

•General Description

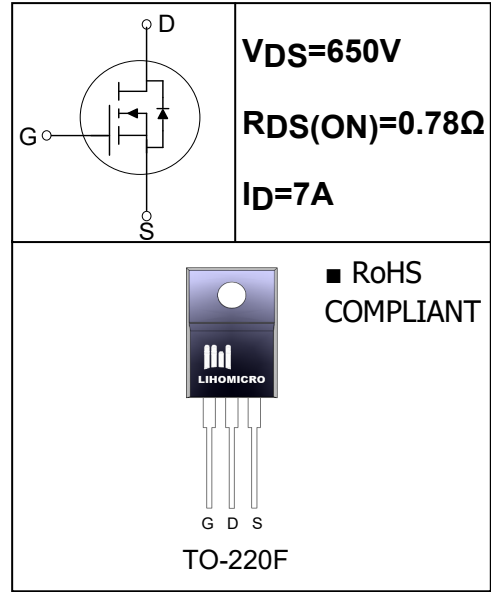
The SJ MOSFET LH65R850-A has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device offers extremely fast and robust body diode, and is suitable for telecom and power supplies.

•Features

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

•Application

- Lighting
- Solar/Renewable/UPS-Micro Inverter System
- Power Supplies


•Ordering Information:

Part number	LH65R850-A
Package	TO-220F
Basic ordering unit (pcs)	1000
Normal Package Material Ordering Code	LH65R850F-A-T0220F-TU
Halogen Free Ordering Code	LH65R850F-A-T0220F-TU-HF

•Absolute Maximum Ratings (TC =25℃)

PARAMETER		SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage		BV_{DSS}	650	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	TC = 25℃	I_D	7	A
	TC = 100℃		4.5	
Pulsed drain current (TC = 25℃, tp limited by Tjmax) ¹		I_D pulse	28	A
Single Pulse Avalanche Energy		I_{AR}	2.5	A
Single Pulse Avalanche Energy ²		E_{AS}	63	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	15	V/ns
Maximum diode commutation speed ³		di/dt	50	V/ns

650V Super-Junction MOSFET
●Electronic Characteristics($T_c=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	650	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	--	4.0	V
Drain-source On Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1.5A$	--	0.68	0.78	Ω
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	--	--	1	μA
		$V_{DS}=650V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	--	--	100	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V$	--	--	± 1	μA
Input Capacitance	C_{iss}	$V_{GS}=0V,$ $V_{DS}=400V$ $f=1.0MHz$	--	384	--	pF
Output Capacitance	C_{oss}		--	439	--	
Reverse transfer Capacitance	C_{rss}		--	19	--	
Turn-on delay time	$T_d(on)$	$V_{DD}=325V,$ $I_D=4.7A$ $R_G=25\Omega$	--	13.5	--	ns
Turn -Off Delay Time	$T_d(off)$		--	56	--	
Rise time	T_r		--	24	--	
Fall time	T_f		--	23.3	--	
Total Gate Charge	Q_g	$I_D=4.7A,$ $V_{DS}=520V$ $V_{GS}=10V$	--	11	---	nC
Gate-to-Source Charge	Q_{gs}		--	4.4	--	
Gate-to-Drain Charge	Q_{gd}		--	2.6	--	

●Dynamic Characteristics($T_c=25^{\circ}\text{C}$, unless otherwise specified)

Continuous Diode Forward Current	I_S	--	--	--	7	A
Reverse Recovery Current ¹	I_{RRM}	--	--	--	28	A
Diode Forward Voltage	V_{SD}	$T_J=25^{\circ}\text{C}, I_S=4.5A$ $V_{GS}=0V$	--	--	1.35	V
Reverse Recovery Time	t_{rr}	$V_{DD}=100V,$ $I_f=I_S$ $di_F/dt=100A/\mu s$	--	263	--	ns
Reverse Recovery Charge	Q_{rr}		--	1.9	--	μC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	R_{thJC}	3.4	$^{\circ}\text{C}/W$
Thermal Resistance Junction-ambient	R_{thJA}	62	$^{\circ}\text{C}/W$

Notes:

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

2. $I_{AS}=2.5A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$

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. On Region Characteristics

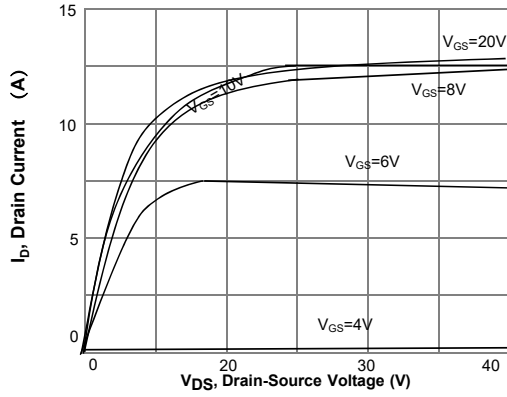


Figure 2. Transfer Characteristics

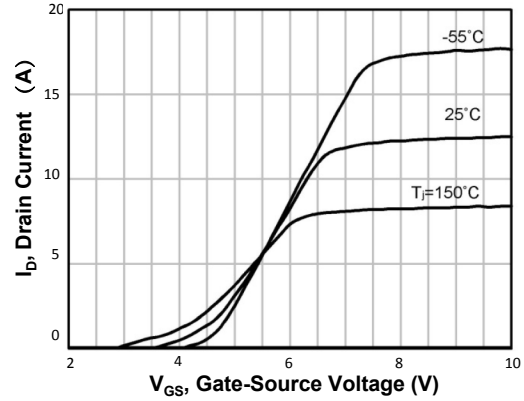


Figure 3. On Resistance Variation vs Drain Current and Gate Voltage

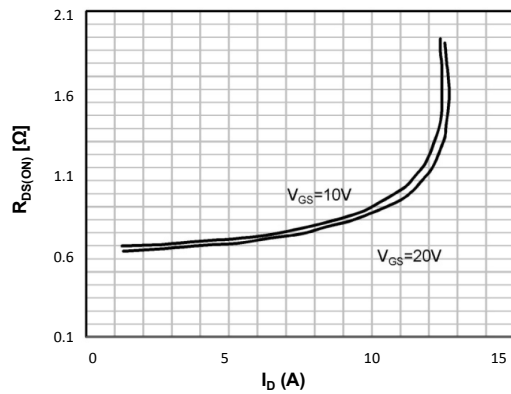


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

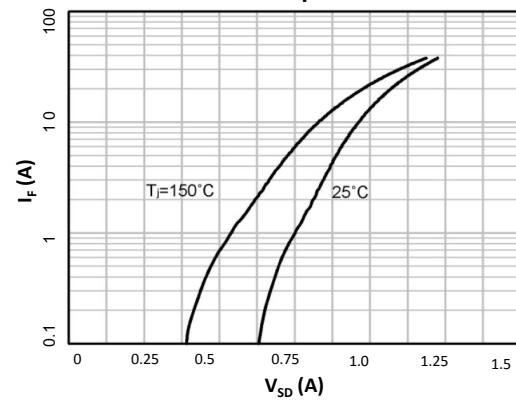


Figure 5. Capacitance Characteristics

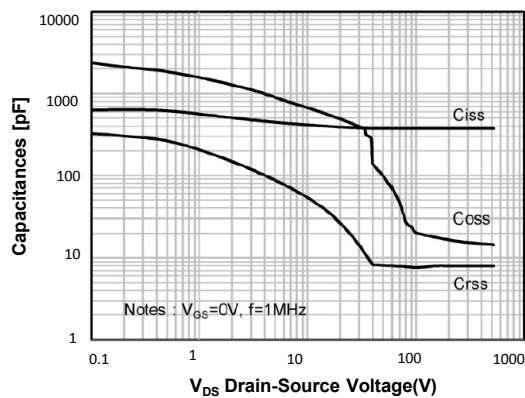
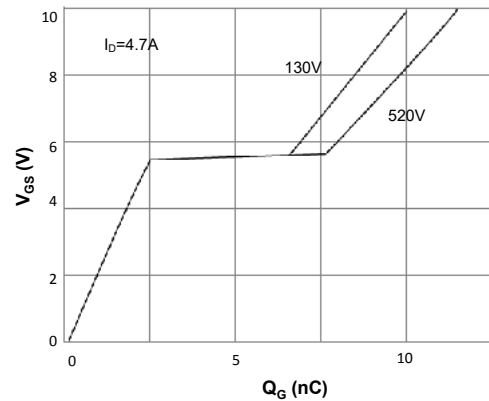


Figure 6. Gate Charge Characteristics



•Typical Characteristics(cont.)

