TM03N02MI

N-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

General Features

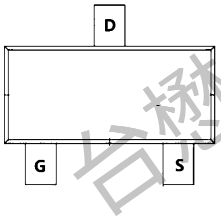
V_{DS} = 20V I_D =3.2A

$R_{DS(ON)}$ = 40mΩ(Typ.)@ V_{GS}=4.5V

100% UIS Tested

100% R_g Tested

MI:SOT-23-3L



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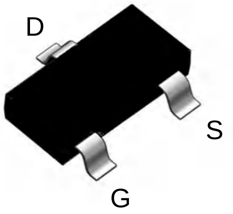
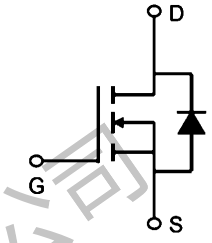




Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_A=25˚C	Continuous Drain Current, V_{GS} @ 4.5V[1]	3.2	A
I_{DM}	Pulsed Drain Current[2]	12	A
P_D@T_A=25˚C	Total Power Dissipation[3]	0.9	mW
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
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	139	˚C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	---	˚C/W

Electrical Characteristics (T_J=25℃ unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage (I_D =250uA,V_{GS}=0V)	BV_{DSS}	20	—	—	V
Gate Threshold Voltage(I_D =250uA,V_{GS}= V_{DS})	$V_{GS(th)}$	0.5	0.7	0.9	V
Zero Gate Voltage Drain Current (V_{GS}=0V, V_{DS}= 20V)	I_{DSS}	—	—	1	uA
Gate Body Leakage (V_{GS}=±10V, V_{DS}=0V)	I_{GSS}	—	—	±100	nA
Static Drain-Source On-State Resistance (I_D=3.5A,V_{GS}=4.5V) (I_D=2A,V_{GS}=2.5V)	$R_{DS(ON)}$	—	40 55	52 80	mΩ
Diode Forward Voltage Drop (I_{SD}=3A,V_{GS}=0V)	V_{SD}	—	—	1.2	V
Input Capacitance (V_{GS}=0V, V_{DS}=10V,f=1MHz)	C_{ISS}	—	220	—	pF
Common Source Output Capacitance (V_{GS}=0V, V_{DS}=10V,f=1MHz)	C_{OSS}	—	34	—	pF
Reverse Transfer Capacitance (V_{GS}=0V, V_{DS}=10V,f=1MHz)	C_{RSS}	—	26	—	pF
Total Gate Charge (V_{DS}=10V, I_D=3A, V_{GS}=4.5V)	Q_g	—	3.6	—	nC
Gate Source Charge (V_{DS}=10V, I_D=3A, V_{GS}=4.5V)	Q_{gs}	—	0.9	—	nC
Gate Drain Charge (V_{DS}=10V, I_D=3A, V_{GS}=4.5V)	Q_{gd}	—	0.8	—	nC
Turn-ON Delay Time (V_{DS}=10V I_D=3A, R_{GEN}=3Ω,V_{GS}=4.5V)	$t_{d(on)}$	—	8	—	ns
Turn-ON Rise Time (V_{DS}=10V I_D=3A, R_{GEN}=3Ω,V_{GS}=4.5V)	t_r	—	58	—	ns
Turn-OFF Delay Time (V_{DS}=10V I_D=3A, R_{GEN}=3Ω,V_{GS}=4.5V)	$t_{d(off)}$	—	15	—	ns
Turn-OFF Fall Time (V_{DS}=10V I_D=3A, R_{GEN}=3Ω,V_{GS}=4.5V)	t_f	—	53	—	ns

