

CHIPLINK N-Channel Enhancement Mode SGT Power MOSFET

Description

The LXS1H140R combines advanced SGT technology to provide excellent $R_{DS(ON)}$, it tailored to minimize conduction loss, and provide superior switching performance.

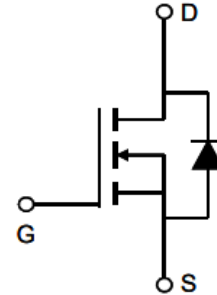
Features

- $V_{DS}=100V$, $I_D=140A$
 $R_{DS(ON)typ.}=3.7m\Omega@V_{GS}=10V$
- Fast switching
- High power and current handling capability
- Excellent gate charge $\times R_{DS(ON)}$ product(FOM)
- Termination is Lead-free and RoHS Compliant

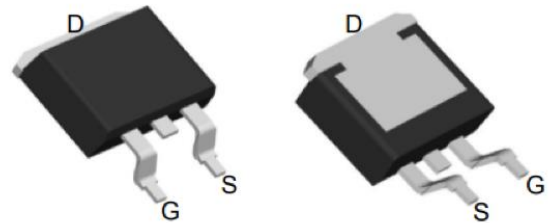


Applications

- DC/DC Converter
- Load switch
- BMS



Schematic Diagram



TO263 Package

Maximum Ratings($T_A=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D(T_C=25^{\circ}C)$	140	A
	$I_D(T_C=100^{\circ}C)$	90	A
Pulsed Drain Current ^B	I_{DM}	430	A
Maximum Power Dissipation ^A	P_D	160	W
Single pulse avalanche energy	E_{AS}	380	mJ
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^{\circ}C$

Thermal Characteristic

Thermal Resistance, Junction to Ambient	R_{QJA}	55	$^{\circ}C/W$
Thermal Resistance, Junction to Case	R_{QJC}	0.8	$^{\circ}C/W$

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}	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate-Threshold Voltage	$V_{th(GS)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	2.8	4	V
Gate-body Leakage	IGSS	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	IDSS	$V_{DS}=80V, V_{GS}=0V$			1	μA
Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$		3.7	4.2	m Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1MHz$		3450		pF
Output Capacitance	C_{oss}			865		
Reverse Transfer Capacitance	C_{rss}			25		
Switching Capacitance						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=50V, R_L=2.5\Omega, V_{GS}=10V, R_{GEN}=6\Omega$		15		nS
Turn-on Rise Time	t_r			34		nS
Turn-off Delay Time	$t_{d(off)}$			60		nS
Turn-off Fall Time	t_f			50		nS
Total Gate Charge	Q_g	$V_{DS}=50V, I_D=30A, V_{GS}=10V$		59		nC
Gate-Source Charge	Q_{gs}			12		nC
Gate-Drain Charge	Q_{gd}			16		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_D=30A$			1.2	V
Diode Reverse Recovery Time	t_{rr}	$T_J=25^{\circ}C, I_F=15A, di/dt=100A/\mu s$		60		nS
Diode Reverse Recovery Charge	Q_{rr}			63		nC
Diode Forward Current	Is	$T_c=25^{\circ}C$			160	A

Notes:

- The Power dissipation P_D is based on $T_{J(MAX)}=150^{\circ}\text{C}$, using $\leq 10s$ junction-to ambient thermal resistance.
- 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 $T_J=25^{\circ}\text{C}$.
- The Static characteristics in Figures are obtained using $<300\mu s$ pulses, duty cycle 2% max.
- EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=50V, V_{GS}=10V, R_G=6\Omega, L=0.5Mh$.

