

●General Description

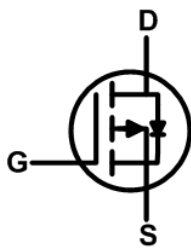

The LH09P02 uses trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge. This device is suitable for high current load applications.

●Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching

●Application

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

	$V_{DS} = -20V$ $R_{DS(ON)} = 9m\Omega$ $I_D = -14A$
 TO-252	■ RoHS COMPLIANT

●Ordering Information:

Part Number	LH09P02
Package	TO-252
Basic Ordering Unit (pcs)	2500
Normal Package Material Ordering Code	LH09P02T5-TO252-TAP
Halogen Free Ordering Code	LH09P02T5-TO252-TAP-HF

●Absolute Maximum Ratings (TC =25°C)

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

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	-20	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	-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}	$V_{DS}=-20V, V_{GS}=0V, T_J=25^\circ C$	--	--	-1	μA
		$V_{DS}=-20V, V_{GS}=0V, T_J=125^\circ C$	--	--	-100	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	--	--	±100	nA
Gate Resistance	R_g	$F=1MHz$	--	2.3	--	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V,$ $V_{DS}=-10V$ $f=1.0MHz$	--	4600	--	pF
Output Capacitance	C_{oss}		--	500	--	
Reverse transfer Capacitance	C_{rss}		--	420	--	
Total Gate Charge	Q_g	$I_D=-7A,$ $V_{DS}=-10V$ $V_{GS}=-4.5V$	--	46	---	nC
Gate-to-Source Charge	Q_{gs}		--	8.7	--	
Gate-to-Drain Charge	Q_{gd}		--	10.6	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=10V,$ $I_D=-7A,$ $R_g=2.2\Omega,$ $V_{GS}=-10V$	--	8.5	--	nS
Turn-On Rise Time	T_r		--	65	--	
Turn-Off Delay Time	$T_{d(off)}$		--	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}	$T_J=25^\circ C, I_S=-7A$ $V_{GS}=0V$	--	--	-1.2	V
Reverse Recovery Time	t_{rr}	$I_f=I_S$ $di_F/dt=100A/\mu s$	--	16	--	ns
Reverse Recovery Charge	Q_{rr}		--	7.1	--	μC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	R_{thJC}	3.3	°C/W
Thermal Resistance Junction-ambient ³	R_{thJA}	36	°C/W

Notes:

1. Repetitive rating; pulse width limited by max junction temperature.
2. Pulse Test : Pulse width $\leq 300 \mu s$, Duty cycle $\leq 2\%$.
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

