KJ4407

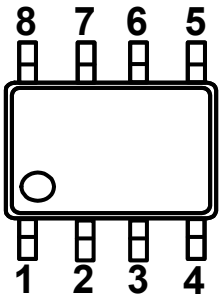
30V P-Channel Power MOSFET

Description

P-Channel Power MOSFET designed by KUAIJIEXIN, according to the advanced Trench Technology. This devices provide an excellent Gate charge and Rds(on), which leads to extremely communication and conduction losses. So it is very suitable for AC/DC power conversion, Lighting, and industrial power applications. The package form is SOP-8 which accords with the RoHS standard.

Pin	Description
1,2,3	Source(S)
4	Gate(G)
5,6,7,8	Drain(D)

Simplified Outline



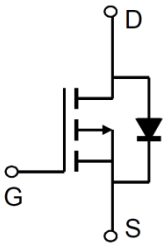
Top View
SOP-8L

Features

- Low FOM $R_{DS(on)} \times Q_g$
- 100% avalanche tested
- Easy to use/drive
- RoHS compliant

Applications

- Power Switch Circuit of Adaptor and Charger
- Battery Protection Charge/Discharge
- Notebook AC-in Load Switch



RoHS

Key Performance Parameters

Parameter	Value	Unit
$V_{DS@\ TA=25℃}$	-30	V
$R_{DS(on),max@-10V}$	11.5	mΩ
$R_{DS(on),max@-4.5V}$	16	mΩ
$Q_{g,typ}$	61.9	nC
$I_{D@TA=25℃}$	-14	A
$I_{D,pulse}$	-56	A
E_{AS} 1)	135	mJ
PD@T_A=25℃	2.9	W
T_J,T_{STG}	-55 to 150	℃

Device Marking and Package Information

Device	Package	Marking
KJ4407	SOP 8	4407

Absolute Maximum Ratings T_A = 25ºC, unless otherwise noted				
Parameter		**Symbol**	**Values**	**Unit**
Drain-Source voltage(V_{GS}=0V)		V_{DS}	-30	V
Continuous Drain Current[2]	T_A = 25ºC	I_D	-14	A
	T_A = 100ºC		-8.8	
Pulsed Drain Current[3]		$I_{D,pulse}$	-56	A
Gate-Source Voltage		V_{GSS}	±25V	V
Single Pulse Avalanche Energy		E_{AS}	135	mJ
Power Dissipation		P_D	2.9	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150	ºC

Thermal Resistance			
Parameter	**Symbol**	**Max.**	**Unit**
Thermal Resistance, Junction-to-Ambient	R_{thJA}	42	ºC/W

Notes

1) L=0.3mH,VDD=-15V,Ias=-30A Start TJ=25℃

2) Limited by maximum junction temperature.

3) Repetitive Rating: Pulse width limited by maximum junction temperature.

Electrical Characteristics T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -30V V_{GS} = 0V, T_J = 25ºC	--	--	-1	μA
		V_{DS} = -24V, V_{GS} = 0V, T_J = 125ºC	--	--	-100	
Gate-Source Leakage Current	I_{GSS}	V_{GS} = ±25V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1.2	-1.7	-2.3	V
Drain-Source On-State-Resistance	$R_{DS(on)}$	V_{GS} = -20V, I_D = -14A	--	7.9	10.5	mΩ
		V_{GS} = -10V, I_D = -14A	--	8.8	11.5	mΩ
		V_{GS} = -6V, I_D = -10A	--	10	13	mΩ
		V_{GS} = -4.5V, I_D = -10A	--	11.8	16	mΩ
Gate Resistance	R_G	f = 1.0MHz open drain	--	3.7	--	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -15V f = 1.0MHz	--	3351	--	pF
Output Capacitance	C_{oss}		--	327.6	--	
Reverse Transfer Capacitance	C_{rss}		--	285	--	
Total Gate Charge	Q_g	V_{DS} = -15V , I_D = -14A V_{GS} = -10V	--	61.9	--	nC
Gate-Source Charge	Q_{gs}		--	9.85	--	
Gate-Drain Charge	Q_{gd}		--	11.5	--	
Gate Plateau Voltage	$V_{Plateau}$		--	2.9	--	V
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = -15V , V_{GS} = -10V R_G = 3Ω, I_D = -14A	--	12	--	ns
Turn-on Rise Time	t_r		--	7	--	
Turn-off Delay Time	$t_{d(off)}$		--	53	--	
Turn-off Fall Time	t_f		--	16.5	--	
Drain-Source Body Diode Characteristics						
Body Diode Forward Voltage	V_{SD}	T_J = 25ºC, I_{SD} = -14A, V_{GS} = 0V	--	--	-1.2	V
Continuous Diode Forward Current	I_S		--	--	-14	A
Reverse Recovery Time	t_{rr}	I_F = -14A, di_F/dt = 500A/μs	--	18	--	ns
Reverse Recovery Charge	Q_{rr}		--	32	--	nC

Typical Characteristics T_J = 25ºC, unless otherwise noted

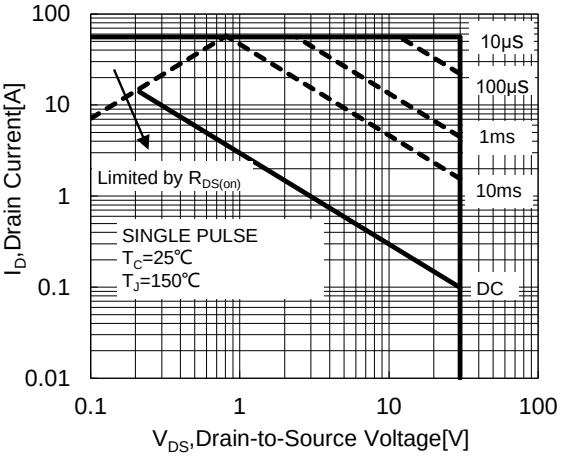


Figure 1. Maximum Safe Operating Area

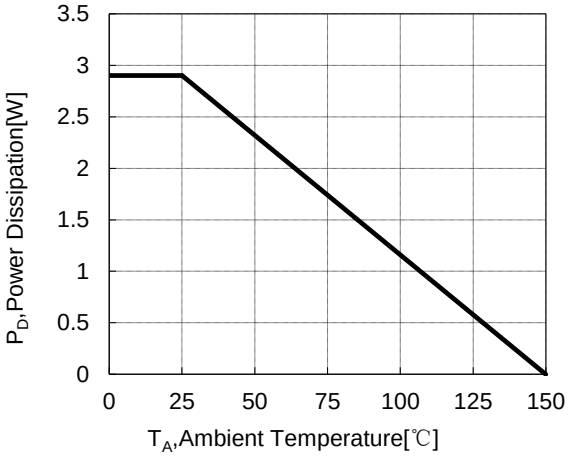


Figure 2. Maximum Power Dissipation vs Ambient Temperature

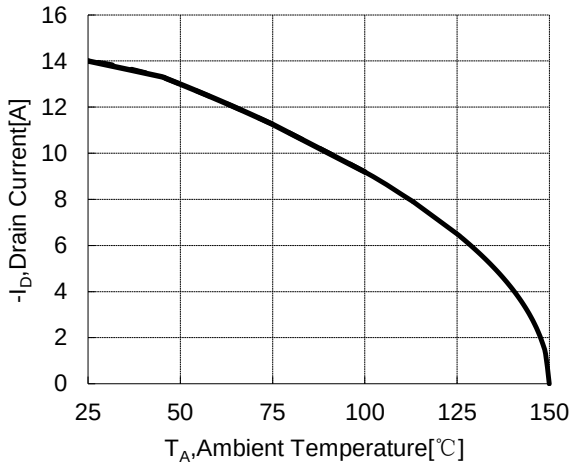


Figure 3. Maximum Continuous Drain Current vs Ambient Temperature

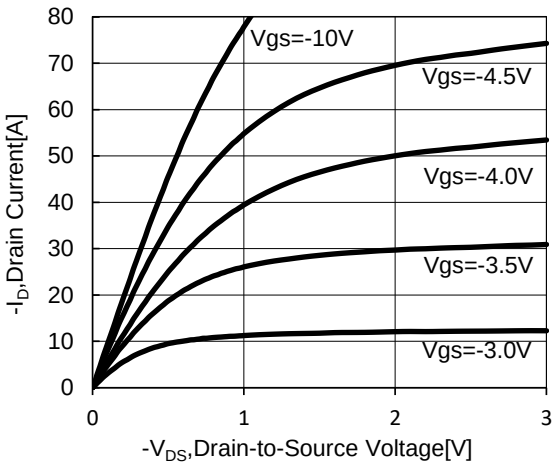


Figure 4. Typical output Characteristics

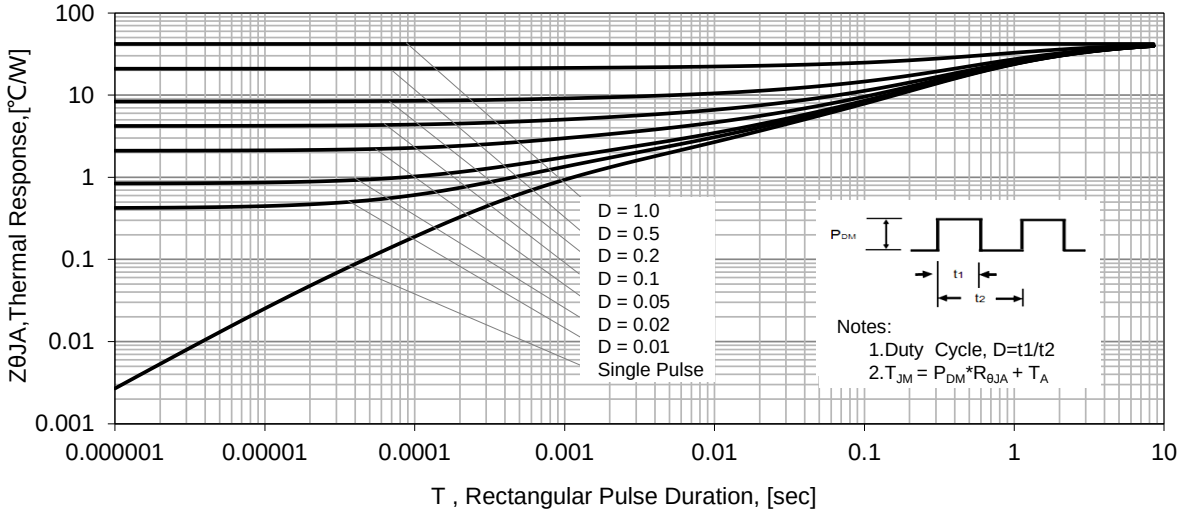


Figure 5 Maximum Effective Thermal Impedance , Junction to Ambient

Typical Characteristics T_J = 25ºC, unless otherwise noted

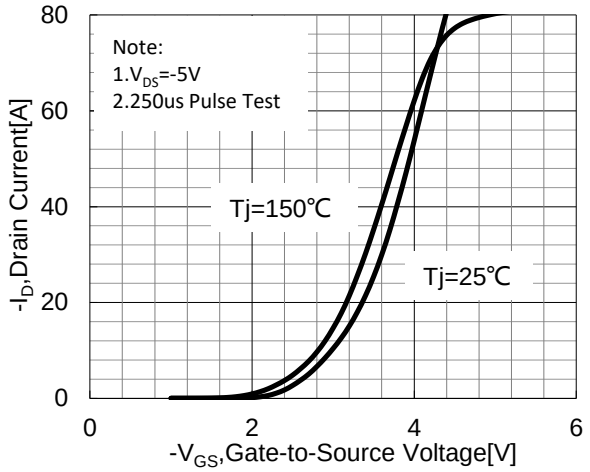


Figure 6 Typical Transfer Characteristics

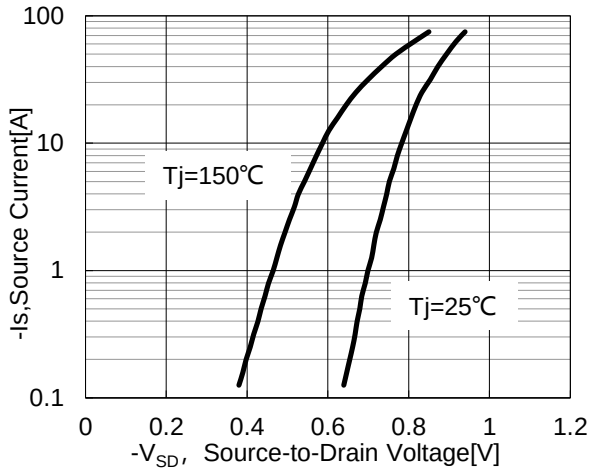


Figure 7 Typical Body Diode Transfer Characteristics

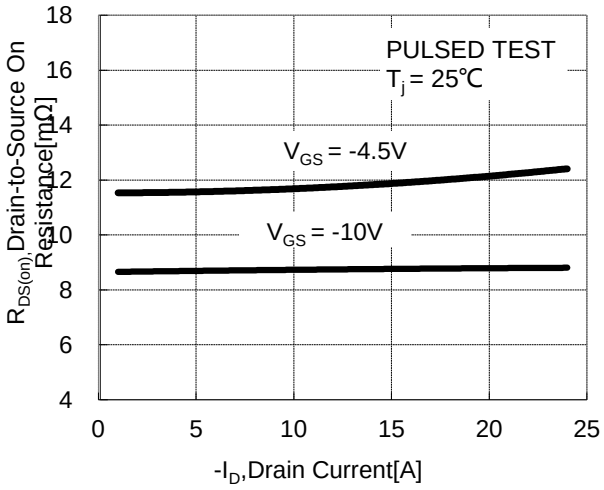


Figure 8. Drain-to-Source On Resistance vs Drain Current

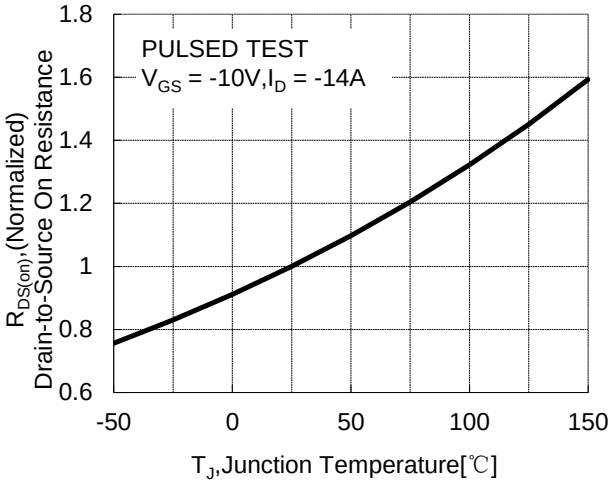


Figure 9. Normalized On Resistance vs Junction Temperature

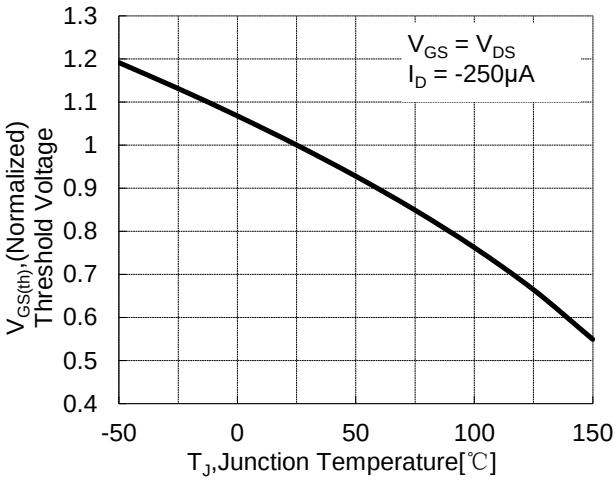


Figure10. Normalized Threshold Voltage vs Junction Temperature

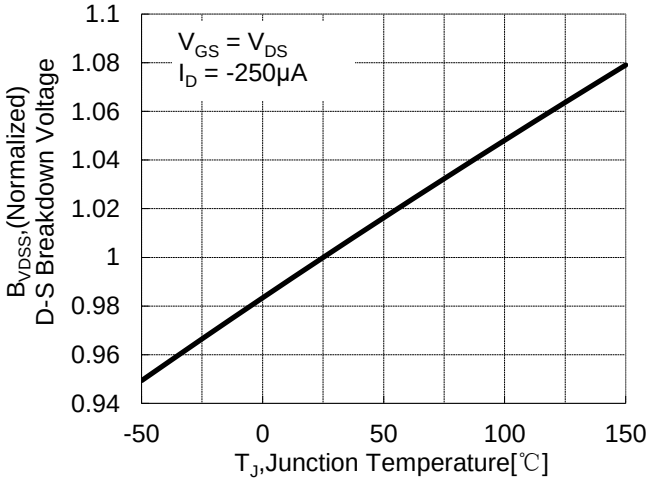


Figure 11. Normalized Breakdown Voltage vs Junction Temperature

Typical Characteristics T_J = 25ºC, unless otherwise noted

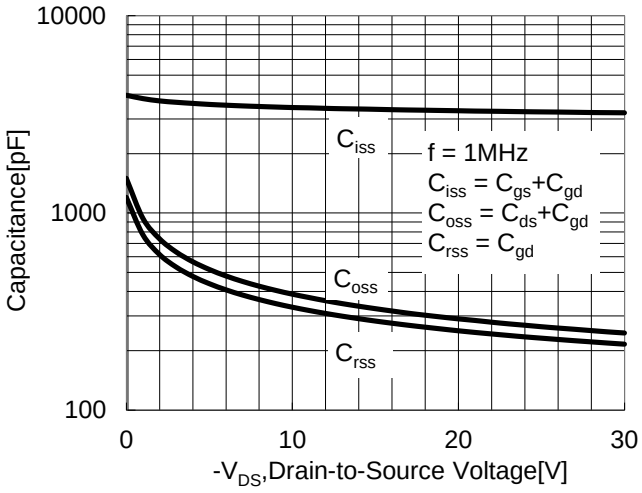


Figure 12. Capacitance Characteristics

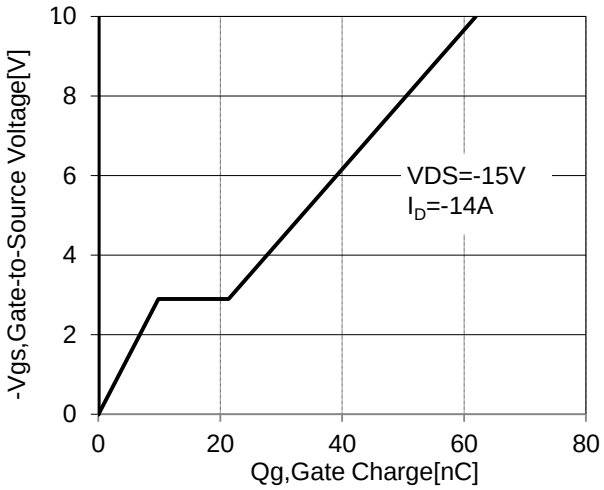


Figure 13 Typical Gate Charge vs Gate to Source Voltage

Figure A：Gate Charge Test Circuit and Waveform

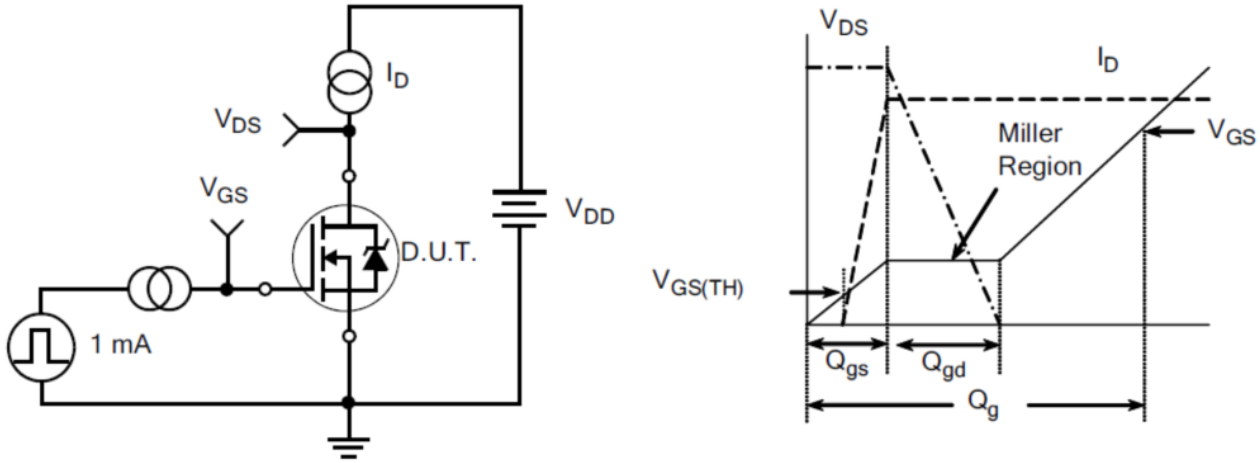


Figure B：Resistive Switching Test Circuit and Waveform

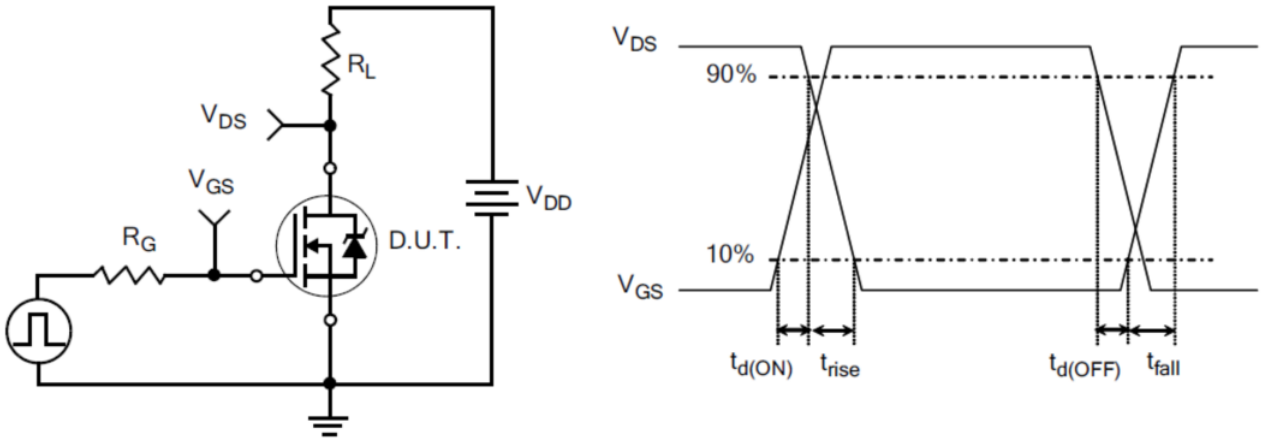
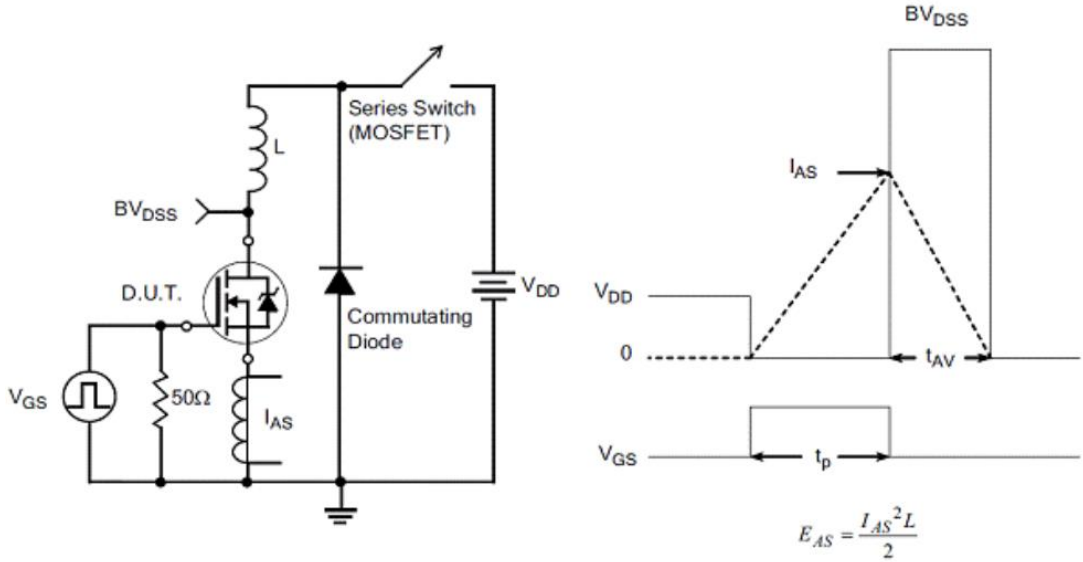
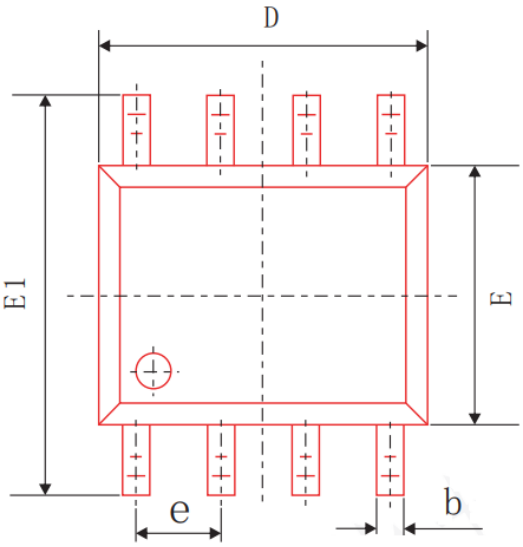
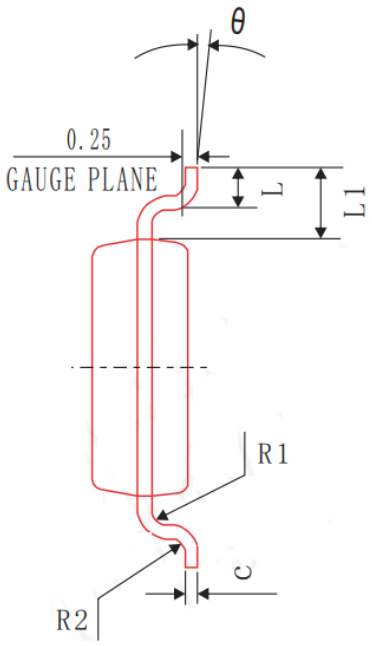


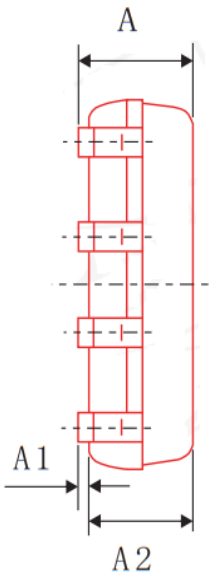
Figure C：Unclamped Inductive Switching Test Circuit and Waveform



SOP8 Package







COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	1.40	1.60	1.80
A1	0.05	0.15	0.25
A2	1.35	1.45	1.55
b	0.30	0.40	0.50
c	0.153	0.203	0.253
D	4.80	4.90	5.00
E	3.80	3.90	4.00
E1	5.80	6.00	6.20
L	0.45	0.70	1.00
θ	2°	4°	6°
L1	1.04 REF		
e	1.27 BSC		
R1	0.07 TYP		
R2	0.07 TYP		