Single N-Channel, 30V, 12mΩ, Power MOSFET

Features

- ✧ High density cell design for Low $R_{DS(on)}$
- ✧ Green device available
- ✧ Small package : SOT-223-3L
- ✧ Low gate charge

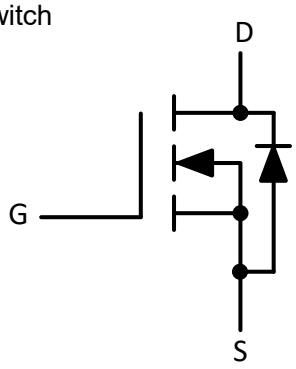
V_{DS} (V)	Typical $R_{DS(on)}$ (mΩ)
30	18 @ V_{GS}=4.5V
	12 @ V_{GS}=10V

Applications

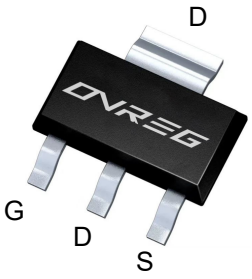
- ✧ PWM Application
- ✧ Load switch for portable devices
- ✧ Battery Switch

Mechanical Data

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



Circuit Diagram



SOT-223-3L

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

Parameter		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25 ℃	I_D	9.4	A
	T_C=100℃		5.9	
Power Dissipation	T_C=25 ℃	P_D	2	W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	63	℃/W
Junction Temperature		T_J	150	℃
Storage Temperature		T_{STG}	-55~ +150	℃

OVREG Semiconductor (Xi'an) Co.,Ltd.

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	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V T_J=25℃			1	μA
		V_{DS}=30V, 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		10		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=5A T_J=25℃		12	14.3	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=4.5V, I_D=4A T_J=25℃		18	22.6	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V,V_{GS}=0V, f=1.0MHz		733		pF
C_{oss}	Output Capacitance			13.5		pF
C_{rss}	Reverse Transfer Capacitance			5		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1.0MHz		1.4		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=10V, V_{DS}=15V, R_L=3Ω, R_{GEN}=6Ω		4.5		nS
t_r	Turn-on Rise Time			4		nS
$t_{d(off)}$	Turn-Off Delay Time			20		nS
t_f	Turn-Off Fall Time			4		nS
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=15V, I_D=5A		12		nC
Q_{gs}	Gate-Source Charge			2.2		nC
Q_{gd}	Gate-Drain Charge			2.5		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				9.4	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		5		ns
Q_{rr}	Reverse Recovery Charge	I_F=5A, dI/dt=100A/μs		6		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
Notes 2.E_{AS} condition: T_J=25℃,V_{DD}=30V,V_G=10V, Rg=25Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

OVREG Semiconductor (Xi'an) Co.,Ltd.

