

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



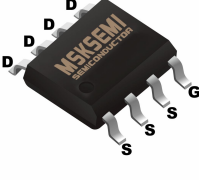
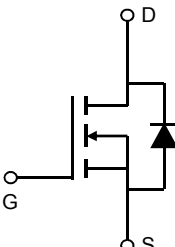

PLED

## **AO4406-MS**

**Product specification**

## Features

- $V_{DS} (V) = 30V$
- $I_D = 12 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 12.0m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 15.5m\Omega (V_{GS} = 4.5V)$

PACKAGE OUTLINE	N-Channel MOSFET	Marking
 <p>SOP-8</p>		

## Absolute Maximum Ratings ( $T_A=25^{\circ}C$ unless otherwise noted)

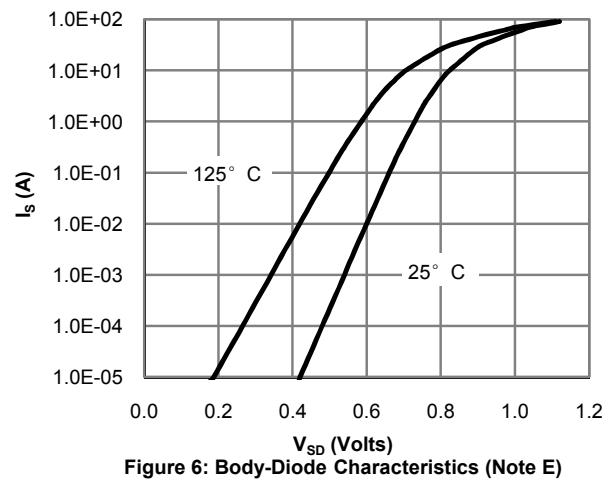
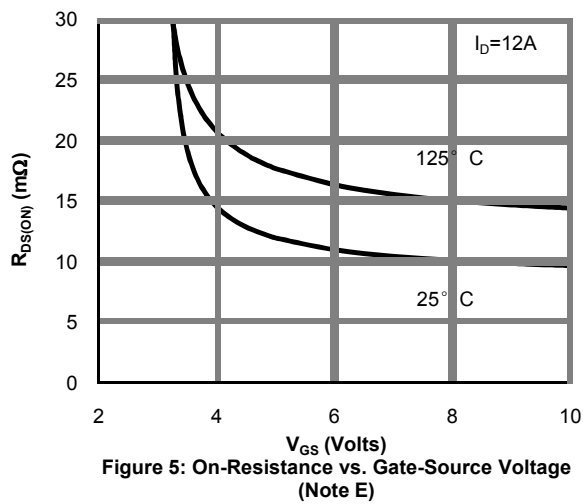
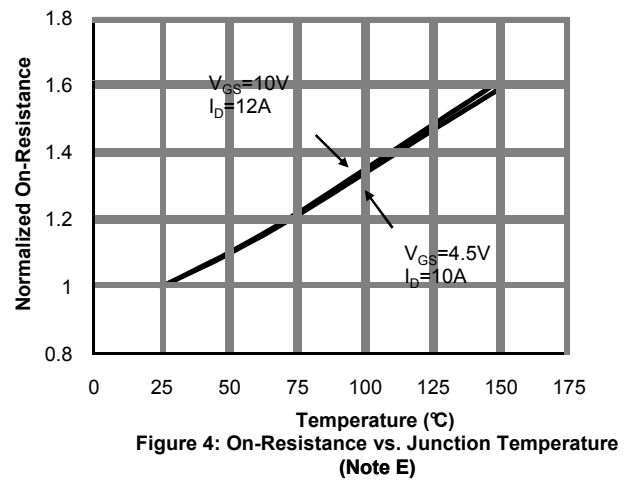
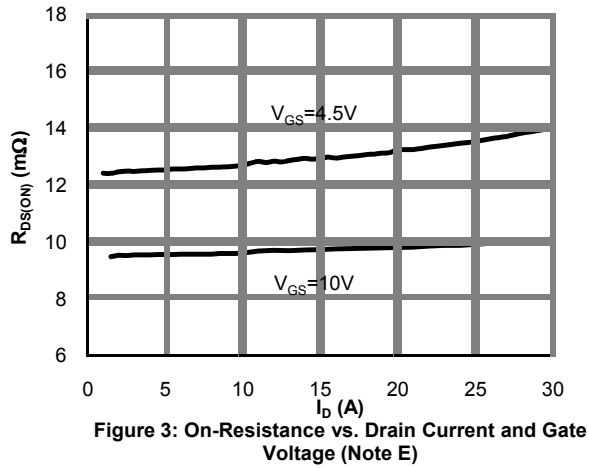
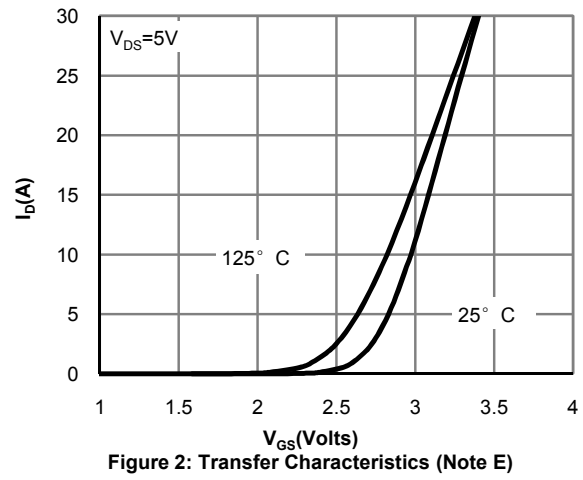
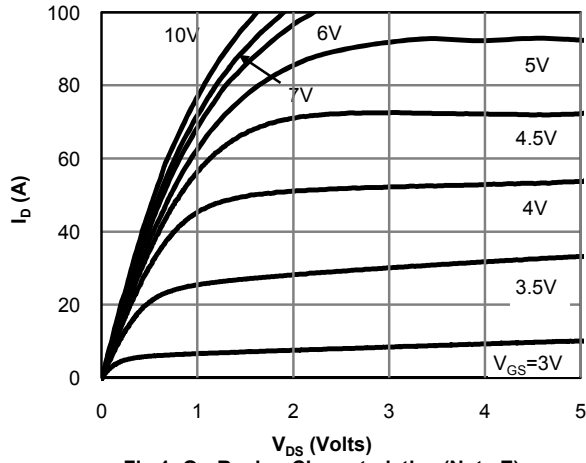
Parameter		Symbol	Rating	Unit
Drain-Source Voltage		$V_{DS}$	30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current	$T_A=25^{\circ}C$	$I_D$	12	A
	$T_A=70^{\circ}C$		10	
Pulsed Drain Current		$I_{DM}$	100	
Avalanche Current		$I_{AS}$	22	
Avalanche energy	$L=0.1mH$	$E_{AS}$	24	mJ
Power Dissipation	$T_A=25^{\circ}C$	$P_D$	3.1	W
	$T_A=70^{\circ}C$		2	
Thermal Resistance.Junction- to-Ambient	$t \leq 10s$	$R_{thJA}$	40	$^{\circ}C/W$
	Steady-State		75	
Thermal Resistance.Junction- to-Lead		$R_{thJL}$	24	
Junction Temperature		$T_J$	150	$^{\circ}C$
Storage Temperature Range		$T_{stg}$	-55 to 150	

