TM10N10MSI

N-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

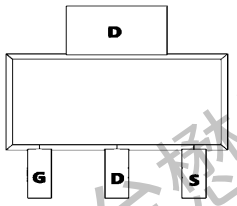
General Features

V_{DS} = 100V I_D =10A

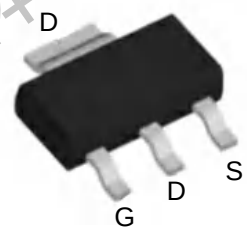
$R_{DS(ON)}$ =75 mΩ (typ.) @ V_{GS}=10V

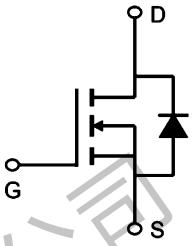
100% UIS Tested
100% R_g Tested

MSI:SOT-223-3L



Marking:10N10





Absolute Maximum Ratings (T_C = 25°C Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	10	A
I_D@T_C=70°C	Continuous Drain Current, V_{GS} @ 10V[1]	4	A
I_{DM}	Pulsed Drain Current[2]	24	A
P_D	Total Power Dissipation[3]	2.5	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
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	50	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	---	°C/W

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Electrical Characteristics: (T_C=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}=80V	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1.0	2.0	3.0	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=5A	---	75	90	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=50V, V_{GS}=0V, f=1MHz	---	1008	---	pF
C_{oss}	Output Capacitance		---	31	--	
C_{rss}	Reverse Transfer Capacitance		---	22	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=50V, I_D=5A, R_{ENG}=3Ω ,V_{GS}=10V	---	37	---	ns
t_r	Rise Time		---	25.7	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	15	---	ns
t_f	Fall Time		---	8.7	---	ns
Q_{gs}	Total Gate Charge	V_{GS}=10V, V_{DS}=50V, I_D=5A	---	16.3	---	nC
Q_{gd}	Gate-Source Charge		---	3.67	---	nC
Q_g	Gate-Drain “Miller” Charge		---	2.96	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V, I_{SD}=1A	---	---	1.2	V
I_S	Continuous Drain Curren[1,5]	VD=VG=0V	---	---	10	A
I_{SM}	Pulsed Drain Current[2,5]		---	---	24	A

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Typical Characteristics: (T_A=25℃ unless otherwise noted)