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

Figure 1. Output Characteristics

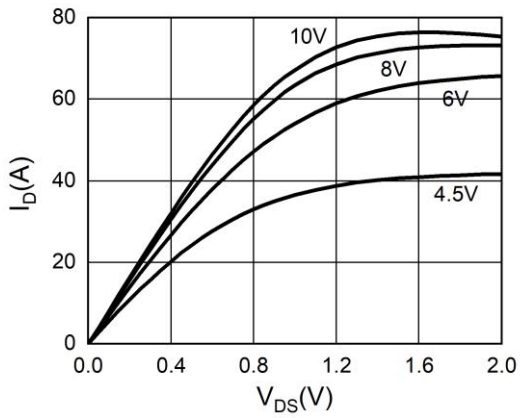


Figure 2. Transfer Characteristics

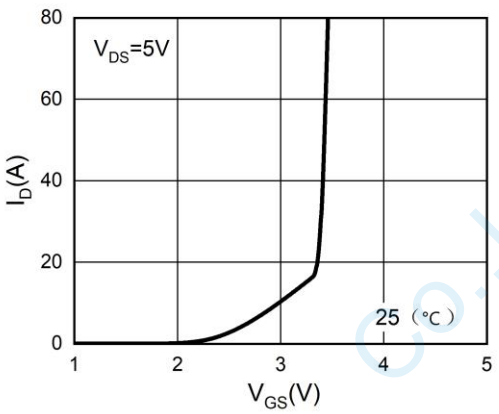


Figure 3. Power Dissipation

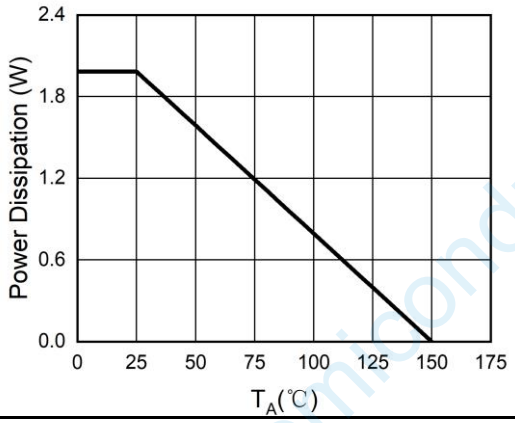


Figure 4. Drain Current

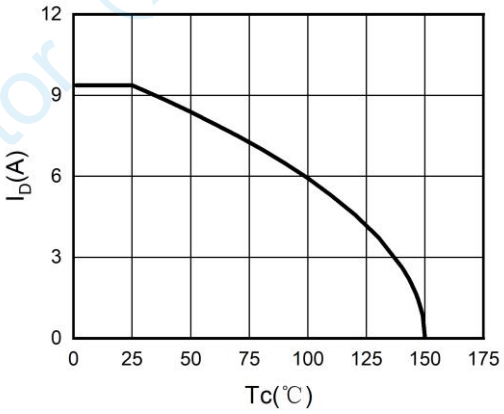


Figure 5. BV_{DSS} vs Junction Temperature

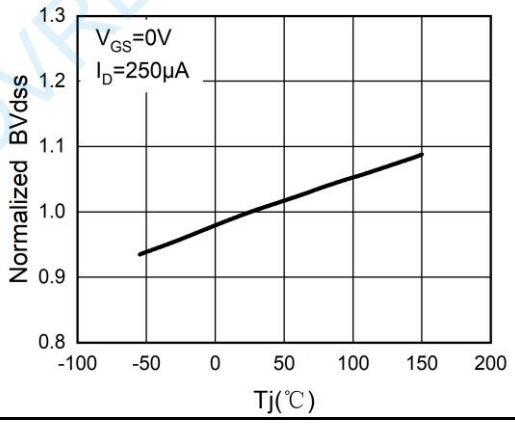
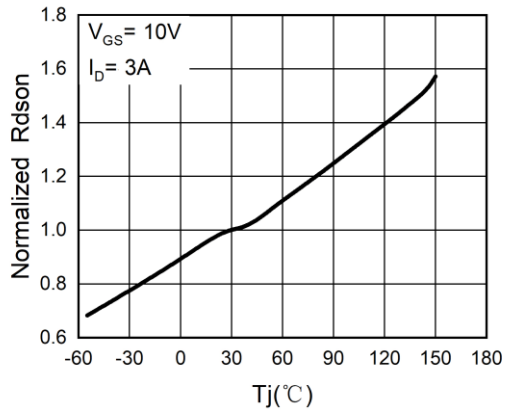


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



OVREG Semiconductor (Xi'an) Co.,Ltd.

