BORN SEMICONDUCTOR

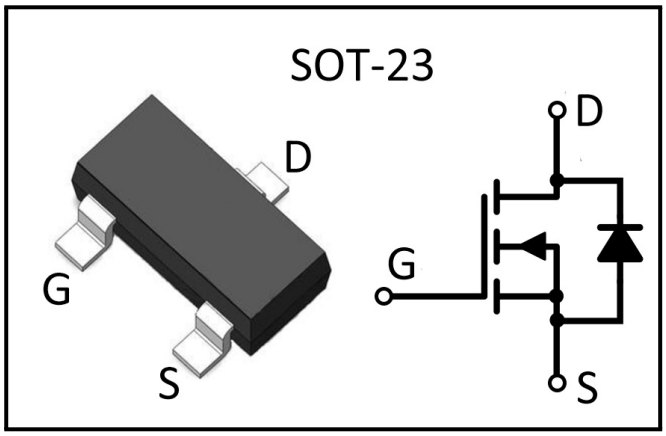
SI2312

N-Channel MOSFET

Features

- V_{DS}=20V
- I_D=6A
- $R_{DS(ON)}$ @V_{GS}=4.5V, TYP=14mΩ
- $R_{DS(ON)}$ @V_{GS}=2.5V, TYP=18mΩ

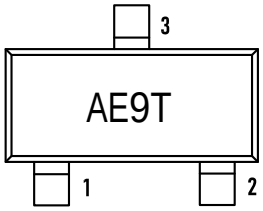
Package



Description

- Super High dense cell design for extremely low $R_{DS(ON)}$
- Reliable and Rugged.
- SOT-23 for Surface Mount Package.

Marking



Ordering information

Order code	Package	Marking	Base qty	Delivery mode
SI2312	SOT-23	AE9T	3K	Tape and reel

Absolute Maximum Ratings (@T_A=25°C unless otherwise noted)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current		6	A
I_{DM}	Pulsed Drain Current (1)		18	A
P_D	Maximum Power Dissipation	T_A = 25°C	0.9	W
		T_A = 75°C	0.6	W
T_J,T_{stg}	Operating Junction and Storage Temperature Range		-55 to + 150	°C
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance (PCB mounted) (2)		140	°C/W

Notes:(1)Pulse width limited by maximum junction temperature.

(2)Surface Mounted on FR4 Board, t < 5 sec.

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Electrical Characteristics @T_A=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static(3)						
BV_{DS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250uA	20	–	–	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS} = 2.5V, I_D = 4 .0A	–	18.0	35.0	mΩ
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS} = 4.5V, I_D = 5 .0A	–	14.0	20.0	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250uA	0.45	0.65	1.0	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 20V, V_{GS} = 0V	–	–	1	uA
I_{GSS}	Gate Body Leakage	V_{GS} = ±12V, V_{DS} = 0V	–	–	±100	nA
g_{fs}	Forward Transconductance	V_{DS} = 10V, I_D = 5 A	–	5	–	S
Dynamic(4)						
Q_g	Total Gate Charge	V_{DS} = 10V	–	11	–	nC
Q_{gs}	Gate-Source Charge	I_D = 5 A,	–	1.5	–	
Q_{gd}	Gate-Drain Charge	V_{GS} = 4.5V	–	2.2	–	
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 10V, R_G = 1Ω,	–	12	–	ns
t_r	Turn-On Rise Time	I_D = 4A,	–	26	–	
$t_{d(off)}$	Turn-Off Delay Time	V_{GS} = 4.5V,	–	34	–	
t_f	Turn-Off Fall Time	R_L = 2 .2Ω	–	12	–	
C_{iss}	Input Capacitance	V_{DS} = 10V,	–	840	–	pF
C_{oss}	Output Capacitance	V_{GS} = 0V,	–	105	–	
C_{rss}	Reverse Transfer Capacitance	f = 1.0MHZ	–	53	–	
Source-Drain Diode						
I_S	Max. Diode Forward Current		–	–	5.0	A
V_{SD}	Diode Forward Voltage	I_S = 2 .0A,V_{GS} = 0V,	–	–	1.2	V

Notes:(3)Short duration test pulse used to minimize self-heating effect.

