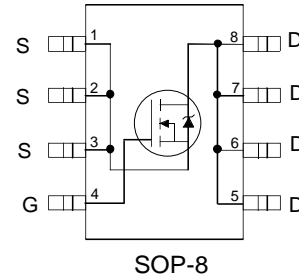


Benefits

- $V_{DS} (V) = 12V$
- $R_{DS(ON)} < 8m\Omega$ ($V_{GS} = 4.5V$)
- $R_{DS(ON)} < 30m\Omega$ ($V_{GS} = 2.8V$)

Applications

- High Frequency 3.3V and 5V input Point-of-Load Synchronous Buck Converters for Netcom and Computing Applications.
- Power Management for Netcom, Computing and Portable Applications.
- Lead-Free



Absolute Maximum Ratings

Symbol	Parameter	Max.	Units
V_{DS}	Drain-Source Voltage	12	V
V_{GS}	Gate-to-Source Voltage	± 12	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	15	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	12	
I_{DM}	Pulsed Drain Current ^①	120	
$P_D @ T_A = 25^\circ C$	Maximum Power Dissipation ^④	2.5	W
$P_D @ T_A = 70^\circ C$	Maximum Power Dissipation ^④	1.6	W
	Linear Derating Factor	0.02	W/ $^\circ C$
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	$^\circ C$

Thermal Resistance

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

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ C$, $L = 2.3mH$
 $R_G = 25\Omega$, $I_{AS} = 12A$.
- ③ Pulse width $\leq 400\mu s$; duty cycle
- ④ When mounted on 1 inch square copper board.

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	12			V	V _{GS} = 0V, I _D = 250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp. Coefficient		0.014		V/°C	Reference to 25°C, I _D = 1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance		6.0	8.0	mΩ	V _{GS} = 4.5V, I _D = 15A ③
			12	30		V _{GS} = 2.8V, I _D = 12A ③
V _{GS(th)}	Gate Threshold Voltage	0.6		1.9	V	V _{DS} = V _{GS} , I _D = 250μA
I _{DSS}	Drain-to-Source Leakage Current			100	μA	V _{DS} = 9.6V, V _{GS} = 0V
				250		V _{DS} = 9.6V, V _{GS} = 0V, T _J = 125°C
I _{GSS}	Gate-to-Source Forward Leakage			200	nA	V _{GS} = 12V
	Gate-to-Source Reverse Leakage			-200		V _{GS} = -12V

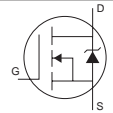
Dynamic @ T_J = 25°C (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
g _{fs}	Forward Transconductance	31			S	V _{DS} = 6.0V, I _D = 12A
Q _g	Total Gate Charge		26	40		I _D = 12A
Q _{gs}	Gate-to-Source Charge		4.6		nC	V _{DS} = 10V
Q _{gd}	Gate-to-Drain ("Miller") Charge		11			V _{GS} = 4.5V
Q _{oss}	Output Gate Charge		17			V _{GS} = 0V, V _{DS} = 5.0V
t _{d(on)}	Turn-On Delay Time		11			V _{DD} = 6.0V
t _r	Rise Time		29		ns	I _D = 12A
t _{d(off)}	Turn-Off Delay Time		19			R _G = 1.8Ω
t _f	Fall Time		8.3			V _{GS} = 4.5V ③
C _{iss}	Input Capacitance		2550			V _{GS} = 0V
C _{oss}	Output Capacitance		2190			V _{DS} = 6.0V
C _{rss}	Reverse Transfer Capacitance		450		pF	f = 1.0MHz

Avalanche Characteristics

Symbol	Parameter	Typ.	Max.	Units
E _{AS}	Single Pulse Avalanche Energy②		160	mJ
I _{AR}	Avalanche Current①		12	A

Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)			2.5	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①			120		
V _{SD}	Diode Forward Voltage		0.87	1.2	V	T _J = 25°C, I _S = 12A, V _{GS} = 0V ③
			0.73			T _J = 125°C, I _S = 12A, V _{GS} = 0V ③
t _{rr}	Reverse Recovery Time		55	82	ns	T _J = 25°C, I _F = 12A, V _R = 12V
Q _{rr}	Reverse Recovery Charge		59	89	nC	di/dt = 100A/μs ③
t _{rr}	Reverse Recovery Time		54	81	ns	T _J = 125°C, I _F = 12A, V _R = 12V
Q _{rr}	Reverse Recovery Charge		60	90	nC	di/dt = 100A/μs ③

