

Description

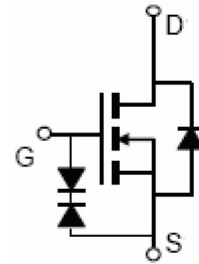
The **VS11N03-S8** uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications. It is ESD protected.

General Features

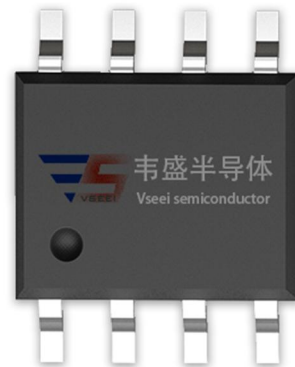
- $V_{DS} = 30V, I_D = 11A$
 $R_{DS(ON)} < 10m\Omega @ V_{GS}=10V$
 $R_{DS(ON)} < 14m\Omega @ V_{GS}=4.5V$
ESD Rating: 2000V HBM
- High power and current handling capability
- Lead free product is acquired
- Surface mount package

Application

- PWM application
- Load switch



Schematic diagram



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
VS11N03-S8	VS11N03-S8	SOP-8	Ø330mm	12mm	

Absolute Maximum Ratings ($T_A=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current-Continuous	I_D	11	A
Drain Current-Pulsed ^(Note 1)	I_{DM}	50	A
Maximum Power Dissipation	P_D	2.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^{\circ}C$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	50	$^{\circ}C/W$
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Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	30		-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	-	-	1	μA
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V	-	-	±10	μA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =8A	-	7	10	mΩ
		V _{GS} =4.5V, I _D =6A	-	10	14	mΩ
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =11A	25	-	-	S
Dynamic Characteristics ^(Note4)						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, F=1.0MHz	-	1155	-	PF
Output Capacitance	C _{oss}		-	260	-	PF
Reverse Transfer Capacitance	C _{rss}		-	95	-	PF
Switching Characteristics ^(Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =15V, R _L =2.2Ω V _{GS} =5V, R _{GEN} =3Ω	-	10		nS
Turn-on Rise Time	t _r		-	16		nS
Turn-Off Delay Time	t _{d(off)}		-	40		nS
Turn-Off Fall Time	t _f		-	10.8		nS
Total Gate Charge	Q _g	V _{DS} =15V, I _D =8A, V _{GS} =4.5V	-	17.5		nC
Gate-Source Charge	Q _{gs}		-	4.5	-	nC
Gate-Drain Charge	Q _{gd}		-	2.5	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V, I _S =1A	-	-	1.2	V
Diode Forward Current ^(Note 2)	I _S		-	-	11	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

