

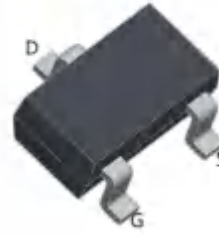


TS2301AE

Single P-Channel Power MOSFET

V _{DSS} (V)	R _{DS (ON)}	I _{D(A)}
-20	44mΩ(Typ)@V _{GS} =-4.5V	-3.3
	55mΩ(Typ)@V _{GS} =-2.5V	

Pin Description



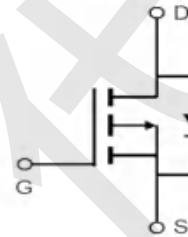
SOT-23

FEATURE:

- The TS2301AE uses advanced trench technology to provide excellent R_{DS(ON)}, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

APPLICATIONS:

- Load Switch for Portable Devices
- Power Management



Ordering and Marking Information

Product ID	Marking	Package	Packaging	Quantity
TS2301AE	A1SHB	SOT23	Tape&Reel	3000

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DSS}	Drain-Source Voltage	-20	V
V _{GSS}	Gate-Source Voltage	±12	V
I _D	Continuous Drain Current(V _{GS} = -4.5V)	T _A =25°C	-3.3
		T _A =70°C	-2
T _J	Maximum Junction Temperature	150	°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
I _{DM}	Pulsed Drain Current	-12	A
P _D	Maximum Power Dissipation	T _A =25°C	1
		T _A =70°C	---
E _{AS}	Avalanche Energy, Single Pulsed	---	mJ
R _{θJC}	Thermal Resistance-Junction to Case	---	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient	105	°C/W



TS2301AE

SingleP-ChannelPowerMOSFET

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BVDSS	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	-20	---	---	V
$V_{GS(th)}$	Gate threshold voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	-0.4	-0.7	1.1	V
RDS(on)	Drain-Source On-state Resistance	$V_{GS}=-4.5V, I_D=-3.5A$	---	44	62	m Ω
		$V_{GS}=-2.5V, I_D=-2A$	---	55	83	m Ω
IGSS	Gate-source leakage current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 100	μA
IDSS	Zero gate voltage drain current	$V_{DS}=-20V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	-1	μA
		$T_J=55^{\circ}\text{C}$	---	---	---	
Dynamic Characteristic						
Ciss	Input Capacitance	$V_{GS}=0V, V_{DS}=-10V,$ Frequency=1.0MHz	---	533	---	pF
Coss	Output Capacitance		---	72	---	
Crss	Reverse Transfer Capacitance		---	67	---	
QG	Gate Total Charge	$V_{DS}=-10V, V_{GS}=-5V,$ $I_{DS}=-3A$	---	8.3	---	nC
Qgs	Gate-Source charge		---	1.2	---	
Qgd	Gate-Drain charge		---	1.6	---	
td(on)	Turn-on delay time	$V_{DD}=-10V, V_{GS}=-5V,$ $R_G=5\Omega, I_D=-3A$	---	12	---	ns
tr	Turn-on Rise Time		---	35	---	
td(off)	Turn-off Delay Time		---	30	---	
tf	Turn-off Fall Time		---	10	---	
RG	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	---	---	Ω
Diode Characteristics						
VSD	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A,$ $T_J=25^{\circ}\text{C}$	---	---	-1.2	V
trr	Reverse Recovery Time	$I_{SD}=-4.1A,$ $dI_{SD}/dt=-100A/\mu s$	---	---	---	ns
Qrr	Reverse Recovery Charge		---	---	---	nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

