

# MSKSEMI 美森科

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## MS3134KDFN

Product specification

**Features**

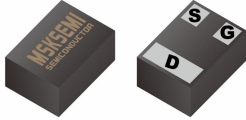
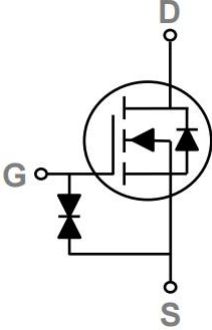

- 20V, 750mA, RDS(ON) = 200mΩ@VGS = 4.5V
- Fast switching
- Green Device Available
- 2KV HBM ESD Capability

**Application**

- Notebook
- Smartphone
- Battery Protection
- Hand-held Instruments

BVDSS	RDS(ON)	ID
20V	200mΩ	750mA

**Reference News**

PACKAGE OUTLINE	Pin Configuration	Marking
 <p>DFN1006-3</p>		

**Absolute Maximum Ratings Tc=25°C unless otherwise noted**

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	20	V
V <sub>GS</sub>	Gate-Source Voltage	±10	V
I <sub>D</sub>	Drain Current - Continuous (T <sub>A</sub> =25°C)	750	mA
	Drain Current - Continuous (T <sub>A</sub> =70°C)	400	mA
I <sub>DM</sub>	Drain Current - Pulsed <sup>1</sup>	2000	mA
P <sub>D</sub>	Power Dissipation (T <sub>A</sub> =25°C)	155	mW
	Power Dissipation - Derate above 25°C	1.25	mW/°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 125	°C

**Thermal Characteristics**

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	---	800	°C/W

**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**
**Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	20	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C , I <sub>D</sub> =1mA	---	-0.01	---	V/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =20V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =16V , V <sub>GS</sub> =0V , T <sub>J</sub> =125°C	---	---	10	uA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> = ±10V , V <sub>DS</sub> =0V	---	---	±10	uA

**On Characteristics**

R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =4.5V , I <sub>D</sub> =0.5A	---	200	350	mΩ
		V <sub>GS</sub> =2.5V , I <sub>D</sub> =0.4A	---	235	450	
		V <sub>GS</sub> =1.8V , I <sub>D</sub> =0.2A	---	295	700	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	0.3	0.5	0.8	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	3	---	mV/°C

**Dynamic and switching Characteristics**

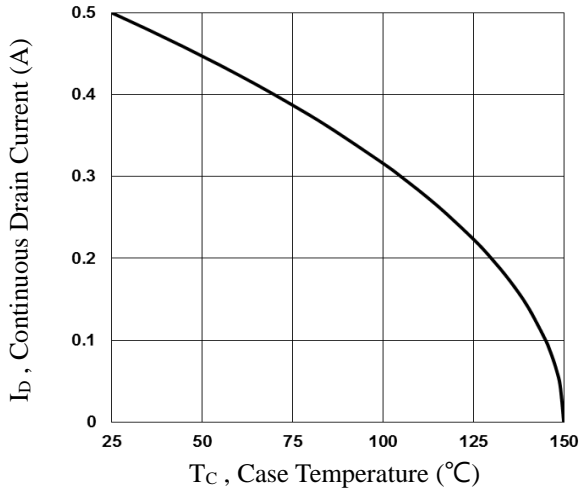
Q <sub>g</sub>	Total Gate Charge <sup>2, 3</sup>	V <sub>DS</sub> =10V , V <sub>GS</sub> =4.5V , I <sub>D</sub> =0.5A	---	1	---	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>2, 3</sup>		---	0.26	---	
Q <sub>gd</sub>	Gate-Drain Charge <sup>2, 3</sup>		---	0.2	---	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>2, 3</sup>	V <sub>DD</sub> =10V , V <sub>GS</sub> =4.5V , R <sub>G</sub> =10Ω I <sub>D</sub> =0.5A	---	5	---	ns
T <sub>r</sub>	Rise Time <sup>2, 3</sup>		---	3.5	---	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>2, 3</sup>		---	14	---	
T <sub>f</sub>	Fall Time <sup>2, 3</sup>		---	6	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =10V , V <sub>GS</sub> =0V , F=1MHz	---	38.2	---	pF
C <sub>oss</sub>	Output Capacitance		---	14.4	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	6	---	