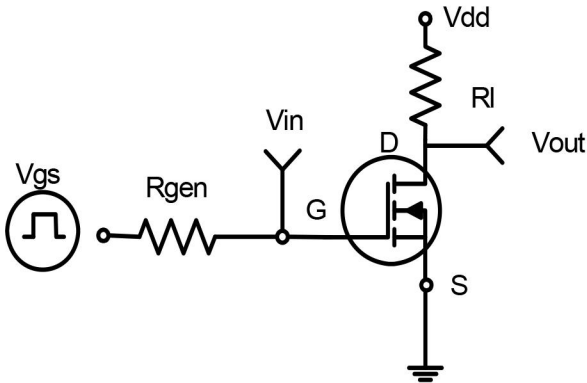


Figure 1: Switching Test Circuit

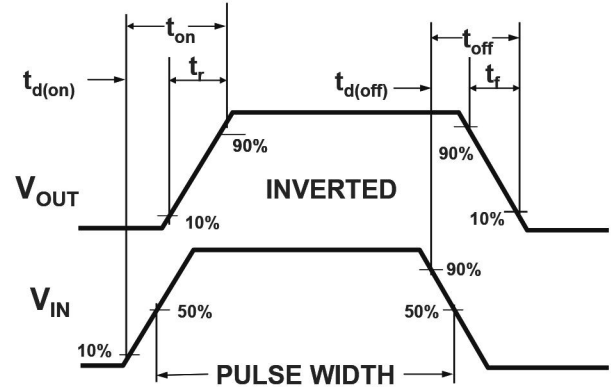


Figure 2: Switching Waveforms

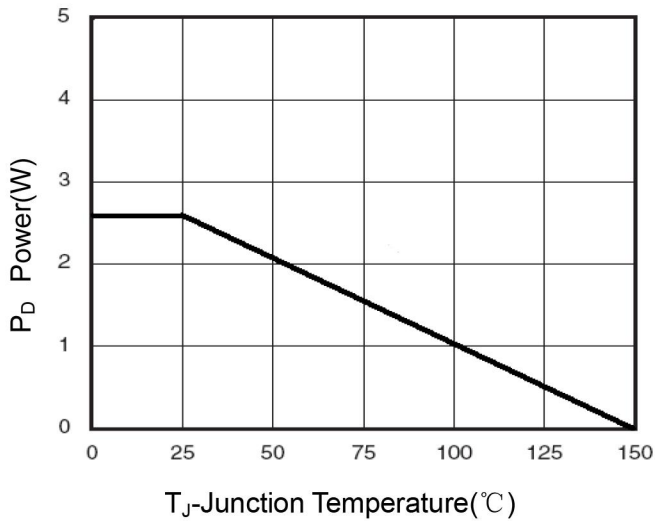


Figure 3 Power Dissipation