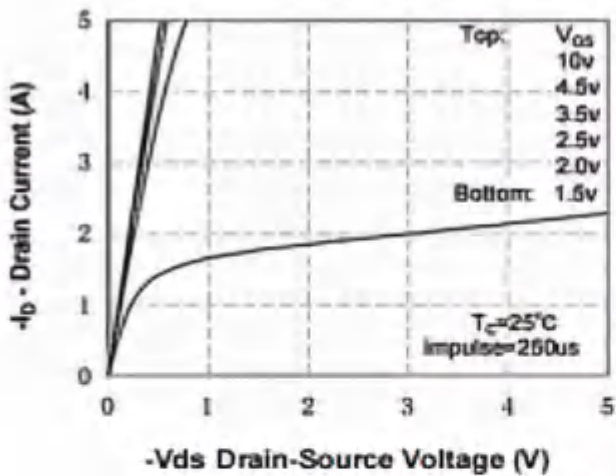


Figure 1. On-Region Characteristics

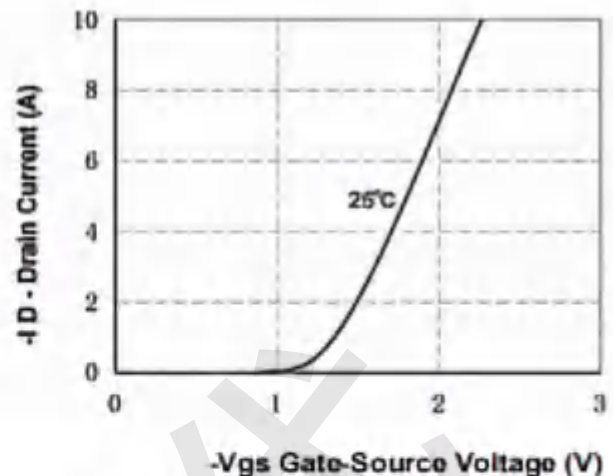


Figure 2. Transfer Characteristics

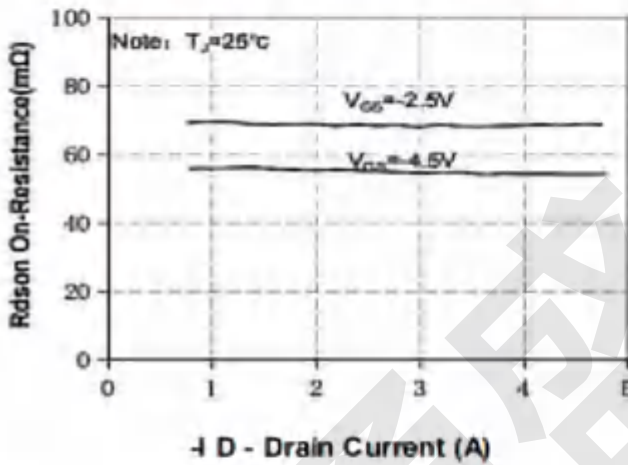


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

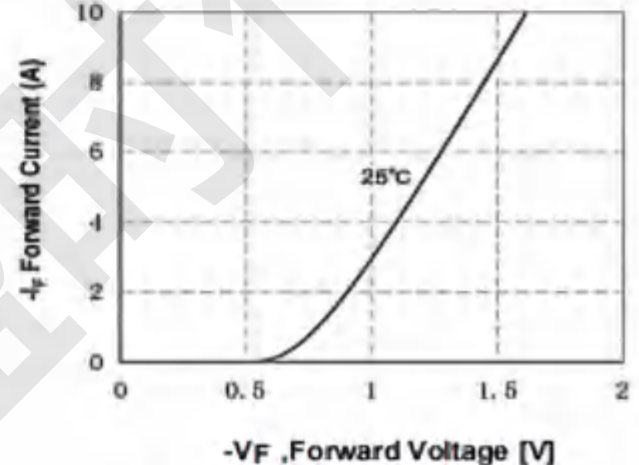


Figure 4. Body Diode Forward Voltage Variation with Source Current

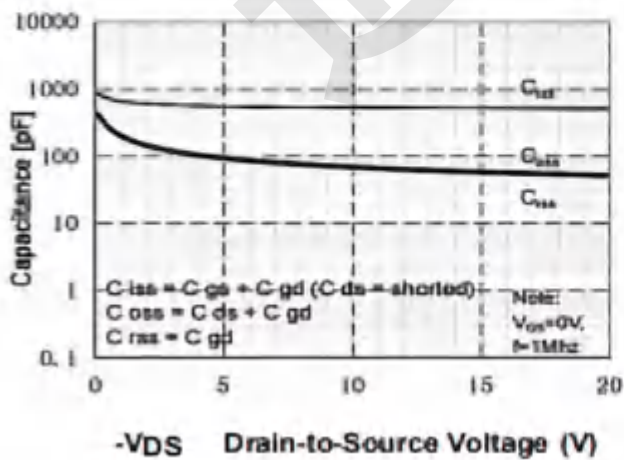


