

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



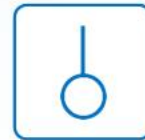
MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	IRLR2905
▶ Overseas	Part Number	IRLR2905
▶ Equivalent	Part Number	IRLR2905

EV is the abbreviation of name EVVO

60V N-Channel Enhancement Mode Power MOSFET

General Description

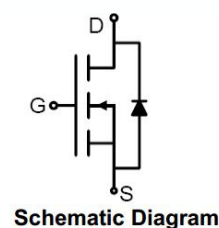
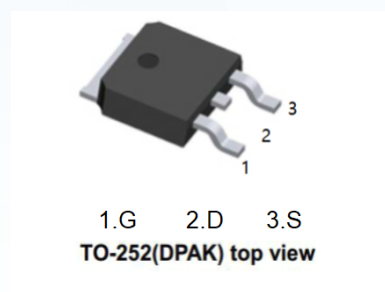
The IRLR2905 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

Features

- $V_{DS} = 60V, I_D = 30A$
 $R_{DS(ON)}, 23m\Omega$ (Typ) @ $V_{GS} = 10V$
 $R_{DS(ON)}, 29m\Omega$ (Typ) @ $V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

Application

- Load Switch
- PWM Application
- Power management



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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous ^{Note3}	$TC = 25^\circ C$	I_D	30	A
	$TC = 100^\circ C$		20	A
Drain Current-Pulsed ^{Note1}		I_{DM}	120	A
Avalanche Energy ^{Note4}		E_{AS}	72	mJ
Maximum Power Dissipation	$TC = 25^\circ C$	P_D	55	W
Storage Temperature Range		T_{STG}	-55 to +150	$^\circ C$
Operating Junction Temperature Range		T_J	-55 to +150	$^\circ C$

Thermal Resistance

Parameter	Symbol	Min.	Typ.	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	-	-	2.7	$^\circ C/W$

60V N-Channel Enhancement Mode Power MOSFET

Electrical Characteristics(T_J=25℃ unless otherwise noted)

OFF CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250uA	60	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	-	-	1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA

ON CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250uA	1.0	1.6	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _{DS} =15A	-	23	29	mΩ
		V _{GS} =4.5V, I _{DS} =10A	-	29	40	mΩ

DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} = 0V, f=1MHz	-	1562	-	pF
Output Capacitance	C _{OSS}		-	75.4	-	
Reverse Transfer Capacitance	C _{rss}		-	66.8	-	

SWITCHING CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Delay Time	T _{d(on)}	V _{GS} =10V, V _{DS} =30V, R _{GEN} =1.8Ω I _D =15A	-	7.5	-	ns
Rise Time	t _r		-	21	-	
Turn-Off Delay Time	T _{d(off)}		-	16	-	
Fall Time	t _f		-	23.5	-	
Total Gate Charge at 10V	Q _g	V _{DS} =30V, I _{DS} =15A, V _{GS} =10V	-	25	-	nC
Gate to Source Gate Charge	Q _{gs}		-	4.5	-	
Gate to Drain"Miller"Charge	Q _{gd}		-	6.5	-	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _{DS} =15A	-	-	1.2	V
Reverse Recovery Time	t _{rr}	T _J =25℃, I _F =15A di/dt=100A/us	-	29	-	nS
Reverse Recovery Charge	Q _{rr}		-	45	-	nC

Notes:

- 1: Repetitive rating, pulse width limited by maximum junction temperature.
- 2: Surface mounted on FR4 Board, t≤10sec.
- 3: Pulse width ≤ 300μs, duty cycle ≤ 2%.
- 4: EAS condition: L=0.5mH, VDD=30V, V_G=10V, V_{GATE}=60V, Start T_J=25℃.

