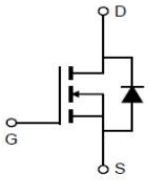
•General Description

The SJ MOSFET LH70R140SFD has the low $R_{DS(on)}$, low gate charge,fast switching and excellent avalanche characteristics.This device offers extremely fast and robust body diode,and is suitable for telecom and power supplies.



V_{DS} =700V

$R_{DS(ON)}$ =140mΩ

I_D =22A

TO-220F

■ RoHS COMPLIANT

•Features

■Much lower $R_{DS(ON)}$

■Much lower FOM for fast switching effciency

•Application

■Lighting

■Inverter System

■Power Supplies

•Ordering Information:

Part number	LH70R140SFD
Package	TO-220F
Basic ordering unit (pcs)	1000
Normal Package Material Ordering Code	LH70R140SFDF-TO220F-TU
Halogen Free Ordering Code	LH70R140SFDF-TO220F-TU-HF

•Absolute Maximum Ratings（TC =25℃）

PARAMETER		SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage		BV_{DSS}	700	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	TC = 25°C	I_D	22	A
	TC = 100°C		14	
Pulsed drain current (TC = 25°C, tp limited by Tjmax)[1]		I_D pulse	66	A
Single Pulse Avalanche Energy[1]		I_{AR}	4.2	A
Single Pulse Avalanche Energy[2]		E_{AS}	484	mJ
Repetitive Avalanche Energy[1]		E_{AR}	0.7	mJ
Power Dissipation(TC=25℃)		P_D	34	W
Operating Temperature and Storage Temperature Range		T_J/T_{STG}	-55~+150	℃
Reverse Diode dv/dt[3]		dv/dt	50	V/ns
Maximum Diode Commutation Speed[3]		di/dt	900	A/ns

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D=250uA	700	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=VGS,I_D=250uA	2.5	--	4.5	V
Drain-source On Resistance[3]	$R_{DS(ON)}$	V_{GS} =10V, I_D=7.5A	--	0.12	0.14	Ω
Drain-Source Leakage Current	I_{DSS}	V_{DS}=680V,V_{GS}=0V,T_J=25℃	--	--	1	uA
		V_{DS}=680V,V_{GS}=0V,T_J=125℃	--	--	100	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30	--	--	±100	nA
Forward Transconductance[3]	R_G	f=1.0MHz open drain	--	--	12	Ω
Input Capacitance	Ciss	V_{GS} = 0V, V_{DS} = 100V f = 1.0MHz	--	1834	--	pF
Output Capacitance	Coss		--	57	--	
Reverse transfer Capacitance	Crss		--	1.7	--	
Turn-on delay time	Td(on)	V_{DD}=400V, I_D= 20A R_G= 25Ω	--	34	--	nS
Rise time	Tr		--	72	--	
Turn -Off Delay Time	Td(off)		--	114	--	
Fall time	Tf		--	41	--	
Total Gate Charge	Qg	I_D =20A, V_{DS} = 520V V_{GS} = 10V	--	42	---	nC
Gate-to-Source Charge	Qgs		--	10	--	
Gate-to-Drain Charge	Qgd		--	17	---	
Continuous Diode Forward Current	I_S		--	--	22	A
Pulsed Diode Forward Current	I_{SM}		--	--	66	A
Diode Forward Voltage	V_{SD}	Tj=25°C, Is=20A V_{GS} =0V	--	0.9	1.2	V
Reverse Recovery Time	trr	V_{RR}=400V, If=Is di_F/dt=100A/μs	--	112	--	ns
Reverse Recovery Charge	Qrr		--	0.54	--	uC
Peak Reverse Recovery Current	I_{RRM}		--	9.6	--	A

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	Rth_{JC}	3.7	℃/W
Thermal Resistance Junction-ambient	Rth_{JA}	80	℃/W

Notes:

1.Repetitive Rating: Pulse width limited by maximum junction temperature.

