

CH IPLINK N-Channel Enhancement Mode Power MOSFET

Description

The LX30160K combines advanced trench technology to provide excellent $R_{DS(ON)}$, it is tailored to minimize conduction loss, and provide superior switching performance. It can be used in a wide variety of applications.

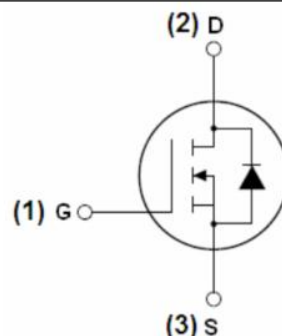
Features

- $V_{DS}=30V$, $I_D=160A$
 $R_{DS(ON)max.} < 2m\Omega @ V_{GS}=10V$ (Typ: 1.5m Ω)
 $R_{DS(ON)max.} < 3m\Omega @ V_{GS}=4.5V$ (Typ: 2.25m Ω)
- 100% Avalanche Tested
- Fast Switching
- High Power and Current Handling Capability
- Termination is Lead-Free and RoHS Compliant

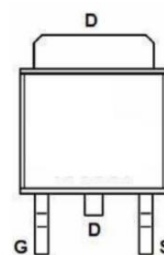


Applications

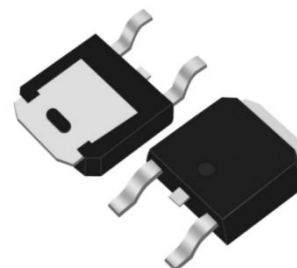
- PWM Applications
- Load Switch
- Power Management



Schematic Diagram



Pin Assignment



TO252 Package

Maximum Ratings

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

PARAMETER	SYMBOL	MAX	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^A	$I_D (T_C=25^\circ C)$	160	A
	$I_D (T_C=100^\circ C)$	105	A
Pulsed Drain Current ^B	I_{DM}	650	A
Maximum Power Dissipation ($T_C=25^\circ C$)	P_D	130	W
Single Pulse Avalanche Energy	E_{AS}	195	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 Case	$R_{\theta JC}$	0.96	$^{\circ}\text{C}/\text{W}$

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}	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	30			V
Gate-Threshold Voltage	$V_{th(GS)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1	1.6	2.2	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}	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$			1	μA
Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{V}, I_D = 15\text{A}$		1.5	2	m Ω
		$V_{GS} = 4.5\text{V}, I_D = 15\text{A}$		2.25	3	m Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V},$ $F = 1\text{MHz}$		5600		pF
Output Capacitance	C_{oss}			800		
Reverse Transfer Capacitance	C_{rss}			560		

Switching Capacitance

Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 15\text{V}, I_D = 10\text{A},$ $V_{GEN} = 10\text{V}, R_G = 6\Omega$		25		ns
Turn-On Rise Time	t_r			23		ns
Turn-Off Delay Time	$t_{d(off)}$			90		ns
Turn-Off Fall Time	t_f			39		ns
Total Gate Charge	Q_g	$V_{DS} = 15\text{V}, I_D = 12\text{A},$ $V_{GS} = 10\text{V}$		99		nC
Gate-Source Charge	Q_{gs}			17		nC
Gate-Drain Charge	Q_{gd}			11		nC

Drain-Source Diode Characteristics

Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{V}, I_S = 20\text{A}$			1.2	V
Diode Forward Current	I_S				160	A
Reverse Recovery Time	t_{rr}	$I_F = 20\text{A}, T_J = 25^{\circ}\text{C},$ $dI/dt = 100\text{A}/\mu\text{s}$		39		ns
Reverse Recovery Charge	Q_{rr}			35		nC

Notes:

- The maximum current rating is package limited.
- Repetitive Rating: pulse width limited by maximum junction temperature.

