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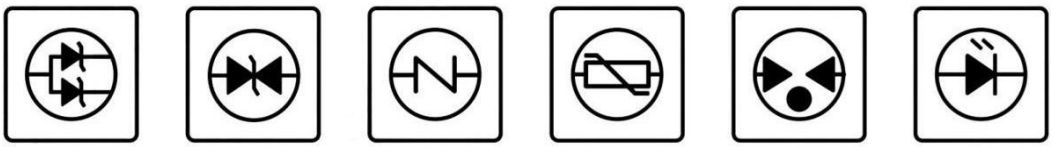
SEMICONDUCTOR



MS10N10

Product specification

General Description

- These N-Channel enhancement mode power field effect transistors are using trench DMOS 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.

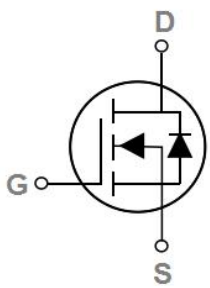
General Features

- 100V,12A , RDS(ON)=115mΩ@VGS=
- 10V Improved dv/dt capability
- Fast switching
- Green Device Available

Application

- Networking
- Load Switch
- LED applications

Reference News

PACKAGE OUTLINE	Pin Configuration	Marking
		MSKSEMI 10N10 MS10N
TO-252		

AbsoluteMaximumRatings 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	Drain Current – Continuous (T_C=25℃)	12	A
	Drain Current – Continuous (T_C=100℃)	7.6	A
I_{DM}	Drain Current – Pulsed[1]	48	A
EAS	Single Pulse Avalanche Energy[2]	6	mJ
IAS	Single Pulse Avalanche Current[2]	11	A
P_D	Power Dissipation (T_C=25℃)	34.7	W
	Power Dissipation – Derate above 25℃	0.27	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	3.1	℃/W

Electrical Characteristics (TJ=25℃ , unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.09	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=125℃	---	---	10	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=10A	---	115	130	mΩ
		V_{GS}=4.5V , I_D=8A	---	120	150	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	1.6	2.5	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5	---	mV/℃
gfs	Forward Transconductance	V_{DS}=10V , I_D=2A	---	8.7	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[3,4]	V_{DS}=50V , V_{GS}=10V , I_D=2A	---	20	---	nC
Q_{gs}	Gate-Source Charge[3,4]		---	3.2	---	
Q_{gd}	Gate-Drain Charge[3,4]		---	3.6	---	
$T_{d(on)}$	Turn-On Delay Time[3,4]	V_{DD}=50V , V_{GS}=10V , R_G=3.3Ω I_D=1A	---	18	---	ns
T_r	Rise Time[3,4]		---	4	---	
$T_{d(off)}$	Turn-Off Delay Time[3,4]		---	40	---	
T_f	Fall Time[3,4]		---	3	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	1400	---	pF
C_{oss}	Output Capacitance		---	60	---	
C_{rss}	Reverse Transfer Capacitance		---	35	---	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	2	---	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	---	---	12	A
I_{SM}	Pulsed Source Current		---	---	24	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V
t_{rr}	Reverse Recovery Time[3]	I_S=1A , dI/dt=100A/μs T_J=25℃	---	38	---	ns
Q_{rr}	Reverse Recovery Charge[3]		---	27	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0. 1mH,I_{AS}=11A.,R_G=25Ω,Starting T_J=25℃ .
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

