

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

MS35N06

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.


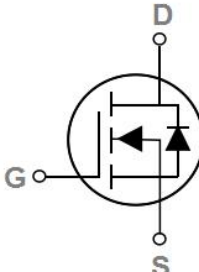

General Features

- 60V,35A, RDS(ON)=23mΩ@VGS=10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

Application

- Motor Drive
- Power Tools
- LED Lighting

Reference News

PACKAGE OUTLINE	Pin Configuration	Marking
		
<p>TO-252</p>		

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_c=25^{\circ}\text{C}$)	35	A
	Drain Current – Continuous ($T_c=100^{\circ}\text{C}$)	18	A
I_{DM}	Drain Current – Pulsed ¹	140	A
P_D	Power Dissipation ($T_c=25^{\circ}\text{C}$)	40	W
	Power Dissipation – Derate above 25°C	0.32	W/ $^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}\text{C}$

Thermal Characteristics

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

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	60	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$	---	0.06	---	V/ $^{\circ}\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=60\text{V}$, $V_{GS}=0\text{V}$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
		$V_{DS}=48\text{V}$, $V_{GS}=0\text{V}$, $T_J=125^{\circ}\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$	---	---	± 100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V , I _D =10A	---	23	31	mΩ
		V _{GS} =4.5V , I _D =5A	---	30	38	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-4.6	---	mV/°C
g _{fs}	Forward Transconductance	V _{DS} =10V , I _D =8A	---	11	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{3, 4}	V _{DS} =30V , V _{GS} =10V , I _D =10A	---	16.4	---	nC
Q _{gs}	Gate-Source Charge ^{3, 4}		---	3.1	---	
Q _{gd}	Gate-Drain Charge ^{3, 4}		---	3.7	---	
T _{d(on)}	Turn-On Delay Time ^{3, 4}	V _{DD} =30V , V _{GS} =10V , R _G =6Ω I _D =1A	---	4.6	---	ns
T _r	Rise Time ^{3, 4}		---	14.8	---	
T _{d(off)}	Turn-Off Delay Time ^{3, 4}		---	27.2	---	
T _f	Fall Time ^{3, 4}		---	7.8	---	
C _{iss}	Input Capacitance	V _{DS} =30V , V _{GS} =0V , F=1MHz	---	1180	---	pF
C _{oss}	Output Capacitance		---	80	---	
C _{rss}	Reverse Transfer Capacitance		---	52	---	
R _g	Gate resistance	V _{GS} =0V , V _{DS} =0V , F=1MHz	---	1.3	---	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	---	---	35	A
I _{SM}	Pulsed Source Current		---	---	70	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=0. 1mH, I_{AS}=23A., 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.

