

CHIPLINK N-Channel Enhancement Mode SGT Power MOSFET

Description

The LXS1H140T combines advanced SGT technology to provide excellent $R_{DS(ON)}$, it tailored to minimize conduction loss, and provide superior switching performance.

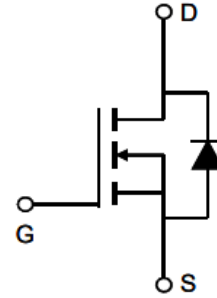
Features

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

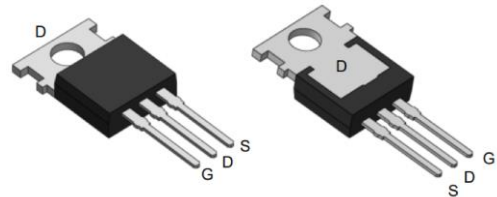


Applications

- DC/DC Converter
- Load switch
- BMS



Schematic Diagram



TO220 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 =250uA	100			V
Gate-Threshold Voltage	V _{th(GS)}	V _{DS} = V _{GS} , I _D =250 uA	2.0	2.8	4	V
Gate-body Leakage	IGSS	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	IDSS	V _{DS} =80V, V _{GS} =0V			1	uA
Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A		3.7	4.2	mΩ
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 =2.5Ω V _{GS} = 10V, R _{GEN} =6Ω		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℃, I _F =15A dI/dt=100A/ μ s		60		nS
Diode Reverse Recovery Charge	Q _{rr}			63		nC
Diode Forward Current	I _S	T _C =25℃			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

