

# EVVOSEMI<sup>®</sup>

THINK CHANGE DO



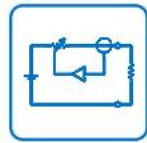
ESD



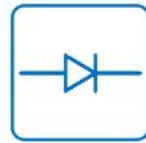
TVS



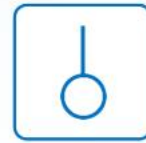
MOS



LDO



Diode



Sensor



DC-DC

## Product Specification

▶ Domestic	Part Number	IRF7351
▶ Overseas	Part Number	IRF7351
▶ Equivalent	Part Number	IRF7351

EV is the abbreviation of name EVVO

## Features

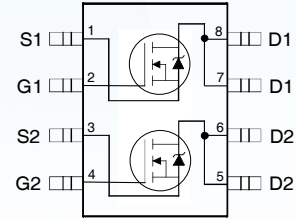
- $V_{DS} (V) = 60V$
- $I_D = 8A (V_{GS}=10V)$
- $R_{DS(ON)} < 23 m\Omega (V_{GS} = 10V)$

## Applications

- Synchronous Rectifier MOSFET for Isolated DC-DC Converters
- Low Power Motor Drive Systems

## Benefits

- Ultra-Low Gate Impedance
- Fully Characterized Avalanche Voltage and Current
- 20V  $V_{GS}$  Max. Gate Rating



SOP-8

## Absolute Maximum Ratings

	Parameter	Max.	Units
$V_{DS}$	Drain-to-Source Voltage	60	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	8.0	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	6.4	
$I_{DM}$	Pulsed Drain Current ①	64	
$P_D @ T_A = 25^\circ C$	Power Dissipation ④	2.0	W
$P_D @ T_A = 70^\circ C$	Power Dissipation ④	1.28	
	Linear Derating Factor	0.016	W/ $^\circ C$
$T_J$	Operating Junction and	-55 to + 150	$^\circ C$
$T_{STG}$	Storage Temperature Range		

## Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JL}$	Junction-to-Drain Lead ⑤		20	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient ④⑤		62.5	

**Static @ T<sub>J</sub> = 25°C (unless otherwise specified)**

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV <sub>DSS</sub>	Drain-to-Source Breakdown Voltage	60			V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Breakdown Voltage Temp. Coefficient		0.068		V/°C	Reference to 25°C, I <sub>D</sub> = 1mA
R <sub>DS(on)</sub>	Static Drain-to-Source On-Resistance		13.7	23	mΩ	V <sub>GS</sub> = 10V, I <sub>D</sub> = 8.0A ③
V <sub>GS(th)</sub>	Gate Threshold Voltage			2	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 50μA
ΔV <sub>GS(th)</sub>	Gate Threshold Voltage Coefficient		-8.2		mV/°C	
I <sub>DSS</sub>	Drain-to-Source Leakage Current			20	μA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V
				250		V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125°C
I <sub>GSS</sub>	Gate-to-Source Forward Leakage			100	nA	V <sub>GS</sub> = 20V
	Gate-to-Source Reverse Leakage			-100		V <sub>GS</sub> = -20V
g <sub>fs</sub>	Forward Transconductance	18			S	V <sub>DS</sub> = 25V, I <sub>D</sub> = 6.4A
Q <sub>g</sub>	Total Gate Charge		24	36		V <sub>DS</sub> = 30V V <sub>GS</sub> = 10V I <sub>D</sub> = 6.4A See Fig. 17
Q <sub>gs1</sub>	Pre-V <sub>th</sub> Gate-to-Source Charge		3.8		nC	
Q <sub>gs2</sub>	Post-V <sub>th</sub> Gate-to-Source Charge		1.2			
Q <sub>gd</sub>	Gate-to-Drain Charge		7.2			
Q <sub>godr</sub>	Gate Charge Overdrive		11.8			
Q <sub>sw</sub>	Switch Charge (Q <sub>gs2</sub> + Q <sub>gd</sub> )		8.4			
Q <sub>oss</sub>	Output Charge		7.5		nC	
t <sub>d(on)</sub>	Turn-On Delay Time		5.1		ns	V <sub>DD</sub> = 30V, V <sub>GS</sub> = 10V ③ I <sub>D</sub> = 6.4A R <sub>G</sub> = 1.8Ω
t <sub>r</sub>	Rise Time		5.9			
t <sub>d(off)</sub>	Turn-Off Delay Time		17			
t <sub>f</sub>	Fall Time		6.7			
C <sub>iss</sub>	Input Capacitance		1330		pF	V <sub>GS</sub> = 0V V <sub>DS</sub> = 30V f = 1.0MHz
C <sub>oss</sub>	Output Capacitance		190			
C <sub>rss</sub>	Reverse Transfer Capacitance		92			

