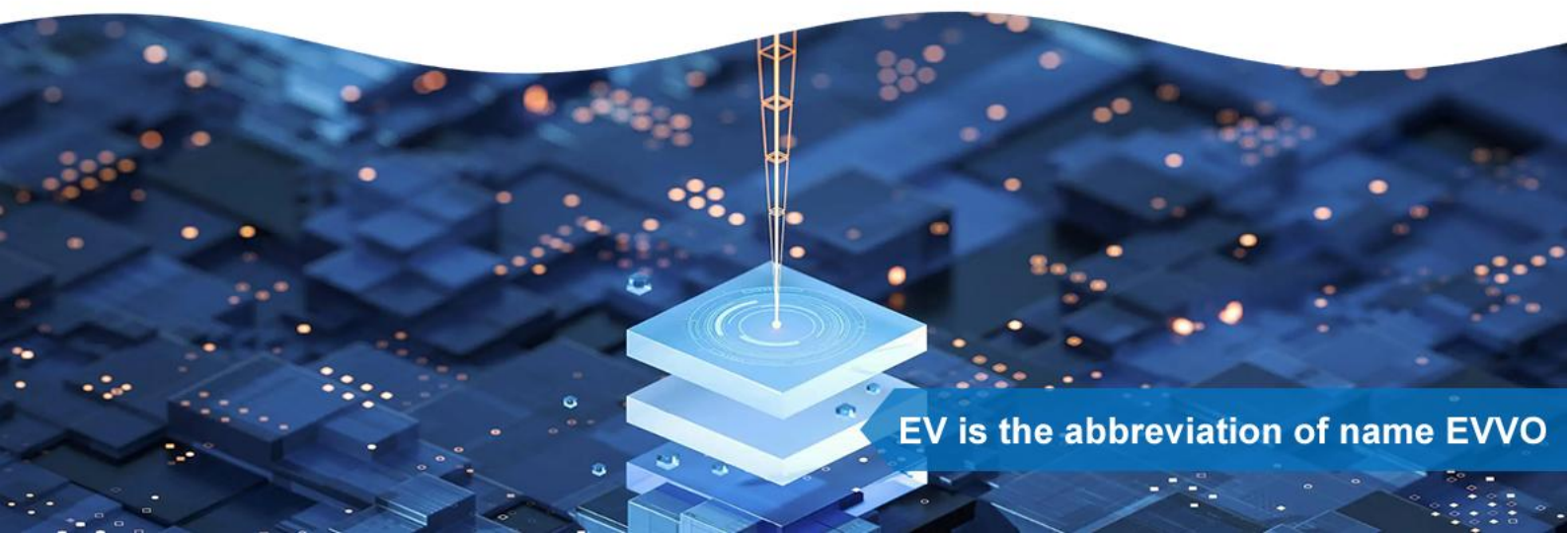
EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

Domestic Part Number	IRF7807
Overseas Part Number	IRF7807
Equivalent Part Number	IRF7807

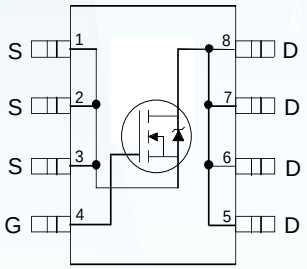


Features

- $V_{DS\ (V)}$ = 30V
- $R_{DS(ON)}$ < 13.8mΩ (V_{GS} = 10V)
- $R_{DS(ON)}$ < 18.2mΩ (V_{GS} = 4.5V)

Applications

- Control FET for Notebook Processor Power
- Synchronous Rectifier MOSFET for Graphics Cards and POL Converters in Networking and Telecommunication Systems



Top View

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	
I_D @ T_A = 25°C	Continuous Drain Current, V_{GS} @ 10V	11	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	8.7	
I_{DM}	Pulsed Drain Current ①	88	
P_D @T_A = 25°C	Power Dissipation ④	2.5	W
P_D @T_A = 70°C	Power Dissipation ④	1.6	
	Linear Derating Factor	0.02	W/°C
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150	°C

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JL}$	Junction-to-Drain Lead	——	20	°C/W
$R_{\theta JA}$	Junction-to-Ambient ④	——	50	

Notes:

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

② Starting T_J = 25°C, L = 1.6mH R_G = 25Ω, I_{AS} = 8.8A.

