

TDSEMIC

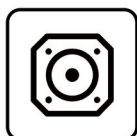
拓電半導體

自主封測 品質把控 售後保障

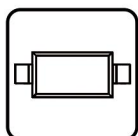
WEB | WWW.TDSEMIC.COM



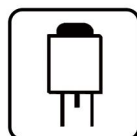
電源管理



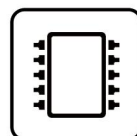
顯示驅動



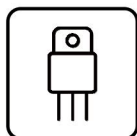
二三極管



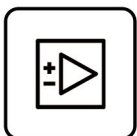
LDO穩壓器



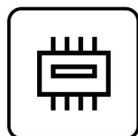
觸摸芯片



MOS管



運算放大器



存儲芯片



MCU



串口通信

2302S A2SHB-TD(160K)

產品規格說明書

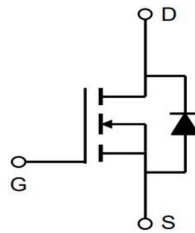
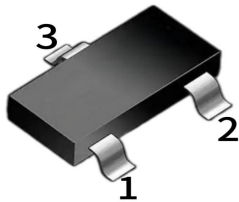
Features

The **2302S-TD** 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.

Product Summary

V_{DS}	20V
I_D	2.3A
$R_{DS(ON)}$ (at $V_{GS} = 4.5V$)	< 60m Ω
$R_{DS(ON)}$ (at $V_{GS} = 2.5V$)	< 80m Ω

SOT-23
1.BASE
2.EMITTER
3.COLLECTOR



Order Information

Product	Package	Marking	Packing
2302S-TD	SOT-23	A2SHB	3000PCS/Reel

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	
Continuous Drain Current	I_D	2.3	A
Pulsed Drain Current ①	I_{DM}	10	
Continuous Source-Drain Current(Diode Conduction)	I_S	0.8	
Power Dissipation ②	P_D	0.35	W
Thermal Resistance from Junction to Ambient ($t \leq 5s$)	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Operating Junction	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~+150	$^\circ\text{C}$

Electrical Characteristics(TJ=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters ③						
Drain-Source Breakdown Voltage	BVDSS	VGS = 0V, ID = -250μA	20			V
Gate Threshold Voltage	VGS(th)	VDS =VGS, ID = -250μA	0.5		1.1	V
Gate-Body leakage Current	IGSS	VDS =0V, VGS = ±8V			±100	nA
Zero Gate Voltage Drain Current	IDSS	VDS = 18V, VGS =0V			1	μA
Static Drain-Source On-Resistance	RDS(on)	VGS = 4.5V, ID = 2.3A		45	60	mΩ
		VGS = 2.5V, ID = 1.5A		60	80	mΩ
Forward Transconductance	gFs	VDS = 4.5V, ID = 2.3A		4		S
Diode Forward Voltage	VSD	IS=1A,VGS=0V		0.8	1.3	V
Dynamic Parameters ④						
Input Capacitance	Ciss	VDS = 10V,VGS =0V, f=1MHz		405		pF
Output Capacitance	Coss			75		pF
Reverse Transfer Capacitance	Crss			55		pF
Total Gate Charge	Qg	VDS = 10V,VGS = 2.5V, ID = 2.3A		3.3	6	nC
Gate Source Charge	Qgs			0.7		nC
Gate Drain Charge	Qgd			1.3		nC
Gate Resistance	Rg	f=1MHz		6.0		Ω
Switching Parameters ④						
Turn-On DelayTime	td(on)	VDD= 10V RL=3Ω, ID ≈1A, VGEN= 4.5V,Rg=1Ω		11	20	ns
Turn-On Rise Time	tr			35	60	ns
Turn-Off DelayTime	td(off)			30	50	ns
Turn-Off Fall Time	tf			10	20	ns
Drain-source body diode characteristics						
Continuous Source-Drain Diode Current	IS	Tc=25℃			1.3	A
Pulsed Diode forward Curren	ISM				10	A
Note :						
1. Repetitive Rating : Pulse width limited by maximum junction temperature.						
2. Surface Mounted on FR4 Board, t < 5 sec.						
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.						
4. Guaranteed by design, not subject to production testing.						