Figure 7. Breakdown Voltage Variation vs. Temperature

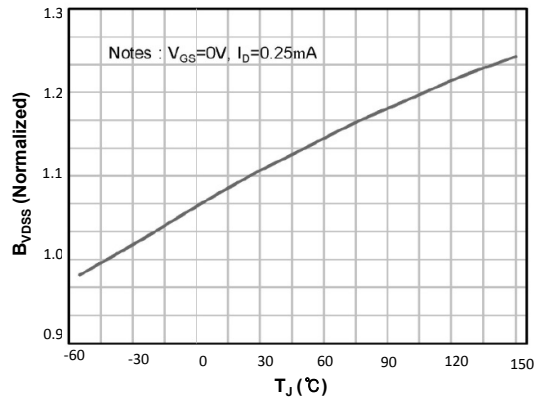


Figure 8. On-Resistance Variation vs. Temperature

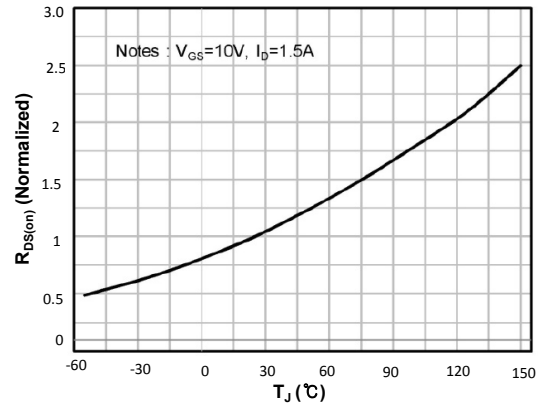


Figure 9. Maximum Safe Operating Area

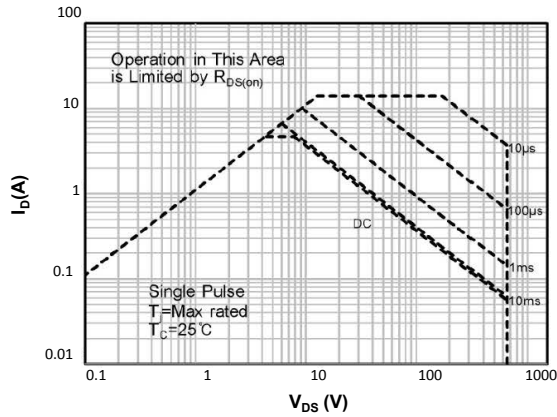


Figure 10. Maximum Drain Current vs. Case Temperature

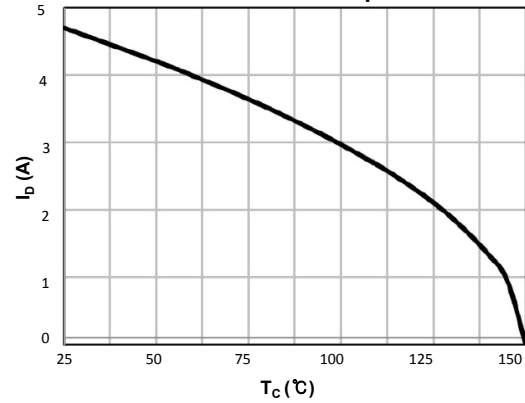
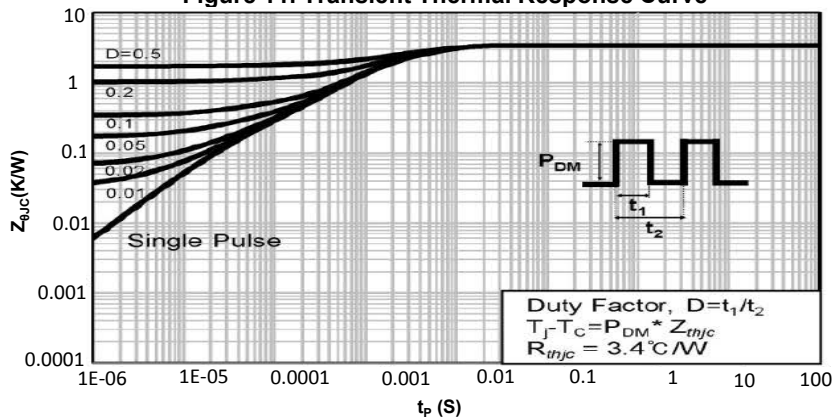


