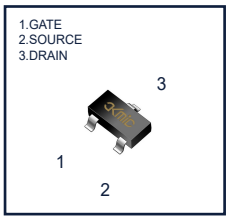
General Features

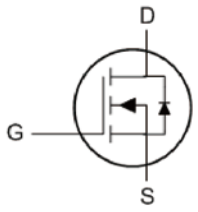
- V_{DSS}=30V I_D =4.2A
- $R_{DS(ON)}$ < 30mΩ @ V_{GS}=±12V



SOT23

Applications

- Green Device Available
- Super Low Gate Charge
- Excellent Cdv/dt effect decline
- Advanced high cell density Trench technology



Equivalent Circuit

Description

The SI2304BDS-T1-GE3 is the high cell density trenched N-ch MOSFETs, which provides excell ent RDSON and efficiency for most of the small power switching and load switch applications.

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	30	V
V_{GS}	Continuous Gate-Source Voltage	±12	V
I_D@TA=25℃	Continuous Drain Current, V_{GS} @ 4.5V[1]	4.2	A
I_D@TA=70℃	Continuous Drain Current, V_{GS} @ 4.5V[1]	2.8	A
I_{DM}	Pulsed Drain Current[2]	16.4	A
P_D@TA=25℃	Power Dissipation[3]	1.1	W
T_J,T_{STG}	Operation Junction and Storage Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-ambient[1]	113	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	℃/W

Ordering information

Product ID	Pack	Marking	Qty(PCS)
SI2304BDS-T1-GE3	SOT23	S6	3000

Electrical Characteristics (T_A=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250μA	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V,V_{GS}= 0V	---	---	1.0	μA
I_{GSS}	Gate -Source leakage current	V_{GS}=±12V, V_{DS}=0V	---	---	±100	nA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate-threshold voltage	V_{DS}=V_{GS}, I_D=250μA	0.5	0.9	1.4	V
$R_{DS(on)}$	Drain-Source On-Resistance(note 2)	V_{GS}= 10V, I_D=4A	---	30	44	mΩ
		V_{GS}= 4.5V, I_D=3A	---	41	54	
		V_{GS}= 2.5V, I_D=2A	---	56	72	
Dynamic characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V,V_{GS}=0V,f=1MHz	---	285	---	pF
C_{oss}	Output Capacitance		---	33	---	
C_{rss}	Reverse Transfer Capacitance		---	27	---	
Q_g	TotalGateCharge	V_{DS}=15V,I_D=4A,V_{GS}=4.5V	---	2.6	---	nC
Q_{gs}	Gate-SourceCharge		---	0.6	---	
Q_{gd}	Gate-Drain(“Miller”)Charge		---	0.9	---	
SWITCHING CHARACTERISTICS						
$T_{d(on)}$	Turn-on delay time	V_{DS}=15V,I_D=2A, R_{GEN}=3Ω,V_{GS}=4.5V	---	15	---	ns
T_r	Rise time		---	42	---	
$T_{d(off)}$	Turn-off delay time		---	16	---	
T_f	Fall time		---	10	---	
DRAIN-SOURCEDIODECHARACTERISTICSANDMAXIMUMRATINGS						
I_S	MaximumContinuousDraintoSourceDiodeForward Current		---	---	4.5	A
I_{SM}	MaximumPulsedDraintoSourceDiodeForwardCurrent		---	---	16	A
V_{SD}	DraintoSourceDiodeForward Voltage	V_{GS}=0V,I_S=4A	---	---	1.2	V

Notes:

