

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

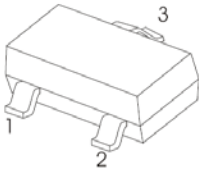
▶ Domestic	Part Number	IRLML5103
▶ Overseas	Part Number	IRLML5103
▶ Equivalent	Part Number	IRLML5103

EV is the abbreviation of name EVVO

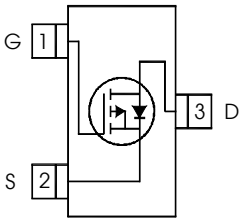
Features

- Generation VTechnology
- UltraLowOn-Resistance
- P-ChannelMOSFET
- SOT-23Footprint
- Low Profile(<1.1mm)
- Available in Tape and Reel
- Fast Switching
- Lead-Free
- RoHS CompliantHalogen-Free

SOT - 23



- 1. GATE
- 2. SOURCE
- 3. DRAIN



Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_A = 25^{\circ}\text{C}$	Continuous Drain Current, $V_{GS} @ -10\text{V}$	-0.76	A
$I_D @ T_A = 70^{\circ}\text{C}$	Continuous Drain Current, $V_{GS} @ -10\text{V}$	-0.61	
I_{DM}	Pulsed Drain Current ①	-4.8	
$P_D @ T_A = 25^{\circ}\text{C}$	Power Dissipation	540	mW
	Linear Derating Factor	4.3	mW/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
dv/dt	Peak Diode Recovery dv/dt ②	-5.0	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ④	—	230	°C/W

Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

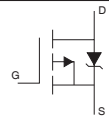
	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-30	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	-0.029	—	V/ $^\circ\text{C}$	Reference to 25°C , $I_D = -1mA$
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	—	—	600	m Ω	$V_{GS} = -10V, I_D = -0.60A$ ③
		—	—	1000		$V_{GS} = -4.5V, I_D = -0.30A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	-1.0	—	—	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
g_{fs}	Forward Transconductance	0.44	—	—	S	$V_{DS} = -10V, I_D = -0.30A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	-1.0	μA	$V_{DS} = -24V, V_{GS} = 0V$
		—	—	-25		$V_{DS} = -24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	-100	nA	$V_{GS} = -20V$
	Gate-to-Source Reverse Leakage	—	—	100		$V_{GS} = 20V$
Q_g	Total Gate Charge	—	3.4	5.1	nC	$I_D = -0.60A$
Q_{gs}	Gate-to-Source Charge	—	0.52	0.78		$V_{DS} = -24V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	1.1	1.7		$V_{GS} = -10V$, See Fig. 6 and 9 ③
$t_{d(on)}$	Turn-On Delay Time	—	10	—	ns	$V_{DD} = -15V$
t_r	Rise Time	—	8.2	—		$I_D = -0.60A$
$t_{d(off)}$	Turn-Off Delay Time	—	23	—		$R_G = 6.2\Omega$
t_f	Fall Time	—	16	—		$R_D = 25\Omega$, See Fig. 10 ③
C_{iss}	Input Capacitance	—	75	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	37	—		$V_{DS} = -25V$
C_{rss}	Reverse Transfer Capacitance	—	18	—		$f = 1.0MHz$, See Fig. 5

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-0.54	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	-4.8		
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	$T_J = 25^\circ\text{C}, I_S = -0.60A, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time	—	26	39	ns	$T_J = 25^\circ\text{C}, I_F = -0.60A$
Q_{rr}	Reverse Recovery Charge	—	20	30	nC	$di/dt = 100A/\mu s$ ③

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)
- ② $I_{SD} \leq -0.60A$, $di/dt \leq 110A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ\text{C}$
- ③ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.
- ④ Surface mounted on FR-4 board, $t \leq 5sec$.



