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SEMICONDUCTOR



ESD



TVS



TSS



MOV



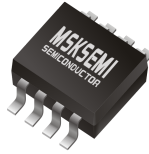
GDT



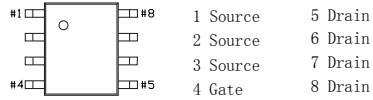
PLED

Product data sheet  
Product data sheet

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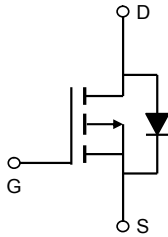


SOP-8



■ Features

- $V_{DS} (V) = -30V$
- $I_D = -15 A (V_{GS} = -10V)$
- $R_{DS(ON)} < 7.5m\Omega (V_{GS} = -10V)$
- $R_{DS(ON)} < 12m\Omega (V_{GS} = -4.5V)$



Absolute Maximum Ratings  $T_a = 25^\circ C$

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	-30	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current	$I_D$	$T_A = 25^\circ C$	-15	A
		$T_A = 70^\circ C$	-12.8	
Pulsed Drain Current	$I_{DM}$	-80		
Avalanche Current	$I_{AS}, I_{AR}$	30		
Avalanche energy	$L = 0.1mH$	$E_{AS}, E_{AR}$	135	mJ
Power Dissipation	$P_D$	$T_A = 25^\circ C$	3.1	W
		$T_A = 70^\circ C$	2	
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	$t \leq 10s$	40	$^\circ C/W$
		Steady-State	75	
Thermal Resistance.Junction- to-Lead	$R_{thJL}$	24		
Junction Temperature	$T_J$	150	$^\circ C$	
Junction 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 μ 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			-5	μA	
		V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C			-25		
Gate-Body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> I <sub>D</sub> =-250 μ A	-1.4		-2.7	V	
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-15A			7.5	mΩ	
		V <sub>GS</sub> =-10V, I <sub>D</sub> =-15A T <sub>J</sub> =125°C			11.5		
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A			12		
On state drain current	I <sub>D(ON)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-5V	-80			A	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-15A	35	50		S	
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-15V, f=1MHz		5270	6400	pF	
Output Capacitance	C <sub>oss</sub>			945			
Reverse Transfer Capacitance	C <sub>rss</sub>			745			
Gate resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz		2	3	Ω	
Total Gate Charge (10V)	Q <sub>g</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-15A		100	120	nC	
Total Gate Charge (4.5V)				51.5			
Gate Source Charge			Q <sub>gs</sub>		14.5		
Gate Drain Charge			Q <sub>gd</sub>		23		
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, R <sub>L</sub> =1Ω, R <sub>GEN</sub> =3Ω		14		ns	
Turn-On Rise Time	t <sub>r</sub>			16.5			
Turn-Off DelayTime	t <sub>d(off)</sub>			76.5			
Turn-Off Fall Time	t <sub>f</sub>			37.5			
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =-15A, d <sub>i</sub> /d <sub>t</sub> =100A/us		36.7	45	nC	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			28			
Maximum Body-Diode Continuous Current	I <sub>s</sub>				-5	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 μs pulses, duty cycle 0.5% max.

Typical Characteristics

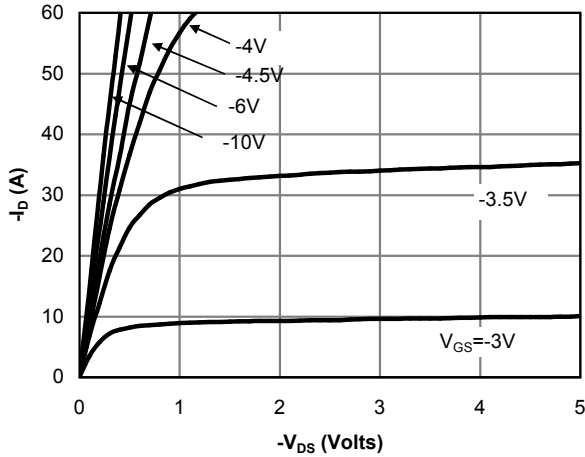


Fig 1: On-Region Characteristics (Note E)

