EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

Domestic Part Number	IRLS4030
Overseas Part Number	IRLS4030
Equivalent Part Number	IRLS4030

100V N-Channel Enhancement Mode MOSFET

Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Product Summary

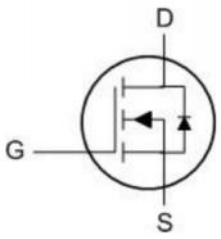
V_{DS} = 100V,I_D = 260A

$R_{DS(ON)}$ < 2.8 mΩ @ V_{GS}=10V (Typ:2.4 mΩ)

Applications

- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

TO-263-2L Pin Configuration



Absolute Maximum Ratings (T_A = 25°C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	260	A
	T_C=100°C		163	
Pulsed Drain Current[1]		I_{DM}	1028	A
Single Pulse Avalanche Energy[2]		EAS	583	mJ
Total Power Dissipation	T_C=25°C	P_D	379	W
Operating Junction and Storage Temperature Range		T_J , T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient[3]	$R_{\theta JA}$	59	°C/W
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	0.33	°C/W

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Electrical Characteristics（T_J = 25°C, unless otherwise noted）

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100	-	-	V
Gate-body Leakage current		I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25°C	I_{DSS}	V_{DS} =100V, V_{GS} = 0V	-	-	1	μA
	T_J=100°C			-	-	100	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	3	4	V
Drain-Source on-Resistance[4]		$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A	-	2.4	2.8	mΩ
Forward Transconductance[4]		g_{fs}	V_{DS}=10V, I_D=20A	-	76	-	S
Dynamic Characteristics[5]							
Input Capacitance		C_{iss}	V_{DS} = 50V, V_{GS} =0V, f =1MHz	-	9030	-	pF
Output Capacitance		C_{oss}		-	1505	-	
Reverse Transfer Capacitance		C_{rss}		-	40	-	
Gate Resistance		R_g	f =1MHz	-	2.3	-	Ω
Switching Characteristics[5]							
Total Gate Charge		Q_g	V_{GS} = 10V, V_{DS} = 50V, I_D=20A	-	150	-	nC
Gate-Source Charge		Q_{gs}		-	32.5	-	
Gate-Drain Charge		Q_{gd}		-	49	-	
Turn-on Delay Time		$t_{d(on)}$	V_{GS} =10V, V_{DD} =50V, R_G = 3Ω, I_D= 20A	-	27	-	ns
Rise Time		t_r		-	78.5	-	
Turn-off Delay Time		$t_{d(off)}$		-	110	-	
Fall Time		t_f		-	86	-	
Body Diode Reverse Recovery Time		t_{rr}	I_F = 20A, dI/dt=100A/μs	-	88	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}		-	220	-	nC
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[4]		V_{SD}	I_D = 20A, V_{GS} = 0V	-	-	1.2	V
Continuous Source Current	T_C=25°C	I_S	-	-	-	260	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The EAS data shows Max. rating . The test condition is V_{DD}=50V, V_{GS}=10V, L=0.4mH, I_{AS}=54A.
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