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

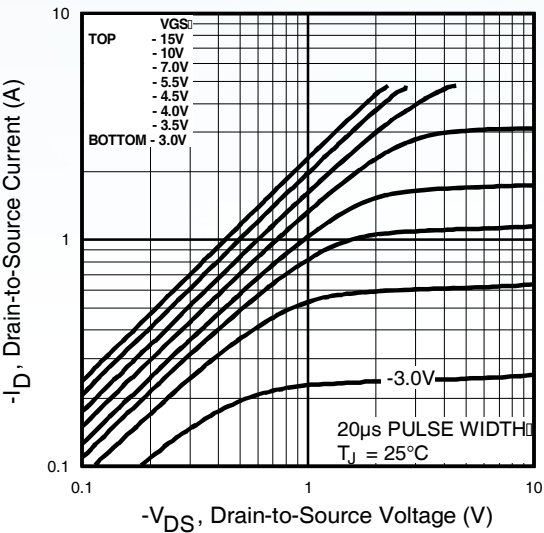


Fig 1. Typical Output Characteristics

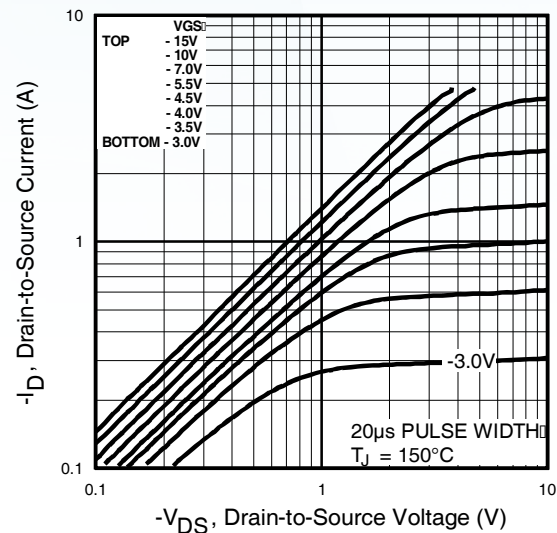


Fig 2. Typical Output Characteristics

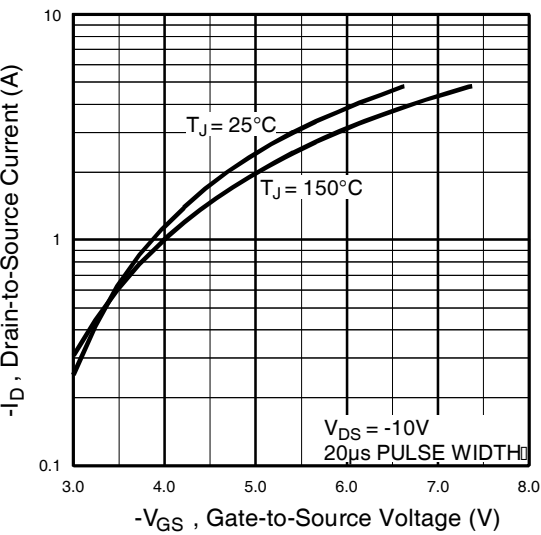