2. I_{AS} = 3.5A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C

3. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

●Typical Characteristics T_J=25ºC,unless otherwise noted

Figure 1. Output Characteristics

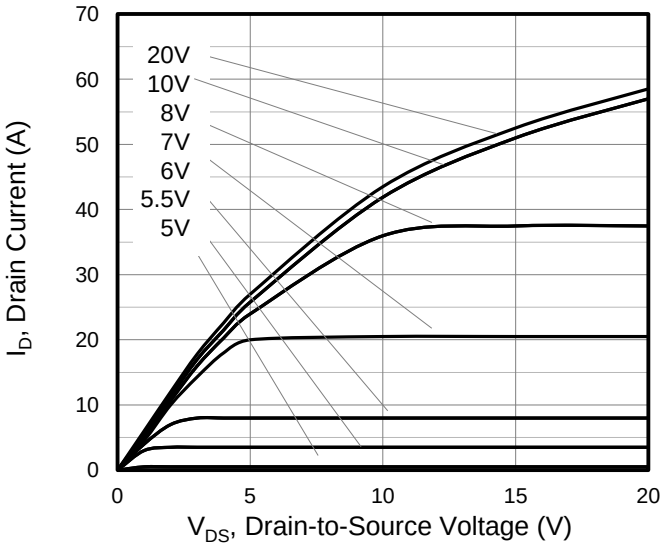


Figure 2. Transfer Characteristics

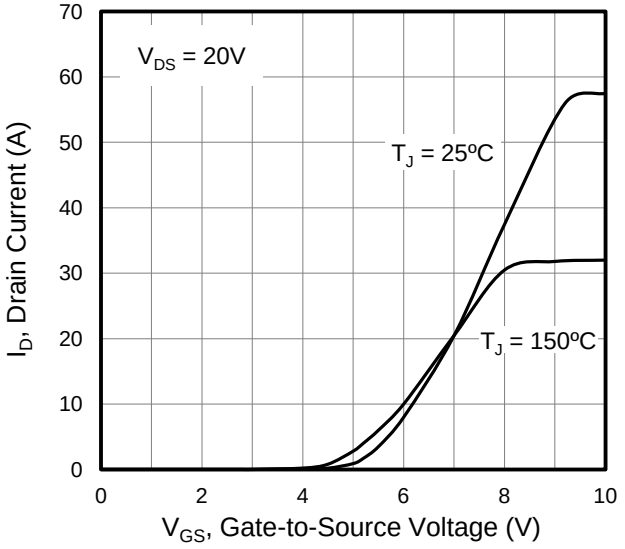


