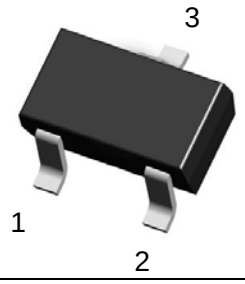
N-Channel High Density Trench MOSFET (20V, 5.4A)

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(on)}$ (mΩ) Max
20V	5.4A	30 @ V_{GS} = 4.0V, I_D=5.4A
		40 @ V_{GS} = 2.5V, I_D=4.3A

Features

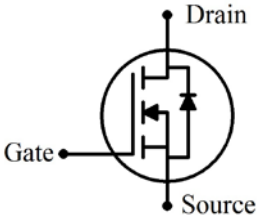
- Advanced Trench Process Technology
- High Density Cell Design for Ultra Low On-Resistance
- Rugged and reliable.
- Ordering information:GV2300-G(Lead(Pb)-free and halogen-free)

RoHS+HF



GV2300 Pin Assignment & Symbol

3-Lead Plastic **SOT-23-3L**
Pin 1: Gate 2: Source 3: Drain



Absolute Maximum Ratings (T_A=25℃, unless otherwise noted)

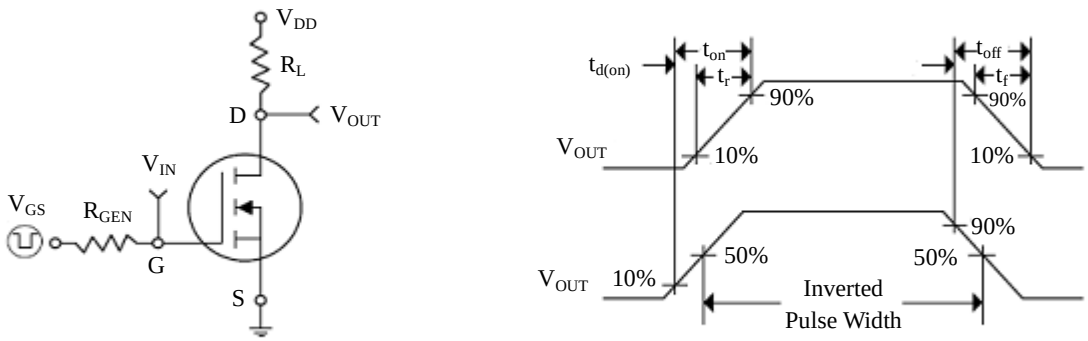
Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Drain Current (Continuous)	5.4	A
I_{DM}	Drain Current (Pulsed) [a]	24	A
P_D	Total Power Dissipation @T_A=25℃	1.4	W
I_S	Maximum Diode Forward Current	1.7	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	℃
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (PCB mounted) [b]	100	℃/W

Note: a: Repetitive Rating: Pulse width limited by the maximum junction temperation.
b: 1-in^2 2oz Cu PCB board

Electrical Characteristics (T_A=25℃, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=16V, V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
• On Characteristics[c]						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.6	-	1.2	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=4.0V, I_D=5.4A	-	23	30	mΩ
		V_{GS}=2.5V, I_D=4.3A	-	30	40	
g_{FS}	Forward Transconductance	V_{DS}=10 V, I_D=5A	-	15.4	-	S
• Dynamic Characteristics[d]						
C_{iss}	Input Capacitance	V_{DS}=8 V_{GS}=0V, f=1MHz	-	522	-	pF
C_{oss}	Output Capacitance		-	136	-	
C_{rss}	Reverse Transfer Capacitance		-	112	-	
• Switching Characteristics[d]						
Q_g	Total Gate Charge	V_{DS}=12VI_D=3.0V_{GS}=4.5V	-	5.0	-	nC
Q_{gs}	Gate-Source Charge		-	0.9	-	
Q_{gd}	Gate-Drain Charge		-	1.4	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=10 R_L=5, I_D=3A V_{GEN}=4.5V, R_G=6Ω	-	10.9	-	nS
t_r	Turn-on Rise Time		-	4.1	-	
$t_{d(off)}$	Turn-off Delay Time		-	22.2	-	
t_f	Turn-off Fall Time		-	5.8	-	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=1.7A	-	0.76	1.2	V

Note: c : Pulse Test : Pulse Width < 300μs, Duty Cycle < 2%.
d: Guaranteed by design, not subject to production testing



