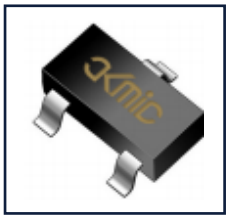
Description

The SI2324DS-AK uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

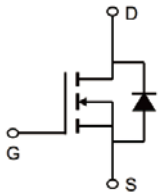
- V_{DS} = 100V I_D =3A
- $R_{DS(ON)}$ < 210mΩ @ V_{GS}=10V



SOT23

Applications

- Atomizer
- Load switch
- Uninterruptible power supply



Equivalent Circuit

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current, VGS @ 4.5V1	3	A
I_D@T_A=70℃	Continuous Drain Current, VGS @ 4.5V1	1.4	A
I_{DM}	Pulsed Drain Current2	8.8	A
P_D@T_A=25℃	Total Power Dissipation3	2.3	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-ambient 1	125	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case1	45	℃/W

Ordering information

Product ID	Pack	Marking	Qty(PCS)
SI2324DS-AK	SOT23	3N10	3000

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V, V_{GS}=0V	---	---	1.0	uA
			---	---	1.0	
I_{GSS}	Gate-Source Leakage Current	V_{DS}=0V, V_{GS}=±20V	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	1.5	2.2	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance2	V_{GS}=10V , I_D=2A	---	210	300	mΩ
		V_{GS}=4.5V , I_D=1A	---	250	320	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V,f=1.0MHz	---	321	---	pF
C_{oss}	Output Capacitance		---	21	---	
C_{rss}	Reverse Transfer Capacitance		---	15	---	
Q_g	Total Gate Charge	V_{DS}=30V, I_D=2A,V_{GS}=10V	---	5.3	---	nC
Q_{gs}	Gate-Source Charge		---	1.3	---	
Q_{gd}	Gate-Drain Charge		---	1.7	---	
Switching Characteristics						
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=30V, I_D=1A, R_{GEN}=3Ω, V_{GS}=10V	---	14	---	ns
T_r	Rise Time		---	54	---	
$T_{d(off)}$	Turn-Off Delay Time		---	18	---	
T_f	Fall Time		---	11	---	
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		---	---	3	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		---	---	8.8	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V, I_S=2.2A	---	---	1.2	V

Note :

1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、The power dissipation is limited by 150℃ junction temperature