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Typical Characteristics

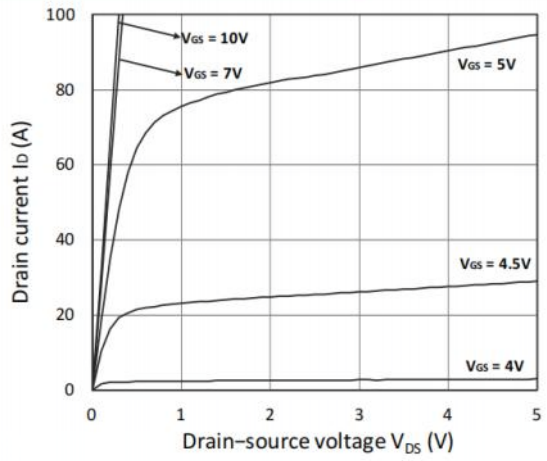

Figure 1. Output Characteristics

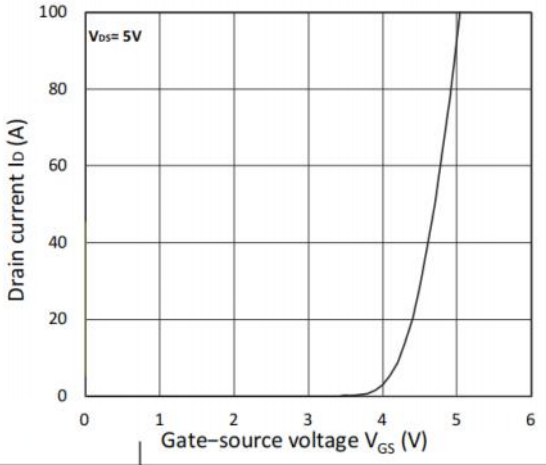

Figure 2. Transfer Characteristics

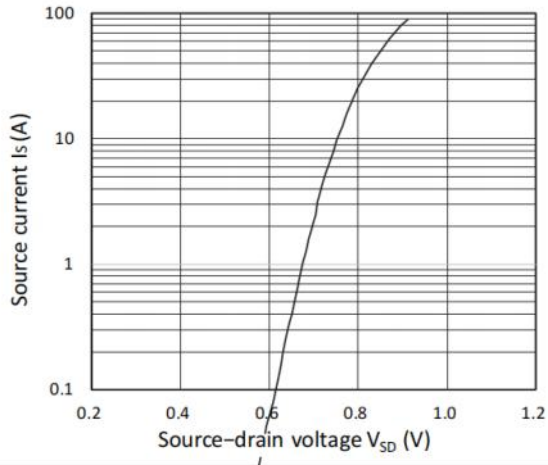

Figure 3. Forward Characteristics of Reverse

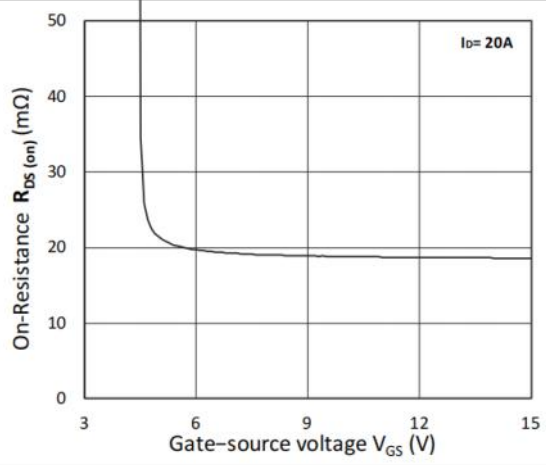

Figure 4. $R_{DS(ON)}$ vs. V_{GS}

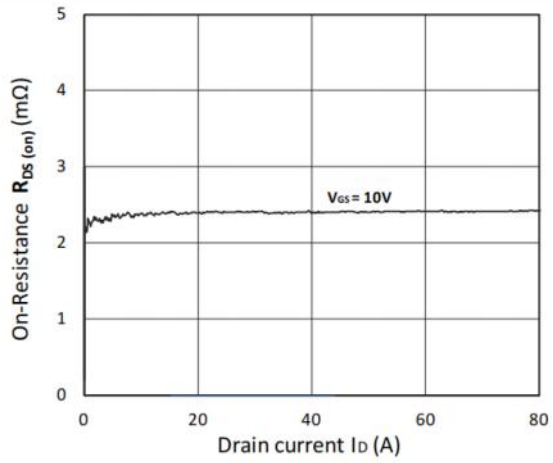

Figure 5. $R_{DS(ON)}$ vs. I_D

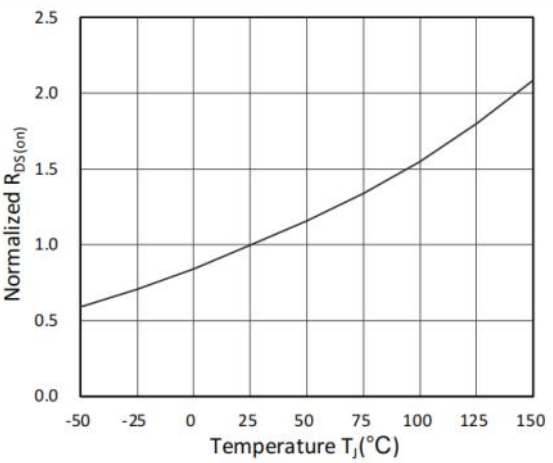

Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

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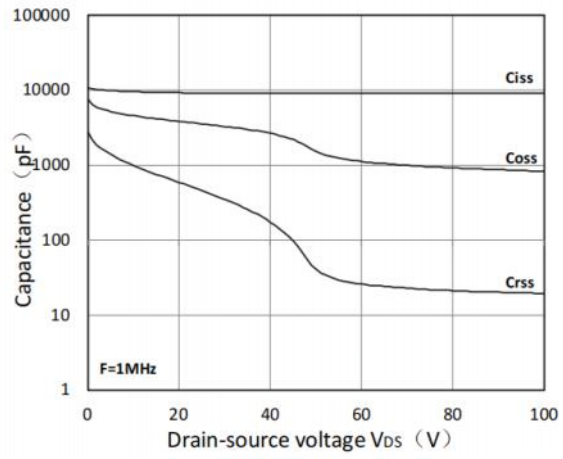

