

CHIPLINK N-Channel Enhancement Mode SGT Power MOSFET

Description

The LXS1H80M combines advanced SGT technology to provide excellent $R_{DS(ON)}$, it tailored to minimize conduction loss, and provide superior switching performance.

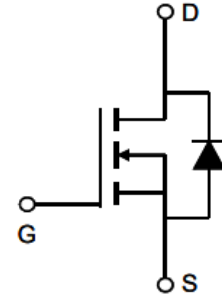
Features

- $V_{DS}=100V$, $I_D=80A$
 $R_{DS(ON)typ.}=7m\Omega@V_{GS}=10V$
 $R_{DS(ON)typ.}=9m\Omega@V_{DS}=4.5V$
- Fast switching
- High power and current handing capability
- Termination is Lead-free and RoHS Compliant

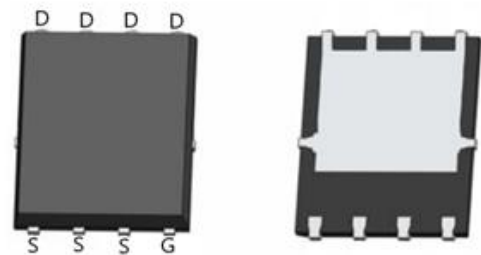


Applications

- Synchronous rectification for AC/DC adapter
- Load switch
- Power Management



Schematic Diagram



PDFN5060 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	$I_D(T_C=25^{\circ}C)$	80	A
	$I_D(T_C=100^{\circ}C)$	50	
Pulsed Drain Current ^B	I_{DM}	300	A
Maximum Power Dissipation ^A	P_D	97	W
Single pulse avalanche energy	E_{AS}	92	mJ
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^{\circ}C$

Thermal Characteristic

Thermal Resistance, Junction to Ambient	R_{QJA}	45	$^{\circ}C/W$
Thermal Resistance, Junction to Case	R_{QJC}	1.3	$^{\circ}C/W$

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	1.0	1.6	2.5	V
Gate-body Leakage	IGSS	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	IDSS	V _{DS} =100V, V _{GS} =0V			1	uA
Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A		7	9.3	mΩ
		V _{GS} =4.5V, I _D =8A		9	13.5	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 50V, V _{GS} =0V, f=1MHz		2046		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 =3Ω V _{GS} = 10V, R _{GEN} =6Ω		20		nS
Turn-on Rise Time	t _r			5.2		nS
Turn-off Delay Time	t _{d(off)}			49		nS
Turn-off Fall Time	t _f			12		nS
Total Gate Charge	Q _g	V _{DS} = 50V, I _D =30A, V _{GS} =10V		39.4		nC
Gate-Source Charge	Q _{gs}			5.2		nC
Gate-Drain Charge	Q _{gd}			9.8		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 =12A dI/dt=100A/ μ s		49		nS
Diode Reverse Recovery Charge	Q _{rr}			85		nC
Diode Forward Current	I _s				80	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: $T_J=25^{\circ}\text{C}, V_{DD}=15V, V_{GS}=10V, R_G=25\Omega, L=0.5Mh, I_{AS}=19A$.