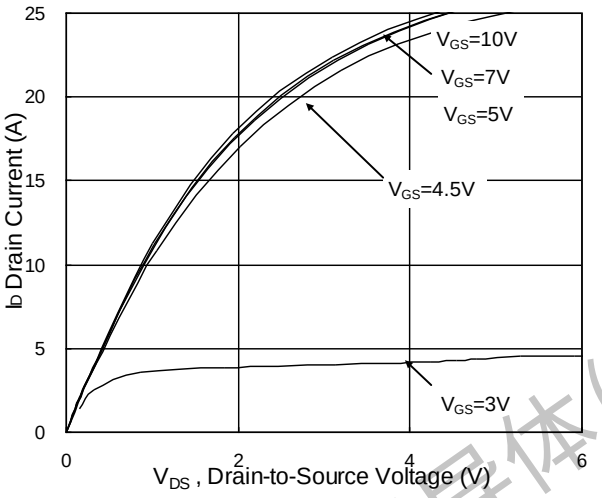

Fig.1 Typical Output Characteristics

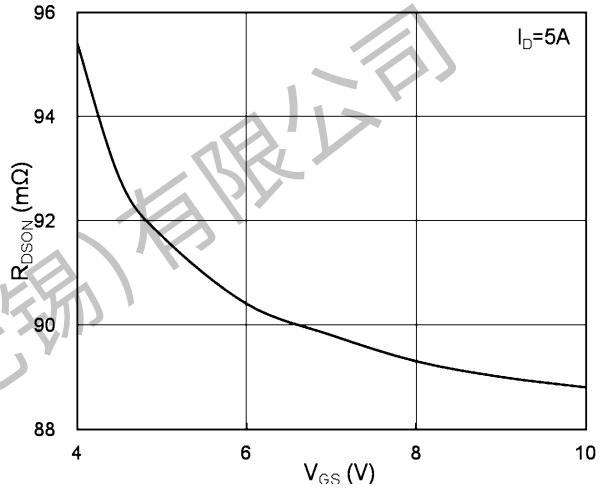

Fig.2 On-Resistance vs G-S Voltage

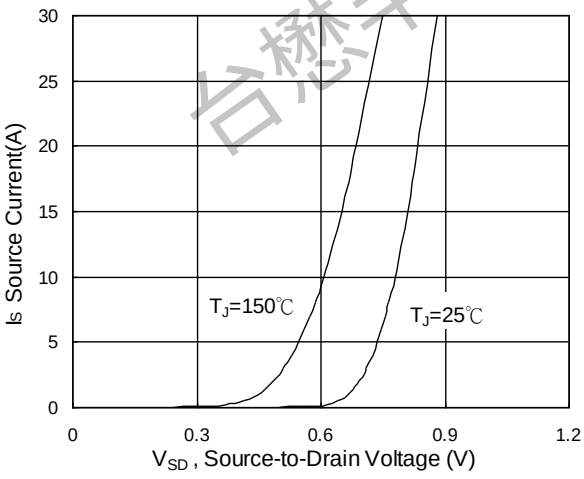

Fig.3 Source Drain Forward Characteristics

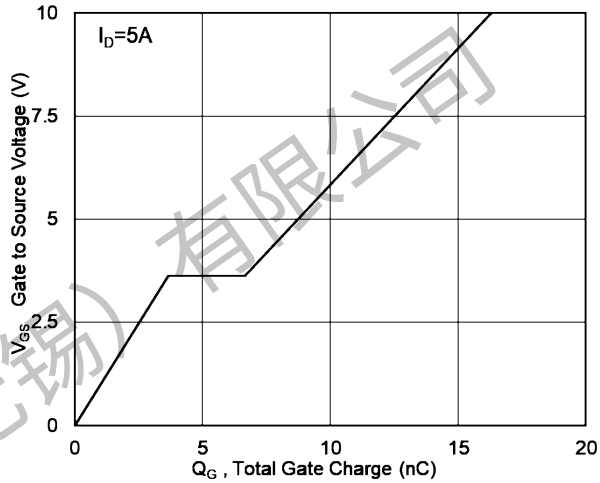

Fig.4 Gate-Charge Characteristics

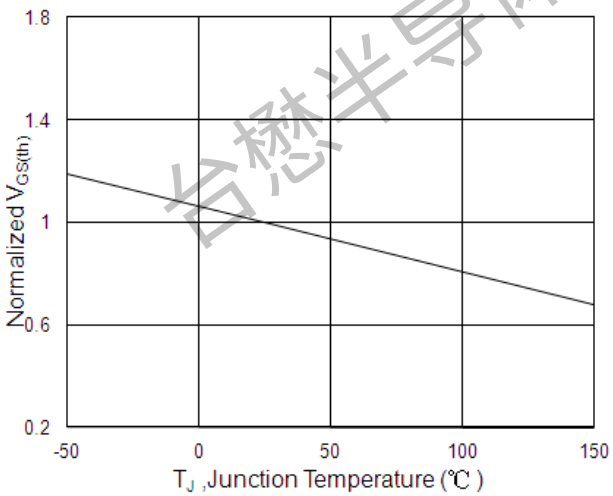

Fig.5 Normalized $V_{GS(th)}$ vs T_J

