

TDSEMIC

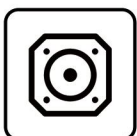
拓電半導體

自主封測 品質把控 售後保障

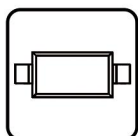
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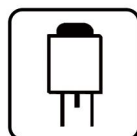
電源管理



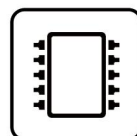
顯示驅動



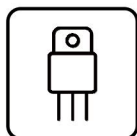
二三極管



LDO穩壓器



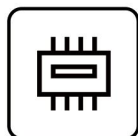
觸摸芯片



MOS管



運算放大器



存儲芯片



MCU



串口通信

SI2301-TD

產品規格說明書

Description

The SI2301-TD is the high cell density trench P-ch MOSFETs, which provides excellent $R_{DS(ON)}$ and efficiency for most of the small power switching and load switch applications.

The JCW2301BFS meet the RoHS and Green Product requirement with full function reliability approved.

- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent C_{dv}/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summary

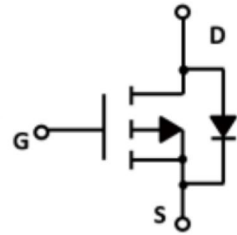
$V_{DS} = -20V$ $I_D = -2.3A$

$R_{DS(ON)} < 125m\Omega$ @ $V_{GS} = 4.5V$

$R_{DS(ON)} < 190m\Omega$ @ $V_{GS} = 2.5V$



SOT-23 Pin Configuration



Package Marking and Ordering Information

Product ID	Package	Marking	QTY(PCS)
SI2301-TD	SOT-23	A1SHB	3000

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-2.3	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-1.4	A
I_{DM}	Pulsed Drain Current ²	-8	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ³	0.8	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	156	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	---	$^\circ C/W$

Electrical Characteristics (TC=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)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 to Body Leakage Current	V _{DS} =0V, V _{GS} = ±12V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-0.4	-0.7	-1.0	V
R _{DS(on)}	Static Drain-Source on-Resistance note2	V _{GS} =-4.5V, I _D =-2A	-	95	125	mΩ
		V _{GS} =-2.5V, I _D =-1A	-	135	190	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = -10V, V _{GS} = 0V, f = 1.0MHz	-	185	-	pF
C _{oss}	Output Capacitance		-	35	-	pF
C _{rss}	Reverse Transfer Capacitance		-	25	-	pF
Q _g	Total Gate Charge	V _{DS} = -10V, I _D = -2A, V _{GS} = -4.5V	-	2.2	-	nC
Q _{gs}	Gate-Source Charge		-	0.5	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	0.5	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} = -10V, R _L =5Ω, R _{GEN} =3Ω,V _{GS} =-4.5V,	-	10	-	ns
t _r	Turn-on Rise Time		-	30	-	ns
t _{d(off)}	Turn-off Delay Time		-	63	-	ns
t _f	Turn-off Fall Time		-	50	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-2	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-8	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S = -2A	-	-	-1.2	V

