

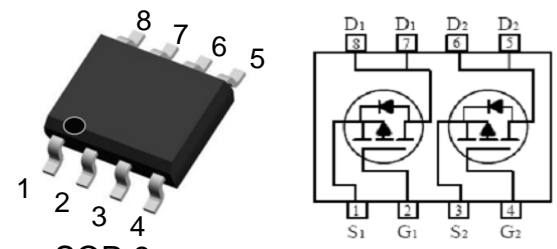
Dual P-Channel Enhancement-Mode MOSFET (-30V, -5.3A)

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (m Ω)TYP
-30V	-5.3A	49 @ $V_{GS} = -10V, I_D = -5.3A$
		68 @ $V_{GS} = -4.5V, I_D = -3.9A$

Features

- Advanced Trench Process Technology
- High Density Cell Design for Ultra Low On-Resistance
- Surface mount Package
- Lead (Pb) -free and halogen-free

 <p>Pin1: Source1 Pin2: Gate1 Pin3: Source2 Pin4: Gate2 Pin5/6: Drain2 Pin7/8: Drain1</p>	<p>TOP Marking</p> <p>ES4953 XXXXXX</p> <p>logo & part number ID CODE</p>
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Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current (Continuous)	-5.3	A
I_{DM}	Drain Current (Pulsed) ^a	-20	A
P_D	Total Power Dissipation @ $T_A = 25^\circ\text{C}$	2.0	W
I_S	Maximum Diode Forward Current	-2	A
T_J, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
R_{QJA}	Thermal Resistance Junction to Ambient (PCB mounted) ^b	50	$^\circ\text{C/W}$

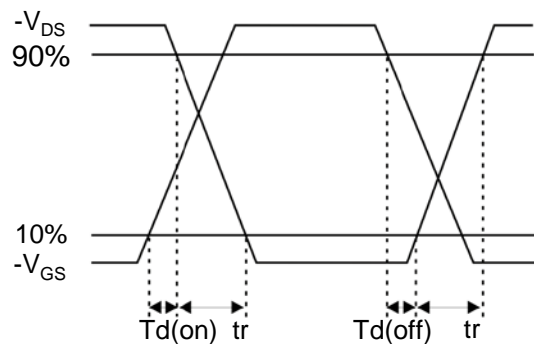
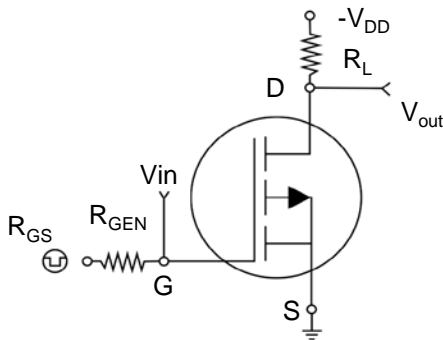
a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

b: 1-in² 2oz Cu PCB board

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

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-18V, V_{GS}=0V$	-	-	-1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	± 100	nA
• On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.4	1.9	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=-10V, I_D=-4.8A$	-	49	60	m Ω
		$V_{GS}=-4.5V, I_D=-2A$	-	68	85	
• Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-6V, V_{GS}=0V, f=1\text{MHz}$	-	504	-	PF
C_{oss}	Output Capacitance		-	68	-	
C_{rss}	Reverse Transfer Capacitance		-	56	-	
• Switching Characteristics						
Q_g	Total Gate Charge	$V_{DS}=-6V, I_D=-2.8A, V_{GS}=-4.5V$	-	12	-	nC
Q_{gs}	Gate-Source Charge		-	2.3	-	
Q_{gd}	Gate-Drain Charge		-	1.4	-	
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=-6V, R_L=5W, I_D=-1A, V_{GEN}=-4.5V, R_G=6W$	-	8.1	-	nS
t_r	Turn-on Rise Time		-	3.3	-	
$t_{d(off)}$	Turn-off Delay Time		-	29.3	-	
t_f	Turn-off Fall Time		-	5.6	-	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward	$V_{GS}=0V, I_S=-2A$	-	-	-1.3	V