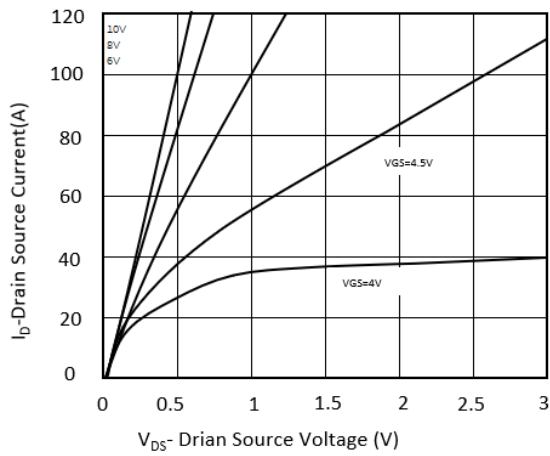


Figure 1: Output Characteristics

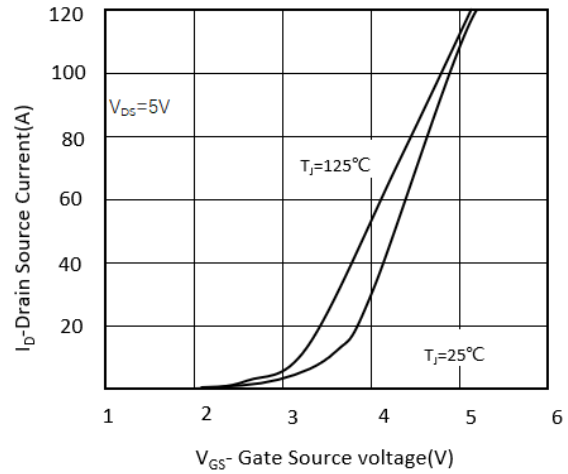


Figure 2: Transfer Characteristics

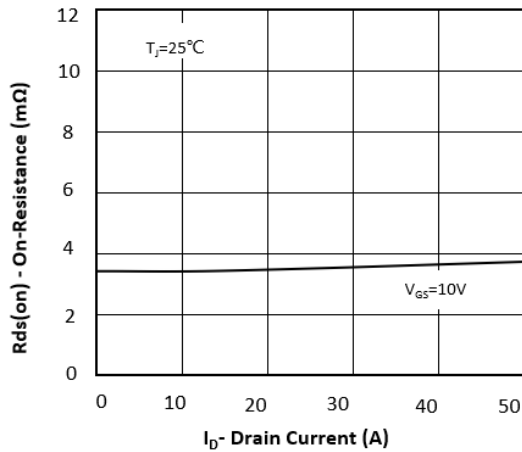


Figure 3: On-Resistance VS Drain Current

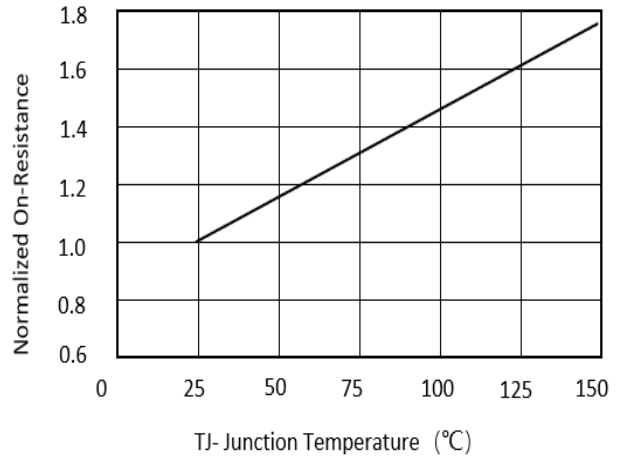


Figure 4: $R_{DS(on)}$ - Junction Temperature