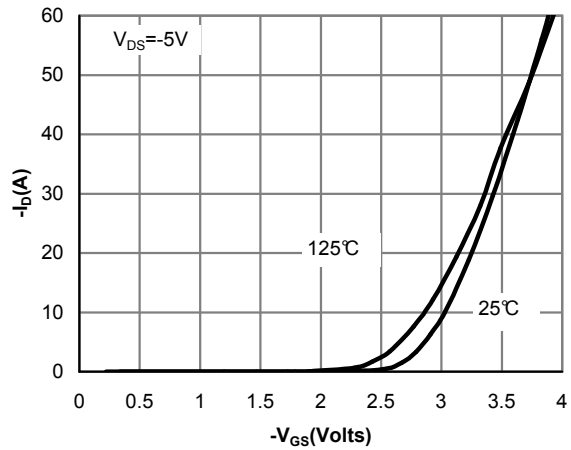


Figure 2: Transfer Characteristics (Note E)

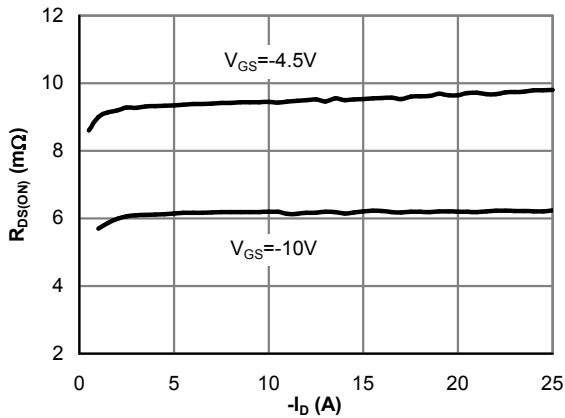


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

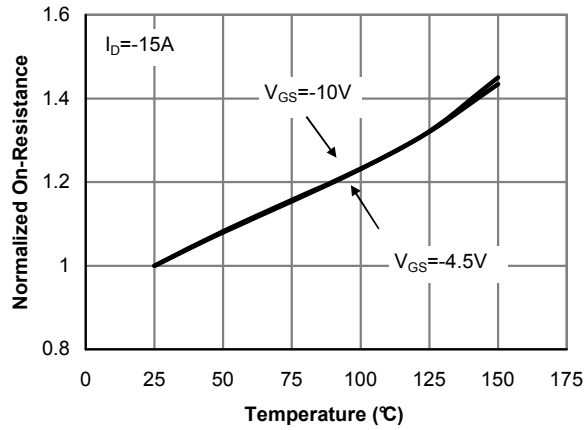


Figure 4: On-Resistance vs. Junction Temperature (Note E)

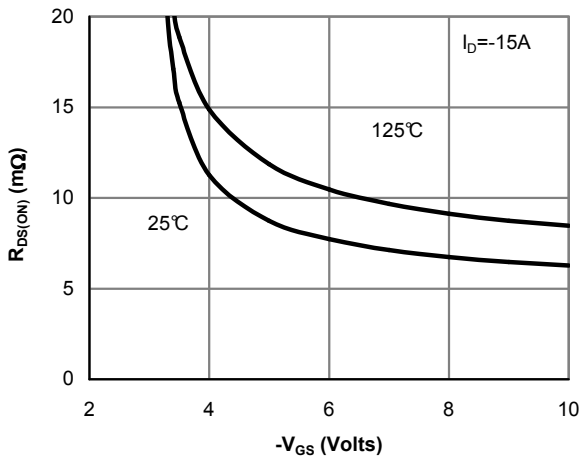


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

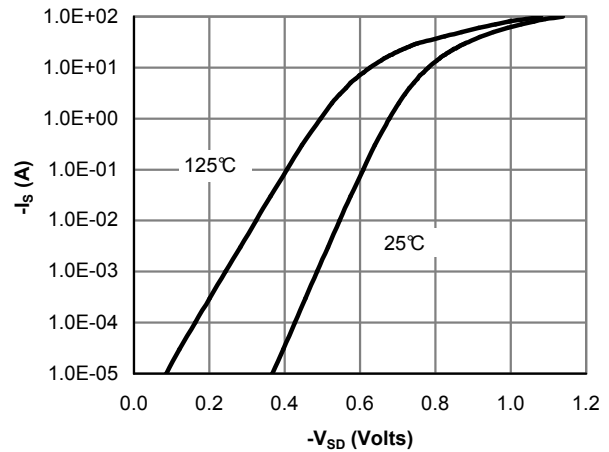


Figure 6: Body-Diode Characteristics (Note E)