Figure 3. On-Resistance vs. Drain Current

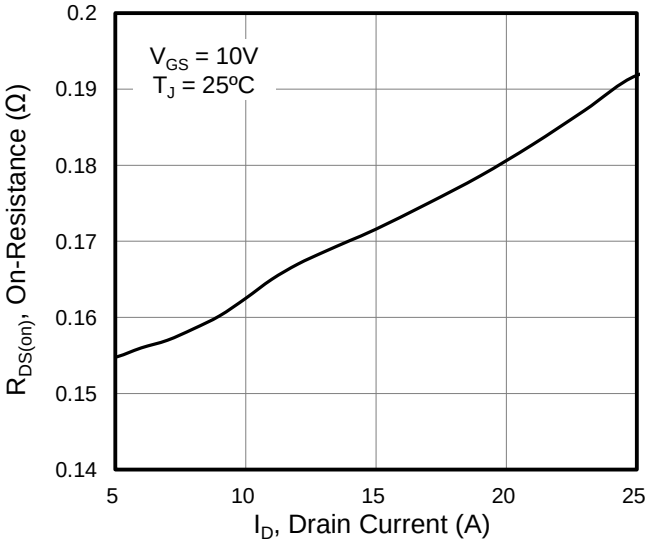


Figure 4. Capacitance

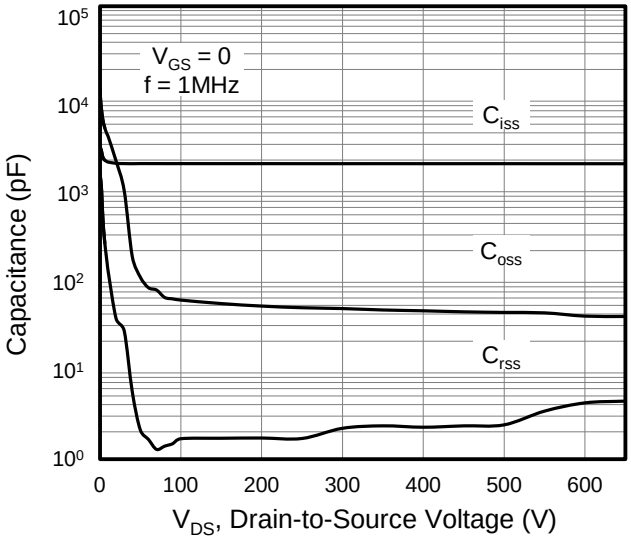


Figure 5. Gate Charge

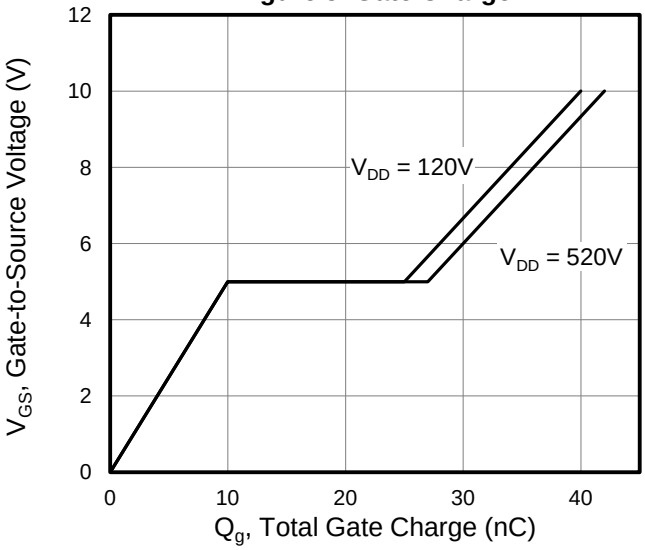
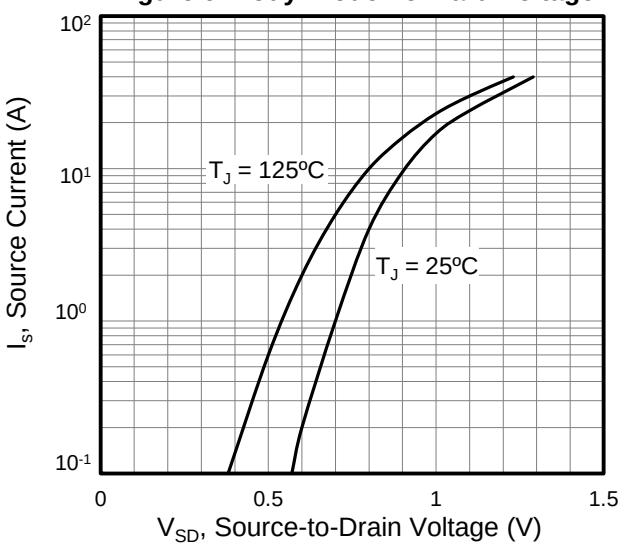


Figure 6. Body Diode Forward Voltage



●Typical Characteristics(Cont.)