1.Repetitive Rating:Pulse Width Limitedby Maximum Junction Temperature

2.Pulse Test:Pulse Width≤300μs,Duty Cycle≤0.5%

Typical Characteristics

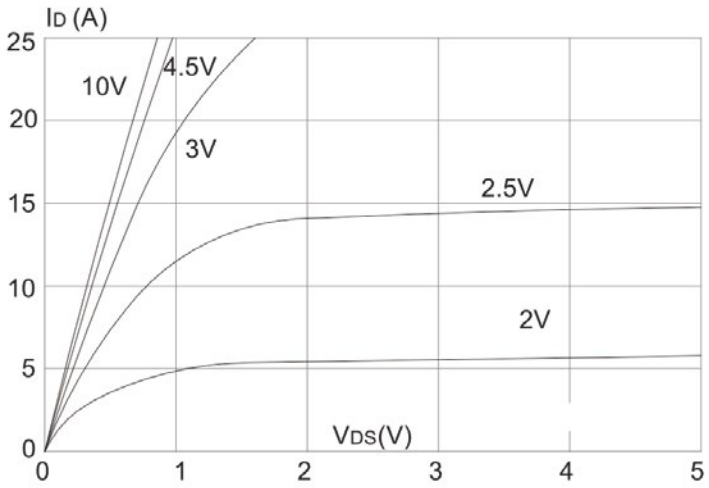


Figure1: Output Characteristics

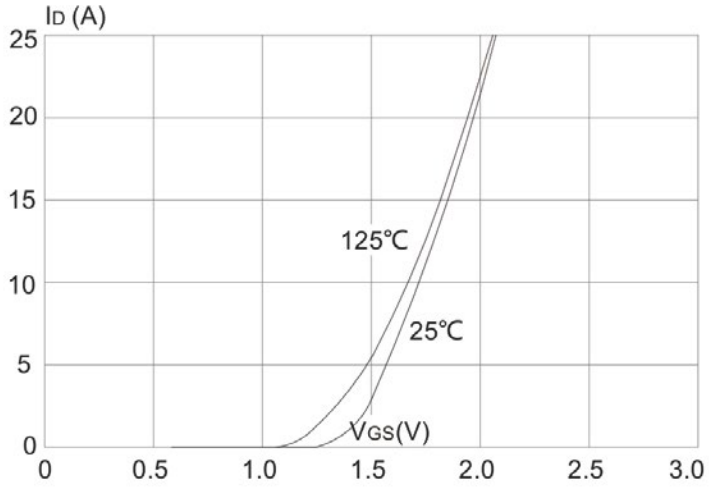


Figure 2: Typical Transfer Characteristics