60V N-Channel Enhancement Mode Power MOSFET

Typical Performance Characteristics

Figure 1: Output Characteristics

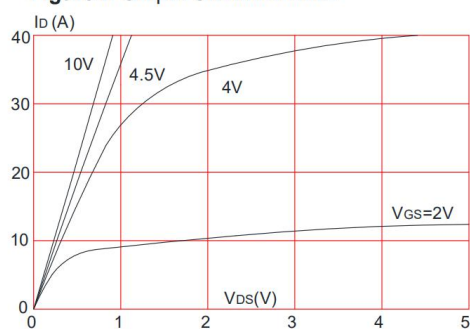


Figure 2: Typical Transfer Characteristics

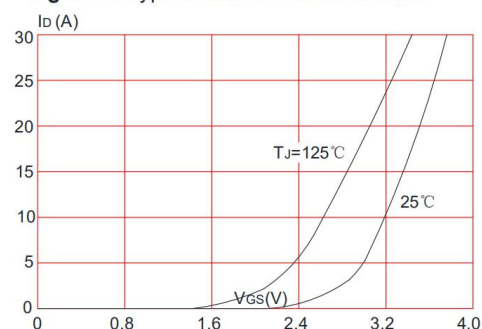


Figure 3: On-resistance vs. Drain Current

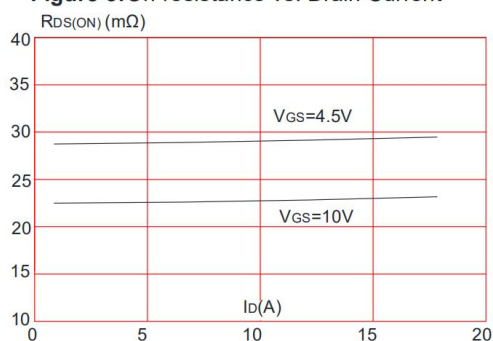


Figure 4: Body Diode Characteristics

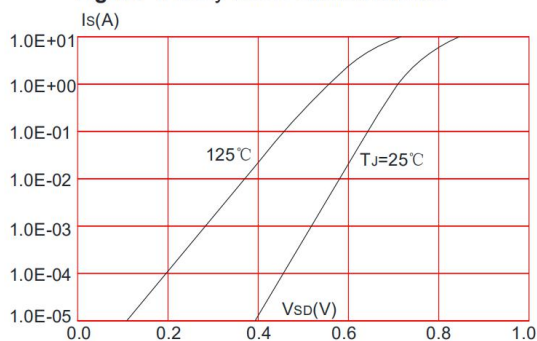


Figure 5: Gate Charge Characteristics

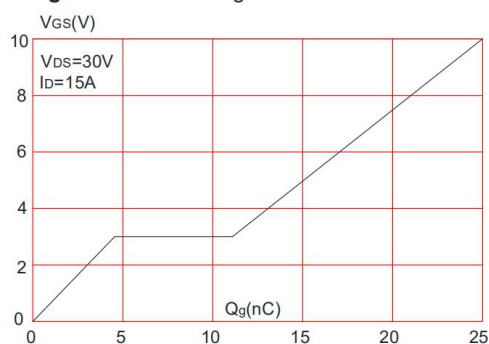
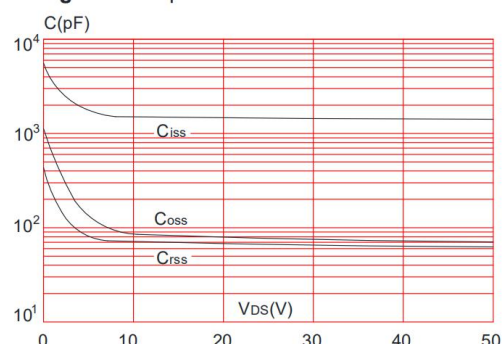