■Typical Characteristic Curve

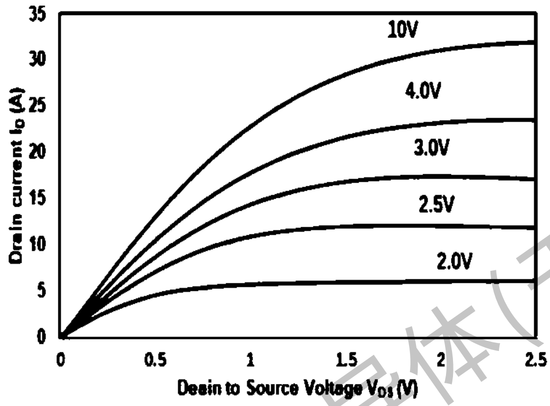


Figure 1: Output Characteristics

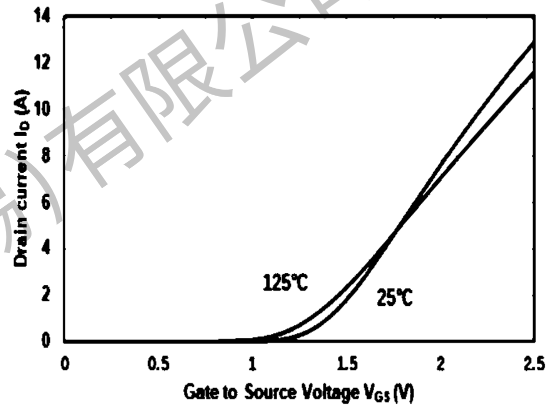


Figure 2: Transfer Characteristics

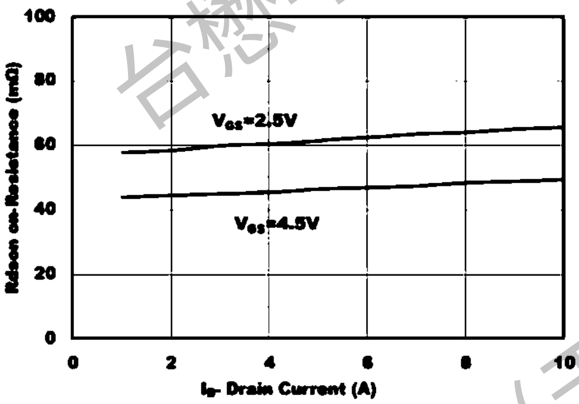


Figure 3: On-Resistance vs. Drain Current

