EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

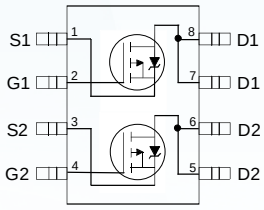
Product Specification

Domestic Part Number	IRF7104
Overseas Part Number	IRF7104
Equivalent Part Number	IRF7104

-30V Dual P-Channel MOSFET

Benefits

- $V_{DS\,(V)}$ = -30V
- I_D = -2.3A
- $R_{DS(ON)}$ < 250mΩ (V_{GS}=-10V)
- $R_{DS(ON)}$ < 400mΩ (V_{GS}=-4.5V)
- Ultra Low On-resistance
- Fast Switching
- Lead-free



Top View

Absolute Maximum Ratings

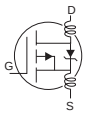
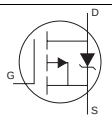
	Parameter	Max.	Units
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	-2.3	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	-1.8	
I_{DM}	Pulsed Drain Current ①	-10	
P_D @T_C = 25°C	Power Dissipation	2.0	W
	Linear Derating Factor	0.016	W/℃
V_{GS}	Gate-to-Source Voltage	± 12	V
dv/dt	Peak Diode Recovery dv/dt ②	-3.0	V/nS
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	℃

Thermal Resistance Ratings

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ④			62.5	°C/W

-30V Dual P-Channel MOSFET

Electrical Characteristics T_A = 25°C unless otherwise noted

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	-30			V	V_{GS} = 0V, I_D = -250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	–––	-0.015	–––	V/°C	Reference to 25°C, I_D = -1mA
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance		190	250	mΩ	V_{GS} = -10V, I_D = -1.0A ③
			300	400		V_{GS} = -4.5V, I_D = -0.50A ③
$V_{GS(th)}$	Gate Threshold Voltage	-1.0	–––	-3.0	V	V_{DS} = V_{GS}, I_D = -250μA
g_{fs}	Forward Transconductance	–––	2.5	–––	S	V_{DS} = -15V, I_D = -2.3A ③
I_{DSS}	Drain-to-Source Leakage Current	–––	–––	-2.0	μA	V_{DS} = -16V, V_{GS} = 0V
		–––	–––	-25		V_{DS} = -16V, V_{GS} = 0V, T_J = 55 °C
I_{GSS}	Gate-to-Source Forward Leakage	–––	–––	-100	nA	V_{GS} = -12V
	Gate-to-Source Reverse Leakage	–––	–––	100		V_{GS} = 12V
Q_g	Total Gate Charge	–––	9.3	25	nC	I_D = -2.3A
Q_{gs}	Gate-to-Source Charge	–––	1.6	–––		V_{DS} = -10V
Q_{gd}	Gate-to-Drain ("Miller") Charge	–––	3.0	–––		V_{GS} = -10V ③
$t_{d(on)}$	Turn-On Delay Time	–––	12	40	ns	V_{DD} = -10V
t_r	Rise Time	–––	16	40		I_D = -1.0A
$t_{d(off)}$	Turn-Off Delay Time	–––	42	90		R_G = 6.0Ω
t_f	Fall Time	–––	30	50		R_D = 10Ω ③
L_D	Internal Drain Inductance	–––	4.0	–––	nH	Between lead,6mm(0.25in.) from package and center of die contact 
L_S	Internal Source Inductance	–––	6.0	–––		
C_{iss}	Input Capacitance	–––	290	–––	pF	V_{GS} = 0V
C_{oss}	Output Capacitance	–––	210	–––		V_{DS} = -15V
C_{rss}	Reverse Transfer Capacitance	–––	67	–––		f = 1.0MHz
I_S	Continuous Source Current (Body Diode)	–––	–––	-2.0	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	–––	–––	-9.2		
V_{SD}	Diode Forward Voltage	–––	–––	-1.2	V	T_J = 25°C, I_S = -1.25A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	–––	69	100	ns	T_J = 25°C, I_F = -1.25A
Q_{rr}	Reverse RecoveryCharge	–––	90	140	nC	di/dt = 100A/μs ③
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

② I_{SD} ≤ -2.3A, di/dt ≤ 100A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C

③ Pulse width ≤ 300μs; duty cycle ≤ 2%.

④ Surface mounted on FR-4 board, t ≤ 10sec.