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

Figure 7. Gate Charge Waveforms

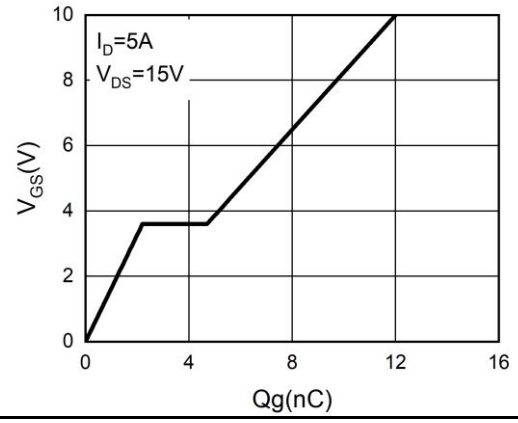


Figure 8. Capacitance

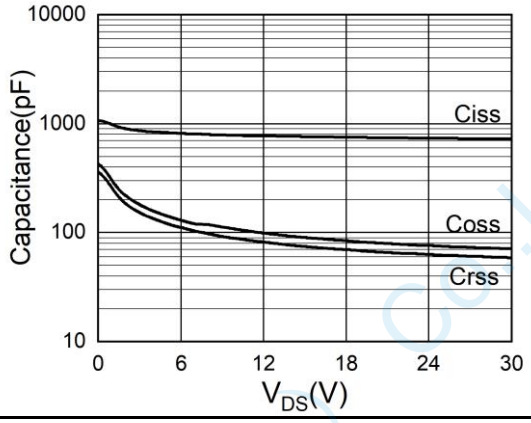


Figure 9. Body-Diode Characteristics

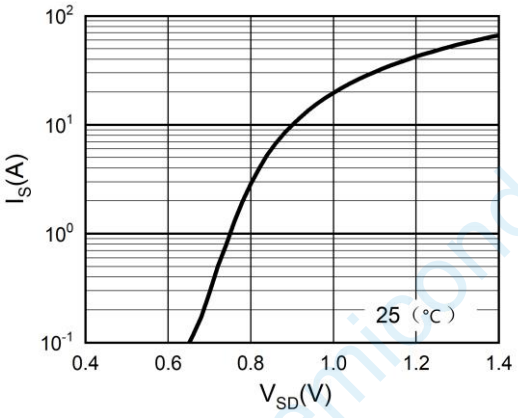
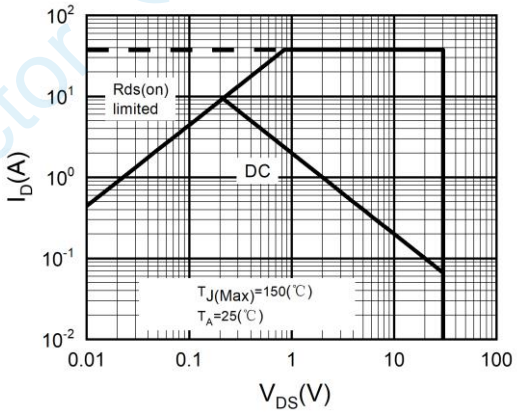
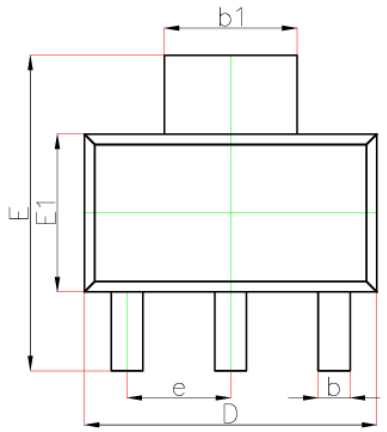


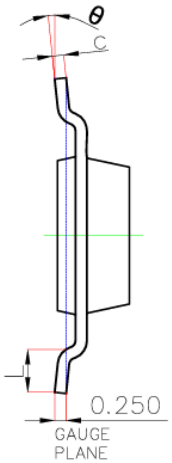
Figure 10. Maximum Safe Operating Area



OVREG Semiconductor (Xi'an) Co.,Ltd.

Package Information

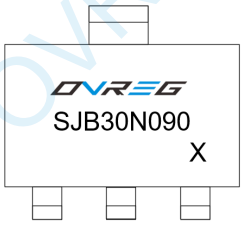






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	——	1.800	——	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	6.700	7.300	0.264	0.287
E1	3.300	3.700	0.130	0.146
e	2.300(BSC)		0.091(BSC)	
L	0.750	——	0.030	——
θ	0°	10°	0°	10°

Marking



X：DATE CODE

Ordering Information

Part number	Material	Type	Reel size	MOQ
OVM30N12T2	GREEN	T/R	13 inch	4k/reel

OVREG Semiconductor (Xi'an) Co.,Ltd.