**Avalanche Characteristics**

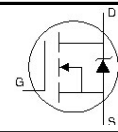
	Parameter	Typ.	Max.	Units
E <sub>AS</sub>	Single Pulse Avalanche Energy ②		325	mJ
I <sub>AR</sub>	Avalanche Current ①		6.4	A

**Diode Characteristics**

	Parameter	Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)			1.8	A	MOSFET symbol showing the integral reverse p-n junction diode.
I <sub>SM</sub>	Pulsed Source Current (Body Diode) ①			64		
V <sub>SD</sub>	Diode Forward Voltage			1.3	V	T <sub>J</sub> = 25°C, I <sub>S</sub> = 6.4A, V <sub>GS</sub> = 0V ③
t <sub>rr</sub>	Reverse Recovery Time		20	30	ns	T <sub>J</sub> = 25°C, I <sub>F</sub> = 6.4A, V <sub>DD</sub> = 30V
Q <sub>rr</sub>	Reverse Recovery Charge		61	92	nC	di/dt = 300A/μs ③

**Notes:**

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting T<sub>J</sub> = 25°C, L = 16mH  
R<sub>G</sub> = 25Ω, I<sub>AS</sub> = 6.4A.
- ③ Pulse width ≤ 400μs; duty cycle ≤ 2%.
- ④ When mounted on 1 inch square copper board.
- ⑤ R<sub>θ</sub> is measured at T<sub>J</sub> approximately 90°C.