Figure 6: Capacitance Characteristics



60V N-Channel Enhancement Mode Power MOSFET

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

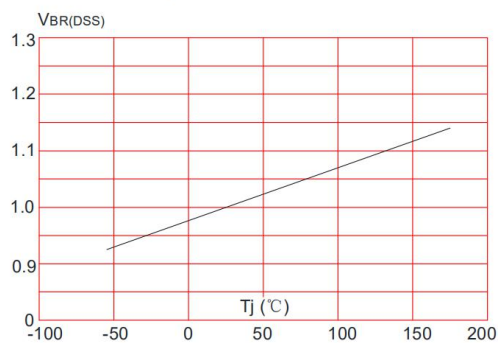


Figure 8: Normalized on Resistance vs. Junction Temperature

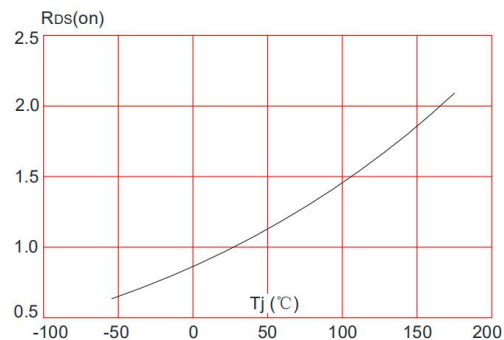


Figure 9: Maximum Safe Operating Area

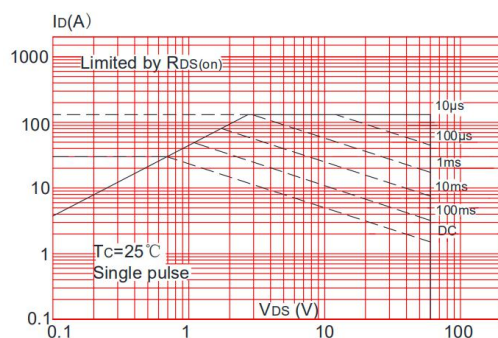


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

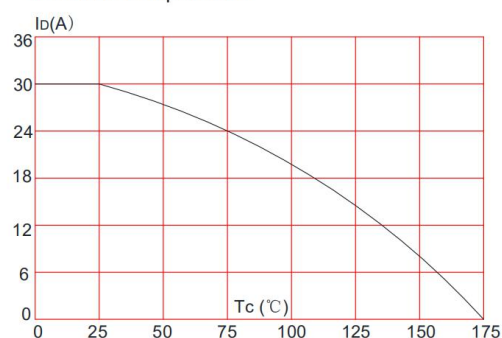
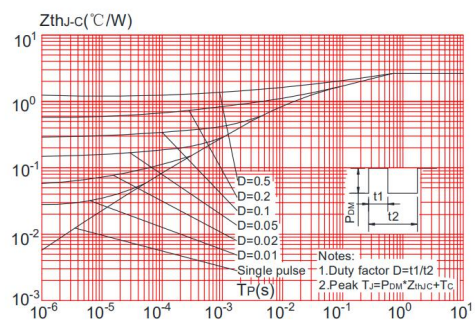


