

P-Channel Enhancement-Mode MOSFET (-20V, -2.5A)


PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (m Ω) Max
-20V	-2.5A	100@ $V_{GS} = -4.5V, I_D = -2.5A$
		130@ $V_{GS} = -2.5V, I_D = -2A$

Features

- Advanced Trench Process Technology
- High Density Cell Design for Ultra Low On-Resistance
- Improved Shoot-Through FOM
- Ordering information:GN2301A-G(Lead(Pb)-free and halogen-free)

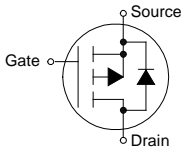
RoHS+HF



GN2301A 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 ($T < 10s$)	-2.5	A
I_{DM}	Drain Current (Pulsed) ^a	-8	A
P_D	Total Power Dissipation @ $T_A=25^\circ\text{C}$	0.9	W
I_S	Maximum Diode Forward Current	-2.2	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	150	$^\circ\text{C/W}$

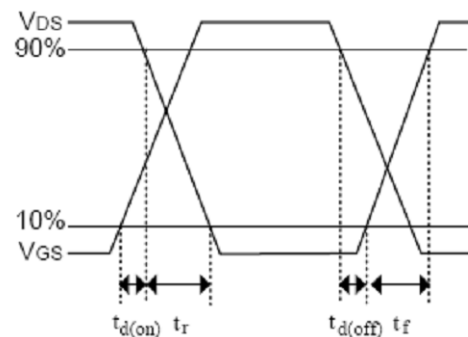
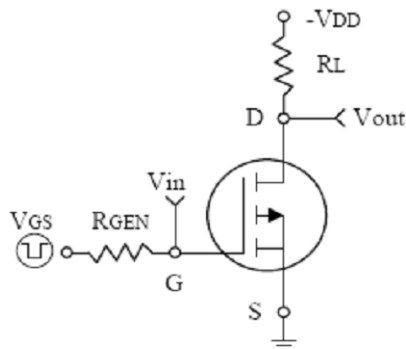
Note: a: Repetitive Rating: Pulse width limited by the maximum junction temperature.
b: 1-in² 2oz Cu PCB board

Electrical Characteristics (T_A=25°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 =-250μA	-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} =±12V, V _{DS} =0V	-	-	±100	μA
• On Characteristics^c						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.4	-	-0.9	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-2.5A	-	80	100	mΩ
		V _{GS} =-2.5V, I _D =-2A	-	100	130	
• Dynamic Characteristics^d						
C _{iss}	Input Capacitance	V _{DS} =-6V, V _{GS} =0V, f=1MHz	-	450	-	pF
C _{oss}	Output Capacitance		-	56	-	
C _{rss}	Reverse Transfer Capacitance		-	37	-	
• Switching Characteristics^d						
Q _g	Total Gate Charge	V _{DS} =-6V, I _D =-2.5A, V _{GS} =-4.5V	-	5.2	-	nC
Q _{gs}	Gate-Source Charge		-	0.9	-	
Q _{gd}	Gate-Drain Charge		-	1.8	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} =-6V, R _L =6Ω, I _D =-1A, V _{GS} =-4.5V, R _{GEN} =6Ω	-	8.3	-	nS
t _r	Turn-on Rise Time		-	7.6	-	
t _{d(off)}	Turn-off Delay Time		-	40	-	
t _f	Turn-off Fall Time		-	9.2	-	
• Drain-Source Diode Characteristics						
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =-1.6A	-	-	-1.2	V

