

# EVVOSEMI<sup>®</sup>

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

## Product Specification

▶ Domestic	Part Number	IRLML2502
▶ Overseas	Part Number	IRLML2502
▶ Equivalent	Part Number	IRLML2502

EV is the abbreviation of name EVVO

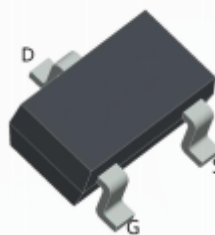
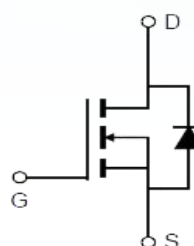
V <sub>DSS</sub> (V)	R <sub>DS</sub> (ON)	I <sub>D</sub> (A)
20	35mΩ(Typ)@V <sub>GS</sub> =4.5V	3.6
	46mΩ(Typ)@V <sub>GS</sub> =2.5V	

**FEATURE:**

- IRLML2502 uses advanced trench technology N-ch MOSFETs, which provides excellent R<sub>DS(on)</sub> and efficiency for most of the small power switching and load switch applications.

**APPLICATIONS:**

- Load Switch for Portable Devices
- Power Management

**Pin Description****SOT-23****Absolute Maximum Ratings**

Symbol	Parameter		Rating	Units
V <sub>DSS</sub>	Drain-Source Voltage		20	V
V <sub>GSS</sub>	Gate-Source Voltage		±12	V
I <sub>D</sub>	Continuous Drain Current(V <sub>GS</sub> = 4.5V)	T <sub>A</sub> =25°C	3.6	A
		T <sub>A</sub> =70°C	1.5	
T <sub>J</sub>	Maximum Junction Temperature		150	°C
T <sub>STG</sub>	Storage Temperature Range		-55 to 150	°C
I <sub>DM</sub>	Pulsed Drain Current		12	A
P <sub>D</sub>	Maximum Power Dissipation	T <sub>A</sub> =25°C	1.05	W
		T <sub>A</sub> =70°C	---	
E <sub>AS</sub>	Avalanche Energy, Single Pulsed		---	mJ
R <sub>θJC</sub>	Thermal Resistance-Junction to Case		---	°C/W
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient		112	°C/W

Electrical Characteristics (T<sub>A</sub>=25°C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	20	---	---	V
V <sub>GS(th)</sub>	Gate threshold voltage	V <sub>DS</sub> =V <sub>GS</sub> ,I <sub>D</sub> =250uA	0.4	0.6	1.1	V
R <sub>DS(ON)</sub>	Drain-Source On-state Resistance	V <sub>GS</sub> =4.5V , I <sub>D</sub> =3.5A	---	35	45	mΩ
		V <sub>GS</sub> =2.5V , I <sub>D</sub> =2A	---	46	57	mΩ
I <sub>GSS</sub>	Gate-source leakage current	V <sub>GS</sub> =±12V , V <sub>DS</sub> =0V	---	---	±100	A
I <sub>DSS</sub>	Zero gate voltage drain current	V <sub>DS</sub> =16V,V <sub>GS</sub> =0V,T <sub>J</sub> =25°C	---	---	1	μA
			T <sub>J</sub> =55°C	---	---	
Dynamic Characteristic						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, Frequency=1.0MHz	---	180	---	pF
C <sub>oss</sub>	Output Capacitance		---	37	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	34	---	
Q <sub>G</sub>	Gate Total Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>DS</sub> =5A	---	6.23	---	nC
Q <sub>gs</sub>	Gate-Source charge		---	6	---	
Q <sub>gd</sub>	Gate-Drain charge		---	0.5	---	
t <sub>d(on)</sub>	Turn-on delay time	V <sub>DD</sub> =10V , V <sub>GS</sub> =4.5V , R <sub>G</sub> =3.3Ω, I <sub>D</sub> =3A	---	4.5	---	ns
t <sub>r</sub>	Turn-on Rise Time		---	31	---	
t <sub>d(off)</sub>	Turn-off Delay Time		---	12	---	
t <sub>f</sub>	Turn-off Fall Time		---	4	---	
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V,V <sub>DS</sub> =0V,F=1MHz	---	---	---	Ω
Diode Characteristics						
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V , I <sub>S</sub> =-1A , T <sub>J</sub> =25°C	---	---	1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =-4.1A, dI <sub>SD</sub> /dt=-100A/μs	---	---	---	ns
Q <sub>rr</sub>	Reverse Recovery Charge		---	---	---	nC

