Single P-Channel, -20V, -3.0A, Power MOSFET

Features

- ✧ Trench Technology
- ✧ Supper high density cell design
- ✧ Excellent on resistance
- ✧ Extremely Low Threshold Voltage
- ✧ Small package SOT-23

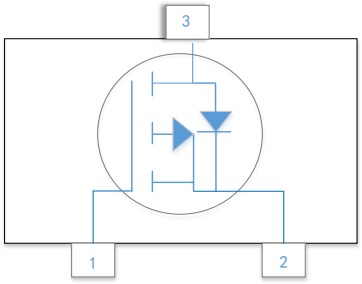
V_{DS} (V)	Max $R_{DS(on)}$ (mΩ)
-20	85 @ V_{GS}=-4.5V
	115 @ V_{GS}=-2.5V

Applications

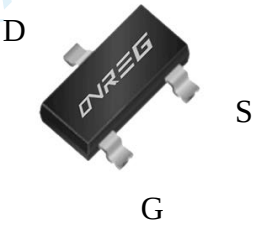
- ✧ DC/DC converters
- ✧ Power supply converters circuit
- ✧ Load/Power Switching for portable device

Mechanical Data

- ✧ UL Flame Rating : UL94V-0
- ✧ Reel Size : 7 inch
- ✧ RoHS/WEEE Compliant



Circuit Diagram



SOT-23

Absolute Maximum Rating (Ta=25℃, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-source voltage		V_{DS}	- 20	V
Gate-source voltage		V_{GS}	± 8	V
Continuous drain current (T_J=150°C)	T_C=25°C	I_D	- 3.0	A
	T_C=70°C		- 2.5	A
	T_A=25°C (note 2,3)		- 2.3	A
	T_A=70°C (note 2,3)		- 1.8	A
Pulsed drain current		I_{DM}	- 10	A
Continuous source-drain diode current	T_C=25°C	I_S	- 1.3	A
	T_A =25°C (note 2,3)		- 0.72	A
Maximum power dissipation	T_C=25°C	P_D	1.6	W
	T_C=70°C		1.0	W
	T_A=25°C (note 2,3)		0.86	W
	T_A=70°C (note 2,3)		0.55	W
Operating junction and storage temperature range		T_J, T_{stg}	-55 ~ +150	°C
Thermal resistance,junction-to-ambient@ t≤5s		R_{thJA}	Typ.:120 Max.:145	°C/W
Thermal resistance,junction-to-foot, (Drain)@ Steady state		R_{thJF}	Typ.:62 Max.:78	°C/W

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Electronics Characteristics (Ta=25℃, unless otherwisen oted)

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Static						
Drain-source breakdown voltage	V_{DS}	-20			V	V_{DS}=0V,I_D=-250μA
V_{DS} temperature coefficient	$\Delta V_{DS}/T_J$		-18		mV/°C	I_D=-250μA
$V_{GS(th)}$ temperature coefficient	$\Delta V_{GS(th)}/T_J$		2.2			
Gate-source threshold voltage	$V_{GS(th)}$	-0.4		-1	V	V_{DS}=V_{GS}, I_D=-250μA
Gate-source leakage	I_{GSS}			±100	nA	V_{DS}=0V,V_{GS}=±8V
Zero gate voltage drain current	I_{DSS}			-1	μA	V_{DS}=-20V,V_{GS}=0V
				-30		V_{DS}=-20V,V_{GS}=0V,T_J=85°C
On-state drain current (note 5)	$I_{D(on)}$	-10			A	V_{DS}≤-5V,V_{GS}=-4.5V
Drain-source on-state resistance (note 5)	$R_{DS(on)}$		66	85	mΩ	V_{GS}=-4.5V,I_D=-3.0A
			88	115		V_{GS}=-2.5V,I_D=-1.0A
Forward transconductance (note 5)	g_{fs}		2.0		S	V_{DS}=-5V,I_D=-3.0A
Dynamic (note 6)						
Input capacitance	C_{iss}		405		pF	V_{DS}=-10V,V_{GS}=0V,f=1MHz
Output capacitance	C_{oss}		75			
Reverse transfer capacitance	C_{rss}		55			
Total gate charge	Q_g		5.5	10	nC	V_{DS}=-10V,V_{GS}=-4.5V,I_D=-3A
			3.3	6		V_{DS}=-10V,V_{GS}=-2.5V,I_D=-3A
Gate-source charge	Q_{gs}		0.7			
Gate-drain charge	Q_{gd}		1.3			
Gate resistance	R_g		6.0		Ω	f=1MHz
Turn-on delay time	$t_{d(on)}$		11	20	ns	V_{DD}=-10V,R_L=10Ω, I_D=-1A,V_{GEN}=-4.5V, R_G=1Ω
Rise time	t_r		35	60		
Turn-off delay time	$t_{d(off)}$		30	50		
Fall time	t_f		10	20		
Drain-source body diode characteristics						
Continuous source-drain diode current	I_S			-1.3	A	T_C=25°C
Pulse diode forward current (Note 5)	I_{SM}			-10		
Body diode voltage	V_{SD}		-0.7	-1.3	V	I_S= -0.7A
Body diode reverse recovery time	t_{rr}		30	50	ns	I_F=-3.0A,dI/dt=100A/μs, T_J=25°C
Body diode reverse recovery charge	Q_{rr}		25	50	nC	
Reverse recovery fall time	t_a		15		ns	
Reverse recovery rise time	t_b		15			