Note: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$



Switching Test Circuit and Switching Waveforms

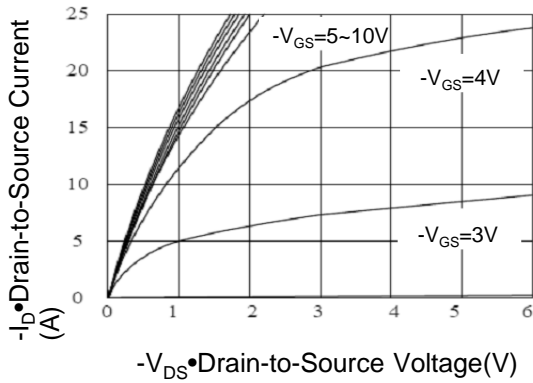


Fig.1 Output Characteristic

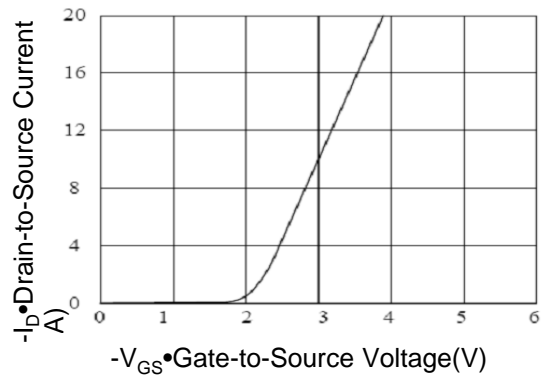


Fig.2 Transfer Characteristic

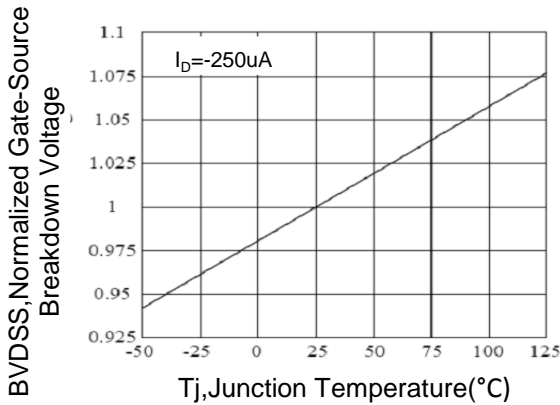


Fig.3 Breakdown Voltage Variation with Temperature

