

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

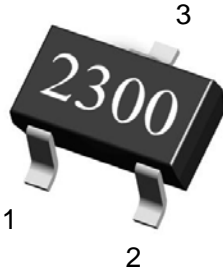
PRODUCT SUMMARY

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

Features

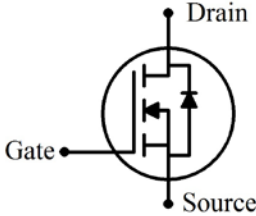
- Advanced Trench Process Technology
- High Density Cell Design for Ultra Low On-Resistance
- Rugged and reliable.
- Ordering information:GN2300-G(Lead(Pb)-free and halogen-free)

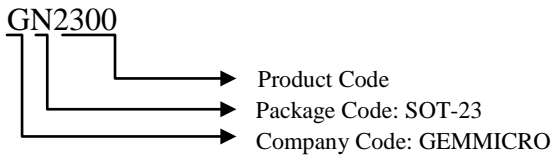




GN2300 Pin Assignment & Symbol

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





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

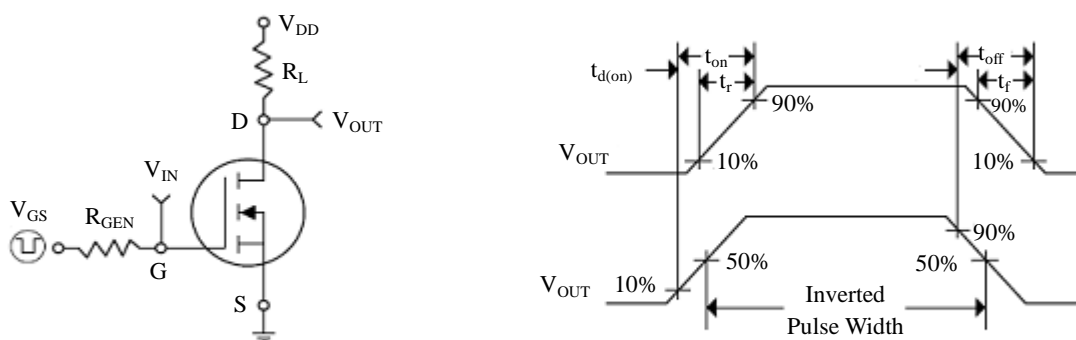
Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current (Continuous)	5.4	A
I_{DM}	Drain Current (Pulsed) ^a	24	A
P_D	Total Power Dissipation @ $T_A=25^\circ\text{C}$	1.25	W
I_S	Maximum Diode Forward Current	1.7	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (PCB mounted) ^b	100	$^\circ\text{C}/\text{W}$

Note: a: Repetitive Rating; Pulse width limited by the maximum junction temperature.
b: 1-in² 2oz Cu PCB board

Electrical Characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)