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics

Figure 1: Output Characteristics

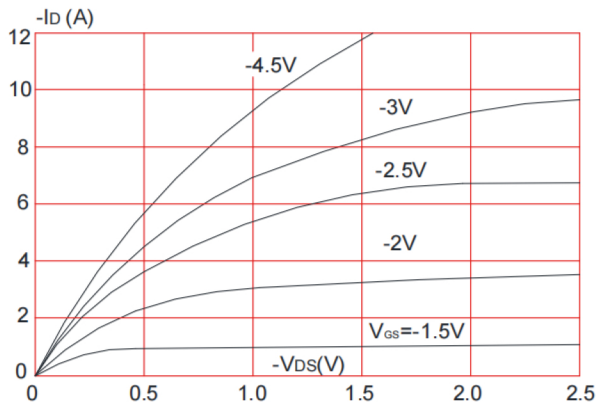


Figure 2: Typical Transfer Characteristics

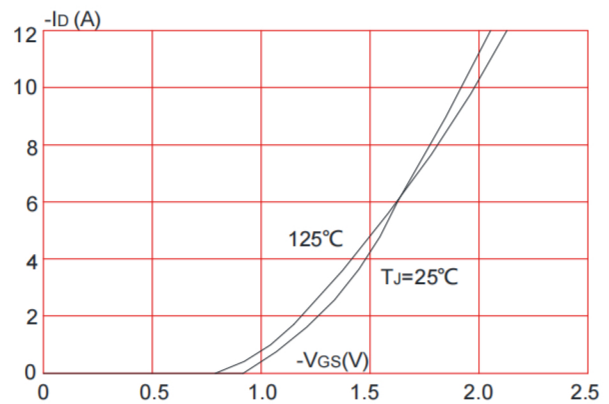


Figure 3: On-resistance vs. Drain Current

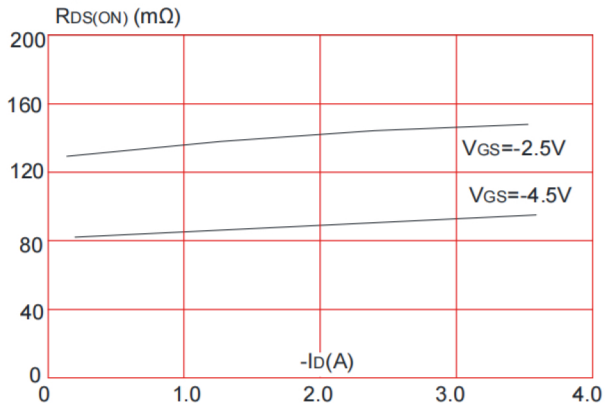


Figure 4: Body Diode Characteristics

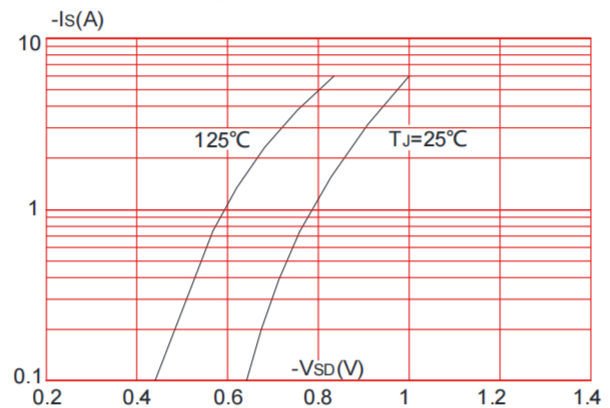


Figure 5: Gate Charge Characteristics

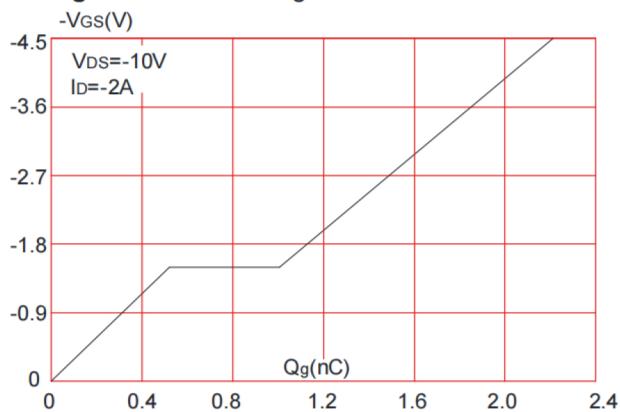
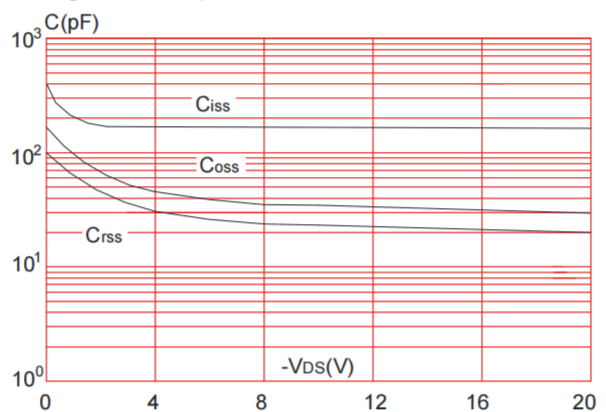