③ Pulse width ≤ 400μs; duty cycle ≤ 2%.

④ When mounted on 1 inch square copper board

Static @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	30	—	—	V	V_{GS} = 0V, I_D = 250μA
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.023	—	V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	11	13.8	mΩ	V_{GS} = 10V, I_D = 11A ③
		—	14.5	18.2		V_{GS} = 4.5V, I_D = 8.8A ③
$V_{GS(th)}$	Gate Threshold Voltage	1.35	1.8	2.25	V	V_{DS} = V_{GS}, I_D = 250μA
$\Delta V_{GS(th)}$	Gate Threshold Voltage Coefficient	—	- 4.7	—	mV/°C	
I_{DSS}	Drain-to-Source Leakage Current	—	—	1.0	μA	V_{DS} = 24V, V_{GS} = 0V
		—	—	150		V_{DS} = 24V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	V_{GS} = 20V
	Gate-to-Source Reverse Leakage	—	—	-100		V_{GS} = -20V
gfs	Forward Transconductance	22	—	—	S	V_{DS} = 15V, I_D = 8.8A
Q_g	Total Gate Charge	—	7.2	11		
Q_{gs1}	Pre-Vth Gate-to-Source Charge	—	2.1	—		V_{DS} = 15V
Q_{gs2}	Post-Vth Gate-to-Source Charge	—	0.7	—	nC	V_{GS} = 4.5V
Q_{gd}	Gate-to-Drain Charge	—	2.7	—		I_D = 8.8A
Q_{godr}	Gate Charge Overdrive	—	1.7	—		See Fig. 16
Q_{sw}	Switch Charge (Q_{gs2} + Q_{gd})	—	3.4	—		
Q_{oss}	Output Charge	—	2.8	—	nC	V_{DS} = 15V, V_{GS} = 0V
R_G	Gate Resistance	—	2.5	4.8	Ω	
$t_{d(on)}$	Turn-On Delay Time	—	6.9	—		V_{DD} = 15V, V_{GS} = 4.5V ③
t_r	Rise Time	—	6.2	—		I_D = 8.8A
$t_{d(off)}$	Turn-Off Delay Time	—	10	—	ns	Clamped Inductive Load
t_f	Fall Time	—	3.1	—		
C_{iss}	Input Capacitance	—	770	—		V_{GS} = 0V
C_{oss}	Output Capacitance	—	190	—	pF	V_{DS} = 15V
C_{rss}	Reverse Transfer Capacitance	—	100	—		f = 1.0MHz

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ②	—	63	mJ
I_{AR}	Avalanche Current ①	—	8.8	A

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	3.1	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	88		
V_{SD}	Diode Forward Voltage	—	—	1.0	V	T_J = 25°C, I_S = 8.8A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time	—	31	46	ns	T_J = 25°C, I_F = 8.8A, V_{DD} = 15V
Q_{rr}	Reverse Recovery Charge	—	17	26	nC	di/dt = 100A/μs ③

