

CH IPLINK N-Channel Enhancement Mode SGT Power MOSFET

Description

The LXS1H130R combines advanced SGT technology to provide excellent $R_{DS(ON)}$, it tailored to minimize conduction loss, and provide superior switching performance.

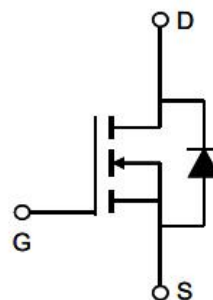
Features

- $V_{DS} = 100V$, $I_D = 130A$
 $R_{DS(ON)typ.} = 4.3m\Omega @ V_{GS} = 10V$
- Fast switching
- Excellent gate charge $\times R_{DS(ON)}$ product(FOM)
- Termination is Lead-free and RoHS Compliant

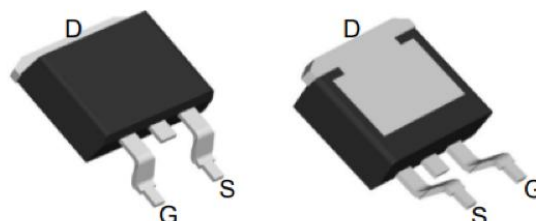


Applications

- DC/DC Converter
- Load Switch
- BMS



Schematic Diagram



TO263 Package

Maximum Ratings

($T_A = 25^\circ C$, unless otherwise noted)

PARAMETER	SYMBOL	MAX	UNIT
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D(T_C=25^\circ C)$	130	A
	$I_D(T_C=100^\circ C)$	80	A
Pulsed Drain Current ^A	I_{DM}	410	A
Maximum Power Dissipation ^B	P_D	160	W
Single pulse Avalanche Energy	E_{AS}	265	mJ
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$

Thermal Characteristic

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	58	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JA}$	0.75	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics

($T_A = 25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	100			V
Gate-Threshold Voltage	$V_{th(GS)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.0	2.8	4	V
Gate-body Leakage	I_{GSS}	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80\text{V}, V_{GS} = 0\text{V}$			1	μA
Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$		4.3	5.2	m Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{DS} = 50\text{V}, V_{GS} = 0\text{V},$ $F = 1\text{MHz}$		4025		pF
Output Capacitance	C_{oss}			660		
Reverse Transfer Capacitance	C_{rss}			14		

Switching Capacitance

Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 50\text{V}, R_L = 2.5\Omega$ $V_{GS} = 10\text{V}, R_{GEN} = 6\Omega$		25		nS
Turn-on Rise Time	t_r			42		nS
Turn-off Delay Time	$t_{d(off)}$			47		nS
Turn-off Fall Time	t_f			29		nS
Total Gate Charge	Q_g	$V_{DS} = 50\text{V}, I_D = 30\text{A},$ $V_{GS} = 10\text{V}$		64		nC
Gate-Source Charge	Q_{gs}			43		nC
Gate-Drain Charge	Q_{gd}			23		nC

Drain-Source Diode Characteristics

Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{V}, I_D = 30\text{A}$			1.2	V
Diode Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}\text{C}, I_F = 15\text{A}$ $di/dt = 100\text{A}/\mu\text{s}$		74		nS
Diode Reverse Recovery Charge	Q_{rr}			78		nC
Diode Forward Current	I_S	$T_c = 25^{\circ}\text{C}$			130	A

Notes:

- A. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^{\circ}\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J = 25^{\circ}\text{C}$.
- B. The power dissipation P_D is based on $T_{J(MAX)} = 150^{\circ}\text{C}$, using $\leq 10\text{s}$ junction-to-ambient thermal resistance.