Typical Characteristics

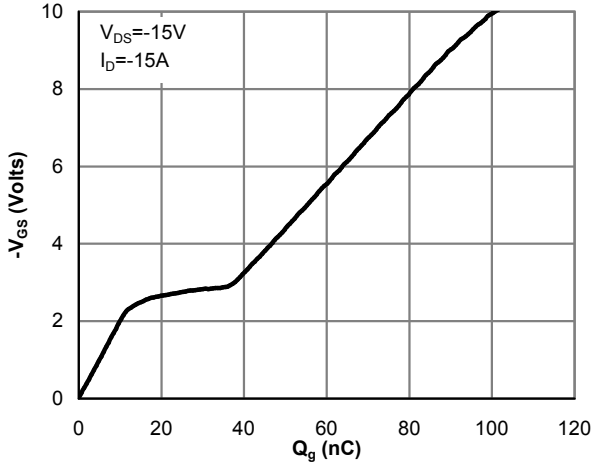


Figure 7: Gate-Charge Characteristics

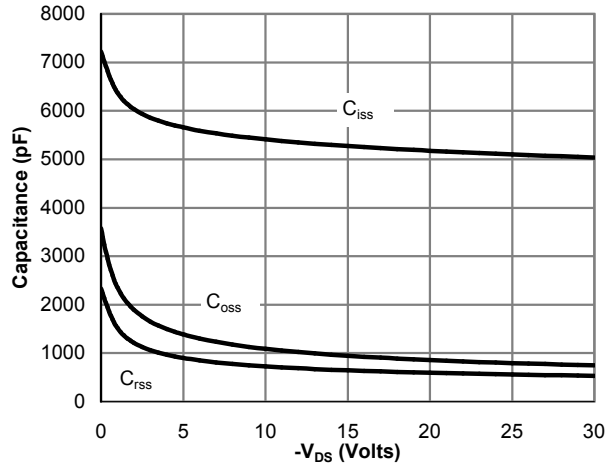


Figure 8: Capacitance Characteristics

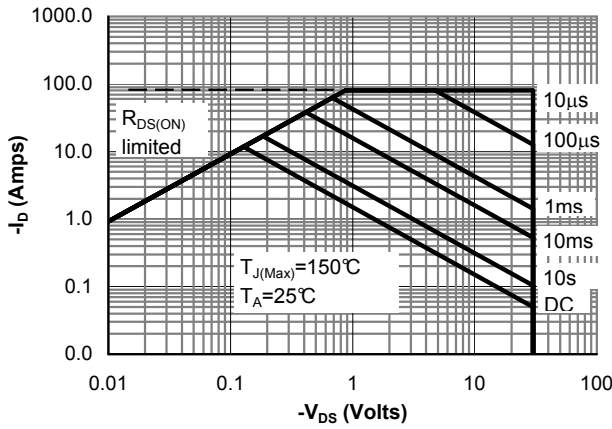


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

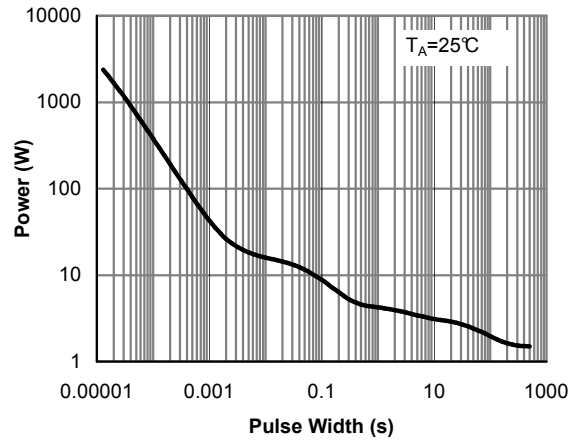


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

