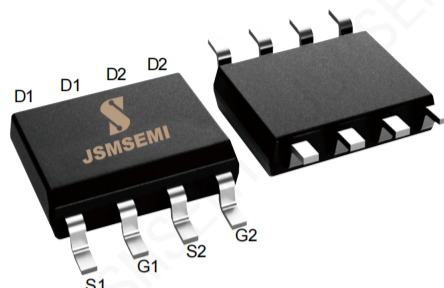


DESCRIPTION

The AO4953 is N channel enhancement mode power effect transistor which is produced using high cell density advanced trench technology.

The high density process is especially able to minize on-state resistance. These devices are. especially suited for low voltage application power management DC-DC converters.

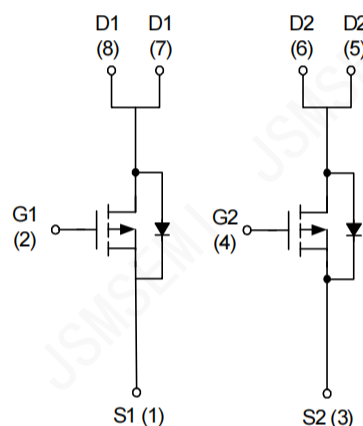


FEATURE

- 30V/-6.5A ,
 $R_{DS(ON)} = 36m\Omega (typ.) @ V_{GS} = -10V$
 $R_{DS(ON)} = 50m\Omega (typ.) @ V_{GS} = -4.5V$
- Reliable and Rugged
- Lead Free and Green Device Available (RoHS Compliant)

APPLICATIONS

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems



P-Channel MOSFET

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

Symbol	Parameter		Rating	Unit
V _{DSS}	Drain-Source Voltage		-30	V
V _{GSS}	Gate-Source Voltage		±20	
I _D *	Continuous Drain Current	V _{GS} =-10V	-6.5	A
I _{DM} *	Pulsed Drain Current		-20	
I _S *	Diode Continuous Forward Current		-2	A
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	
P _D *	Power Dissipation for Single Operation	T _A =25°C	2	W
		T _A =100°C	0.8	
R _{θJA} *	Thermal Resistance-Junction to Ambient		62.5	°C/W

Note: *Surface Mounted on $1in^2$ pad area, $t \leq 10sec$.

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

Symbol	Parameter	Test Condition	AO4953			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-24V, V_{GS}=0V$ $T_J=85^{\circ}C$	-	-	-1	μA
			-	-	-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	-1	-1.5	-2.3	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
$R_{DS(ON)}^a$	Drain-Source On-state Resistance	$V_{GS}=-10V, I_{DS}=-6.5A$ $V_{GS}=-4.5V, I_{DS}=-5.6A$	-	36	45	$m\Omega$
			-	50	65	
V_{SD}^a	Diode Forward Voltage	$I_{SD}=-1.7A, V_{GS}=0V$	-	-0.8	-1.3	V
Gate Charge Characteristics ^b						
Q_g	Total Gate Charge	$V_{DS}=-15V, V_{GS}=-10V, I_{DS}=-4.9A$	-	11.6	16	nC
Q_{gs}	Gate-Source Charge		-	1.3	-	
Q_{gd}	Gate-Drain Charge		-	2.5	-	
Dynamic Characteristics ^b						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	-	8	-	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=-15V, Frequency=1.0MHz$	-	625	-	pF
C_{oss}	Output Capacitance		-	100	-	
C_{rss}	Reverse Transfer Capacitance		-	60	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-15V, R_L=15\Omega, I_{DS}=-1A, V_{GEN}=-10V, R_G=6\Omega$	-	6	12	ns
t_r	Turn-on Rise Time		-	12	23	
$t_{d(OFF)}$	Turn-off Delay Time		-	25	46	
t_f	Turn-off Fall Time		-	6	12	
t_{rr}	Reverse Recovery Time	$I_{DS}=-4.9A,$	-	14	-	ns
Q_{rr}	Reverse Recovery Charge	$di_{SD}/dt=100A/\mu s$	-	5	-	nC

Notes:

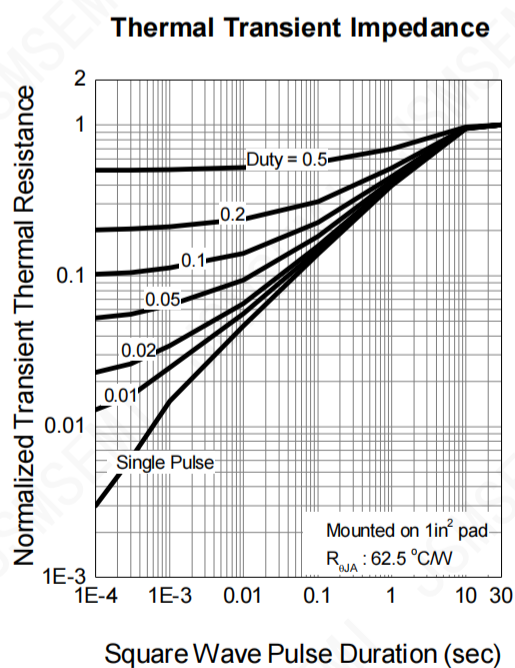
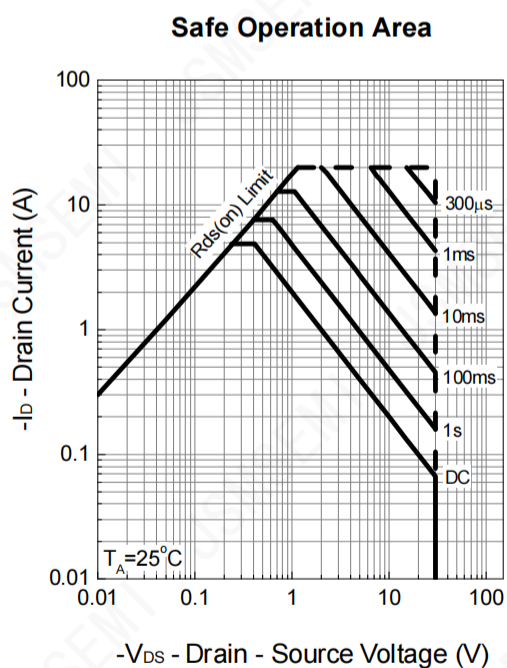
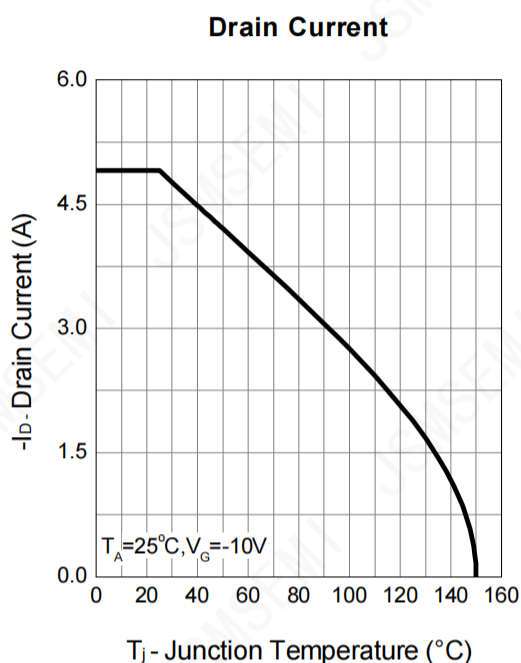
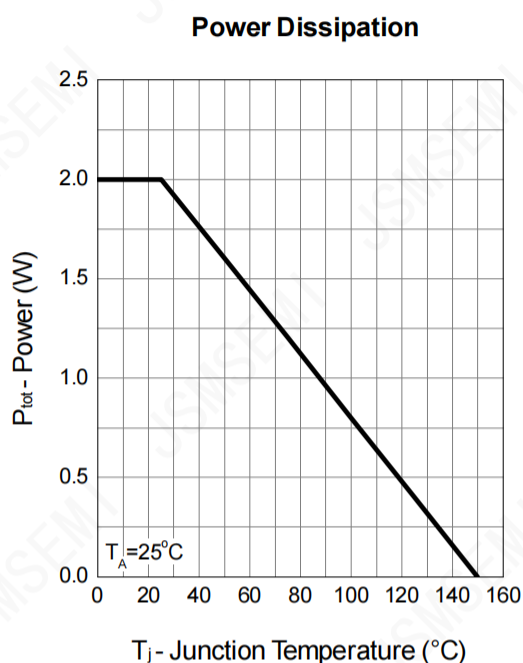
 a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

b : Guaranteed by design, not subject to production testing.