Fig 3. Typical Transfer Characteristics

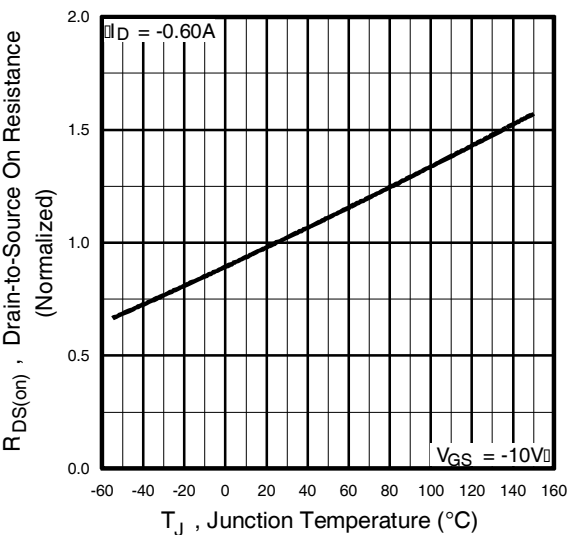
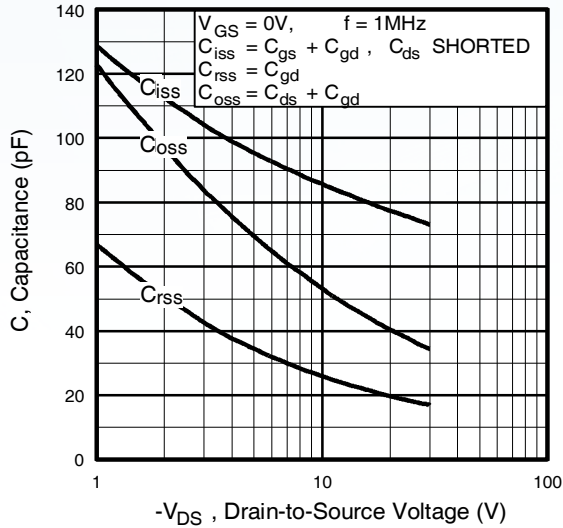
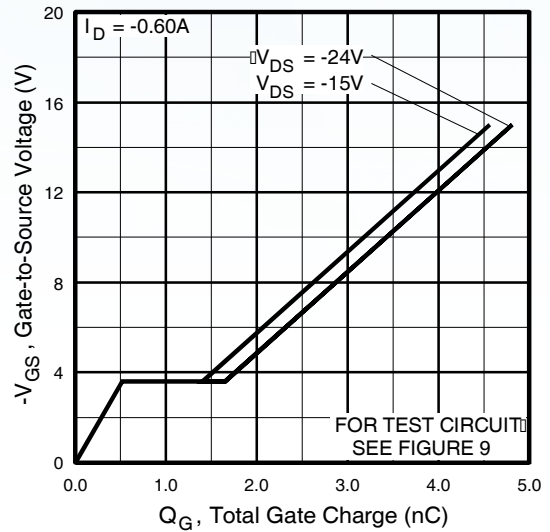
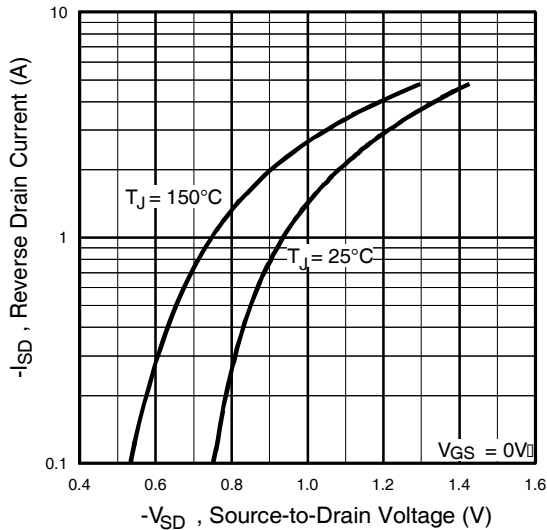
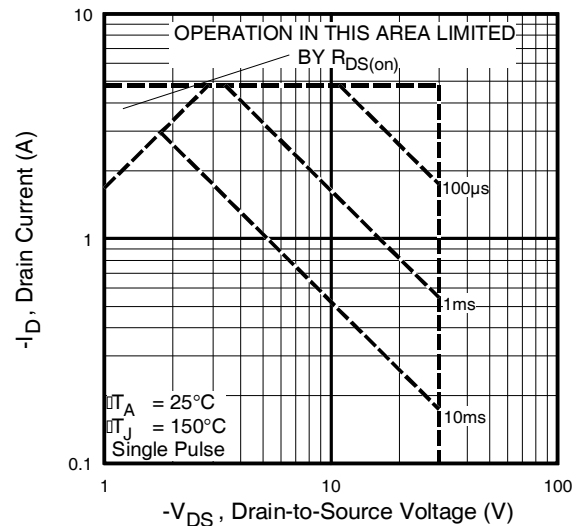