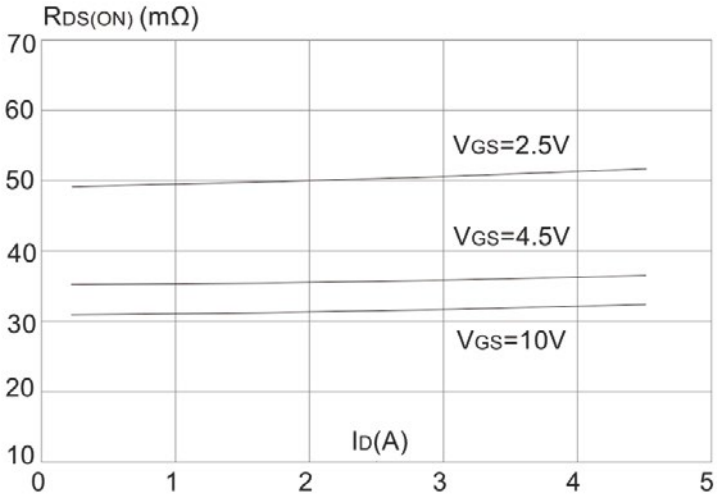


Figure 3:On-resistance vs. Drain Current

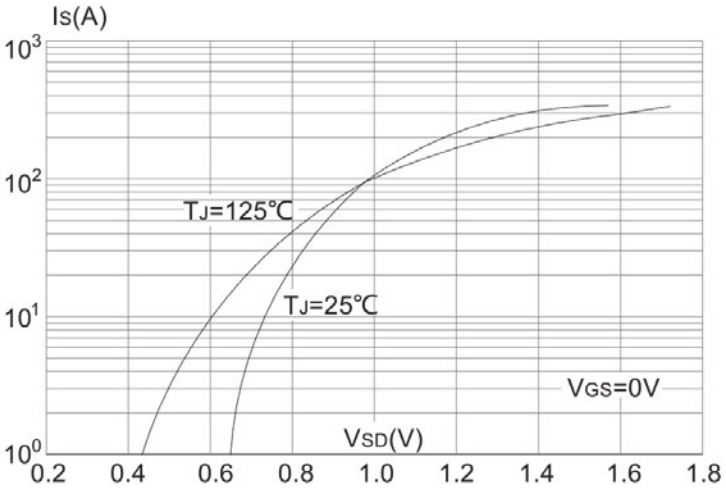


Figure 4: Body Diode Characteristics

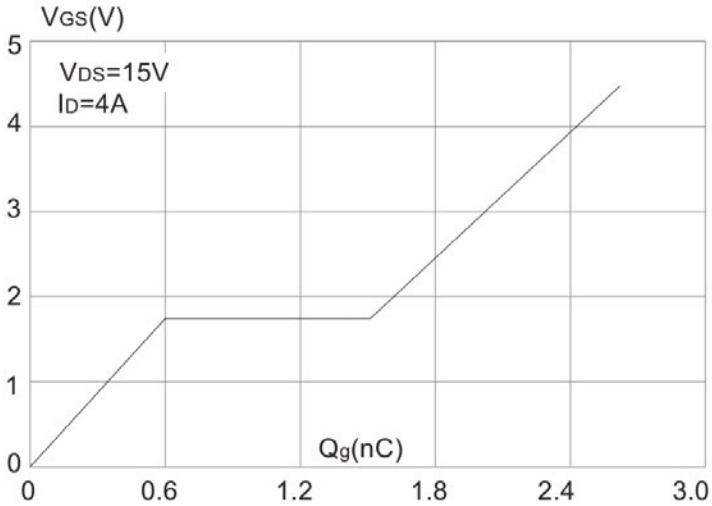


Figure 5: Gate Charge Characteristics

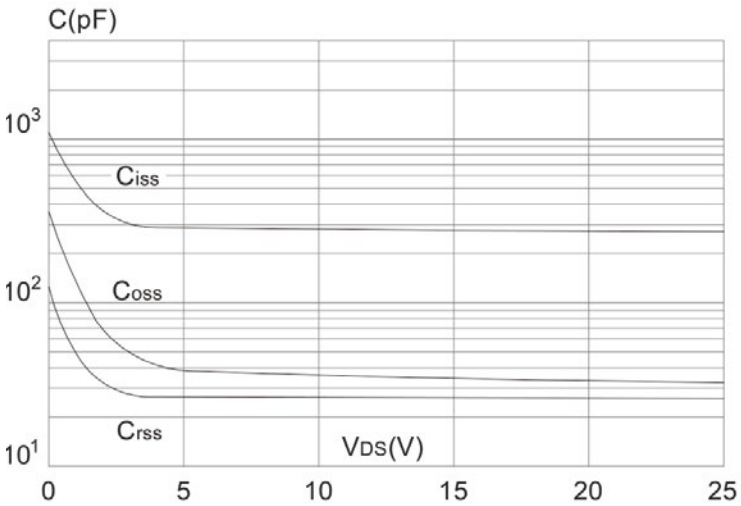


Figure 6: Capacitance Characteristics

Typical Characteristics