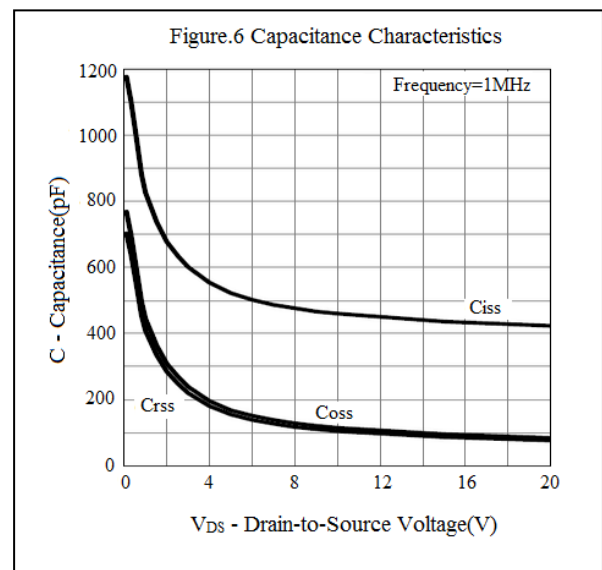
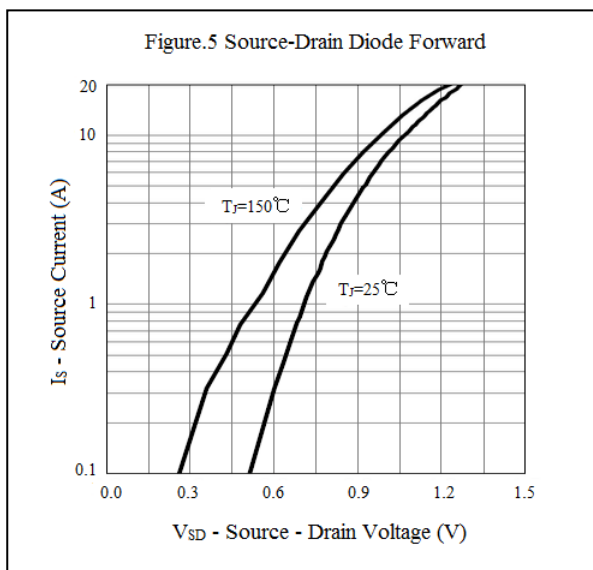
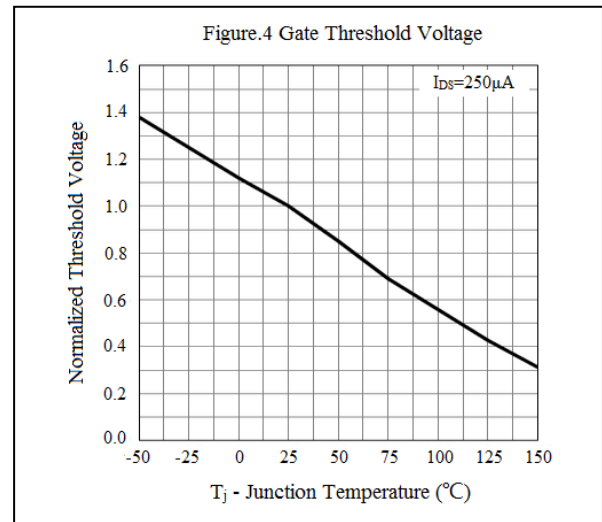
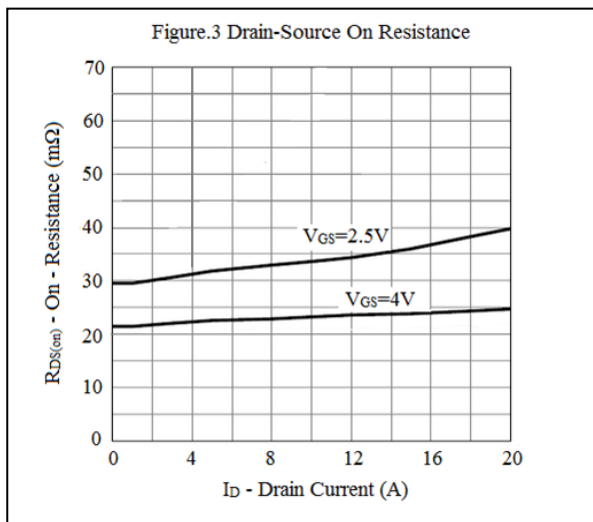
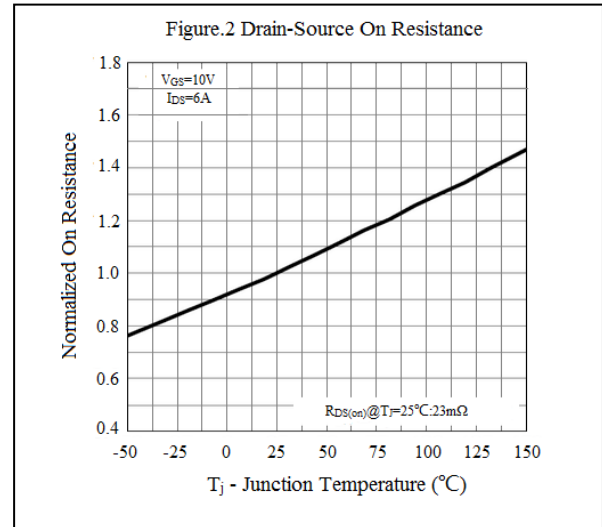
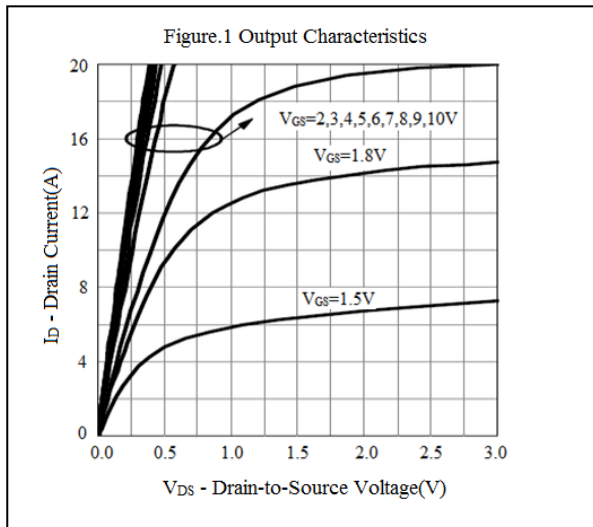
Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 100	nA
• On Characteristics ^c						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.6	-	1.2	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=4.0V, I_D=5.4A$	-	23	30	m Ω
		$V_{GS}=2.5V, I_D=4.3A$	-	30	40	
g_{FS}	Forward Transconductance	$V_{DS}=10V, I_D=5A$	-	15.4	-	S
• Dynamic Characteristics ^d						
C_{iss}	Input Capacitance	$V_{DS}=8V, V_{GS}=0V, f=1MHz$	-	522	-	pF
C_{oss}	Output Capacitance		-	136	-	
C_{rss}	Reverse Transfer Capacitance		-	112	-	
• Switching Characteristics ^d						
Q_g	Total Gate Charge	$V_{DS}=12V, I_D=3.0V, V_{GS}=4.5V$	-	5.0	-	nC
Q_{gs}	Gate-Source Charge		-	0.9	-	
Q_{gd}	Gate-Drain Charge		-	1.4	-	
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=10V, R_L=5\Omega, I_D=3A$ $V_{GEN}=4.5V, R_G=6\Omega$	-	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 < 300 μ s, Duty Cycle < 2%
d: Guaranteed by design, not subject to production testing

