TM08N02I

N-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

General Features

V_{DS} = 20V I_D = 8A

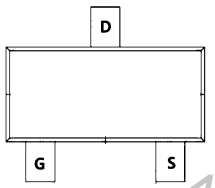
$R_{DS(ON)}$ =13 mΩ(typ.)@ V_{GS}=4.5V

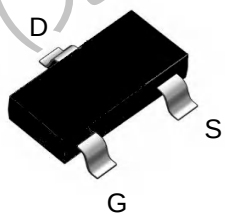
100% UIS Tested

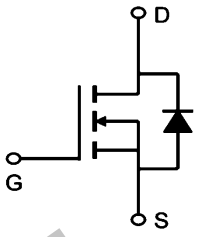
100% R_g Tested

Green Product

I:SOT-23







Marking: 2320

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 4.5V[1]	8	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 4.5V[1]	4.8	A
I_{DM}	Pulsed Drain Current[2]	20	A
P_D@T_A=25℃	Total Power Dissipation[3]	1.25	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	162	℃/W
$R_{\theta JC}$	Thermal Resistance Junction Case[1]	---	---	℃/W

Electrical Characteristics (T_J=25℃ 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,	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS} =0V,V_{GS} = ±10V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	0.5	0.7	0.9	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note2	V_{GS} =4.5V, I_D =8A	-	13	17	mΩ
		V_{GS} =2.5V, I_D =3A	-	17	22	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} =10V, V_{GS} =0V, f = 1.0MHz	-	888	-	pF
C_{oss}	Output Capacitance		-	133	-	pF
C_{rss}	Reverse Transfer Capacitance		-	117	-	pF
Q_g	Total Gate Charge	V_{DS} =10V, I_D =8A, V_{GS} =4.5V	-	11	-	nC
Q_{gs}	Gate-Source Charge		-	2	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	3	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=10V,I_D=8A, R_{GEN}=3Ω, V_{GS} =4.5V	-	7	-	ns
t_r	Turn-on Rise Time		-	46	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	30	-	ns
t_f	Turn-off Fall Time		-	52	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	8	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S=8A	-	-	1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristic Curve