Typical Electrical and Thermal Characteristics

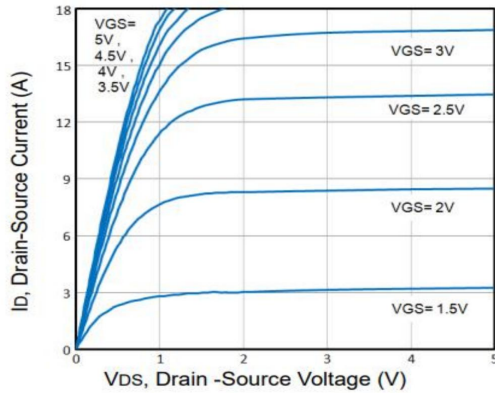


Fig1. Typical Output Characteristics

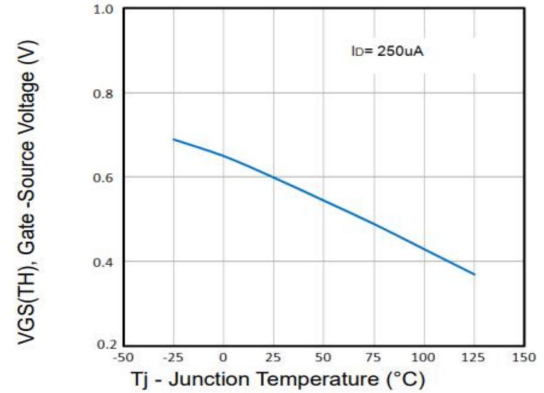


Fig2. Normalized Threshold Voltage Vs. Temperature

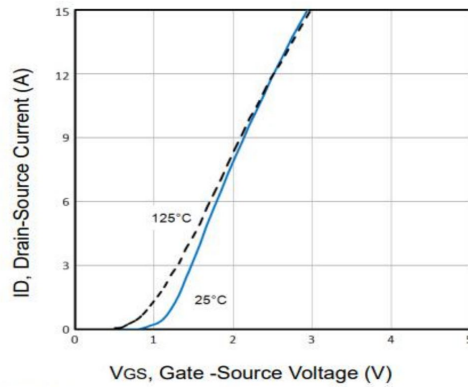


Fig3. Typical Transfer Characteristics

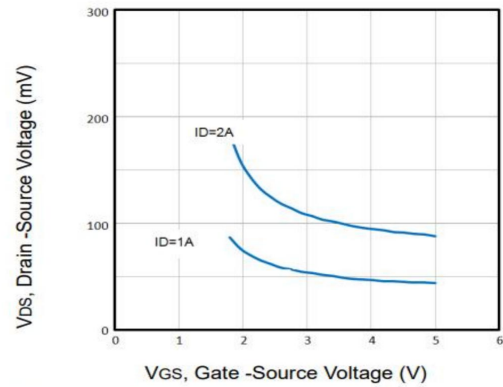


Fig4. Drain-Source Voltage vs Gate-Source Voltage

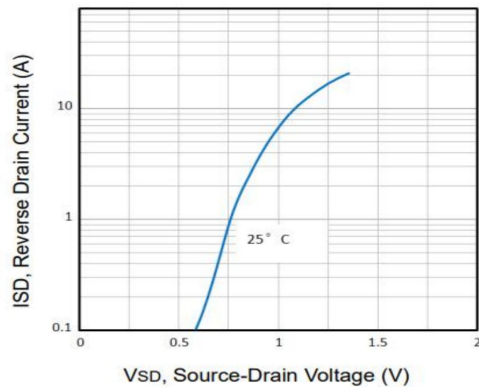


Fig5. Typical Source-Drain Diode Forward Voltage

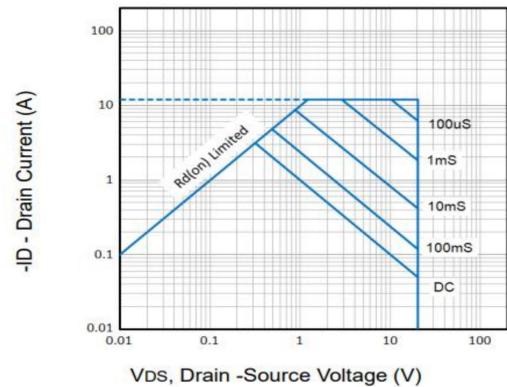


Fig6. Maximum Safe Operating Area

Typical Electrical and Thermal Characteristics

