TM04P04I

P-Channel Enhancement Mosfet

General Description

- Low R DS(ON)
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

General Features

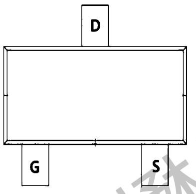
V_{DS} = -40V I_D =-4A

$R_{DS(ON)}$ =63mΩ @ V_{GS}=-10V

100% UIS Tested

100% R_g Tested

I:SOT-23



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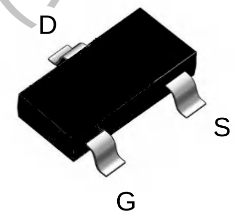
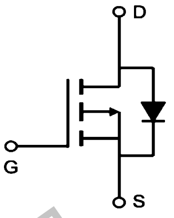




Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-40	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]	-2.4	A
I_{DM}	Pulsed Drain Current[2]	-20	A
P_D@T_A=25°C	Total Power Dissipation[3]	1.2	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{θJA}$	Thermal Resistance Junction-ambient [1]	---	162	°C/W
$R_{θJC}$	Thermal Resistance Junction Case[1]	---	---	°C/W

Electrical Characteristics (T$_J$=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}= 0V, I_D= -250μA	-40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= -40V, V_{GS}= 0V	-	-	-1	μA
Gate-Body Leakage	I_{GSS}	V_{DS}= 0V, V_{GS}= ±20V	-	-	±100	nA
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS}= $V_{GS,}$ I_D= -250μA	-1.4	-1.75	-2.0	V
Drain-Source on-Resistance[3]	$R_{DS(on)}$	V_{GS}= -10V,I_D= -5A	-	63	75	mΩ
		V_{GS}= -4.5V,I_D= -4A	-	76	99	
Dynamic Characteristics[4]						
Input Capacitance	C_{iss}	V_{GS} = 0V ,V_{DS} = -20V, f=1.0MHz	-	553	-	pF
Output Capacitance	C_{oss}		-	50	-	
Reverse Transfer Capacitance	C_{rss}		-	42	-	
Switching Characteristics[4]						
Total Gate Charge	Q_g	V_{GS}= -10V ,V_{DS}= -20V, I_D= -5A	-	11.8	-	nC
Gate-Source Charge	Q_{gs}		-	2.2	-	
Gate-Drain Charge	Q_{gd}		-	3	-	
Turn-on Delay Time	$t_{d(on)}$	V_{DS}= -20V, V_{GS}= -10V R_L= 2.5Ω, R_G= 3Ω	-	7	-	ns
Rise Time	t_r		-	6.5	-	
Turn-off Delay Time	$t_{d(off)}$		-	24	-	
Fall Time	t_f		-	7.8	-	
Drain-Source Body Diode Characteristics						
Body Diode voltage[3]	V_{DS}	I_S= -5A,V_{GS}=0V	-	-	-1.2	V
Continuous Source Current	I_S		-	-	-4	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse width≤300μs, duty cycle≤2%.
4. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