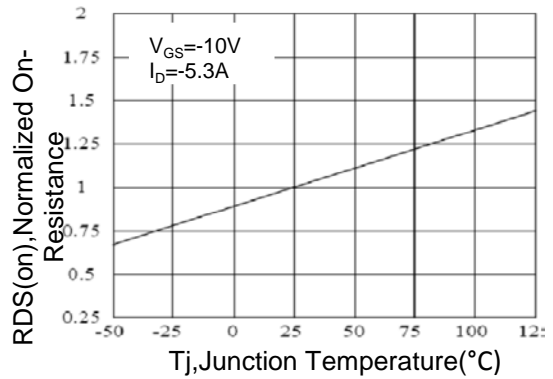


Fig.4 On-Resistance Variation with Temperature

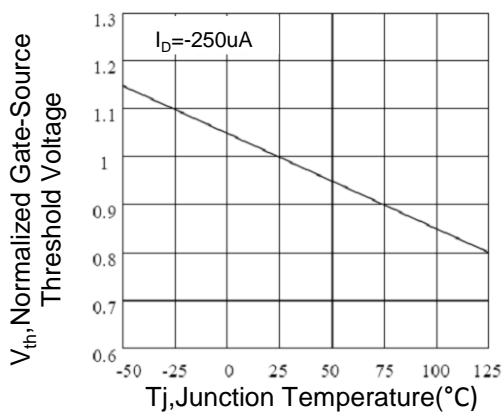


Fig.5 Gate Threshold Variation with Temperature

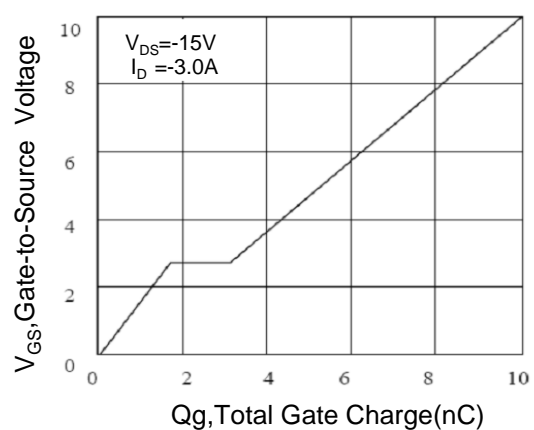
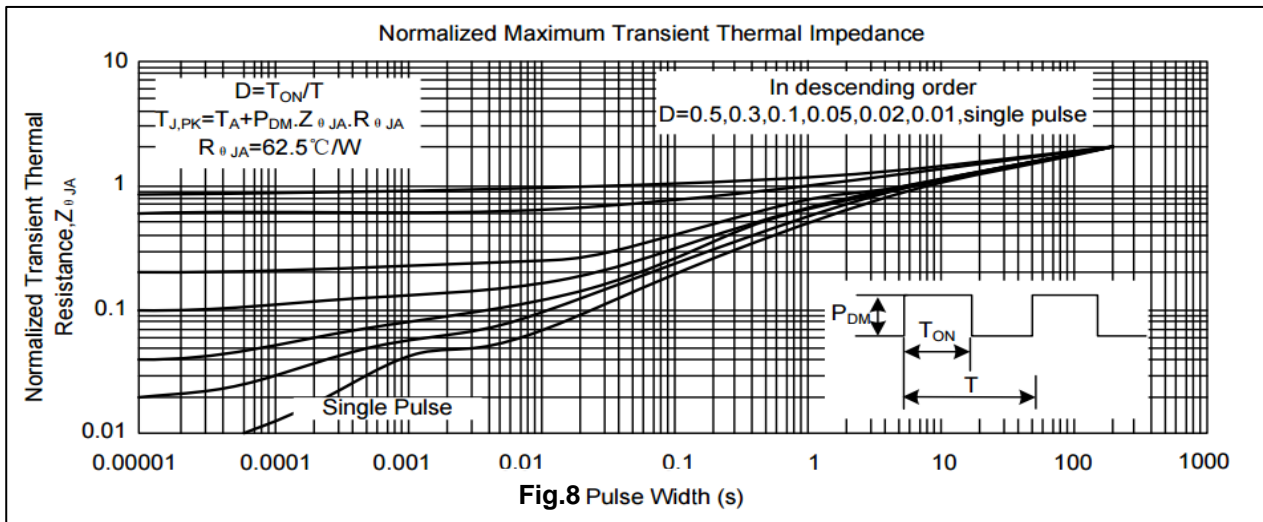
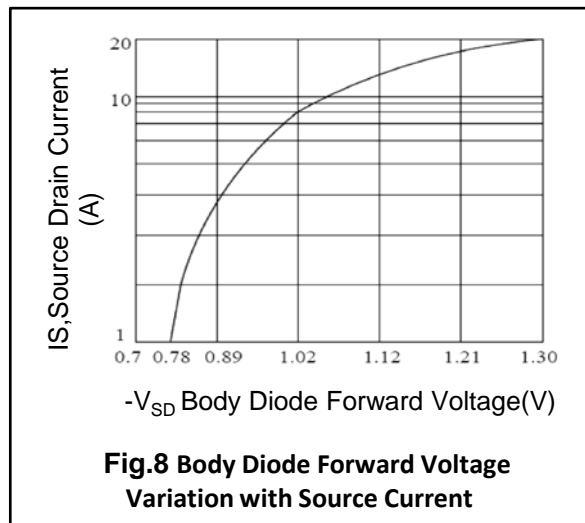