Figure 7. Capacitance Characteristics

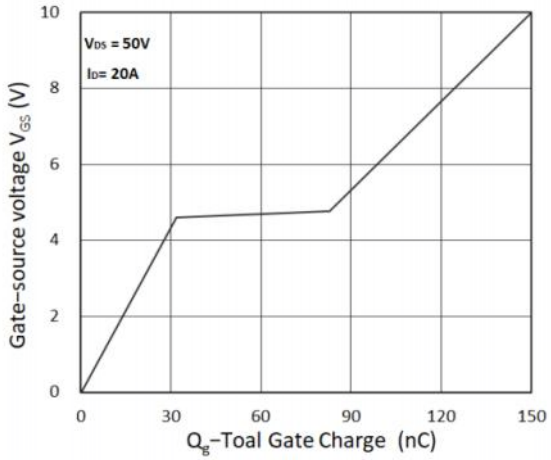

Figure 8. Gate Charge Characteristics

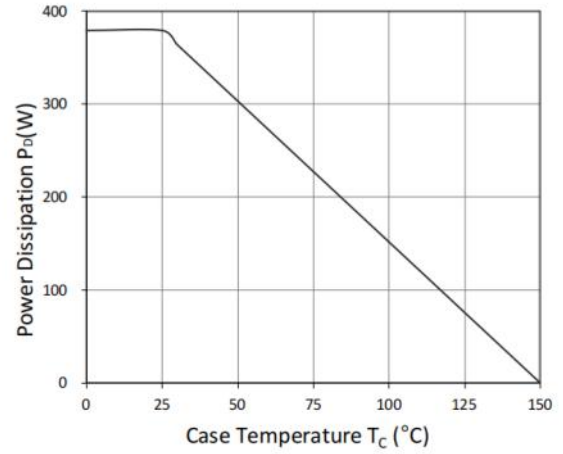

Figure 9. Power Dissipation

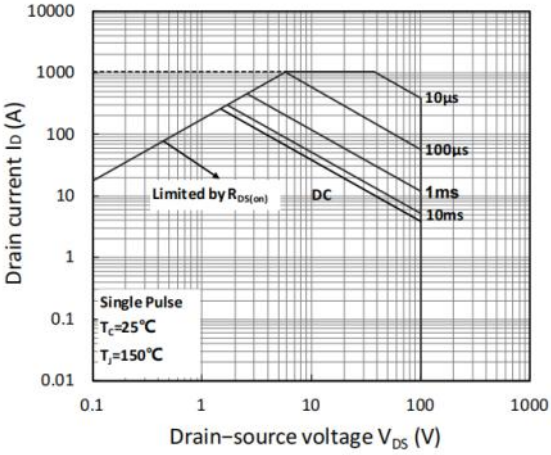

Figure10. Safe Operating Area

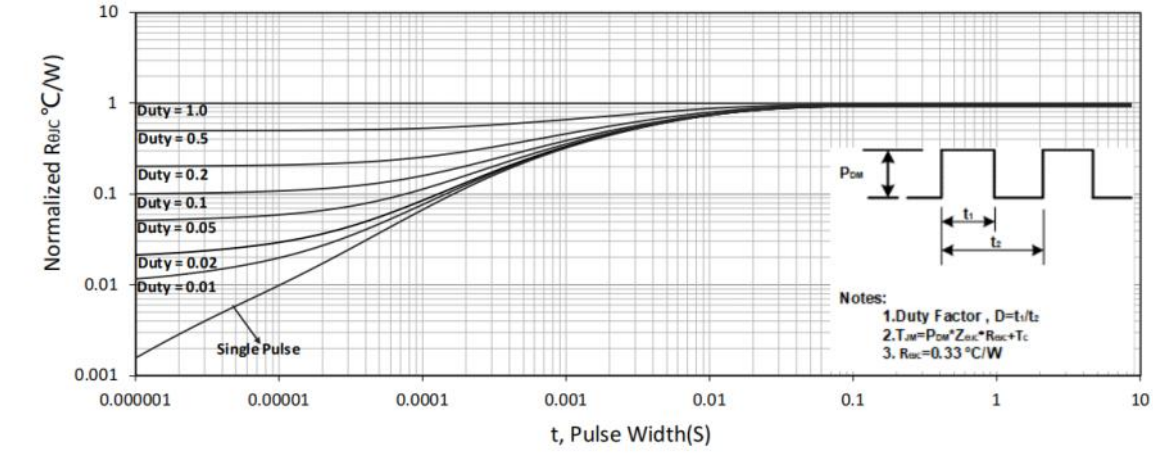

Figure 11. Normalized Maximum Transient Thermal Impedance

