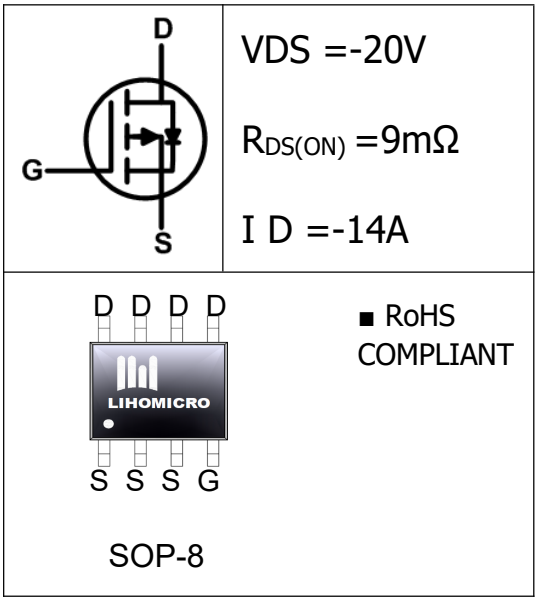
LH09P02

-20V P-Channel MOSFET

•General Description

The LH09P02 uses trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.This device is suitable for high current load applications.



•Features

■Advance high cell density Trench technology
■Low RDS(ON) to minimize conductive loss
■Low Gate Charge for fast switching

•Application

■LED/LCD/PDP TV and monitor Lighting
■Power Supplies

•Ordering Information:

Part Number	LH09P02
Package	SOP-8
Basic Ordering Unit (pcs)	4000
Normal Package Material Ordering Code	LH09P02S-SOP8-TAP
Halogen Free Ordering Code	LH09P02S-SOP8TAP-HF

•Absolute Maximum Ratings（TC =25℃）

PARAMETER	SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	-20	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current ,T_C = 25°C	I_D	-14	A
Pulsed drain current (TC = 25°C, tp limited by Tjmax) [1]	I_{DM}	-55	A
Single Pulse Avalanche Energy	E_{AS}	90	mJ
Power Dissipation(TC=25℃)	P_D	36	W
Operating Temperature	T_J	-55~+150	℃
Storage Temperature	T_{STG}	-55~+150	℃

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D=250uA	-20	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250uA	-0.3	--	-1.0	V
Drain-source On Resistance[2]	$R_{DS(ON)}$	V_{GS} =-10V, I_D=--8A	--	9	13	mΩ
		V_{GS} =-4.5V, I_D=-7A	--	10	15	
		V_{GS} =-2.5V, I_D=-5A	--	13	18	
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-20V,V_{GS}=0V,T_J=25℃	--	--	-1	uA
		V_{DS}=-20V,V_{GS}=0V,T_J=125℃	--	--	-100	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12,V_{DS}=0V	--	--	±100	nA
Gate Resistance	Rg	F=1MHz	--	2.3	--	Ω
Input Capacitance	Ciss	V_{GS} = 0V, V_{DS} = -10V f = 1.0MHz	--	4600	--	pF
Output Capacitance	Coss		--	500	--	
Reverse transfer Capacitance	Crss		--	420	--	
Total Gate Charge	Qg	I_D =-7A, V_{DS} = -10V V_{GS} =-4.5V	--	46	---	nC
Gate-to-Source Charge	Qgs		--	8.7	--	
Gate-to-Drain Charge	Qgd		--	10.6	---	
Turn-On DelayTime	Td(on)	V_{DD}=10V, I_D=-7A, Rg=2.2Ω, V_{GS}=-10V	--	8.5	--	nS
Turn-On Rise Time	T_r		--	65	--	
Turn-Off Delay Time	Td(off)		--	120	--	
Turn-Off Fall Time	T_f		--	42	--	
Continuous Diode Forward Current	I_S	--	--	--	-14	A
Pulsed Diode Forward Current	I_{SM}	--	--	--	-55	A
Diode Forward Voltage	V_{SD}	Tj=25°C, Is=-7A V_{GS} =0V	--	--	-1.2	V
Reverse Recovery Time	trr	If=Is di_F/dt=100A/μs	--	16	--	ns
Reverse Recovery Charge	Qrr		--	7.1	--	uC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	Rth_{JC}	3.3	℃/W
Thermal Resistance Junction-ambient[3]	Rth_{JA}	36	℃/W

Notes:

1. Repetitive rating; pulse width limited by max junction temperature.
2. Pulse Test : Pulse width ≤ 300 μs, Duty cycle ≤ 2%.
3. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.