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

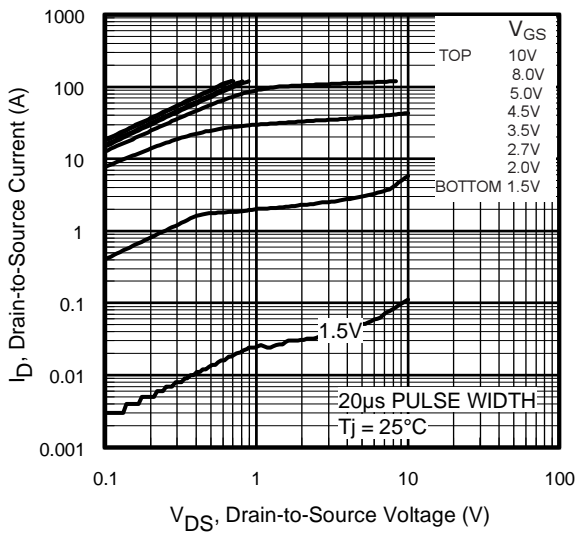


Fig 1. Typical Output Characteristics

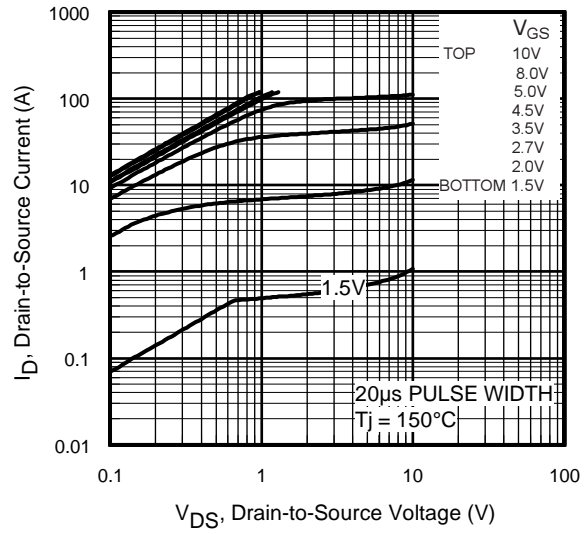


Fig 2. Typical Output Characteristics

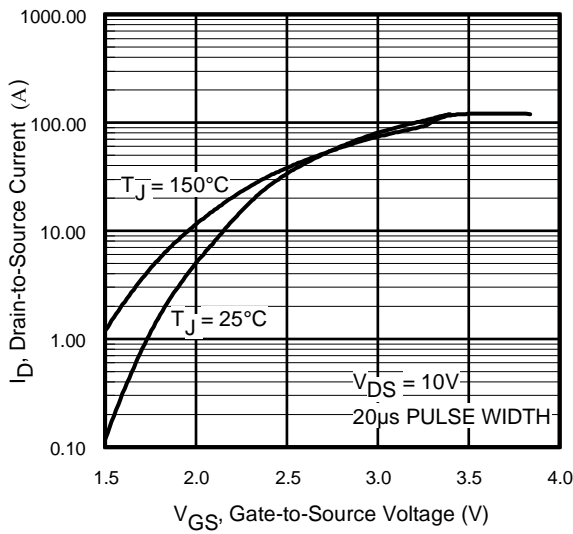


Fig 3. Typical Transfer Characteristics

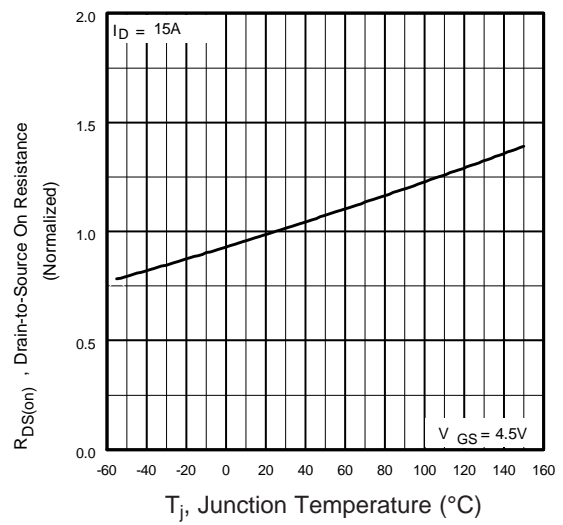