# Typical Electrical and Thermal Characteristics

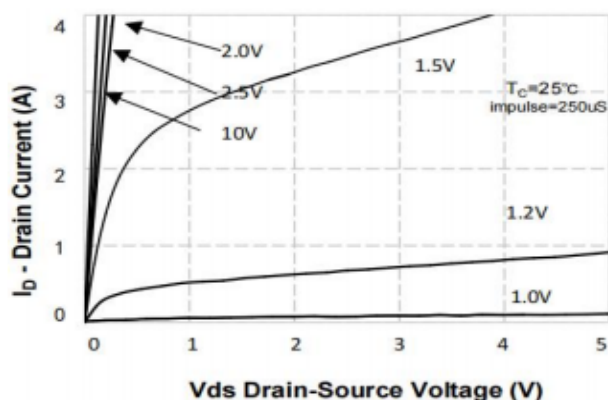


Figure 1. On-Region Characteristics

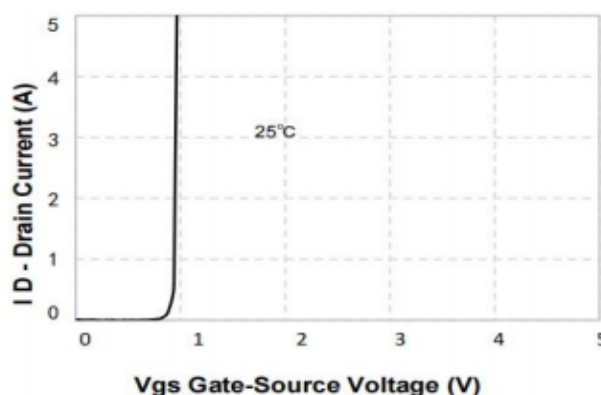


Figure 2. Transfer Characteristics

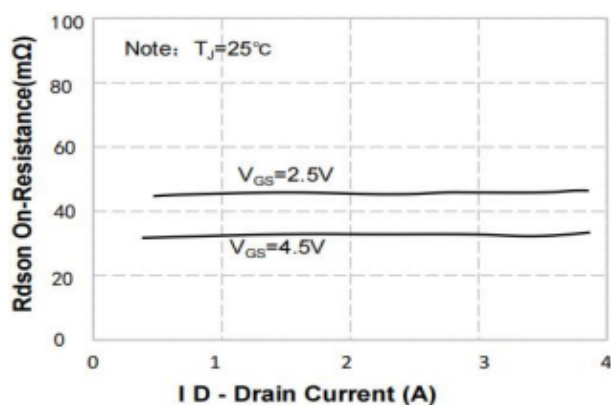


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

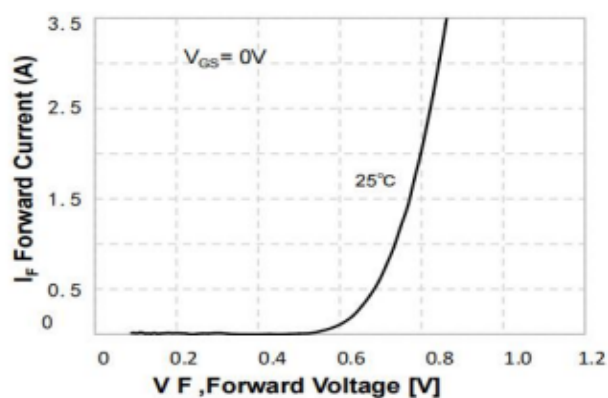


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