-30V Dual P-Channel MOSFET

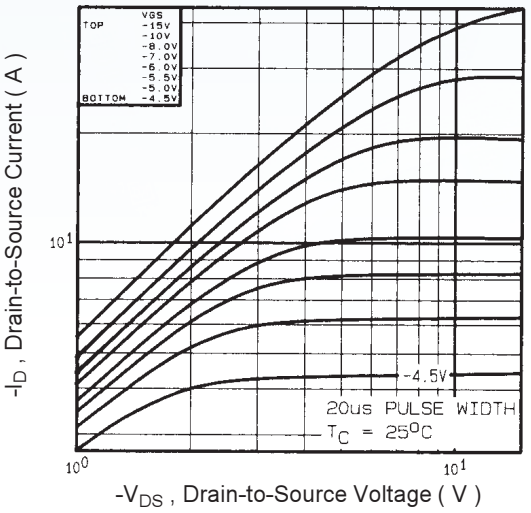


Fig 1. Typical Output Characteristics

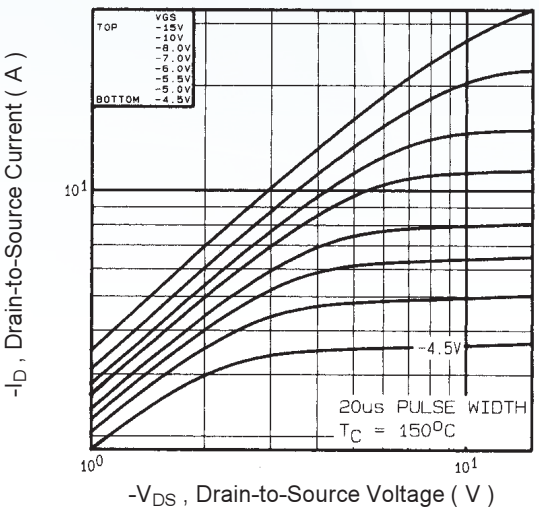


Fig 2. Typical Output Characteristics

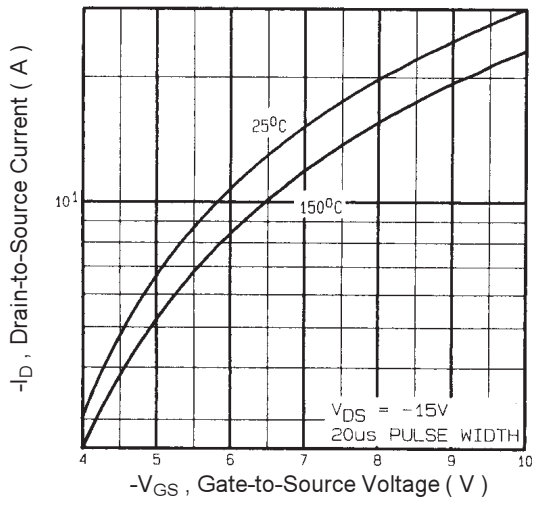


Fig 3. Typical Transfer Characteristics

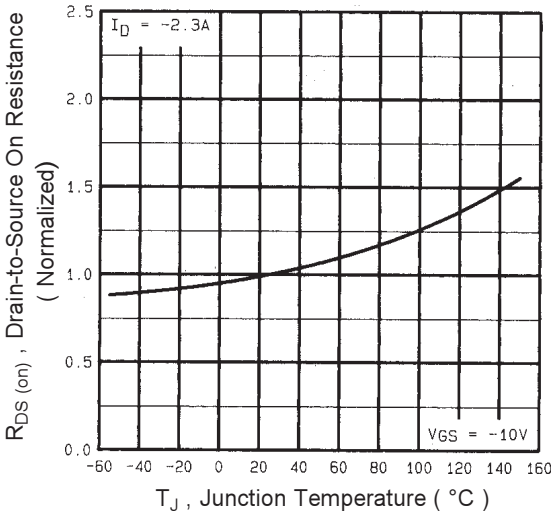


Fig 4. Normalized On-Resistance Vs. Temperature

-30V Dual P-Channel MOSFET

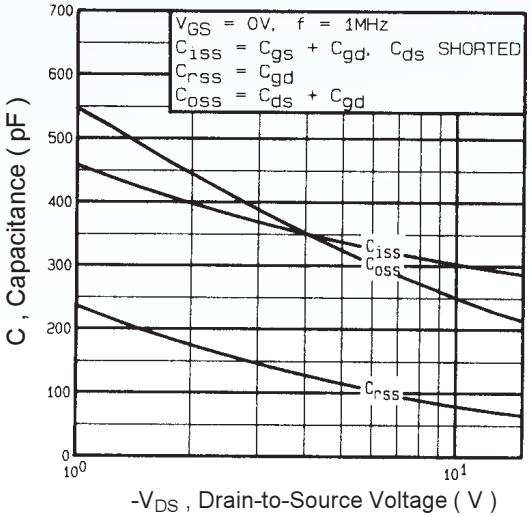


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

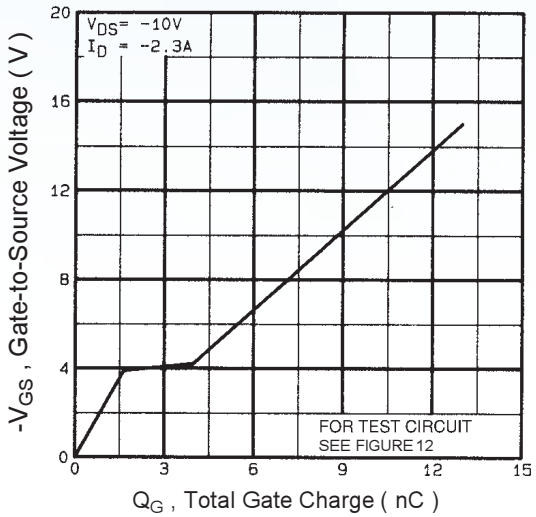