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

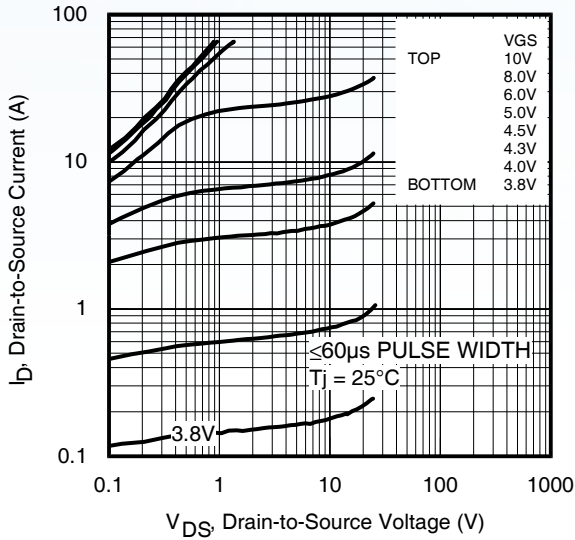


Fig 1. Typical Output Characteristics

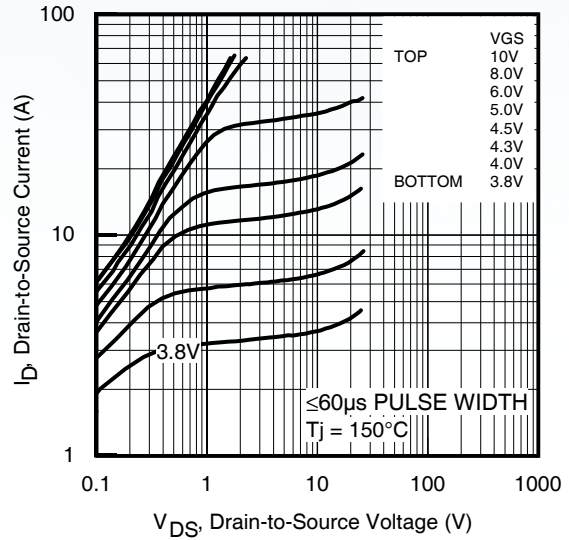


Fig 2. Typical Output Characteristics

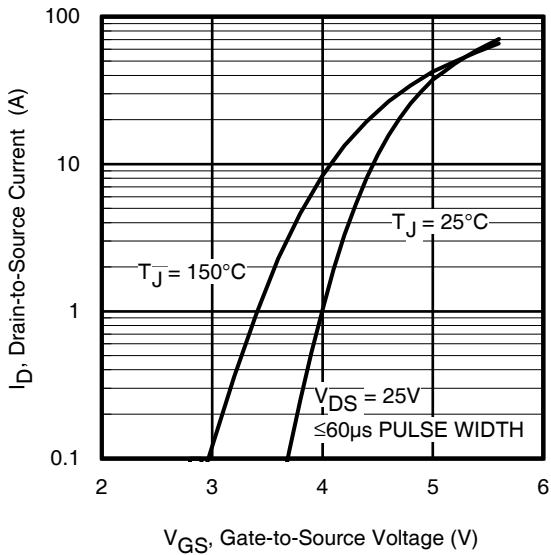


Fig 3. Typical Transfer Characteristics

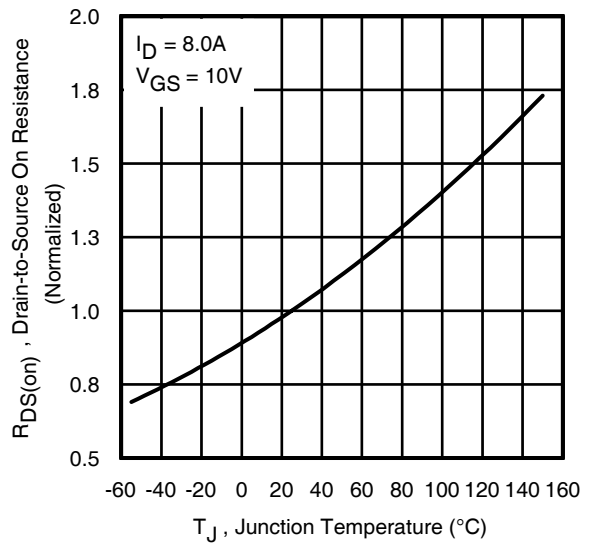


Fig 4. Normalized On-Resistance vs. Temperature