Note:
1. Based on TC = 25 °C.
2. Surface Mounted on 1" x 1" FR4 board.
3. t = 5s.
4. Maximum under Steady State conditions is 175°C/W.
5. Pulse test : pulse width ≤300μs, duty cycle ≤ 2% .
6. Guaranteed by design, not subject to production testing.

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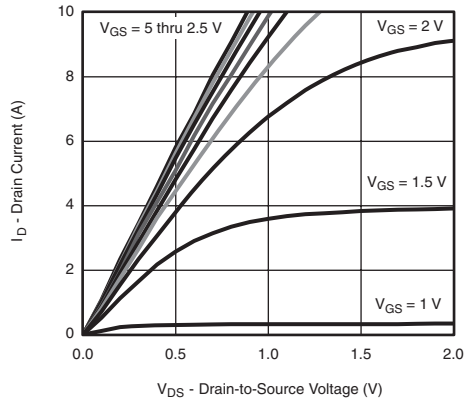
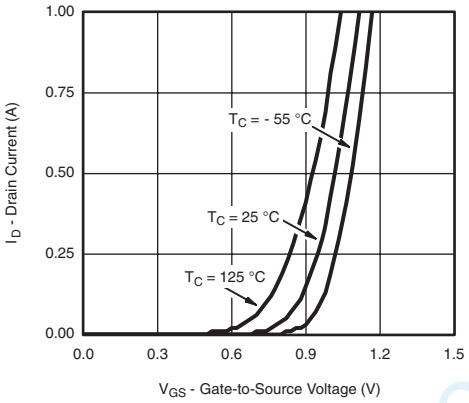
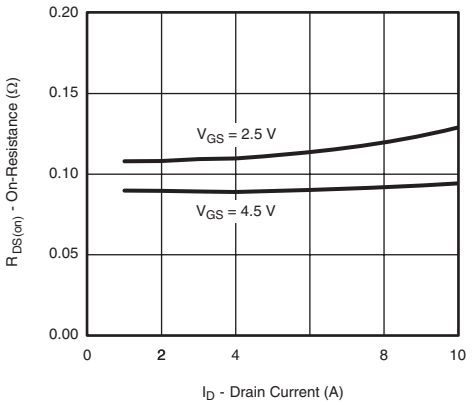
Electronics Characteristics (Ta=25℃, unless otherwise noted)



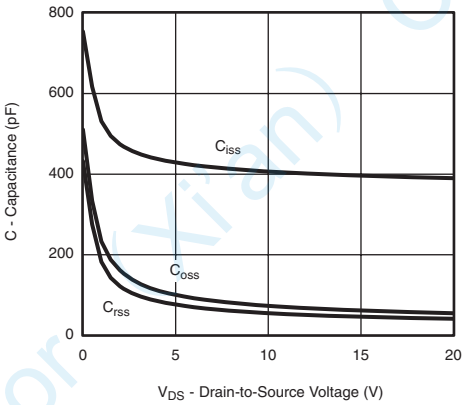
Output Characteristics



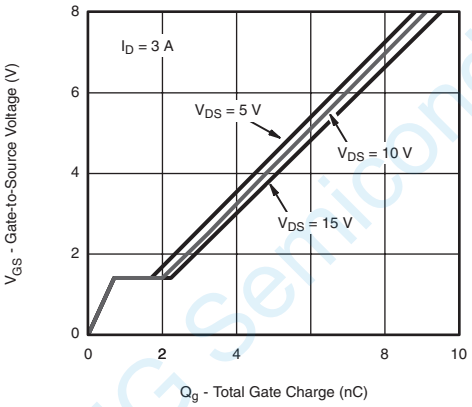
Transfer Characteristics



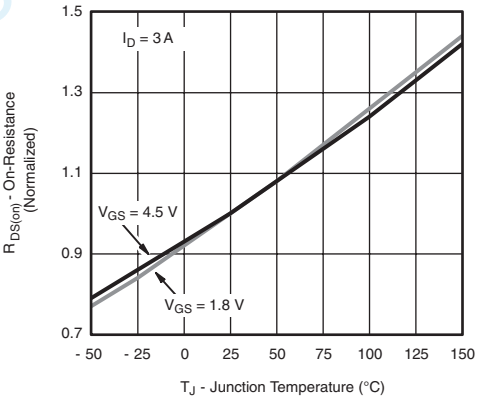
On-Resistance vs. Drain Current and Gate Voltage