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



60V N-Channel Enhancement Mode Power MOSFET

Test Circuit

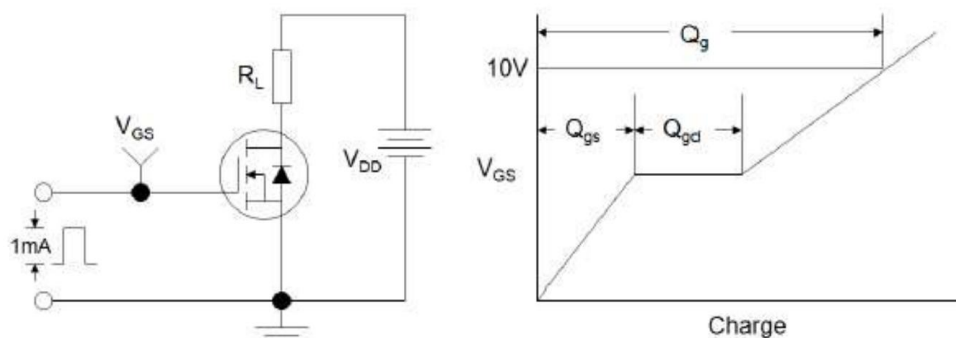


Figure1:Gate Charge Test Circuit & Waveform

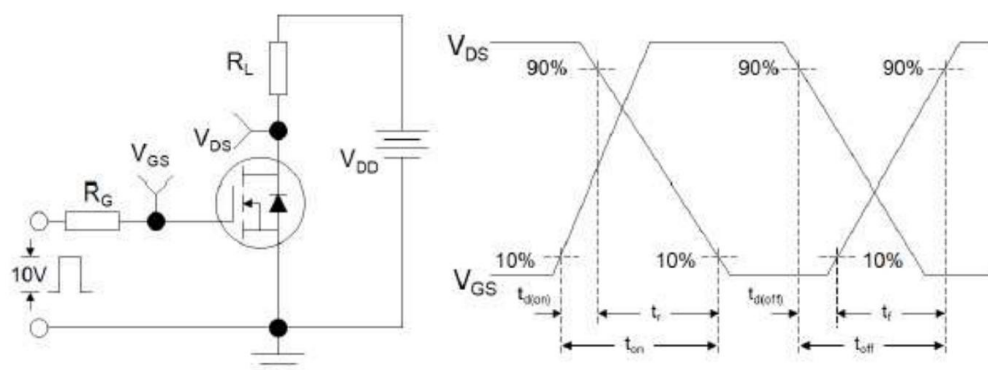


Figure 2: Resistive Switching Test Circuit & Waveforms

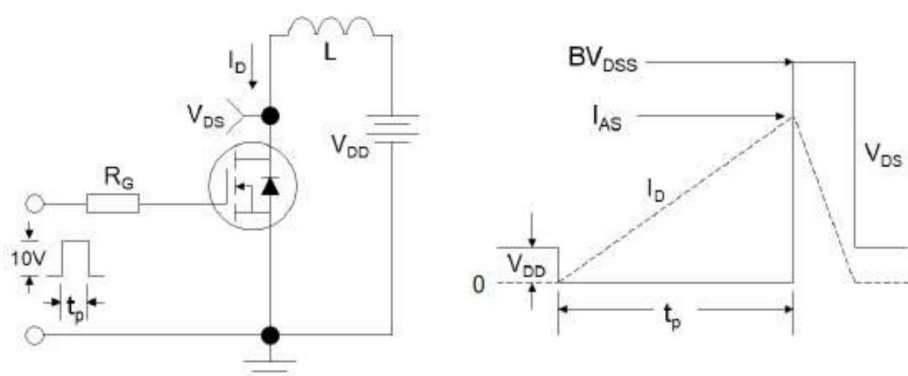
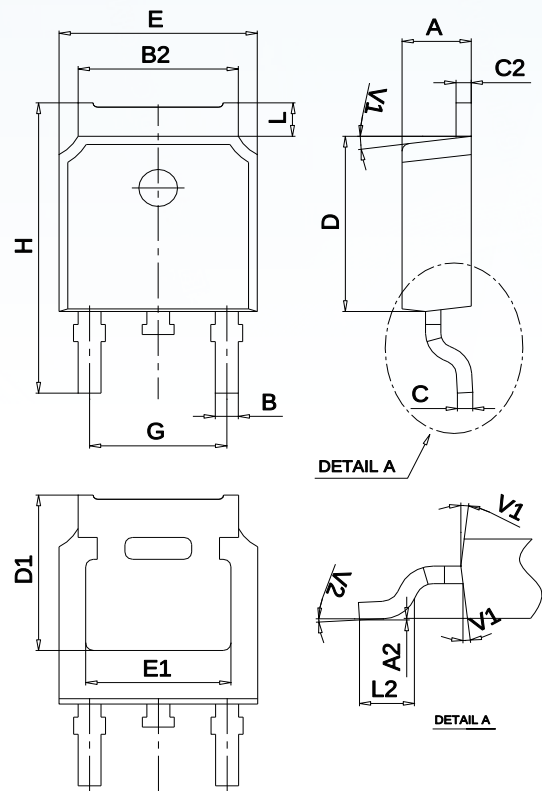


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

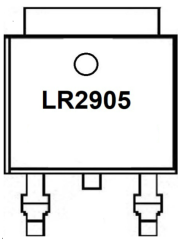
60V N-Channel Enhancement Mode Power MOSFET

Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
IRLR2905	TO-252	2500	Tape and reel

Disclaimer

EVVOSEMI ("EVVO") reserves the right to make corrections, enhancements, improvements, and other changes to its products and services at any time, and to discontinue any product or service without notice.

EVVO warrants the performance of its hardware products to the specifications applicable at the time of sale in accordance with its standard warranty. Testing and other quality control techniques are used as deemed necessary by EVVO to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

Customers should obtain and confirm the latest product information and specifications before final design, purchase, or use. EVVO makes no warranty, representation, or guarantee regarding the suitability of its products for any particular purpose, nor does EVVO assume any liability for application assistance or customer product design. EVVO does not warrant or accept any liability for products that are purchased or used for any unintended or unauthorized application.

EVVO products are not authorized for use as critical components in life support devices or systems without the express written approval of EVVOSEMI.

The EVVO logo and EVVOSEMI are trademarks of EVVOSEMI or its subsidiaries in relevant jurisdictions. EVVO reserves the right to make changes without further notice to any products herein.