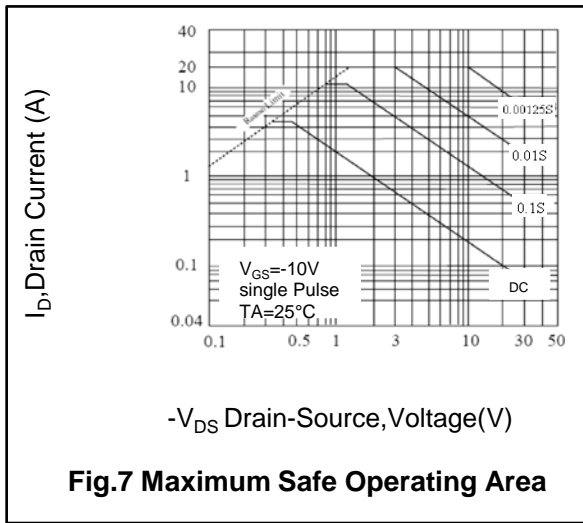
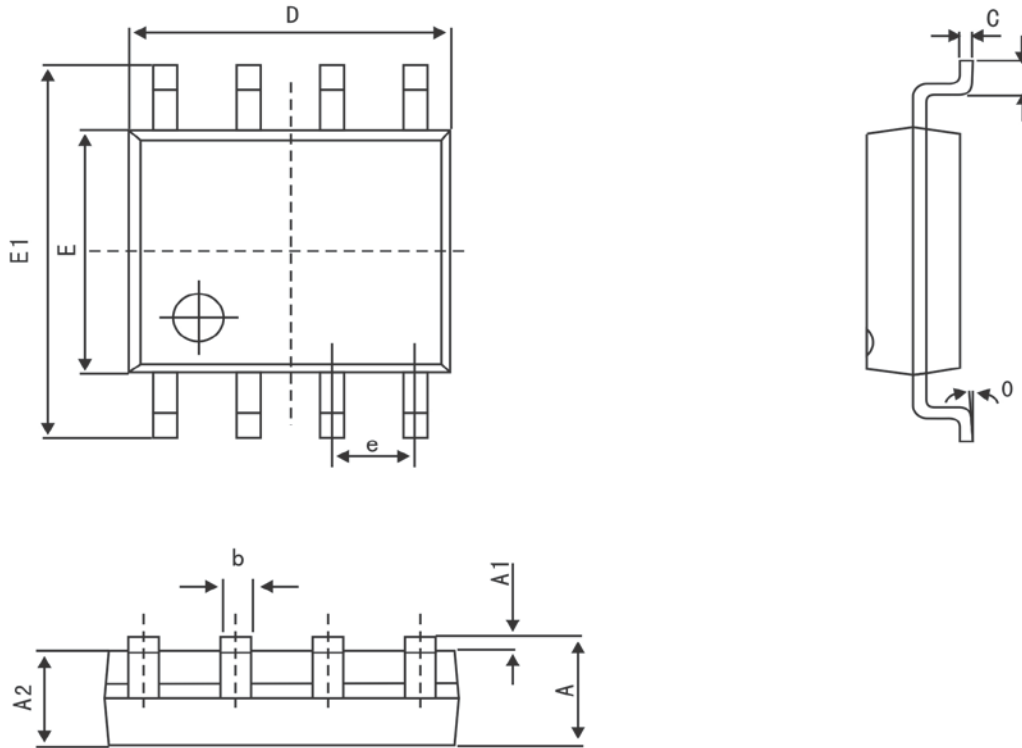


Fig.6 Gate Charge



SO-8 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters (MM)		Dimensions In Inches (MIL)	
	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	4.700	5.100	0.185	0.201
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°