

●General Description

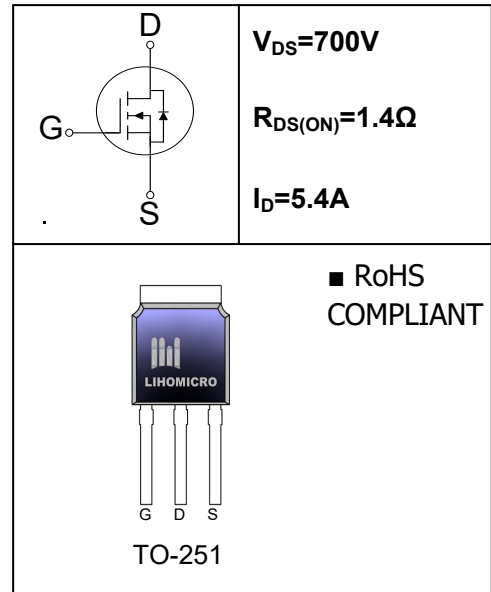
The SJ MOSFET LH70R1K6 has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device offers extremely fast and robust body diode, and is suitable for telecom and power supplies.

●Features

- Much lower $R_{on} \cdot A$ performance for On-state efficiency
- Much lower FOM for fast switching efficiency

●Application

- LED/LCD/PDP TV and monitor Lighting
- Solar/Renewable/UPS-Micro Inverter System
- Power Supplies


●Ordering Information:

Part number	LH70R1K6
Package	TO-251
Basic ordering unit (pcs)	4000
Normal Package Material Ordering Code	LH70R1K6T1-T0251-TU
Halogen Free Ordering Code	LH70R1K6T1-T0251-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	$T_C = 25^\circ C$	I_D	5.4	A
	$T_C = 100^\circ C$		3.4	
Pulsed drain current ($T_C = 25^\circ C$, t_p limited by T_{jmax}) ¹		I_D pulse	16.2	A
Single Pulse Avalanche Energy ²		E_{AS}	26	mJ
Power Dissipation($T_C=25^\circ C$)		P_D	5.4	W
Reverse diode dv/dt ³		dv/dt	15	V/ns
Maximum diode commutation speed ³		di_f/dt	50	V/ns
Operating Temperature and Storage Temperature Range		T_J/T_{STG}	-55~+150	℃

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	700	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.0	4.0	V
Drain-source On Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=2.4A$	--	1.4	1.6	Ω
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=700V, V_{GS}=0V, T_J=25^\circ C$	--	--	1	μA
		$V_{DS}=700V, V_{GS}=0V, T_J=125^\circ C$	--	--	100	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30$	--	--	± 100	A
Gate Resistance	R_G	$V_{GS}=0V, f=1.0MHz$	--	24	--	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V,$ $V_{DS}=250V$ $f=1.0MHz$	--	225	--	pF
Output Capacitance	C_{oss}		--	300	--	
Reverse transfer Capacitance	C_{rss}		--	12	--	
Turn-on delay time	$T_d(on)$	$V_{DD}=350V,$ $I_D=5.4A$ $R_G=25\Omega$	--	11	--	ns
Turn -Off Delay Time	$T_d(off)$		--	30	--	
Rise time	T_r		--	25	--	
Fall time	T_f		--	24	--	
Total Gate Charge	Q_g	$I_D=5.4A,$ $V_{DS}=560V$ $V_{GS}=10V$	--	6.1	---	nC
Gate-to-Source Charge	Q_{gs}		--	1.3	--	
Gate-to-Drain Charge	Q_{gd}		--	3.3	---	
Continuous Diode Forward Current	I_S	--	--	--	5.4	A
Pulsed Diode Forward Current ¹	I_{SM}	--	--	--	23	A
Diode Forward Voltage	V_{SD}	$T_J=25^\circ C, I_S=5.4A$ $V_{GS}=0V$	--	--	1.4	V
Reverse Recovery Time	t_{rr}	$V_{RR}=100V,$ $I_f=I_S$ $di_F/dt=100A/\mu s$	--	358	--	ns
Reverse Recovery Charge	Q_{rr}		--	1.5	--	μC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	R_{thJC}	23	$^\circ C/W$
Thermal Resistance Junction-ambient	R_{thJA}	75	$^\circ C/W$

Notes:

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

2. $I_{AS}=3.4A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^\circ C$

3. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

● **Typical Characteristics** ($T_J=25^\circ\text{C}$, unless otherwise noted)