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

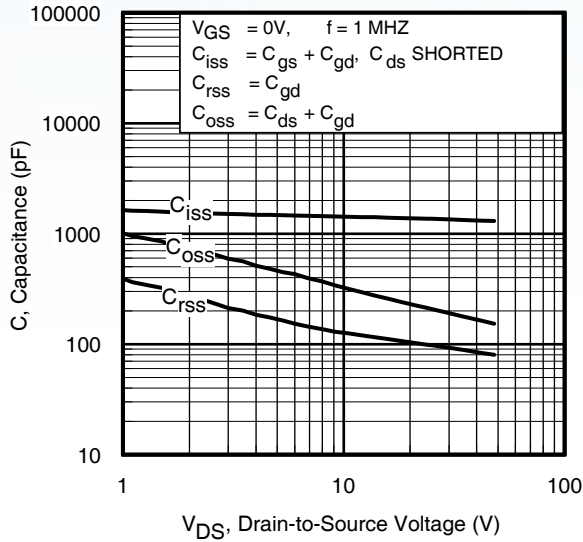


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

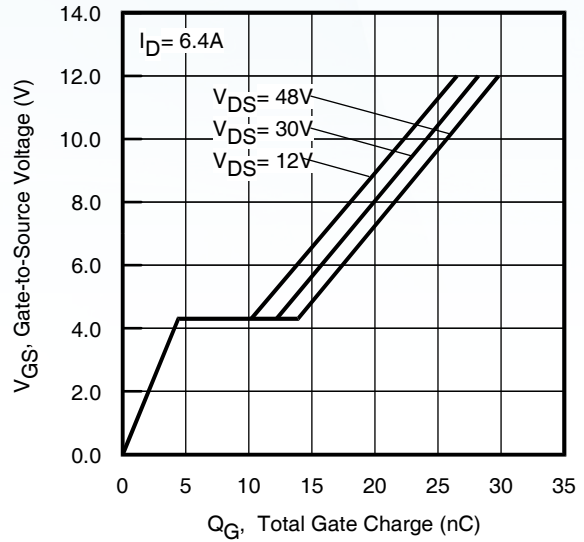


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

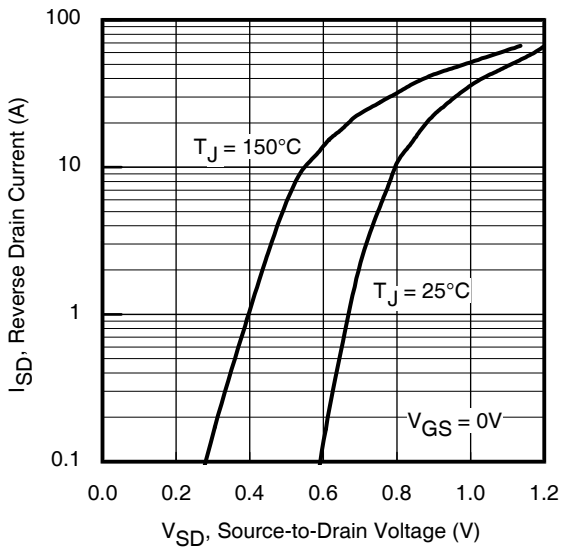


Fig 7. Typical Source-Drain Diode Forward Voltage

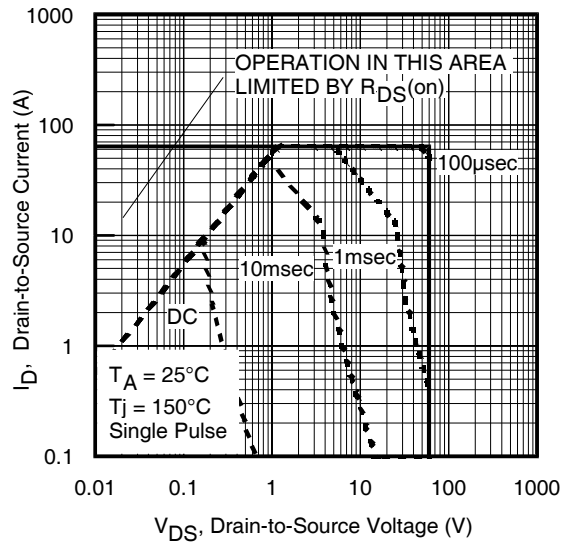


Fig 8. Maximum Safe Operating Area