Typical Electrical and Thermal Characteristics

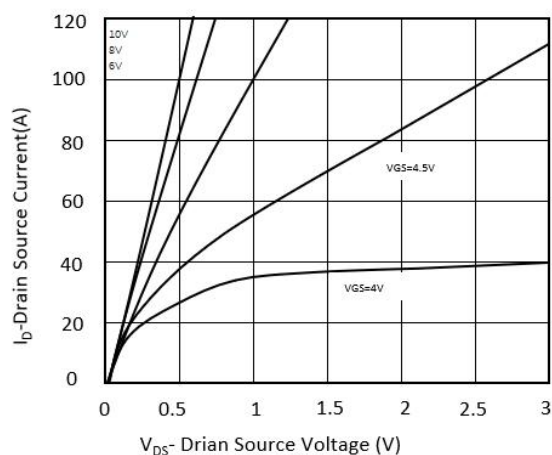


Figure 1. Output Characteristics

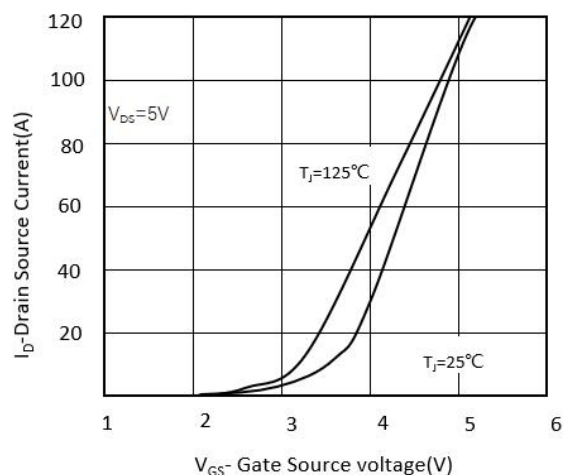


Figure 2. Transfer Characteristics

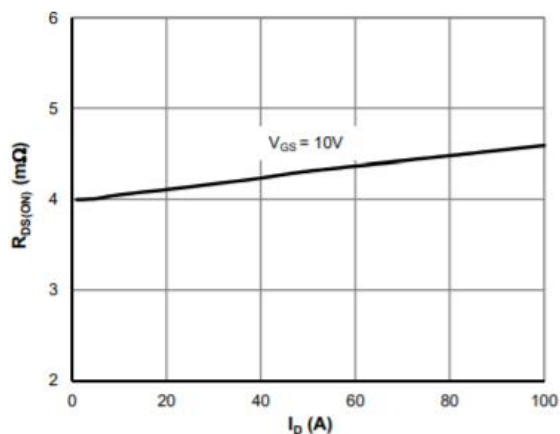


Figure 3. On-Resistance vs Drain Current

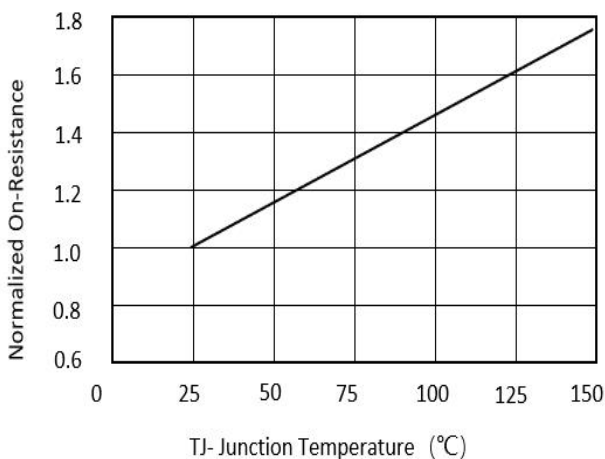


Figure 4. Rdson- Junction Temperature

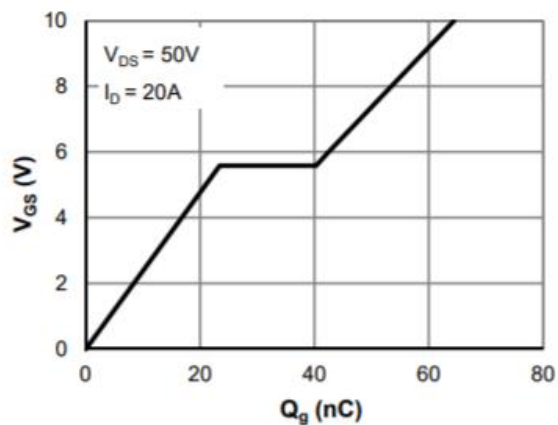


Figure 5. Gate Charge

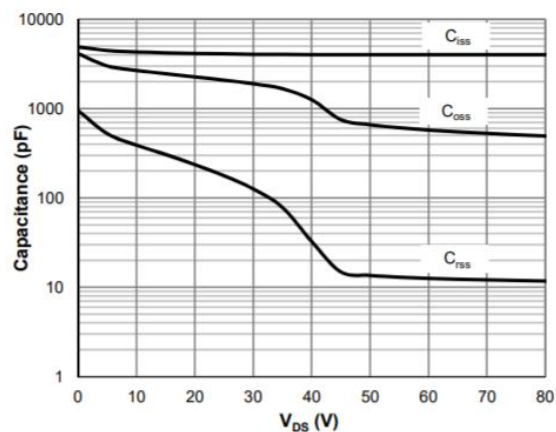