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

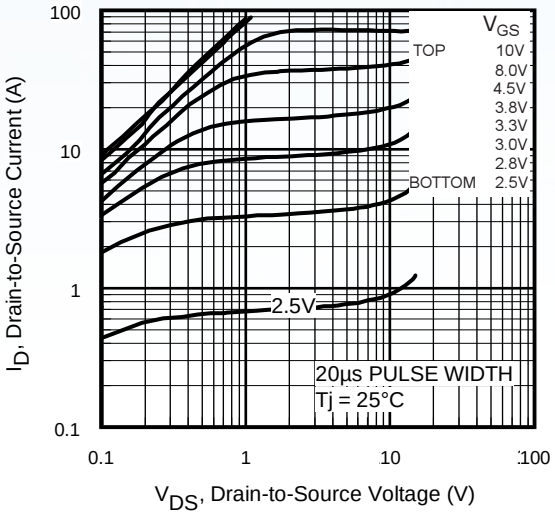


Fig 1. Typical Output Characteristics

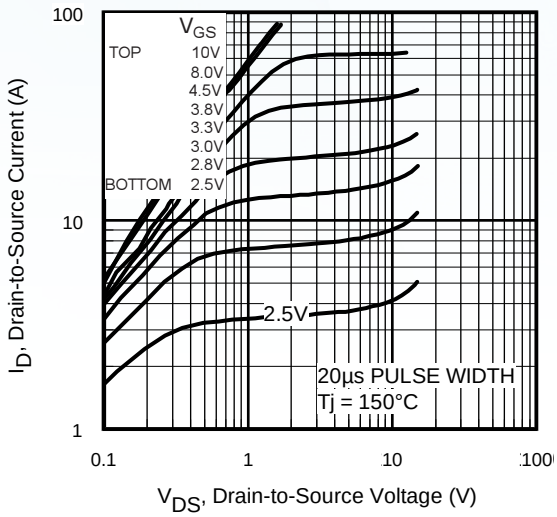


Fig 2. Typical Output Characteristics

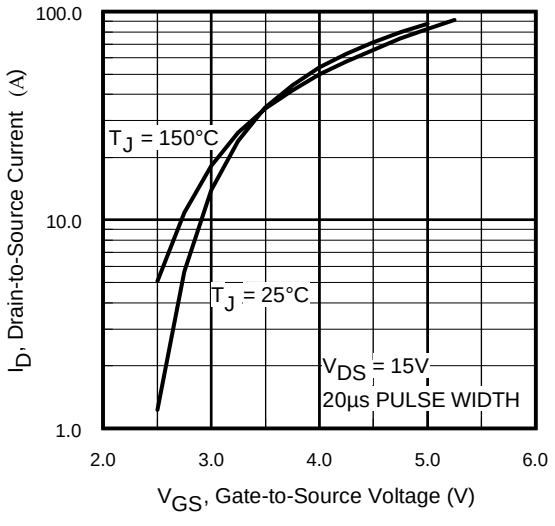


Fig 3. Typical Transfer Characteristics

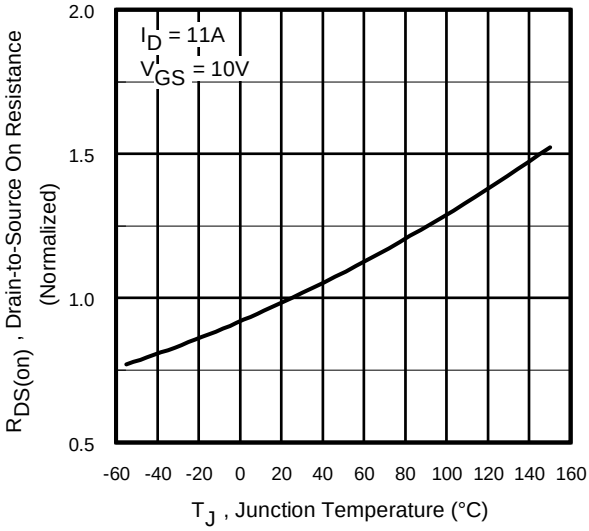