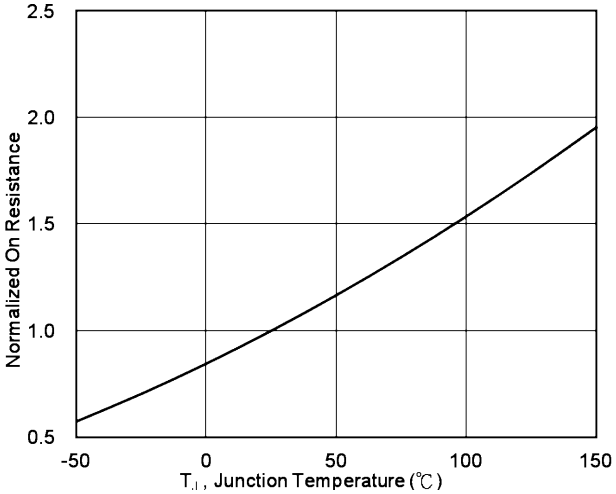

Fig.6 Normalized R_{DSON} vs T_J

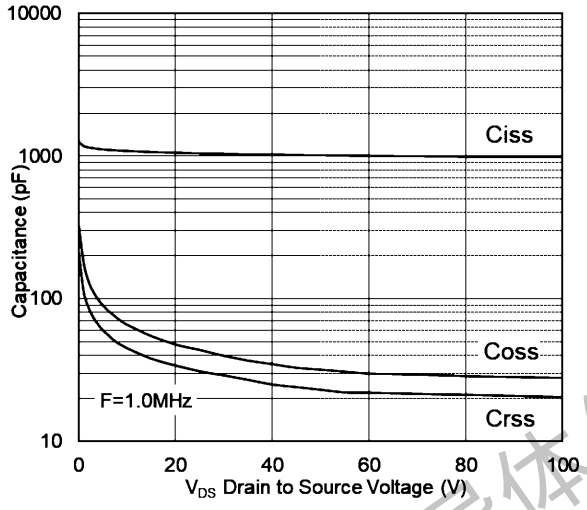

Fig.7 Capacitance

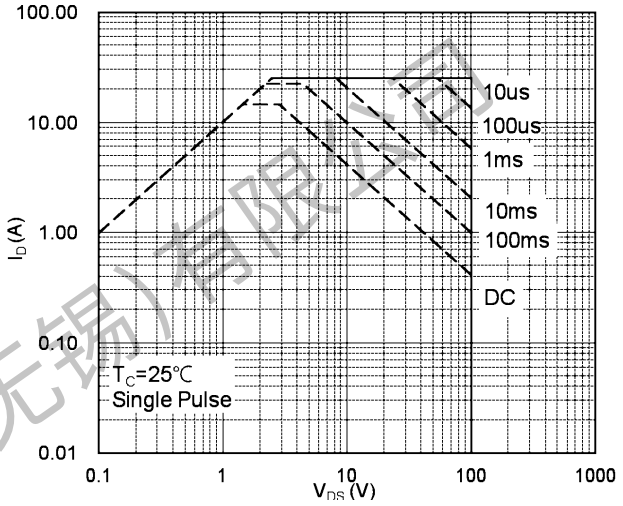

Fig.8 Safe Operating Area

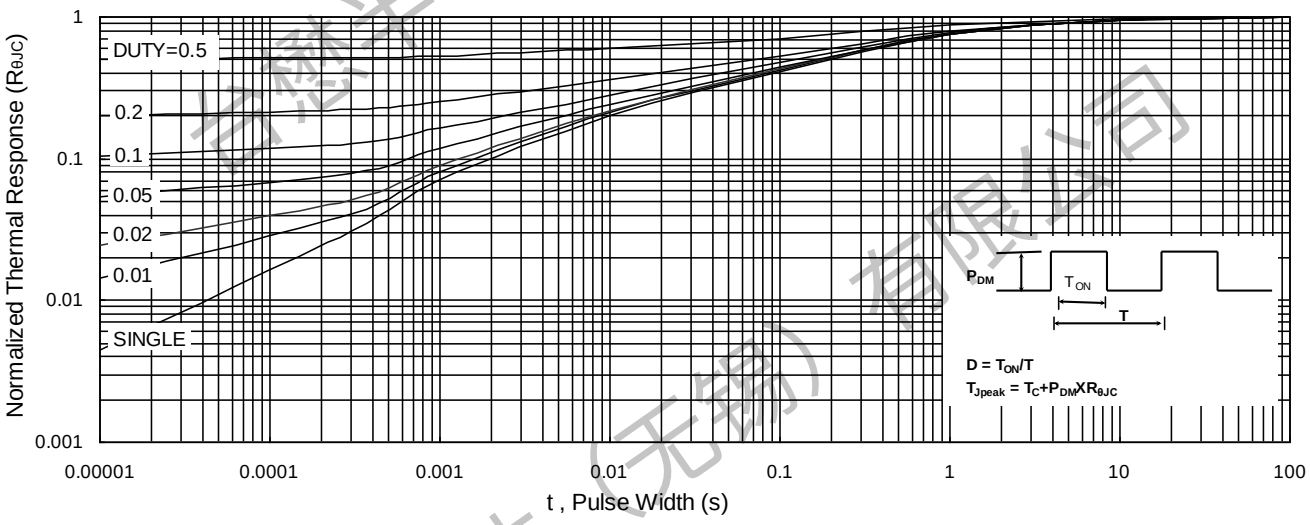

Fig.9 Normalized Maximum Transient Thermal Impedance

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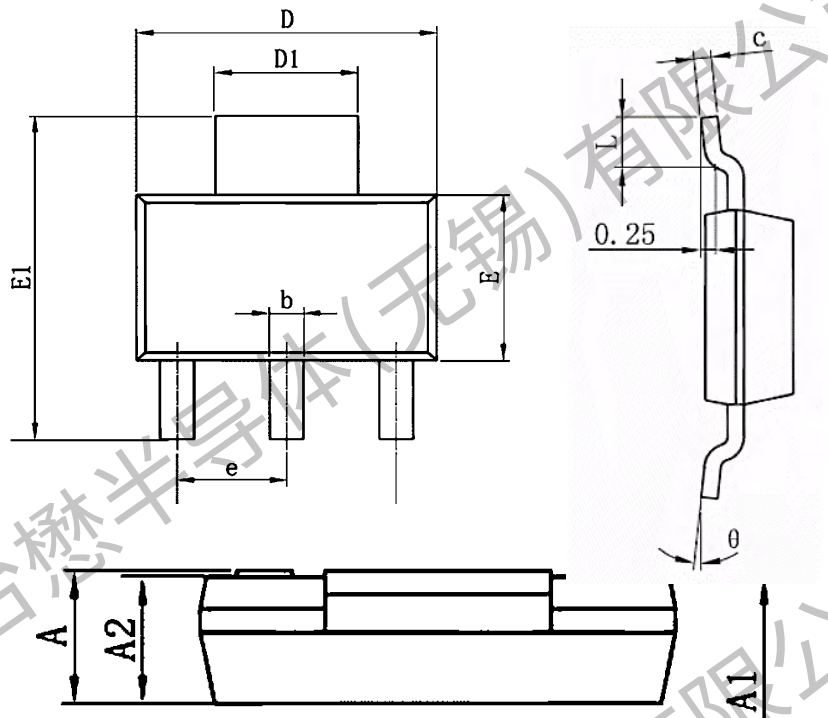
Package Mechanical Data:SOT-223-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.52	1.8	0.06	0.049
A1	0.000	0.100	0.000	0.004
A2	1.5	1.7	0.059	0.045
b	0.66	0.82	0.026	0.032
c	0.25	0.35	0.010	0.014
D	6.2	6.4	0.244	0.252
D1	2.9	3.1	0.114	0.122
E	3.3	3.7	0.130	0.146
E1	6.83	7.07	0.269	0.278
e	2.300(BSC)		0.037(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.15	0.035	0.045
θ	0°	10°	0°	10°