Figure 5. Capacitance Characteristics

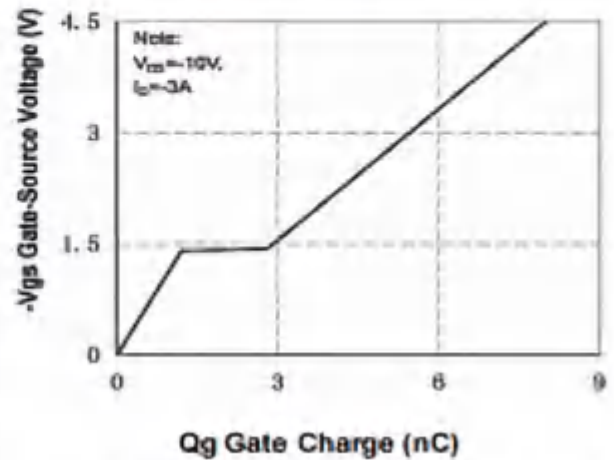


Figure 6. Gate Charge Characteristics

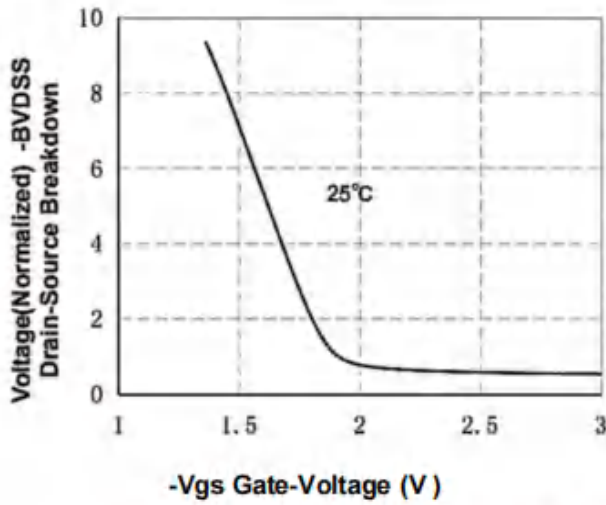


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

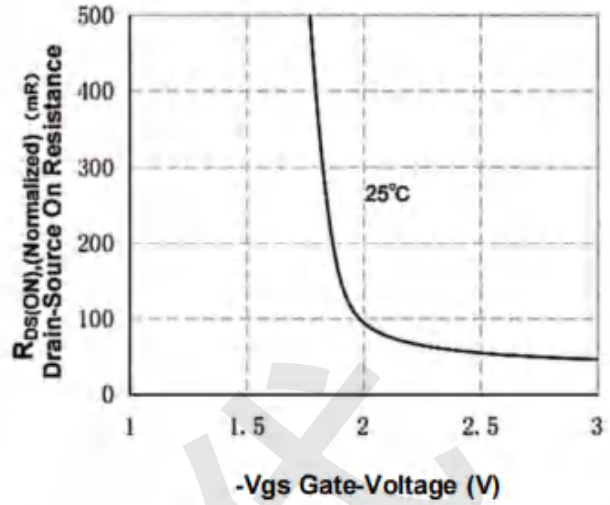


Figure 8. On-Resistance vs Gate Voltage

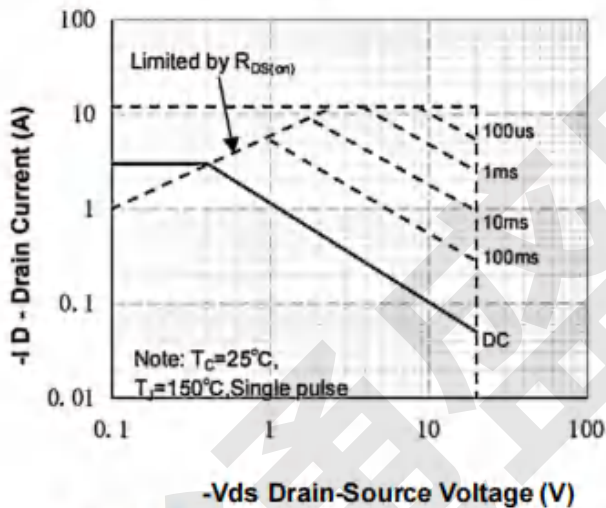


Figure 9. Maximum Safe Operating Area

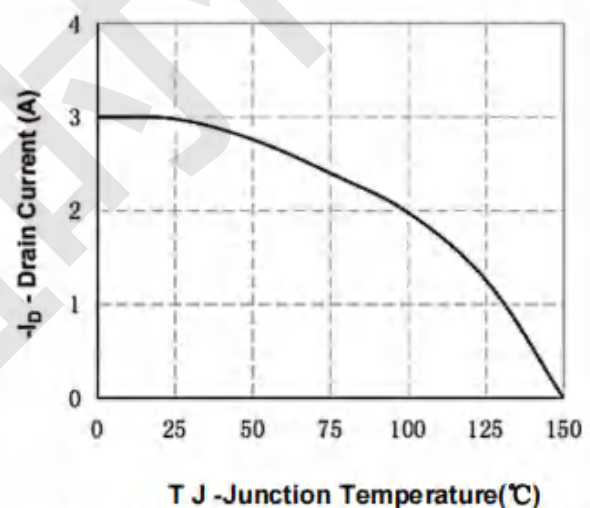