Fig 4. Normalized On-Resistance Vs. Temperature

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

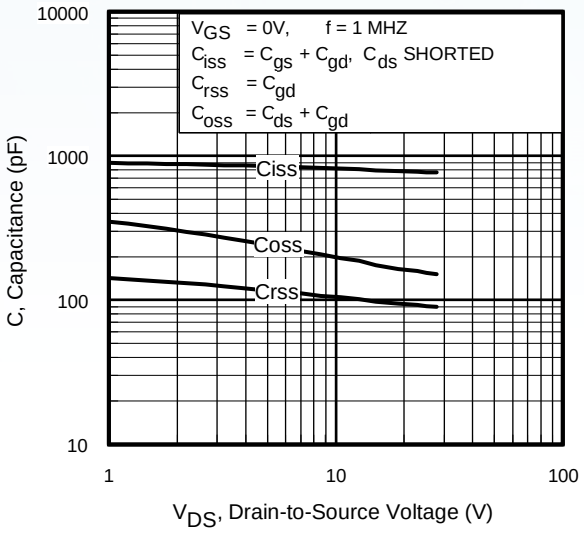


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

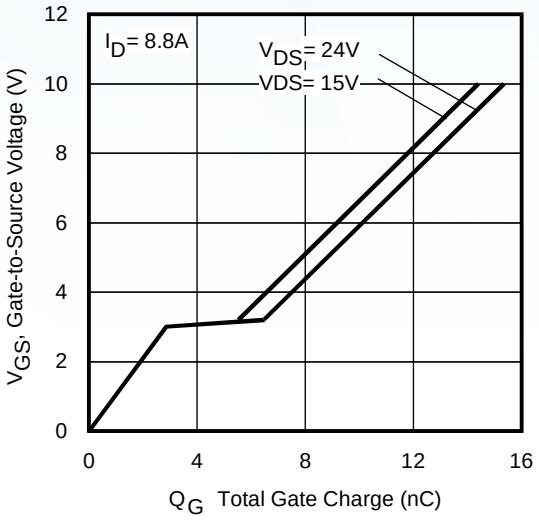


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

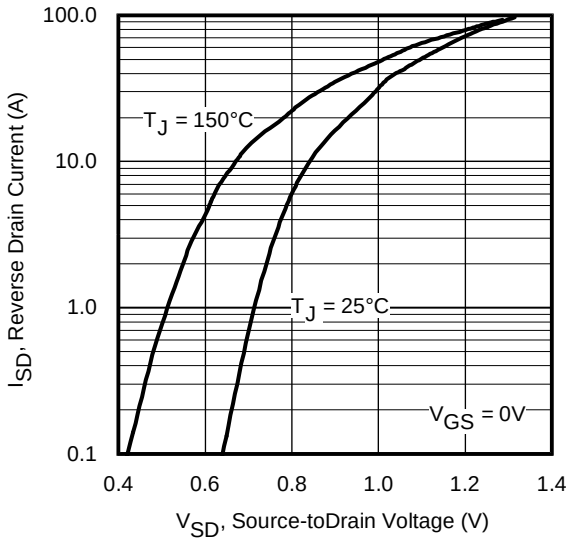


Fig 7. Typical Source-Drain Diode Forward Voltage