**Electrical Characteristics Ta = 25°C**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =250 $\mu$ A, V <sub>GS</sub> =0V	30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V			1	$\mu$ A
		V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			5	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> = $\pm$ 20V			$\pm$ 100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 $\mu$ A	1.5		2.5	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =12A			12	m $\Omega$
		V <sub>GS</sub> =10V, I <sub>D</sub> =12A T <sub>J</sub> =125°C			17	
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A			15.5	
On State Drain Current	I <sub>D(ON)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =5V	100			A
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =12A		45		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz	610		910	pF
Output Capacitance	C <sub>oss</sub>		88		160	
Reverse Transfer Capacitance	C <sub>rss</sub>		40		100	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz	0.8		2.4	$\Omega$
Total Gate Charge (10V)	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =12A	11		17	nC
Total Gate Charge (4.5V)			5		8	
Gate Source Charge	Q <sub>gs</sub>		1.9		2.9	
Gate Drain Charge	Q <sub>gd</sub>		1.8		4.2	
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =1.25 $\Omega$ , R <sub>GEN</sub> =3 $\Omega$		4.4		ns
Turn-On Rise Time	t <sub>r</sub>			9		
Turn-Off DelayTime	t <sub>d(off)</sub>			17		
Turn-Off Fall Time	t <sub>f</sub>			6		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 12A, di/dt= 500A/us	5.6		8	nC
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		6.4		9.6	
Maximum Body-Diode Continuous Current	I <sub>S</sub>				4	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V			1	V