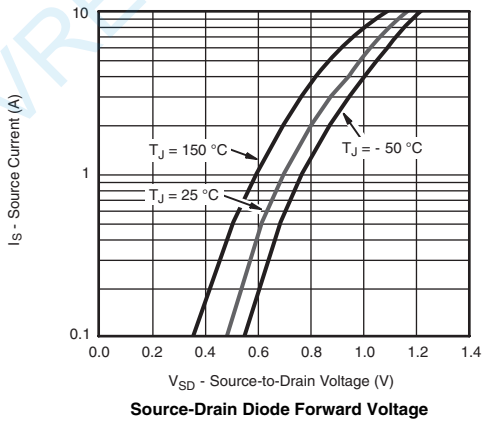
Capacitance



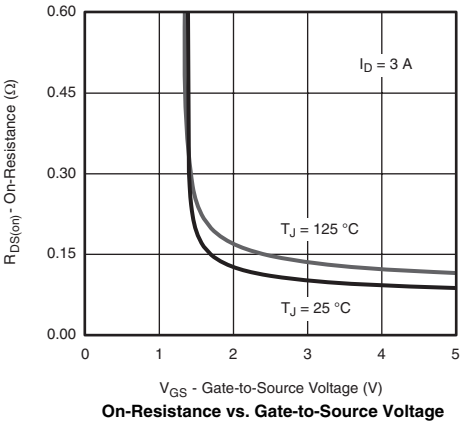
Gate Charge



On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

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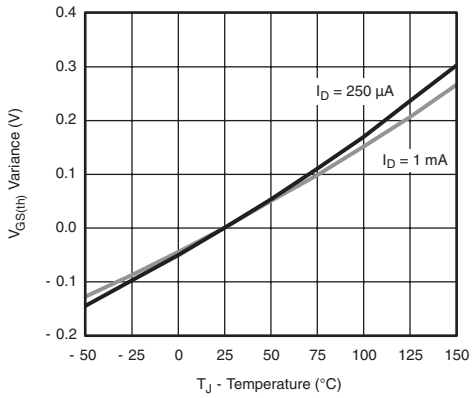
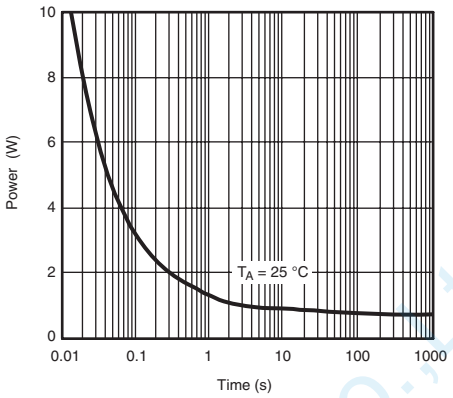
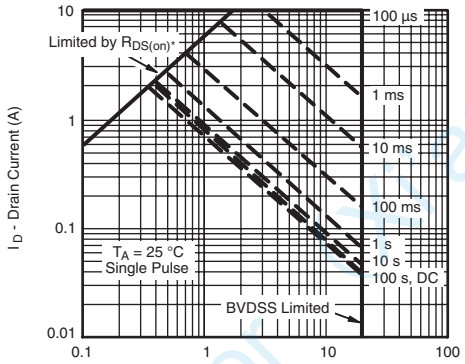
Electronics Characteristics (Ta=25°C, unless otherwise noted)