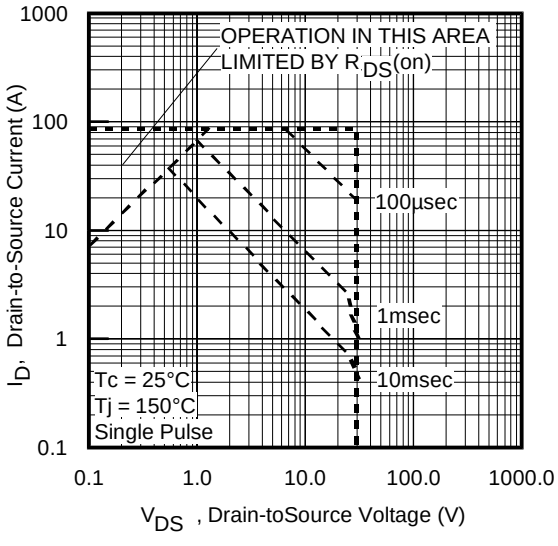


Fig 8. Maximum Safe Operating Area

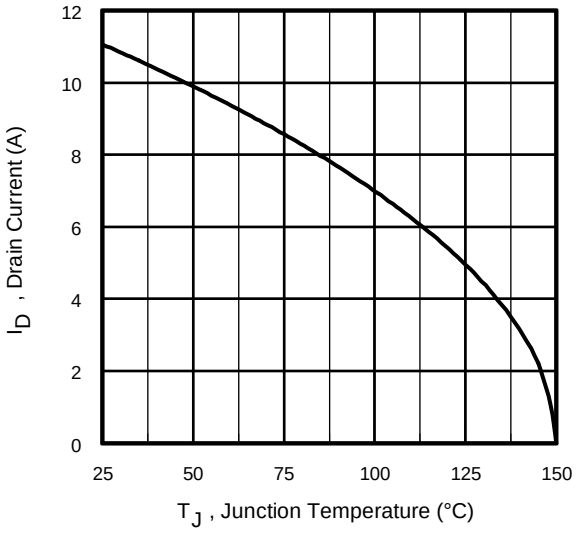


Fig 9. Maximum Drain Current Vs. Case Temperature

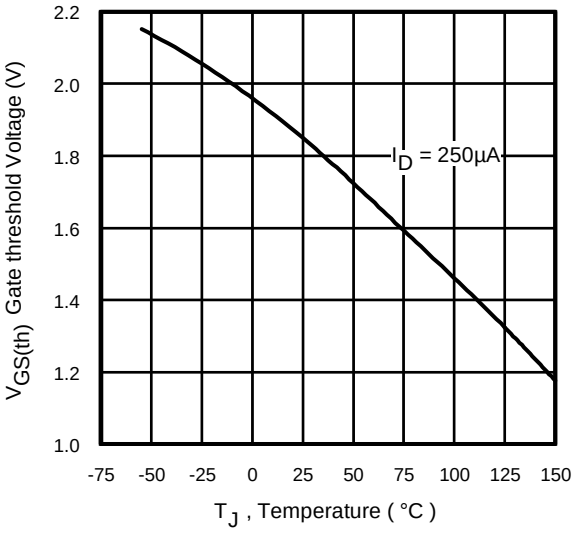


Fig 10. Threshold Voltage Vs. Temperature

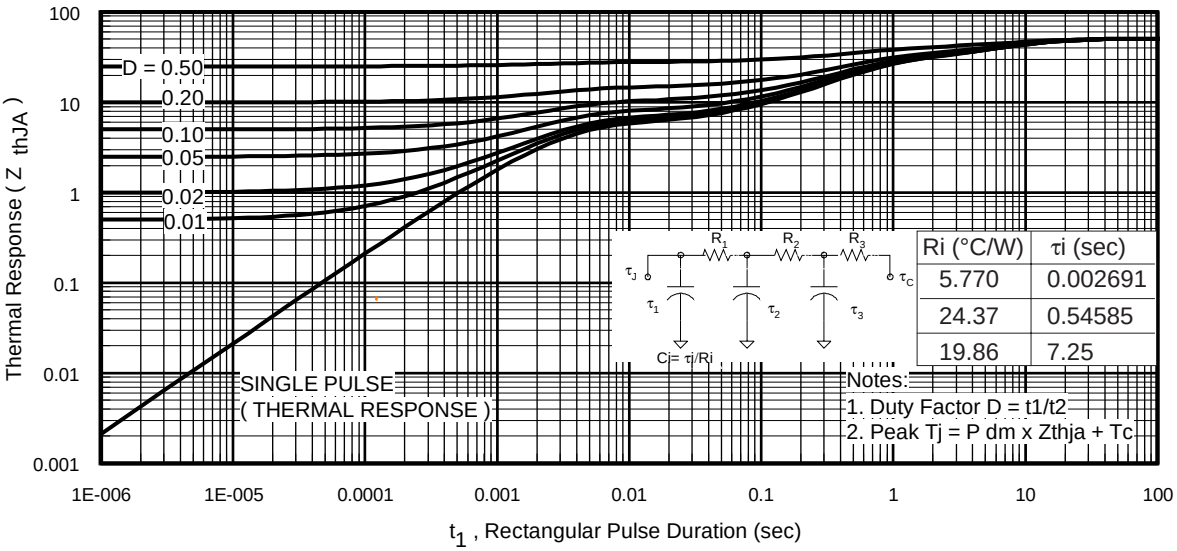


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