**Note** : The static characteristics in Figures 1 to 6 are obtained using <300  $\mu$ s pulses, duty cycle 0.5% max.

## Typical Characteristics



## Typical Characteristics

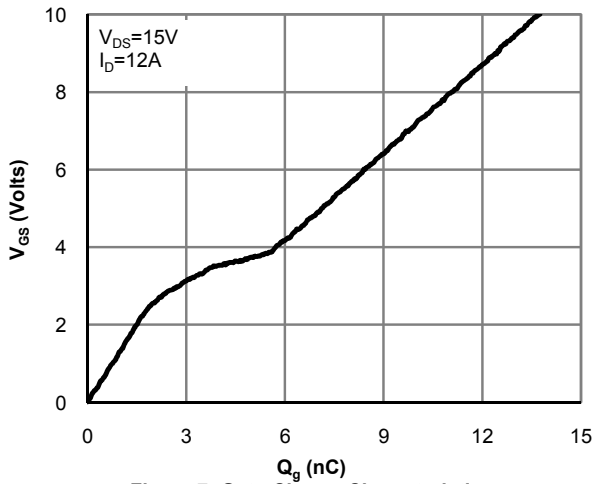


Figure 7: Gate-Charge Characteristics

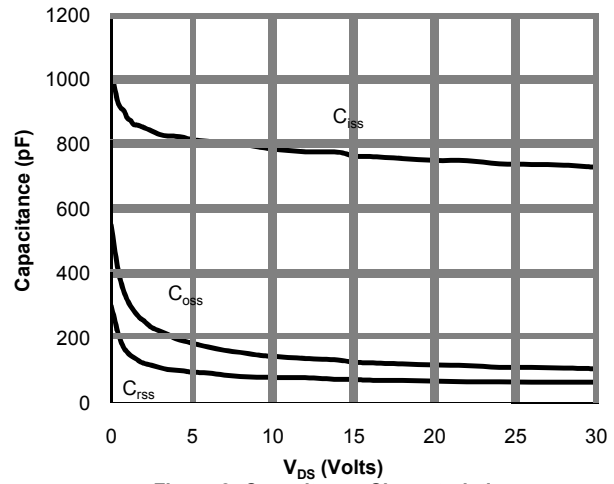


Figure 8: Capacitance Characteristics

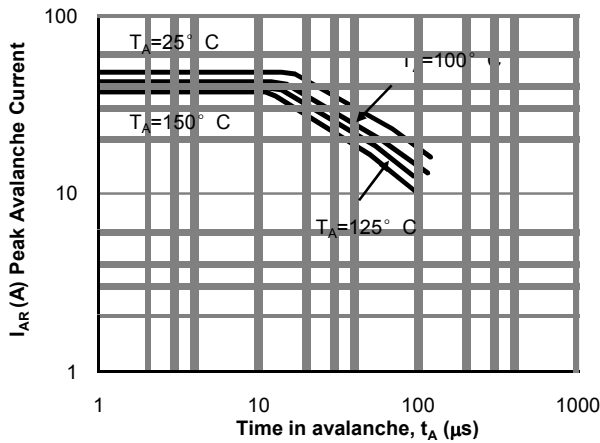


Figure 9: Single Pulse Avalanche capability (Note C)

