

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

MS8003L-TOLL8

Product specification

General Description

These N-Channel enhancement mode power field effect transistors are using trench SGT technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

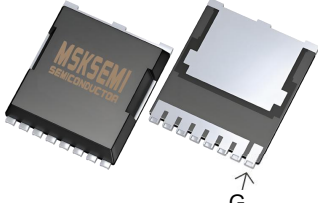
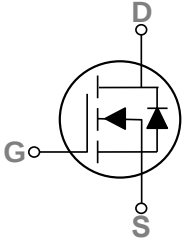
Features

- 80V,383A, $R_{DS(ON)} = 1m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available

Application

- Networking
- Load Switch
- LED applications
- Quick Charger

Reference News

TOLL-8	Pin Configuration	Marking
		

Absolute Maximum Ratings $T_c=25^{\circ}C$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_c=25^{\circ}C$)	383	A
	Drain Current - Continuous ($T_c=100^{\circ}C$)	242	A
I_{DM}	Drain Current - Pulsed ¹	1530	A
EAS	Single Pulse Avalanche Energy ²	1280	mJ
P_D	Power Dissipation ($T_c=25^{\circ}C$)	358	W
	Power Dissipation - Derate above $25^{\circ}C$	3.85	W/ $^{\circ}C$
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.26	$^{\circ}C/W$

Electrical Characteristics (T_J=25 °C, unless otherwise noted)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	80	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =64V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =64V , V _{GS} =0V , T _J =85°C	---	---	30	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V , I _D =30A	---	1.0	1.35	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2	3.0	4	V
g _{fs}	Forward Transconductance	V _{DS} =10V , I _D =3A	---	20	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{3, 4}	V _{DS} =40V , V _{GS} =10V , I _D =100A	---	206	---	nC
Q _{gs}	Gate-Source Charge ^{3, 4}		---	54	---	
Q _{gd}	Gate-Drain Charge ^{3, 4}		---	56	---	
T _{d(on)}	Turn-On Delay Time ^{3, 4}	V _{DD} =40V , V _{GS} =10V , R _G =6Ω I _D =100A	---	30	---	ns
T _r	Rise Time ^{3, 4}		---	70	---	
T _{d(off)}	Turn-Off Delay Time ^{3, 4}		---	40	---	
T _f	Fall Time ^{3, 4}		---	80	---	
C _{iss}	Input Capacitance	V _{DS} =40V , V _{GS} =0V , F=1MHz	---	13100	---	pF
C _{oss}	Output Capacitance		---	3100	---	
C _{rss}	Reverse Transfer Capacitance		---	120	---	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	2.9	---	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V , Force Current	---	---	383	A
I _{SM}	Pulsed Source Current		---	---	766	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =1A , T _J =25°C	---	---	1.2	V

Note :

1.Repetitive Rating : Pulsed width limited by maximum junction temperature.

2.V_{DD}=50V,V_{GS}=10V,L=1mH,I_{AS}=86A.,R_G=25Ω,Starting T_J=25°C .

3.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.

