Single P-Channel, -40V, -12.2A, Power MOSFET

Features

- ✧ High density cell design for Low $R_{DS(on)}$
- ✧ Green device available
- ✧ Small package : SOP-8
- ✧ Low gate charge

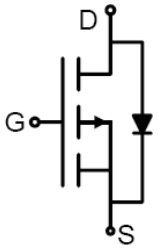
V_{DS} (V)	Typical $R_{DS(on)}$ (mΩ)
-40	15.1 @ V_{GS}= -4.5V
	11.6 @ V_{GS}= -10V

Applications

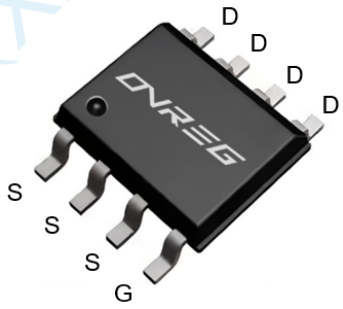
- ✧ PWM Application
- ✧ Load switch for portable devices
- ✧ Battery Switch
- ✧ DC/DC Converter

Mechanical Data

- ✧ UL Flame Rating : UL94V-0
- ✧ RoHS/WEEE Compliant



Circuit Diagram



SOP-8

Absolute Maximum Rating at T_A = 25 °C, unless otherwise specified

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage (V_{GS}=0V)	-40	V
V_{GS}	Gate-Source Voltage (V_{DS}=0V)	±20	V
I_D	Drain Current-Continuous(T_A=25℃)	-12.2	A
	Drain Current-Continuous(T_A=100℃)	-7.7	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	-48.8	A
P_D	Maximum Power Dissipation(T_A=25℃)	3.8	W
	Maximum Power Dissipation(T_A=100℃)	1.5	W
E_{AS}	Avalanche energy (Note 2)	100	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	℃

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Electrical Characteristics at T_A = 25 °C, unless otherwise specified

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=-250μA	-40			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-40V, V_{GS}=0V T_J=25℃			-1	μA
		V_{DS}=-40V, V_{GS}=0V T_J=125℃			-100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-1		-2.5	V
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-5A		33		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-5A T_J=25℃		11.6	15	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-4.5V, I_D=-4A T_J=25℃		15.1	20.1	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-20V,V_{GS}=0V, f=1.0MHz		1420		pF
C_{oss}	Output Capacitance			129		pF
C_{rss}	Reverse Transfer Capacitance			87		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1.0MHz		10		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=-10V, V_{DS}=-20V, R_L=4Ω, R_{GEN}=3Ω		7.5		nS
t_r	Turn-on Rise Time			4		nS
$t_{d(off)}$	Turn-Off Delay Time			30		nS
t_f	Turn-Off Fall Time			6		nS
Q_g	Total Gate Charge	V_{GS}=-10V, V_{DS}=-20V, I_D=-5A		25		nC
Q_{gs}	Gate-Source Charge			6.5		nC
Q_{gd}	Gate-Drain Charge			3.5		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				-12.2	A
V_{SD}	Forward on Voltage (Note 3)	V_{GS}=0V, I_S=-5A			1.2	V
t_{rr}	Reverse Recovery Time	I_F=-5A, dI/dt=100A/μs		36		ns
Q_{rr}	Reverse Recovery Charge	I_F=-5A, dI/dt=100A/μs		40		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
Notes 2.E_{AS} condition: T_J=25℃,V_{DD}=-40V,V_G=10V, Rg=25Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		32.6	℃/W

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Typical Characteristics at T_A = 25 °C, unless otherwise specified