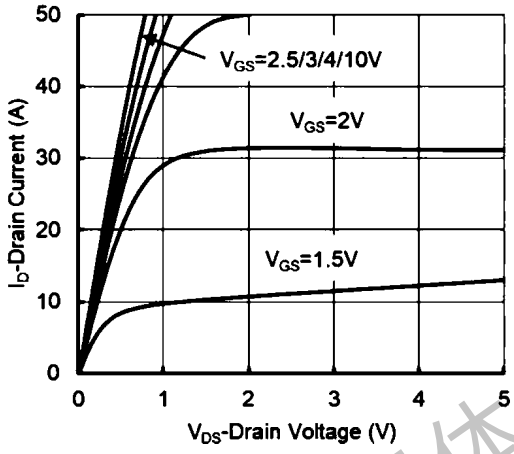


Figure 1: Output Characteristics

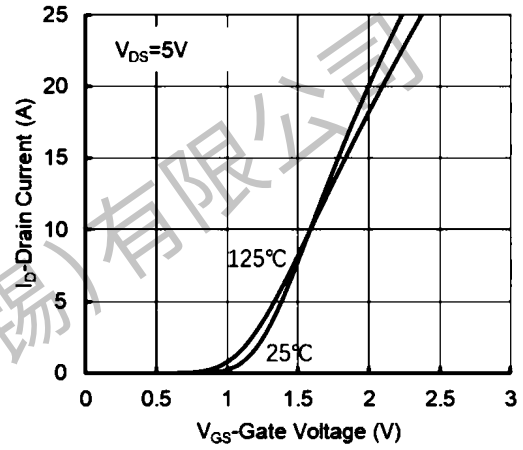


Figure 2: Transfer Characteristics

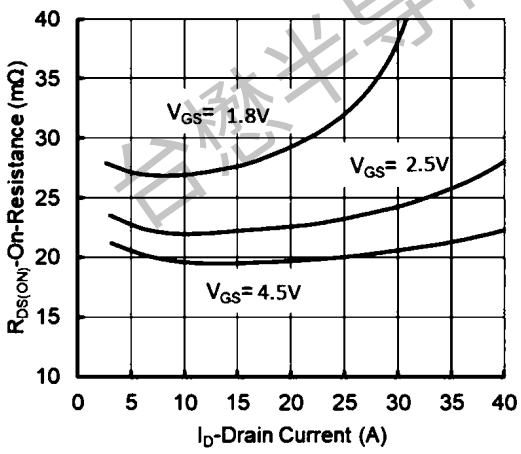


Figure 3: On-Resistance vs. Drain Current

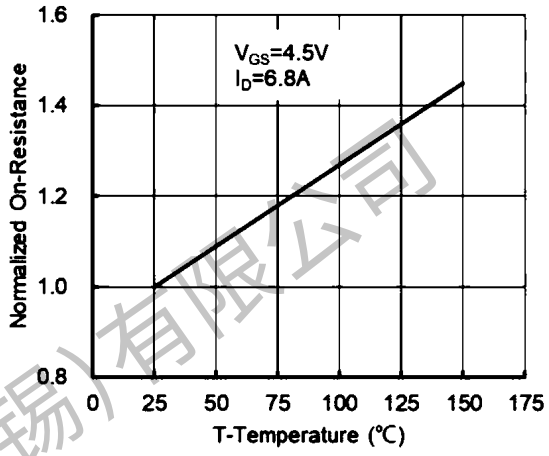


Figure 4: On-Resistance vs. Temperature

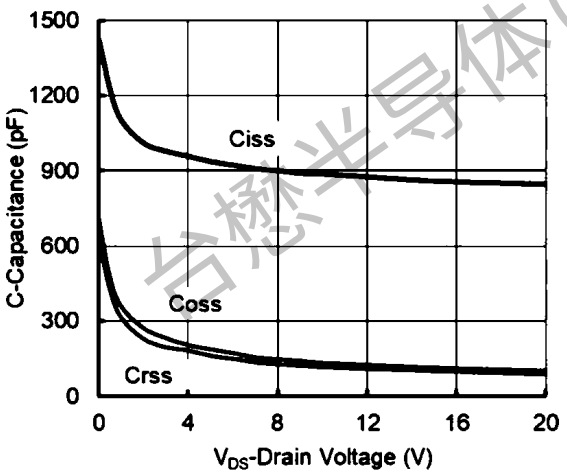


Figure 5: Capacitance Characteristics

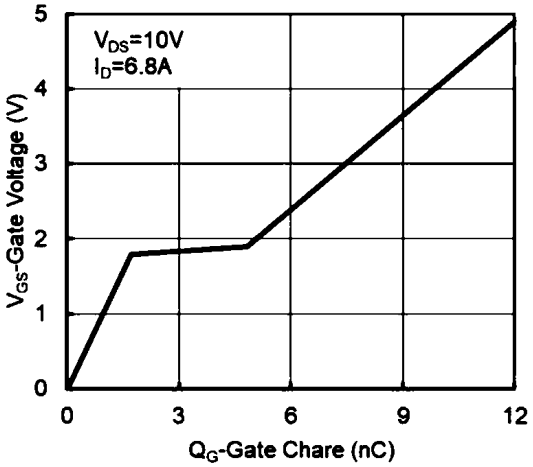