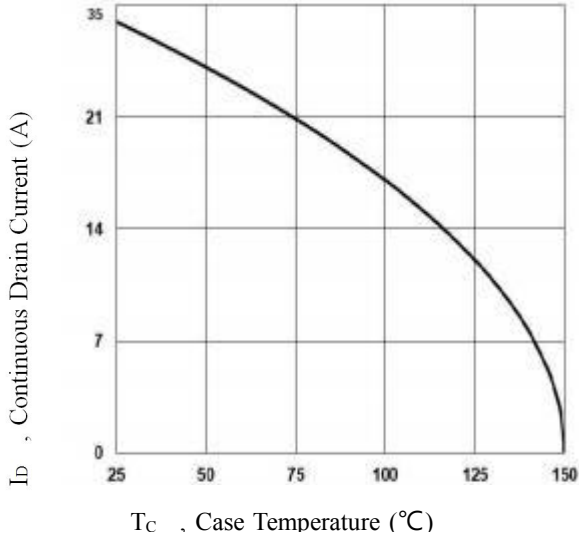


Fig.1 Typical Output Characteristics

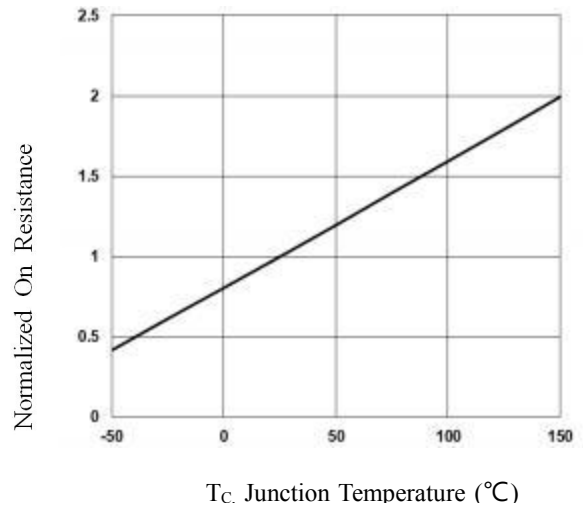


Fig.2 Continuous Drain Current vs. Tc

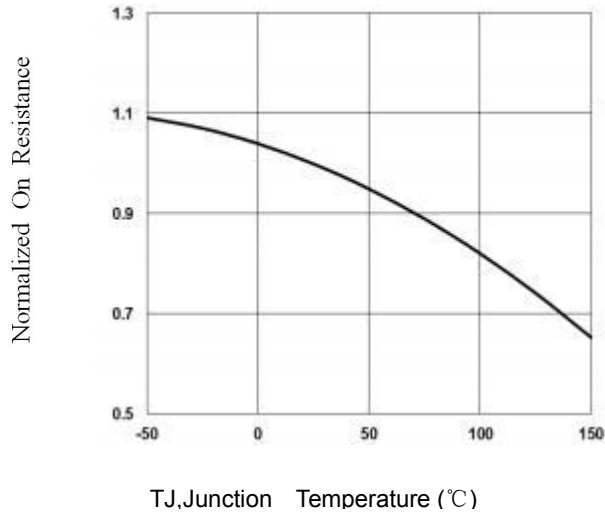


Fig.3 Normalized RDSON vs. Tj

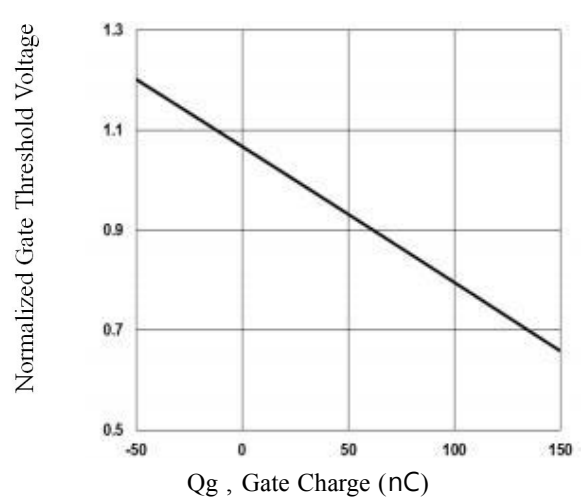


Fig.4 Gate Charge Waveform

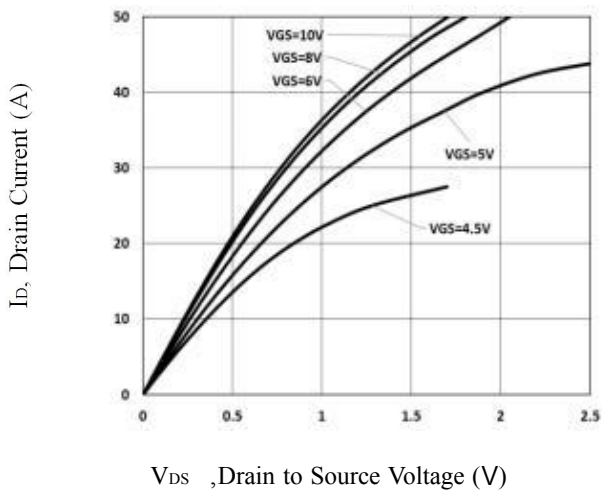


Fig.5 Typical Output Characteristics

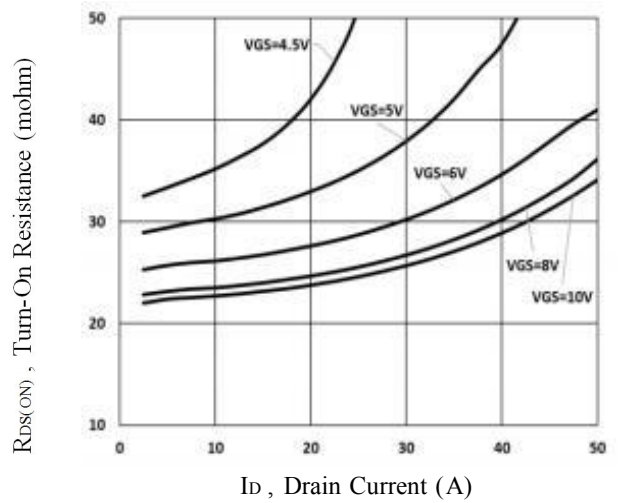
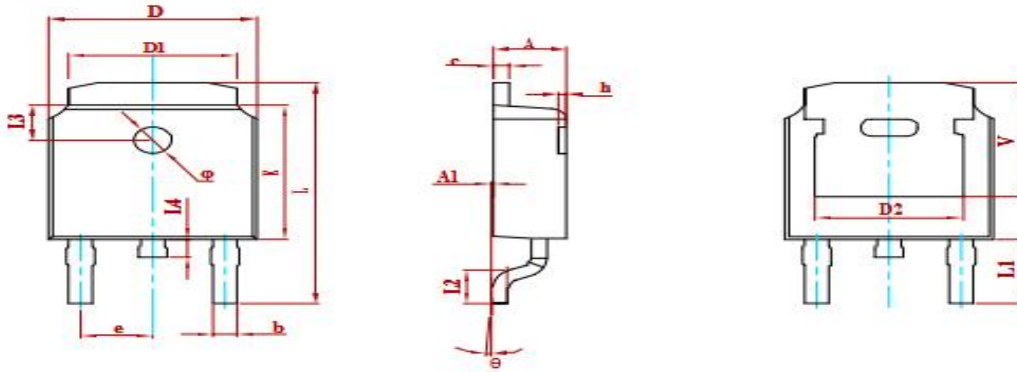


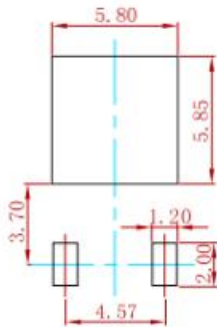
Fig.6 Turn-On Resistance vs. ID

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
MS35N06	TO-252	2500

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