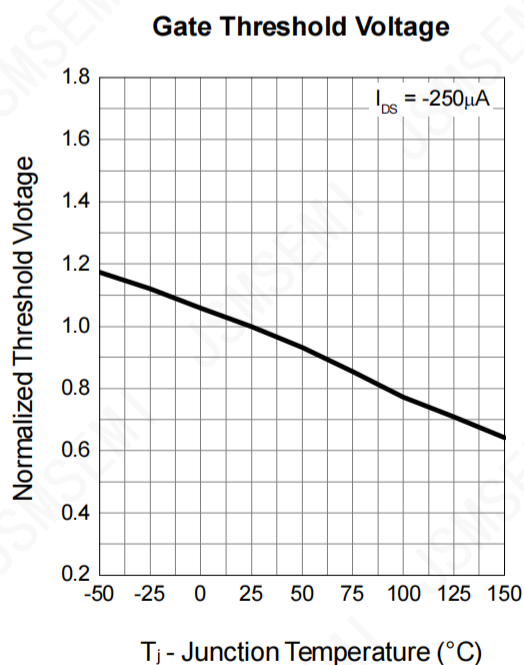
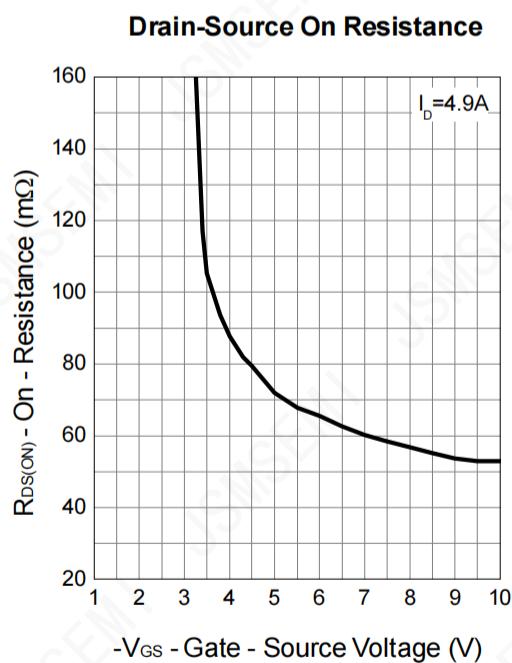
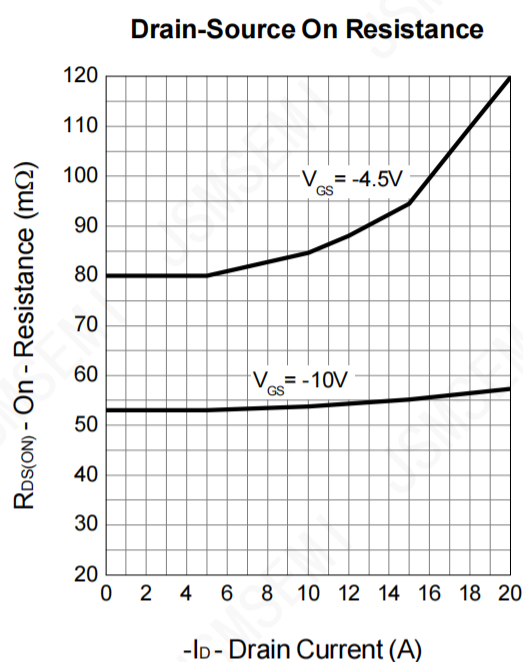
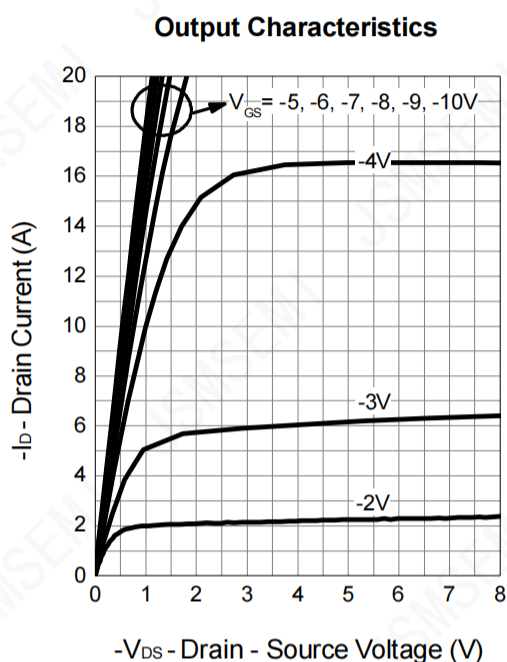
Ordering Information

Order number	Package	Marking	Operation Temperature Range	MSL Grade	Ship,Quantity	Green
AO4953	SOP-8	4953	-55 to 150°C	1	T&R,3000	Rohs