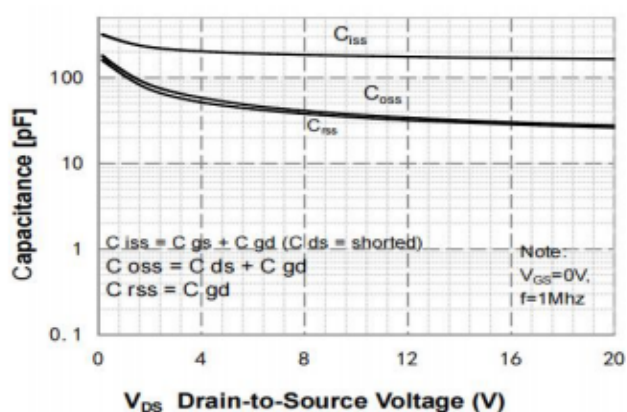


Figure 5. Capacitance Characteristics

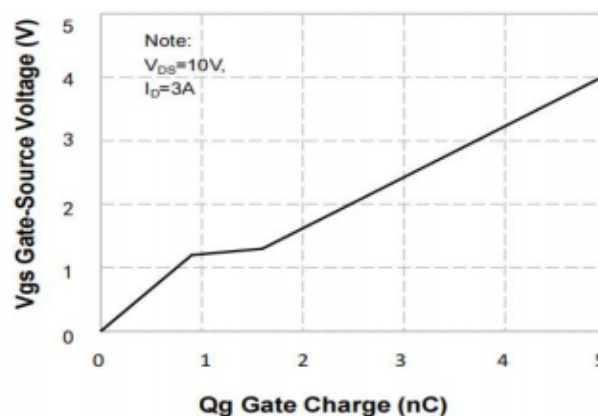
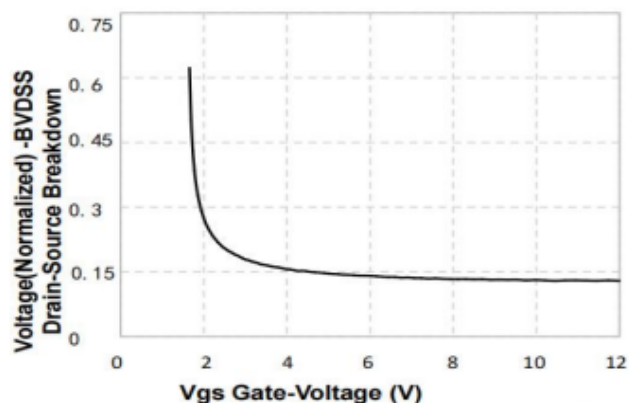
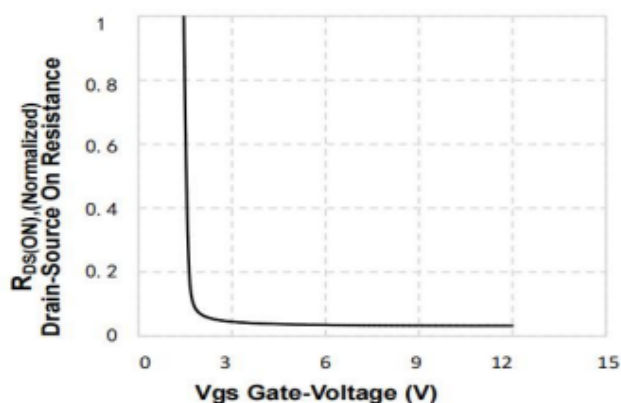


Figure 6. Gate Charge Characteristics

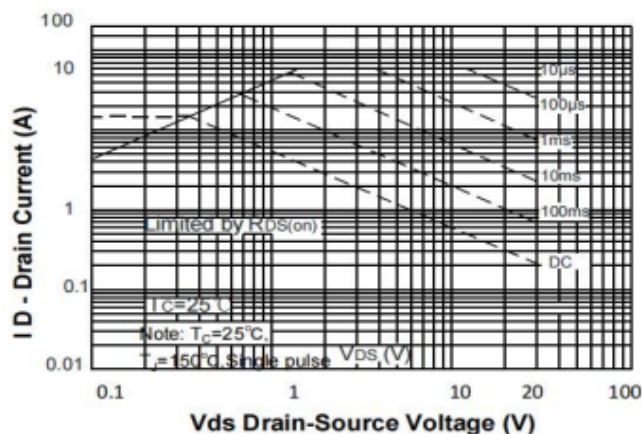




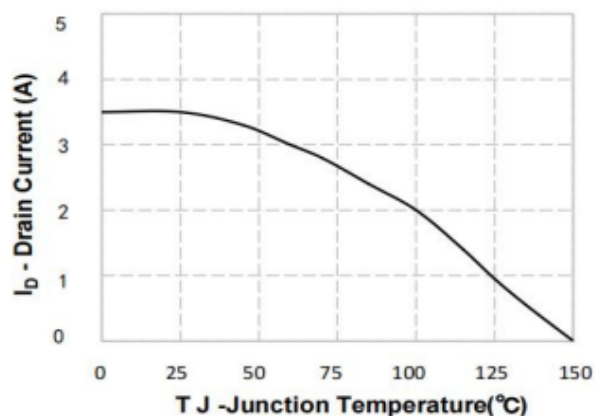
**Figure 7. Breakdown Voltage Variation vs Gate-Voltage**