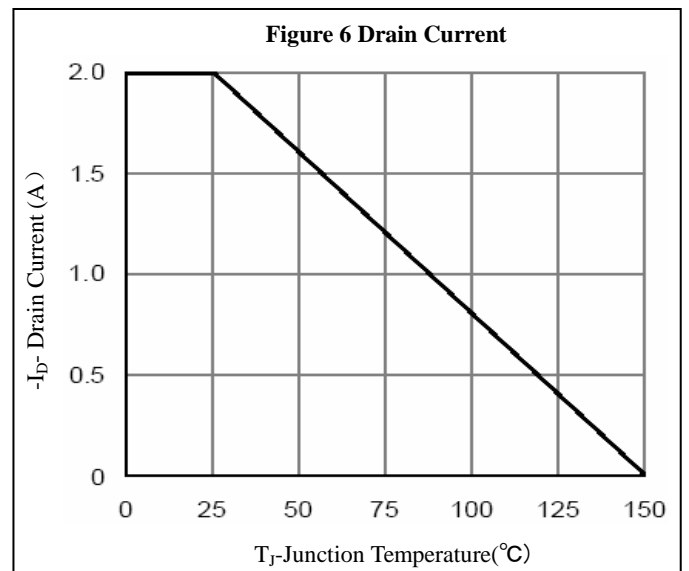
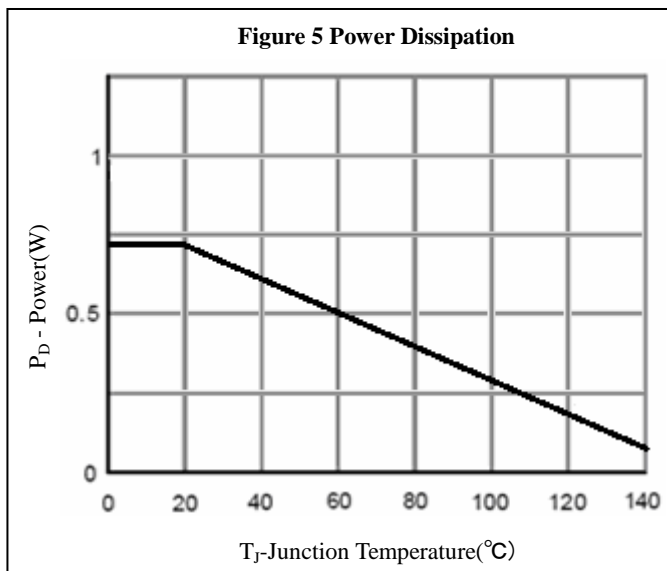
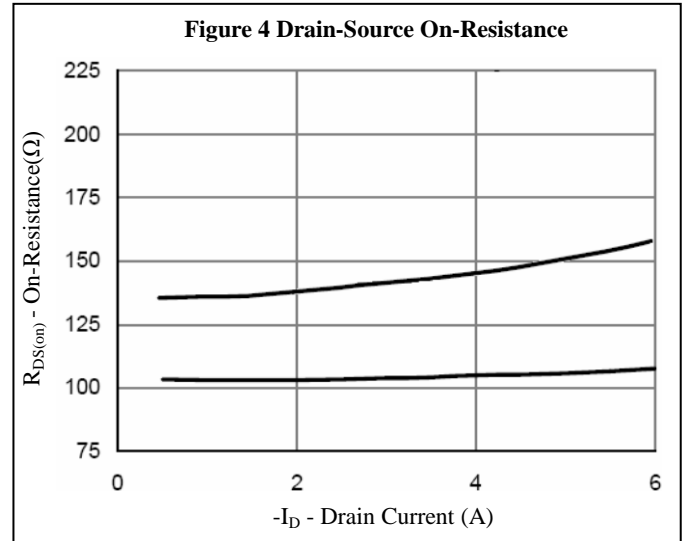
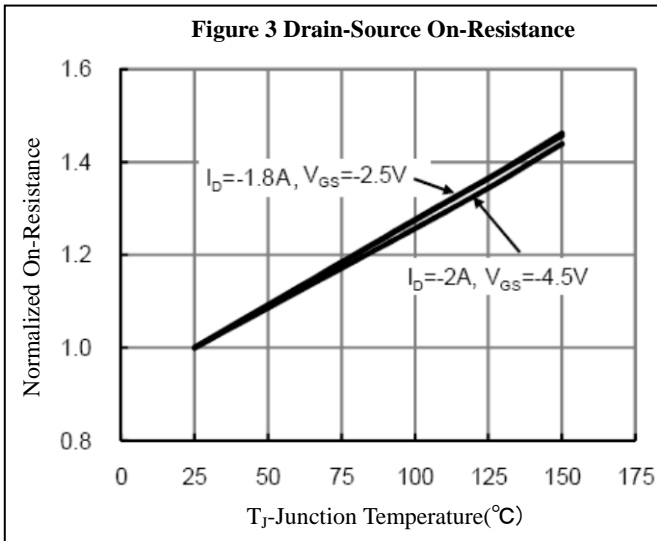
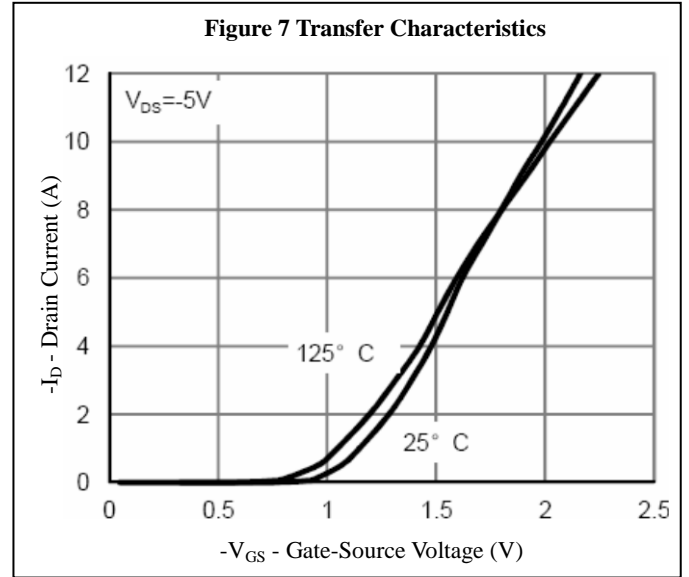
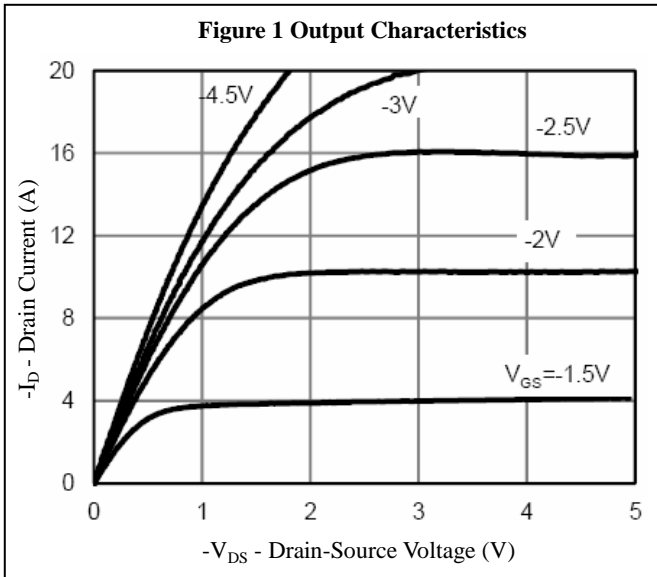
Note: c: Pulse Width ≤300us, Duty Cycle ≤2%