Figure 7. On-Resistance vs. Junction Temperature

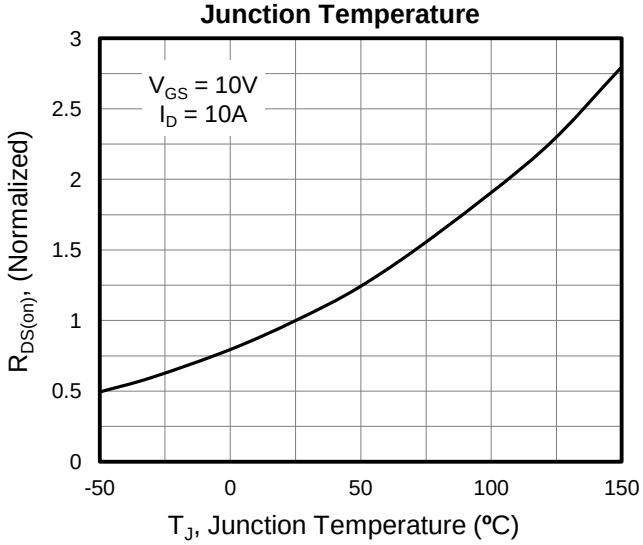


Figure 8. Breakdown voltage vs. Junction Temperature

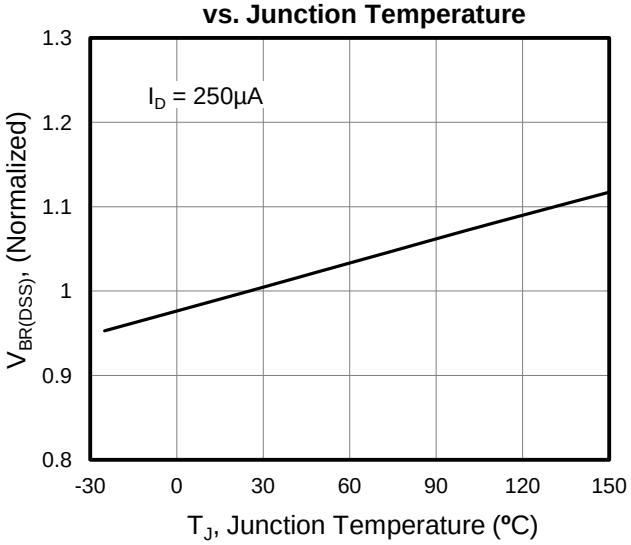


Figure9 . Transient Thermal Impedance

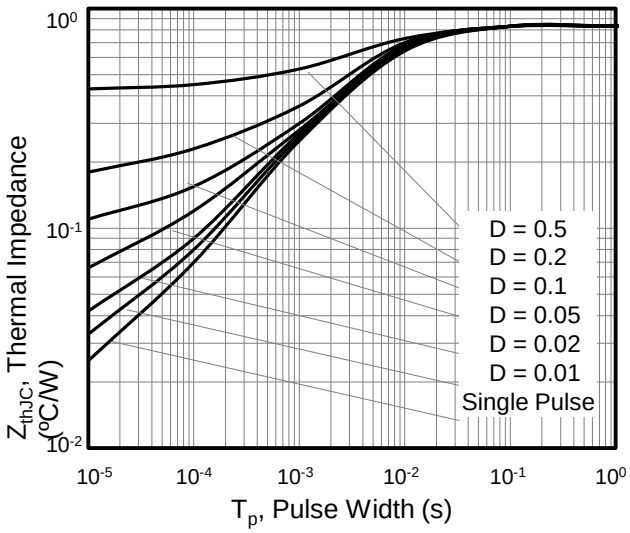
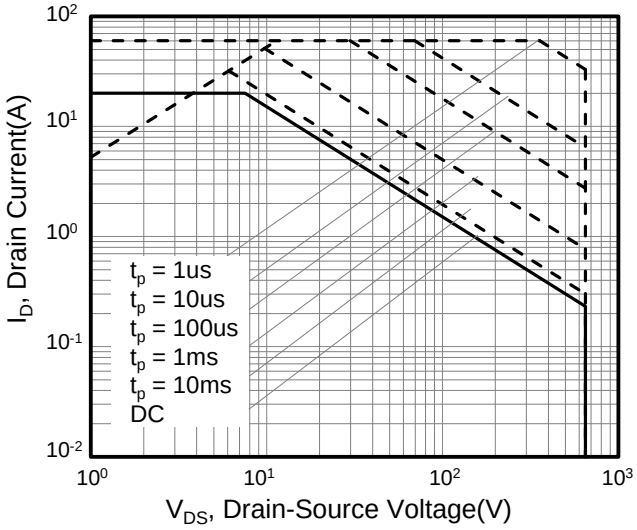