**Drain-Source Diode Characteristics and Maximum Ratings**

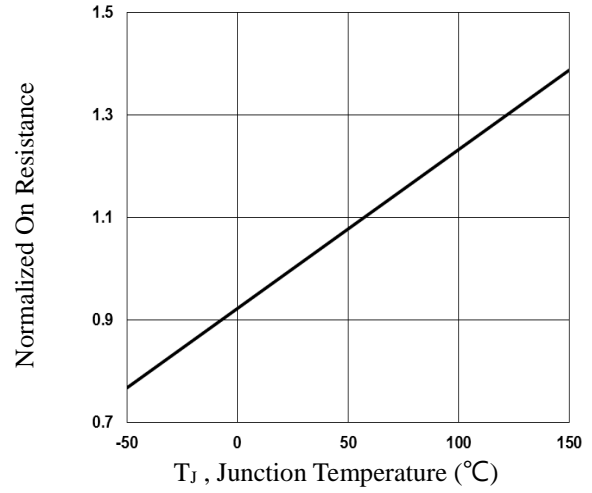
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	750	mA
I <sub>SM</sub>	Pulsed Source Current		---	---	1000	mA
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V , I <sub>S</sub> =0.5A , T <sub>J</sub> =25°C	---	---	1.2	V

Note :

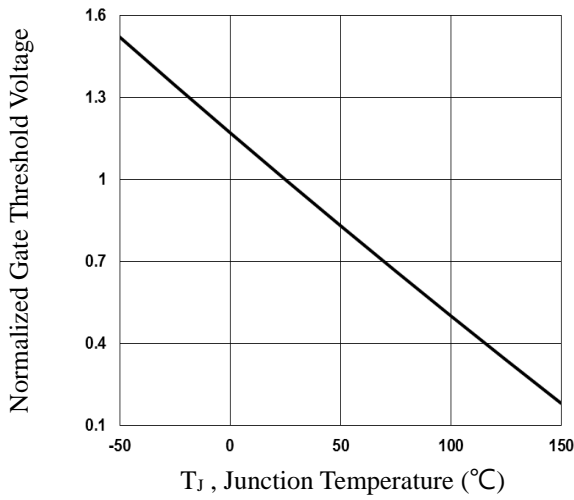
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.



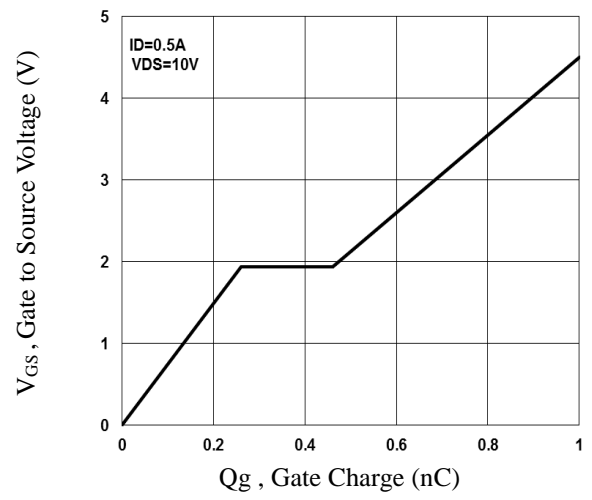
**Fig.1 Continuous Drain Current vs.  $T_c$**



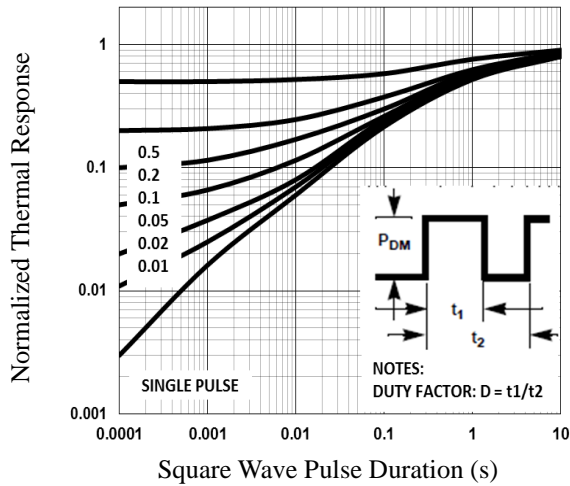
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



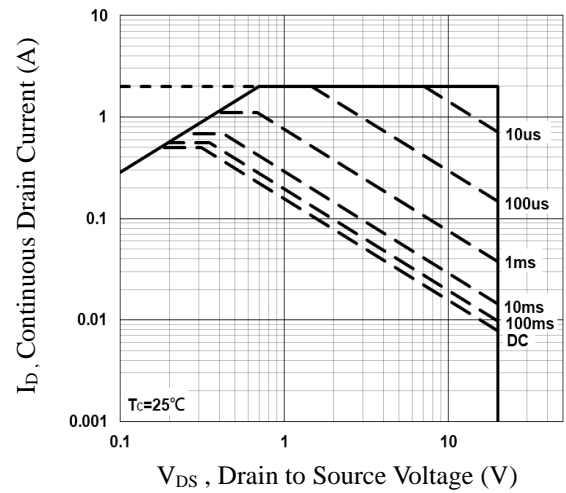
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