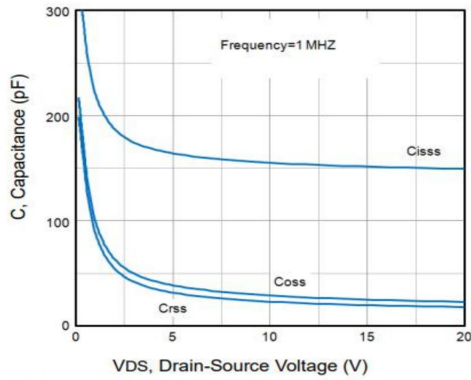


Fig7. Typical Capacitance Vs. Drain-Source Voltage

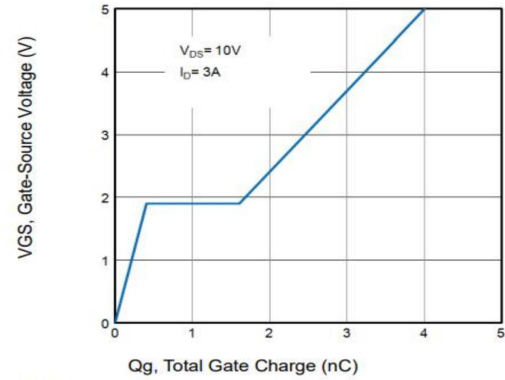


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

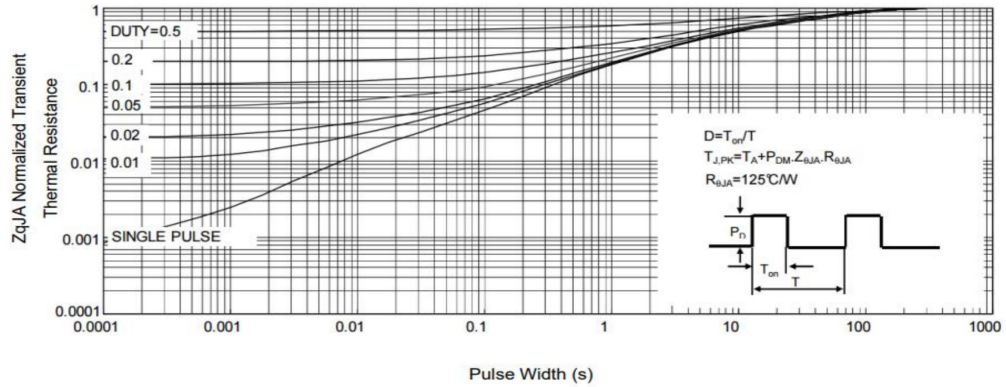


Fig9. Normalized Maximum Transient Thermal Impedance

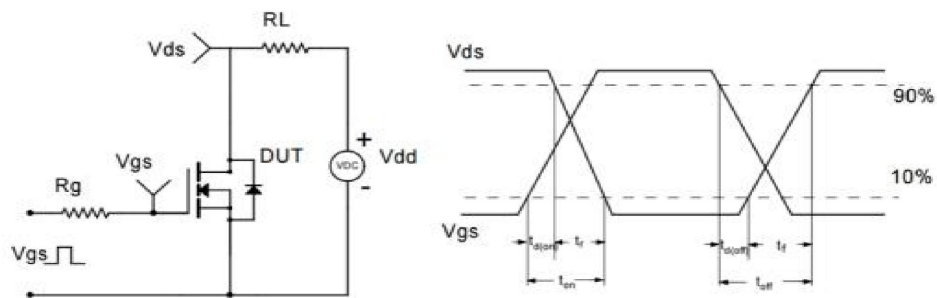
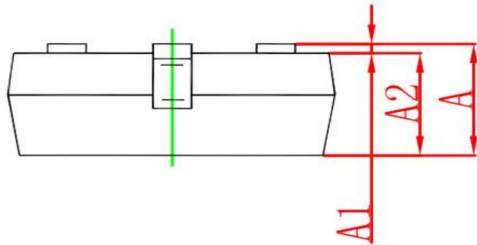
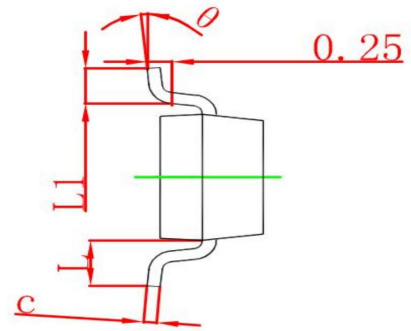
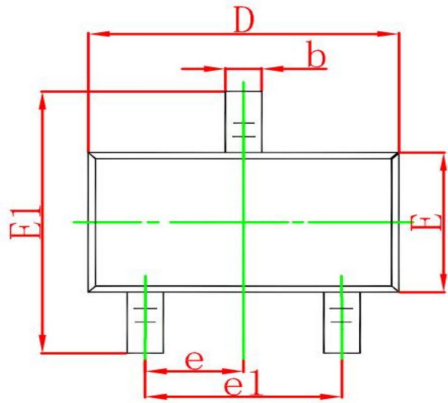


Fig10. Switching Time Test Circuit and waveforms

SOT-23 Package Outline Dimesions



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	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°