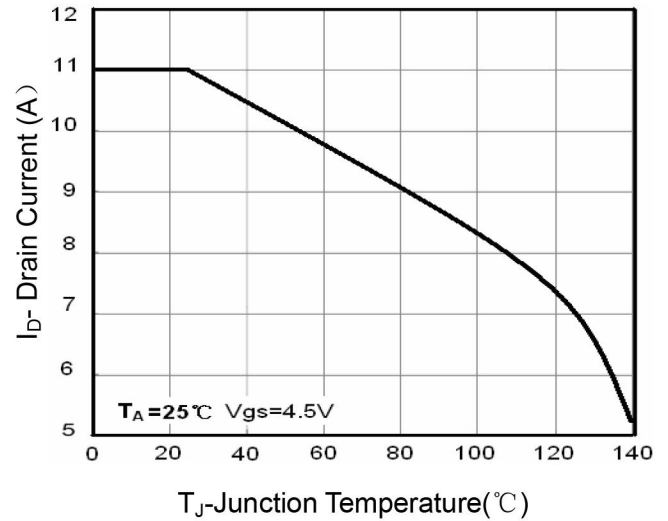


Figure 4 Drain Current

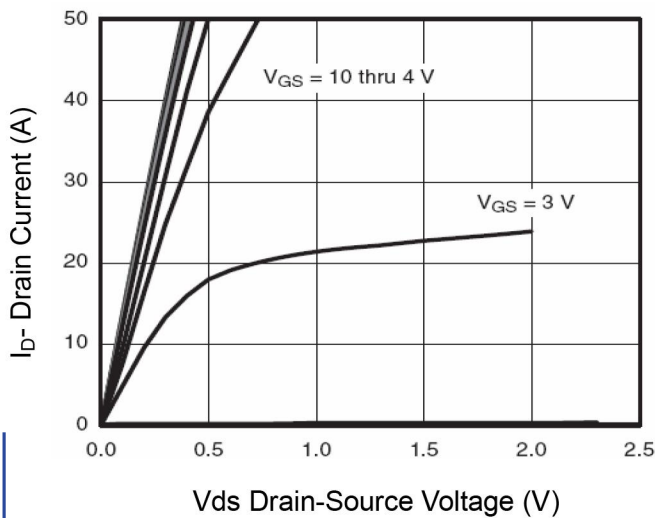


Figure 5 Output Characteristics

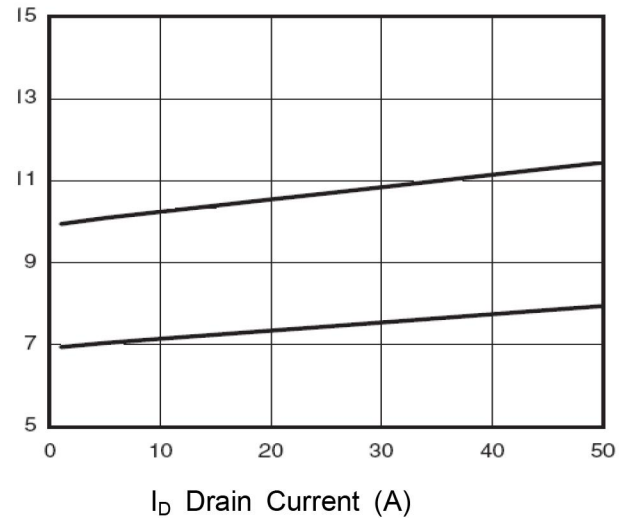
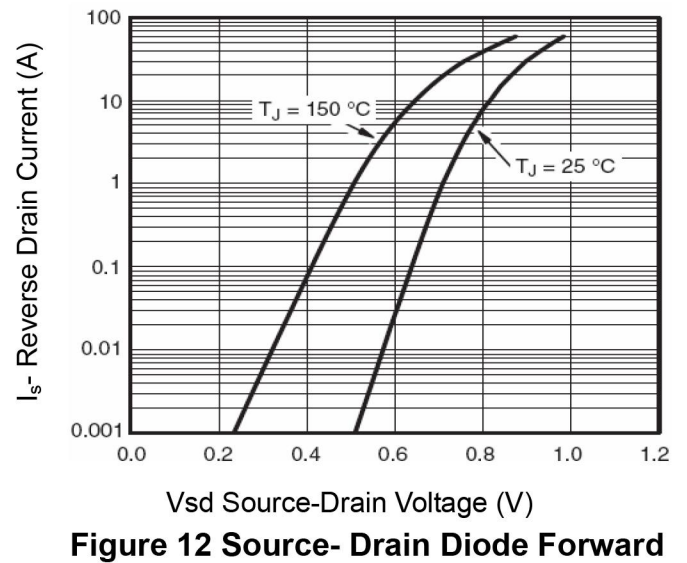