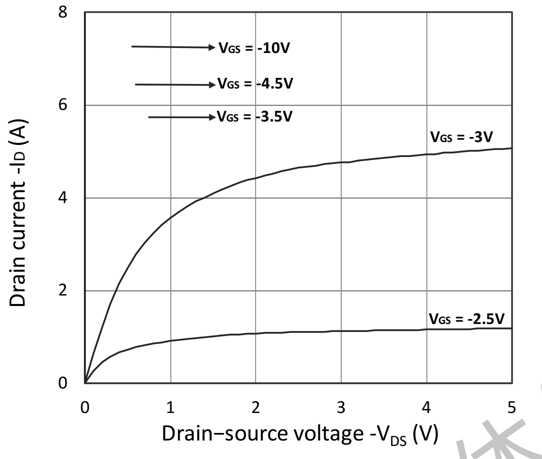


Figure 1. Output Characteristics

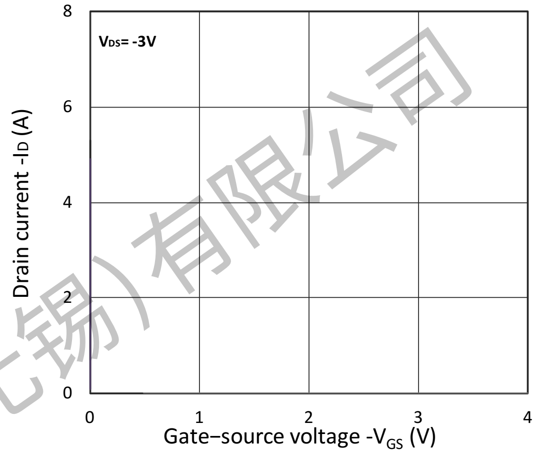


Figure 2. Transfer Characteristics

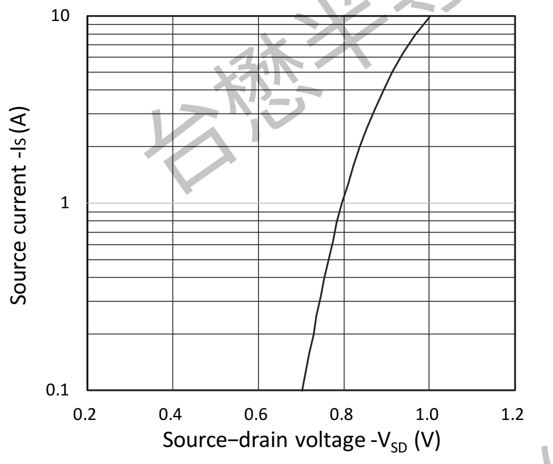


Figure 3. Forward Characteristics of Reverse

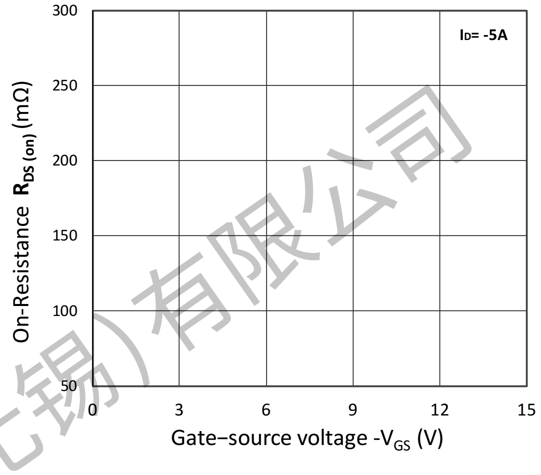


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