Typical Characteristics

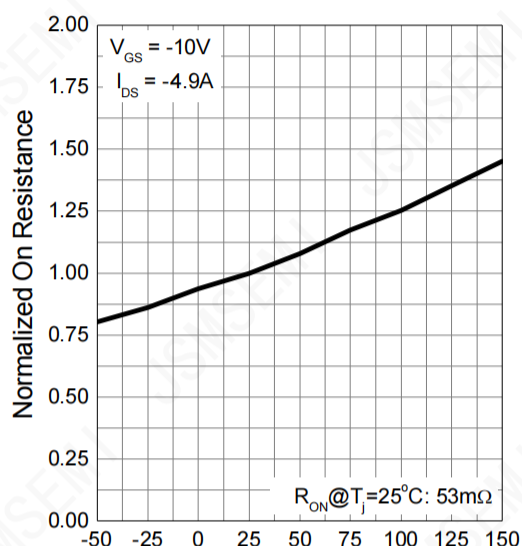


Typical Characteristics (Cont.)



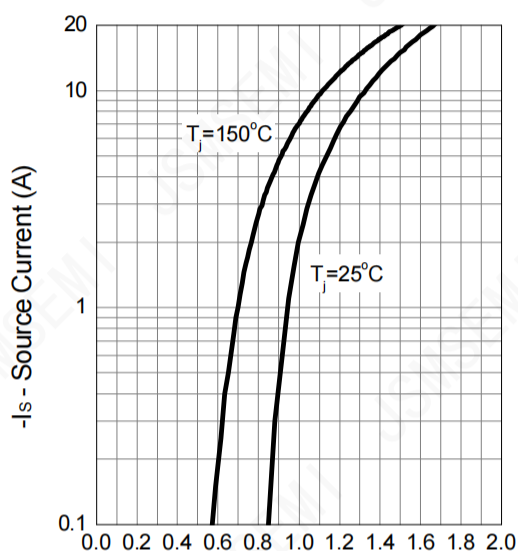
Typical Characteristics (Cont.)

Drain-Source On Resistance



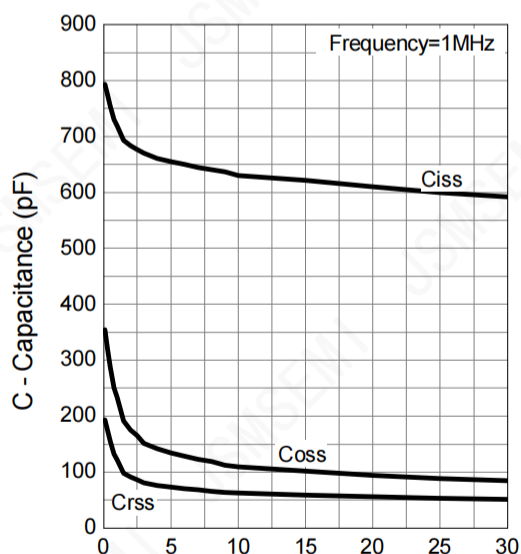
T_j - Junction Temperature ($^{\circ}\text{C}$)

Source-Drain Diode Forward



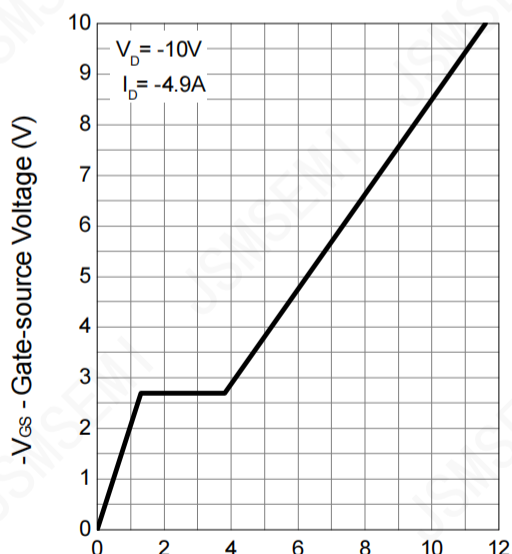
$-V_{SD}$ - Source-Drain Voltage (V)