Figure 6: Gate-Charge Characteristics

Typical Characteristic Curve

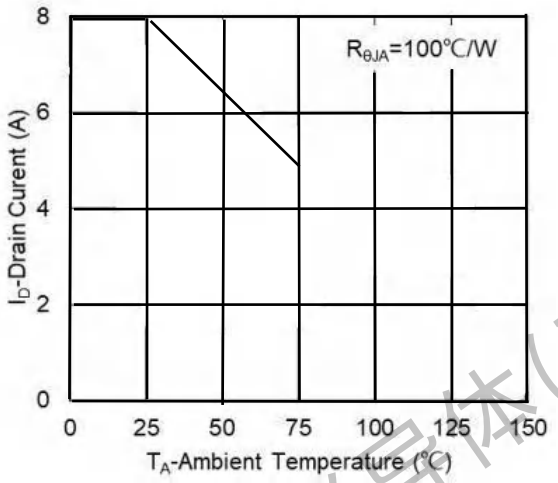


Figure 7: Drain Current vs. Temperature

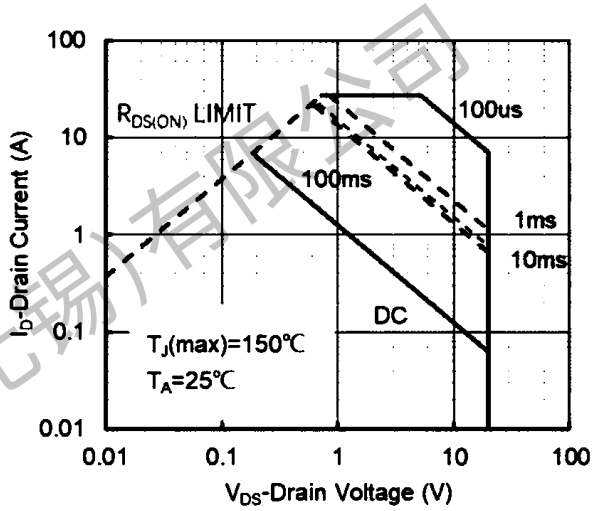


Figure 8: Safe Operating Area

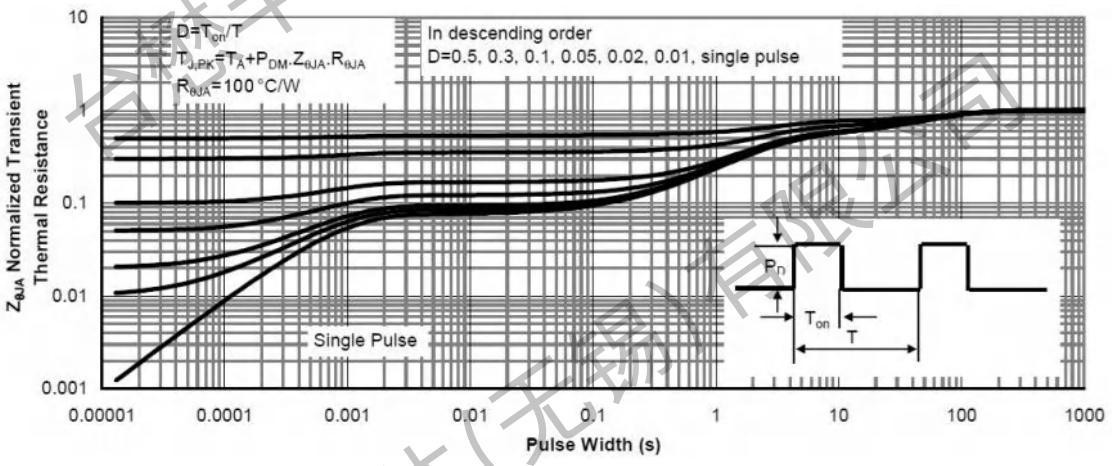
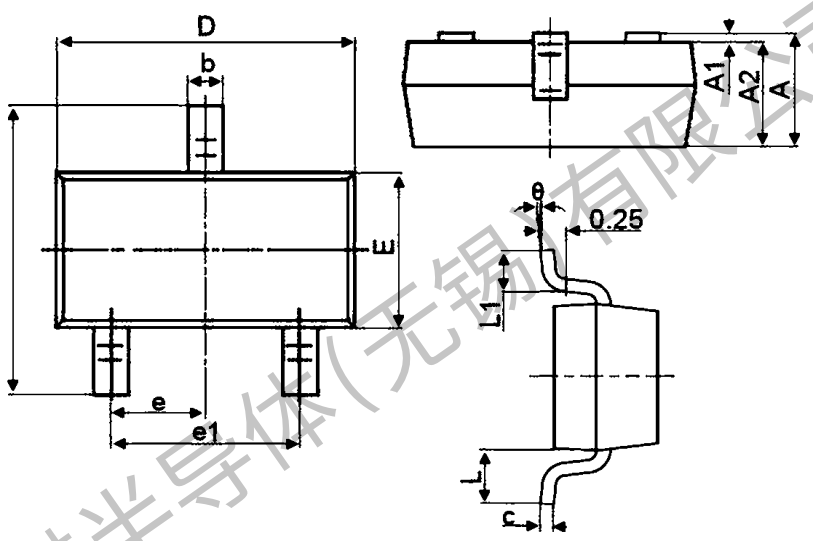


Figure 9: Transient Thermal Response Curve

Package Mechanical Data:SOT-23



Symbol	Dimensions in Millimeters	
	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°