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Test Circuit

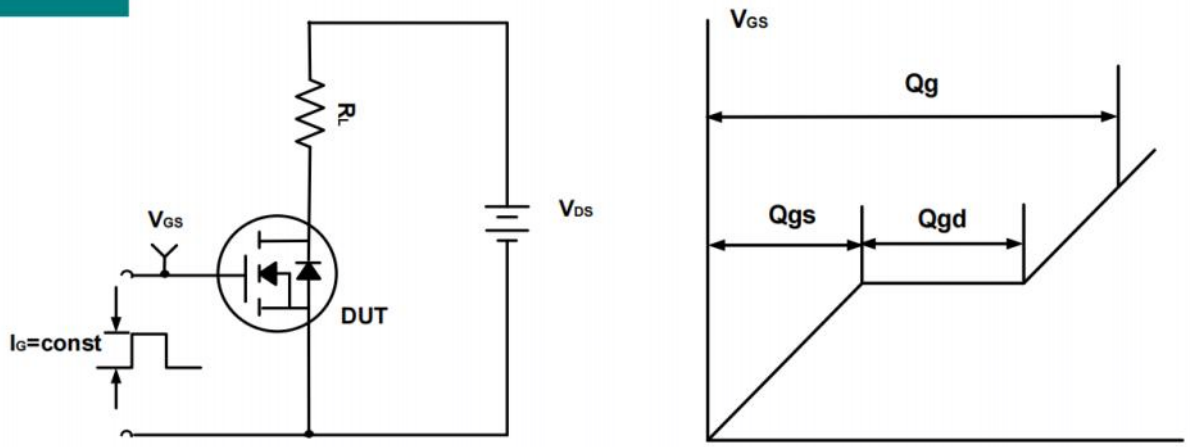

Figure A. Gate Charge Test Circuit & Waveforms

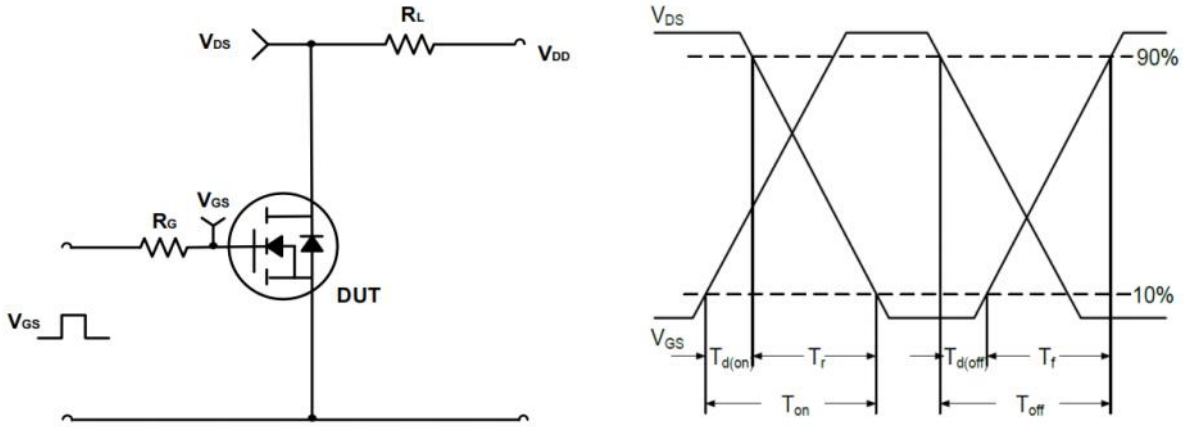

Figure B. Switching Test Circuit & Waveforms

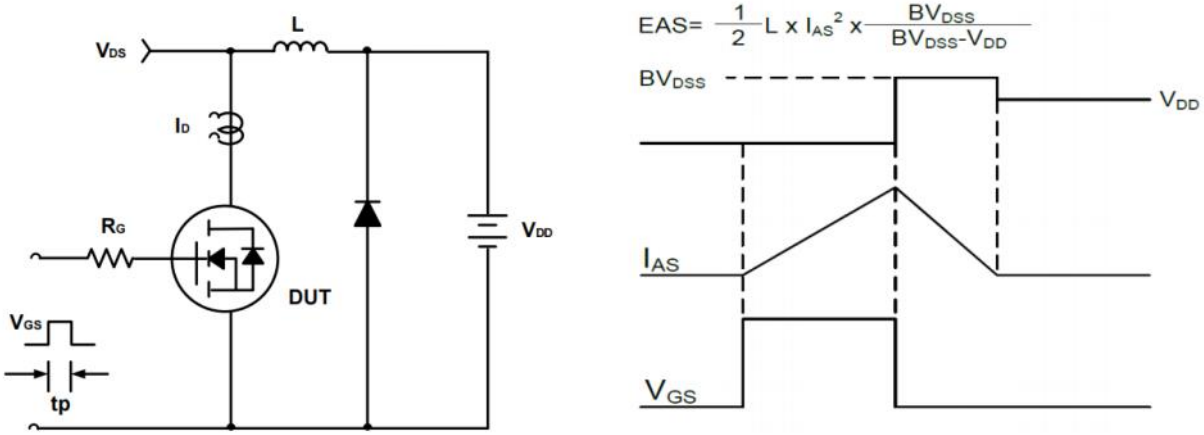

Figure C. Unclamped Inductive Switching Circuit & Waveforms

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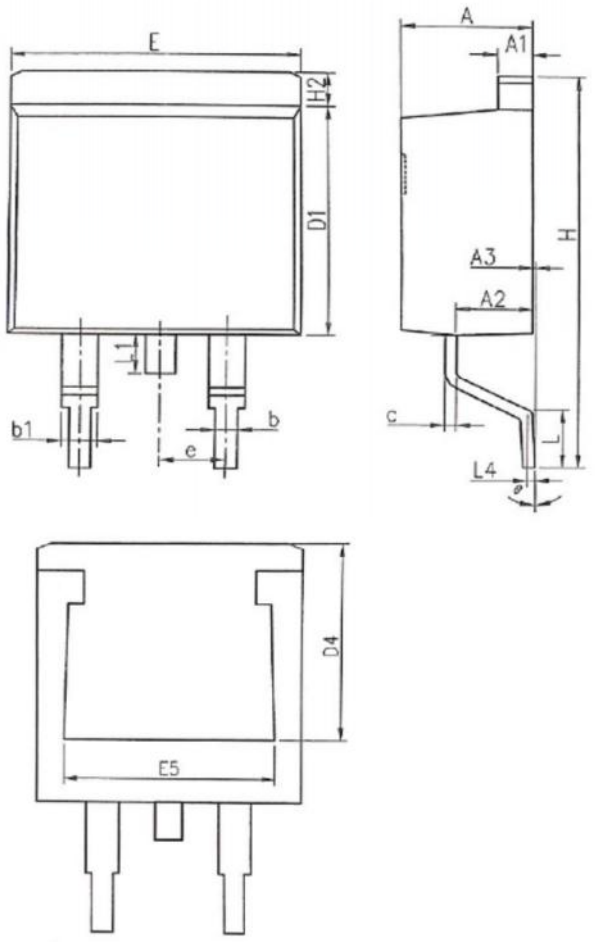
Mechanical Dimensions for TO-263



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	4.37	4.89
A1	1.17	1.42
A2	2.20	2.90
A3	0.00	0.25
b	0.70	0.96
b1	1.17	1.47
c	0.28	0.60
D1	8.45	9.30
D4	6.60	-
E	9.80	10.40
E5	7.06	-
e	2.54BSC	
H	14.70	15.70
H2	1.07	1.47
L	2.00	2.80
L1	-	1.75
L4	0.254BSC	
θ	0°	9°

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