4. Essentially independent of operating temperature.

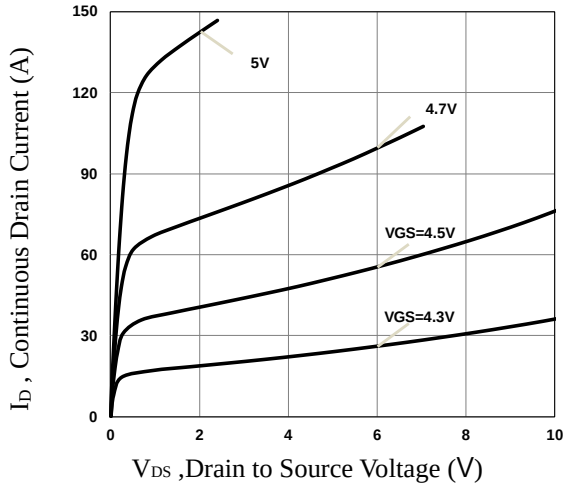


Fig.1 Typical Output Characteristics

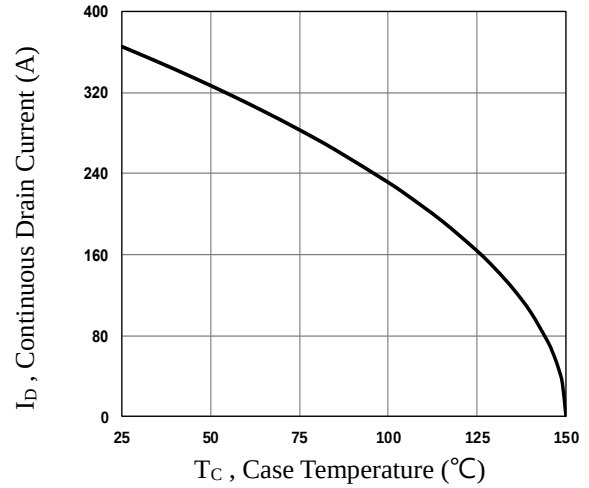


Fig.2 Continuous Drain Current vs. T_C

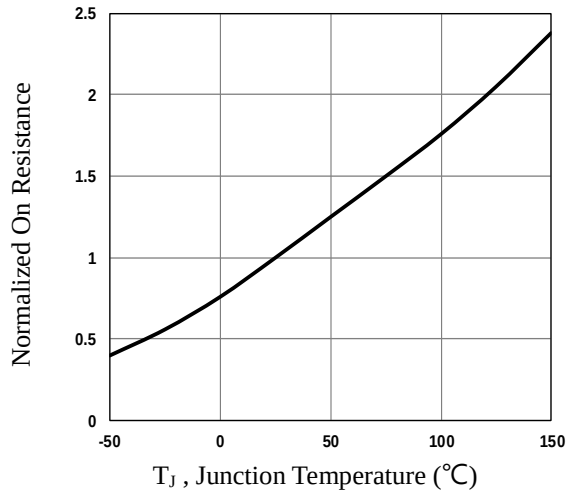


Fig.3 Normalized $R_{DS(on)}$ vs. T_J

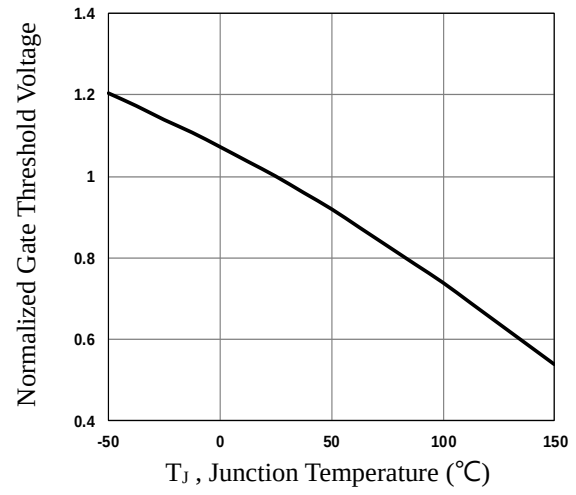


Fig.4 Normalized V_{th} vs. T_J

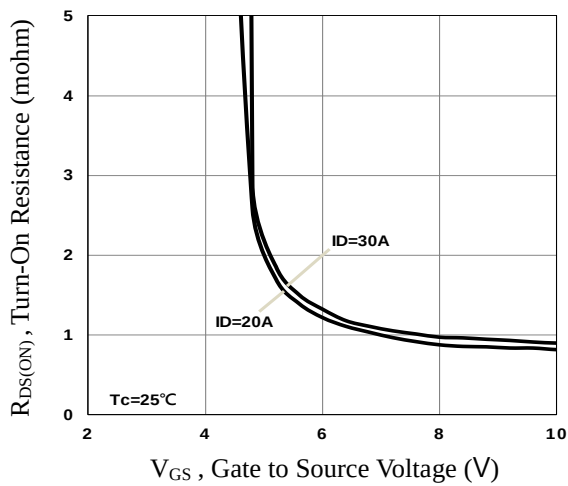


Fig.5 Turn-On Resistance vs. V_{GS}