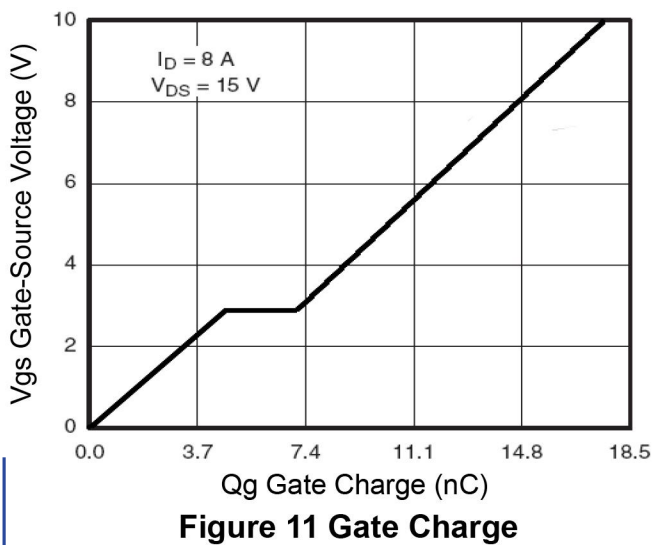
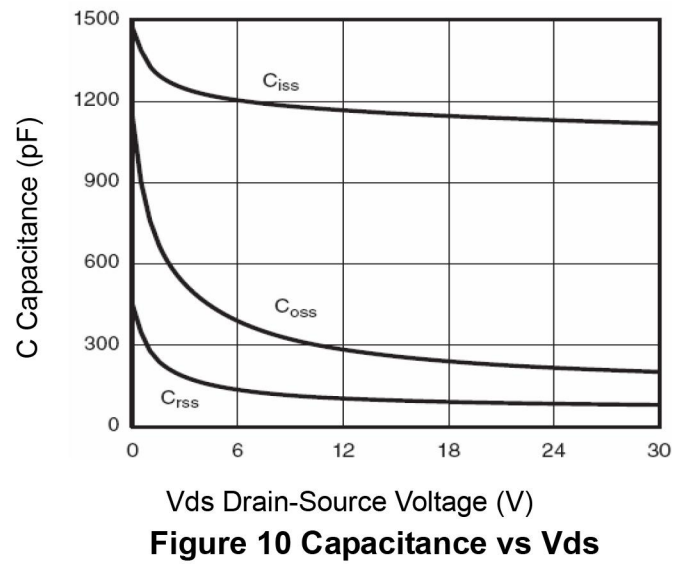
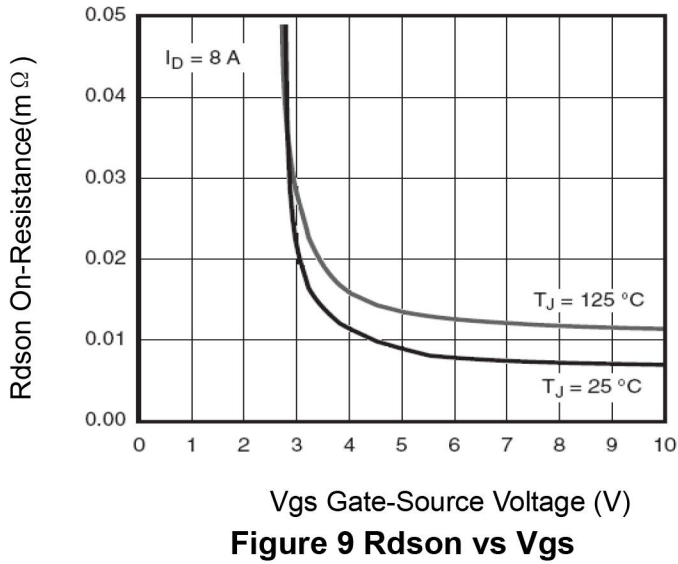
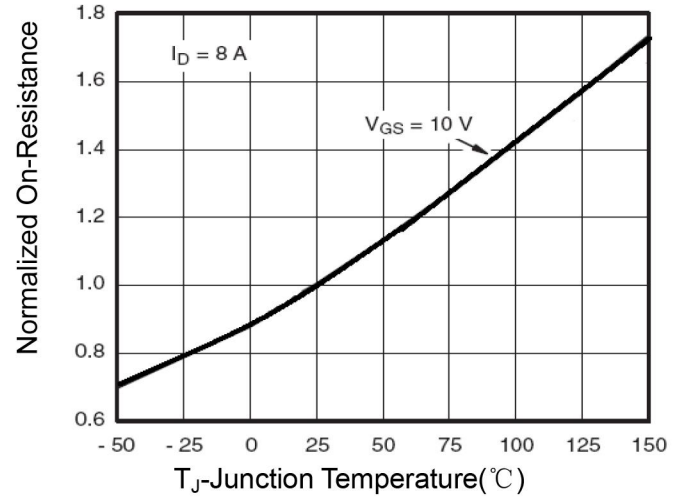
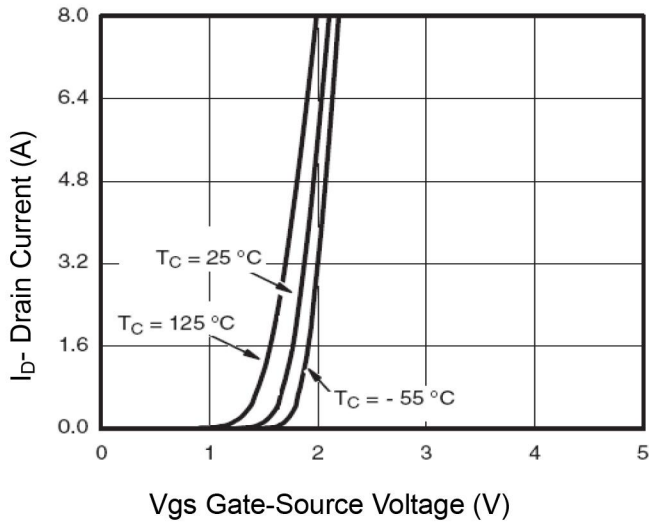