Typical Electrical and Thermal Characteristics

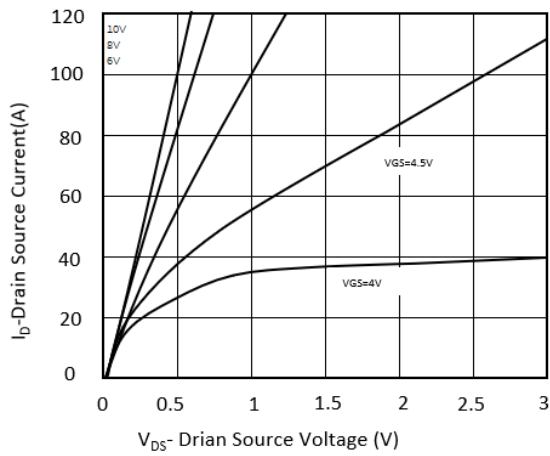


Figure 1: Output Characteristics

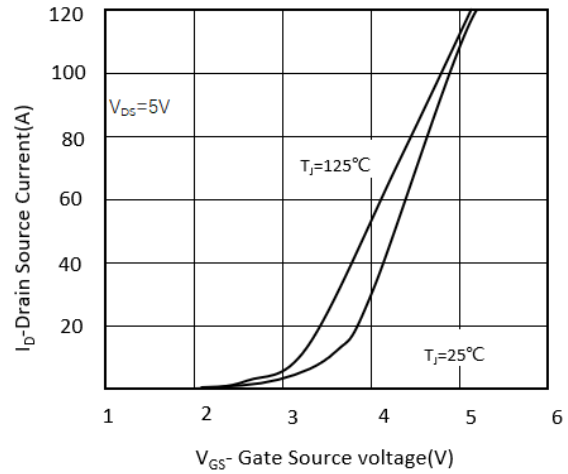


Figure 2: Transfer Characteristics

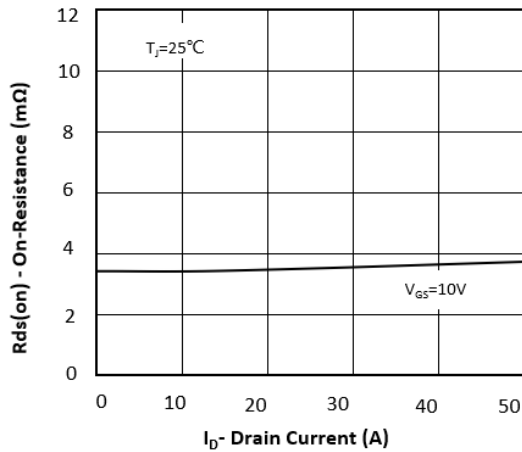


Figure 3: On-Resistance VS Drain Current

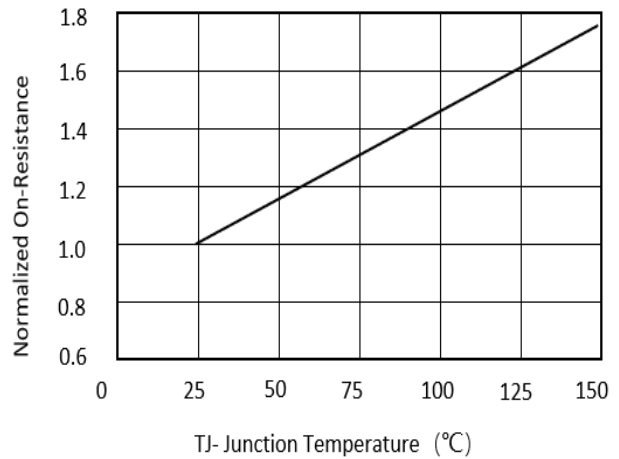