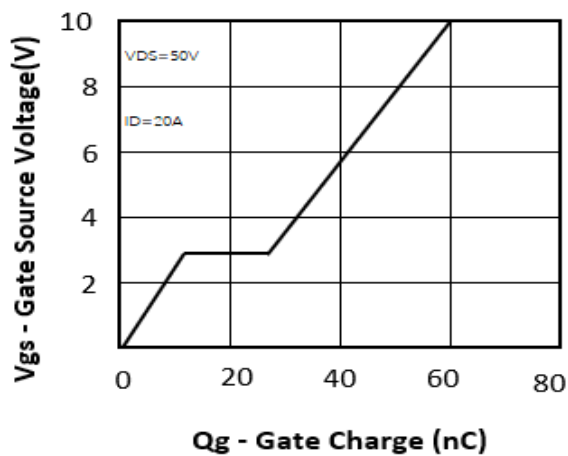


Figure 5: Gate Charge

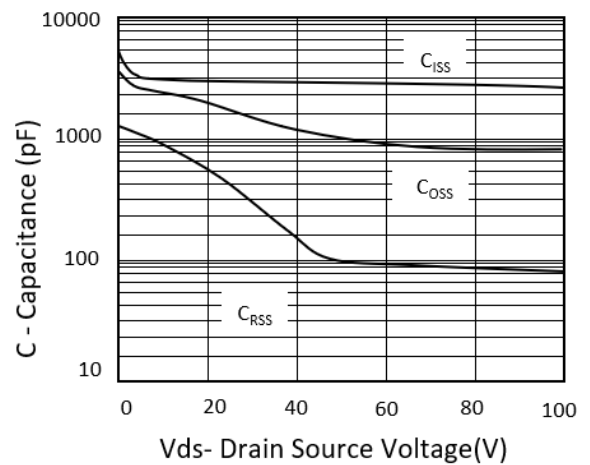


Figure 6: Capacitance VS V_{DS}

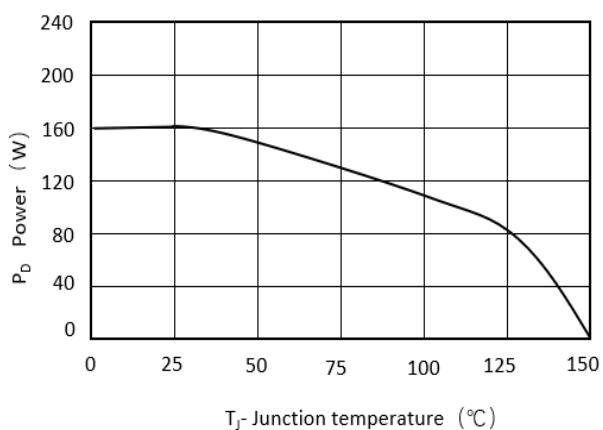


Figure 7: Power De-rating

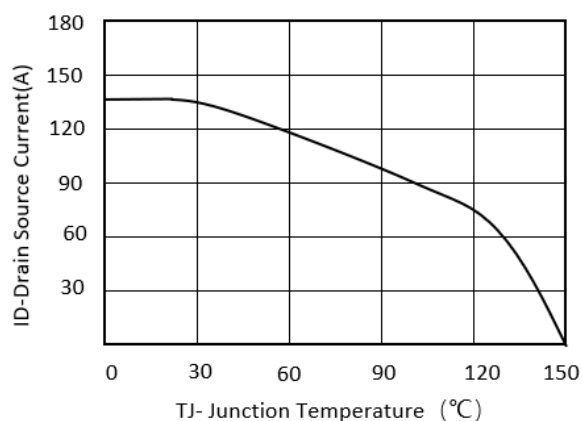


Figure 8: Current De-rating

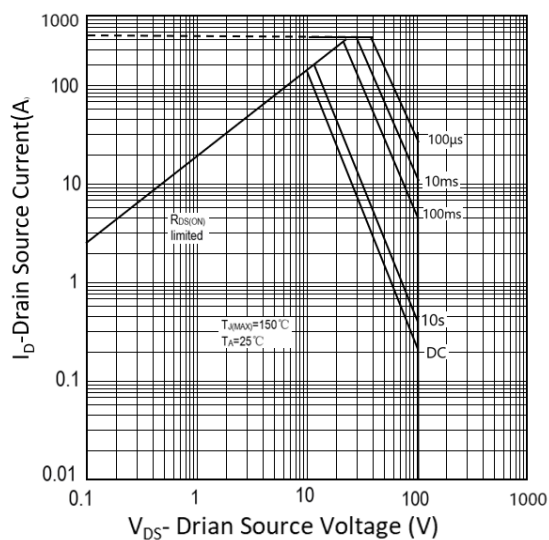