Figure 1. Output Characteristics

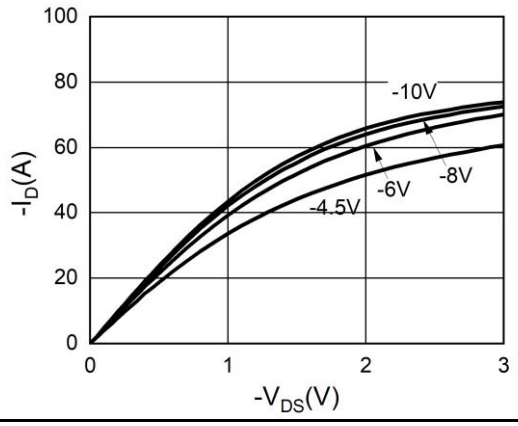


Figure 2. Transfer Characteristics

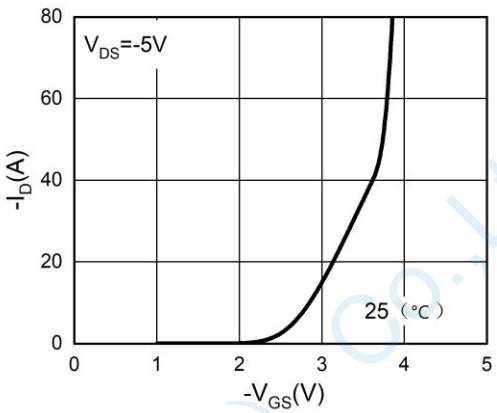


Figure 3. Power Dissipation

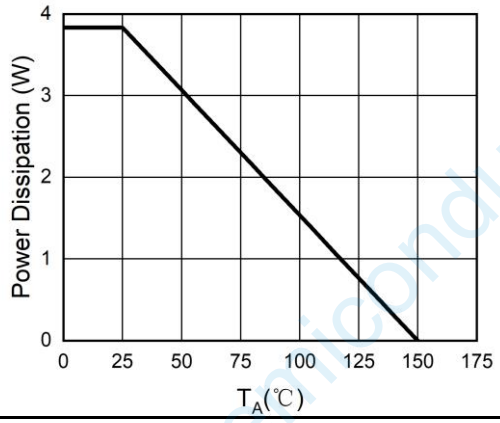


Figure 4. Drain Current

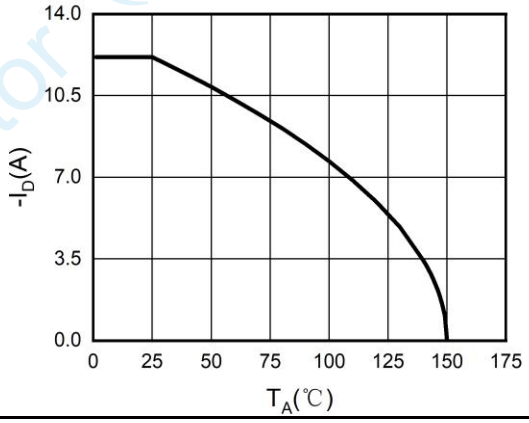


Figure 5. BV_{DSS} vs Junction Temperature

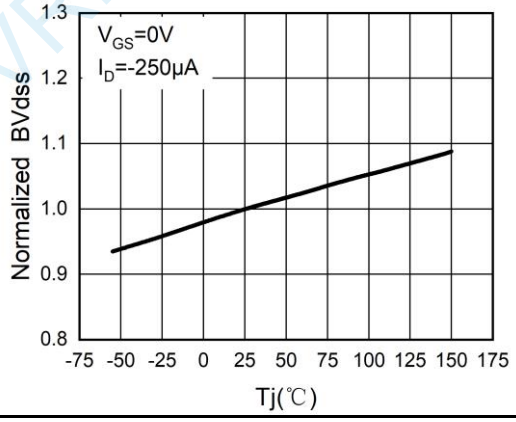
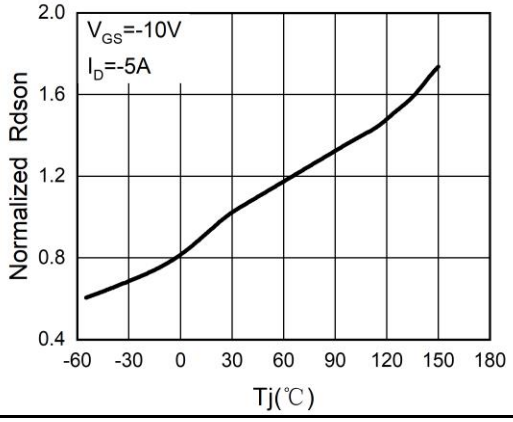


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



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Typical Characteristics at T_A = 25 °C, unless otherwise specified