(4)Pulse test pulse width <=300us,duty cycle <= 2%.

Typical

Figure 1 :Output Characteristics

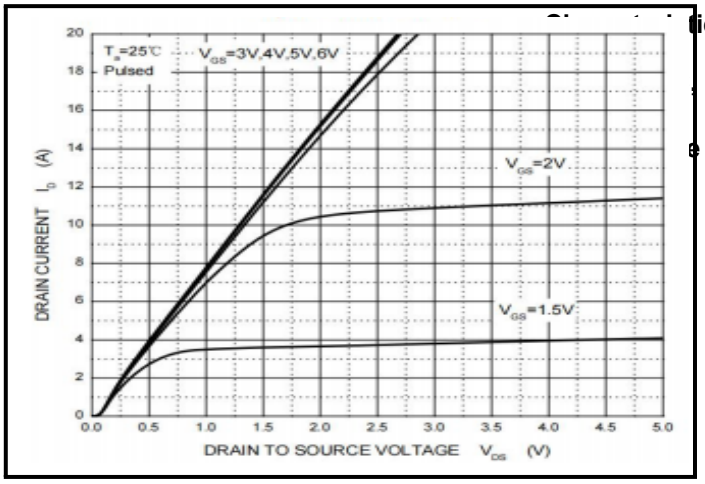


Figure 2 :Transfer Characteristics

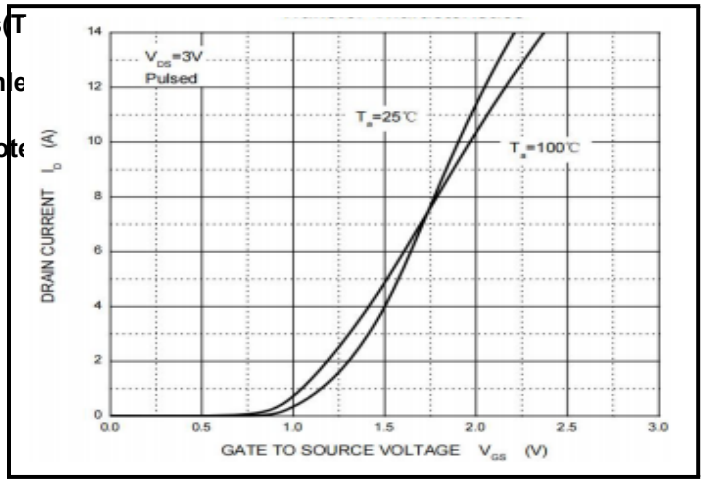