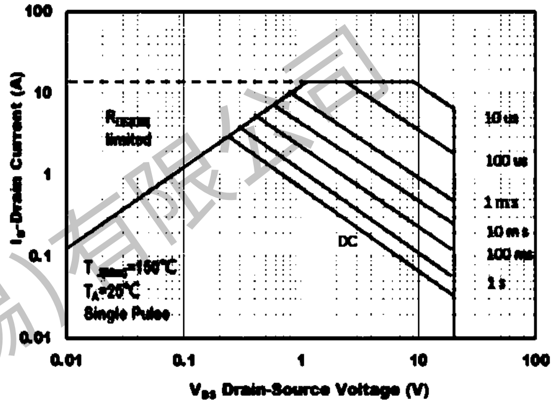


Figure 4: Safe Operating Area

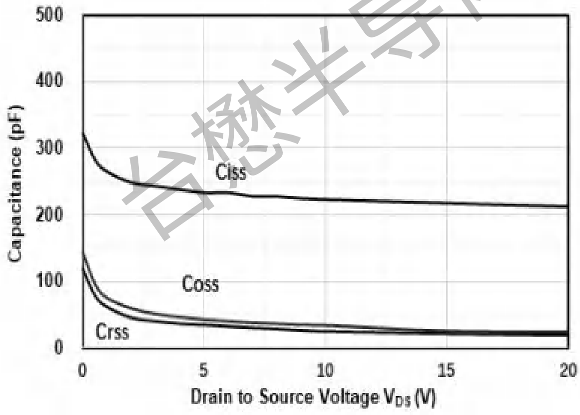


Figure 5: Capacitance Characteristics

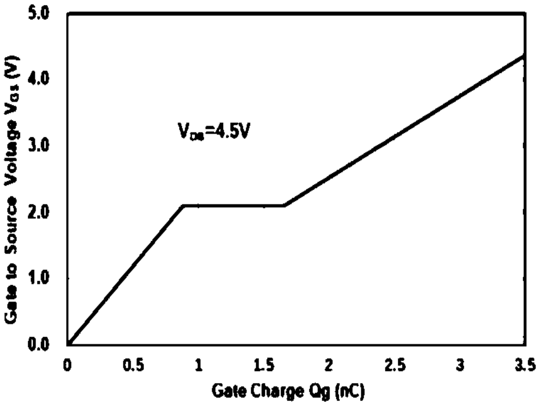
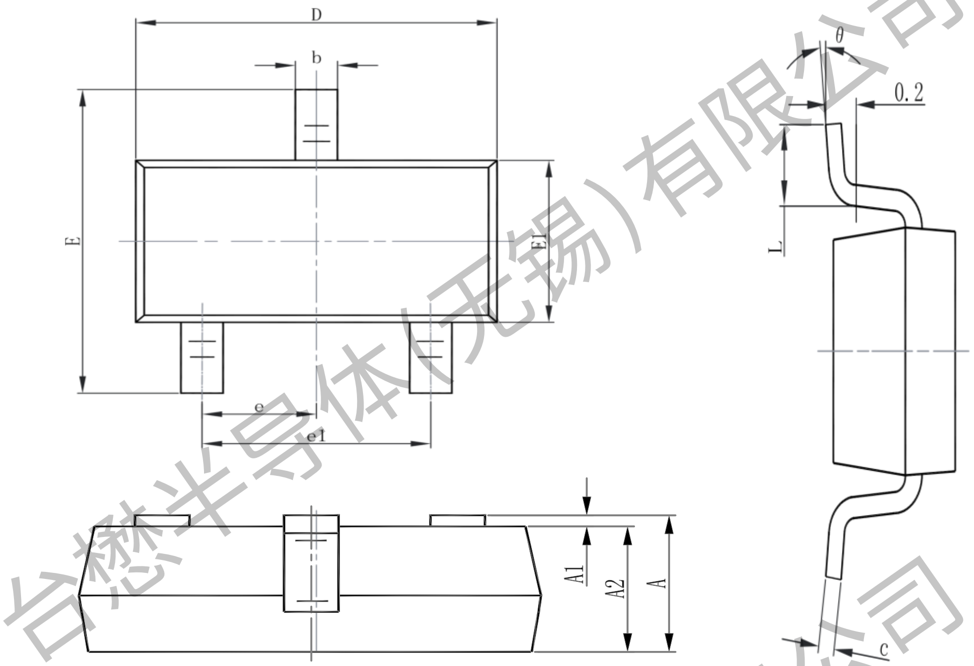


