

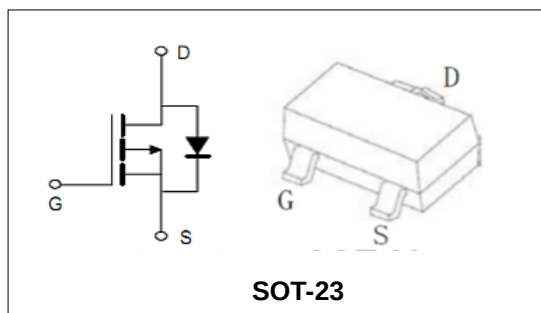
**-20V/-2A P-Channel Enhancement Mode MOSFET****Features**

- Advanced trench process technology
- High Density Cell Design For Ultra Low On-Resistance

Applications

- PWM application
- Load switch

BVDSS	-20	V
ID	-2	A
RDSON@VGS=-4.5V	97	mΩ
RDSON@VGS=-2.5V	126	mΩ

**Order Information**

Product	Package	Marking	Reel Size	Reel	Carton
2301B	SOT-23	A1sHB	7inch	3000PCS	180000PCS

Absolute Maximum Ratings

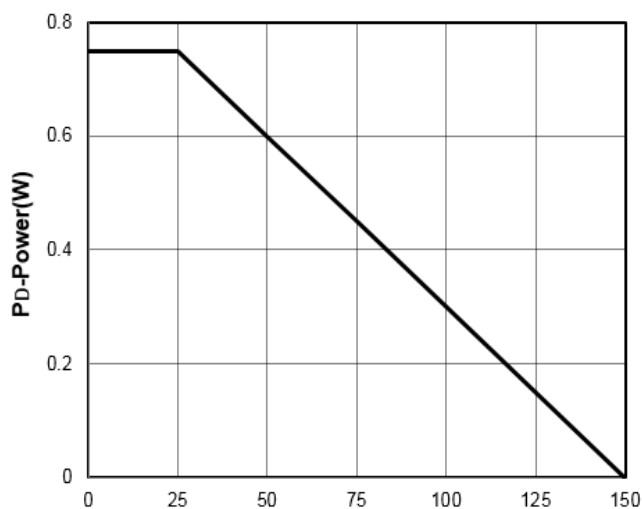
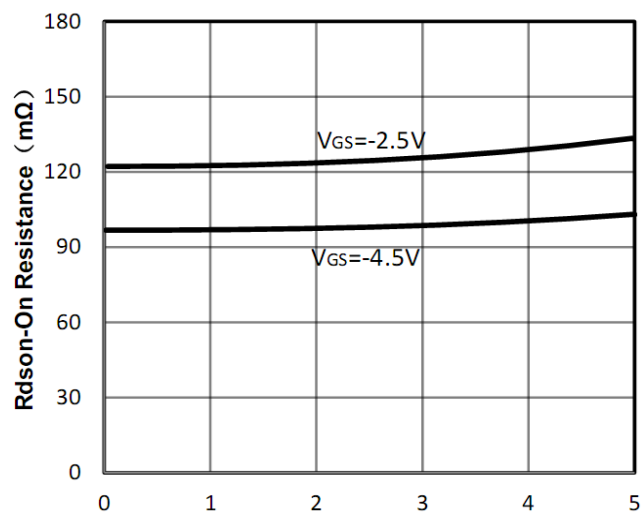
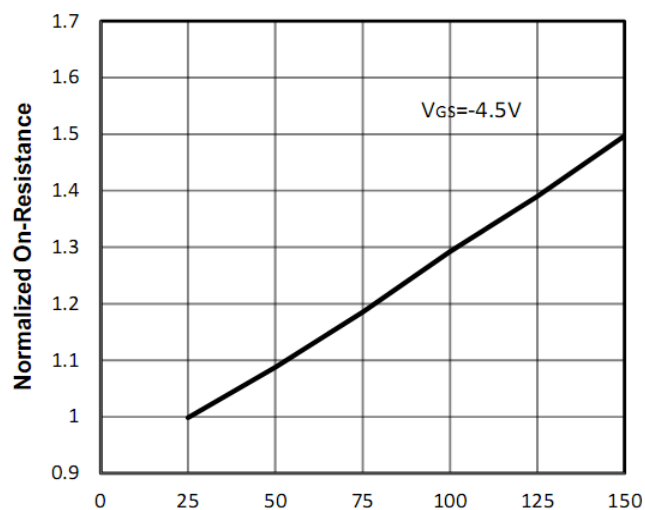