Figure 3 :On-Resistance vs. Drain Current

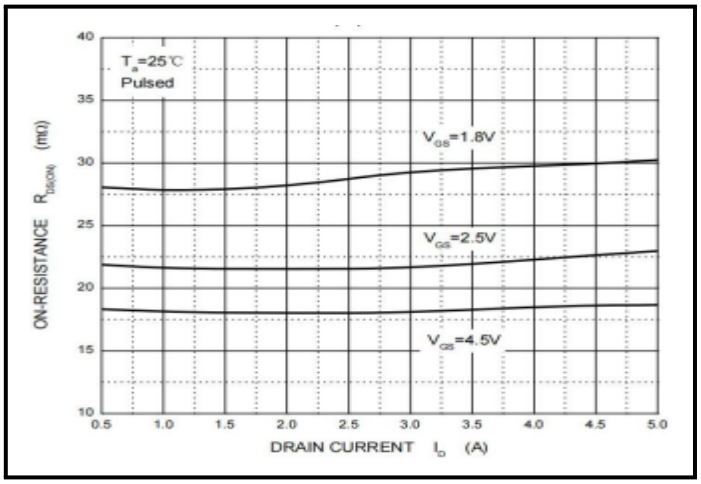


Figure 4 :Capacitance

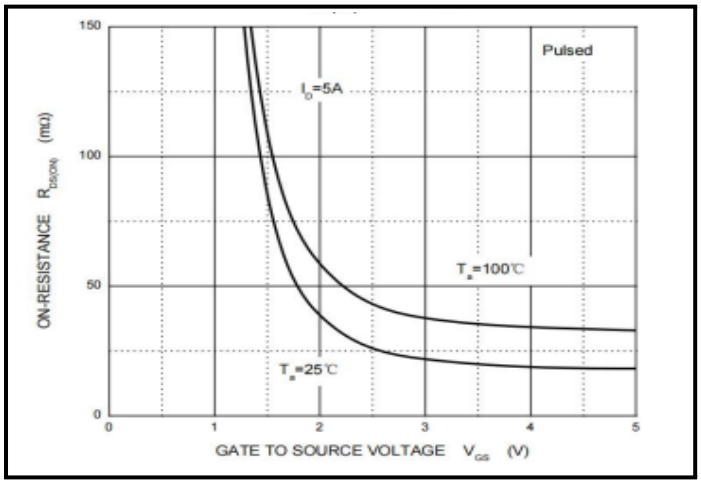


Figure 5 :Is vs VSD

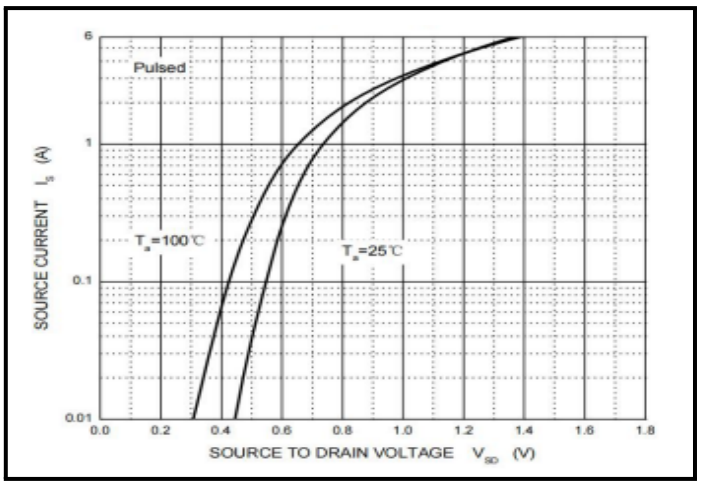
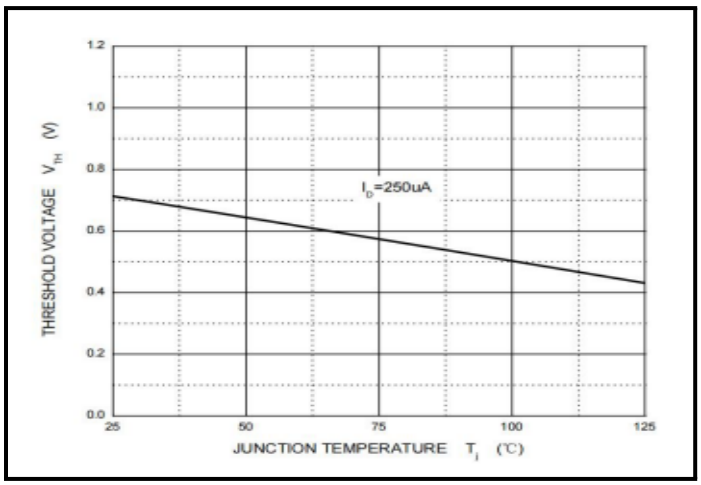