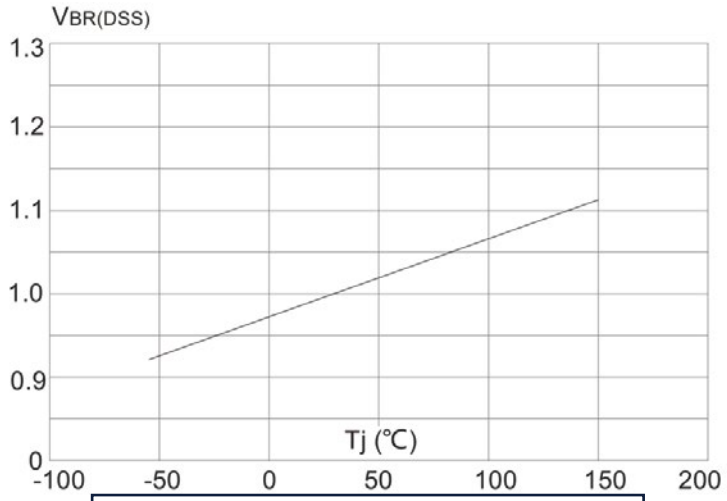


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

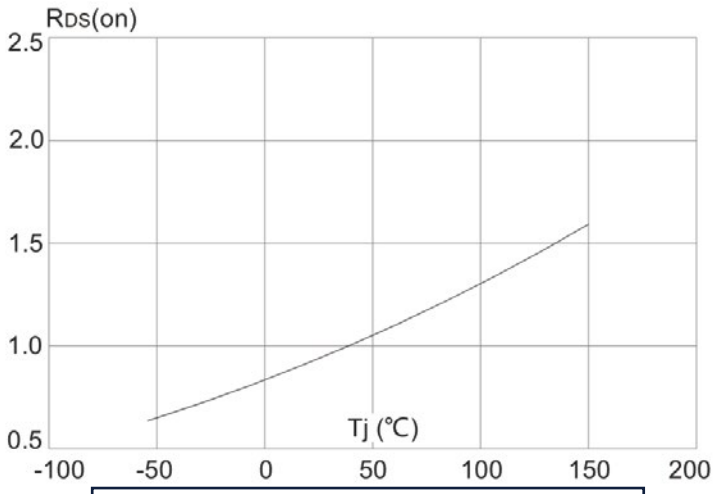


Figure 8: Normalized on Resistance vs. Junction Temperature

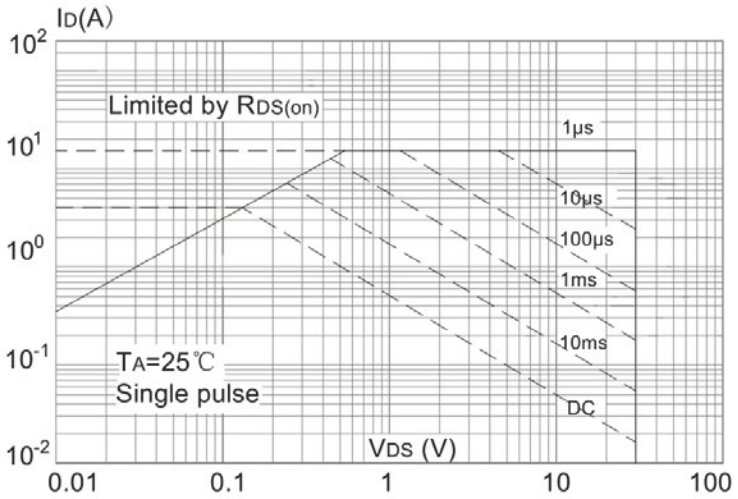


Figure 9: Maximum Safe Operating Area

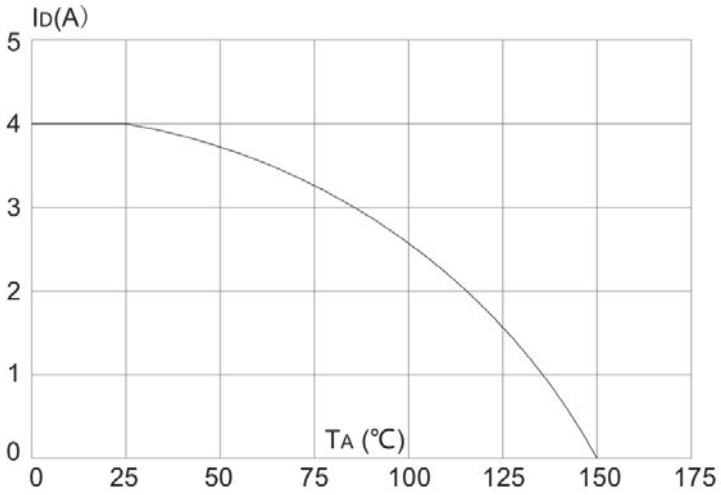