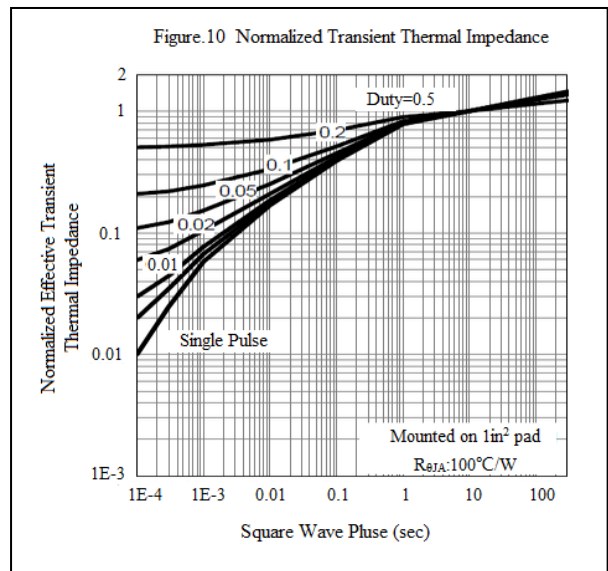
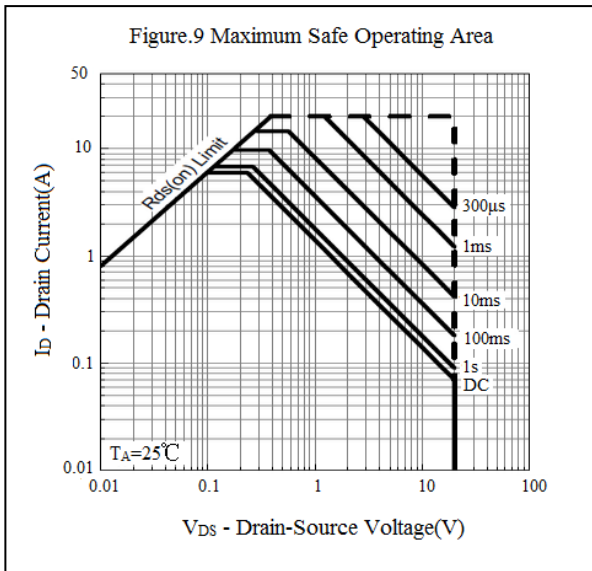
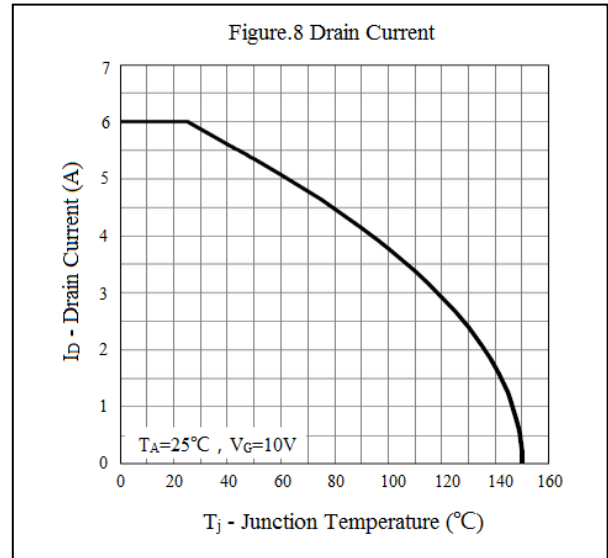
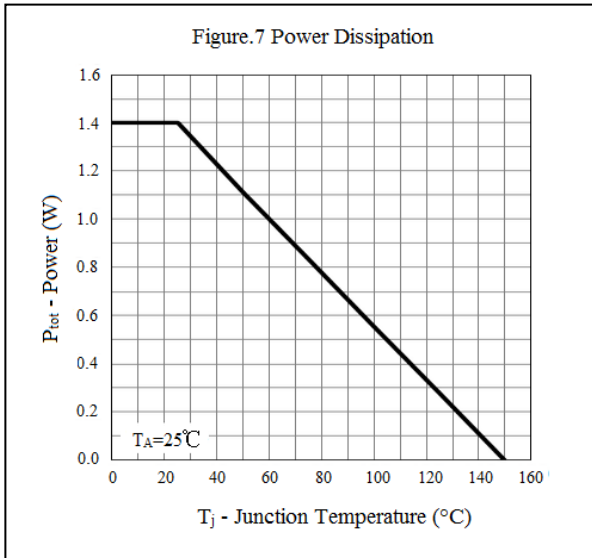