Figure 6 : Threshold Voltage



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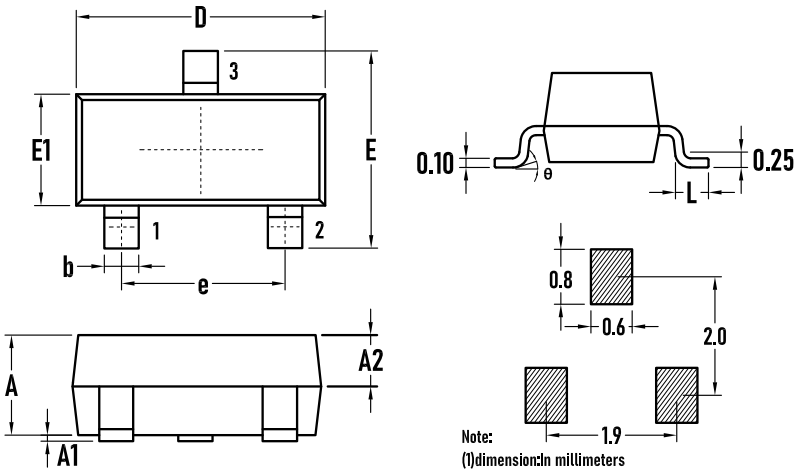
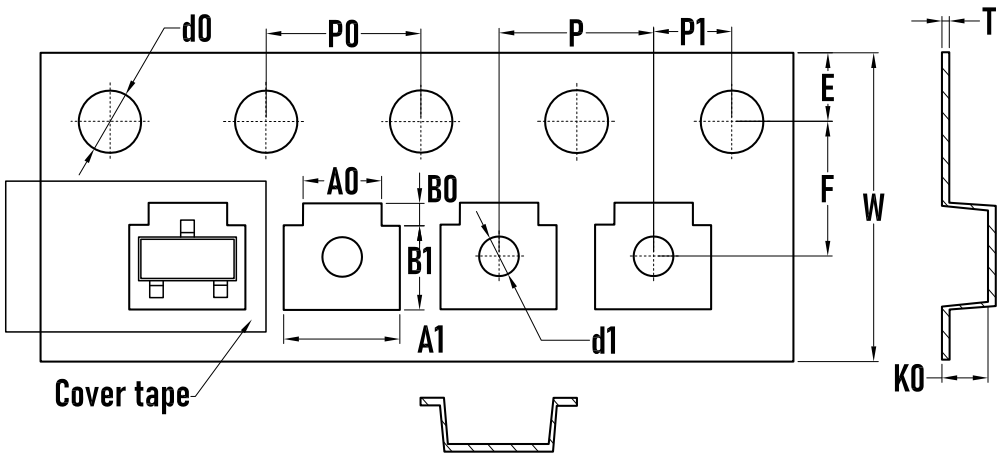
Outline Drawing - SOT-23



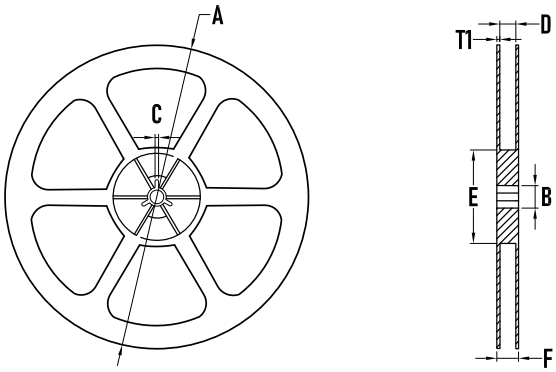
SYMBOL	MILLIMETER		
	MIN.	Typ.	MAX.
A	0.90	1.00	1.10
A1	0.01	–	0.10
A2	0.50	0.60	0.70
D	2.80	2.90	3.00
b	0.25	0.35	0.45
E	2.10	2.30	2.50
E1	1.20	1.30	1.40
e	1.80	1.90	2.00
L	0.25	0.35	0.45
θ	0	–	8°

Packaging Tape - SOT-23



SYMBOL	MILLIMETER
A0	2.10±0.10
A1	3.10±0.10
B0	0.65±0.10
B1	2.75±0.10
d0	1.55±0.10
d1	1.00±0.05
E	1.75±0.10
F	3.50±0.10
K0	1.10±0.10
P	4.00±0.10
P0	4.00±0.10
P1	2.00±0.10
W	8.00±0.30
T	0.20 ±0.05

Packaging Reel



SYMBOL	MILLIMETER
A	177.8±0.2
B	3.1
C	13.50
D	9.6±0.3
E	75±0.2
F	12.3±0.3
T1	1.0±0.2
Quantity	3000PCS

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