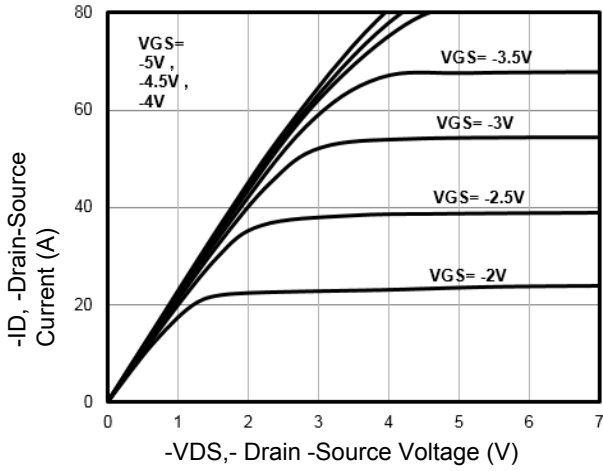


Fig2, -VGS(TH) Gate -Source Voltage Vs. Tj

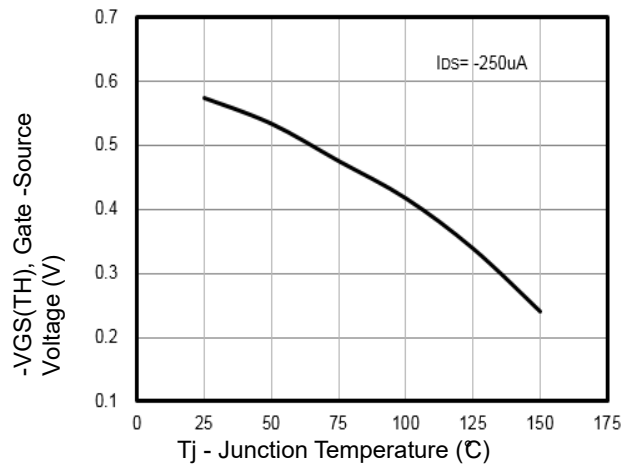


Fig3, Typical Capacitance Vs. Drain-Source Voltage

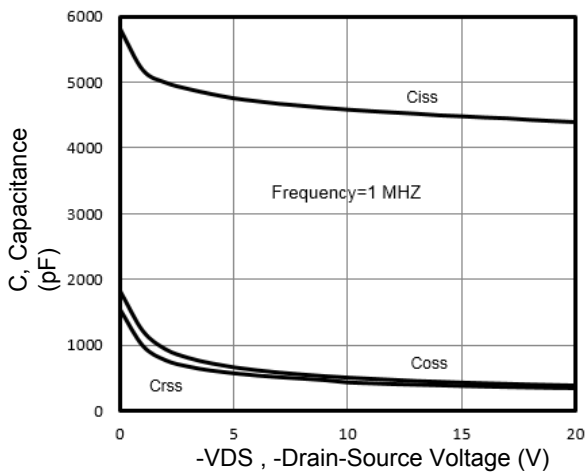


Fig4, Typical Gate Charge Vs. Gate-Source Voltage

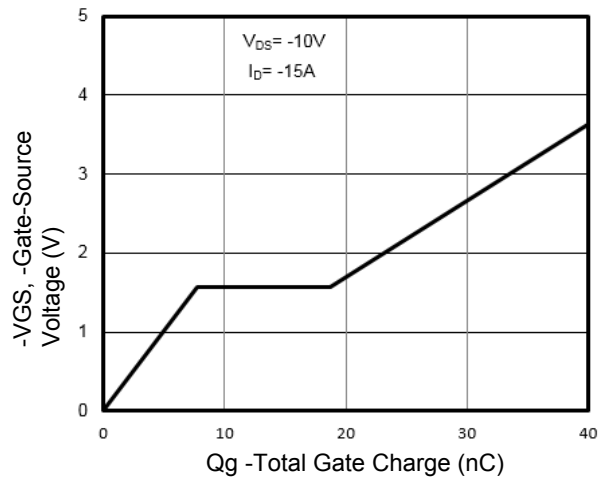


Fig5, Typical Transfer Characteristics

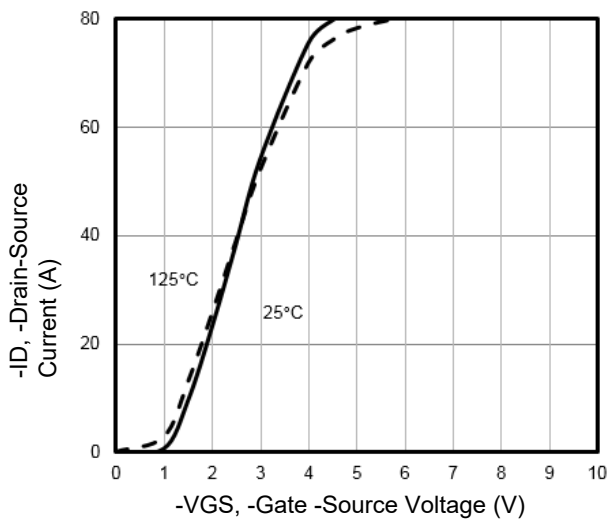
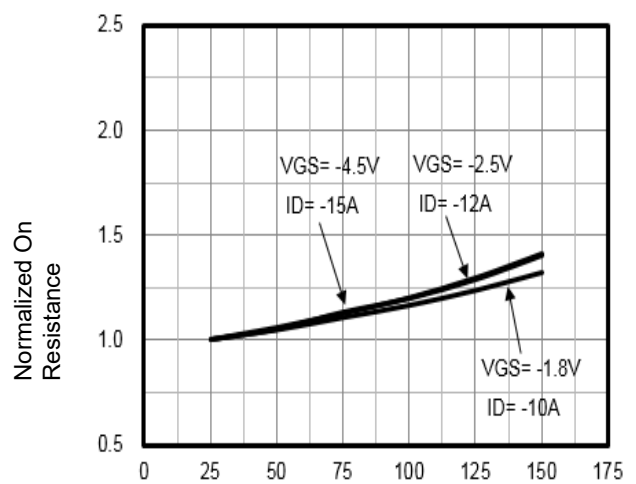


Fig6, Normalized On-Resistance Vs. Tj



●Typical Characteristics(Cont.)