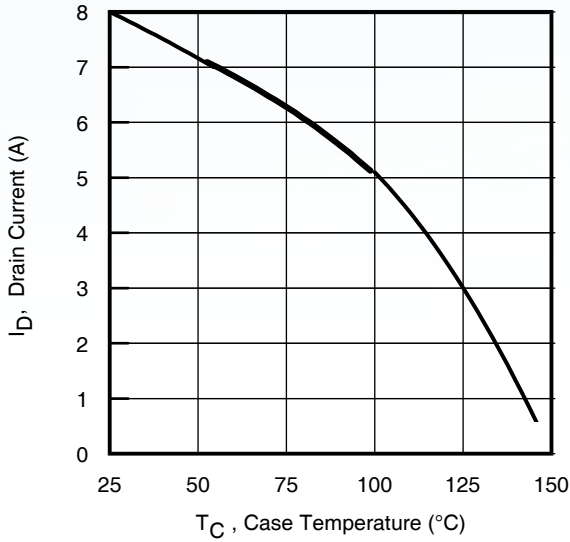


Fig 9. Maximum Drain Current vs. Case Temperature

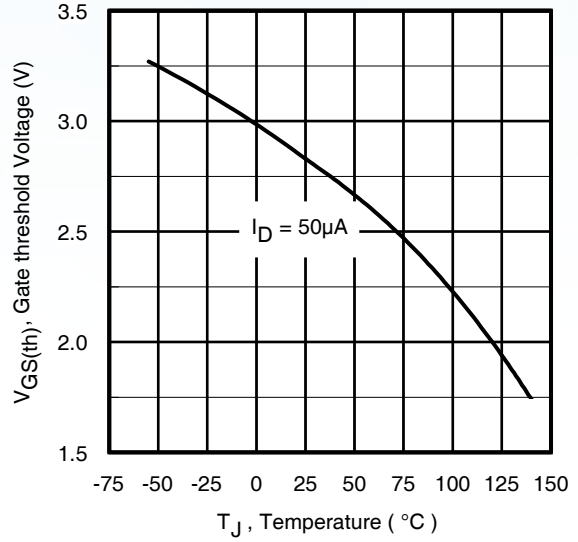


Fig 10. Threshold Voltage vs. Temperature

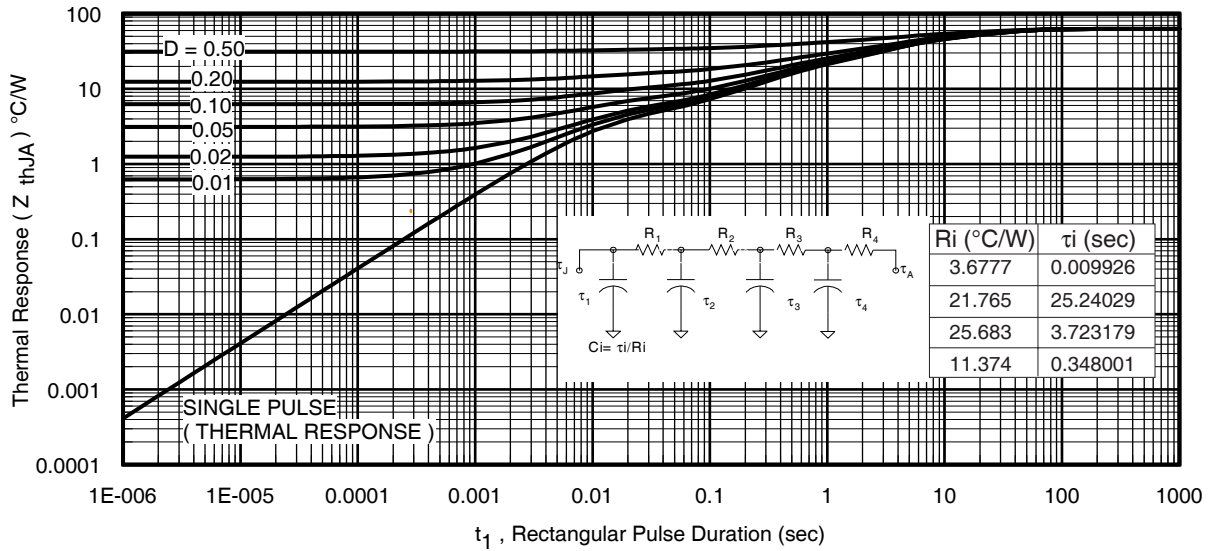


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

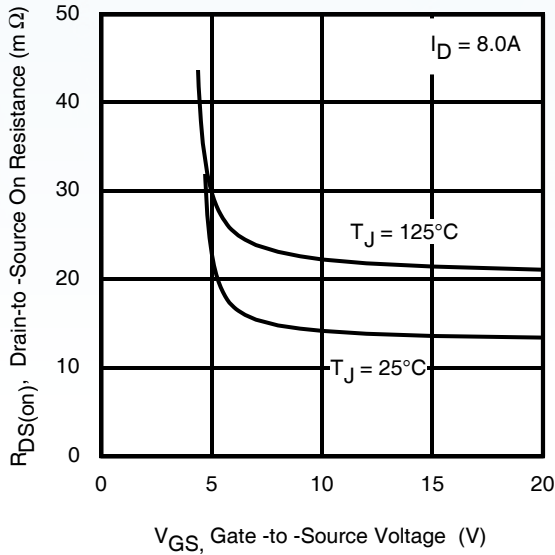


Fig 12. On-Resistance vs. Gate Voltage

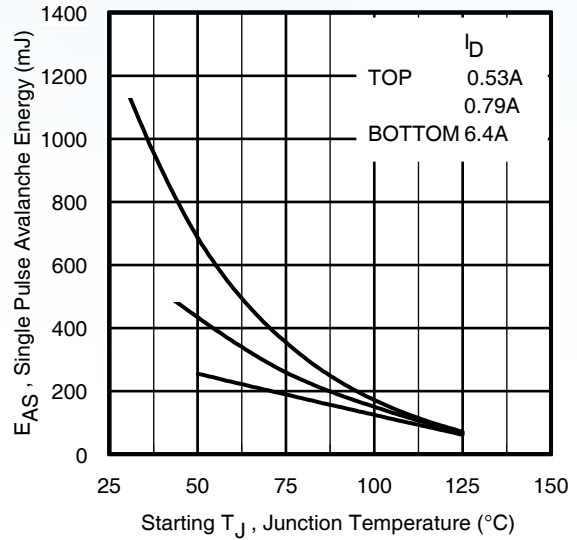