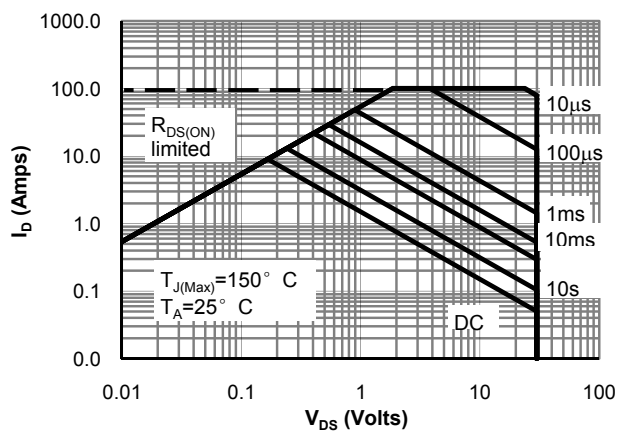


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

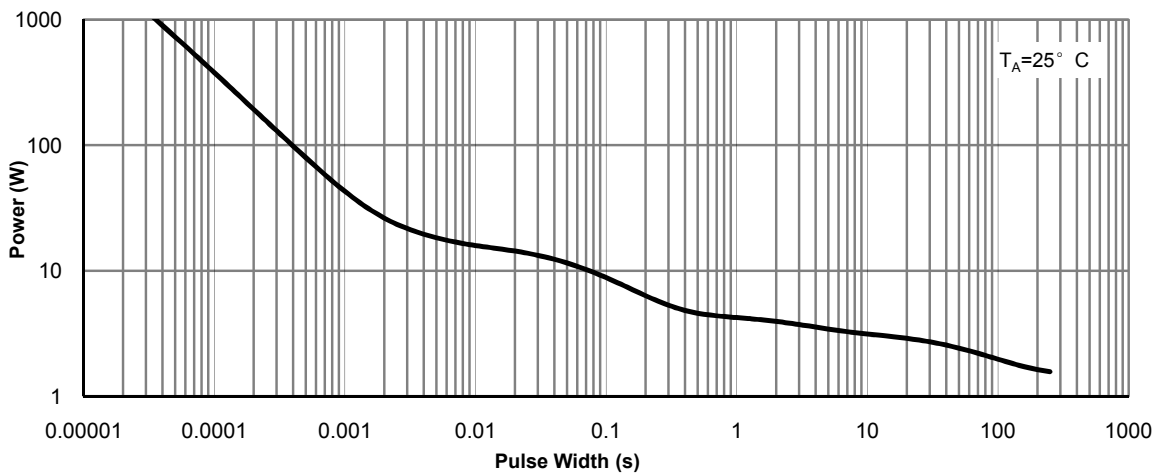
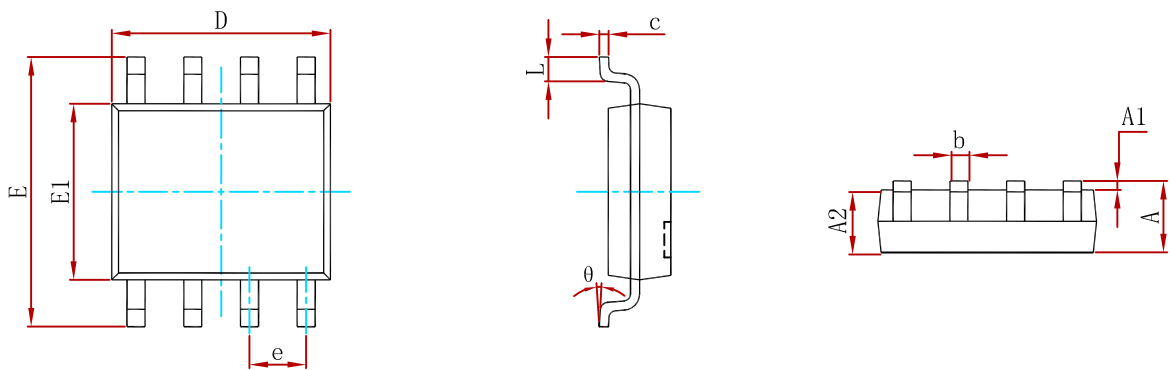


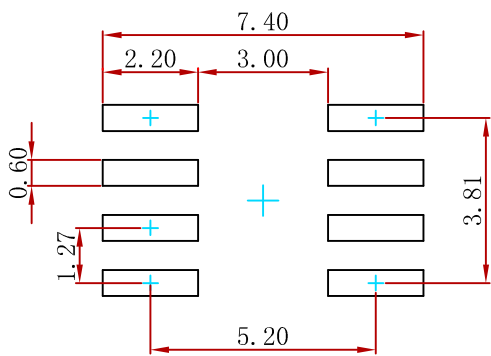
Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

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:  $\pm 0.05\text{mm}$ .  
3. The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
AO4406-MS	SOP-8	3000

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