Typical Electrical and Thermal Characteristics

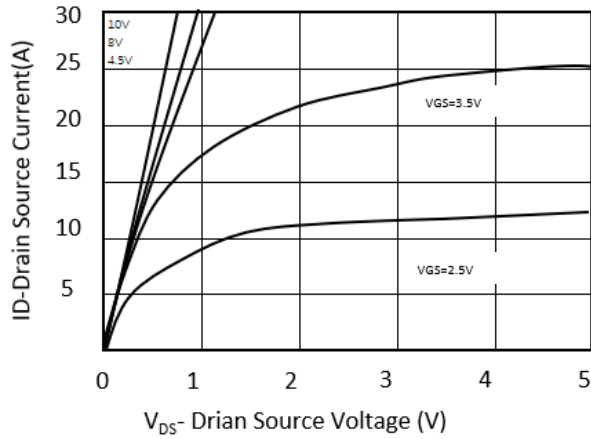


Figure 1: Output Characteristics

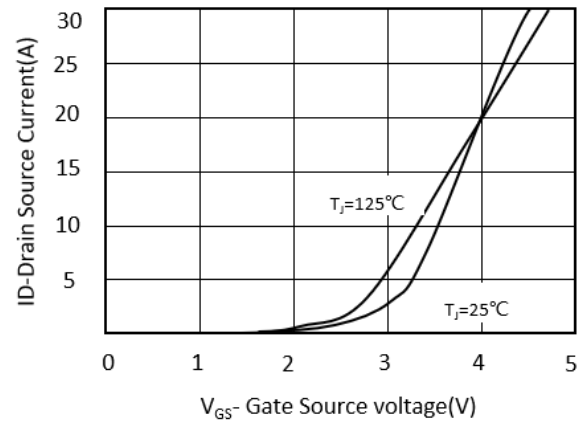


Figure 2: Transfer Characteristics

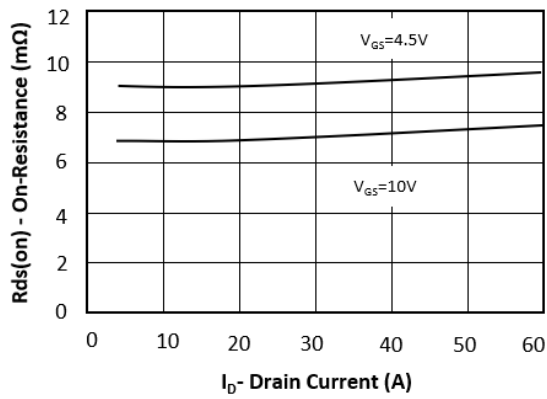


Figure 3: On-Resistance VS Drain Current

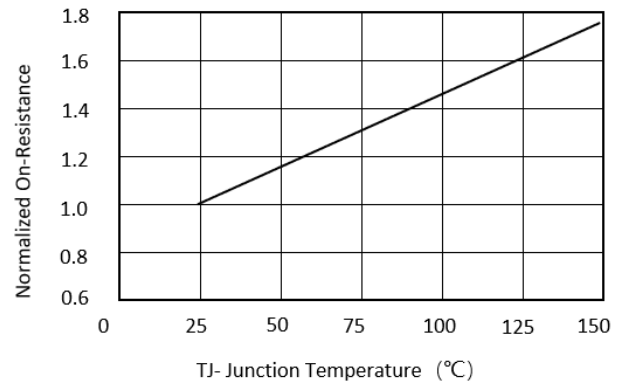


Figure 4: Rds(on) - Junction Temperature

