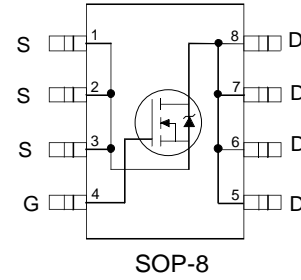


**Benefits**

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

**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	$\pm 12$	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 <sup>①</sup>	120	
$P_D @ T_A = 25^\circ C$	Maximum Power Dissipation <sup>④</sup>	2.5	W
$P_D @ T_A = 70^\circ C$	Maximum Power Dissipation <sup>④</sup>	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 <sup>④</sup>		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<sub>J</sub> = 25°C (unless otherwise specified)

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

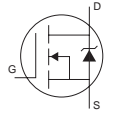
### Dynamic @ T<sub>J</sub> = 25°C (unless otherwise specified)

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

### Avalanche Characteristics

Symbol	Parameter	Typ.	Max.	Units
E <sub>AS</sub>	Single Pulse Avalanche Energy②		160	mJ
I <sub>AR</sub>	Avalanche Current②		12	A

### Diode Characteristics

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

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

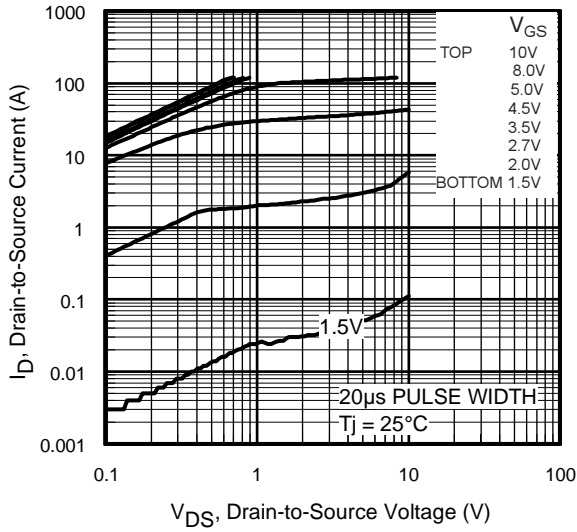


Fig 1. Typical Output Characteristics

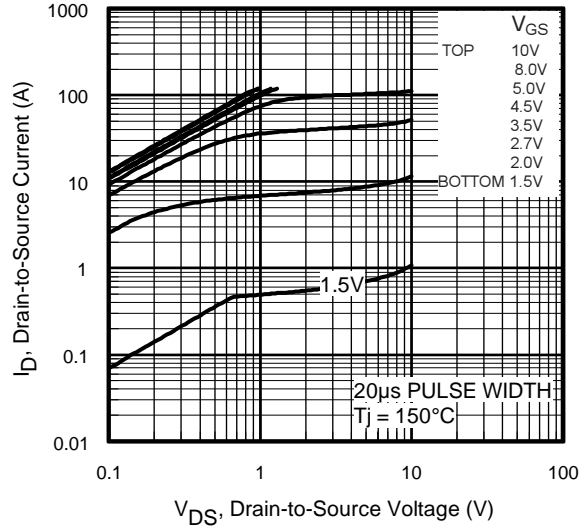


Fig 2. Typical Output Characteristics

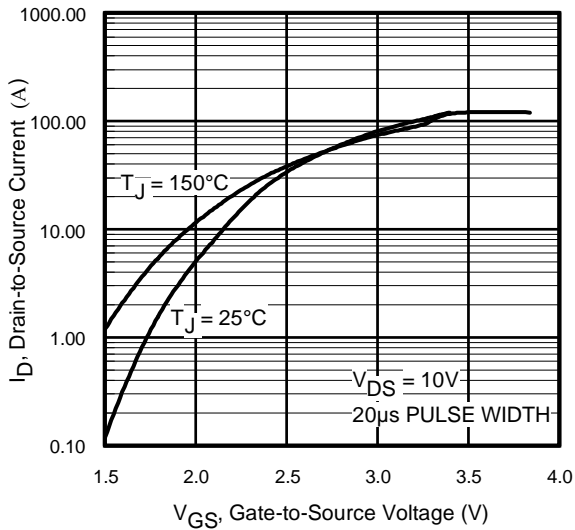


Fig 3. Typical Transfer Characteristics

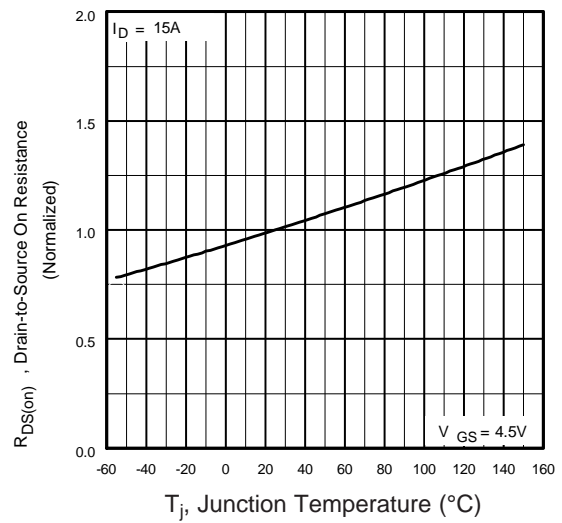
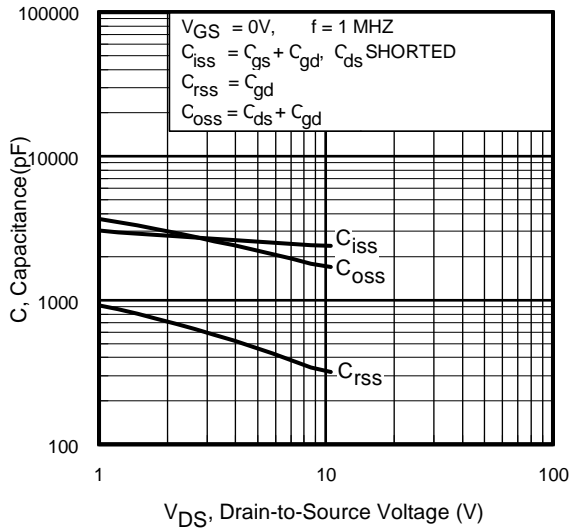
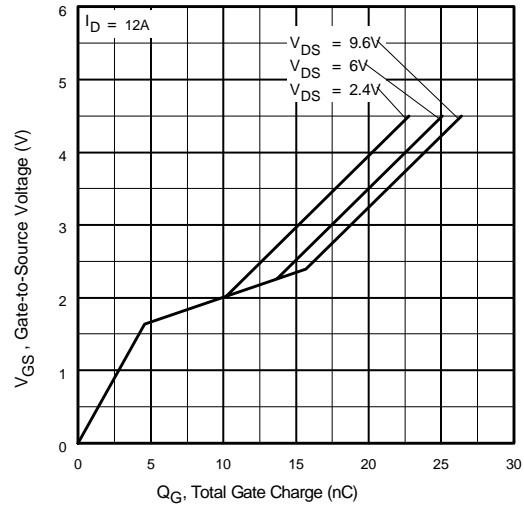


Fig 4. Normalized On-Resistance Vs. Temperature

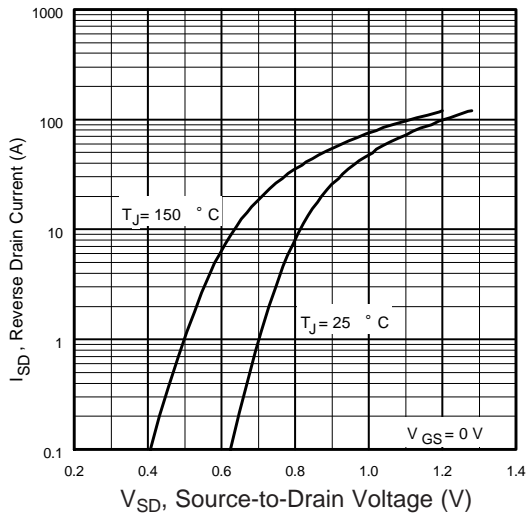
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



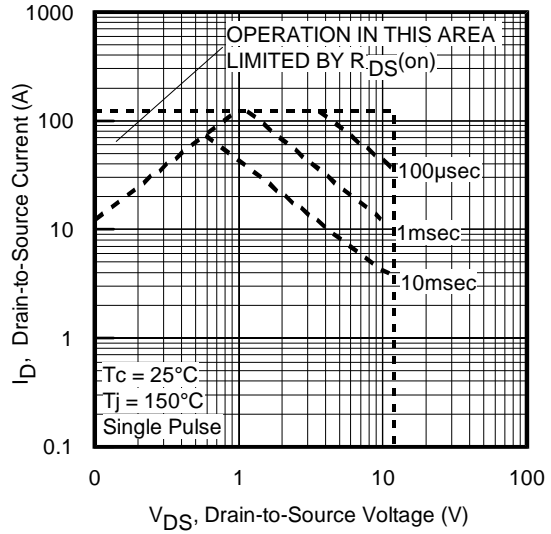
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



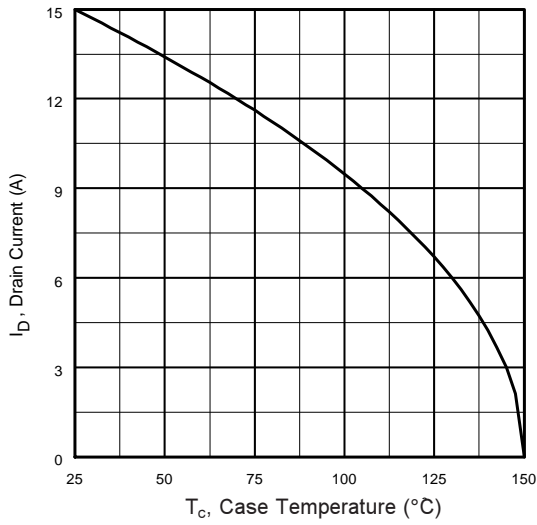
**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage



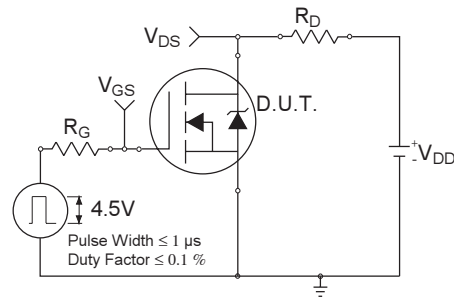
**Fig 7.** Typical Source-Drain Diode Forward Voltage



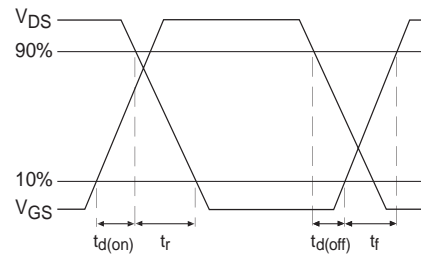
**Fig 8.** Maximum Safe Operating Area



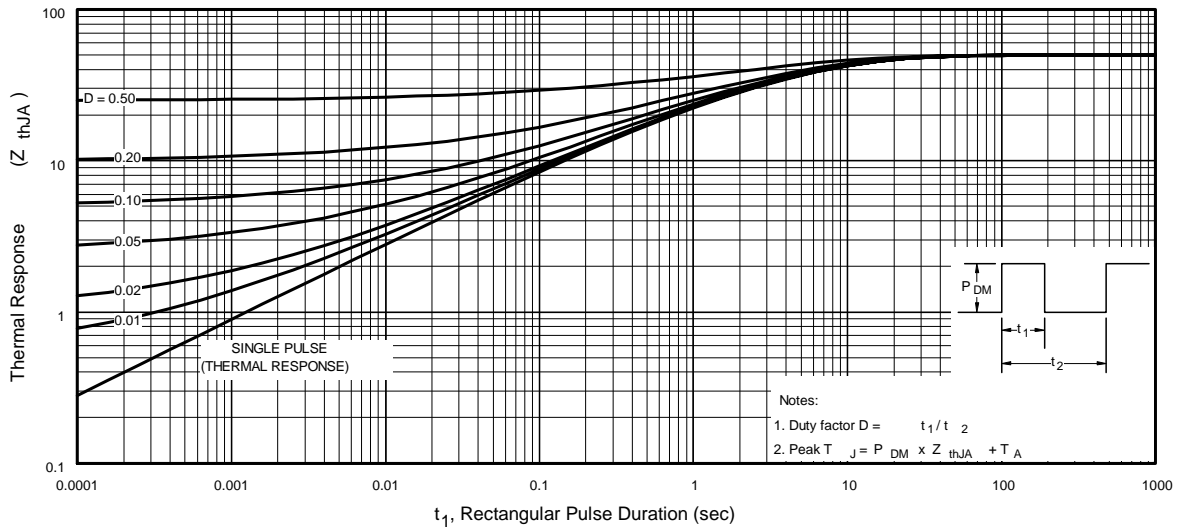
**Fig 9.** Maximum Drain Current Vs. Case Temperature



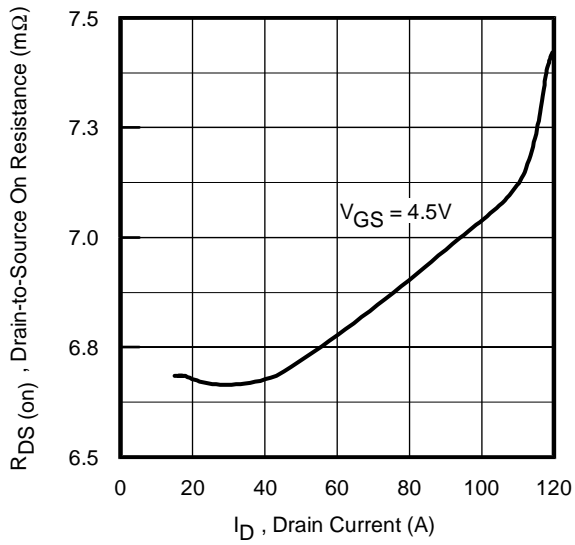
**Fig 10a.** Switching Time Test Circuit



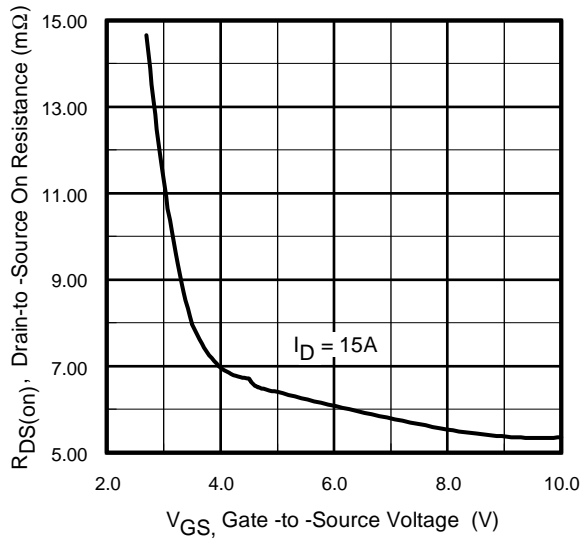
**Fig 10b.** Switching Time Waveforms



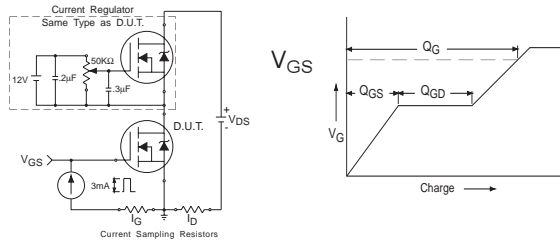
**Fig 10.** Maximum Effective Transient Thermal Impedance, Junction-to-Case



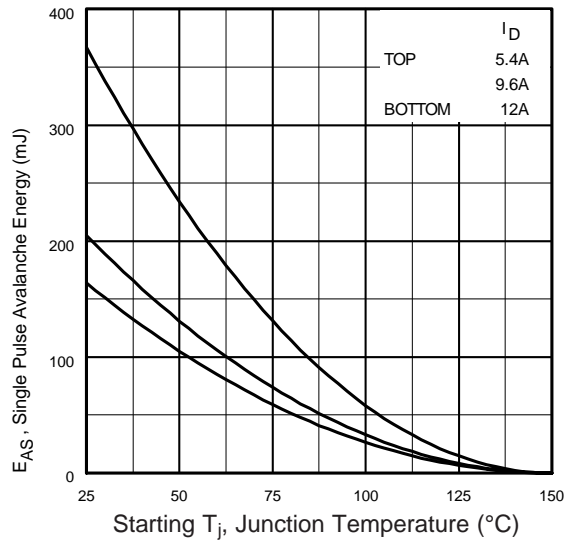
**Fig 12.** On-Resistance Vs. Drain Current



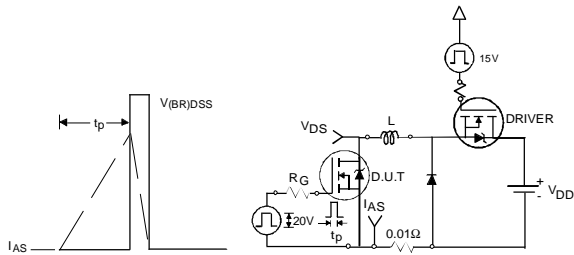
**Fig 13.** On-Resistance Vs. Gate Voltage



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

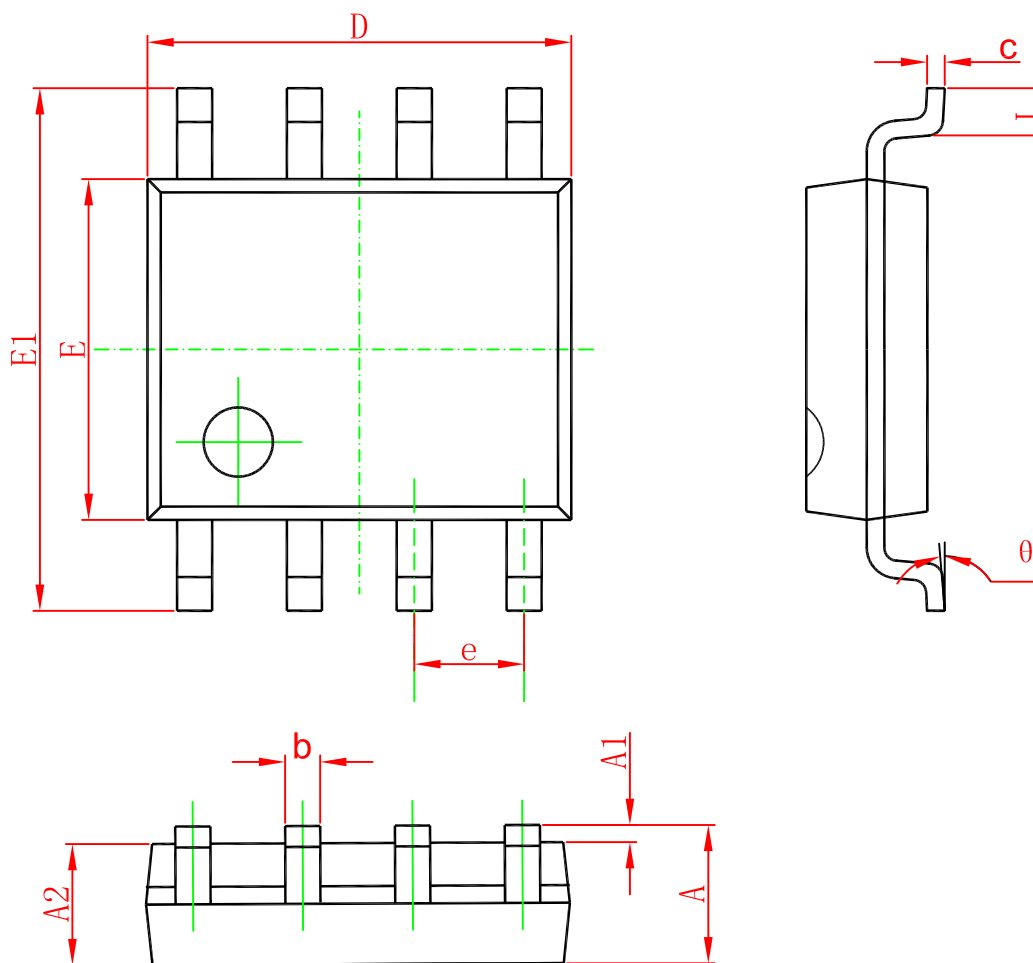


**Fig 14c.** Maximum Avalanche Energy Vs. Drain Current



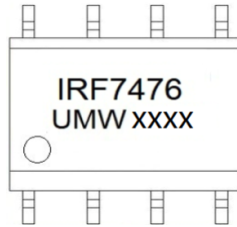
**Fig 14a&b.** Unclamped Inductive Test circuit and Waveforms

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
UMW IRF7476TR	SOP-8	3000	Tape and reel



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