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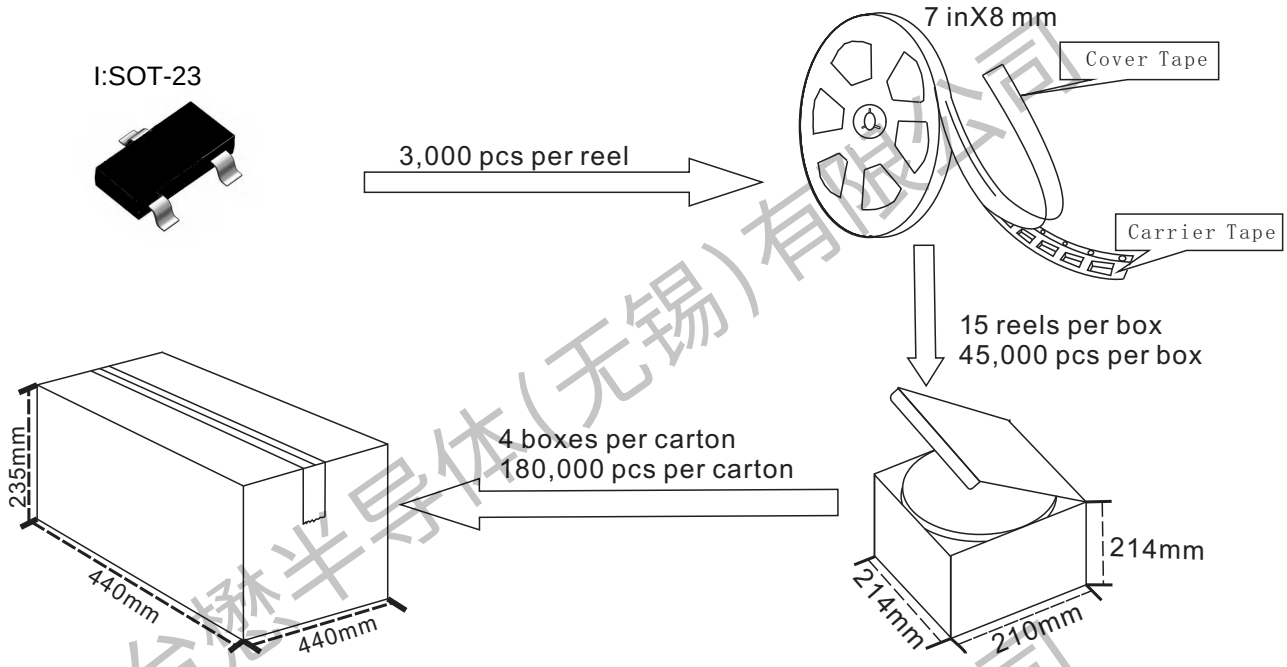
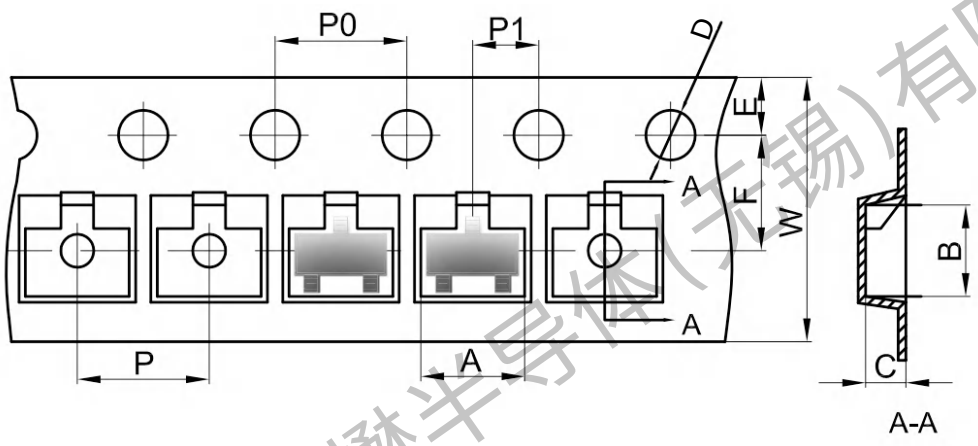
SOT-23 Packing

1.The method of packaging and dimension are shown as below figure. (Dimension in mm)

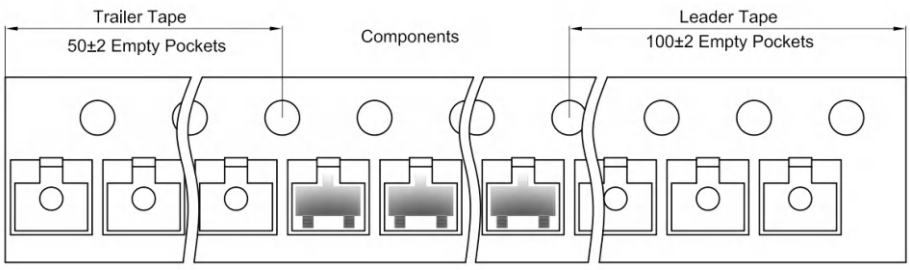


SOT-23 Embossed Carrier Tape



Dimensions are in millimeter										
Pkg type	A	B	C	D	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer



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Revision history:

Date	Rev	Description	Page
2023.07.19	23.07	Original	