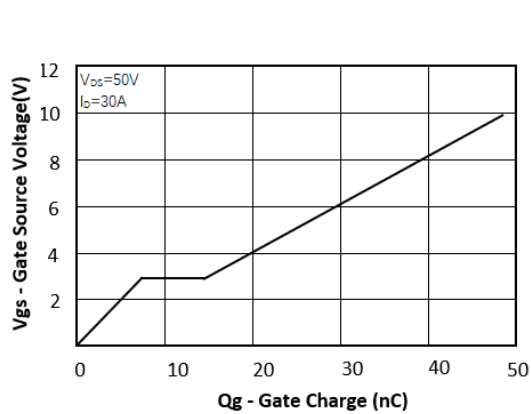


Figure 5: Gate Charge

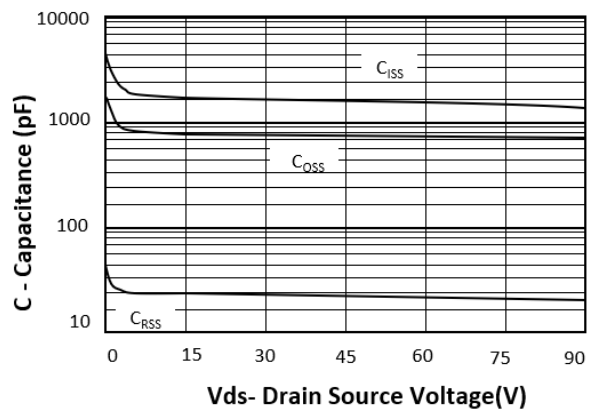


Figure 6: Capacitance VS Vds

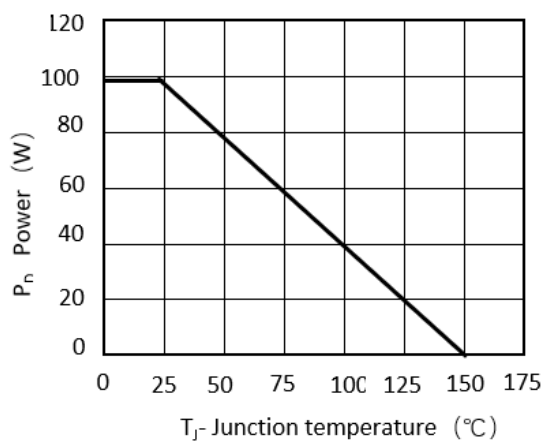


Figure 7: Power De-rating

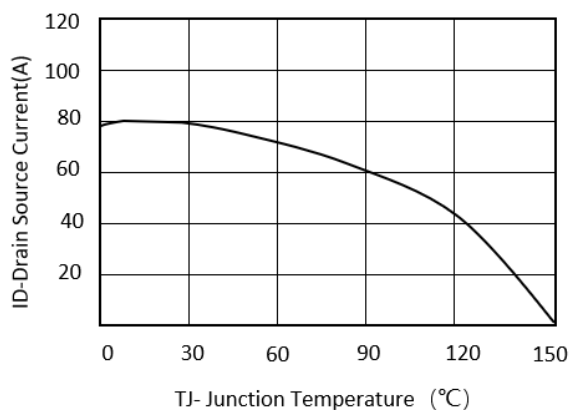


Figure 8: Current De-rating

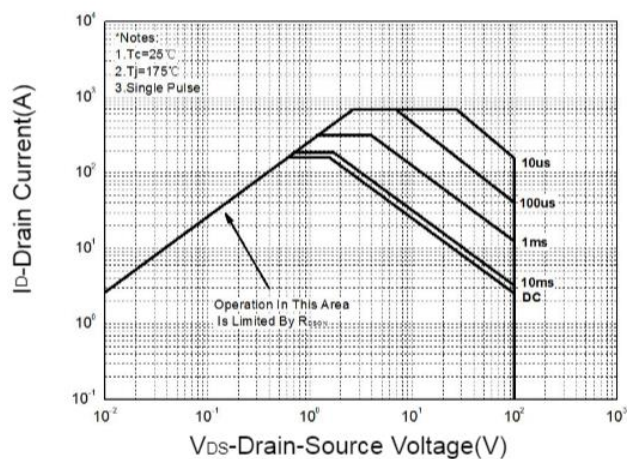


Figure 9: Safe Operation Area