Figure 11. Transient Thermal Response Curve



● **Test circuits&Waveforms**

Fig 1. Gate Charge Test Circuit & Waveform

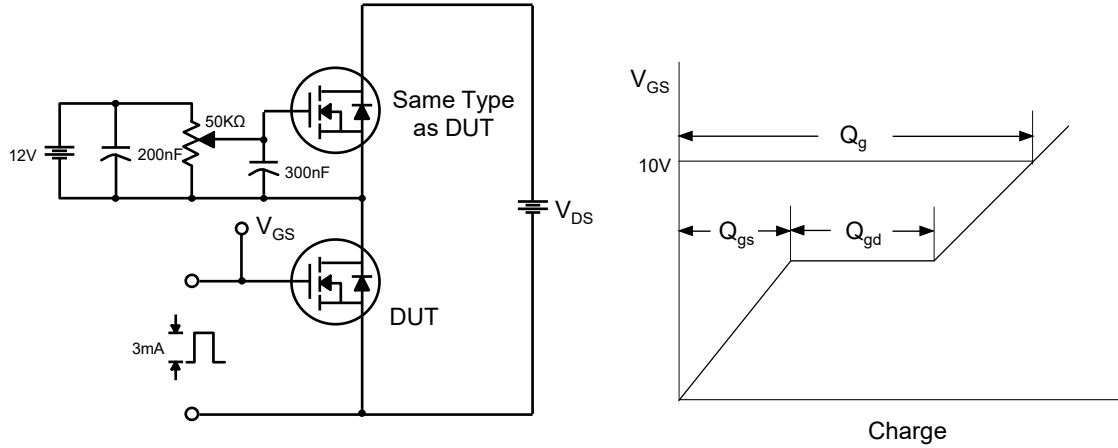


Fig 2. Resistive Switching Test Circuit & Waveforms

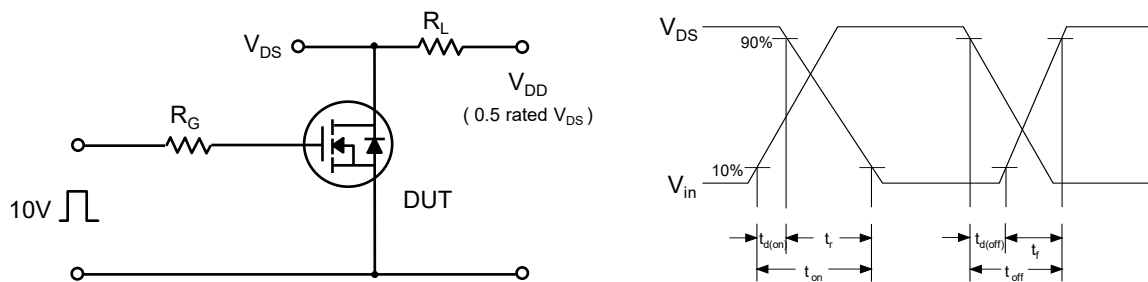
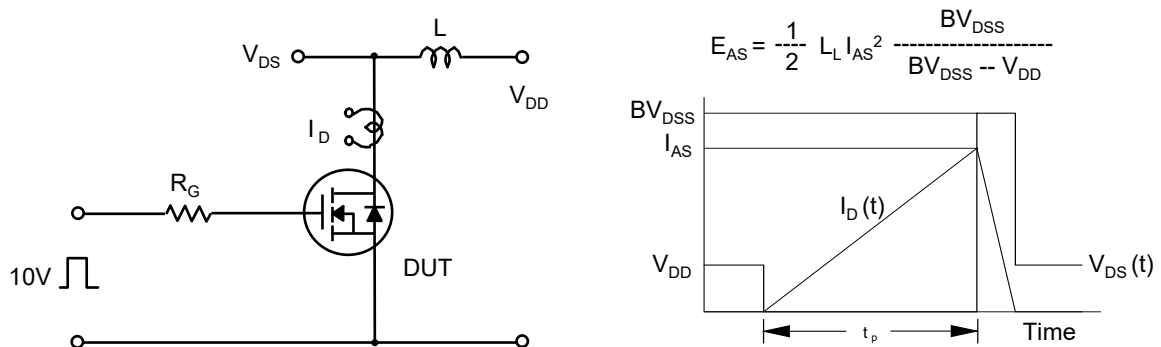