Typical Electrical and Thermal Characteristics

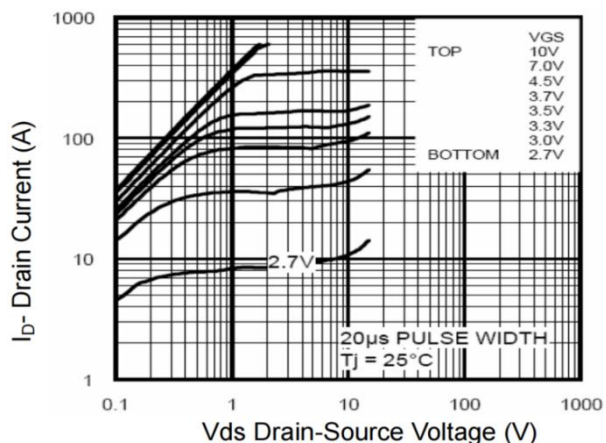


Figure 1. Output Characteristics

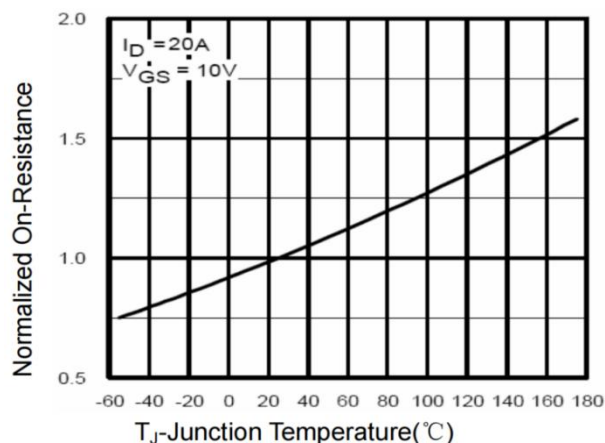


Figure 2. Rdson-Junction Temperature

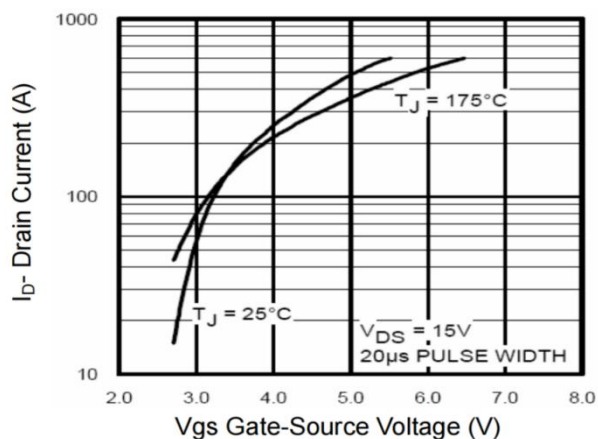


Figure 3. Transfer Characteristics