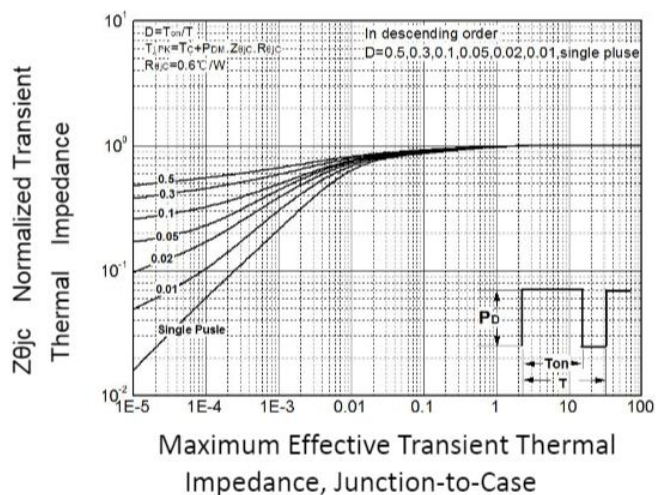
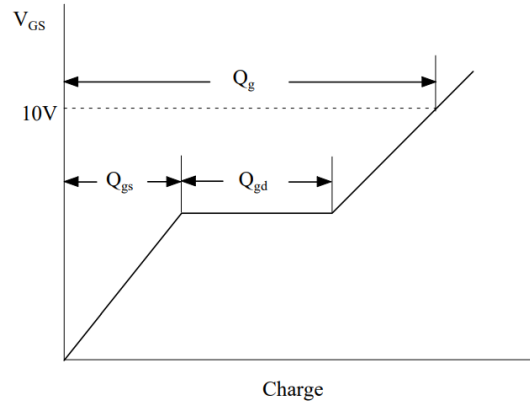
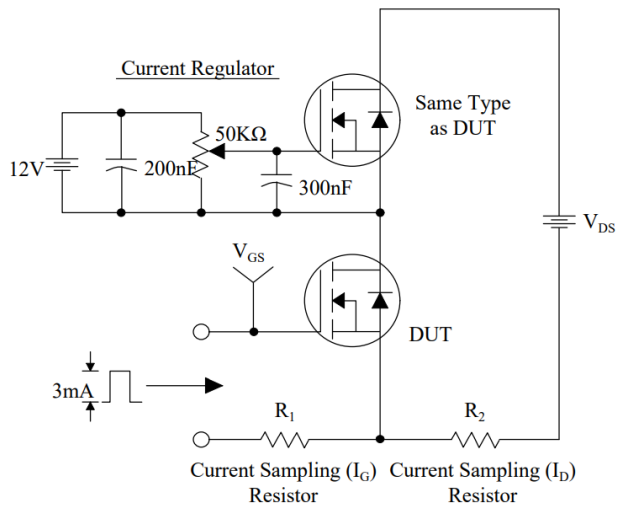
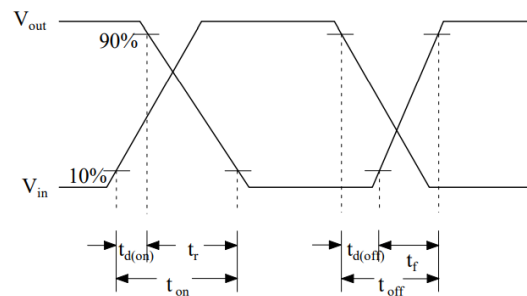
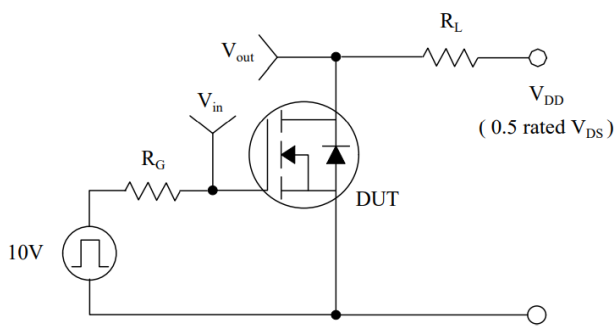


Figure 10: Thermal Transient Impedance

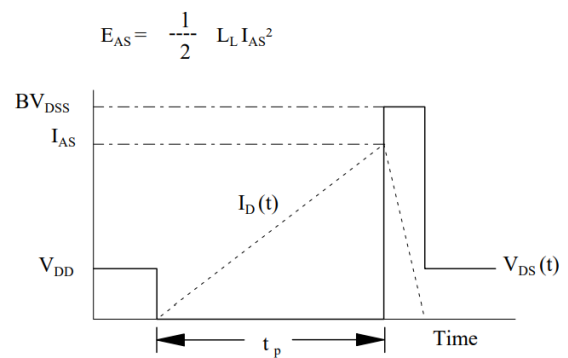
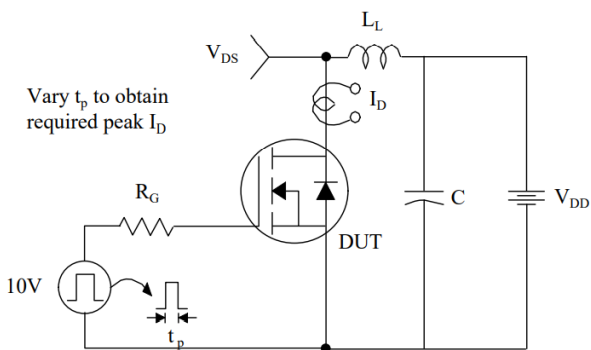
Gate Charge Test Circuit & Waveform