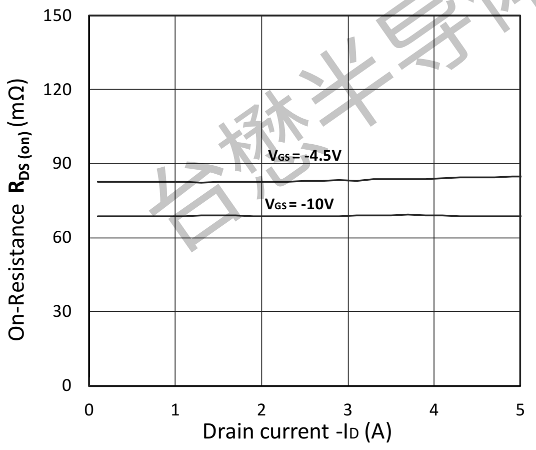


Figure 5. $R_{DS(ON)}$ vs. I_D

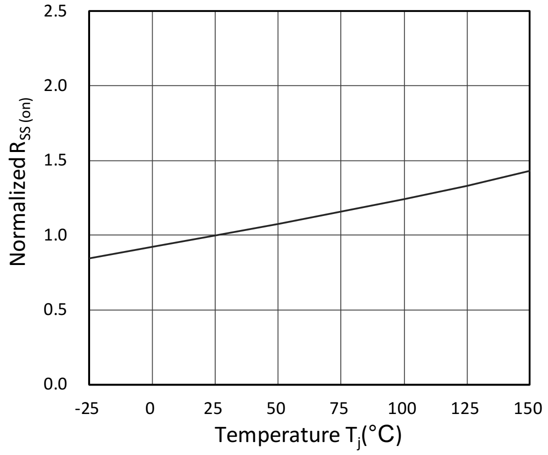


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

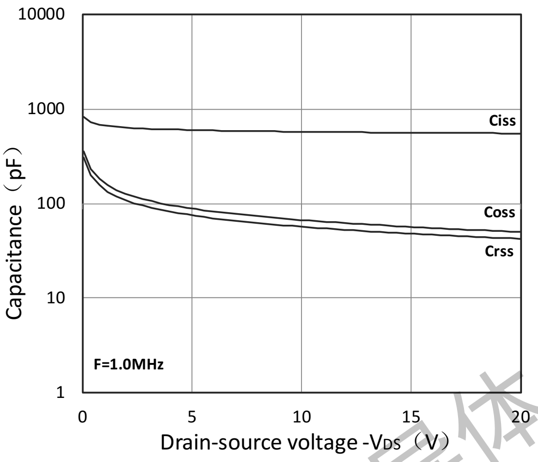


Figure 7. Capacitance Characteristics

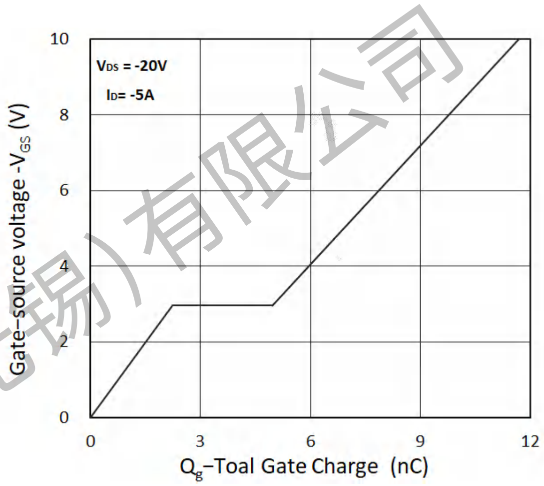
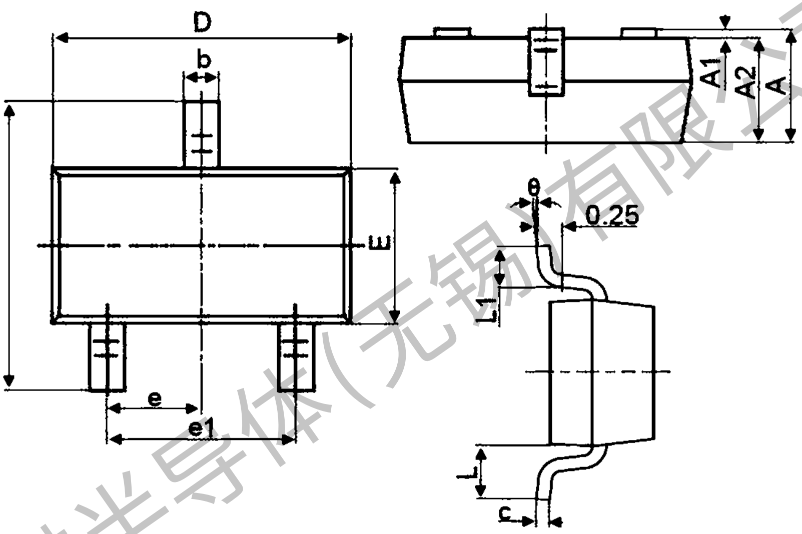