Fig 4. Normalized On-Resistance Vs. Temperature

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

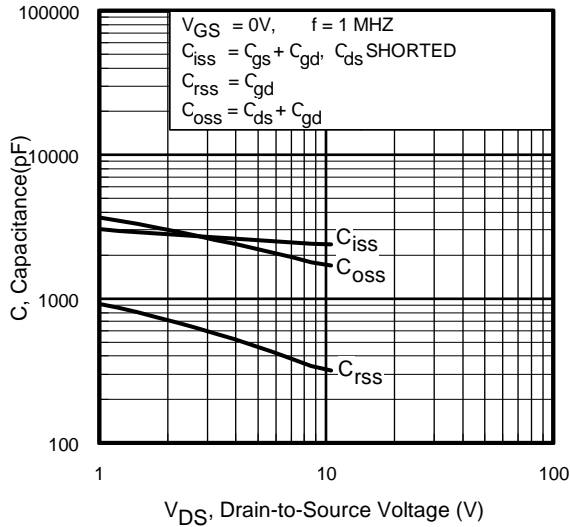


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

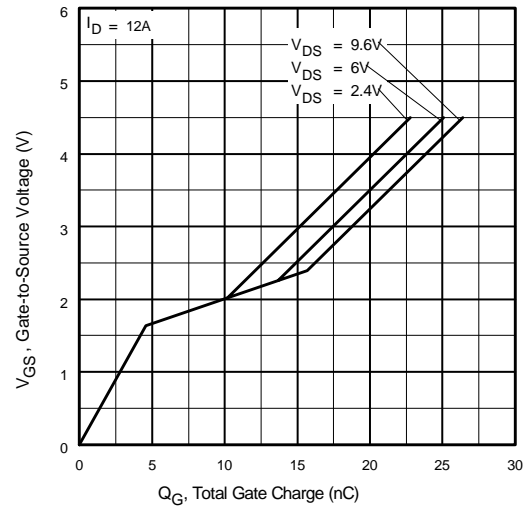


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

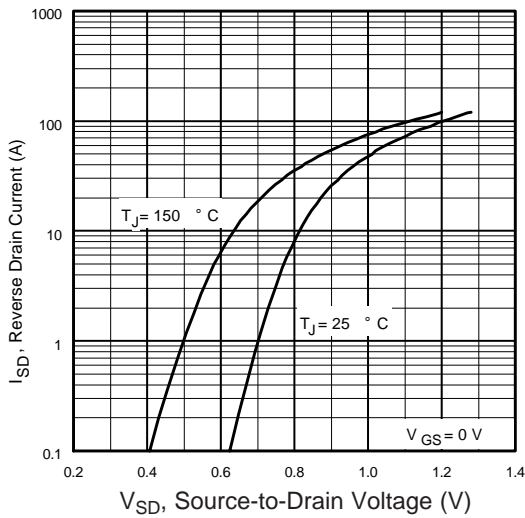


Fig 7. Typical Source-Drain Diode Forward Voltage