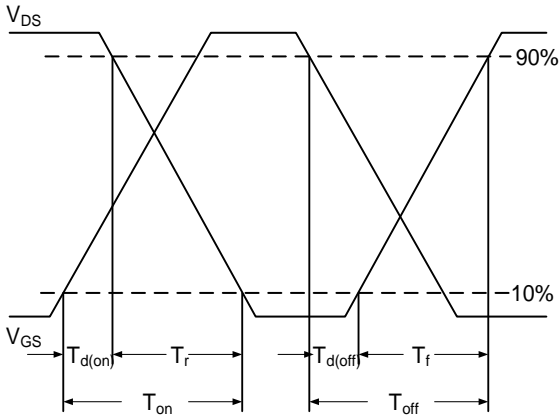
**Fig.4 Gate Charge Waveform**



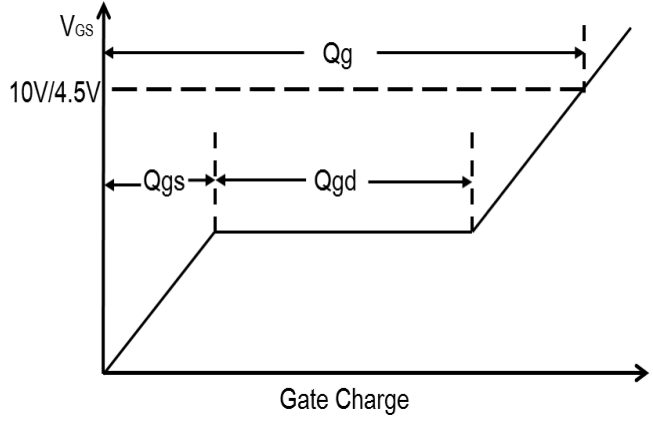
**Fig.5 Normalized Transient Response**



**Fig.6 Maximum Safe Operation Area**

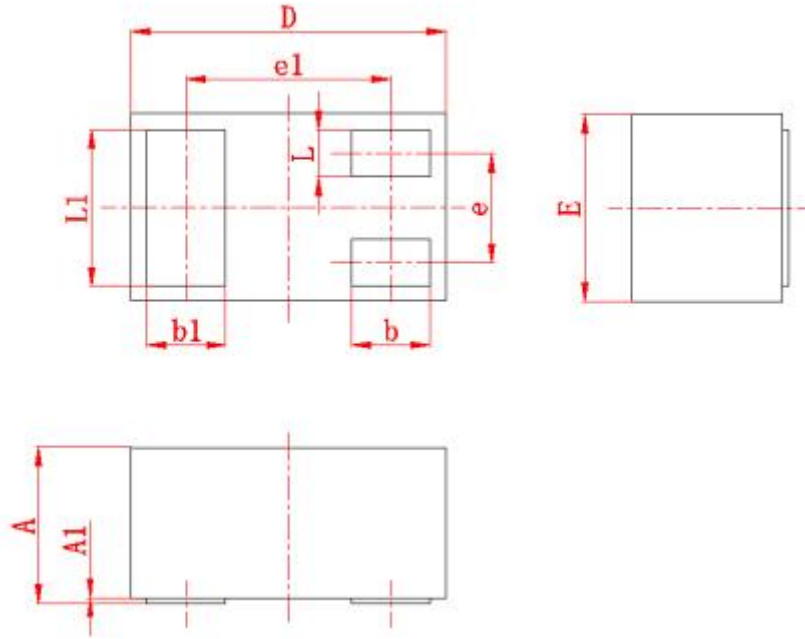


**Fig.7 Switching Time Waveform**



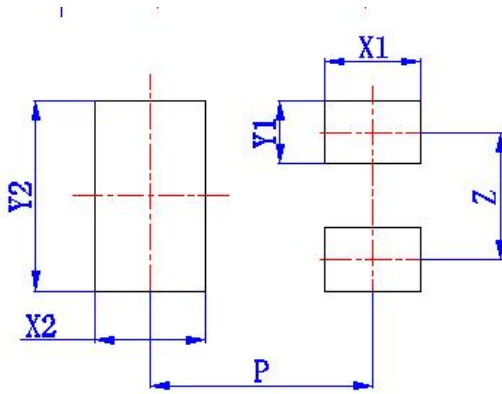
**Fig.8 Gate Charge Waveform**

**Package mechanical data**



Symbol	Millimeters	
	min	max
A	0.4	0.5
A1	0	0.05
D	0.9	1.1
E	0.55	0.65
e	(0.35)	
e1	(0.65)	
b	0.2	0.3
b1	0.2	0.3
L	0.1	0.2
L1	0.45	0.55

**Suggested Land Pattern**



Symbol	Dimension in Millimeters
	typ
X1	(0.3)
X2	(0.35)
Y1	(0.2)
Y2	(0.6)
Z	(0.4)
P	(0.7)

**REEL SPECIFICATION**

P/N	PKG	QTY
MS3134KDFN	DFN1006-3	10000

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