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

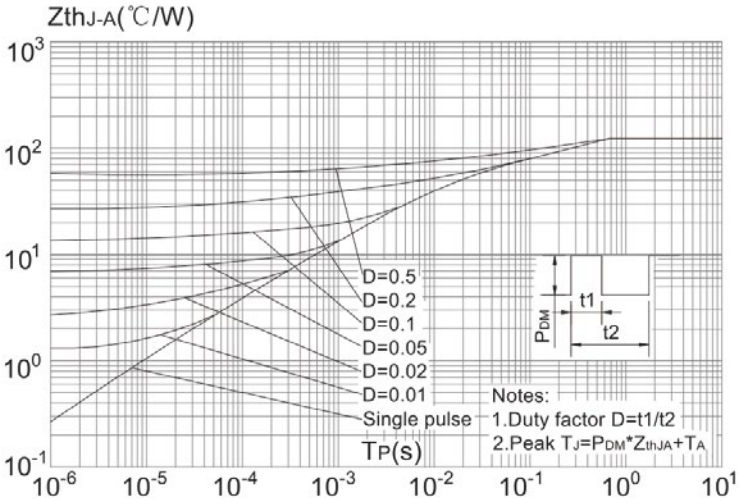
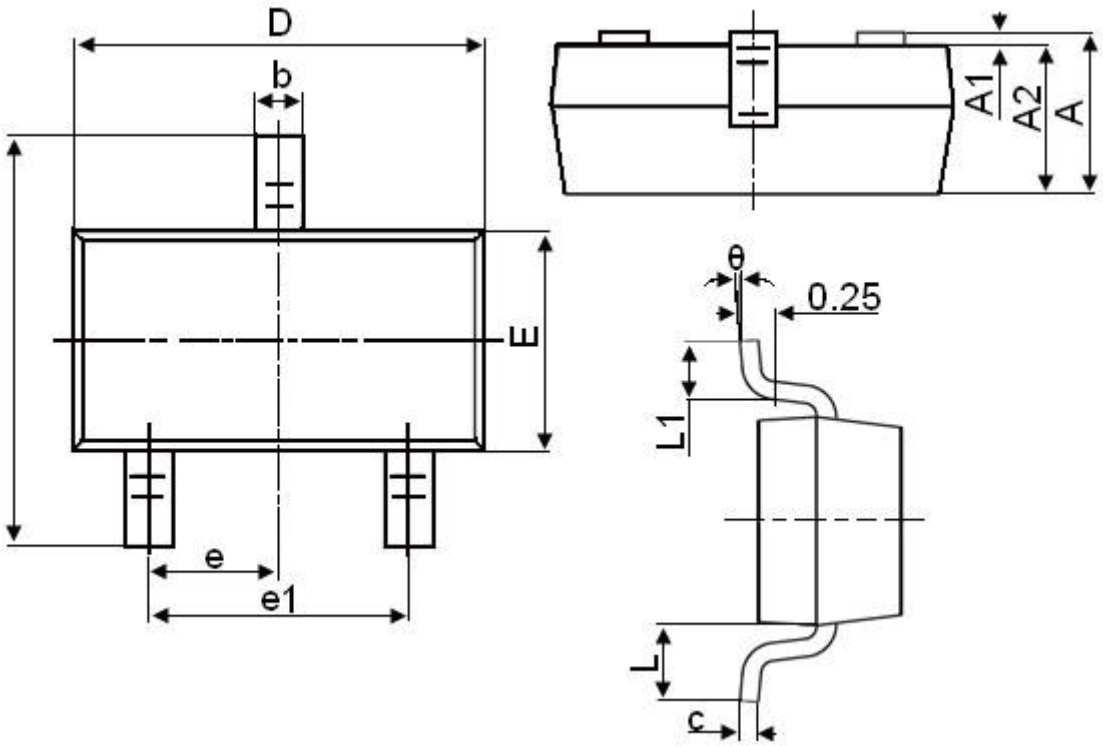


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

SOT23 Package Outline Dimensions



Symbol	Dimensions in Millimeters	
	mm	
	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°