Fig 13. Maximum Avalanche Energy vs. Drain Current

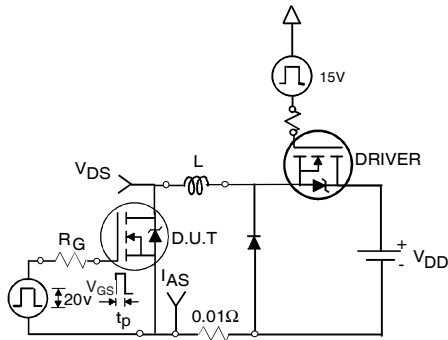


Fig 14a. Unclamped Inductive Test Circuit

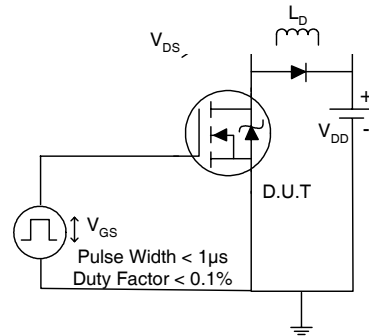


Fig 15a. Switching Time Test Circuit

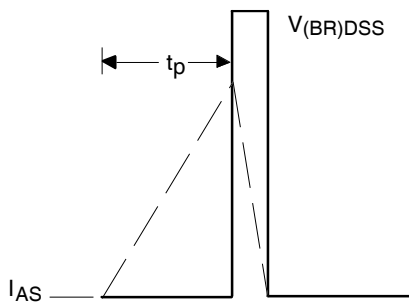


Fig 14b. Unclamped Inductive Waveforms

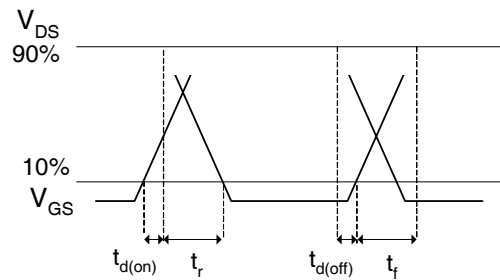
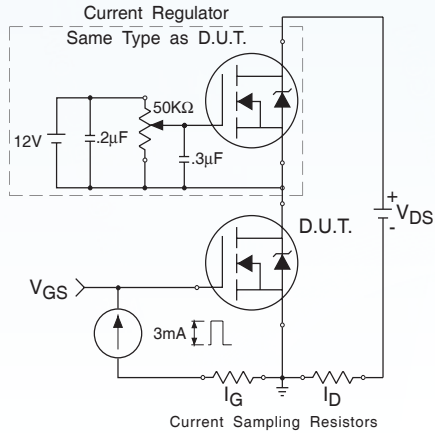
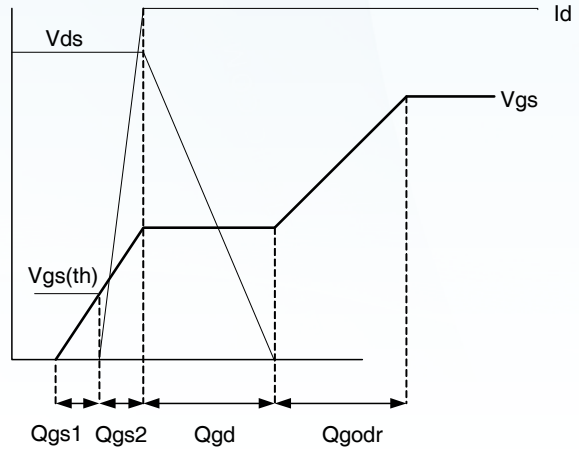