Figure 6 Drain-Source On-Resistance



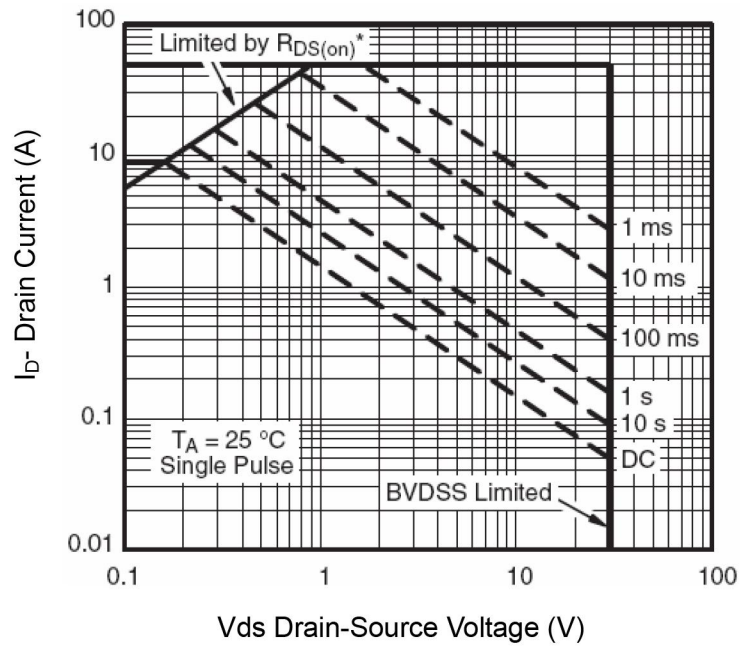


Figure 13 Safe Operation Area

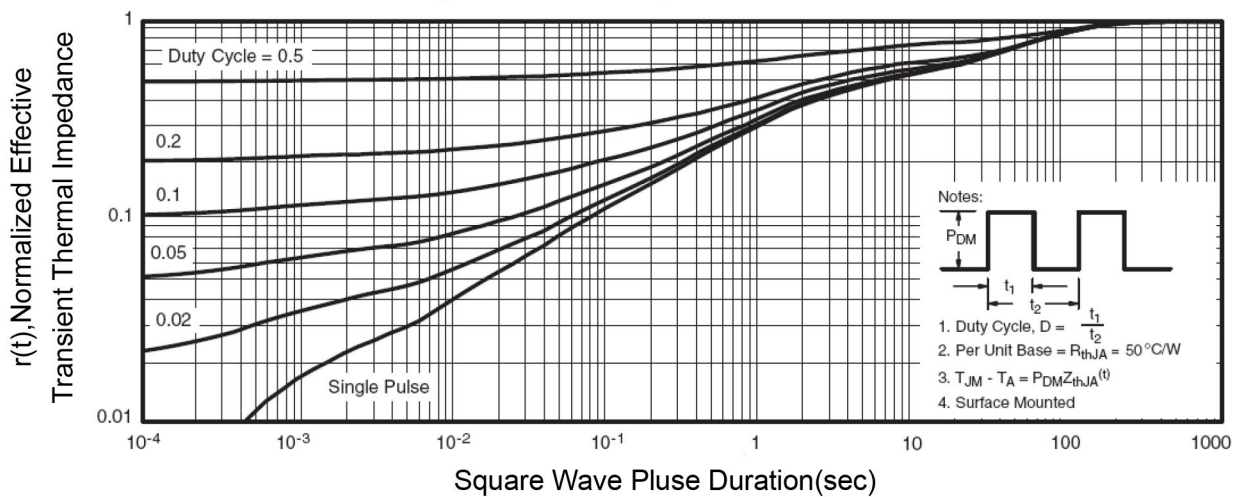


Figure 14 Normalized Maximum Transient Thermal Impedance