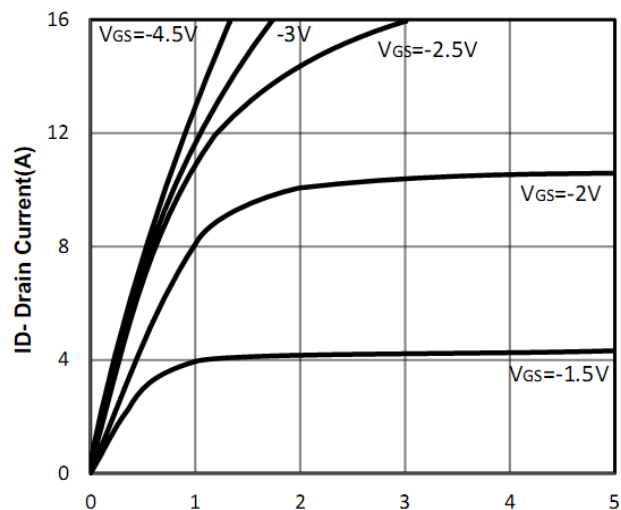
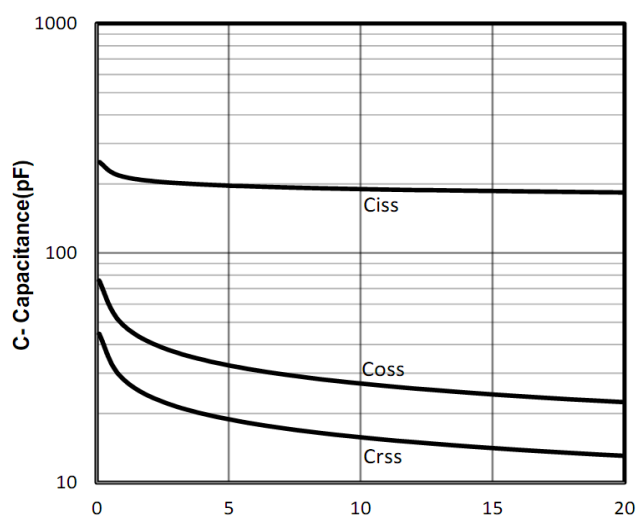
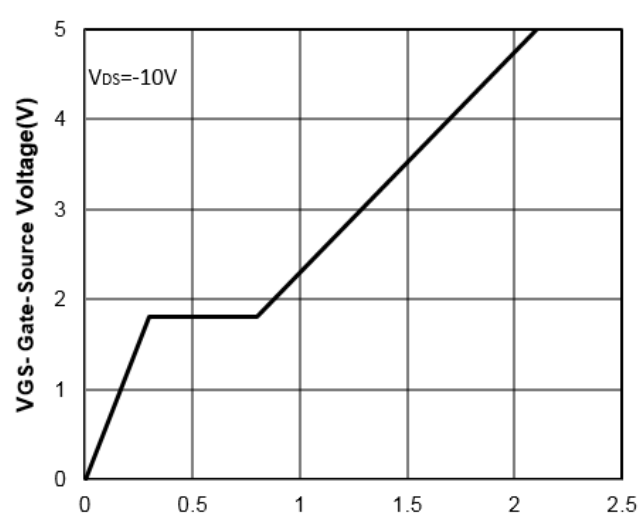
Symbol	Parameter		Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)				
V _{(BR)DSS}	Drain-Source Breakdown Voltage		-20	V
V _{GS}	Gate-Source Voltage		±12	V
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	TA =25°C	-2	A
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested (Silicon Limit) (Note1)	TA =25°C	-8	A
I _D	Continuous Drain current	TA =25°C	-2	A
P _D	Maximum Power Dissipation	TA =25°C	0.75	W
R _{θJA}	Thermal Resistance Junction-to-Ambient (Note2)		167	°C/W