Fig 15b. Switching Time Waveforms



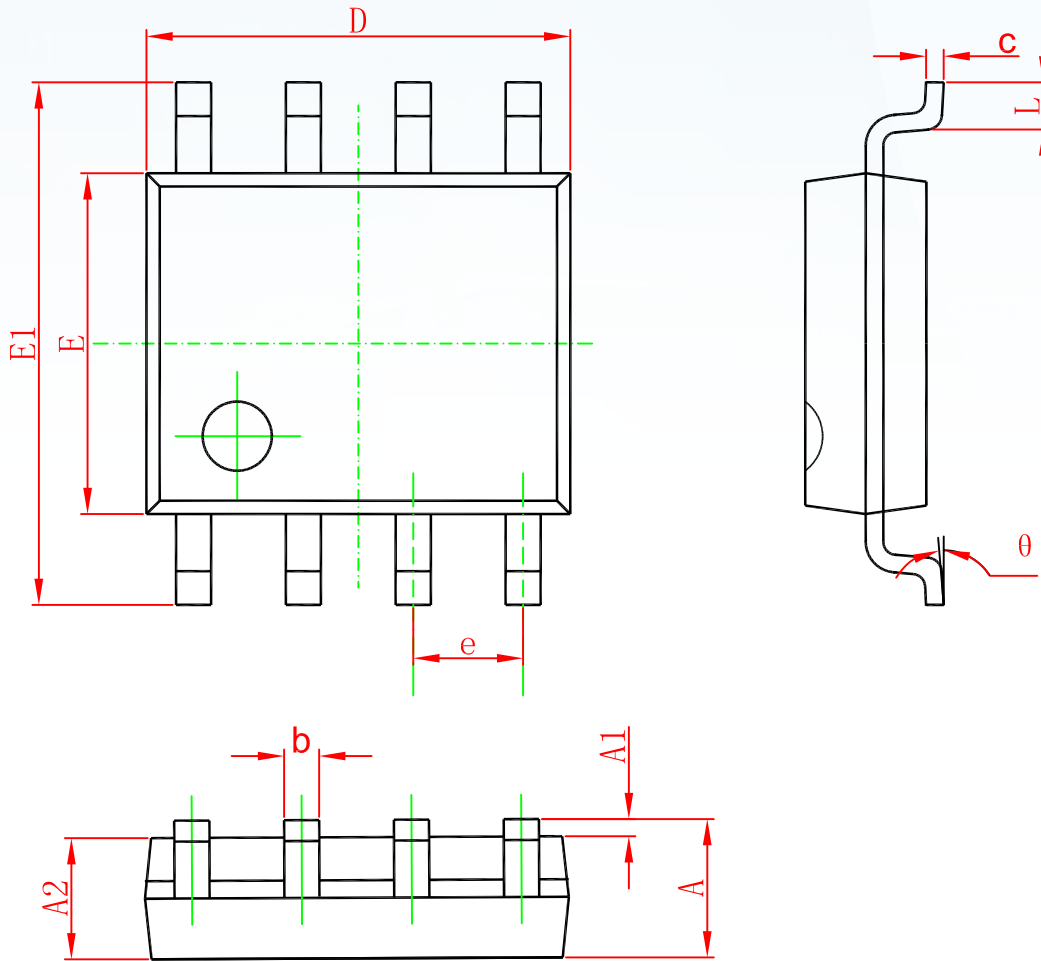
**Fig 17a.** Gate Charge Test Circuit



**Fig 17b.** Gate Charge Waveform

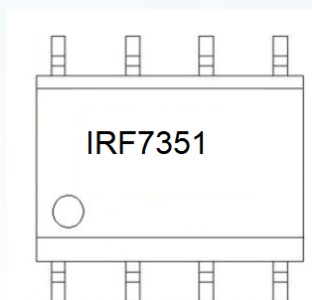


**SOP-8**



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°

## Marking



## Ordering information

Order code	Package	Baseqty	Deliverymode
IRF7351	SOP-8	3000	Tape and reel

## Disclaimer

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