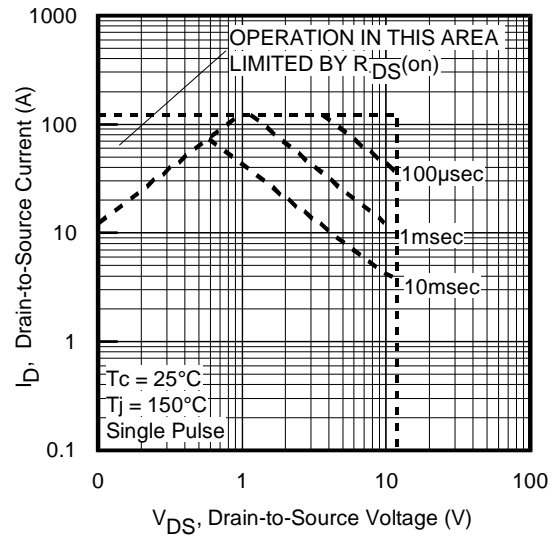


Fig 8. Maximum Safe Operating Area

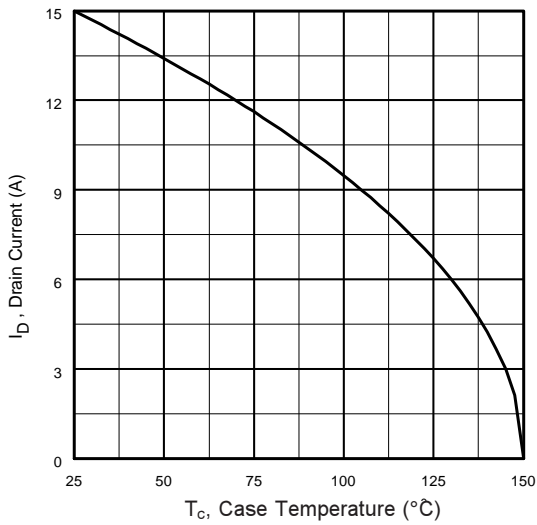


Fig 9. Maximum Drain Current Vs. Case Temperature

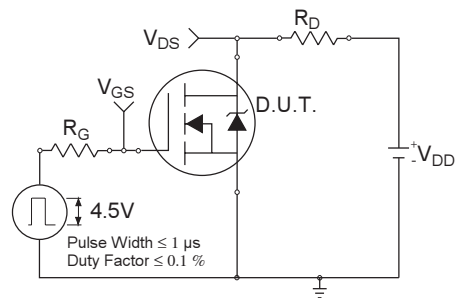


Fig 10a. Switching Time Test Circuit

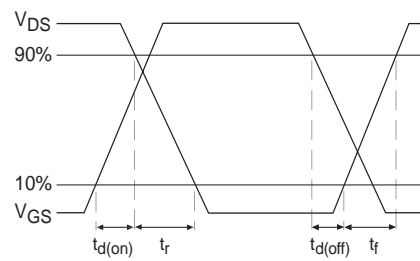


Fig 10b. Switching Time Waveforms

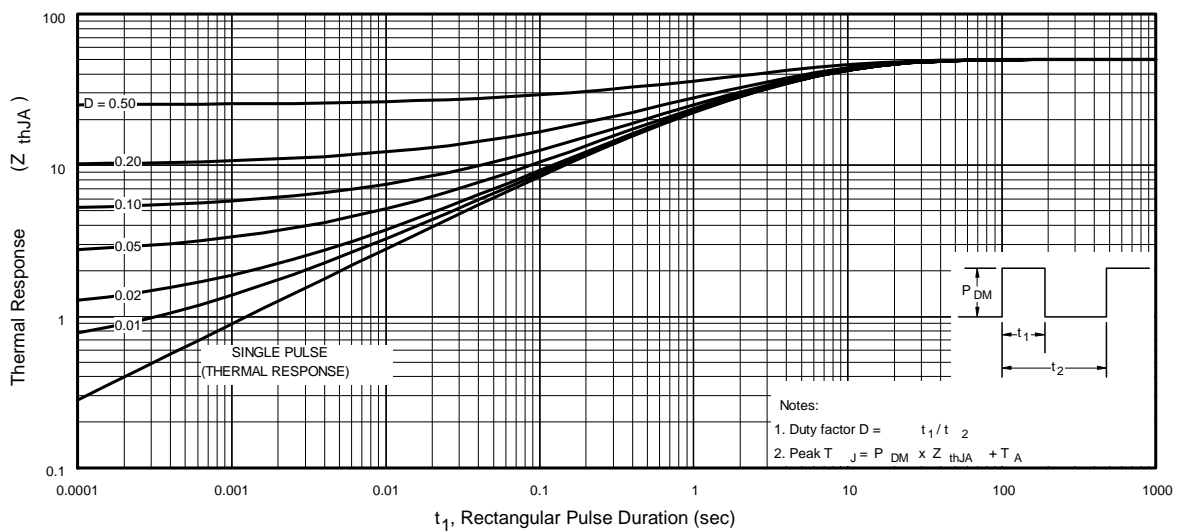