Figure 1. Output Characteristics

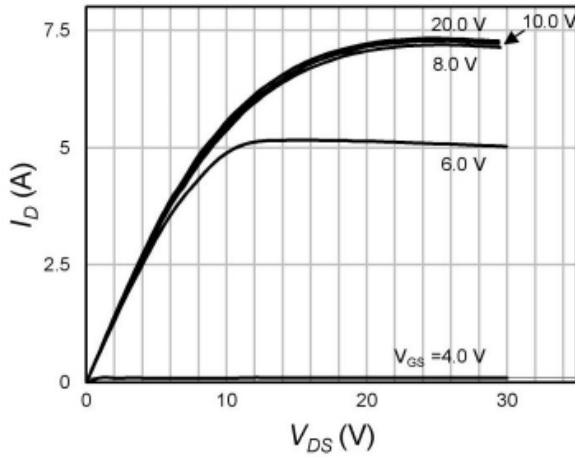


Figure 2. Drain-Source On- State Resistance v.s. Drain Current

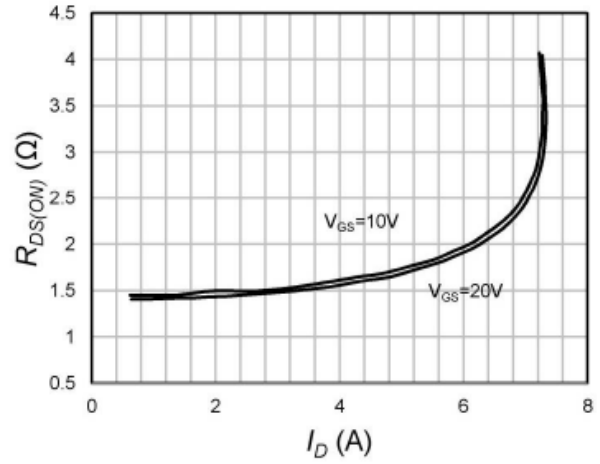


Figure 3. Capacitance

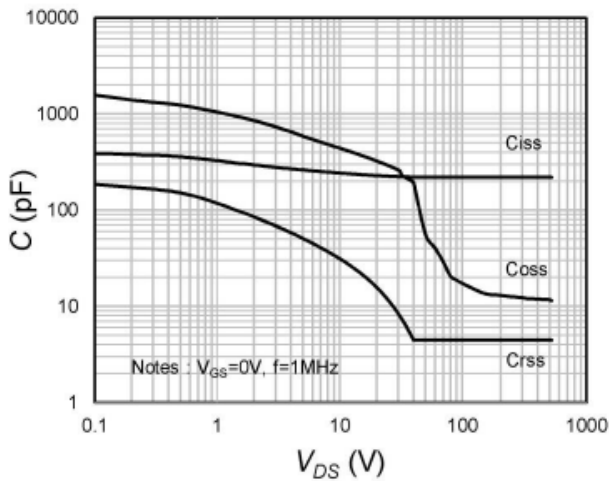


Figure 4. Drain-Source Breakdown Voltage(Normalized)