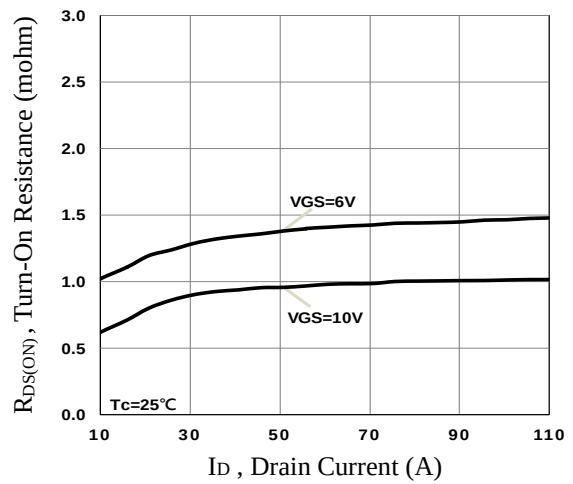


Fig.6 Turn-On Resistance vs. I_D

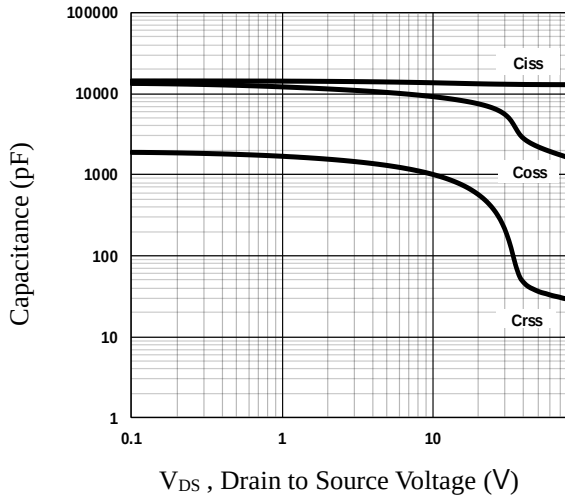


Fig.7 Capacitance Characteristics

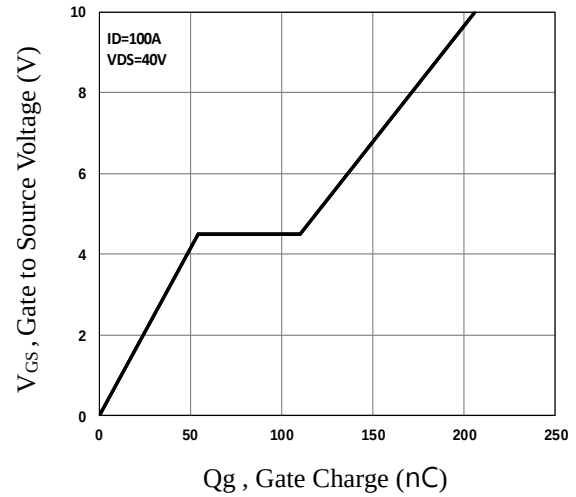


Fig.8 Gate Charge Characteristics

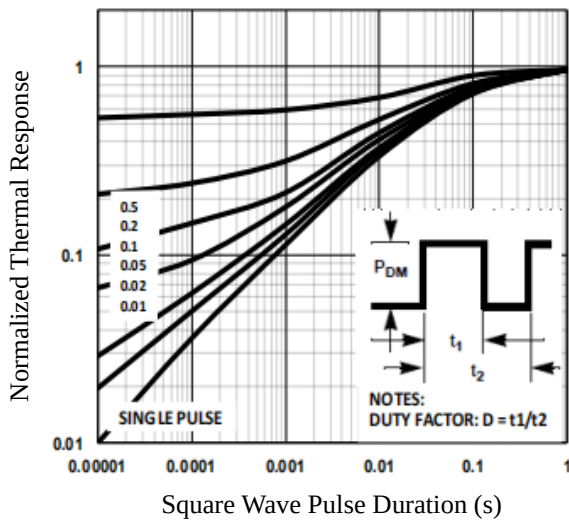


Fig.9 Normalized Transient Impedance

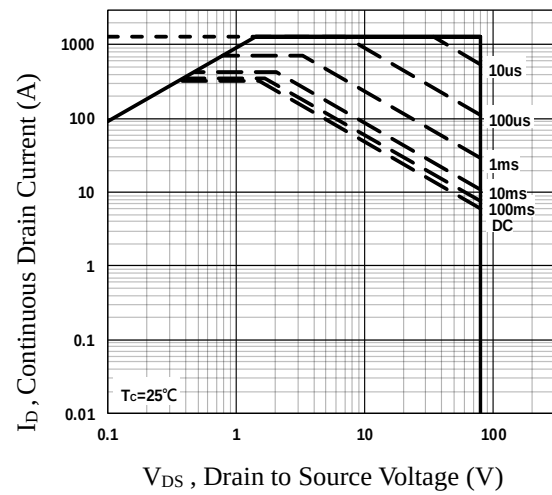


Fig.10 Maximum Safe Operation Area

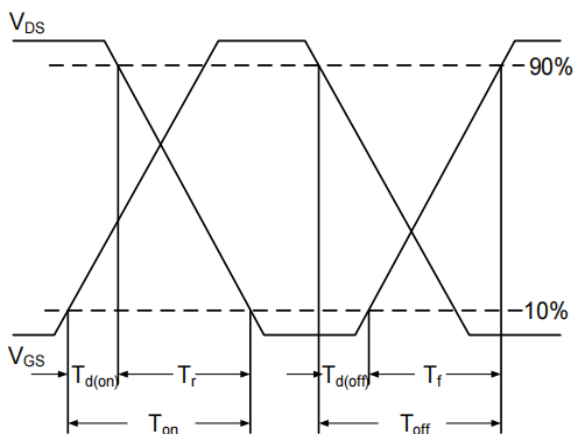