Fig 4. Normalized On-Resistance Vs. Temperature

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

Fig 7. Typical Source-Drain Diode Forward Voltage

Fig 8. Maximum Safe Operating Area

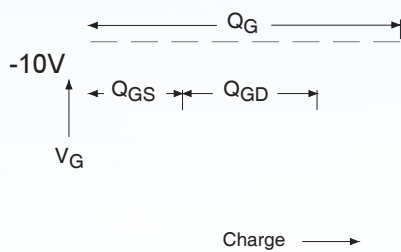


Fig 9a. Basic Gate Charge Waveform

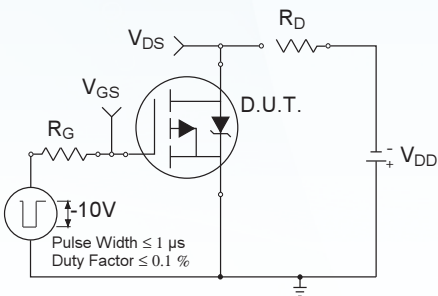


Fig 10a. Switching Time Test Circuit

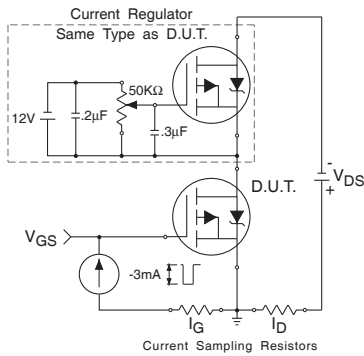


Fig 9b. Gate Charge Test Circuit

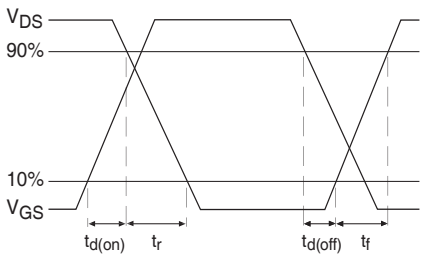


Fig 10b. Switching Time Waveforms

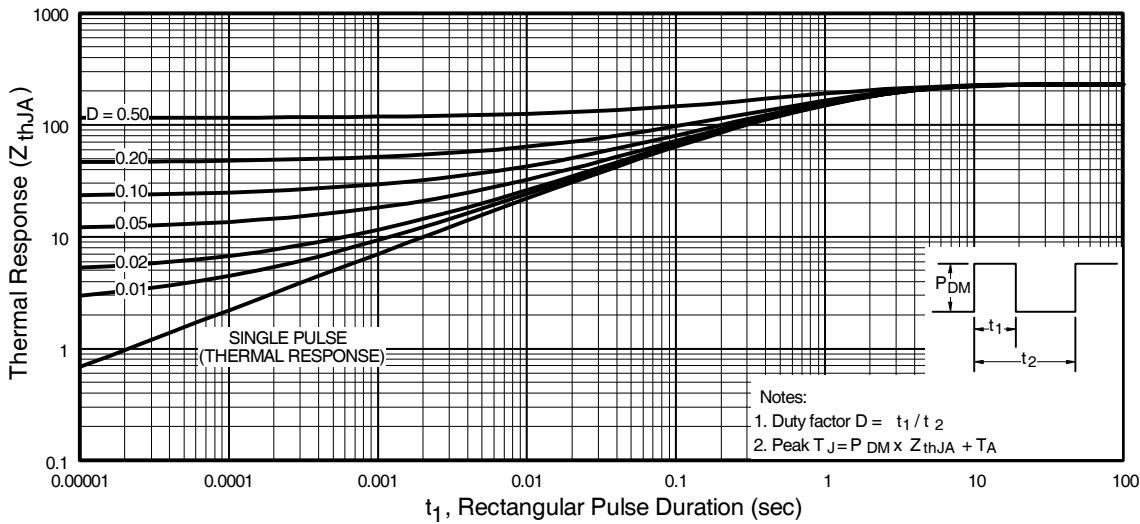
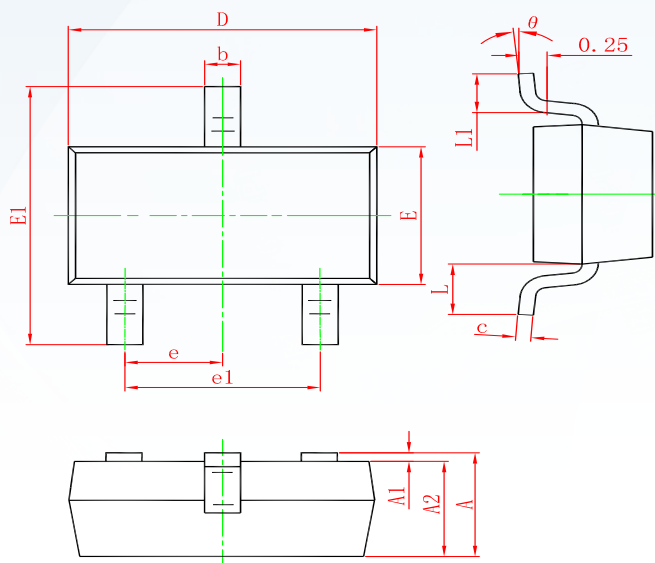


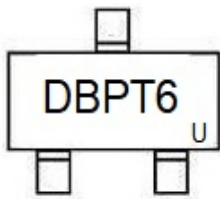
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
IRLML5103	SOT-23	3000	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.