Figure 6: Capacitance Characteristics



-20V P-Channel Enhancement Mode MOSFET

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

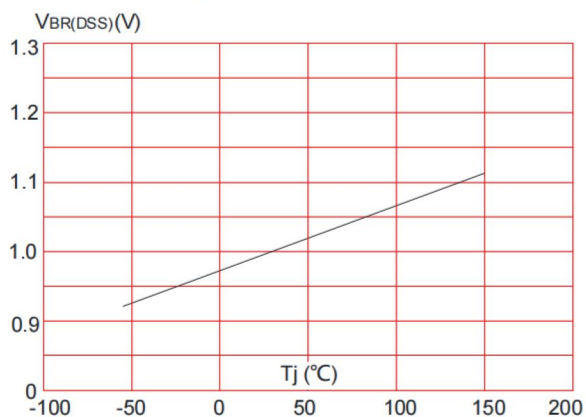


Figure 8: Normalized on Resistance vs. Junction Temperature

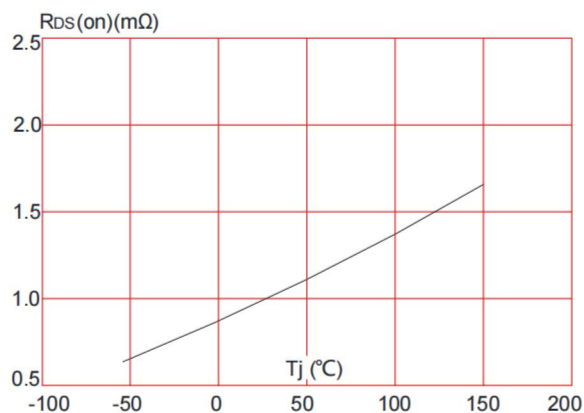


Figure 9: Maximum Safe Operating Area

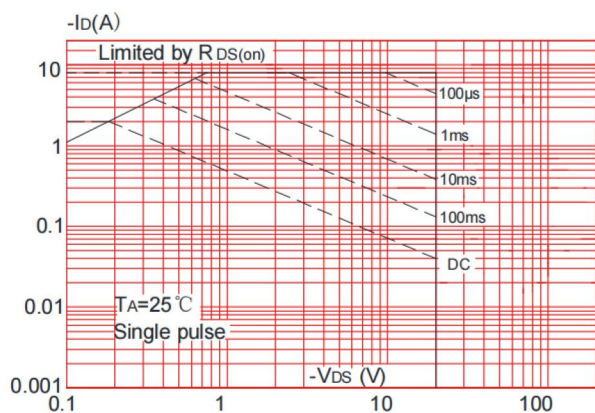


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

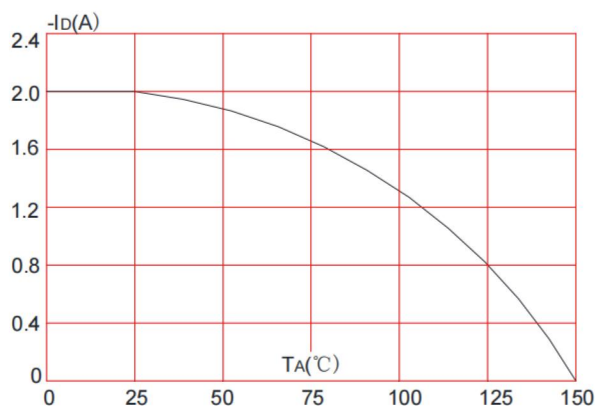