**-20V/-2A P-Channel Enhancement Mode MOSFET**

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain- Source Breakdown Voltage	VGS=0V ID=-250μA	-20	--	--	V
I _{DSS}	Zero Gate Voltage Drain current	VDS=-20V,VGS=0V	--	--	-1	μA
I _{GSS}	Gate-Body Leakage Current	VGS=±12V,VDS=0V	--	--	±100	uA
V _{GS(TH)}	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-0.45	--	-1	V
R _{DS(ON)}	Drain-Source On-State Resistance (Note3)	VGS=-4.5V, ID=-1.5A	--	97	125	mΩ
		VGS=-2.5V, ID=-1A	--	126	165	mΩ
Dynamic Electrical Characteristics @ Tj = 25°C (unless otherwise stated) (Note4)						
C _{iss}	Input Capacitance	VDS= -10V, VGS=0V, F=1MHz	--	194	--	pF
C _{oss}	Output Capacitance		--	28	--	pF
C _{rss}	Reverse Transfer Capacitance		--	18	--	pF
Q _g	Total Gate Charge	VDS= -10V, ID= -2A, VGS= -4.5V	--	1.9	--	nC
Q _{gs}	Gate-Source Charge		--	0.3	--	nC
Q _{gd}	Gate-Drain Charge		--	0.5	--	nC
Switching Characteristics (Note4)						
t _{d(on)}	Turn-on Delay Time	VDD=-10V, ID=-2A, RG=6Ω, VGS=-4.5V	--	6.5	--	nS
t _r	Turn-on Rise Time		--	3.3	--	nS
t _{d(off)}	Turn-off Delay Time		--	14	--	nS
t _f	Turn-off Fall Time		--	4.7	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage (Note3)	IS=-1A,VGS=0V	--	--	-1.2	V

Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec
3. Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

**-20V/-2A P-Channel Enhancement Mode MOSFET****Typical Characteristics**Figure1: T_j Junction Temperature ($^{\circ}\text{C}$)Figure2: $-I_d$ Drain Current (A)Figure3: T_j Junction Temperature ($^{\circ}\text{C}$)Figure4: $-V_{\text{DS}}$ Drain-Source Voltage (V)Figure5: $-V_{\text{DS}}$ Drain-Source Voltage (V)Figure6: Q_g Gate Charge (nC)

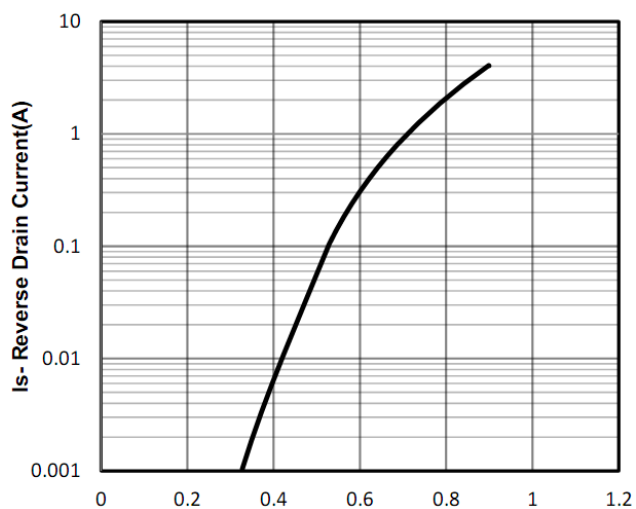
**-20V/-2A P-Channel Enhancement Mode MOSFET**

Figure7: -Vsd Source-Drain Voltage (V)

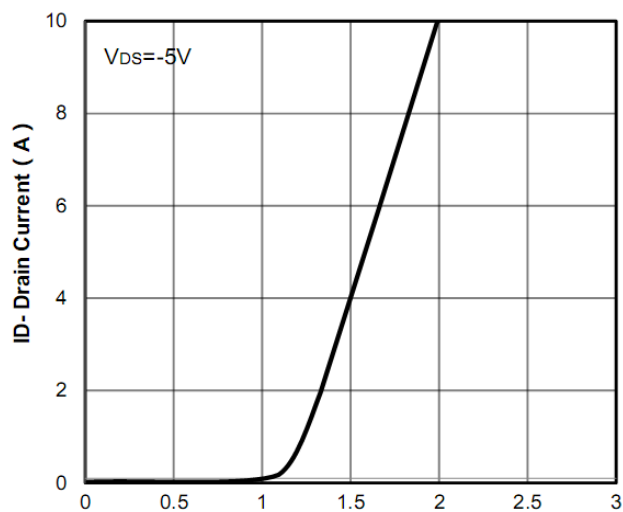


Figure8: -Vgs Gate-Source Voltage (V)