4、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

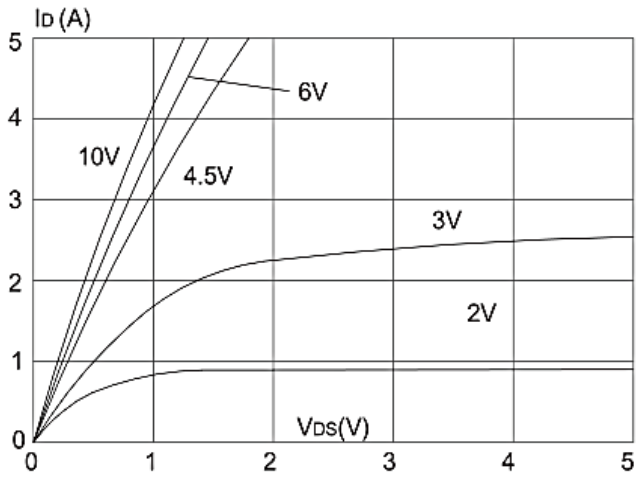


Figure1: Output Characteristics

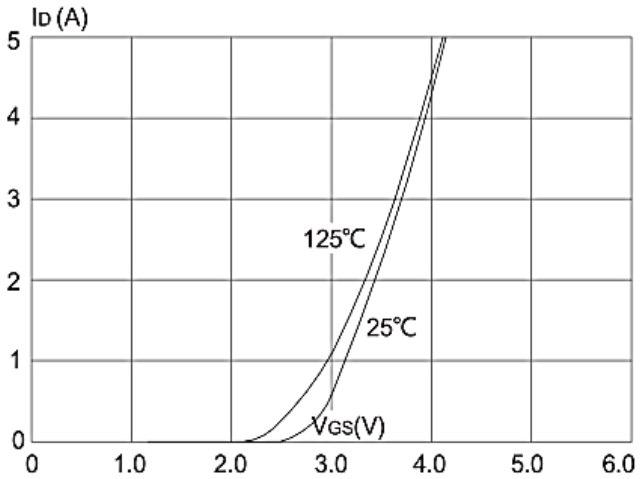


Figure 2: Typical Transfer Characteristics

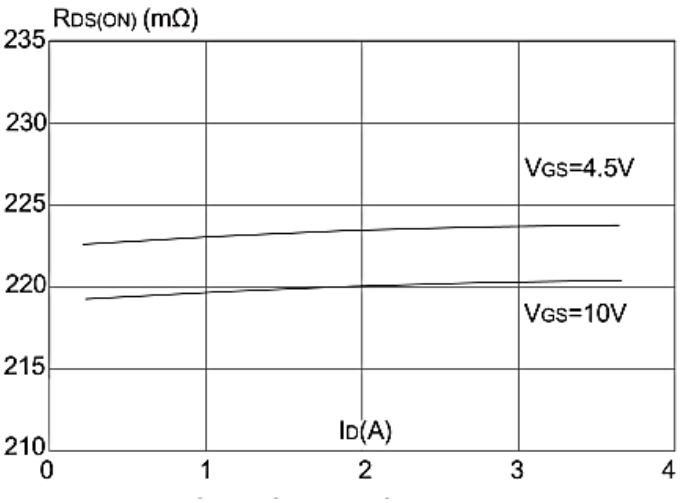


Figure 3:On-resistance vs. Drain Current

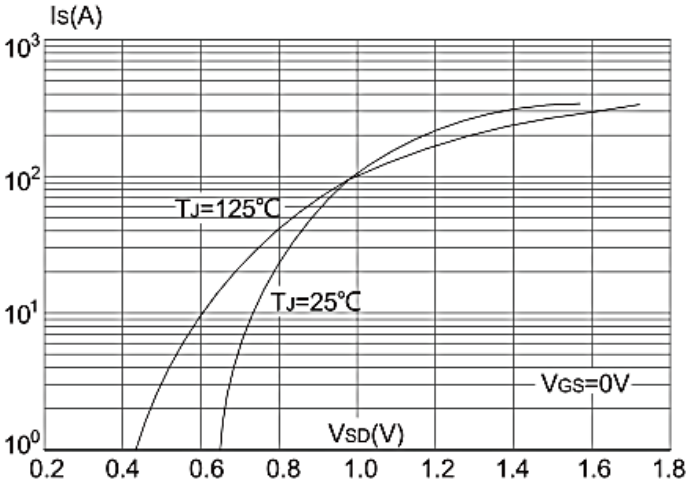


Figure 4: Body Diode Characteristics