Figure 9: Safe Operation Area

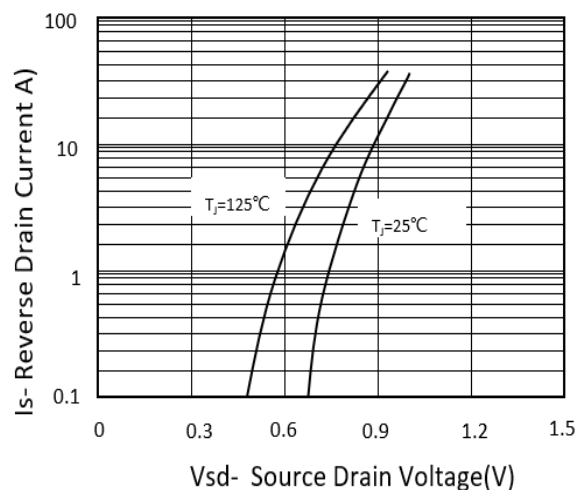


Figure 10: Source Drain Diode Forward

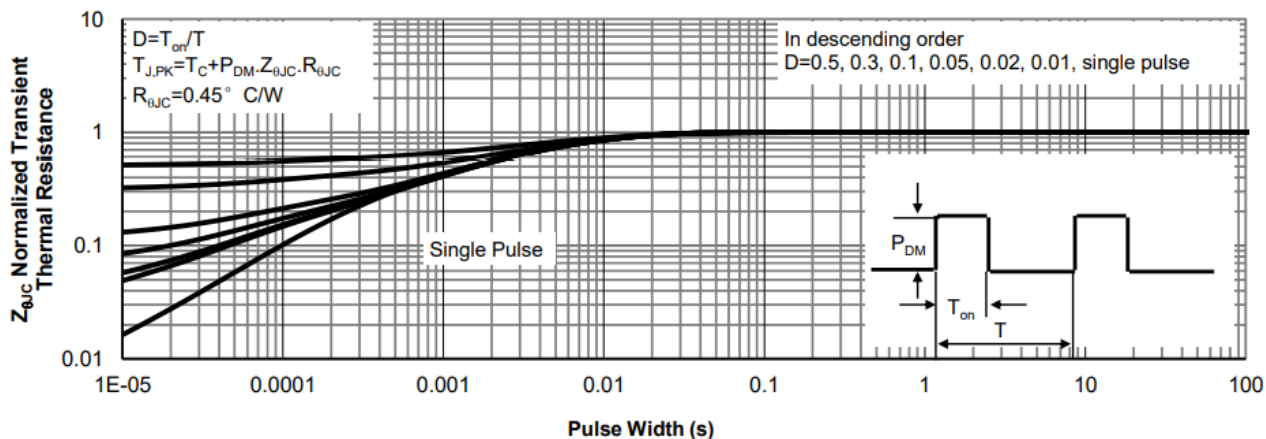
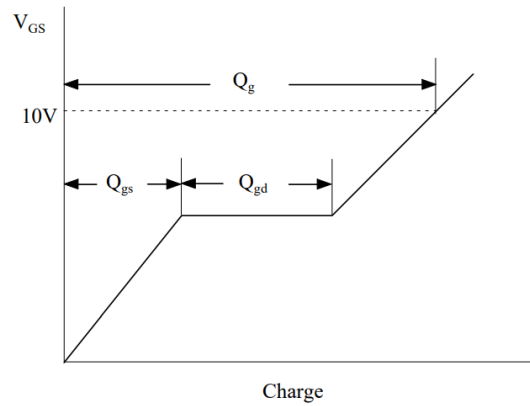
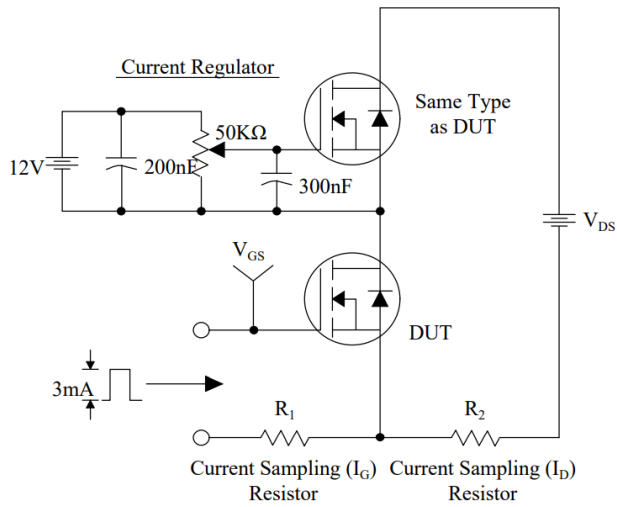
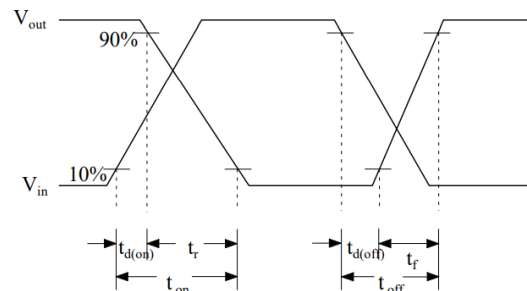
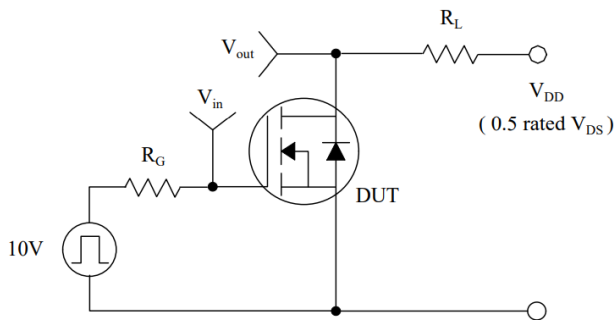