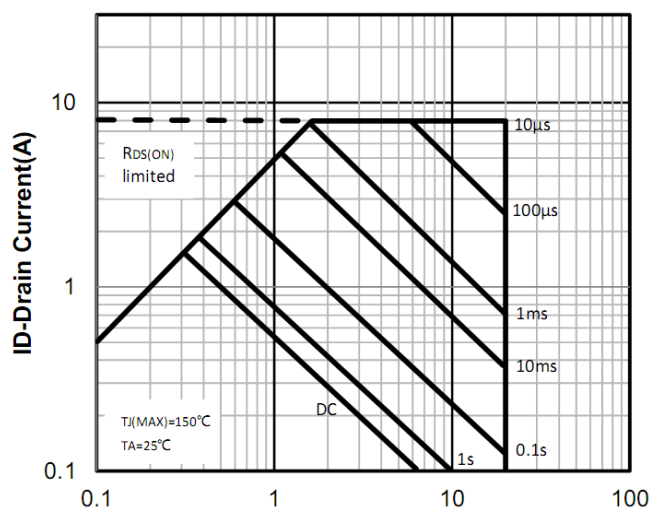


Figure9: -Vds Drain -Source Voltage (V)

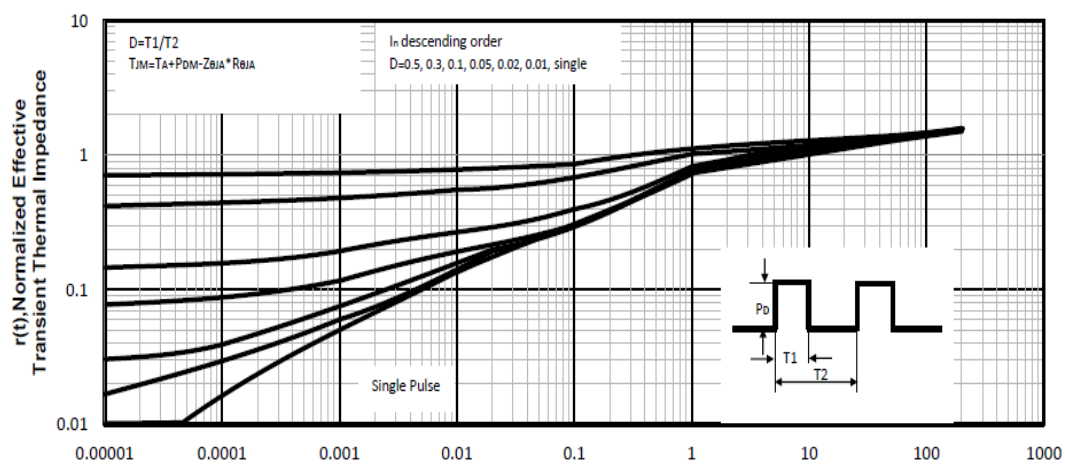
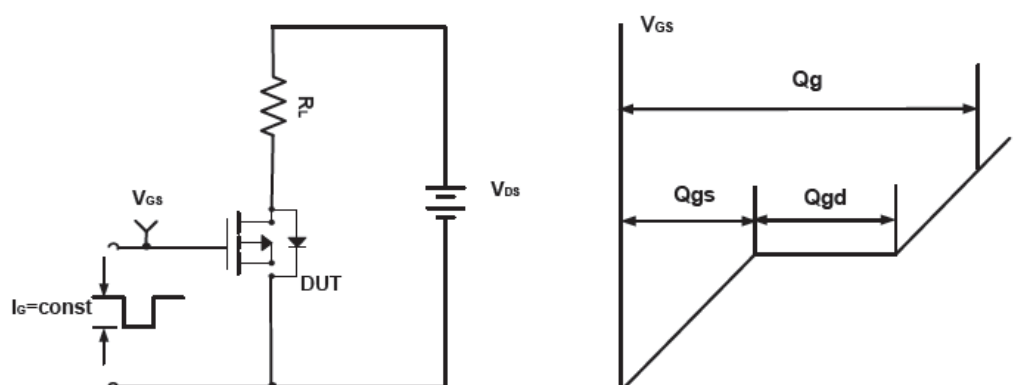
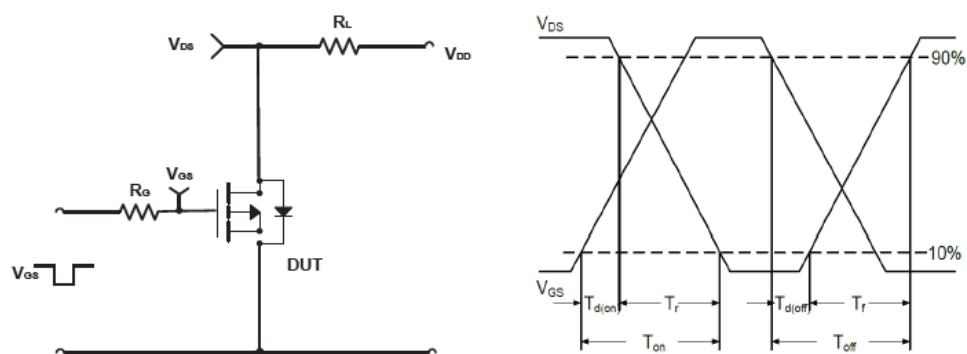