Figure 7. Gate Charge Waveforms

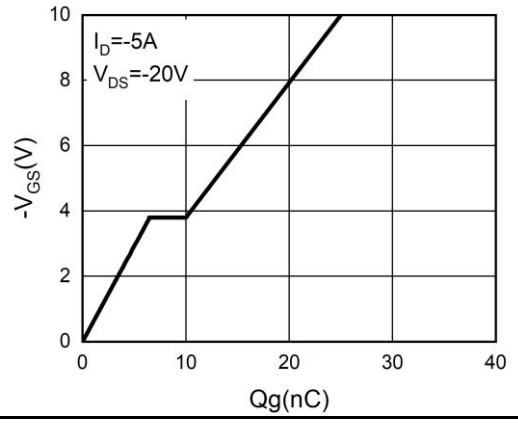


Figure 8. Capacitance

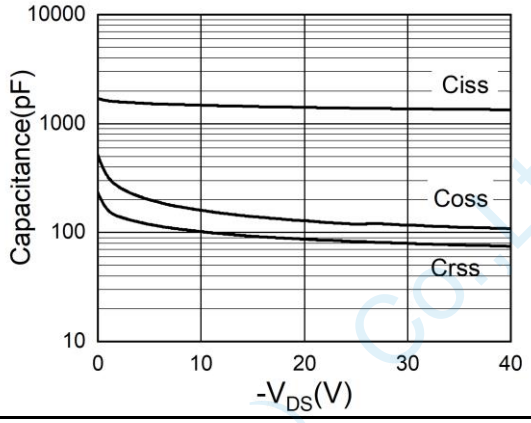


Figure 9. Body-Diode Characteristics

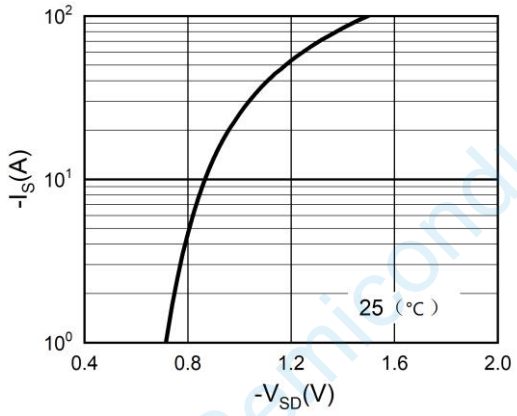
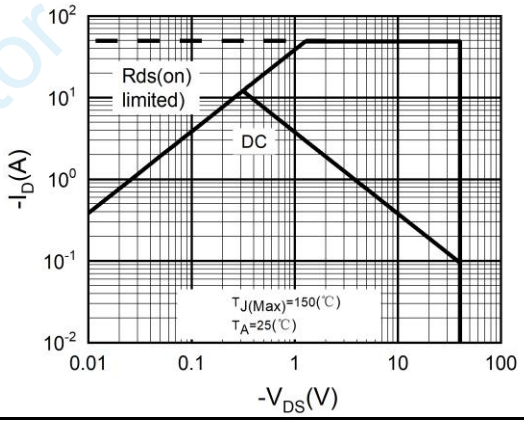


Figure 10. Maximum Safe Operating Area



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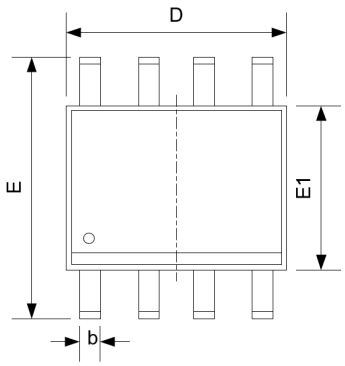
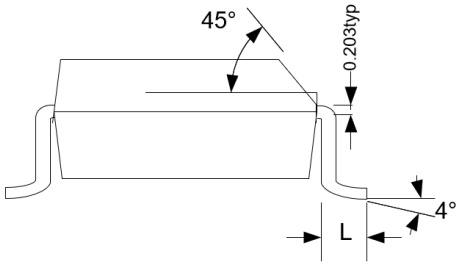
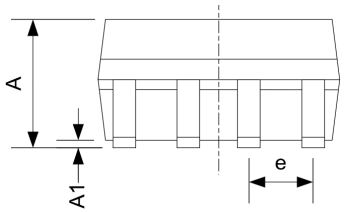
Package Information

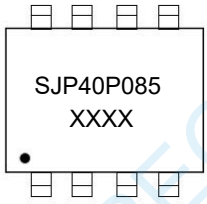






Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max
A	1.35	1.55	1.75
A1	0.1	0.15	0.2
b	0.346	0.406	0.466
D	4.8	4.89	4.98
E	5.75	6.00	6.25
E1	3.81	3.90	3.99
e	1.27TYP		
L	0.406	0.838	1.27

Marking



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Ordering Information

Part number	Material	Type	Reel size	MOQ
OVM40P12P	GREEN	T/R	13 inch	4k/reel

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