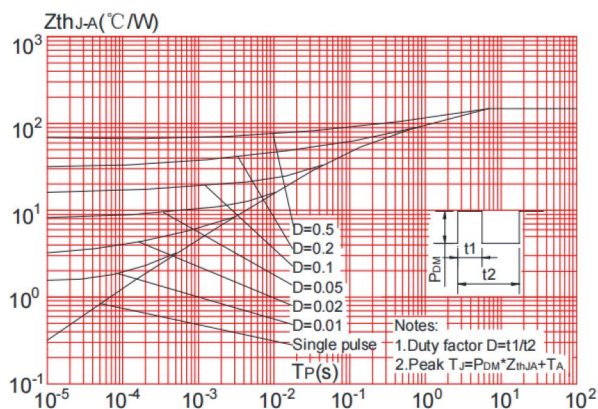
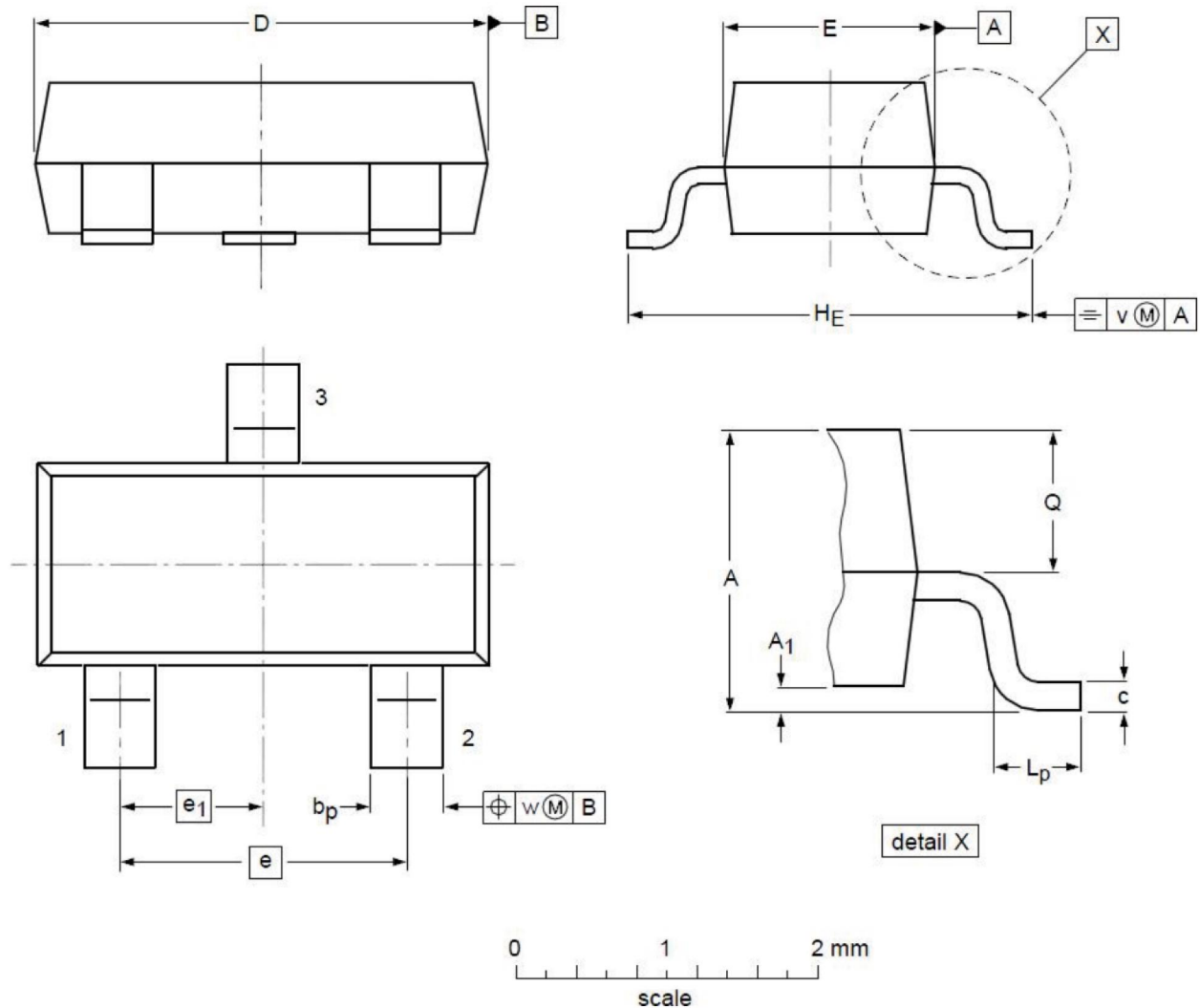


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Package Mechanical Data-SOT-23



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	A_1	0.01	0.05	0.10
b_p	0.30	0.42	0.50	c	0.08	0.13	0.15
D	2.80	2.92	3.00	E	1.20	1.33	1.40
e	--	1.90	--	e_1	--	0.95	--
H_E	2.25	2.40	2.55	L_p	0.30	0.42	0.50
Q	0.45	0.49	0.55	v	--	0.20	--
w	--	0.10	--				