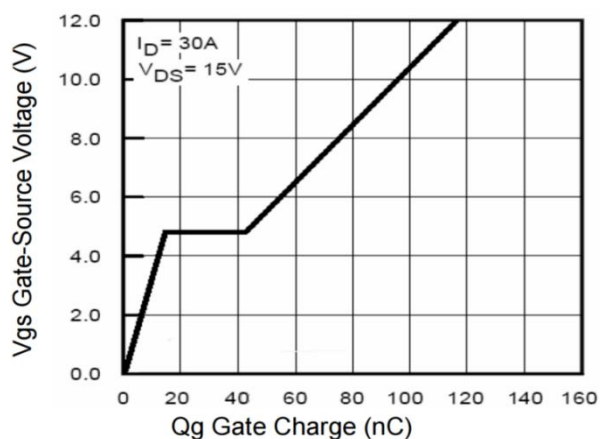


Figure 4. Gate Charge

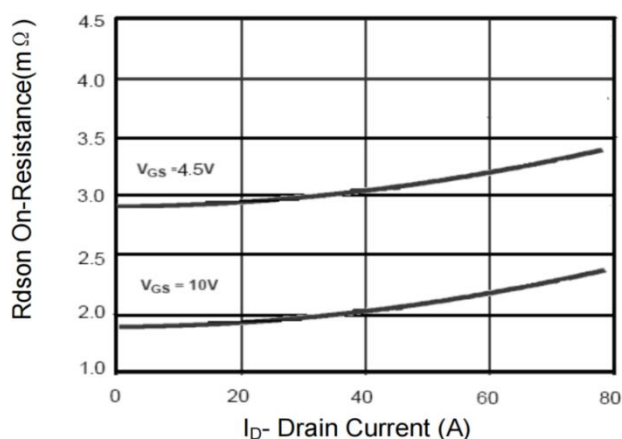


Figure 5. Rdson-Drain Current

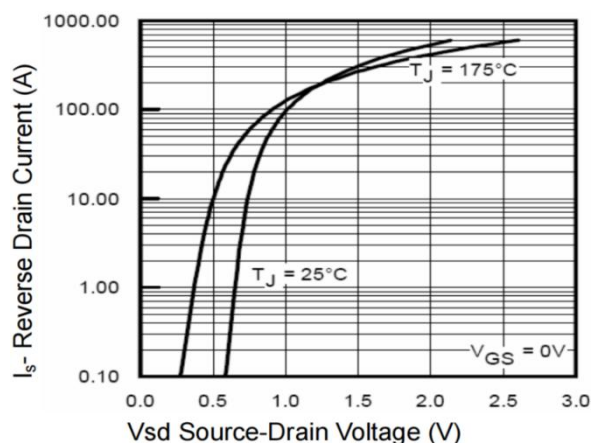


Figure 6. Source-Drain Diode Forward

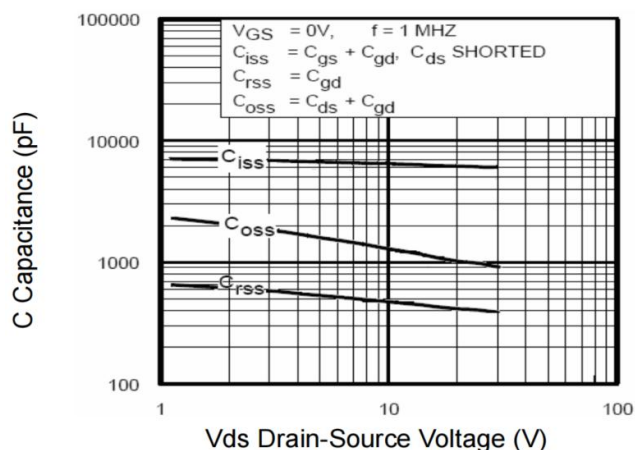


Figure 7. Capacitance vs. Vds