Capacitance



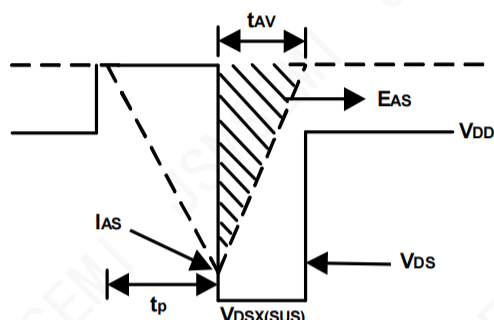
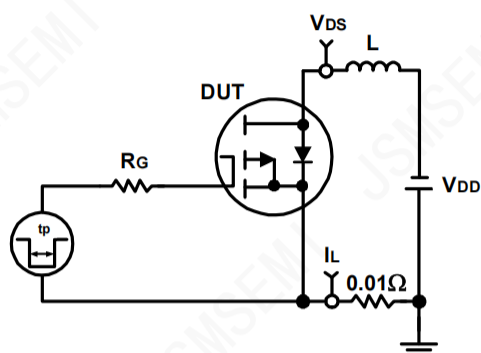
$-V_{DS}$ - Drain-Source Voltage (V)

Gate Charge

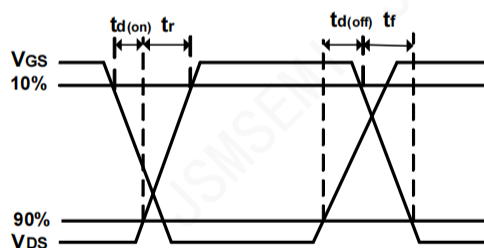
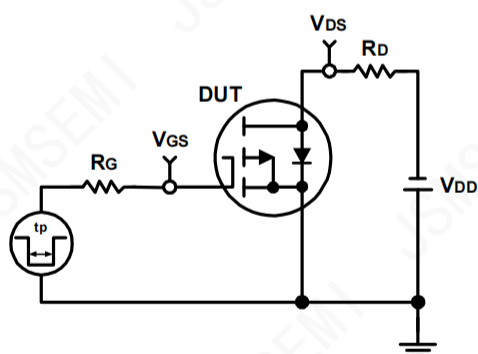


Q_G - Gate Charge (nC)

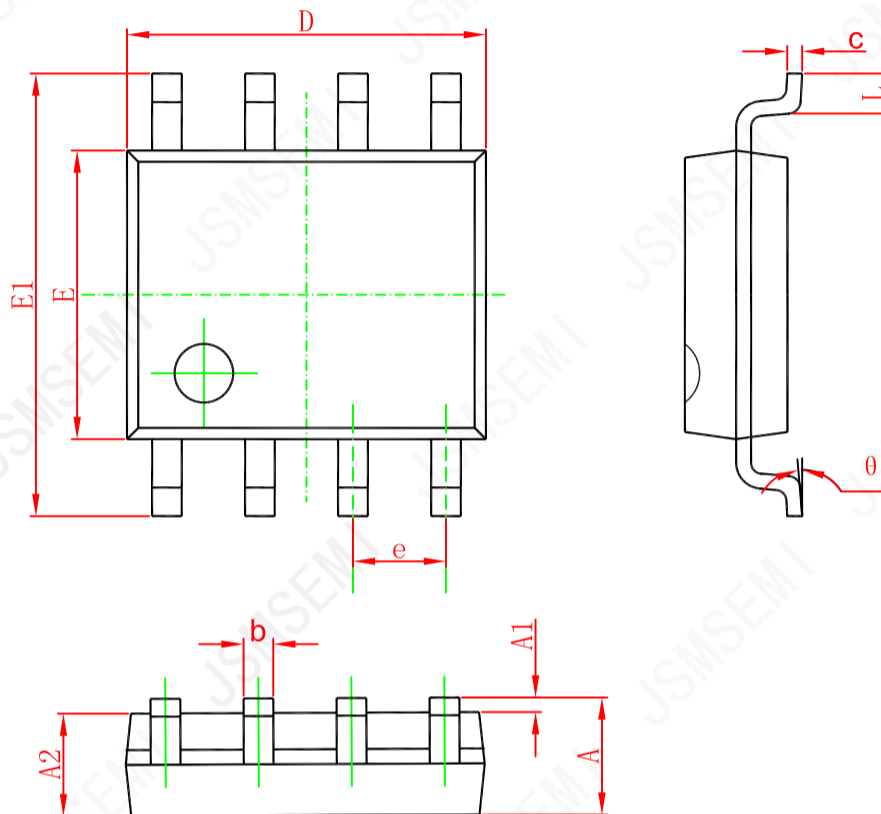
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



■ SOP8 PACKAGE OUTLINE DIMENSIONS



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	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°