d: Guaranteed by design, not subject to production

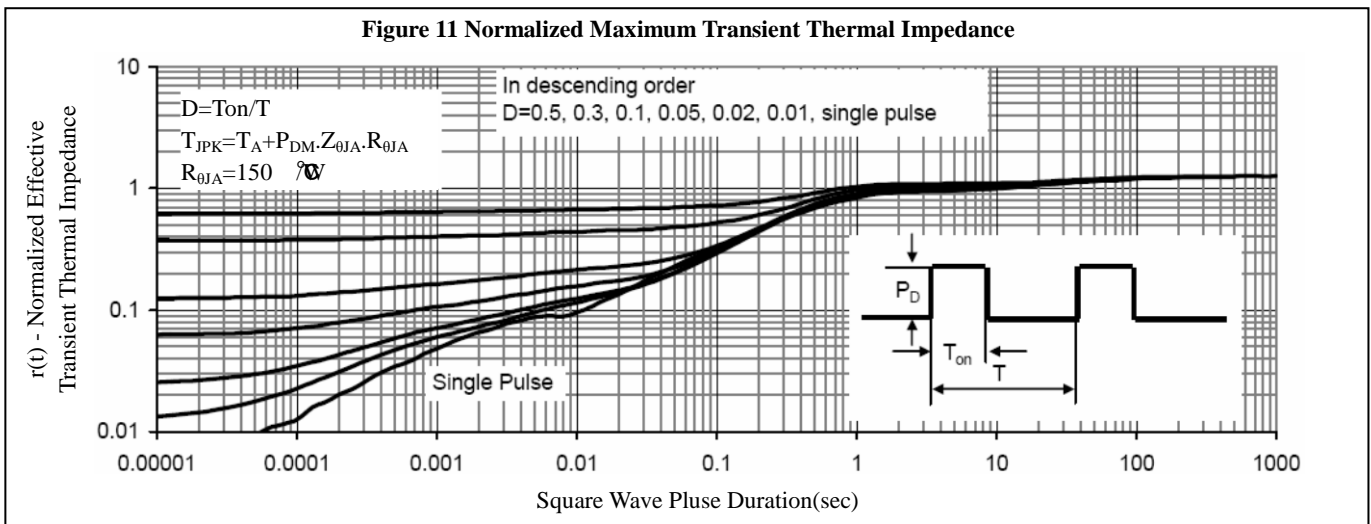
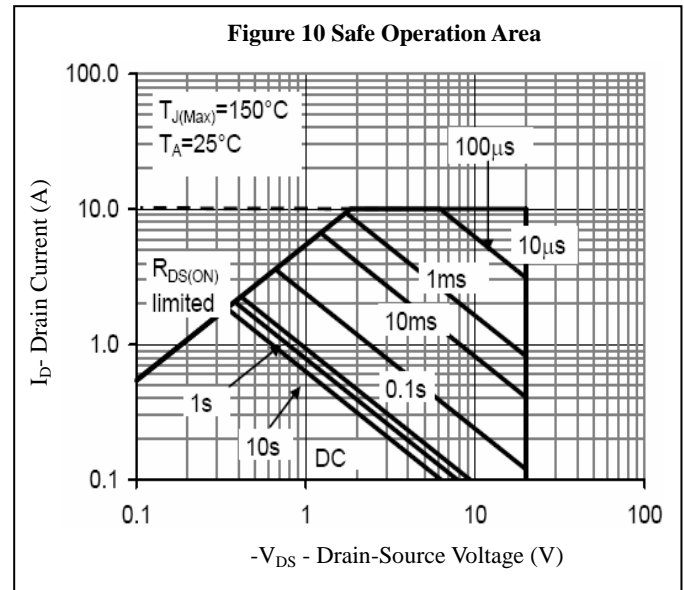