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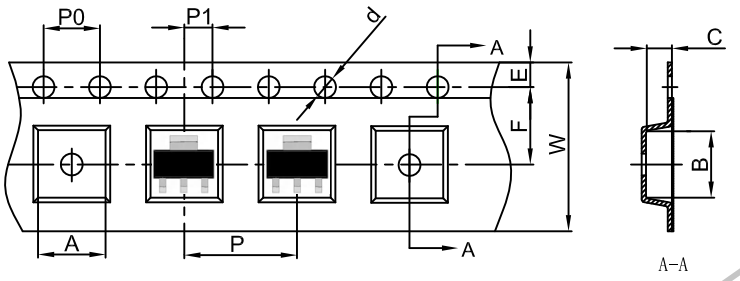
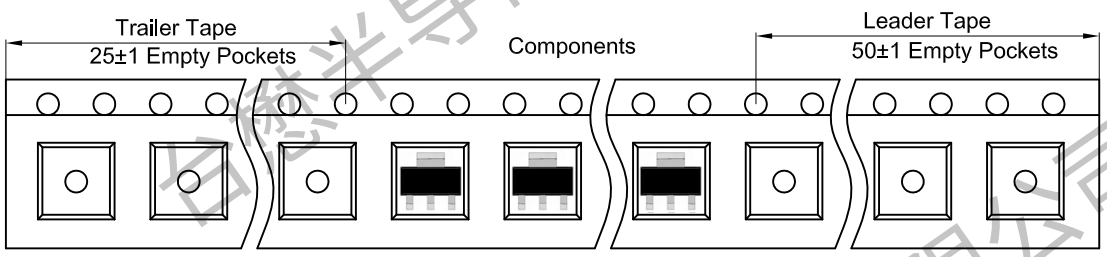
SOT-223-3L Embossed Carrier Tape

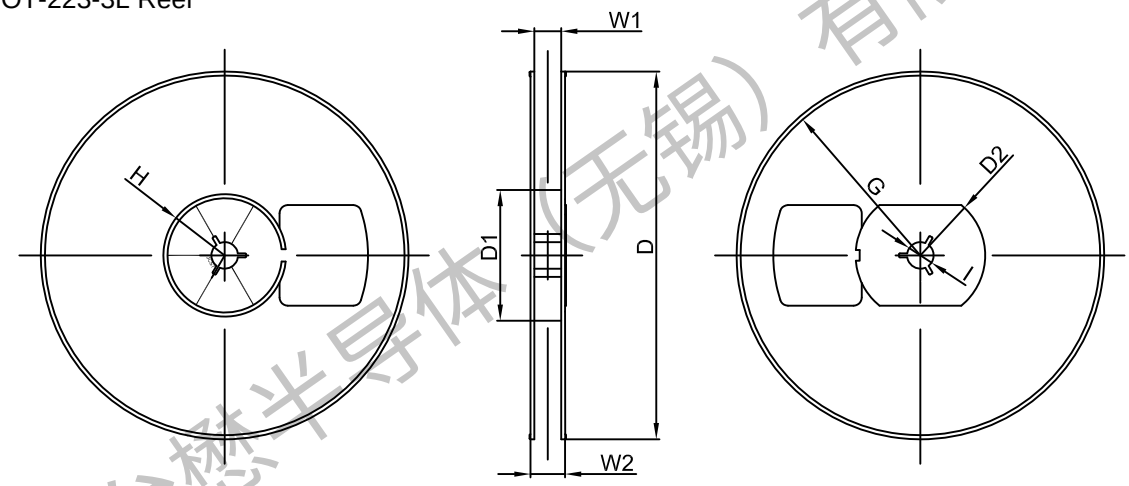


Dimensions are in millimeter									
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-223-3L	4.85	4.45	1.85	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

SOT-223-3L Tape Leader and Trailer



SOT-223-3L Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø180.00	60.00	R32.00	R86.50	R30.00	Ø13.00	13.20	16.50

REEL	Box	Box Size(mm)	Carton	Carton Size(mm)
2500pcs	5000pcs	205×195×220	25000pcs	430×415×240
4000pcs	8000pcs	205×195×220	40000pcs	430×415×240

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Revision history:

Date	Rev	Description	Page
2023.04.10	23.04	Original	