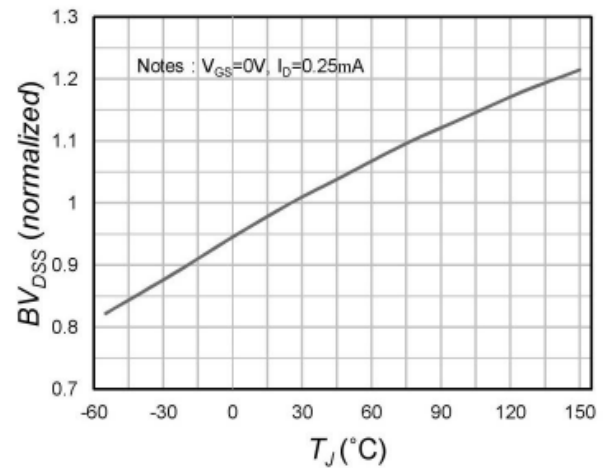


Figure 5. Transfer Characteristics

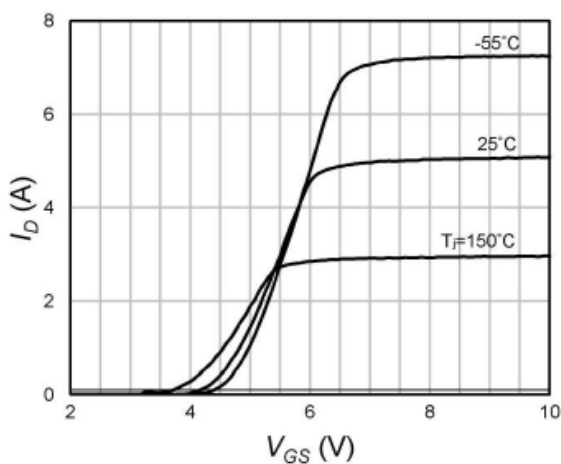
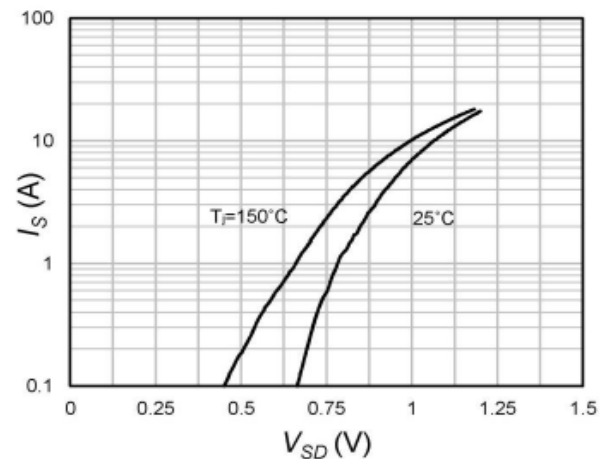