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

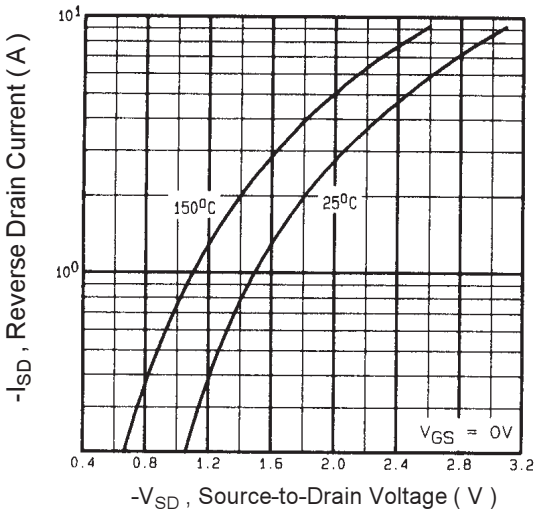


Fig 7. Typical Source-Drain Diode Forward Voltage

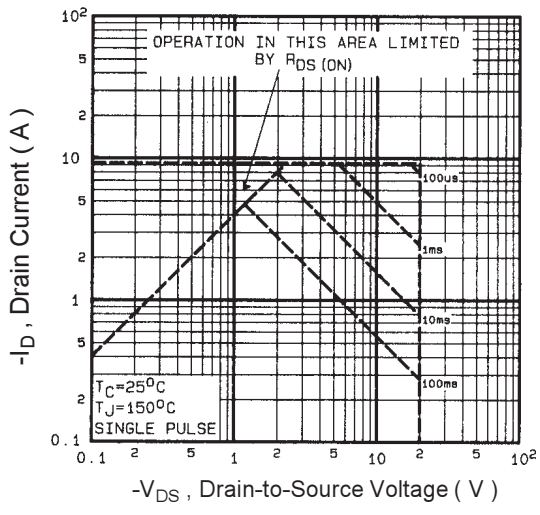


Fig 8. Maximum Safe Operating Area

-30V Dual P-Channel MOSFET

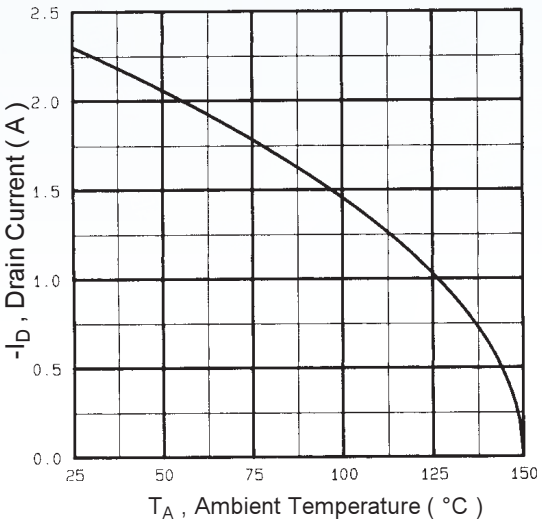


Fig 9. Maximum Drain Current Vs. Ambient Temperature

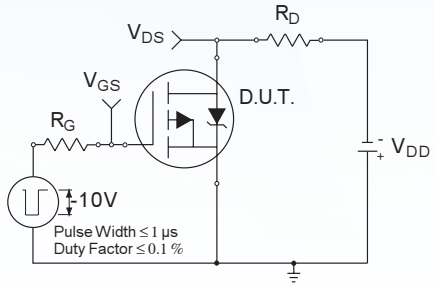


Fig 10a. Switching Time Test Circuit

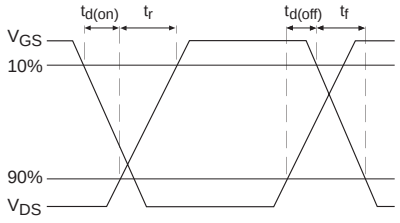


Fig 10b. Switching Time Waveforms

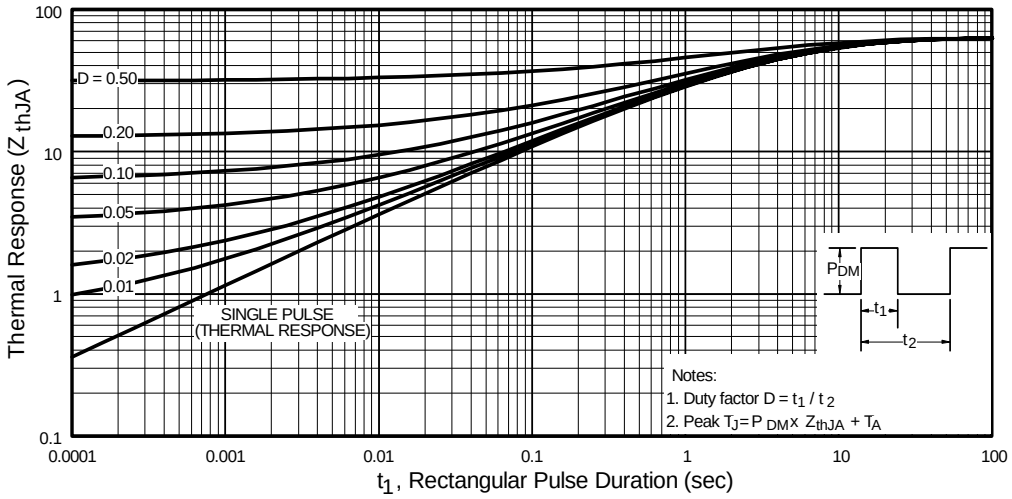