Figure 6. Capacitance vs Vds

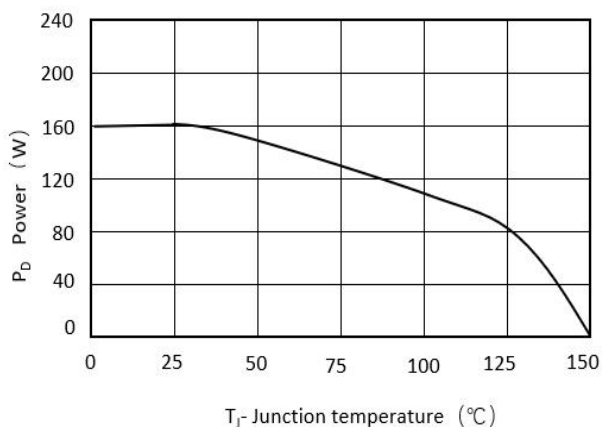


Figure 7. Power De-rating

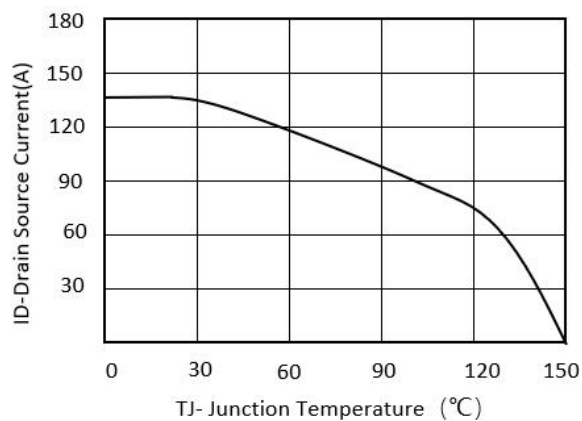


Figure 8. Current De-rating

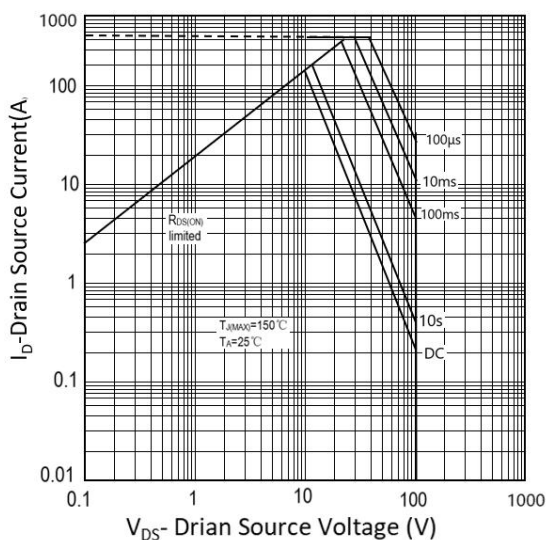


Figure 9. Safe Operation Area

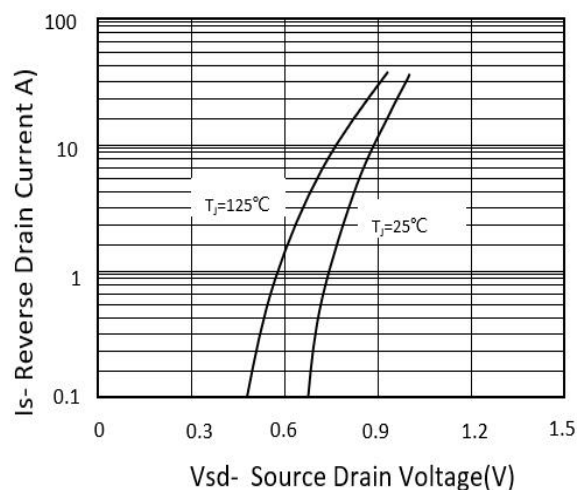


Figure 10. Source Drain Diode Forward

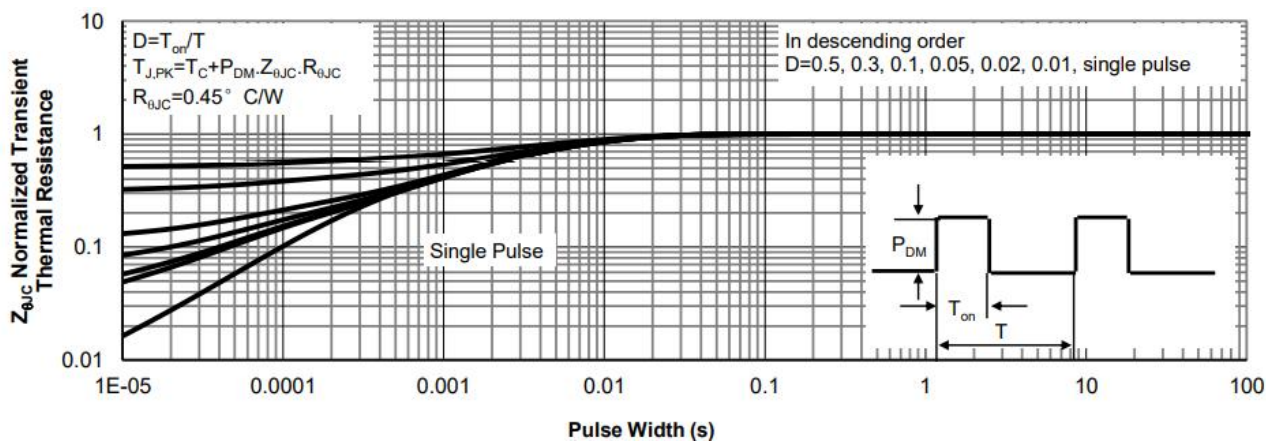


Figure 11. Thermal Transient Impedance

Test Circuit and Waveform

