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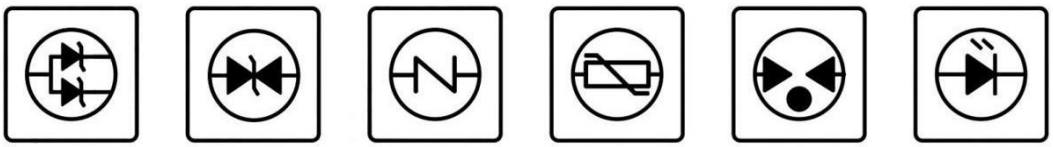
SEMICONDUCTOR



AO4430

Product specification

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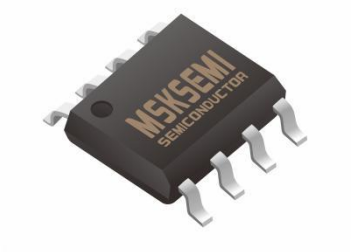
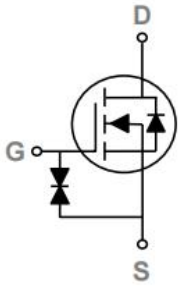
General Features

- 30 V, 16A, RDS(ON)=4.8mΩ@VGS = 10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

Application

- Notebook
- Load Switch
- LED applications
- Hand-Held Device

Reference News

PACKAGE OUTLINE	Pin Configuration	Marking
 SOP-8		MSKSEMI 4430 MS30N

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Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25C)	16	A
	Drain Current – Continuous (T_C=100C)	9.5	A
I_{DM}	Drain Current – Pulsed[1]	60	A
P_D	Power Dissipation (T_C=25C)	4	W
	Power Dissipation – Derate above 25C	0.032	W/ C
T_{STG}	Storage Temperature Range	-55 to 150	C
T_J	Operating Junction Temperature Range	-55 to 150	C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	85	C/ W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	31	C/ 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	30	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25C , I_D=1mA	---	0.04	---	V/ C
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V , T_J=25C	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=125C	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA

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On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=6A	---	4.8	8	mΩ
		V_{GS}=4.5V , I_D=3A	---	7.5	14	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	1.5	2.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4	---	mV/℃
gfs	Forward Transconductance	V_{DS}=10V , I_D=10A	---	18	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[2,3]	V_{DS}=15V , V_{GS}=4.5V , I_D=10A	---	7.5	---	nC
Q_{gs}	Gate-Source Charge[2,3]		---	1.3	---	
Q_{gd}	Gate-Drain Charge[2,3]		---	4.5	---	
$T_{d(on)}$	Turn-On Delay Time[2,3]	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω I_D=15A	---	4.8	---	ns
T_r	Rise Time[2,3]		---	12.5	---	
$T_{d(off)}$	Turn-Off Delay Time[2,3]		---	27.6	---	
T_f	Fall Time[2,3]		---	8.2	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	750	---	pF
C_{oss}	Output Capacitance		---	150	---	
C_{rss}	Reverse Transfer Capacitance		---	110	---	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	2.7	---	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	---	---	16	A
I_{SM}	Pulsed Source Current		---	---	32	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	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.

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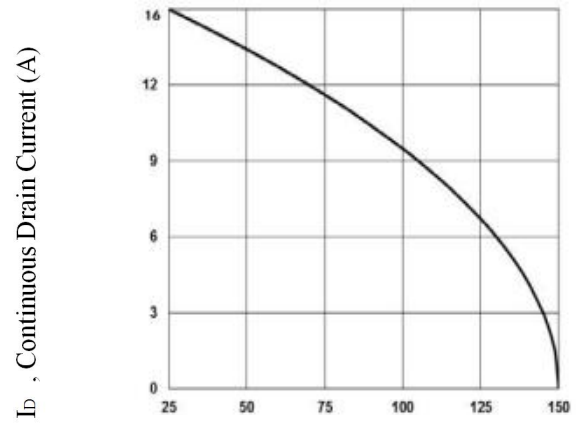
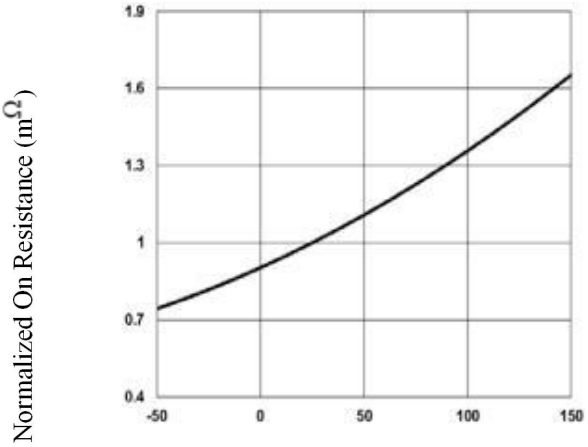


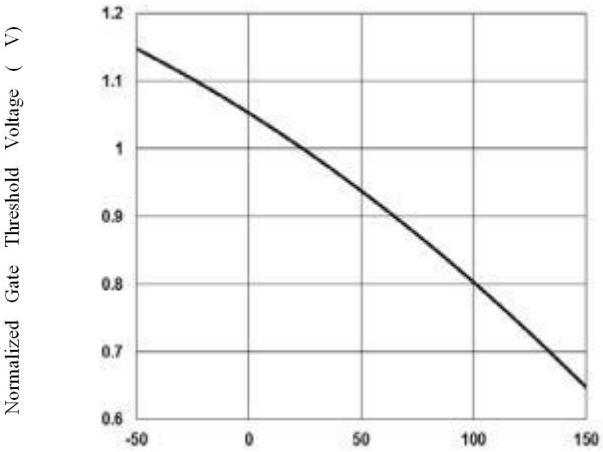
T_C , Case Temperature (℃)

