TMG04N10I N-Channel Enhancement Mosfet

General Description

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

Applications

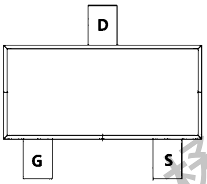
- Load switch
- PWM

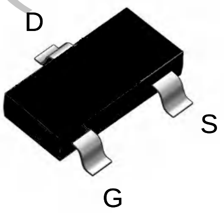
General Features

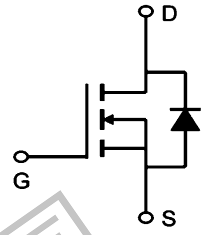
V_{DS} = 100V I_D =4A
$R_{DS(ON)}$ =110 mΩ(typ.)@ V_{GS}=10V

100% UIS Tested
100% R_g Tested

I:SOT-23







Marking: 4T10

Absolute Maximum Ratings (T_C=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˚C	Continuous Drain Current, V_{GS} @ 10V[1]	4	A
I_D@T_A=70˚C	Continuous Drain Current, V_{GS} @ 10V[1]	2.8	A
I_{DM}	Pulsed Drain Current[2]	15	A
P_D@T_A=25˚C	Total Power Dissipation	3.5	W
T_{STG}	Storage Temperature Range	-55 to 150	˚C
T_J	Operating Junction Temperature Range	-55 to 150	˚C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{θJA}$	Thermal Resistance Junction-ambient	---	162	˚C/W
$R_{θJC}$	Thermal Resistance Junction Case	---	---	˚C/W

Electrical Characteristics： (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	100	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=100V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1	2	3	V
$R_{DS(ON)}$	Drain-Source On Resistance [note2]	V_{GS}=10V,I_D=5A	---	110	140	mΩ
		V_{GS}=4.5V,I_D=3A		---	---	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=50V, V_{GS}=0V, f=1MHz	---	202	---	pF
C_{oss}	Output Capacitance		---	28.1	---	
C_{rss}	Reverse Transfer Capacitance		---	1.3	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{GS}=10V ,V_{DS}=50V, R_G=2Ω,I_D=4A	---	14.7	---	ns
t_r	Rise Time		---	3.5	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	20.9	---	ns
t_f	Fall Time		---	2.7	---	ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=50V, I_D=4A	---	4.3	---	nC
Q_{gs}	Gate-Source Charge		---	1.5	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	1.1	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_S=4 A	---	---	1.3	V
trr	Body Diode Revrse Recovery Time	I_S=4A,**V_R=50V**	---	32.1	---	ns
Qrr	Body Diode Revrse Recovery Charge	dI/dt=100A/μs	---	39.4	---	nc

Notes:

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

Typical Characteristics

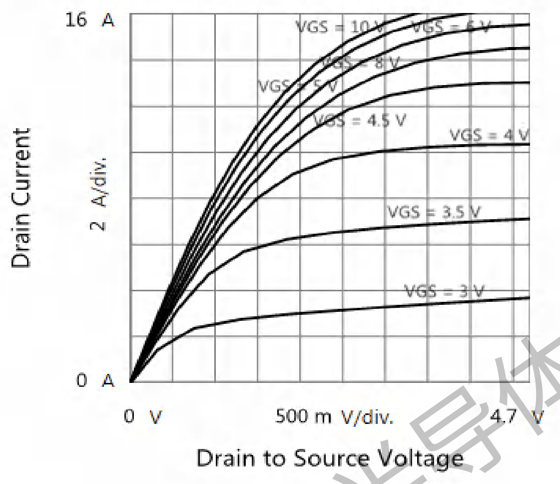


Figure1: Output Characteristics

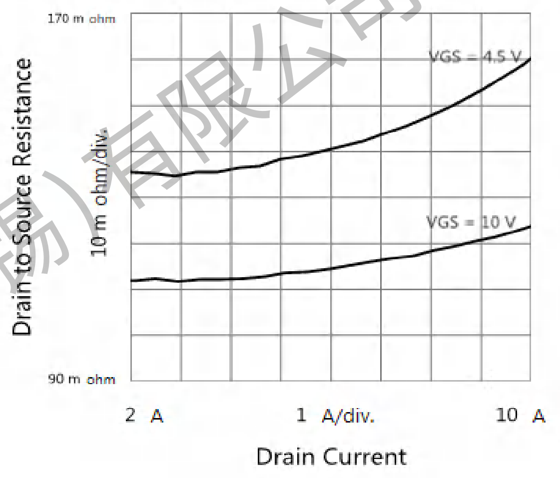


Figure 2: Drain to Resistance vs.Drain Current

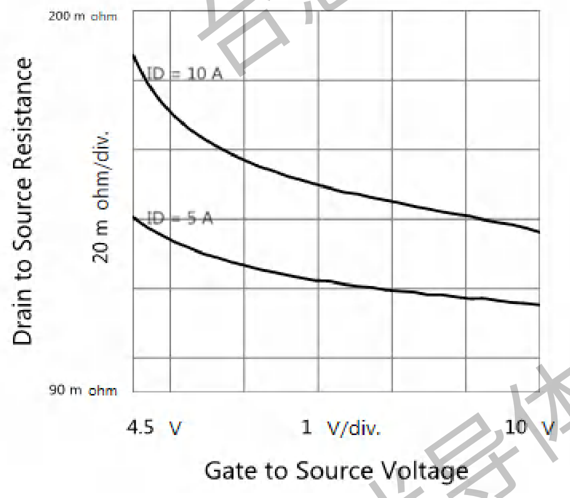


Figure 3: Drain to Resistance vs.Gate to Source Voltage

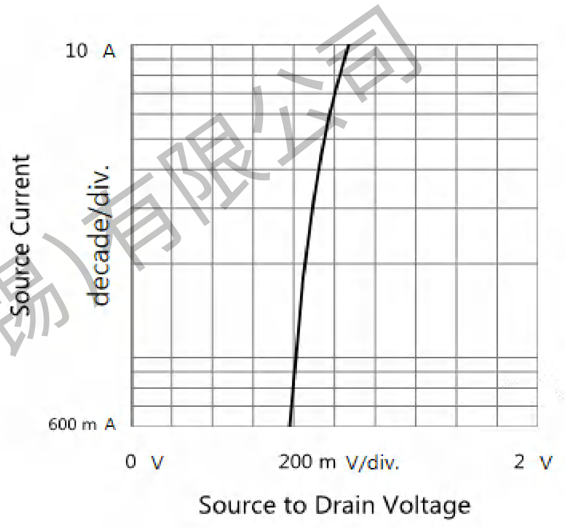


Figure 4: Body Diode Characteristics

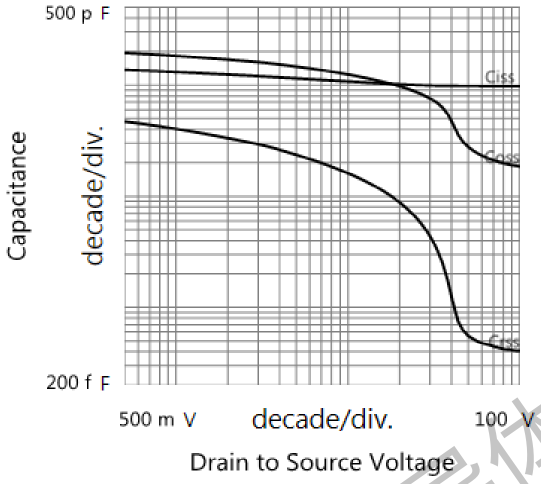


Figure 5: Capacitances

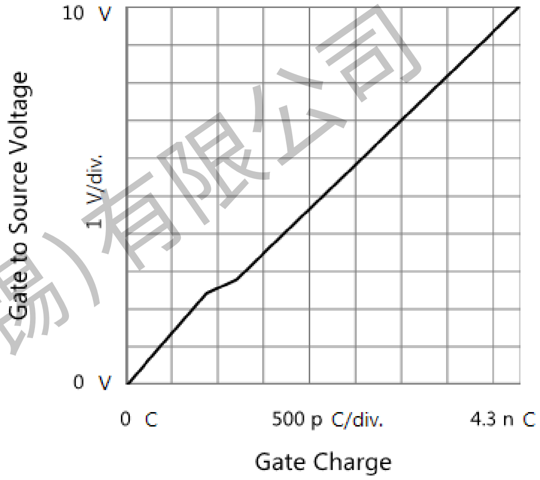
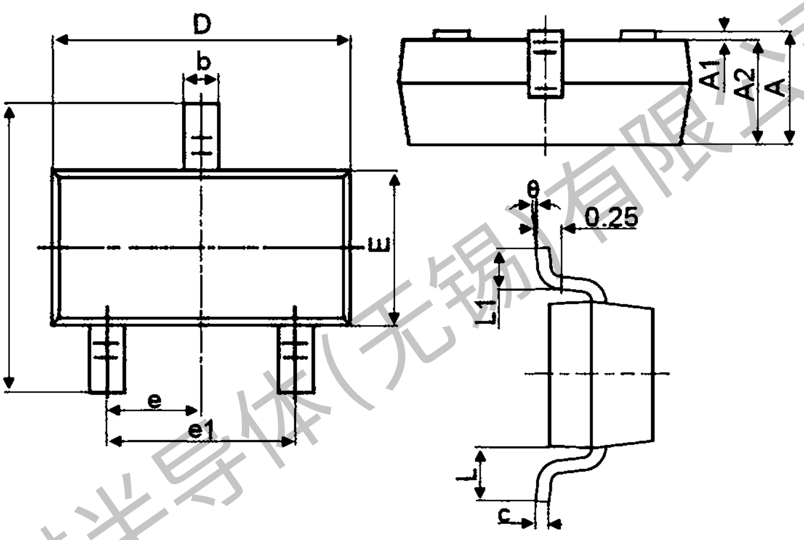