Figure 4: $R_{DS(on)}$ - Junction Temperature

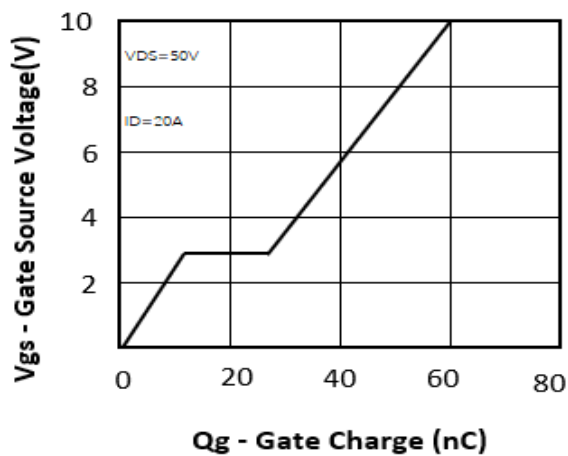


Figure 5: Gate Charge

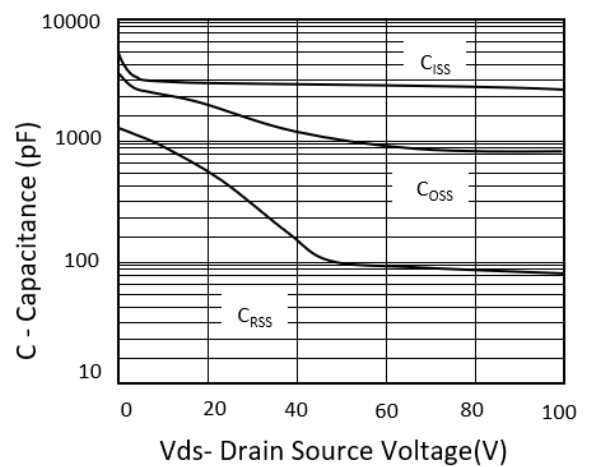


Figure 6: Capacitance VS V_{DS}

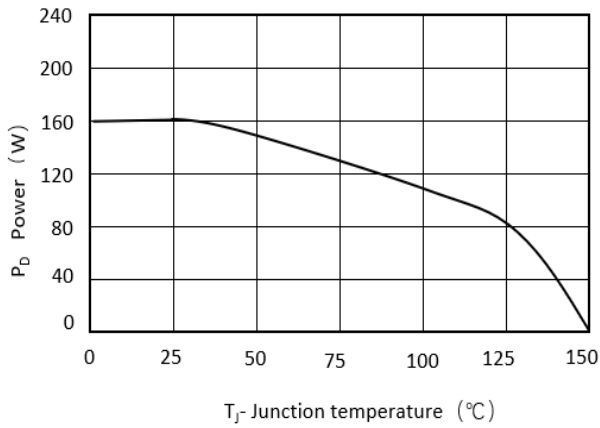


Figure 7: Power De-rating

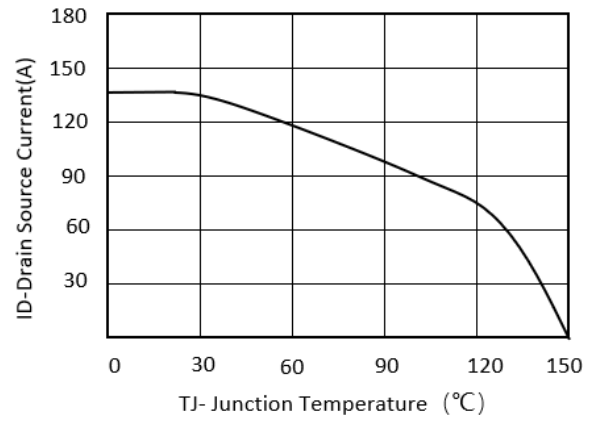


Figure 8: Current De-rating