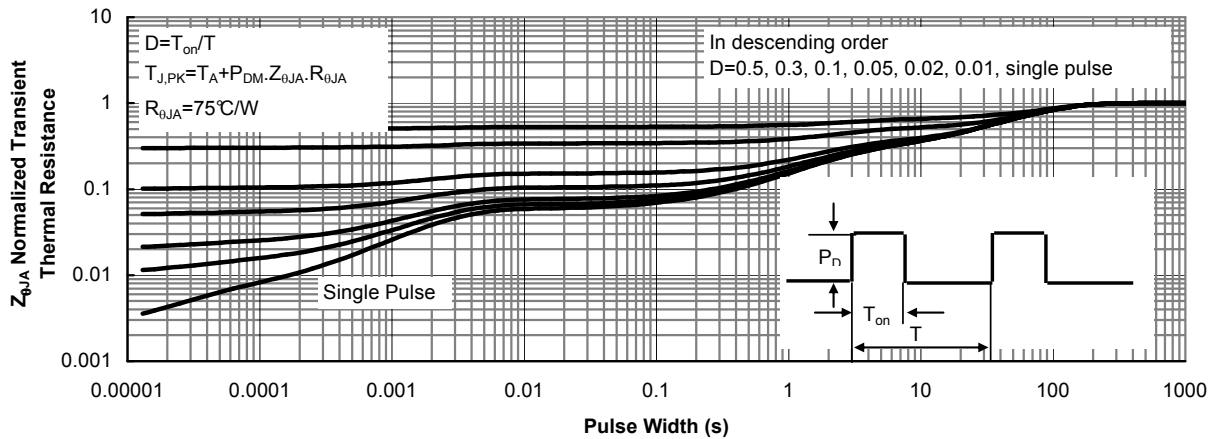
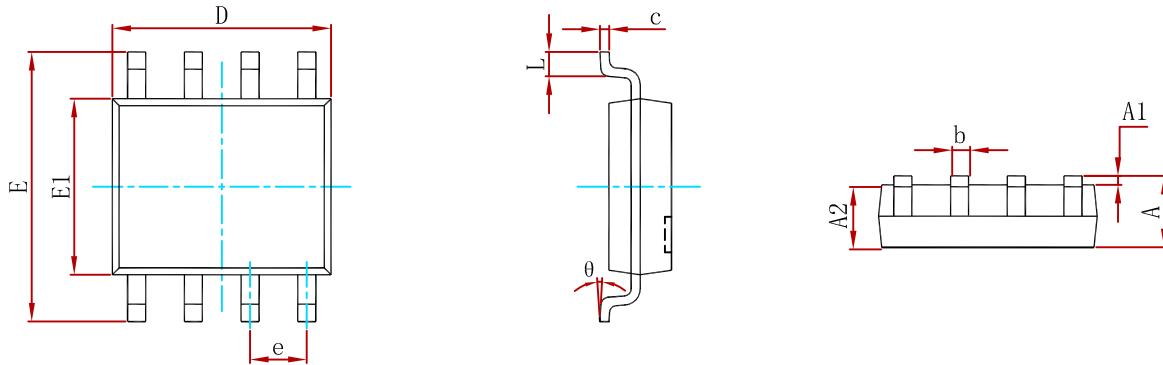


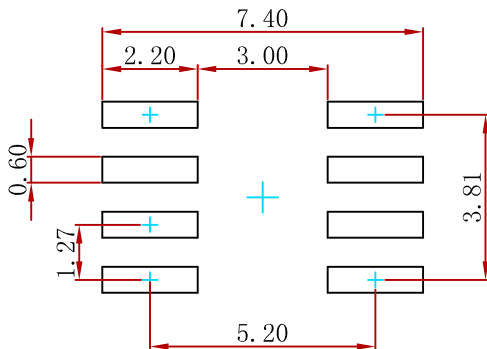
Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

**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: ± 0.05mm.  
 3. The pad layout is for reference purposes only.

**REEL SPECIFICATION**

P/N	PKG	QTY
AO4409-MS	SOP-8	3000

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