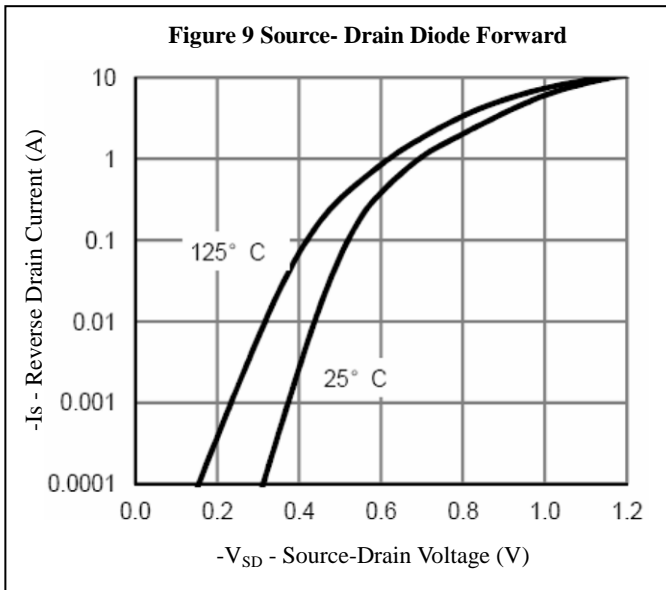
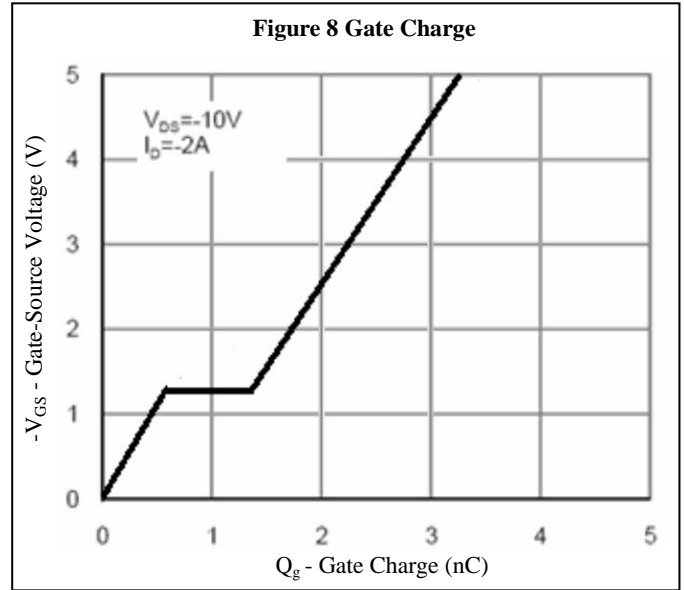
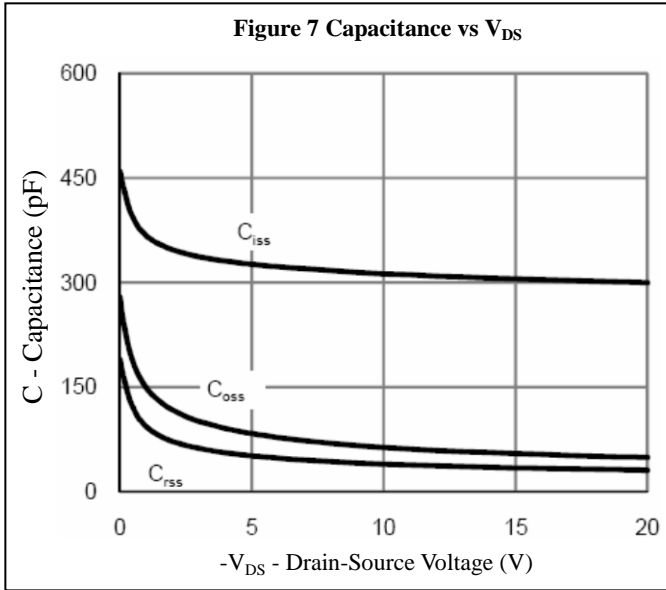