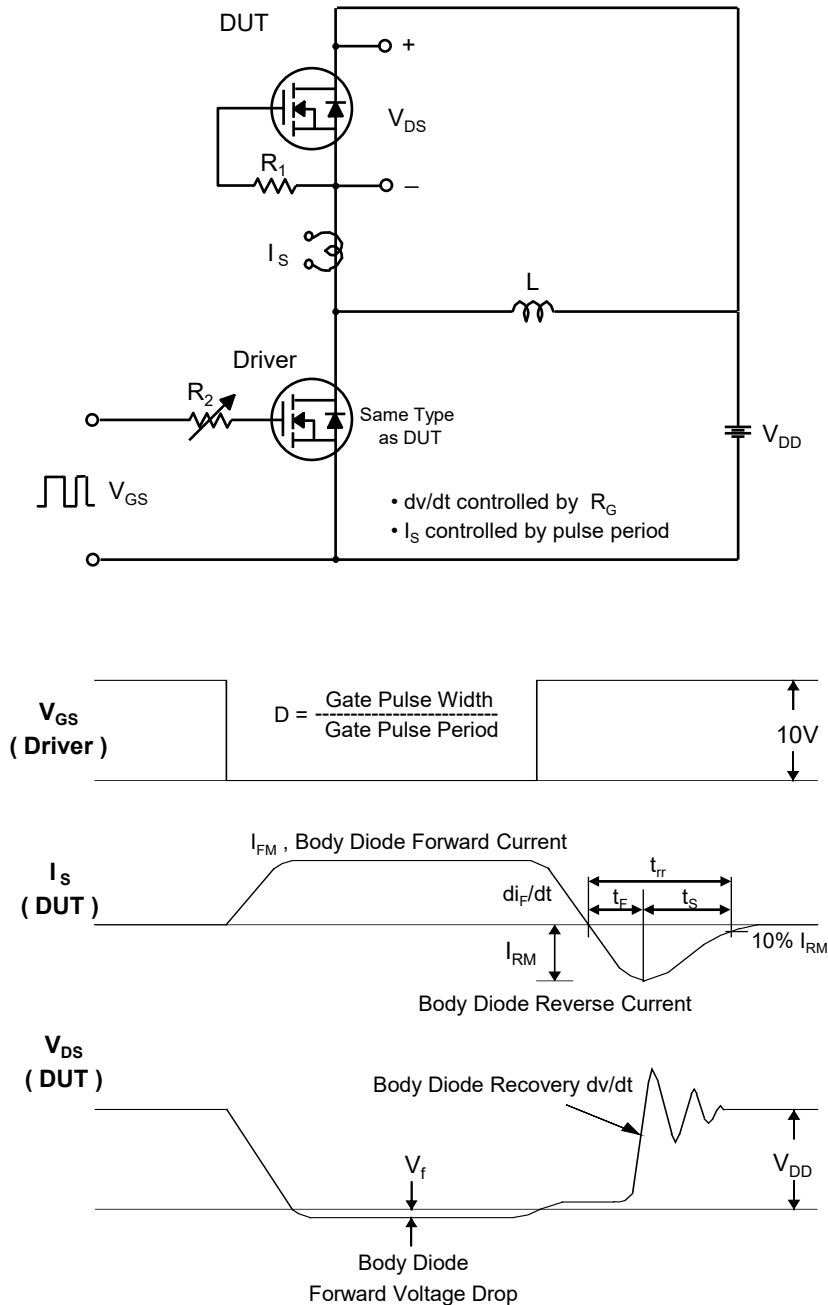


Fig 3. Unclamped Inductive Switching Test Circuit & Waveforms



•Test circuits&Waveforms(cont.)

Fig 4. Peak Diode Recovery dv/dt Test Circuit & Waveforms



●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			