Figure 10. Safe operation area



●Test Circuit and Waveforms

Figure A：Gate Charge Test Circuit and Waveform

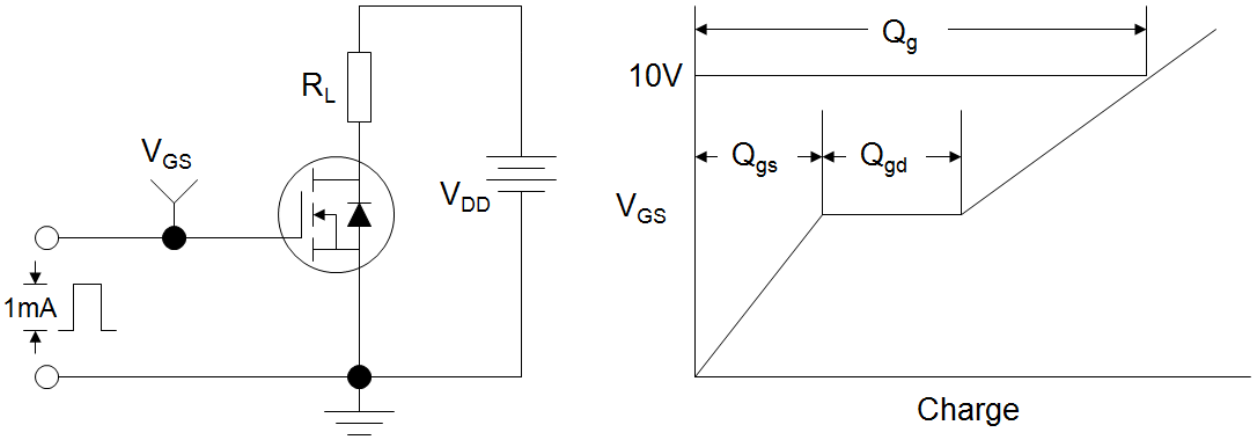


Figure B：Resistive Switching Test Circuit and Waveform

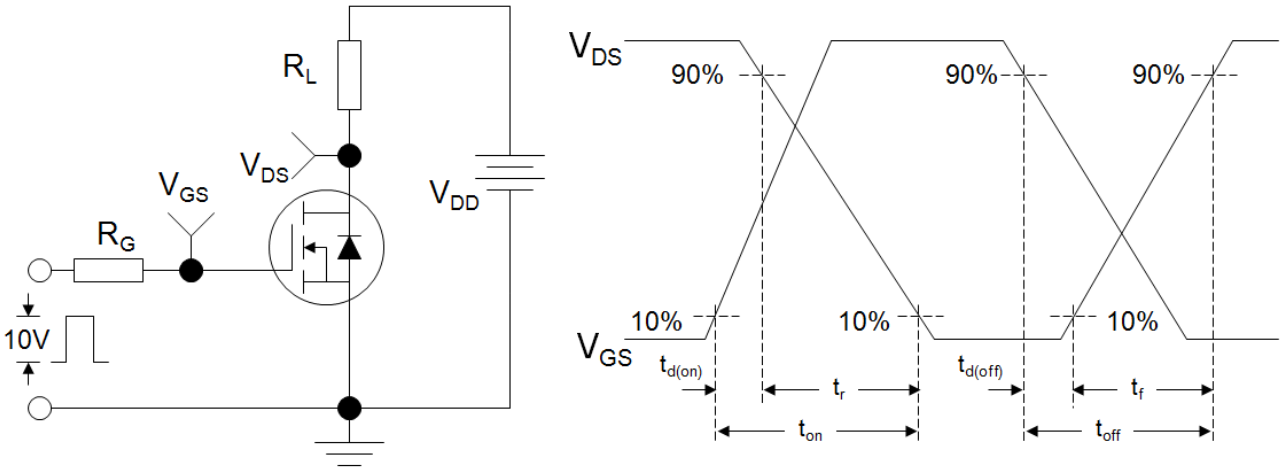
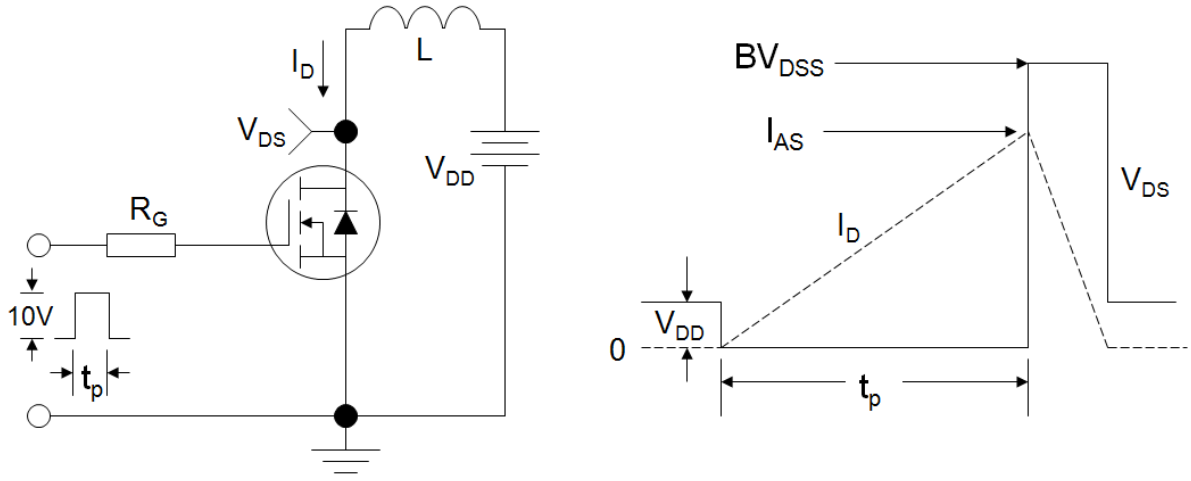


Figure C：Unclamped Inductive Switching Test Circuit and Waveform



●Dimensions（TO-220F)

UNIT:mm

SYMBOL	min	max	SYMBOL	min	max
A	4.20	4.80	E1	8.30	8.70
A1	2.50	2.90	e	2.40	2.70
A2	2.90	3.30	e1	4.95	5.25
b	0.40	0.80	F	2.50	2.90
b1	1.10	1.50	L	13.00	14.00
c	0.50	0.70	L1	3.00	4.00
D	9.80	10.60	⌀P	2.90	3.50
E	14.60	15.60