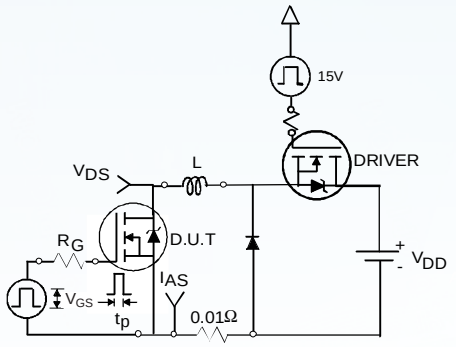


Fig 12a. Unclamped Inductive Test Circuit

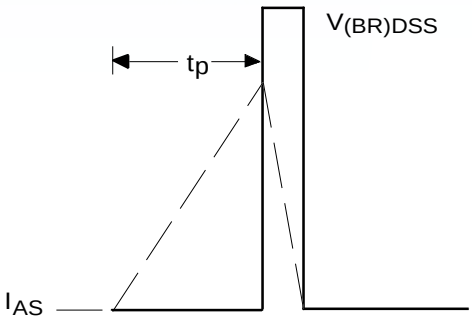


Fig 12b. Unclamped Inductive Waveforms

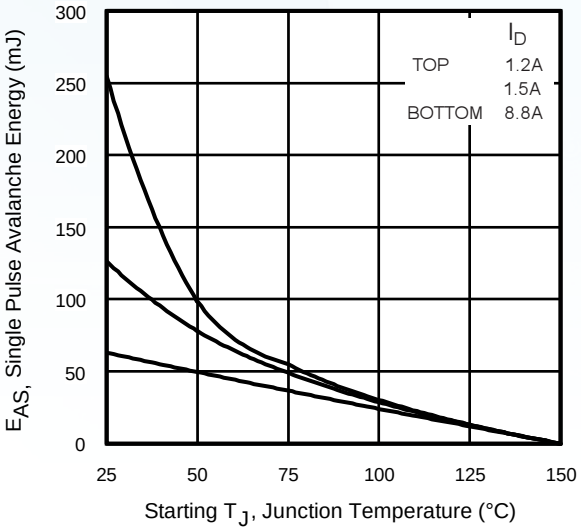


Fig 12c. Maximum Avalanche Energy Vs. Drain Current

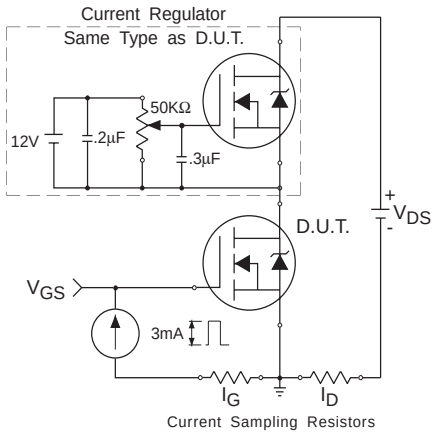


Fig 13. Gate Charge Test Circuit