Figure 6: Gate-Charge Characteristics

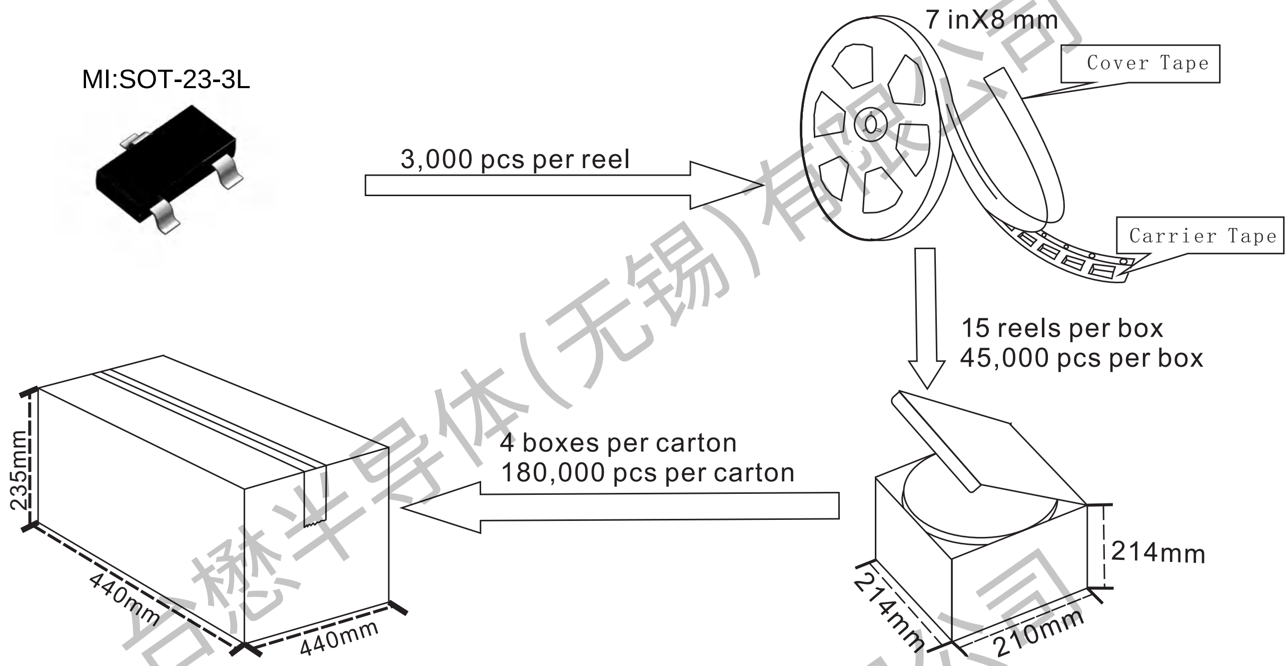
Package Mechanical Data:SOT-23-3L



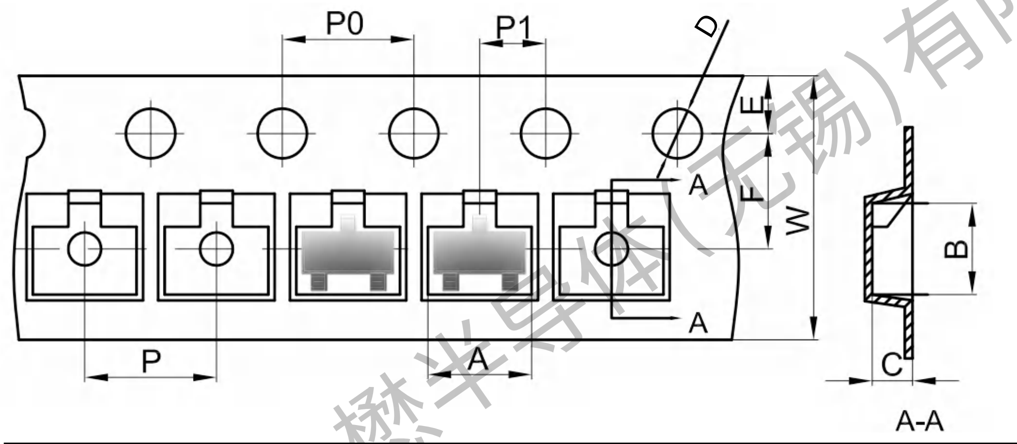
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

SOT-23-3L Packing

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

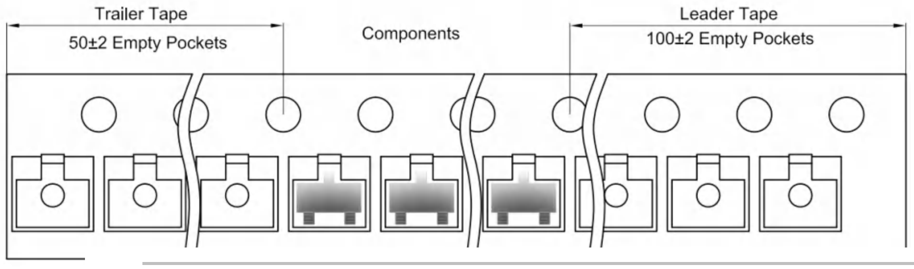


SOT-23-3L Embossed Carrier Tape



Dimensions are in millimeter										
Pkg type	A	B	C	D	E	F	P0	P	P1	W
SOT-23-3L	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23-3L Tape Leader and Trailer



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Revision history:

Date	Rev	Description	Page
2023.05.06	23.05	Original	