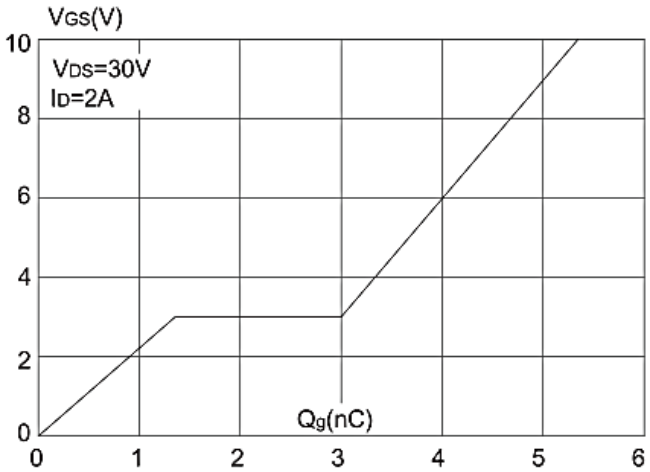


Figure 5: Gate Charge Characteristics

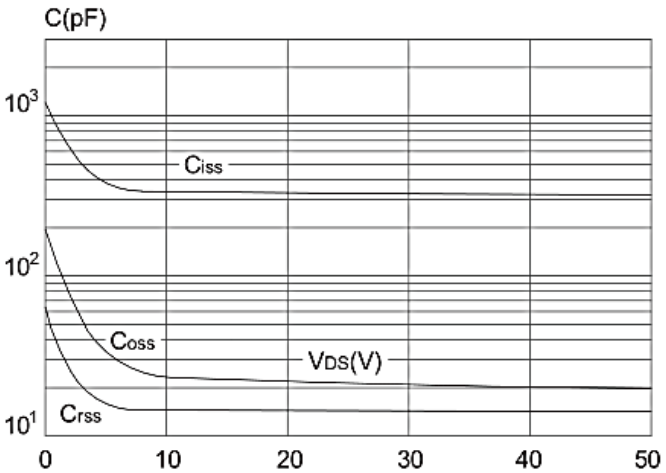


Figure 6: Capacitance Characteristics

Typical Characteristics

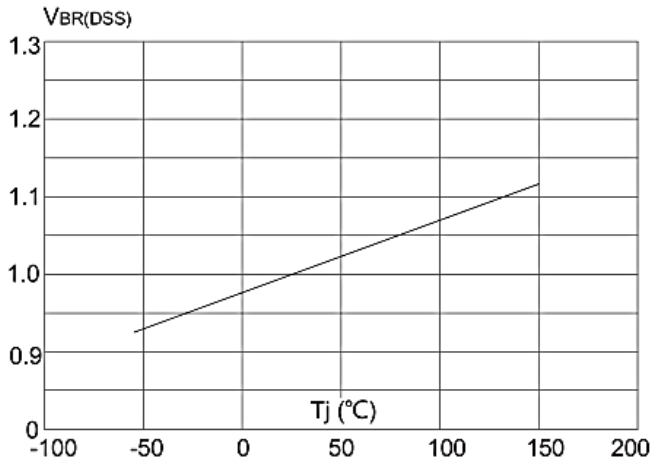


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

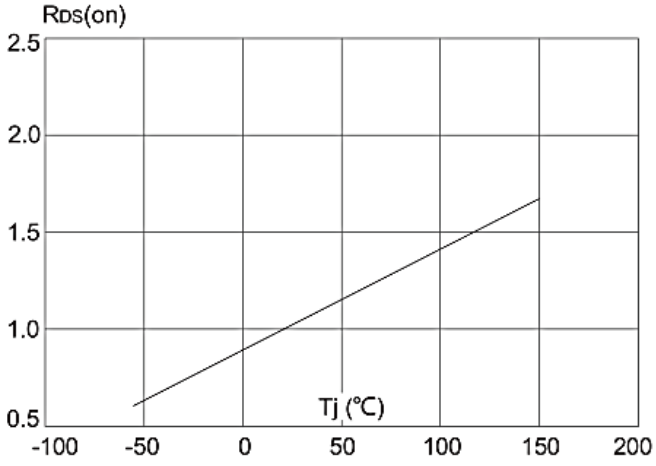


Figure 8: Normalized on Resistance vs. Junction Temperature