Fig. 1 Continuous Drain Current vs. T_C



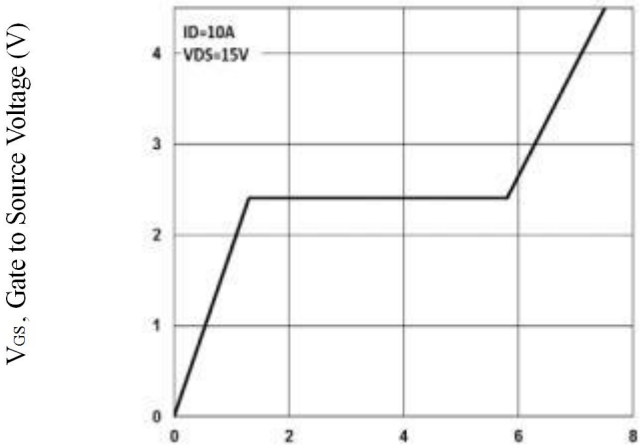
T_J , Junction Temperature (℃)

Fig. 2 Normalized RDSON vs. T_J



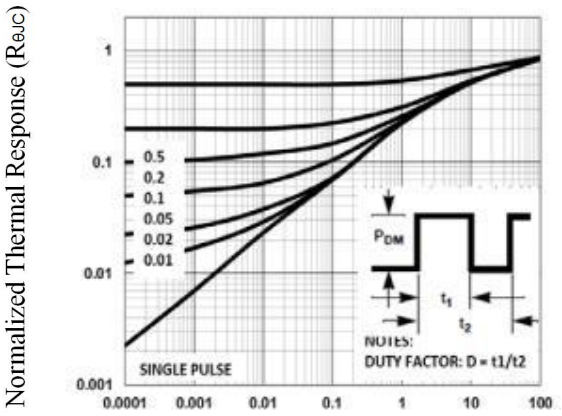
T_J , Junction Temperature (℃)

Fig. 3 Normalized V_{th} vs. T_J



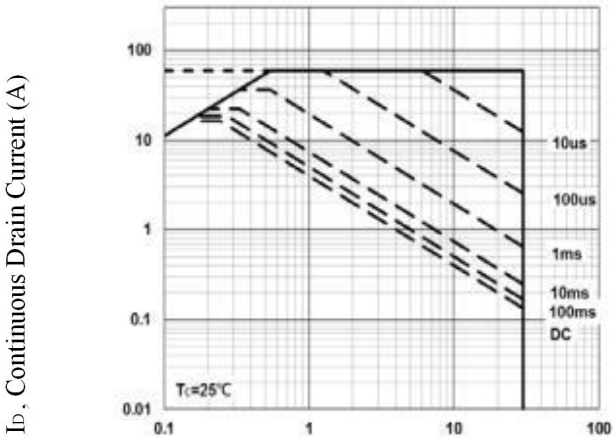
Qg , Gate Charge (nC)

Fig. 4 Gate Charge Waveform



Square Wave Pulse Duration (s)

Fig. 5 Normalized Transient Impedance



V_{DS} , Drain to Source Voltage (V)

Fig. 6 Maximum Safe Operation Area

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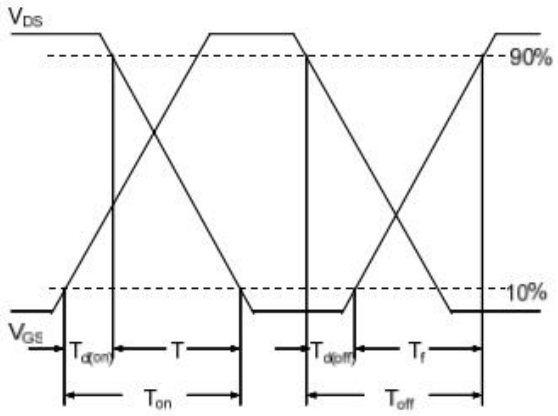

Fig. 7 Switching Time Waveform

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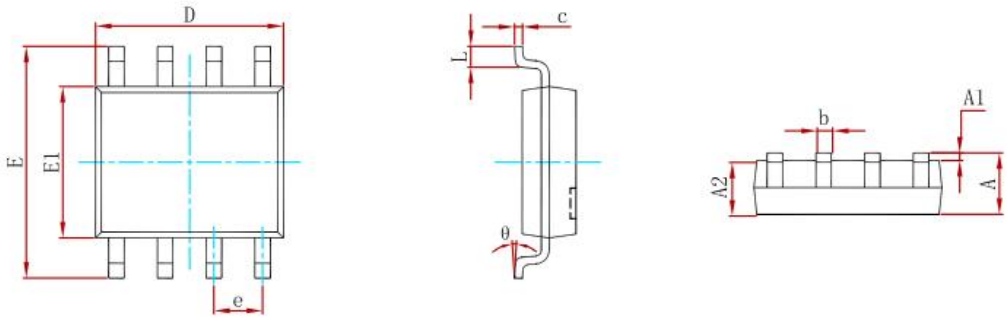
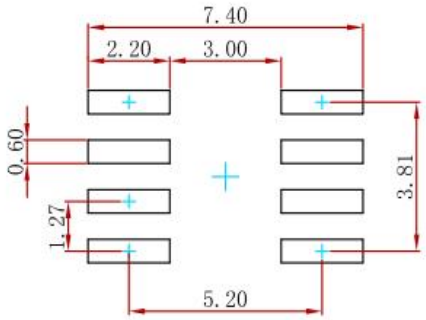
PACKAGE MECHANICAL DATA



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	**Max**	**Min**	**Max**
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270(BSC)		0.050(BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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
AO4430	SOP--8	3000

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