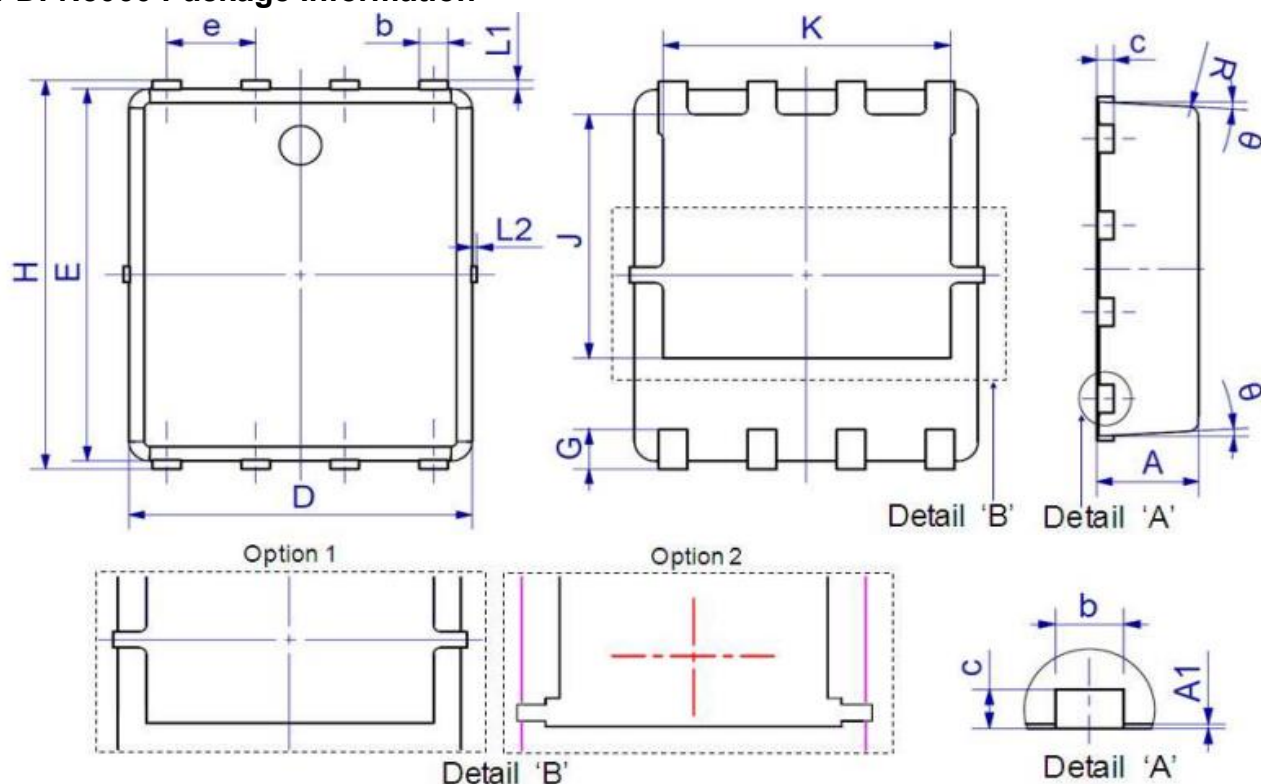
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



PDFN5060 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.80	1.20	0.031	0.047
A1	0.00	0.05	0.000	0.002
b	0.30	0.51	0.012	0.020
c	0.15	0.35	0.006	0.014
D	4.80	5.40	0.189	0.213
e	1.27 BSC		0.050 BSC	
E	5.66	6.06	0.223	0.239
G	0.30	0.71	0.012	0.028
H	5.90	6.35	0.232	0.250
J	3.32	3.92	0.131	0.154
K	3.61	4.25	0.142	0.167
L1	0.05	0.25	0.002	0.010
L2	0.00	0.15	0.000	0.006
R	0.25 REF		0.010 REF	
θ	0°	12°	0°	12°

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