Figure 10: Thermal Transient Impedance

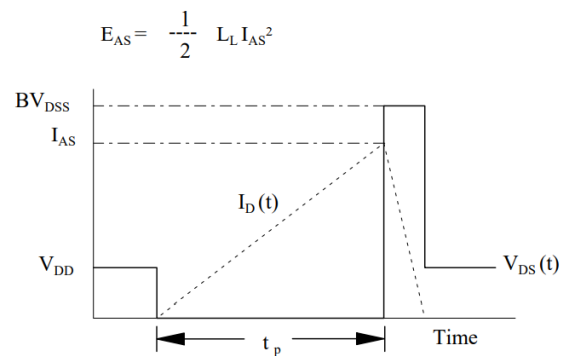
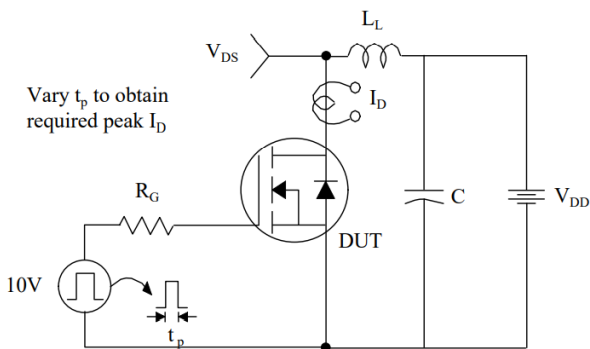
Gate Charge Test Circuit & Waveform



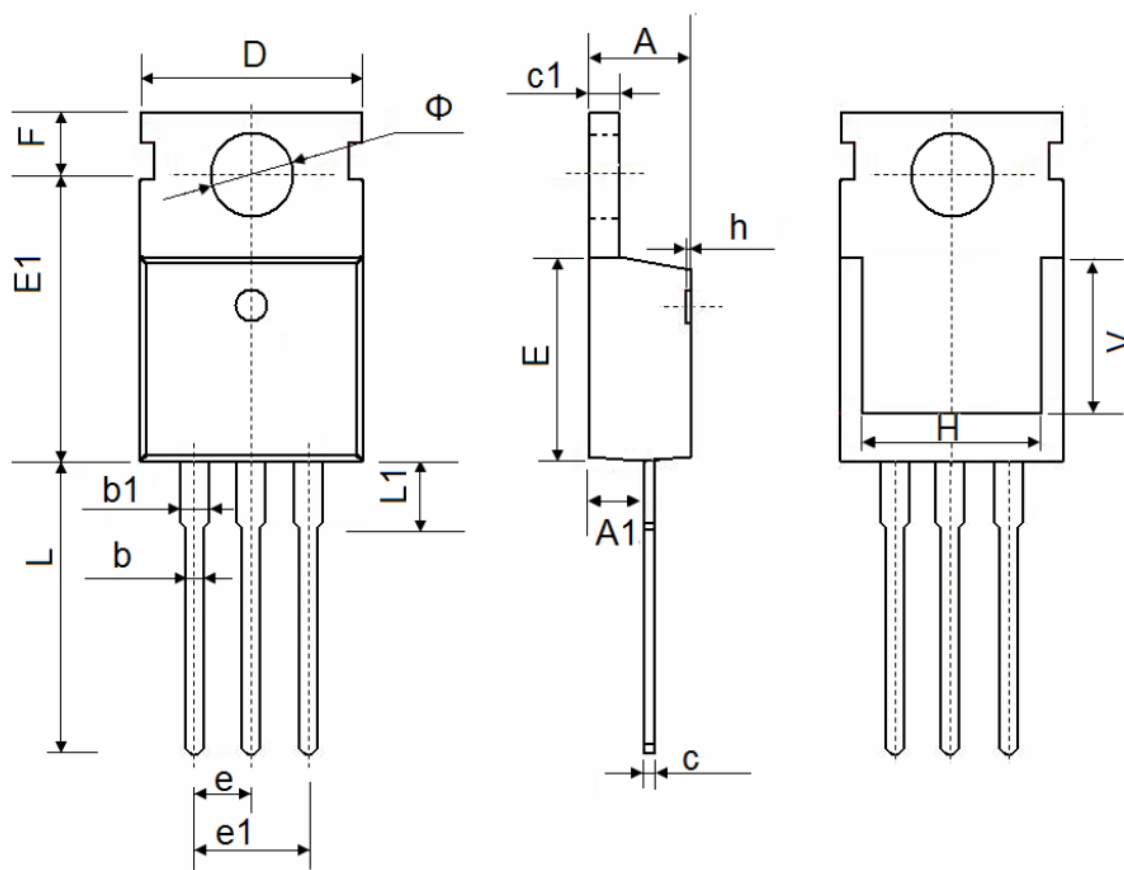
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



TO220 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150

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