Figure 6. Forward Characteristics v.s. Reverse Diode



● **Typical Characteristics (Cont.)**

Figure 7. $V_{GS(th)}$ V.S. Temperature

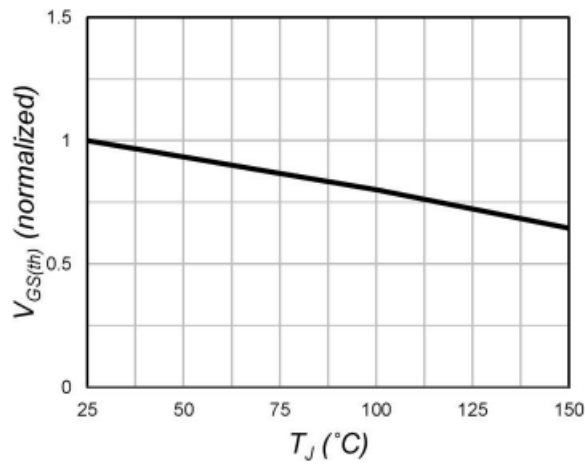


Figure 8. Max. Drain Current V.S. Case Temperature

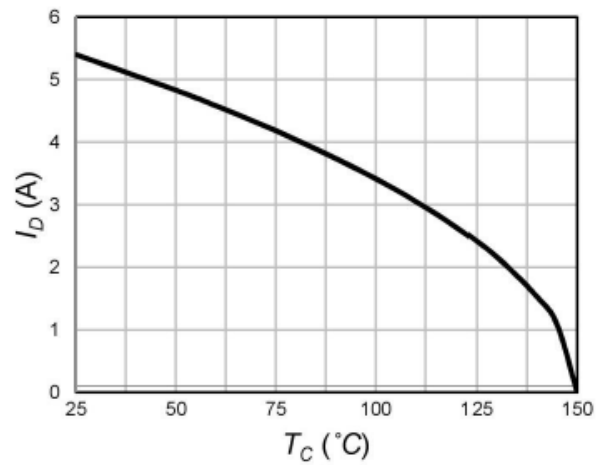


Figure 9. Power Dissipation

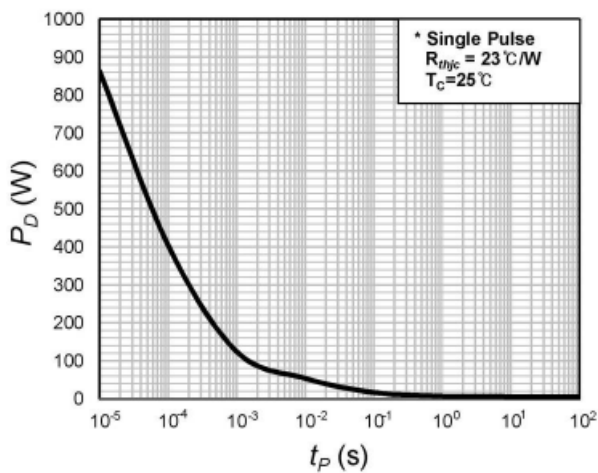


Figure 10. Output Capacitance Stored Energy

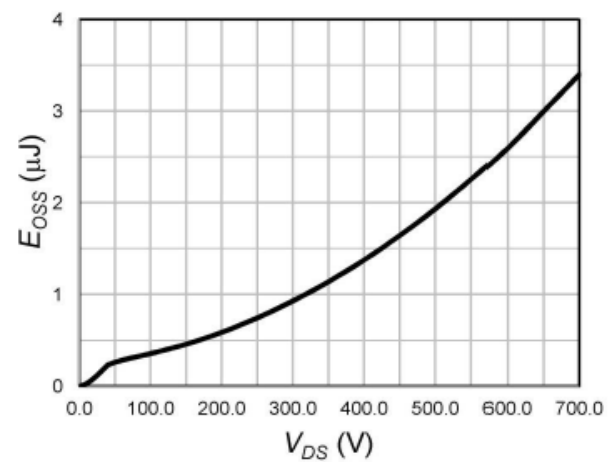


Figure 11. Transient Thermal Impedance

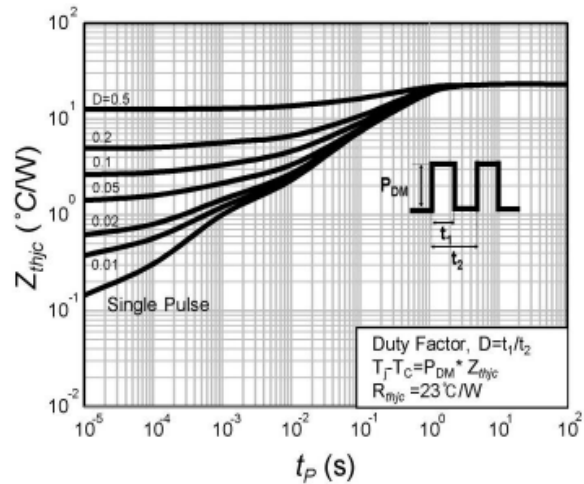
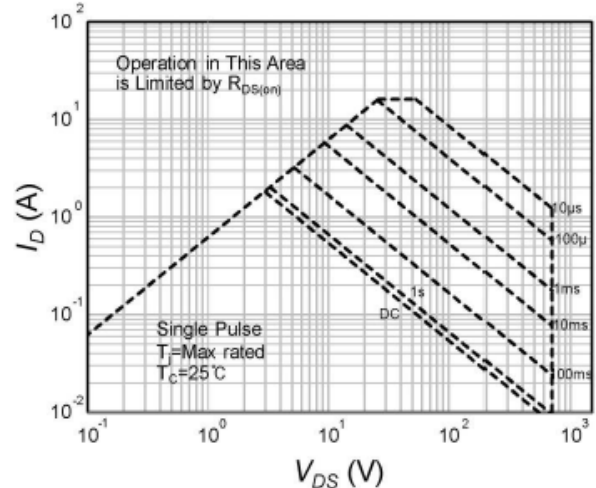