Fig7, Typical Source-Drain Diode Forward Voltage

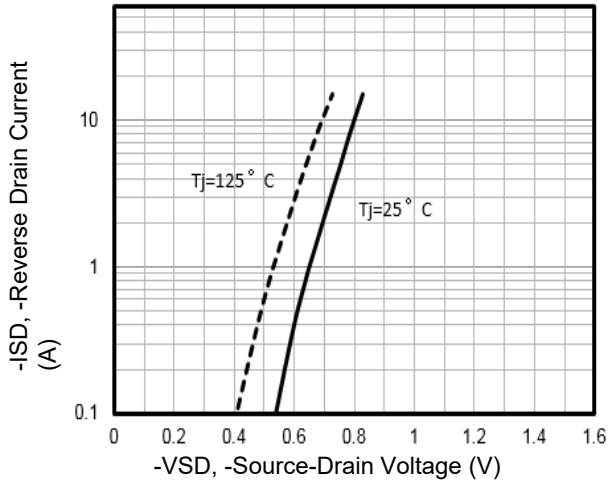
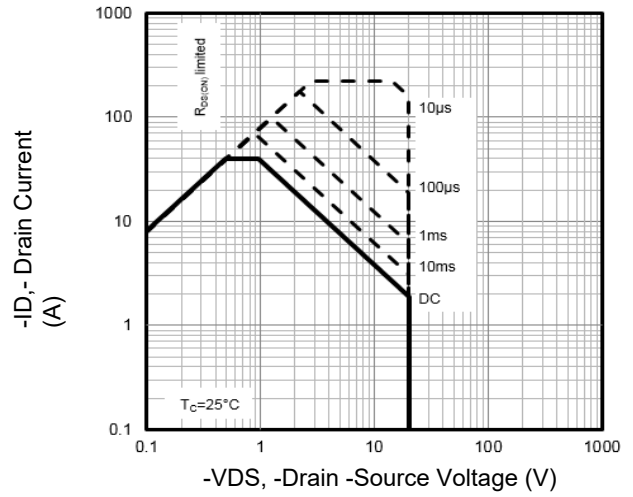


Fig8, Maximum Safe Operating Area



●Test Circuit & Waveforms

Fig1. Unclamped Inductive Test Circuit and Waveforms

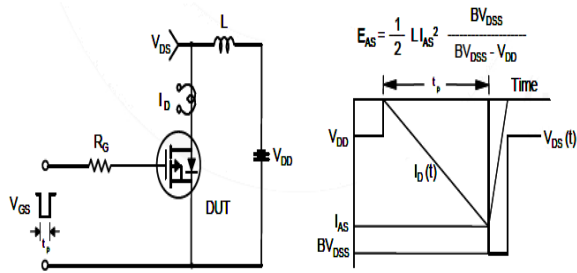
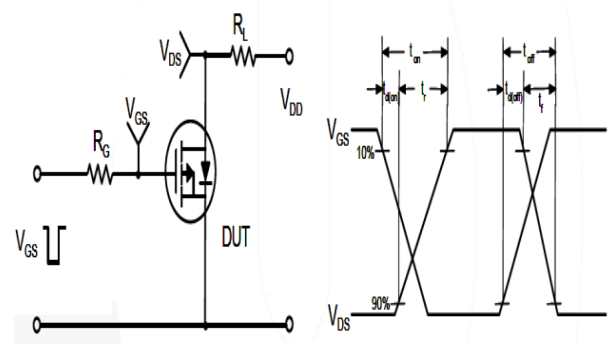


Fig2. Switching Time Test Circuit and waveforms



•Dimensions (TO-252)

UNIT:mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	L2	0.60	1.20
b	0.50	0.90	L3	1.20	1.80
b1	0.70	1.20	B	0.80	1.30
b2	0.40	0.70	C	0.40	0.70
D	6.20	6.80	D1	5.10	5.60
E	5.80	6.40	e1	2.10	2.45
L	3.60	4.60	e2	4.40	4.80
L1	0.80	1.60			