Figure 6: Gate Charge

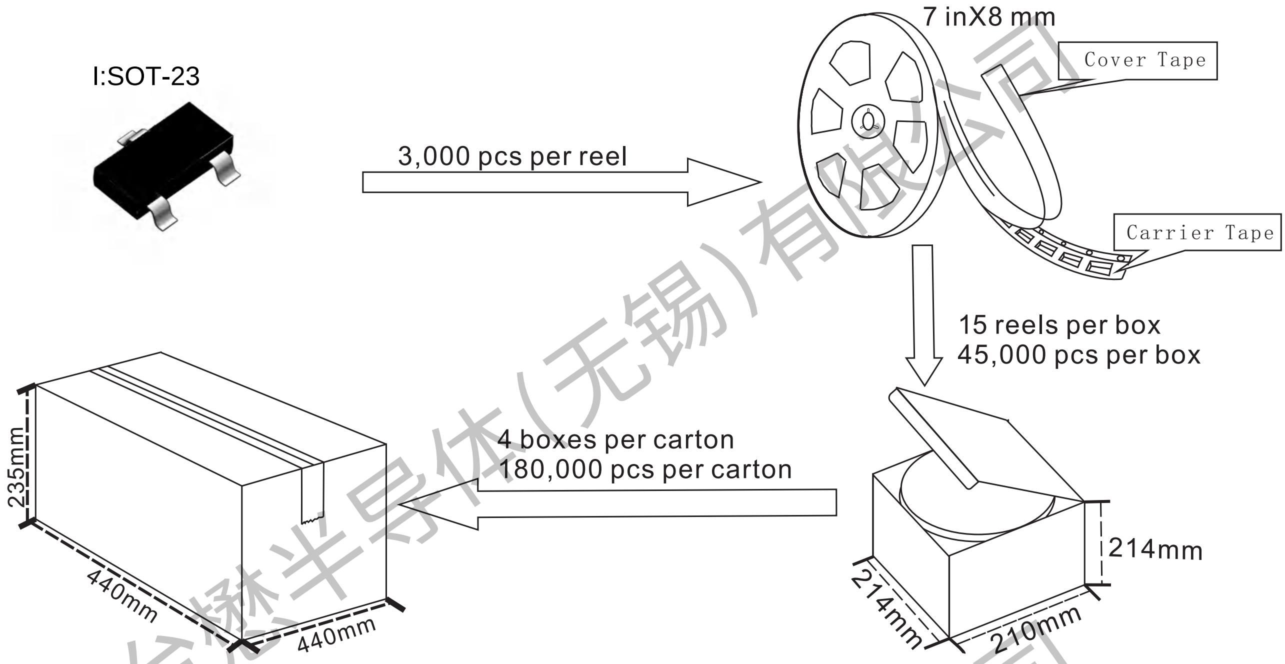
Package Mechanical Data:SOT-23



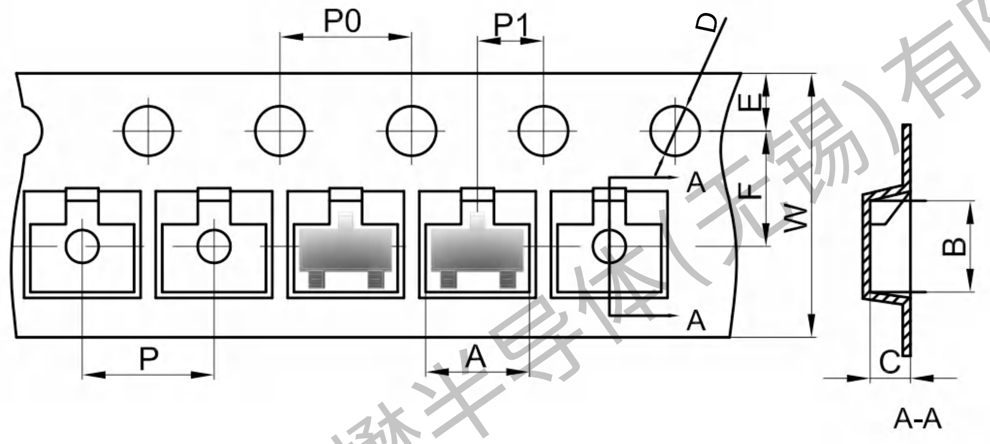
Symbol	Dimensions in Millimeters	
	MIN.	**MAX.**
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

SOT-23 Packing

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

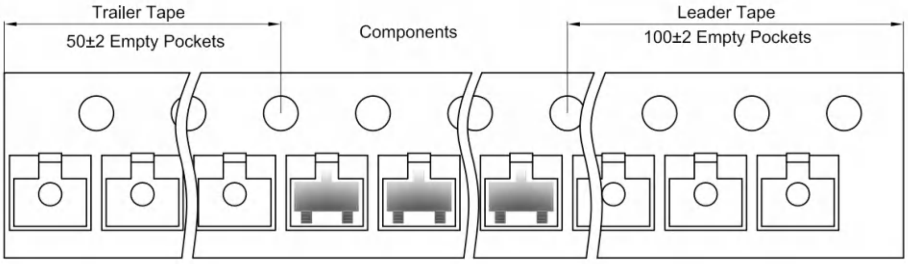


SOT-23 Embossed Carrier Tape



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
2023.07.01	23.07	Original	