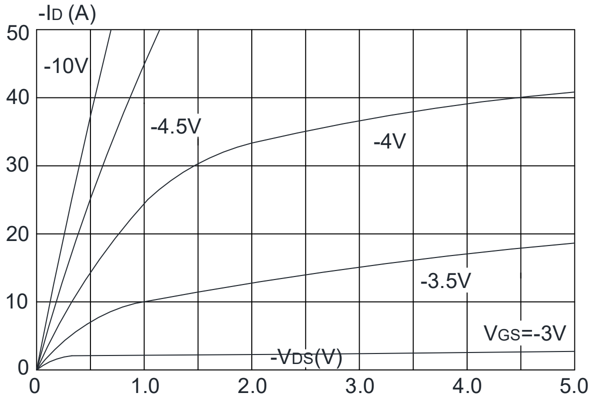


Figure 2: Typical Transfer Characteristics

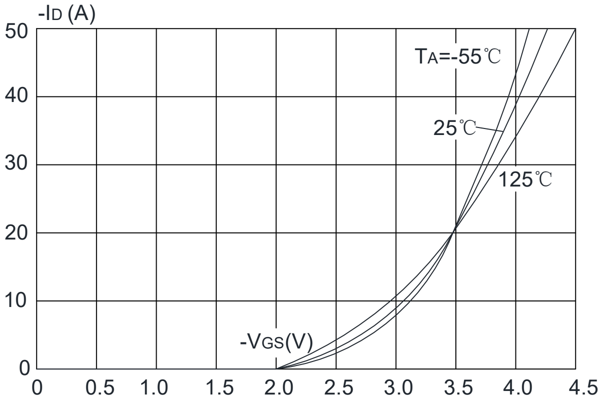


Figure 3: On-resistance vs. Drain Current

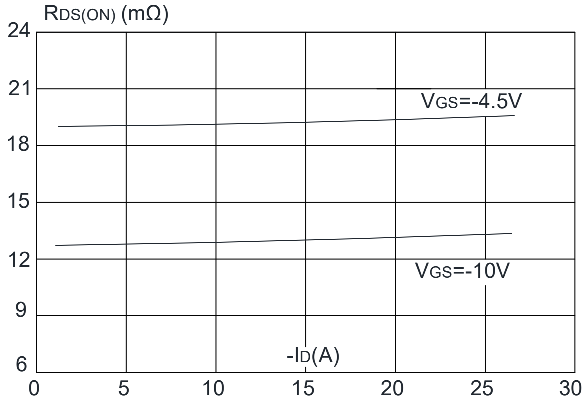


Figure 4: Body Diode Characteristics

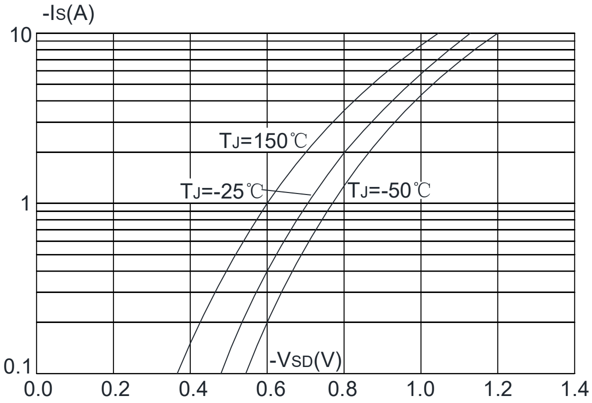


Figure 5: Gate Charge Characteristics

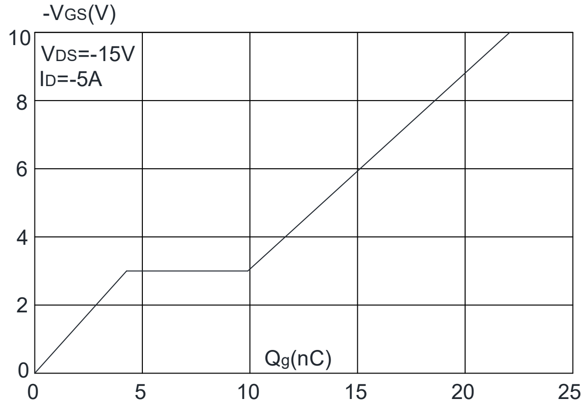