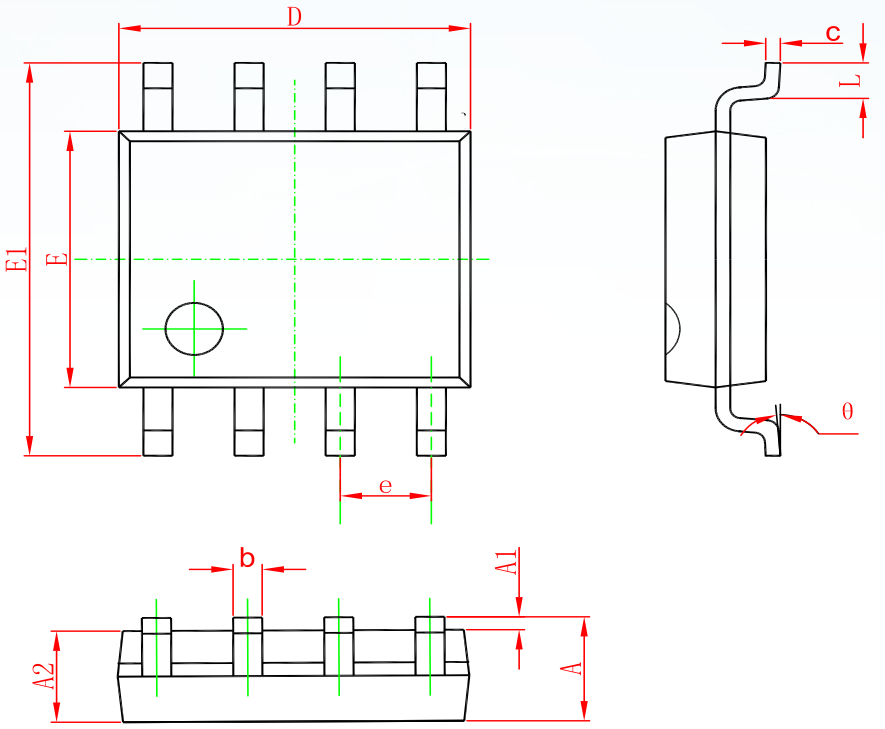


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

-30V Dual P-Channel MOSFET

PACKAGE OUTLINE DIMENSIONS

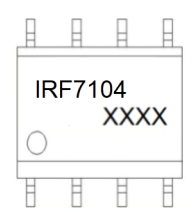
SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	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	0.006	0.010
D	4.700	5.100	0.185	0.200
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°

-30V Dual P-Channel MOSFET

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
IRF7104	SOP-8	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.