Fig 10. Maximum Effective Transient Thermal Impedance, Junction-to-Case

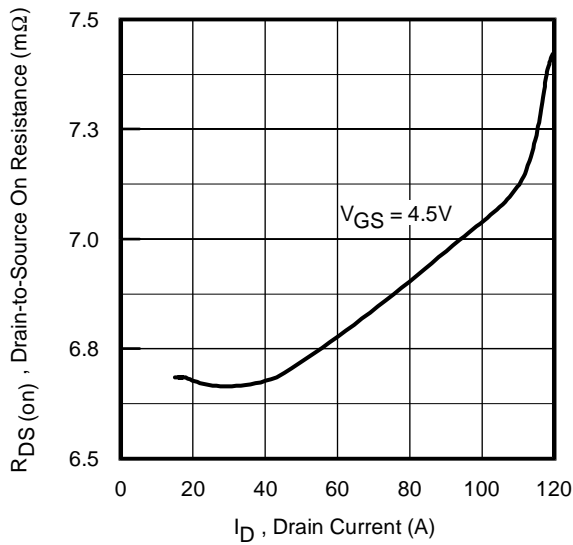


Fig 12. On-Resistance Vs. Drain Current

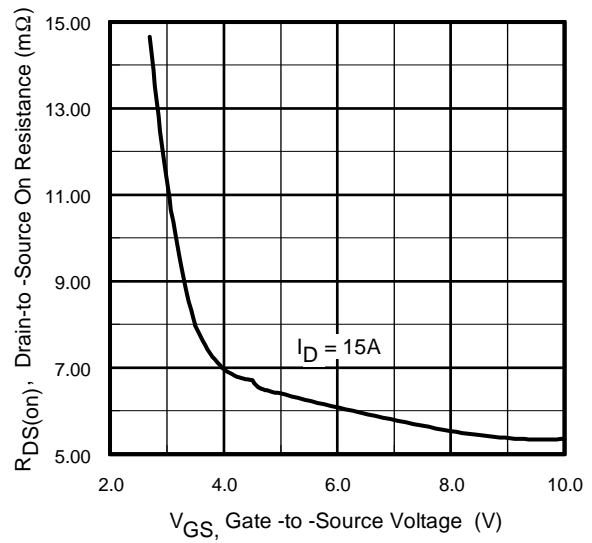


Fig 13. On-Resistance Vs. Gate Voltage

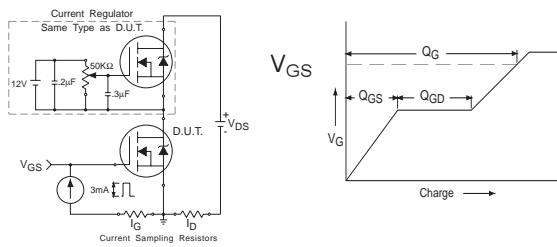


Fig 13a&b. Basic Gate Charge Test Circuit and Waveform