Switching Test Circuit and Switching Waveforms

Characteristics Curve

Figure.1 On - Region Characteristics

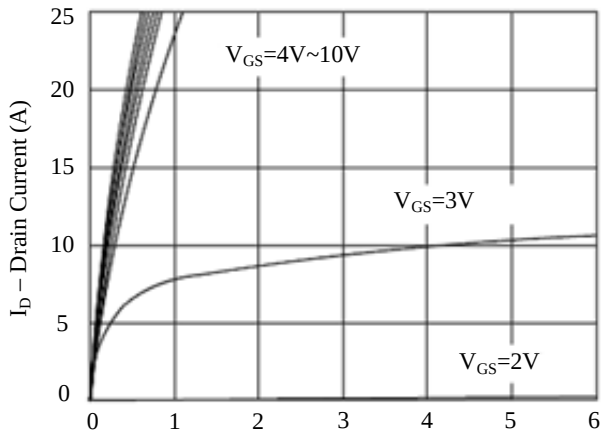


Figure.2 Transfer Characteristics

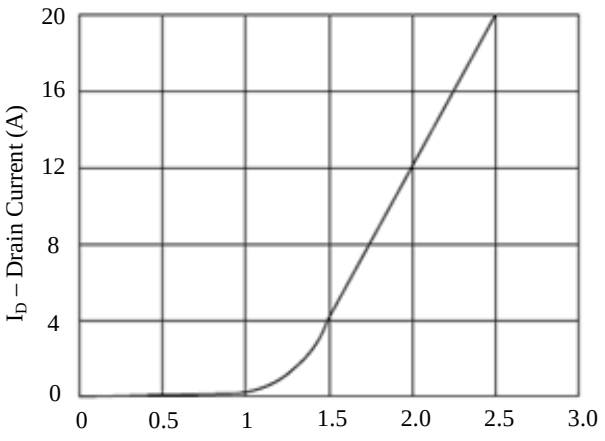


Figure.3 Breakdown Voltage Variation with Temperature

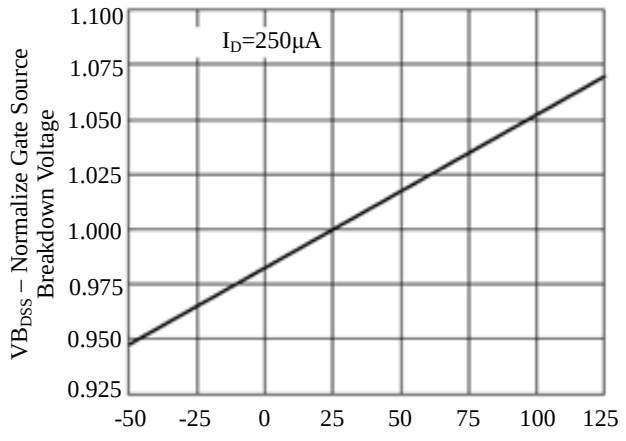


Figure.4 On Resistance Variation with Temperature

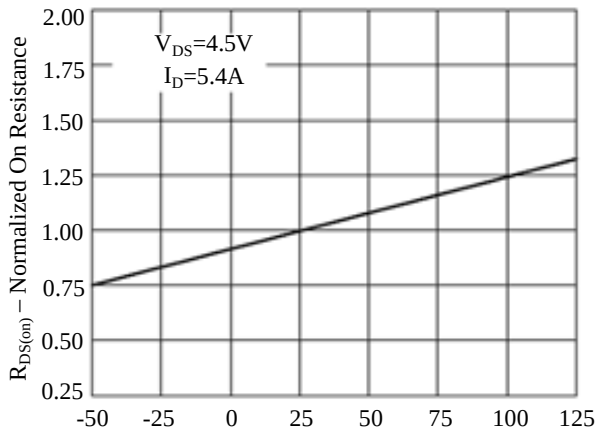


Figure.5 Gate Threshold Variation with Temperature

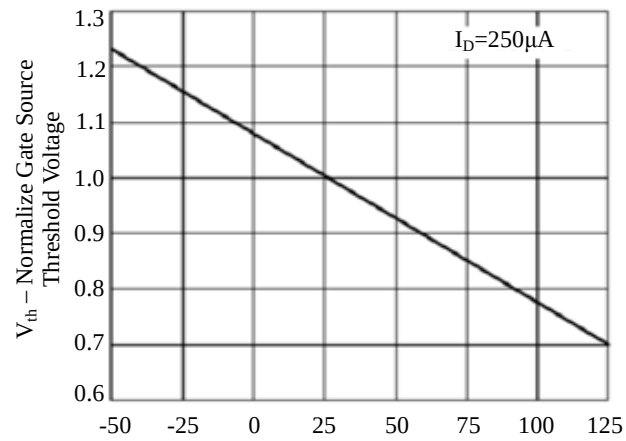
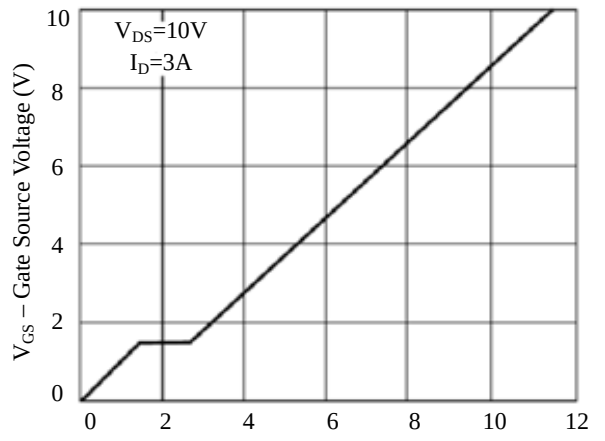