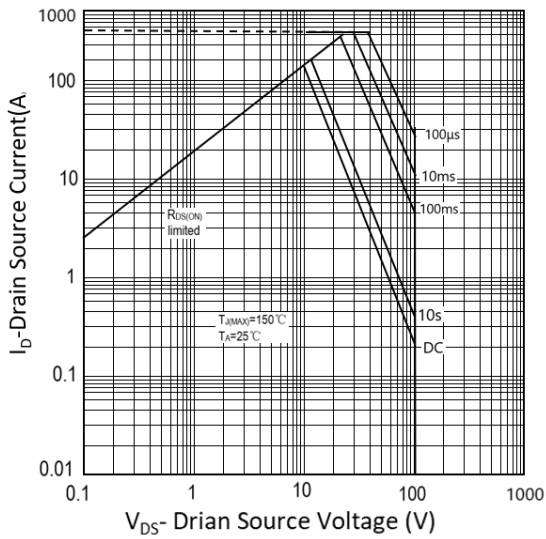


Figure 9: Safe Operation Area

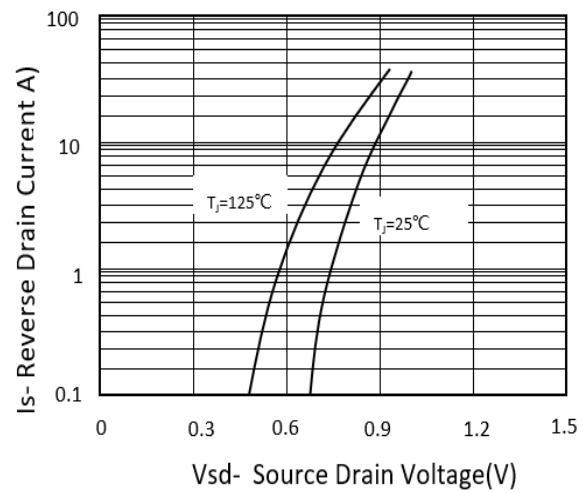


Figure 10: Source Drain Diode Forward

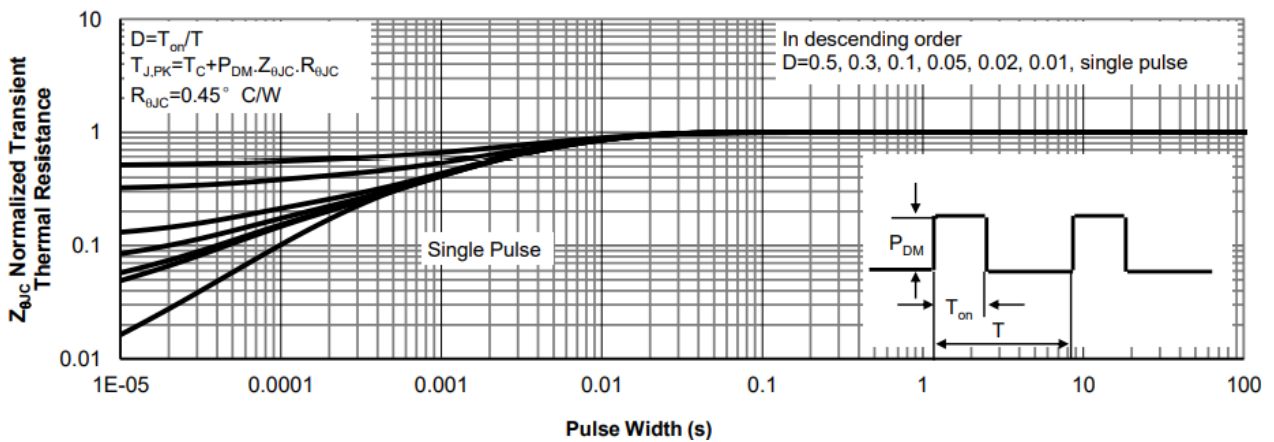
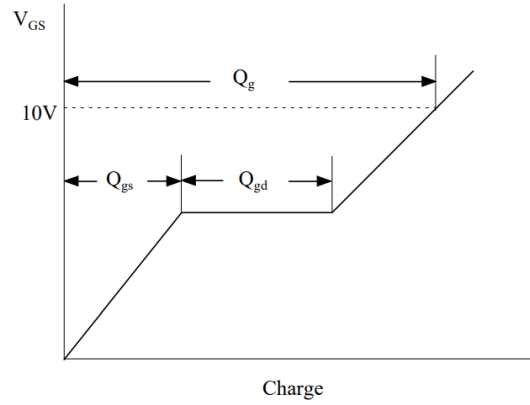
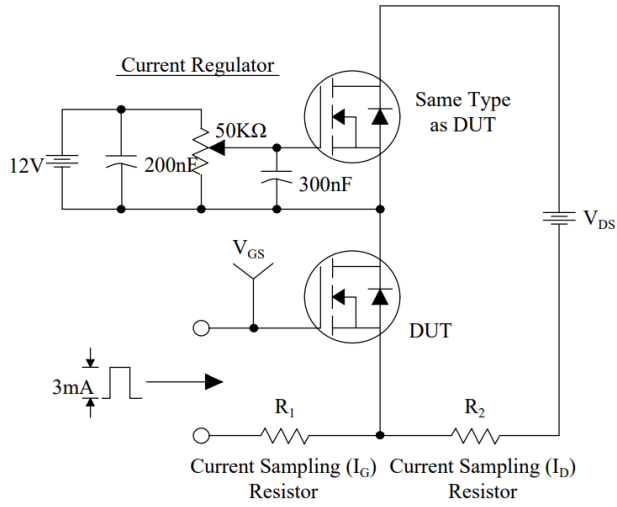
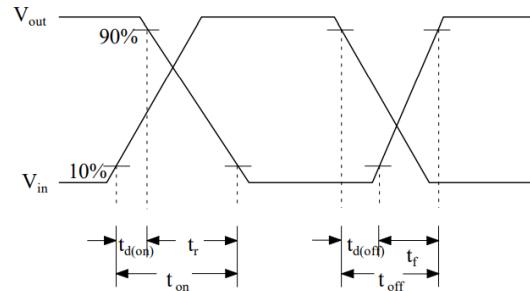
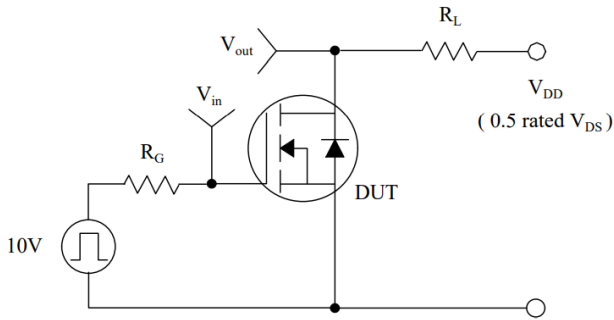