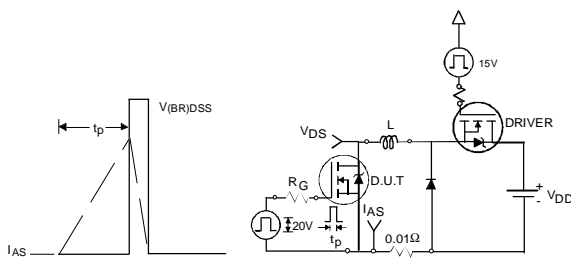


Fig 14a&b. Unclamped Inductive Test circuit and Waveforms

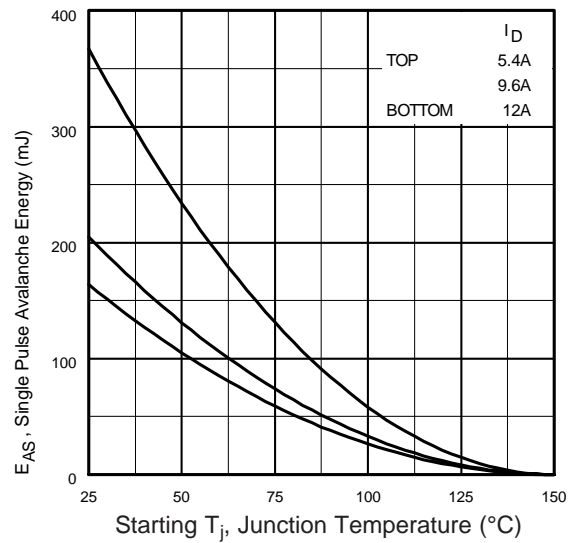
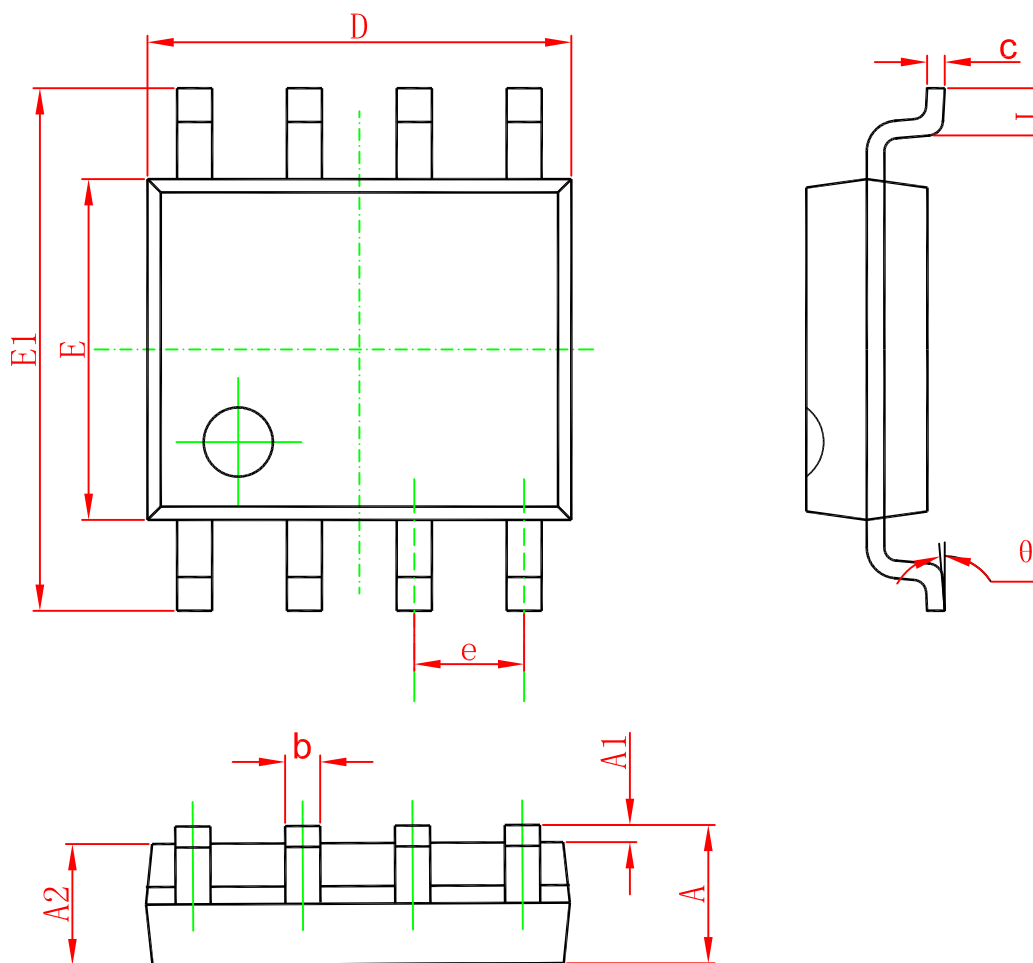


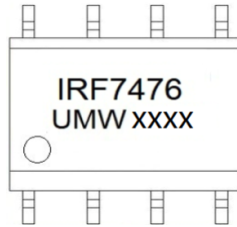
Fig 14c. Maximum Avalanche Energy Vs. Drain Current

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
UMW IRF7476TR	SOP-8	3000	Tape and reel