●Typical Characteristics

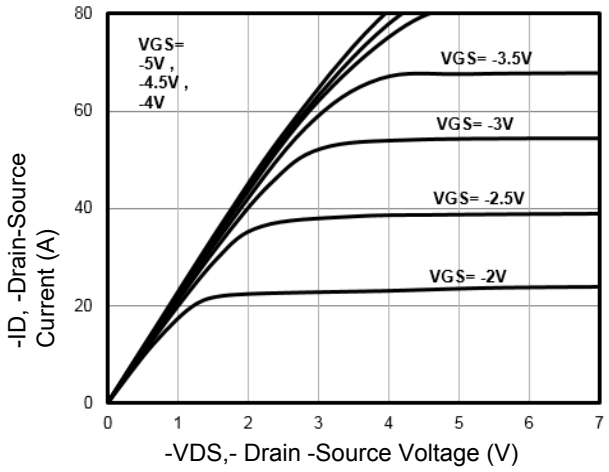


Fig1,Typical Output Characteristics

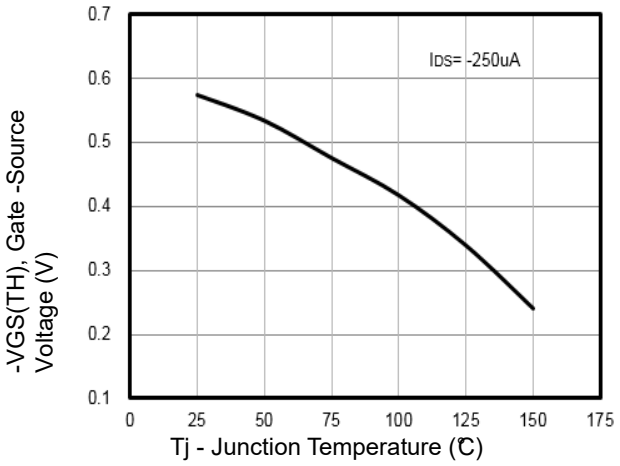


Fig2,-VGS(TH) Gate -Source Voltage Vs.Tj

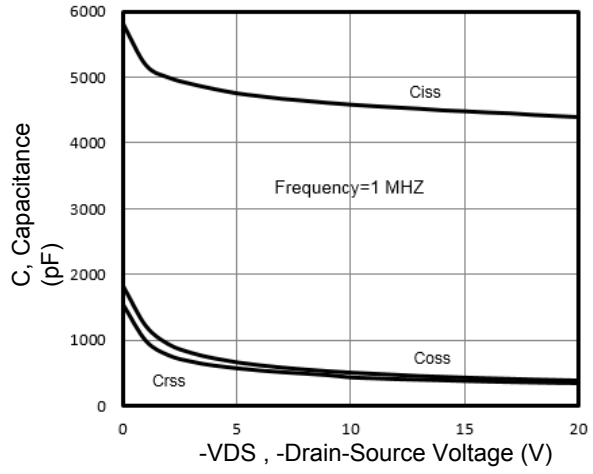


Fig3.,Typical Capacitance Vs.Drain-Source Voltage

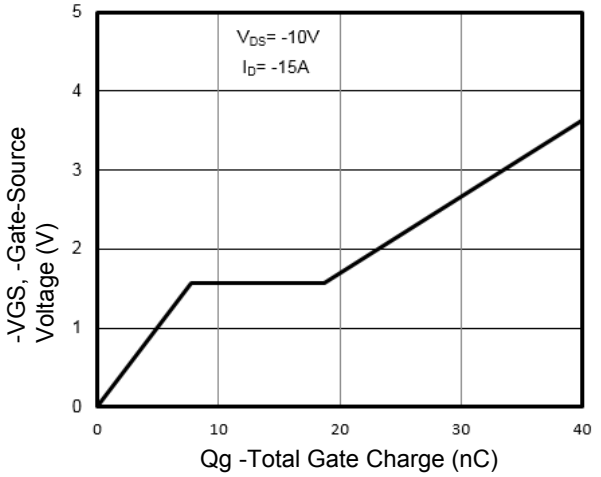


Fig4, Typical Gate Charge Vs.Gate-Source Voltage

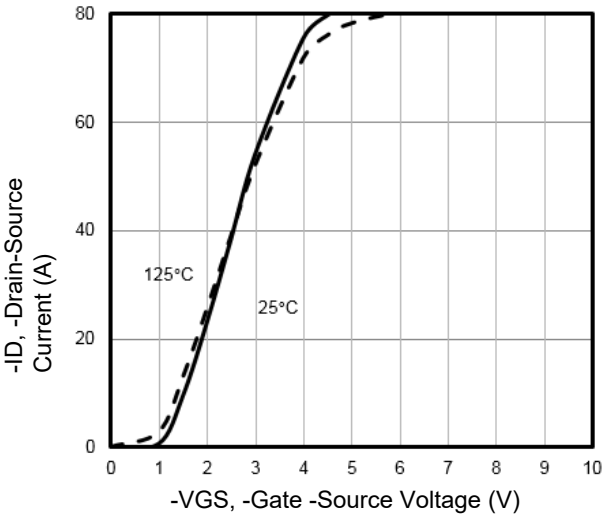


Fig5,Typical Transfer Characteristics

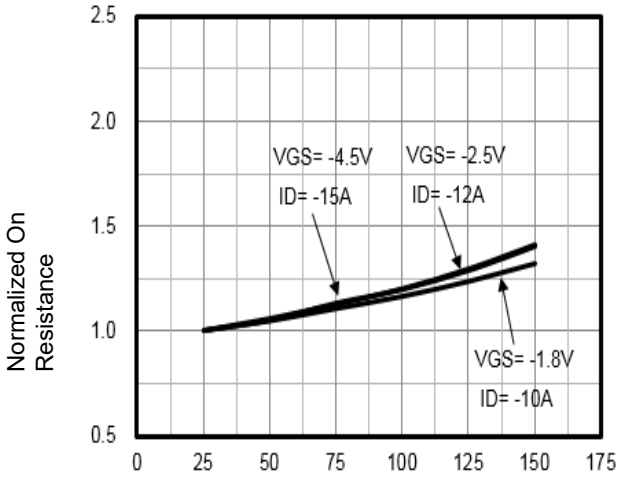


Fig6,Normalized On-Resistance Vs. Tj

●Typical Characteristics(Cont.)