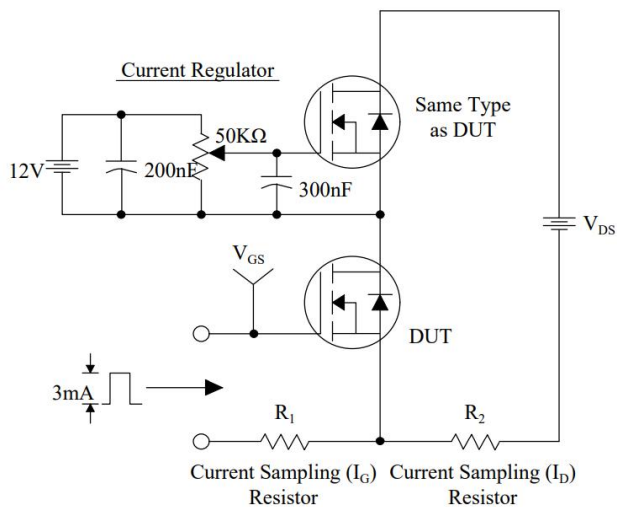


Figure 12. Gate Charge Test Circuit

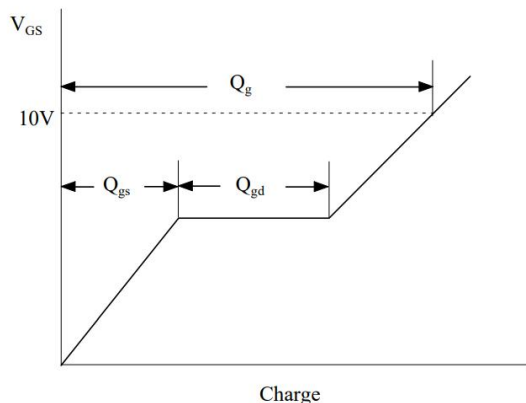


Figure 13. Gate Charge Waveform

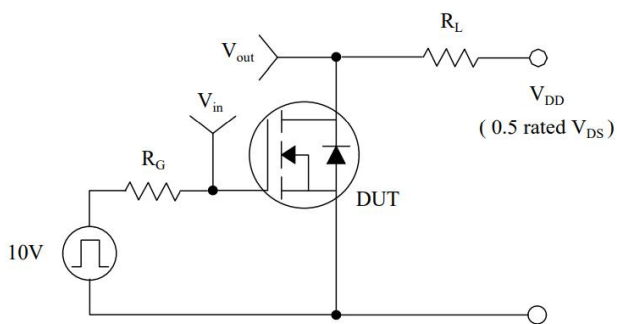


Figure 14. Resistive Switching Test Circuit

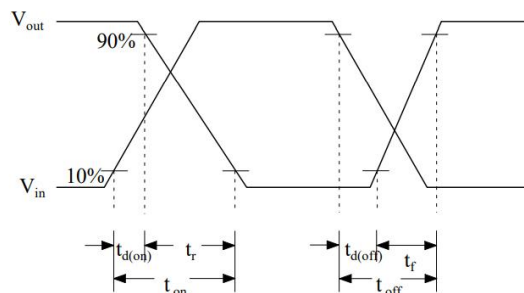


Figure 15. Resistive Switching Waveforms

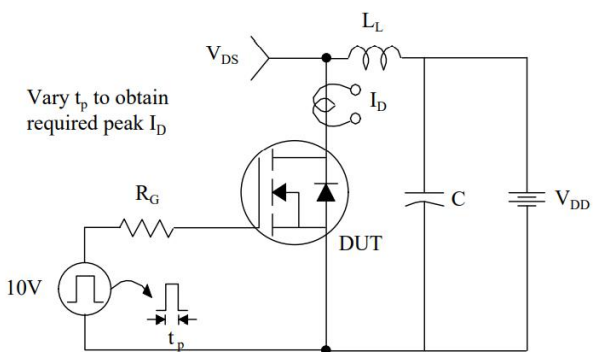


Figure 16. Unclamped Inductive Switching Test Circuit

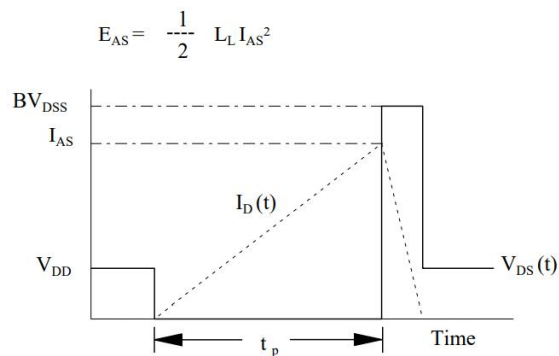