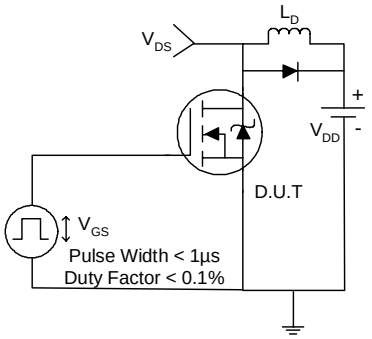


Fig 14a. Switching Time Test Circuit

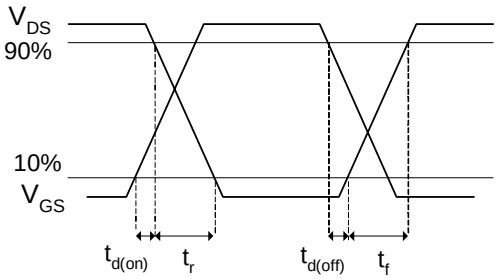
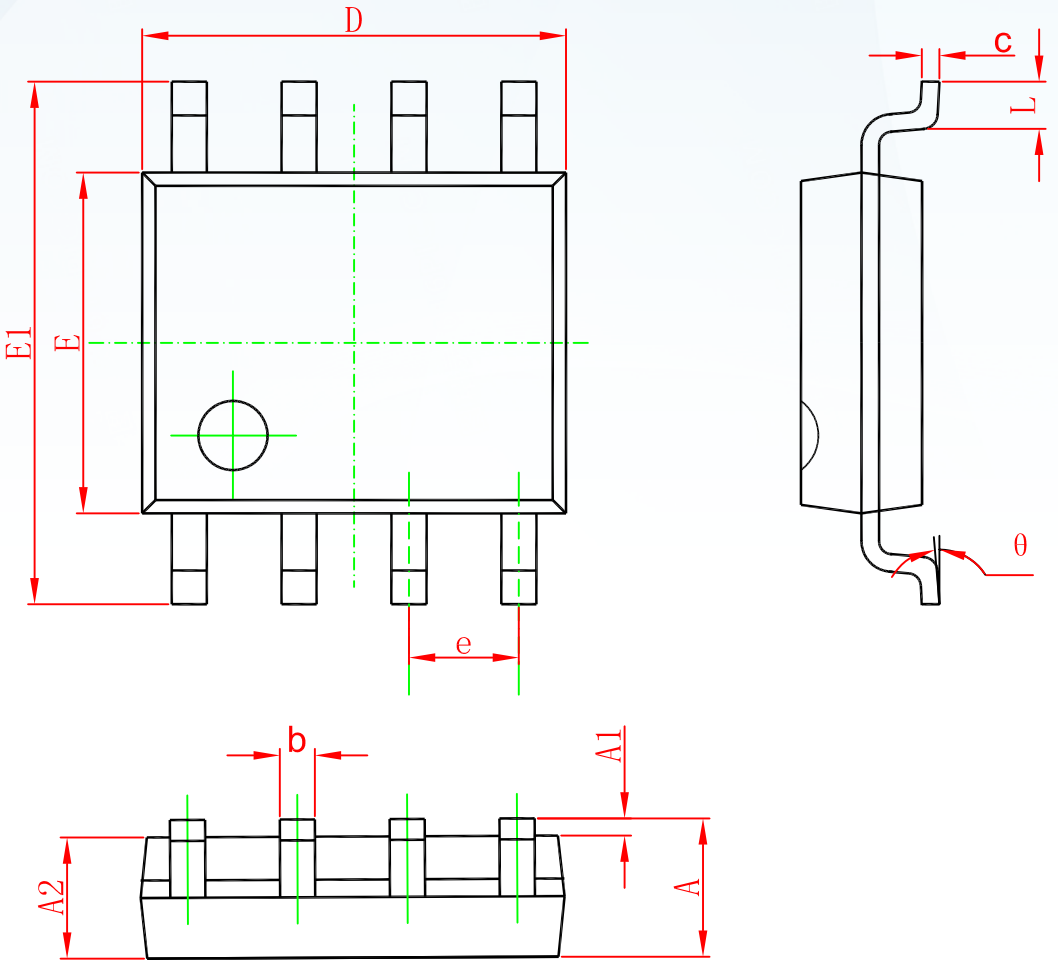


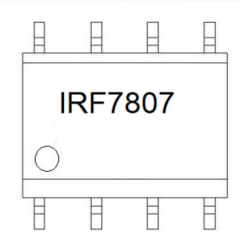
Fig 14b. Switching Time Waveforms

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
IRF7807	SOP-8	3000	Tape and reel

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