Switching Test Circuit and Switching Waveforms

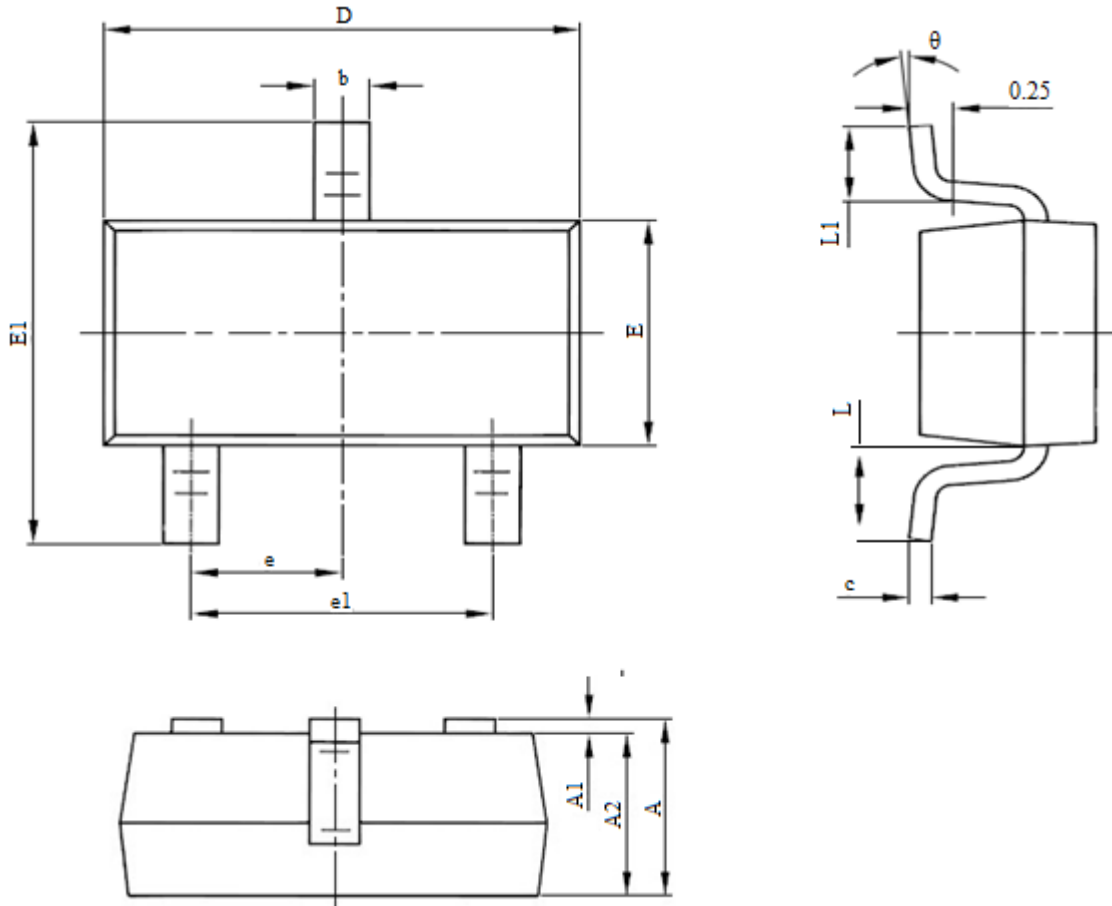
Characteristics Curve



Characteristics Curve



SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.9	1.15	0.035	0.045
A1	0	0.1	0	0.004
A2	0.9	1.05	0.035	0.041
b	0.3	0.5	0.012	0.020
c	0.08	0.15	0.003	0.006
D	2.8	3	0.11	0.118
E	1.2	1.4	0.047	0.055
E1	2.25	2.55	0.089	0.1
e	0.95(BSC)		0.037(BSC)	
e1	1.8	2	0.071	0.079
L	0.55REF		0.022REF	
L	0.3	0.5	0.012	0.02
θ	0°	8°	0°	8°



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