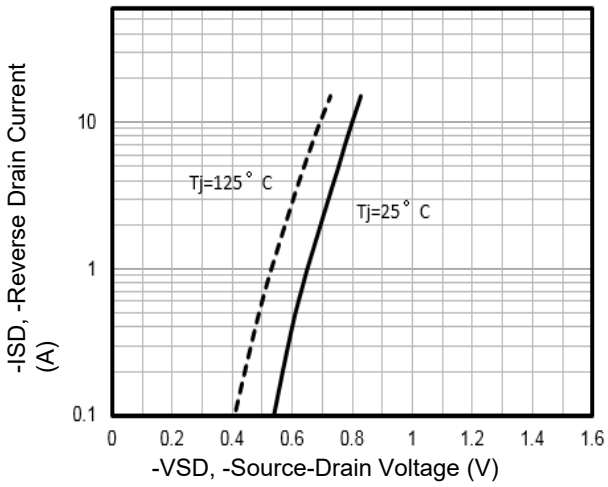


Fig7,Typical Source-Drain Diode Forward Voltage

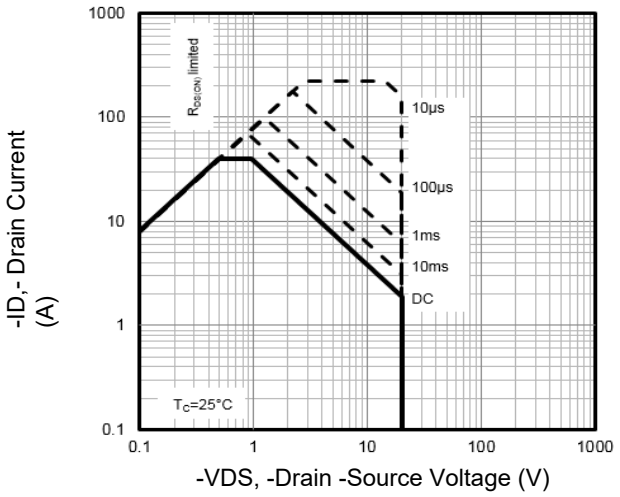


Fig8,Maximum Safe Operating Area

●Test Circuit & Waveforms

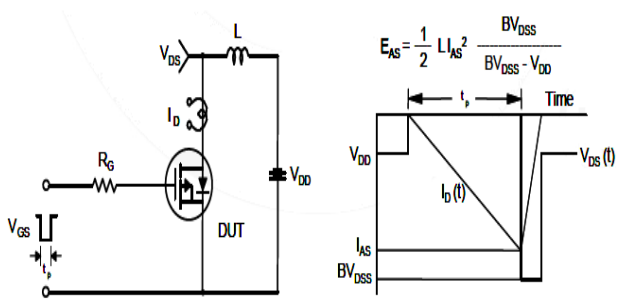


Fig1. Unclamped Inductive Test Circuit and Waveforms

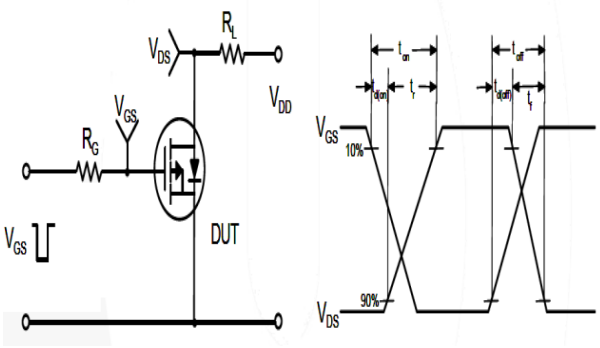


Fig2. Switching Time Test Circuit and waveforms

●Dimensions（SOP-8)

UNIT:mm

SYMBOL	min	max	SYMBOL	min	max
A	1.30	1.60	e	1.27BSC	
A1	1.35	1.85	L	0.40	1.30
b	0.30	0.60			
C	0.15	0.35			
D	4.60	5.20			
E	3.70	4.10			
E1	5.70	6.30