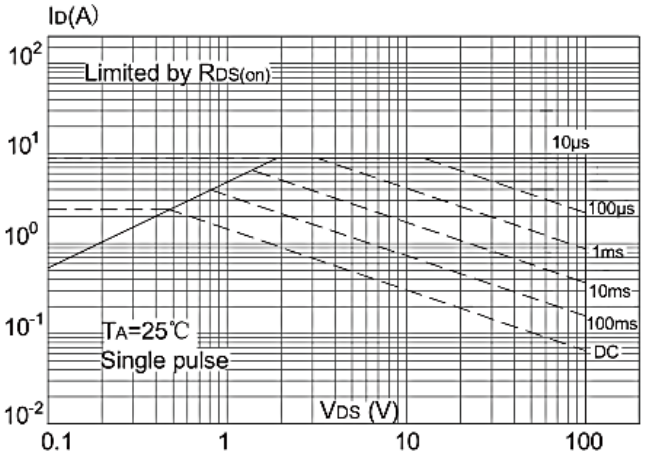


Figure 9: Maximum Safe Operating Area

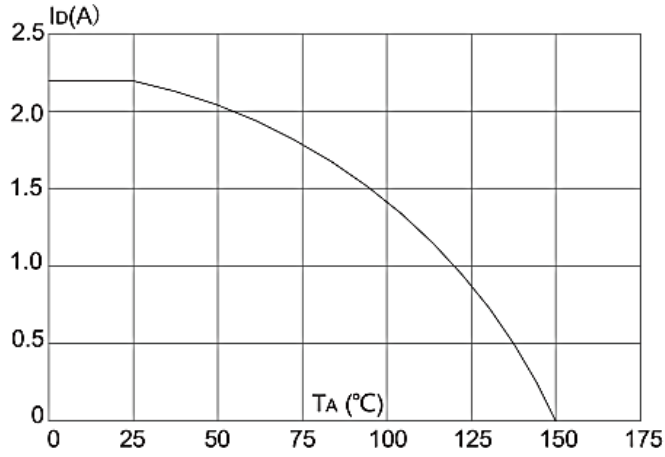


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

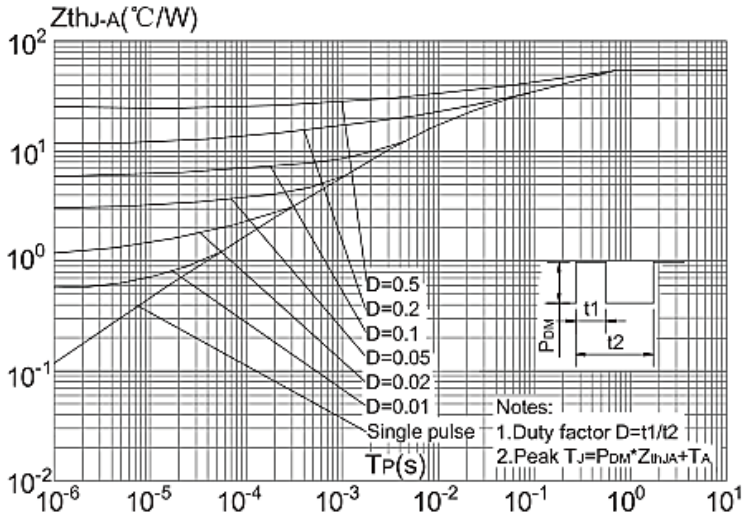
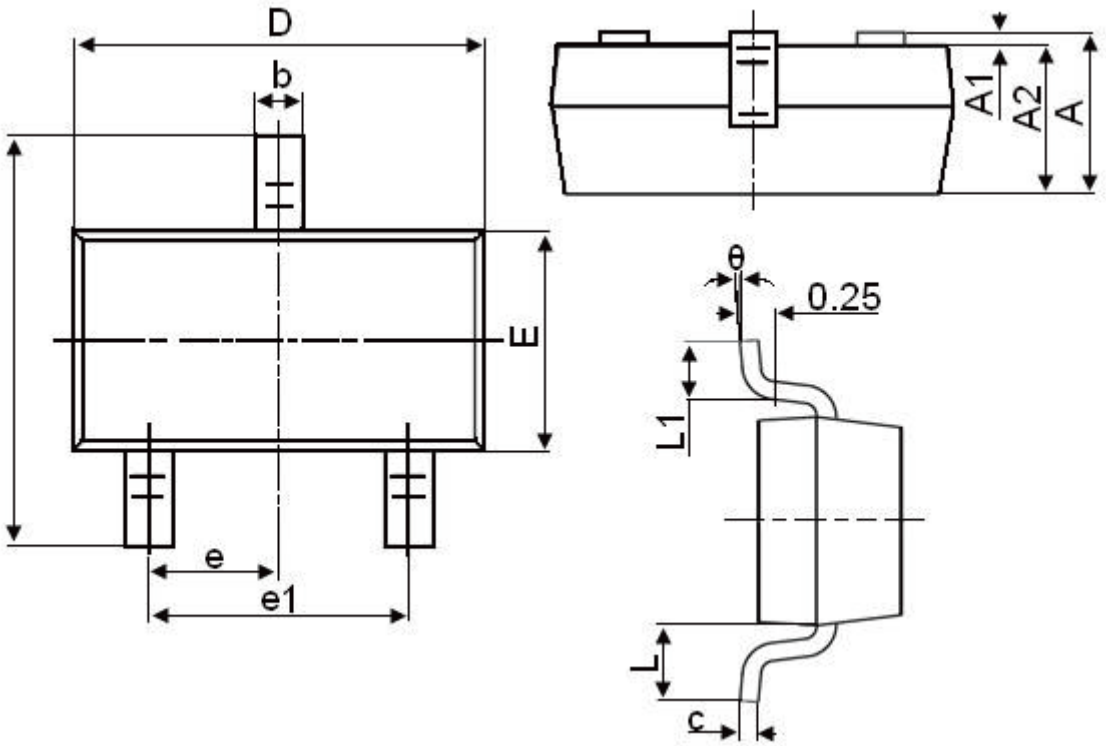


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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°