Figure 10. Maximum Continuous Drain Current vs Temperature

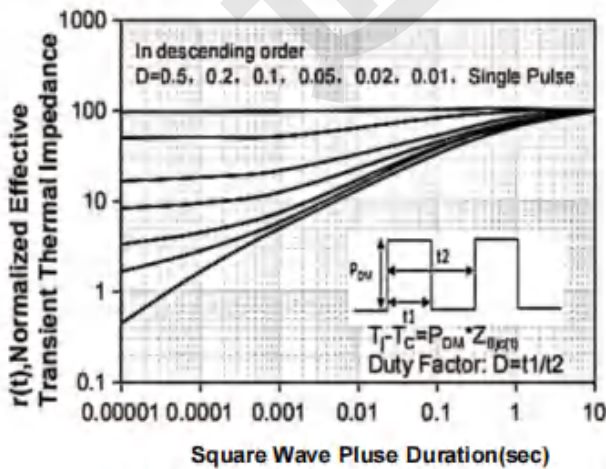
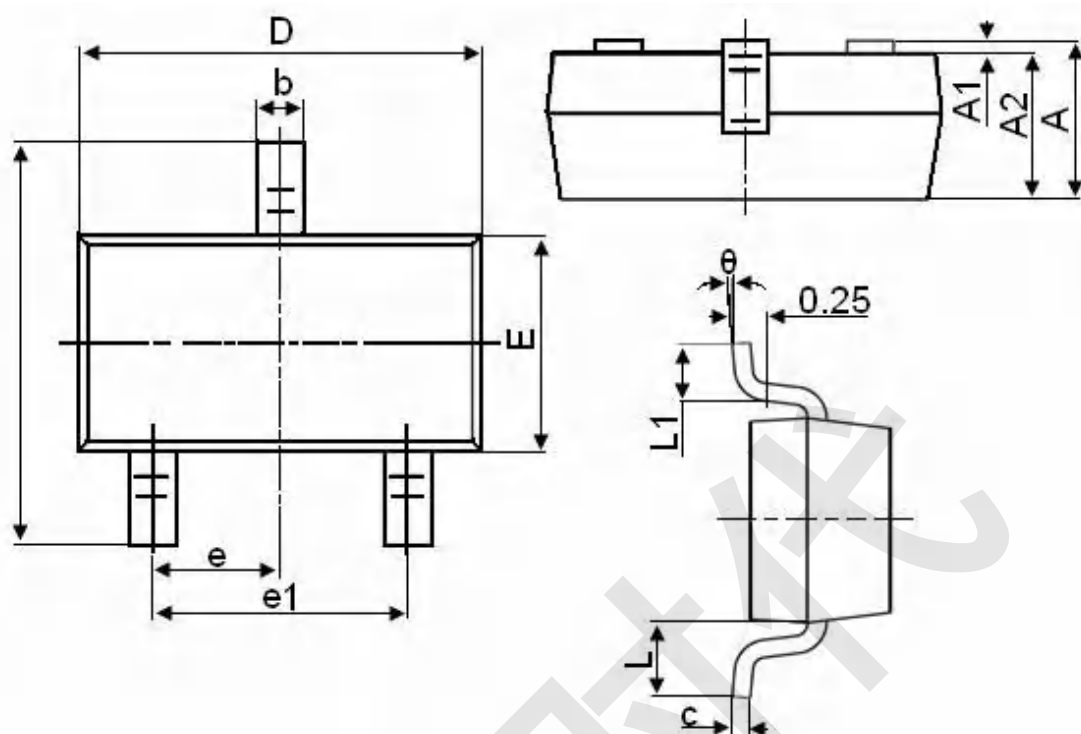


Figure 11. Transient Thermal Response Curve



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	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°



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Edition	Date	Change
Rve1.0	2022/11	Initial release

通盛时代