Figure. 6 Gate Charge Characteristics



Characteristics Curve

Figure.7 Source-Drain Diode Forward Characteristics

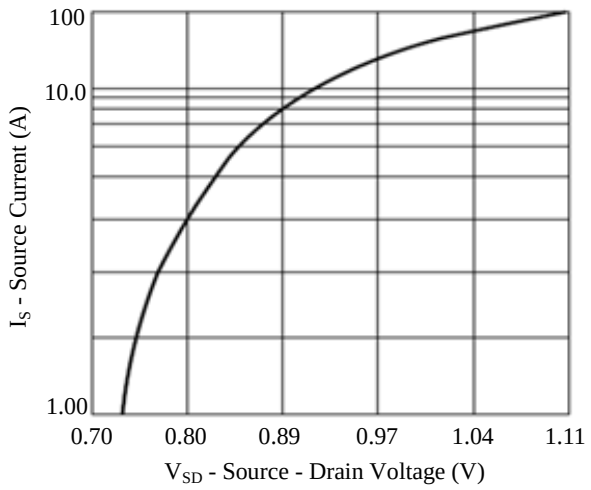
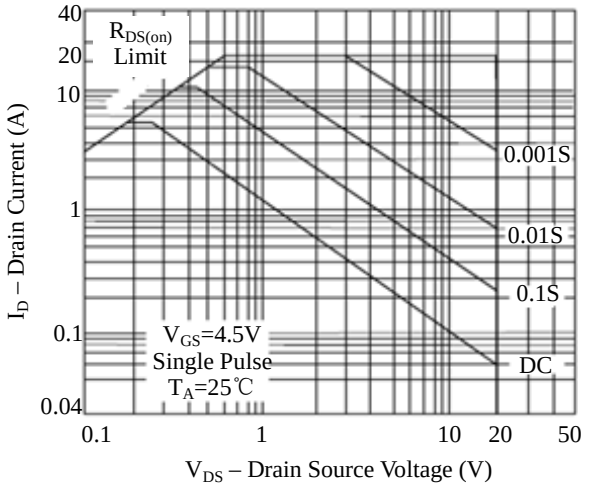
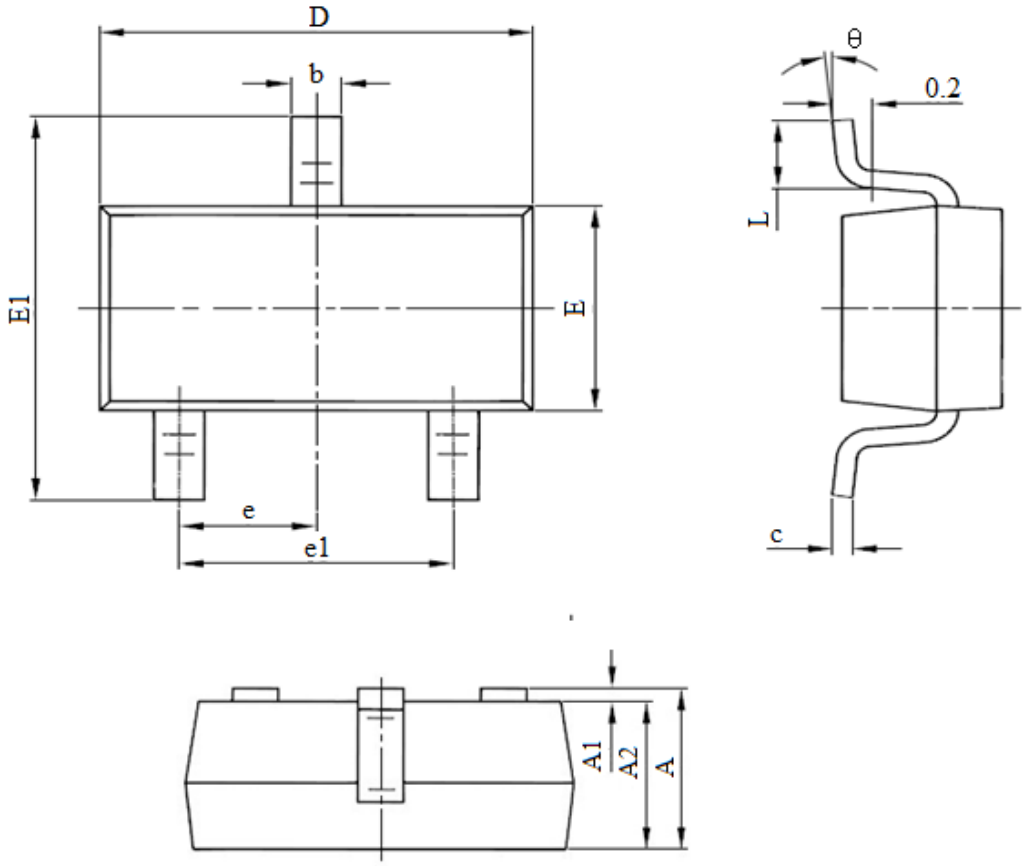


Figure.8 Maximum Safe Operating Area



SOT-23-3L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.850	1.250	0.033	0.049
A1	0.000	0.100	0.000	0.004
A2	0.700	1.150	0.028	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0^o	8^o	0^o	8^o

Notice

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2. Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.