Figure 12. Safe operation area



• **Test Circuit and Waveforms**

Figure A: Gate Charge Test Circuit and Waveform

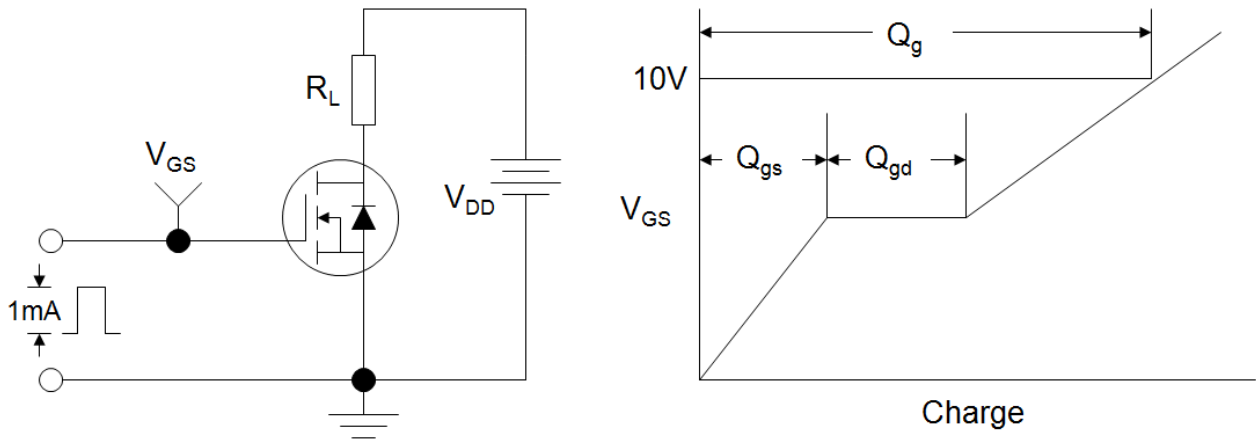


Figure B: Resistive Switching Test Circuit and Waveform

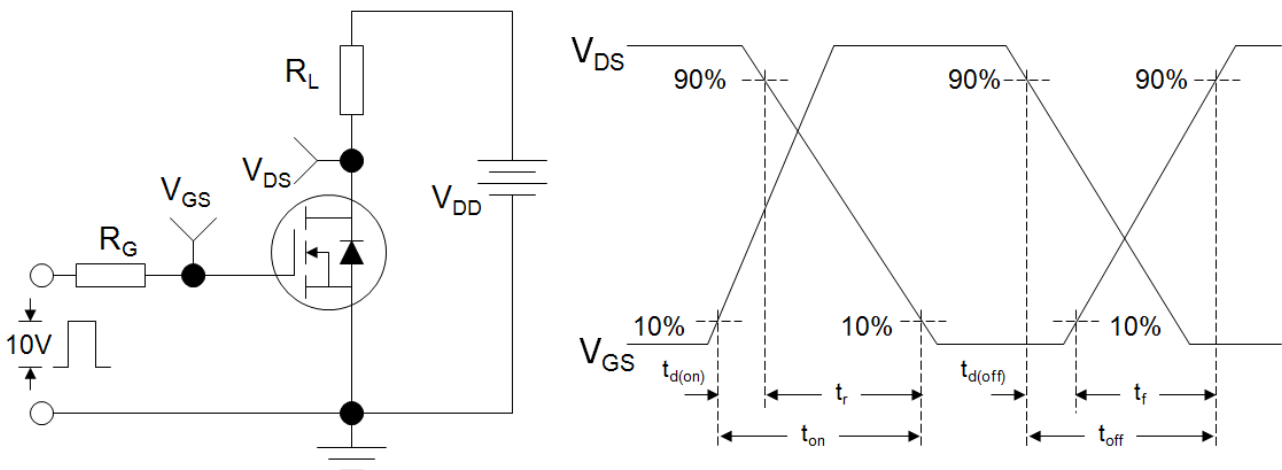
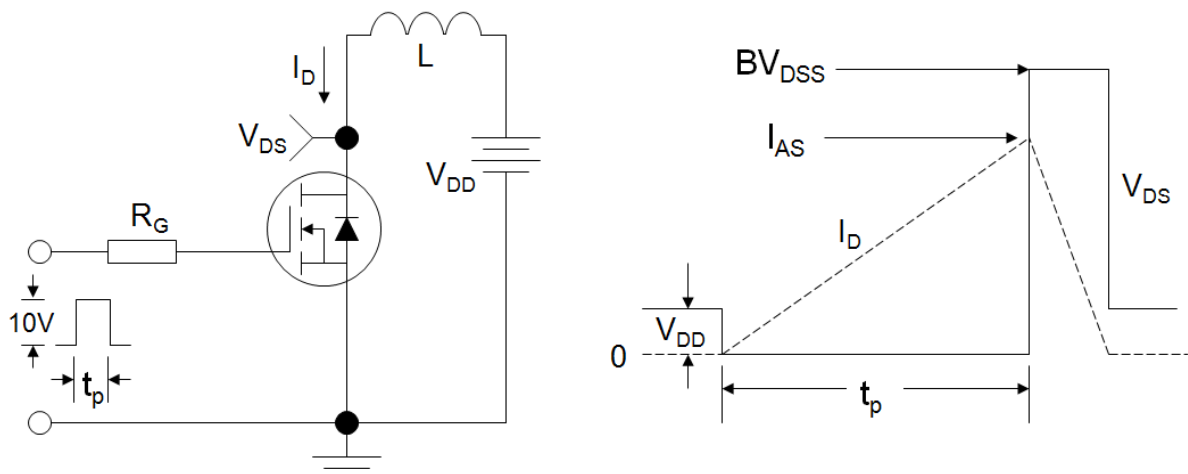


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



•Dimensions (TO-251)

UNIT:mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	B	0.80	1.30
b	0.50	0.90	C	0.40	0.70
b1	0.70	1.20	D1	5.10	5.60
b2	0.40	0.70	e1	2.10	2.45
D	6.20	6.80	e2	4.40	4.80
E	5.80	6.40			
L	3.60	9.80			
L1	0.80	1.60			