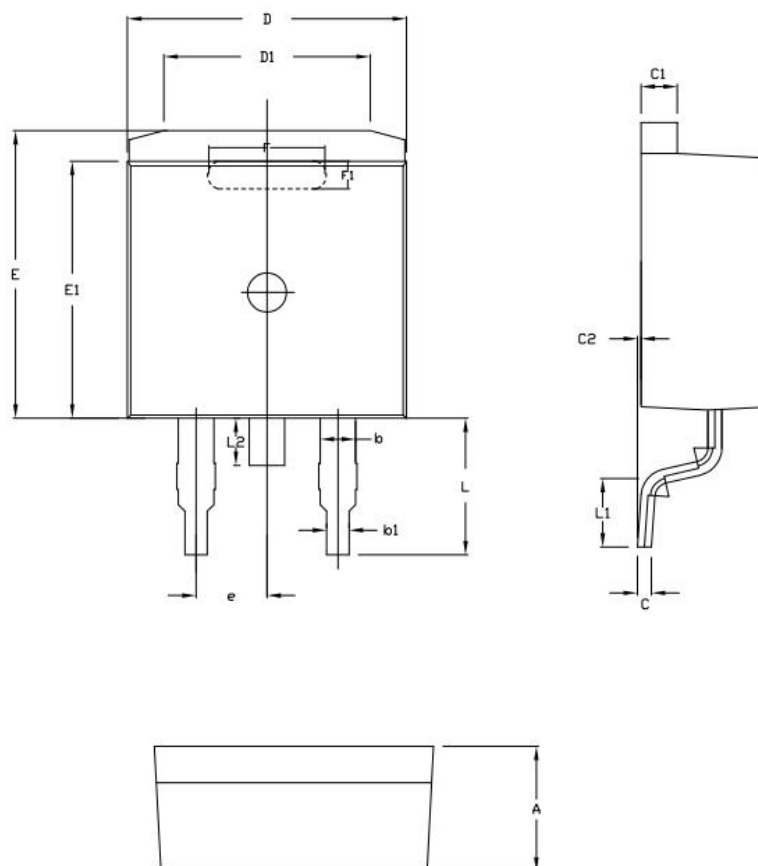


Figure 17. Unclamped Inductive Switching Waveforms

TO263 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	4.40	4.5	4.60
b	1.20	1.28	1.36
b1	0.70	0.8	0.90
C	0.48	0.5	0.53
C1	1.28	1.30	1.32
C2	0.04	0.12	0.20
D	9.80	10.00	10.20
D1	7.25	7.40	7.55
E	10.20	10.30	10.40
E1	9.10	9.20	9.30
e	--	2.54	--
L	4.70	4.90	5.10
L1	1.50	1.70	1.90
F	3.94	4.04	4.14
F1	0.95	1.05	1.15

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