Threshold Voltage

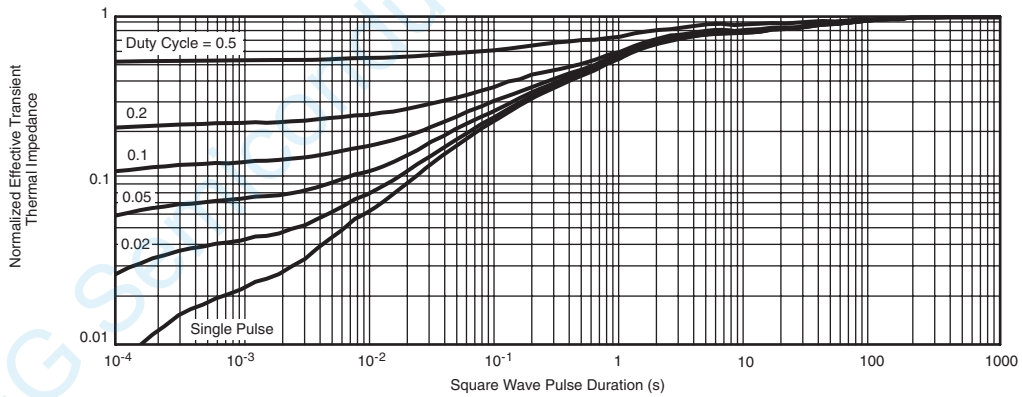


Single Pulse Power

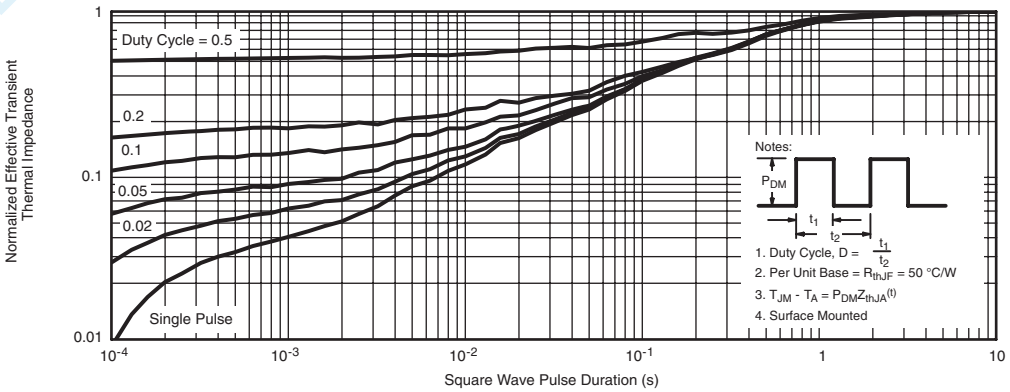


* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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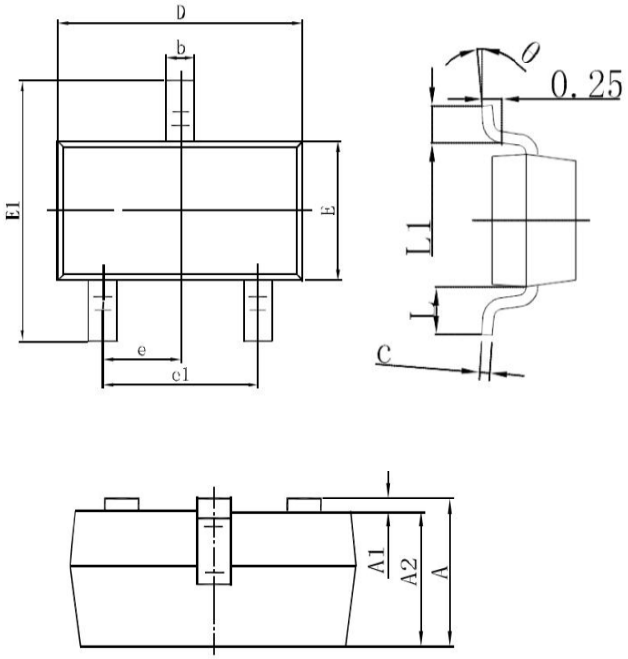
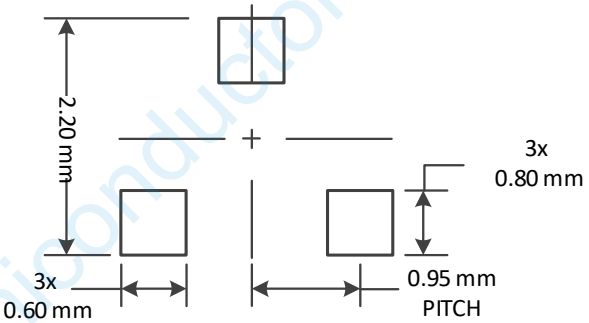
Package information



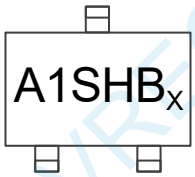
Symbol	Dimensions In Millimeters	
	Min	Max
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	1.150
D	2.900	3.100
E	1.200	1.400
E1	2.250	2.550
e	0.95REF	
e1	1.800	2.000
L	0.55REF	
L1	0.300	0.500

Recommend PCB Layout



Notes: This PCB Layout Is For Reference Purposes Only

Marking



X:Date Code

Ordering Information

Part number	Material	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
OVM20P85T	GREEN	T/R	7 inch	3k/reel	10reel= 30k/box	4boxes=120k/carton

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