Switching Test Circuit and Switching Waveforms

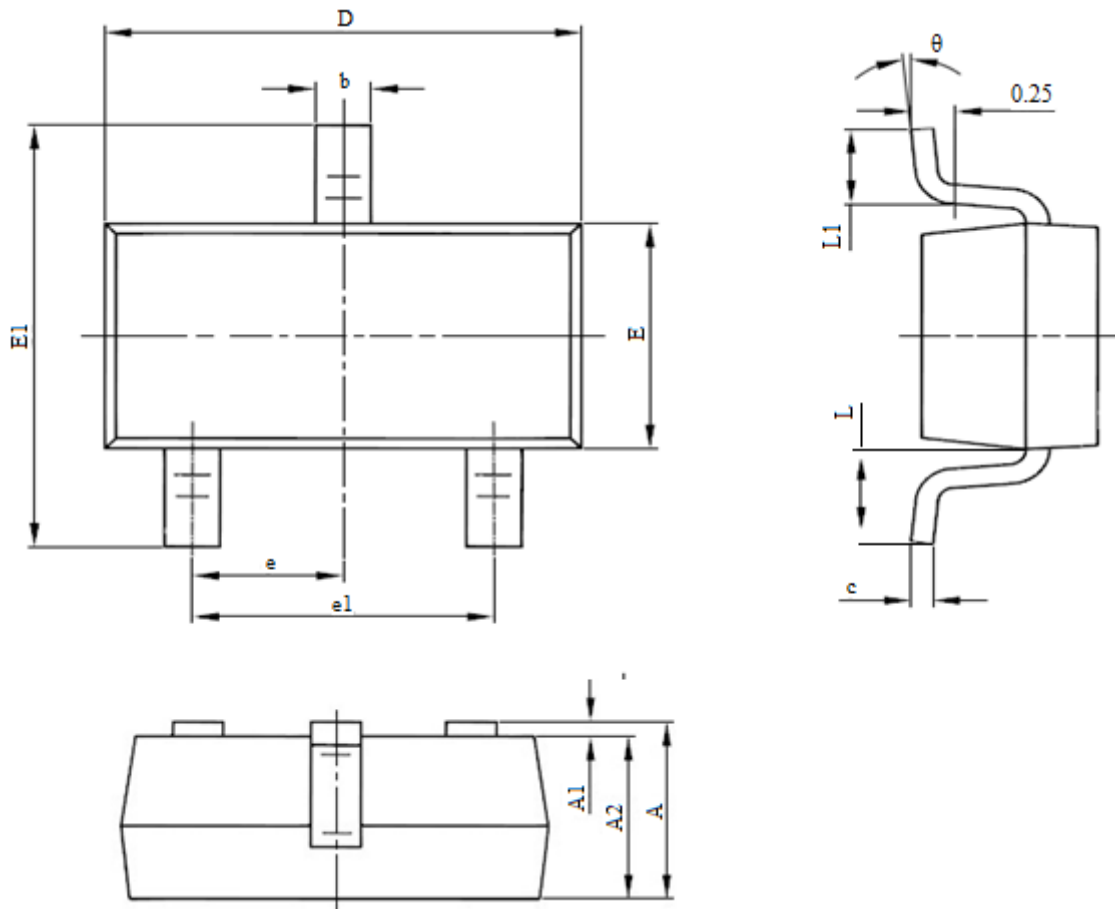
Characteristics Curve



Characteristics Curve



SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.95(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.55REF		0.022REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°



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.