Figure 6: Capacitance Characteristics

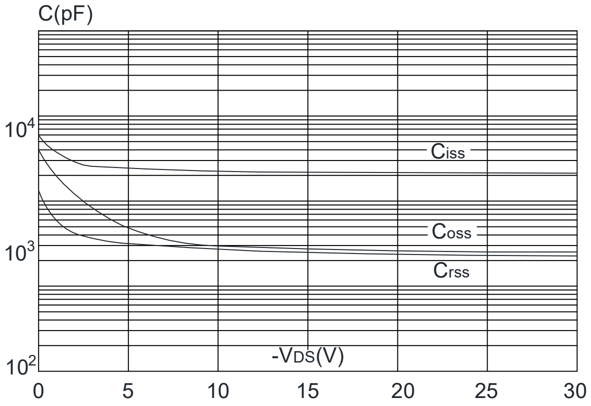


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

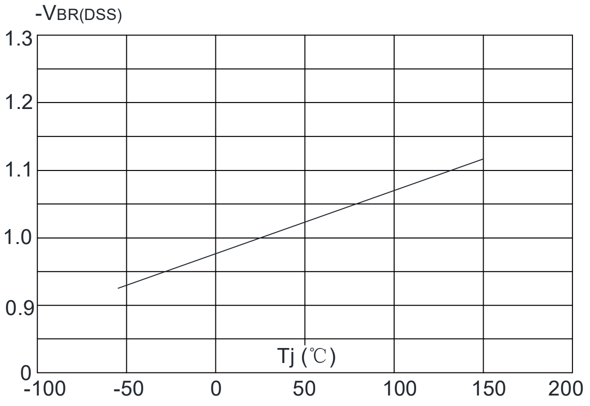


Figure 8: Normalized on Resistance vs. Junction Temperature

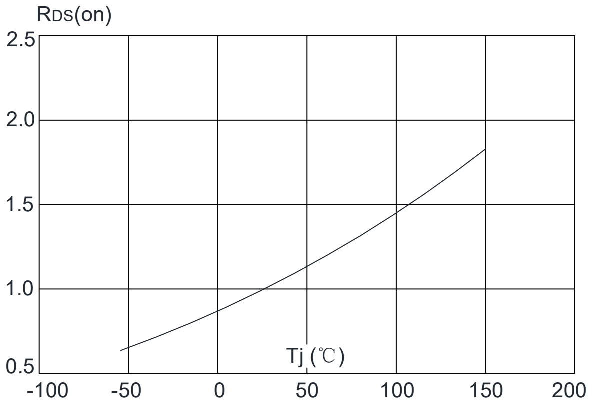


Figure 9: Maximum Safe Operating Area

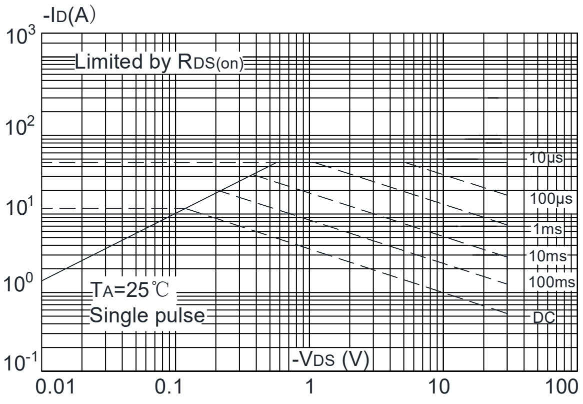