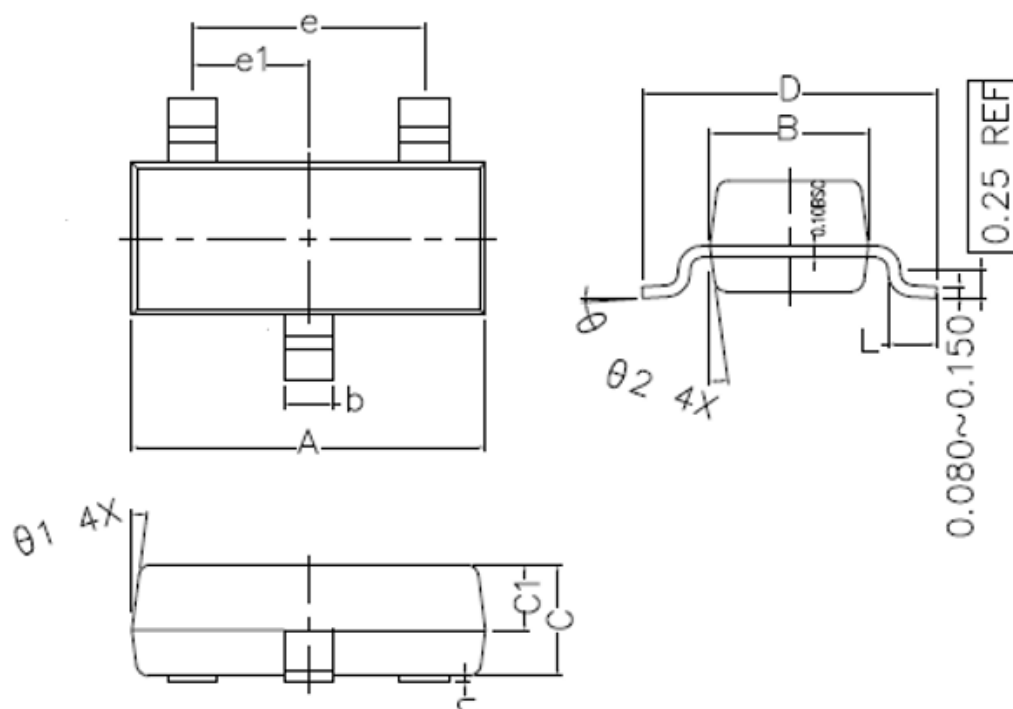
Figure10: Square Wave Pulse Duration (sec)

-20V/-2A P-Channel Enhancement Mode MOSFET
Test Circuit and Waveform:

Figure A Gate Charge Test Circuit & Waveforms

Figure B Switching Test Circuit & Waveforms



-20V/-2A P-Channel Enhancement Mode MOSFET

SOT-23 Package Outline Dimensions (Units: mm)



COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	2.800	2.900	3.000
B	1.200	1.300	1.400
C	0.900	1.000	1.100
C1	0.500	0.550	0.600
D	2.250	2.400	2.550
L	0.300	0.400	0.500
h	0.010	0.050	0.100
b	0.300	0.400	0.500
e	1.90 TYPE		
e1	0.95 TYPE		
θ ₁	7° TYPE		
θ ₂	7° TYPE		
θ	0° ~ 7°		