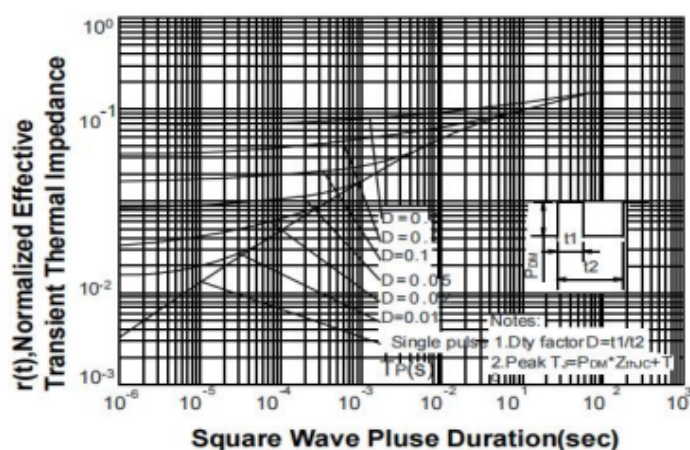
**Figure 8. On-Resistance Variation vs Gate Voltage**



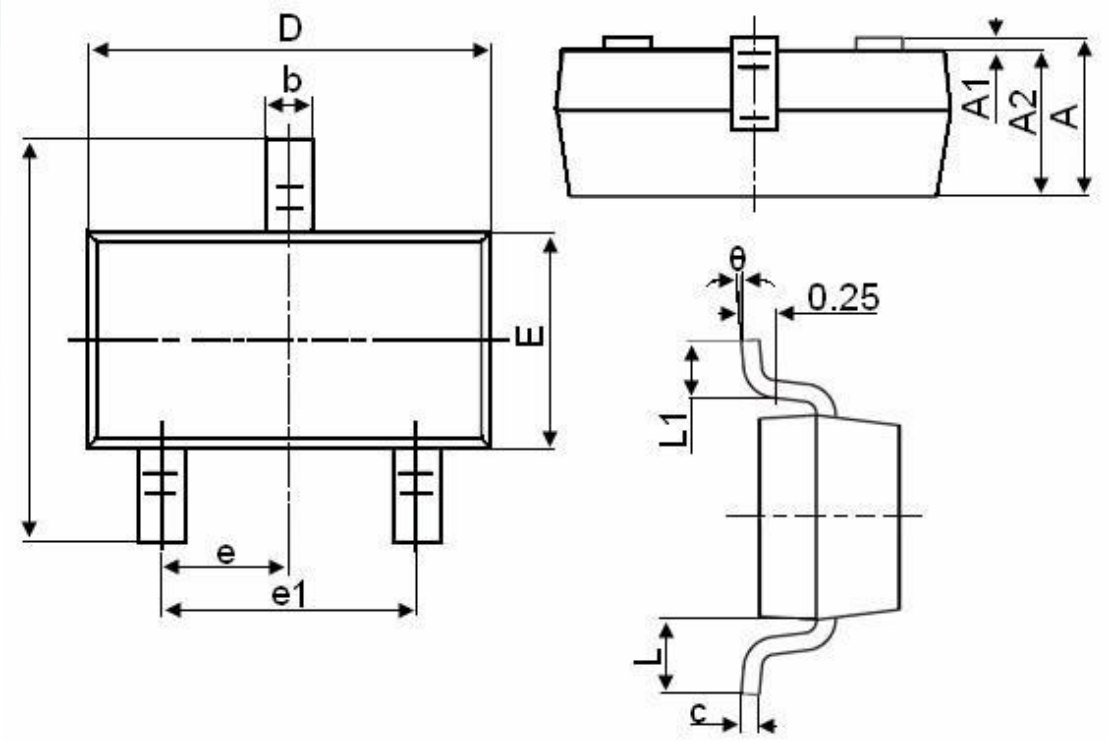
**Figure 9. Maximum Safe Operating Area**



**Figure 10. Maximum PContinuous Drain Current vs Case Temperature**



**Figure 11. Transient Thermal Response Curve**



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

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