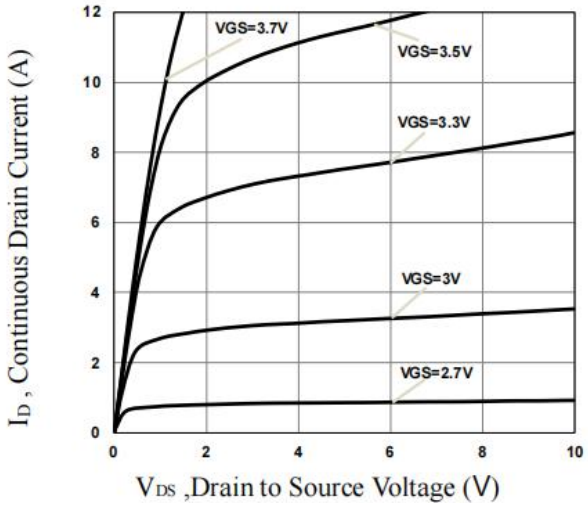


Fig.1 Typical Output Characteristics

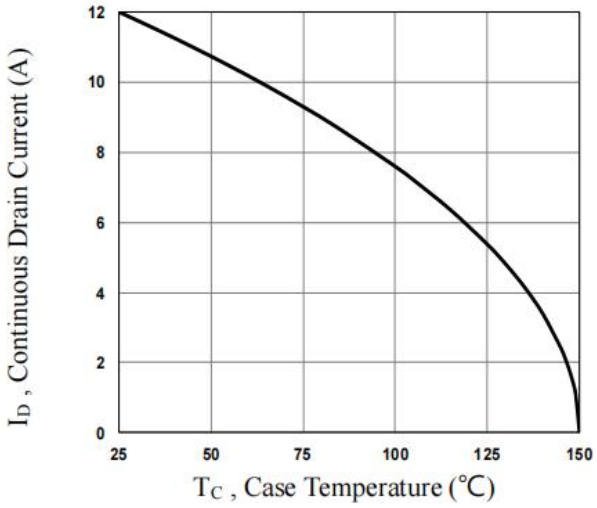


Fig.2 Continuous Drain Current vs. T_C

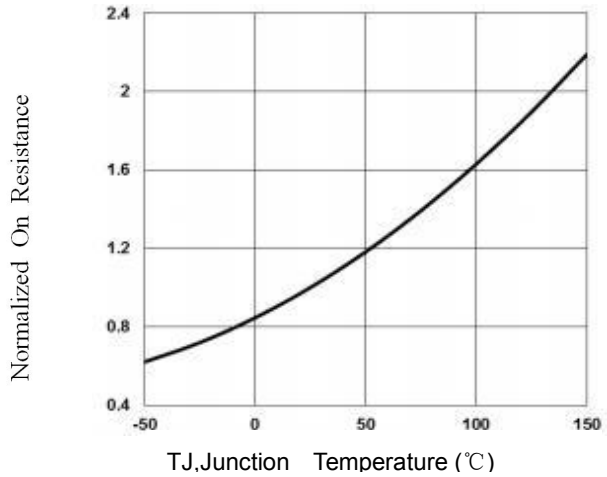


Fig.3 Normalized RDSON vs. T_J

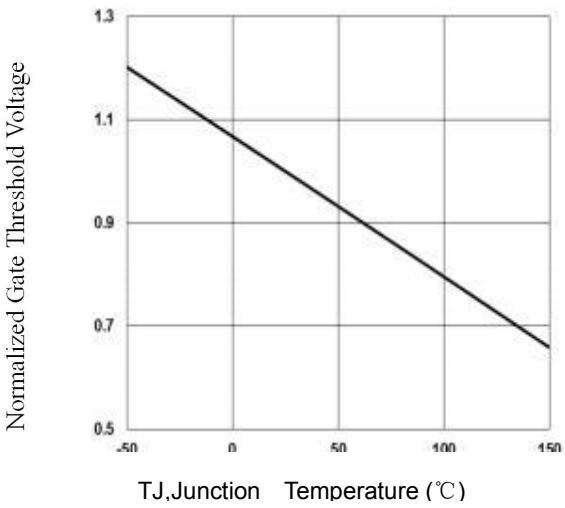


Fig.4 Normalized V_{th} vs. T_J

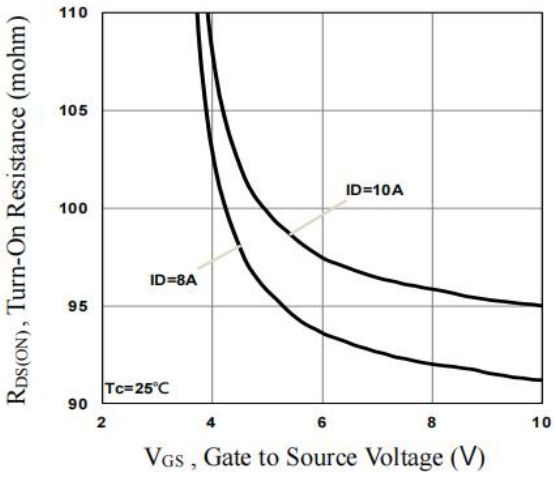


Fig.5 Turn-On Resistance vs. V_{GS}

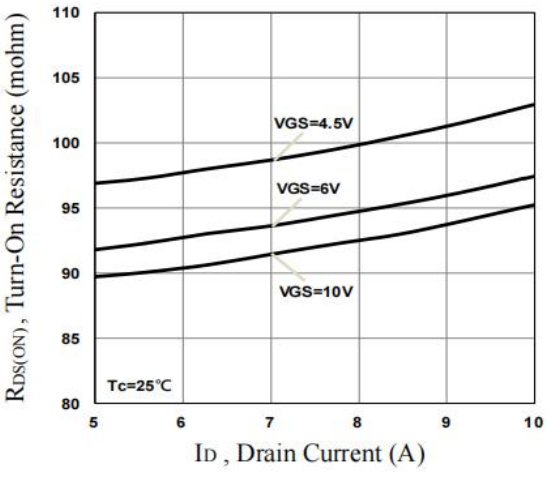
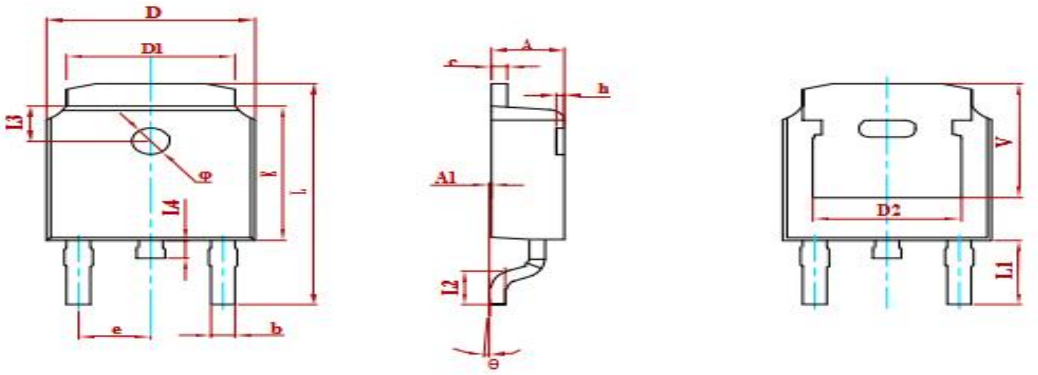


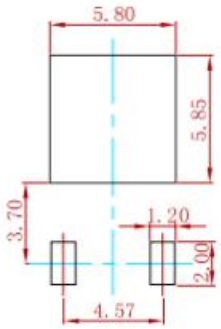
Fig.6 Turn-On Resistance vs. I_D

PACKAGE MECHANICAL DATA



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
MS10N10	TO-252	2500

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