Figure 8. Gate Charge Characteristics

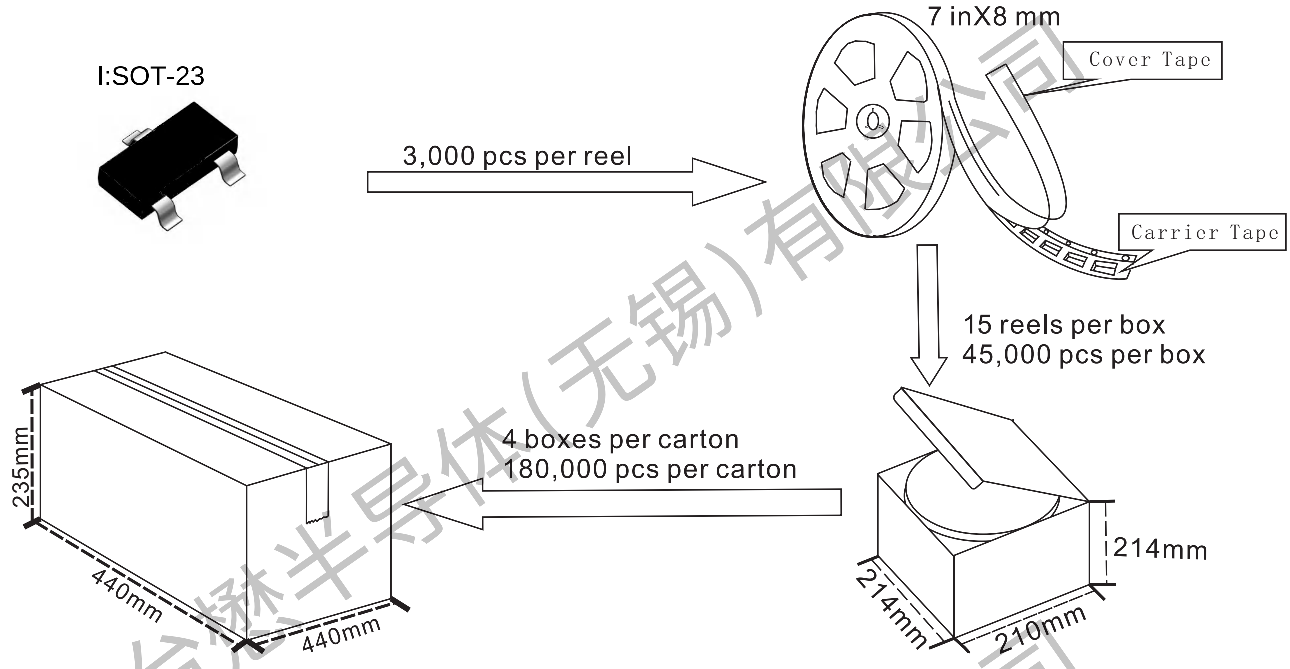
Package Mechanical Data:SOT-23



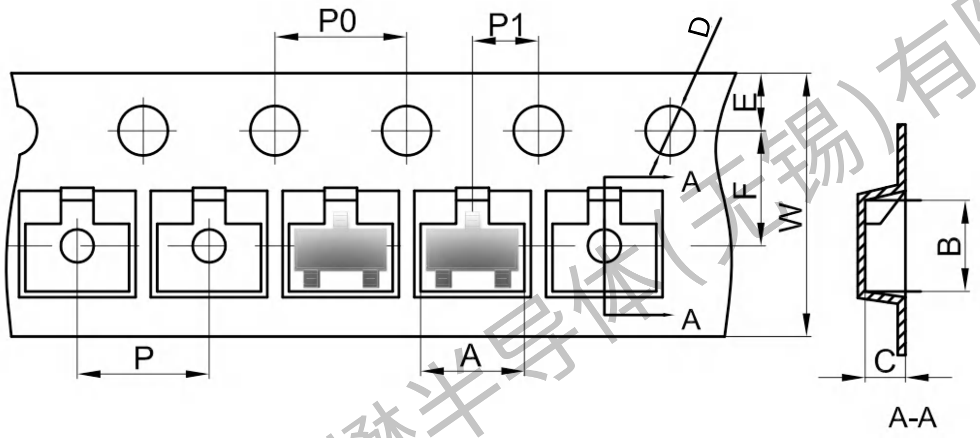
Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

SOT-23 Packing

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

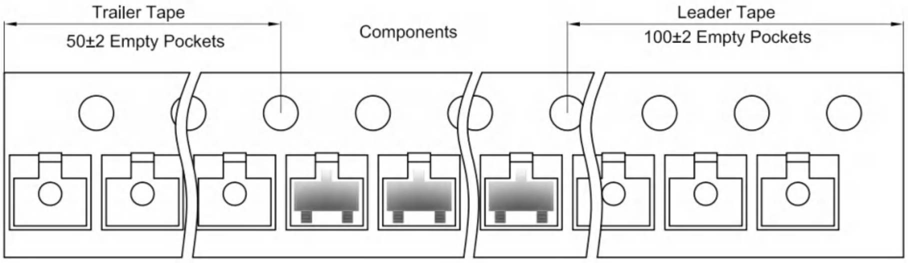


SOT-23 Embossed Carrier Tape



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
2023.08.08	23.08	Original	