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

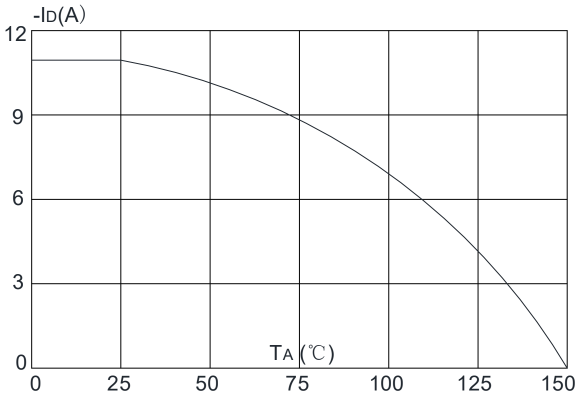
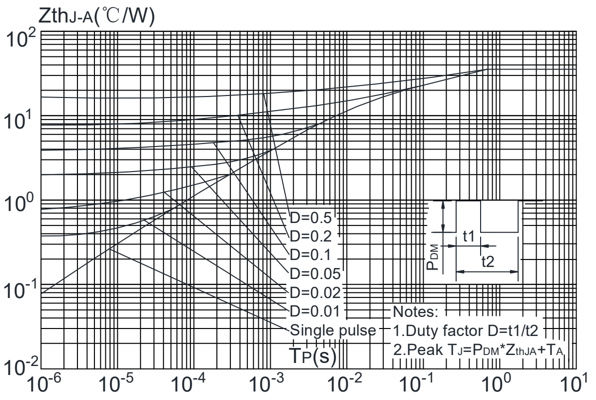
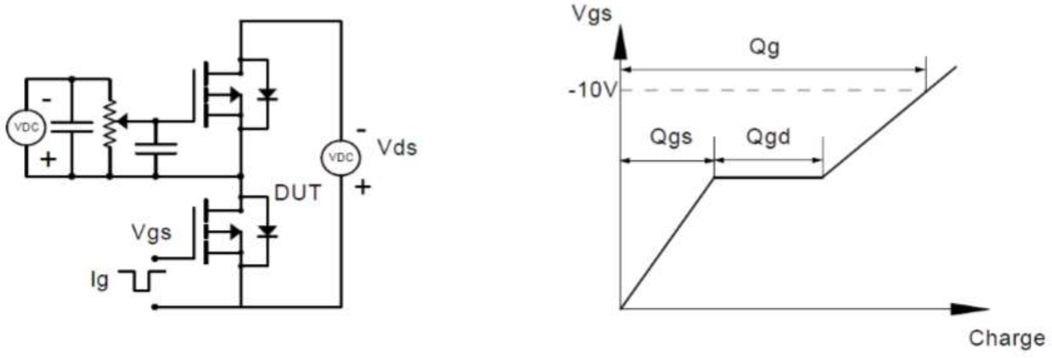


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

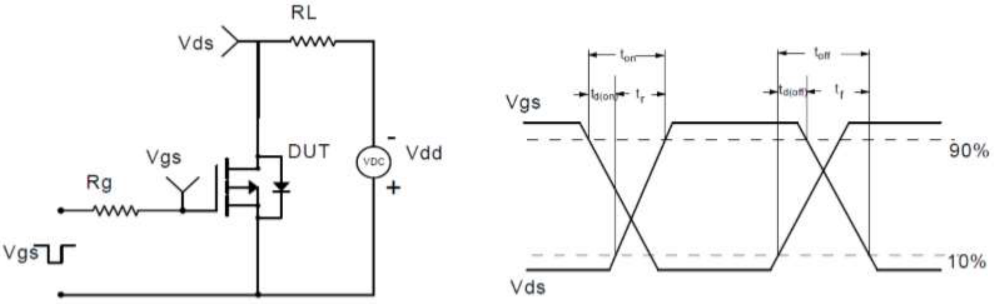


Test Circuit

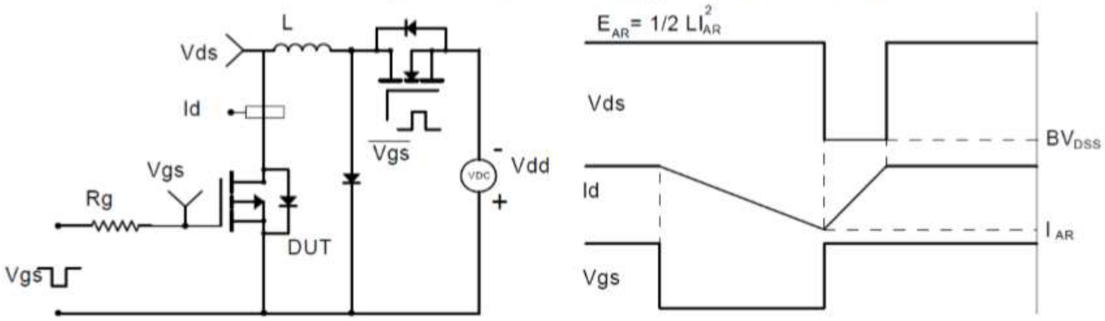
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms