LN115P040S

镭诺
COMTECH

-40V P-Channel Enhancement Mode MOSFET

1.Product Information

1.1 Features

- ◇ Advanced TRENCH cell design
- ◇ Low Gate Charge
- ◇ Low On-Resistance
- ◇ RoHS and Halogen-Free Compliant
- ◇ 100% ΔVDS & UIS & Rg Tested

1.2 Applications

- ◇ DC-DC Converter
- ◇ Drones
- ◇ Motor drivers
- ◇ Light electric vehicles

1.3 Quick reference

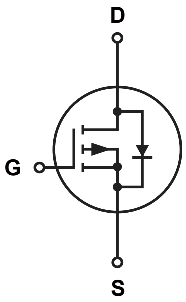
- ◇ BV ≧ -40 V
- ◇ P_{tot} ≦ 3 W
- ◇ I_D ≦ -13 A
- ◇ $R_{DS(ON)}$ ≦ 13 mΩ @ V_{GS} = -10 V
- ◇ $R_{DS(ON)}$ ≦ 19 mΩ @ V_{GS} = -4.5 V

Green Product

RoHS

2.Pin Description

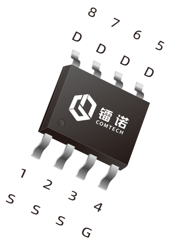
Symbol



Simplified Outline

Top View

SOP8



3.Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit	Note
V_{DS}	Drain-Source Voltage	T_C = 25 ℃	-	-40	V	-
V_{GS}	Gate-Source Voltage	T_C = 25 ℃	-	±20	V	-
I_D*	Drain Current (DC)	T_C = 25 ℃, V_{GS} = -10 V	-	-13	A	Fig.2
		T_C = 100 ℃, V_{GS} = -10 V	-	-8	A	
I_{DM}**,***	Drain Current (Pulsed)	T_C = 25 ℃, V_{GS} = -10 V	-	-32	A	-
P_{tot}	Drain power dissipation	T_C = 25 ℃	-	3	W	Fig.1
		T_C = 100 ℃	-	1.2	W	
T_{stg}	Storage Temperature		-55	150	℃	-
T_J	Junction Temperature		-	150	℃	-
I_S	Continuous-Source Current	T_C = 25 ℃	-	-13	A	-
E_{AS}*	Single Pulsed Avalanche Energy	V_{DD}= -40 V,L=0.1mH	-	222	mJ	Fig.19

4.Thermal Characteristics

Symbol	Parameter	Conditions	Min	Max	Unit	Note
$R_{θJA}$*	Thermal Resistance- Junction to Ambient		-	41	℃/W	Fig.16

Notes：
- * Surface Mounted on 1 in² pad area, t ≤ 10 sec
- ** Pulse width ≤ 300 μs, duty cycle ≤ 2 %
- *** limited by bonding wire

5.Marking Information

Product Name	Package	Reel size	Tape width	Quantity	Note
LN115P040S	**SOP8**	**330mm**	**12mm**	**4000**	

Note: COMTECH defines “ Green ” as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight;Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C)

6. Electrical Characteristics (T_A=25 ° Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	Note
Static Characteristics							
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_{DS} = -250 μA	-40	-	-	V	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = -250 μA	-1	-	-3	V	
I_{DSS}	Drain Leakage Current	V_{DS} = -40 V, V_{GS} = 0 V	-	-	1	μA	
I_{GSS}	Gate Leakage Current	V_{GS} = ± 20 V, V_{DS} = 0 V	-	-	±100	nA	
$R_{DS(ON)}$[a]	On-State Resistance	V_{GS} = -10 V, I_{DS} = -30 A	-	11	13	mΩ	Fig.8
		V_{GS} = -4.5 V, I_{DS} = -20 A	-	15	19		
Diode Characteristics							
V_{SD}[a]	Diode Forward Voltage	I_{SD} = -30 A, V_{GS} = 0 V	-	-	1.3	V	Fig.7
t_{rr}	Reverse Recovery Time	I_{DS} = -30 A, V_{GS} = 0 V	-	32	-	nS	Fig.20
Q_{rr}	Reverse Recovery Charge	$dI_{SD/dt}$ = -100 A/μs	-	68	-	nC	
Dynamic Characteristics[b]							
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = -20 V Frequency = 1 MHz	-	4225	-	pF	Fig.10
C_{OSS}	Output Capacitance		-	646	-		
C_{rSS}	Reverse Transfer Capacitance		-	267	-		
R_G	Gate Resistance	F= 1 MHz	-	7.2	-	Ω	
t_d(on)	Turn-on Delay Time	V_{DS} = -20 V, V_{GS} = -10 V, R_G=2.8 Ω, R_L = 4 uH, I_{DS} = -30 A	-	12	-	nS	Fig.18
t_r	Turn-on Rise Time		-	109	-		
t_d(off)	Turn-off Delay Time		-	86	-		
t_f	Turn-off Fall Time		-	46	-		
dv/dt	Peak Diode Recovery		-	0.146	-	KV/us	
di/dt	Peak Diode Recovery		-	314	-	A/us	
Gate Charge Characteristics[b]							
Q_g	Total Gate Charge	V_{DS} = -20 V, V_{GS} = -10 V, I_{DS} = -30 A	-	45	-	nC	Fig.9
Q_{gs}	Gate-Source Charge		-	7	-		
Q_{gd}	Gate-Drain Charge		-	7	-		
$V_{plateau}$	Gate plateau voltage		-	4.3	-	V	

Notes :
a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2%
b : Guaranteed by design, not subject to production testing

7. Typical Characteristics

Fig.1 Power Capability

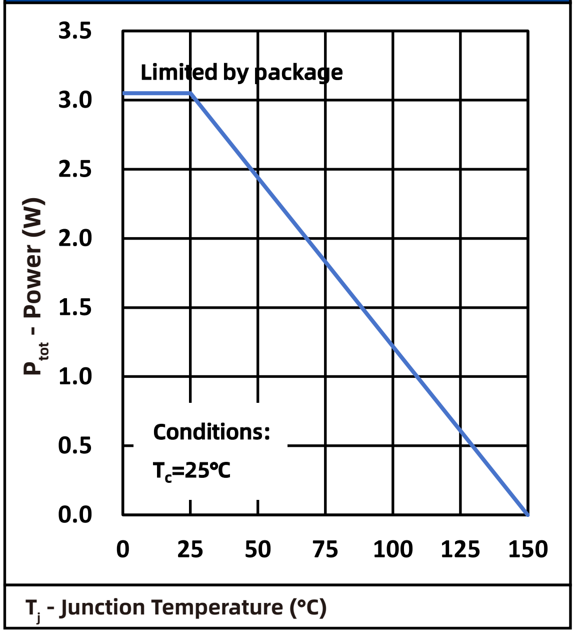


Fig.2 Current Capability

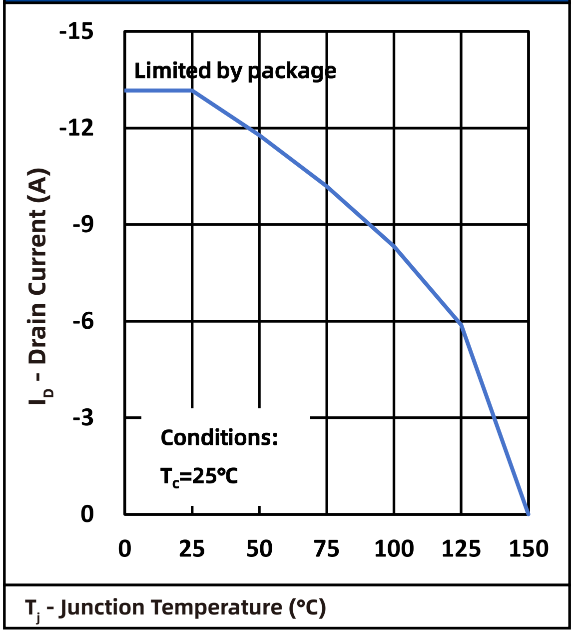


Fig.3 Output Characteristics@Tj -55℃

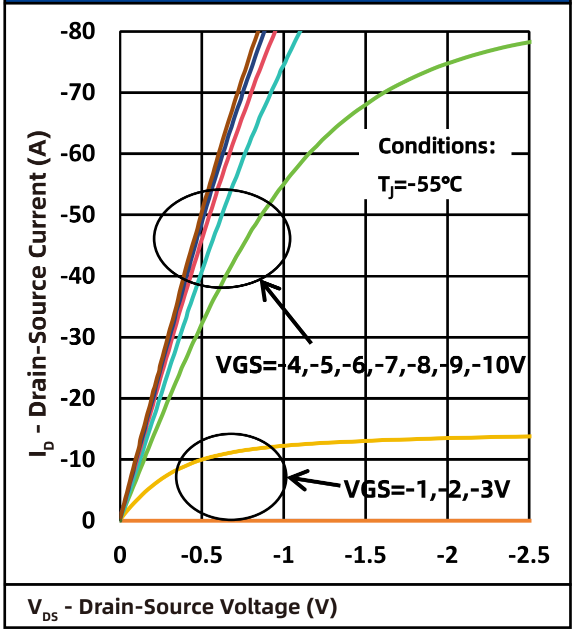
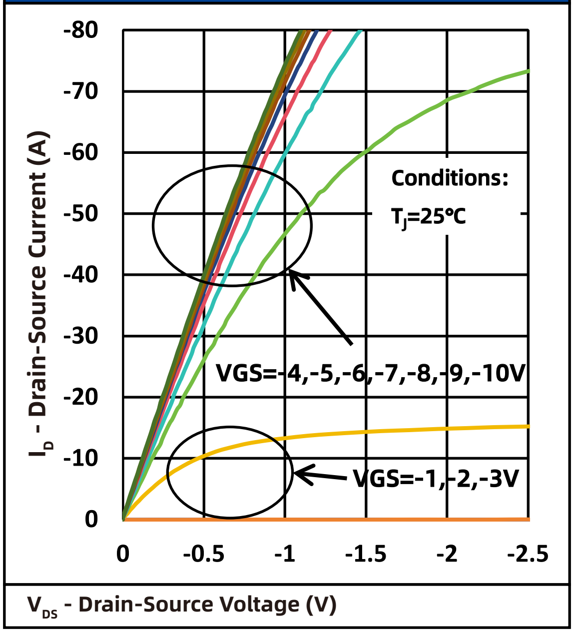


Fig.4 Output Characteristics@Tj 25℃



7. Typical Characteristics

Fig.5 Output Characteristics@Tj 150℃

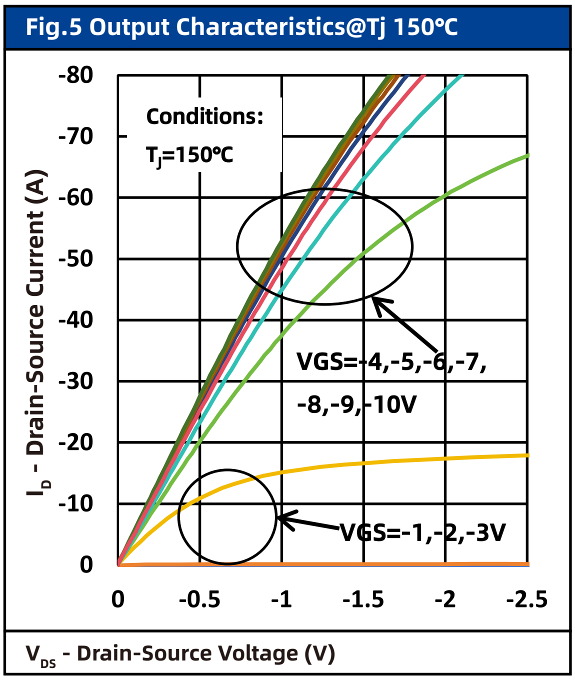


Fig.6 Transfer Characteristics vs Temp

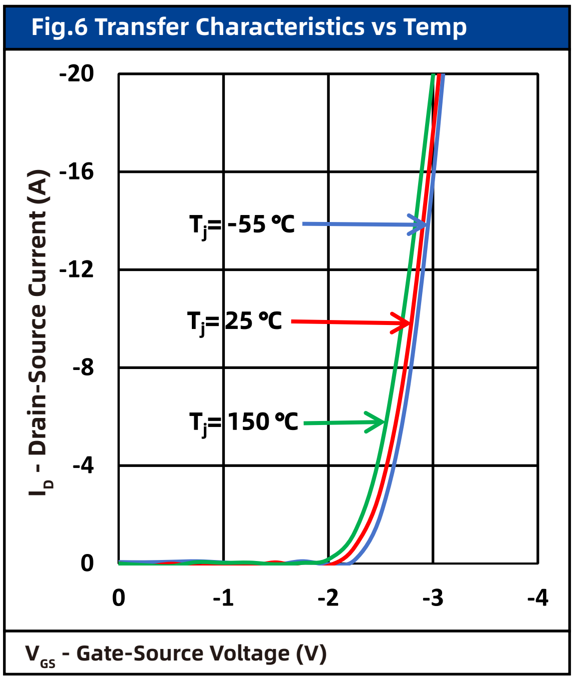


Fig.7 Body Diode Characteristics

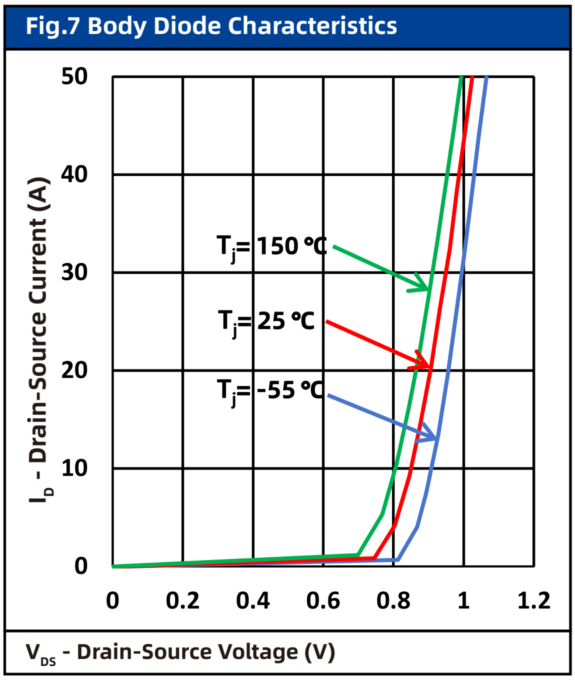
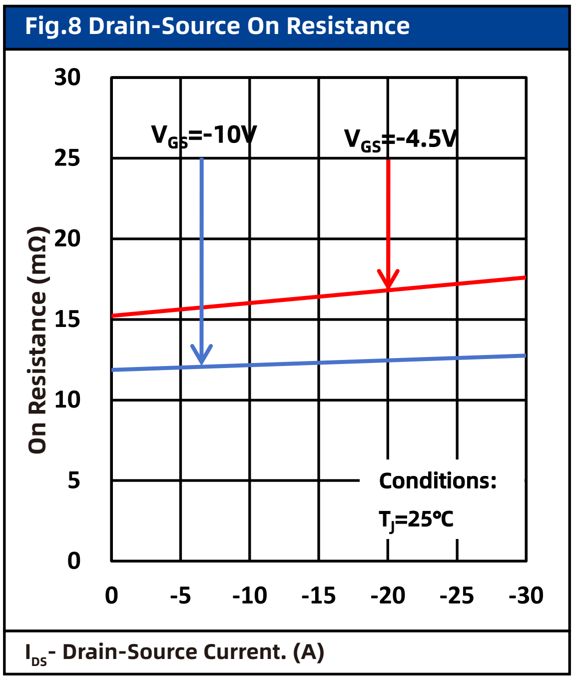


Fig.8 Drain-Source On Resistance



7. Typical Characteristics

Fig.9 Gate Charge

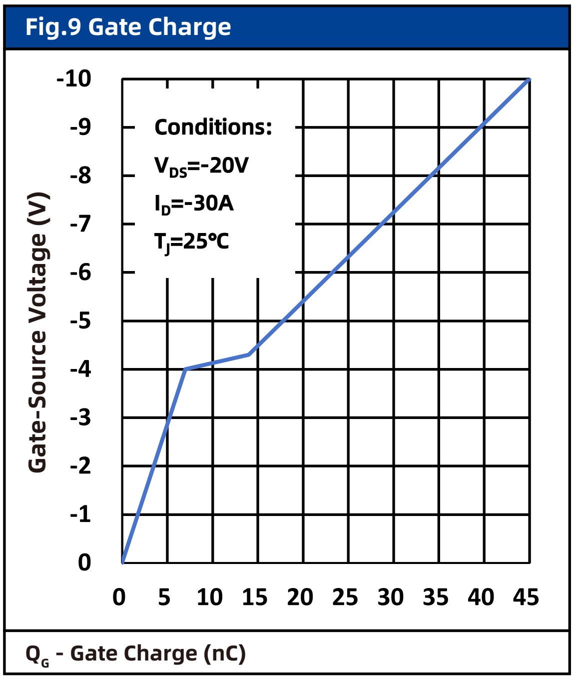


Fig.10 Capacitance

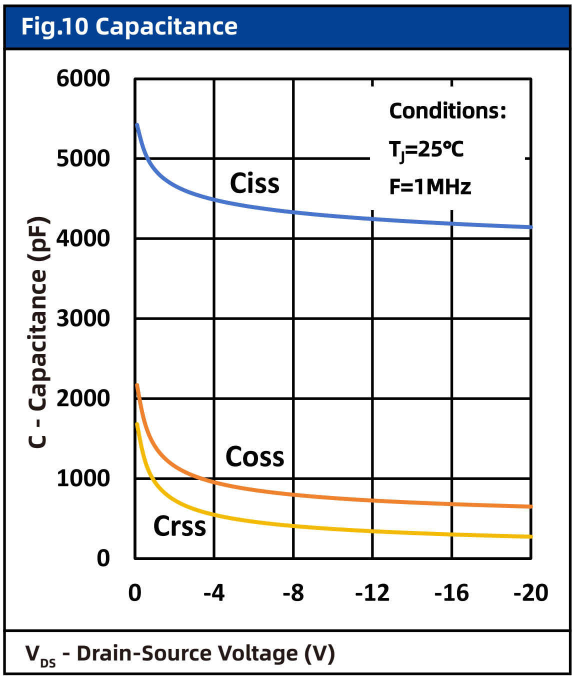


Fig.11 Normalized Threshold Voltage

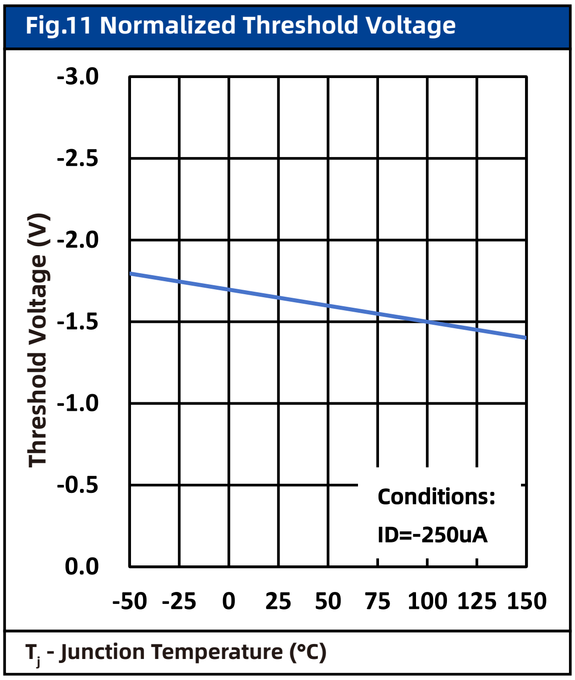
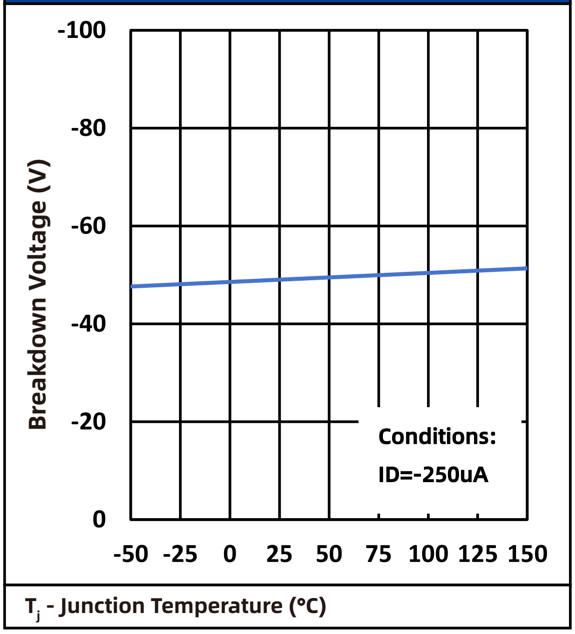


Fig.12 Normalized Breakdown Voltage



7. Typical Characteristics

Fig.13 Normalized On Resistance

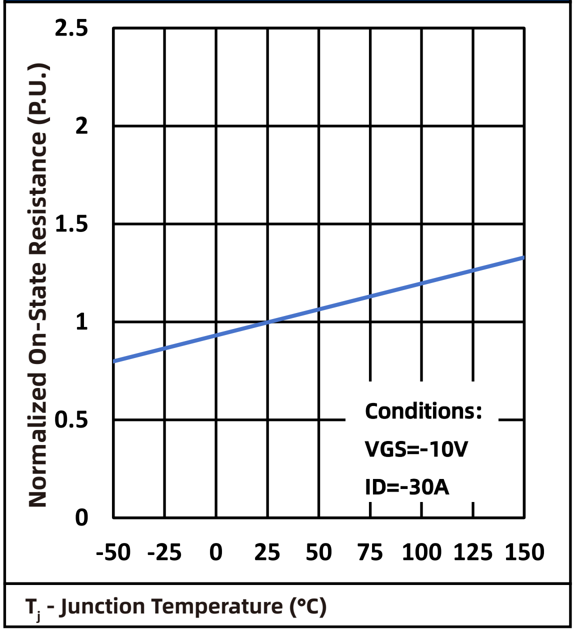


Fig.14 Switching Energy vs ID

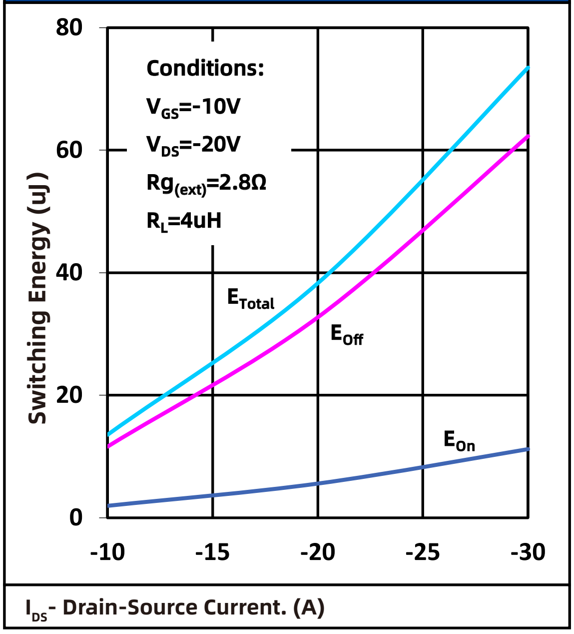


Fig.15 Safe Operating Area

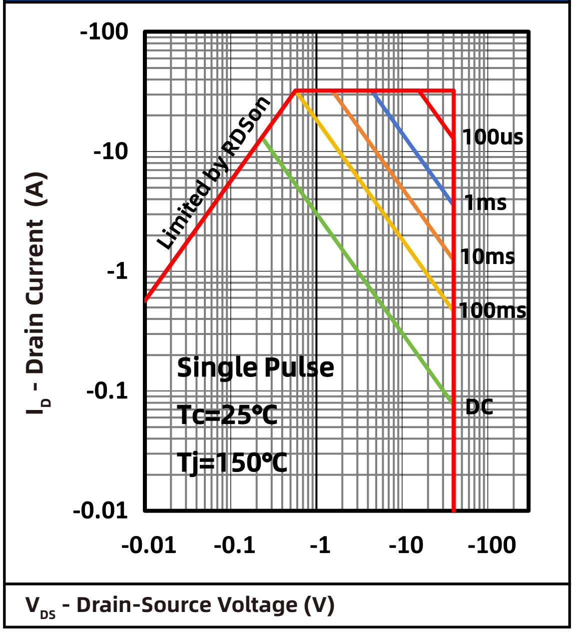
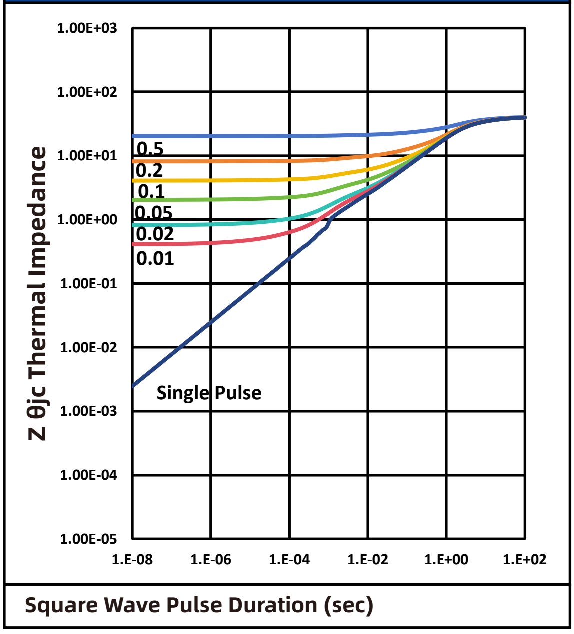


Fig.16 Transient Thermal Impedance



7. Typical Characteristics

Fig.17 Gate Charge Test Circuit & Waveform

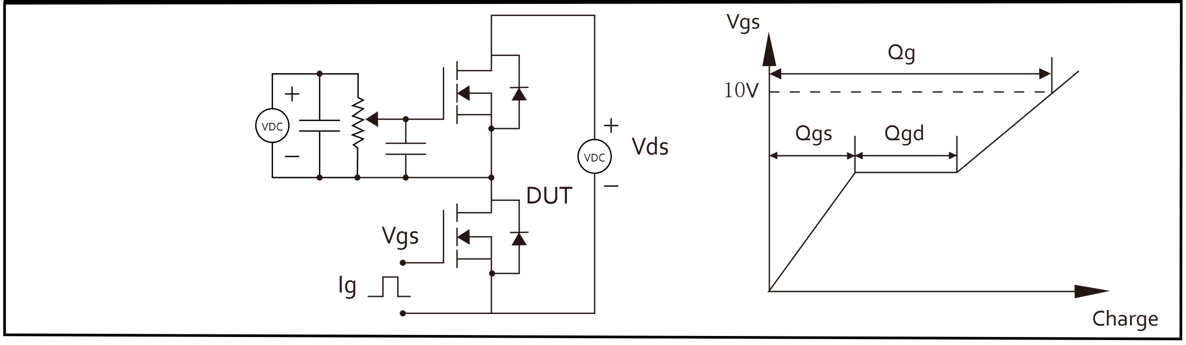


Fig.18 Resistive Switching Test Circuit & Waveforms

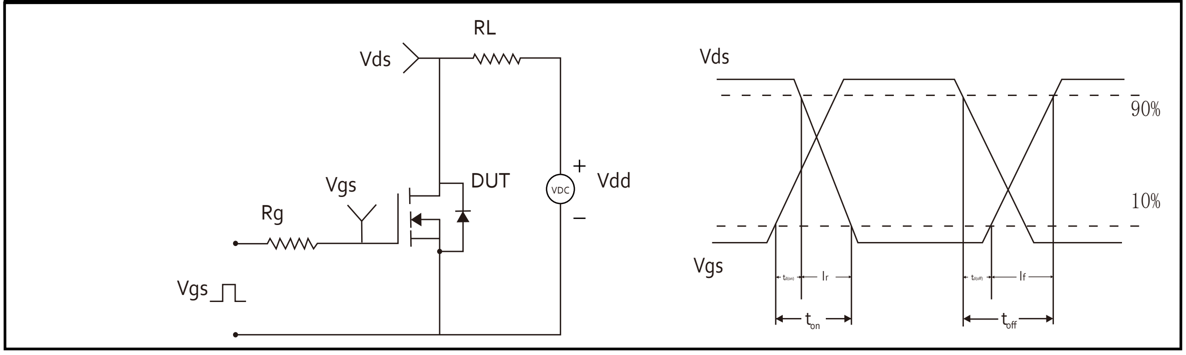


Fig.19 Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

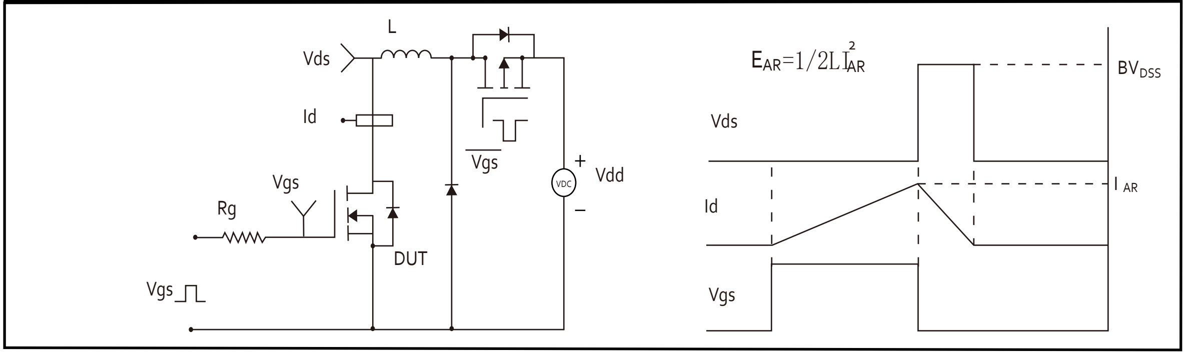
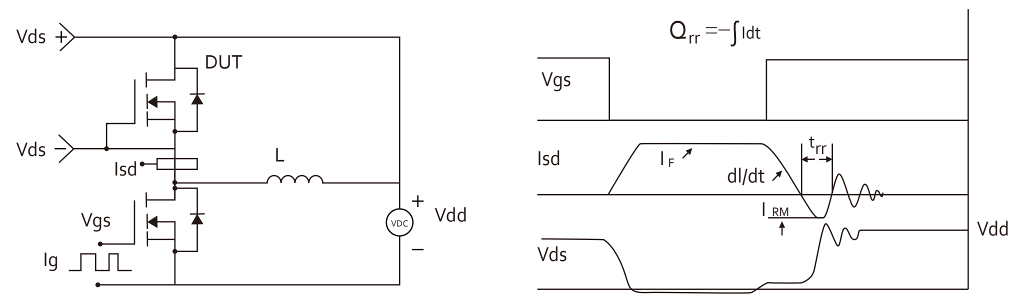
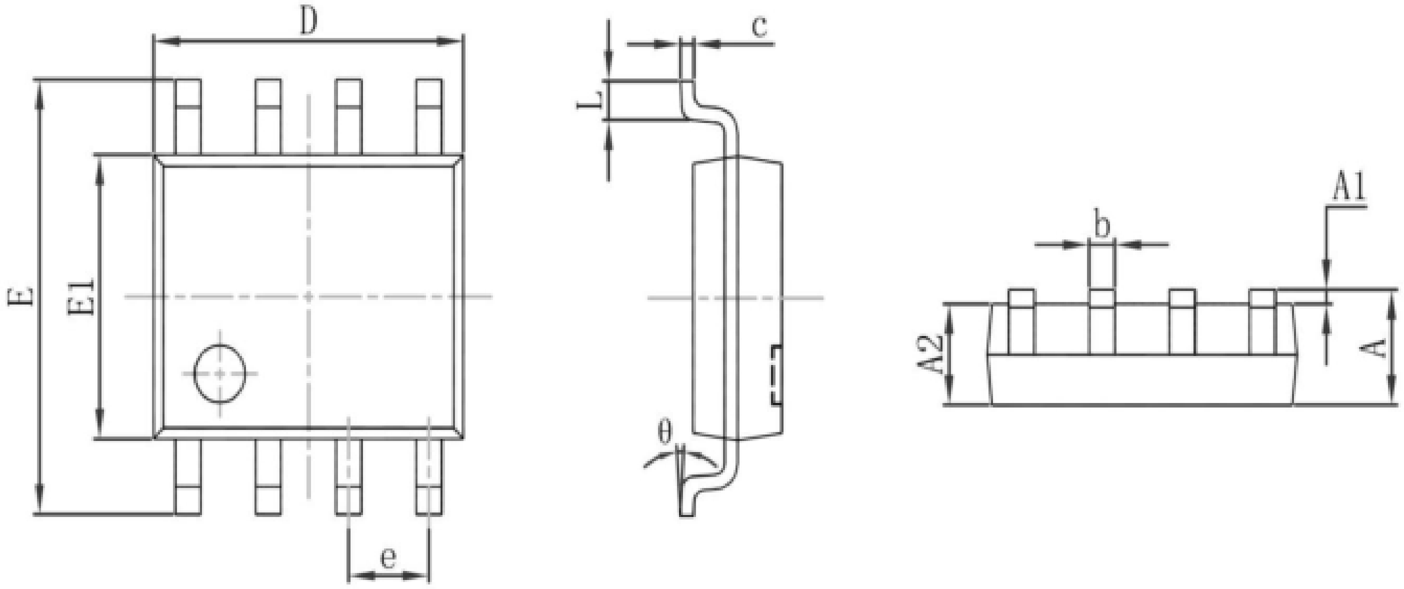


Fig.20 Diode Recovery Test Circuit & Waveforms



8. Package Dimensions

SOP8 Package



Symbol	Dimensions In Millimeters		
	MIN.	NOM.	MAX.
A	1.350	1.550	1.750
A1	0.100	0.175	0.250
A2	1.350	1.450	1.550
b	0.330	0.420	0.510
c	0.170	0.210	0.250
D	4.800	4.900	5.000
E1	3.800	3.900	4.000
E	5.800	6.000	6.200
e	1.270REF		
L	0.400	0.835	1.270

9. Record of Document amendment

产品名称：LN115P040S
版权说明：镭诺电子（宁波）有限公司
联系电话：4008887385

文档类型：产品手册
公司主页：www.leinuosemi.com

版本：02
修改记录：
1.初版发行
2.修改Fig.13不同温度下内阻值的相对变化量，采用归一化物理量变化单位值（P.U.）