Fig.11 Switching Time Waveform

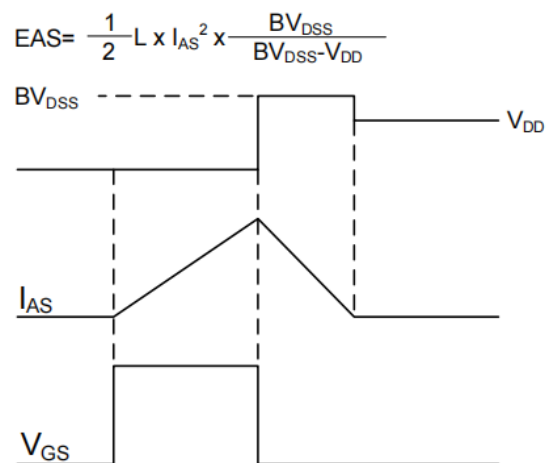
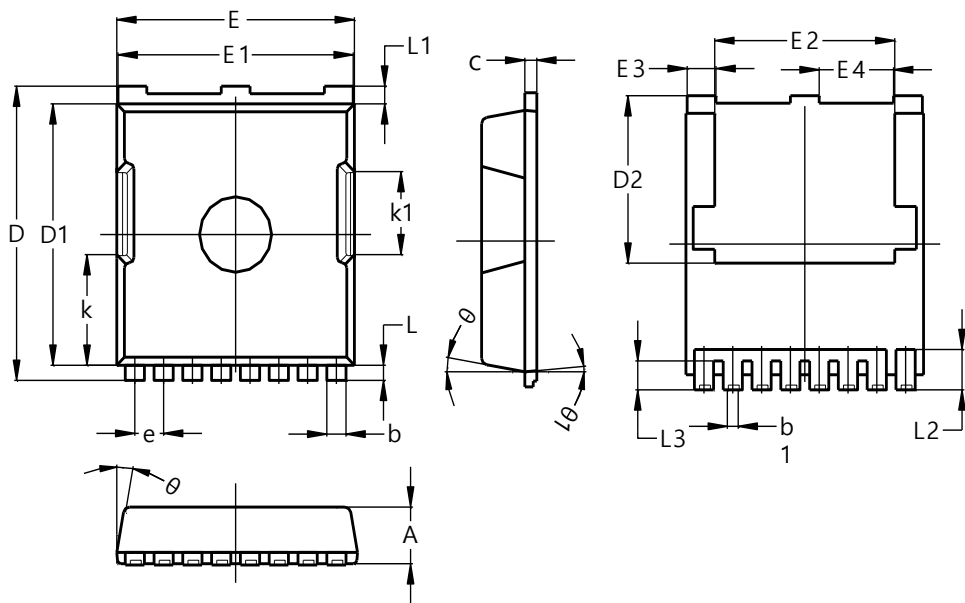


Fig.12 EAS Waveform

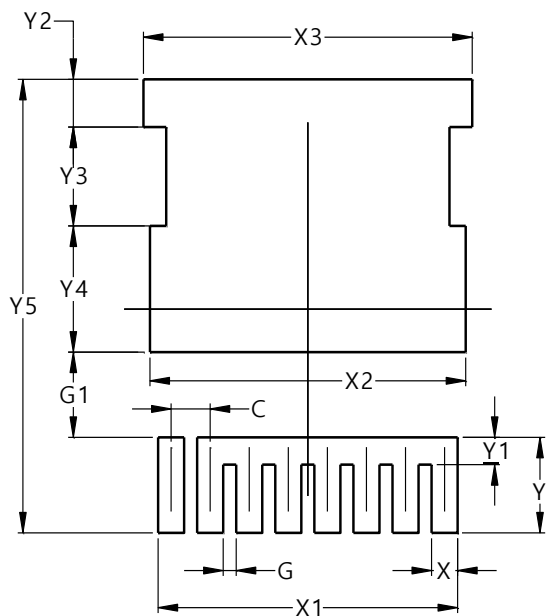
PACKAGE MECHANICAL DATA



TOLL-8			
Dim	Min	Max	Typ
A	2.20	2.40	2.30
b	0.70	0.90	0.80
b1	0.42	0.50	0.45
c	0.40	0.60	0.50
D	11.48	11.88	11.68
D1	10.23	10.53	10.38
D2	6.45	6.85	6.65
E	9.70	10.10	9.90
E1	9.70	9.90	9.80
E2	7.00	8.00	7.50
E3	1.10	1.30	1.20
E4	3.00	3.20	3.10
e	1.20 BSC		
k	4.39 REF		
k1	3.30 REF		
L	0.50	0.70	0.60
L1	0.50	0.90	0.70
L2	1.40	1.80	1.60
L3	1.00	1.30	1.15
θ	0°	15°	10°
θ1	0°	10°	5°
All Dimensions in mm			

Suggested Pad Layout

TOLL-8



Dimensions	Value (in mm)
C	1.200
G	0.400
G1	2.500
X	0.800
X1	9.200
X2	9.700
X3	10.100
Y	2.800
Y1	0.800
Y2	1.400
Y3	2.900
Y4	3.700
Y5	13.300

REEL SPECIFICATION

P/N	PKG	QTY
MS8003L-TOLL8	TOLL-8	2000

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