Figure 10: Thermal Transient Impedance

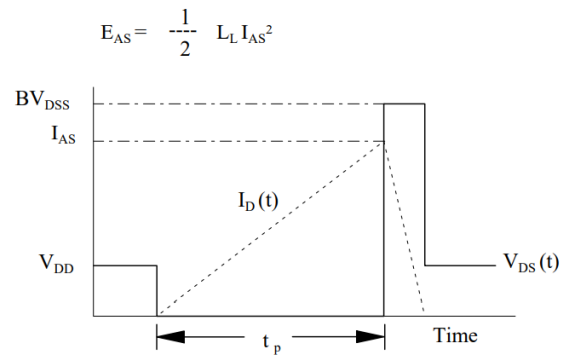
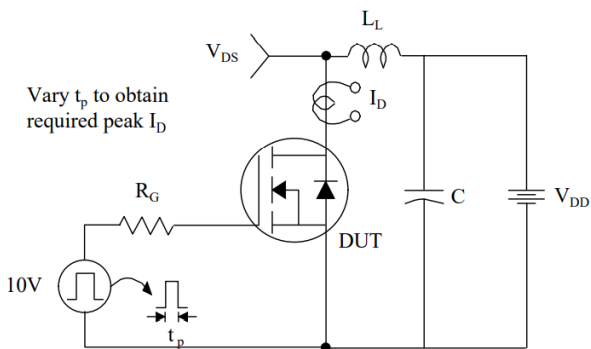
Gate Charge Test Circuit & Waveform



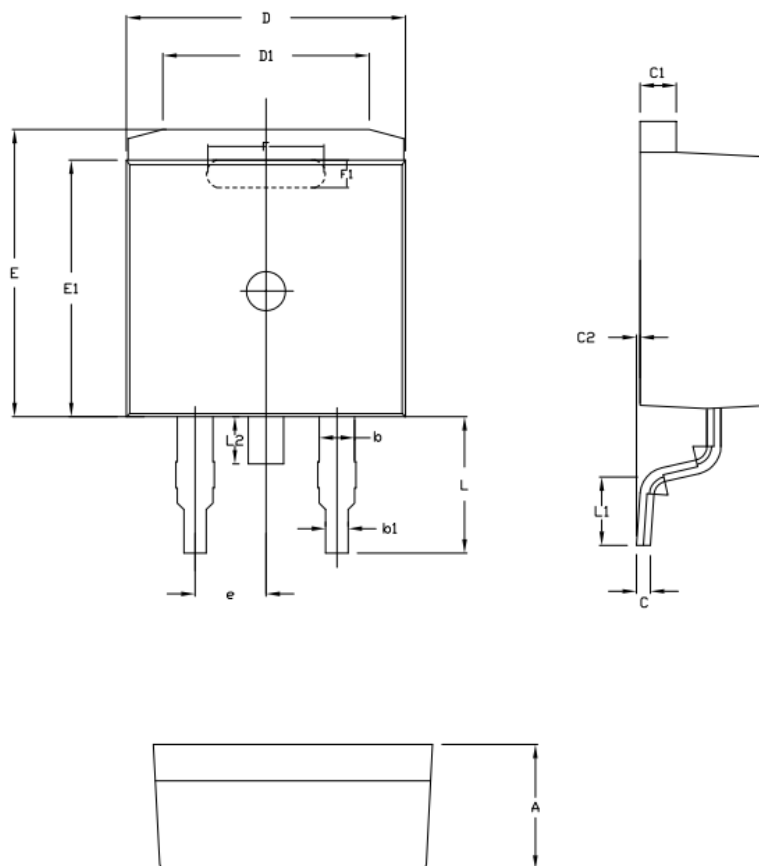
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & 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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