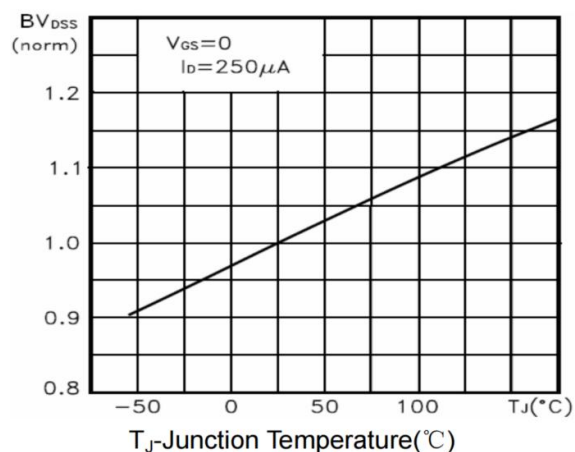


Figure 8. BV_{DSS} vs. Junction Temperature

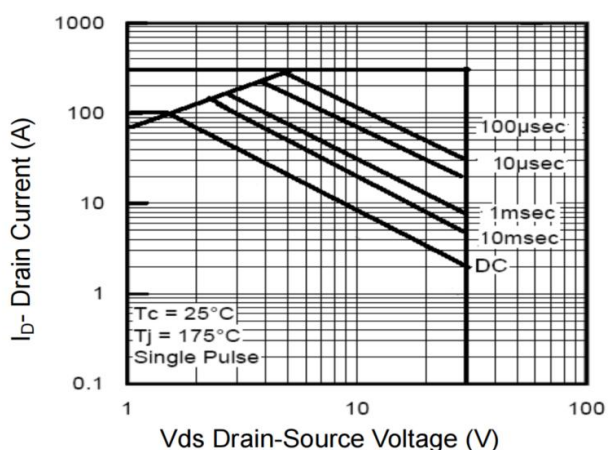


Figure 9. Safe Operation Area

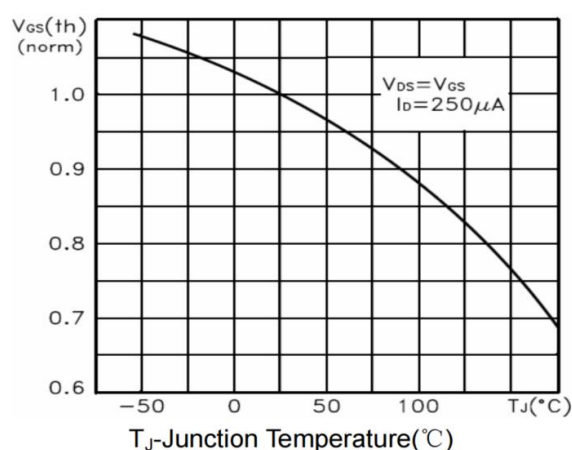


Figure 10. VGS(th) vs. Junction Temperature

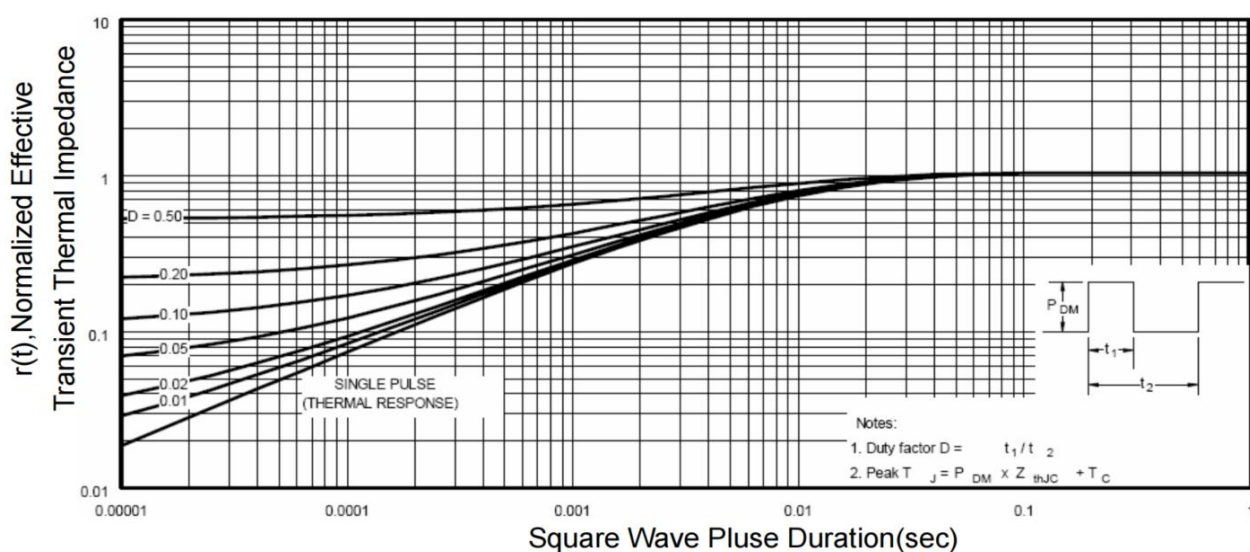


Figure 11. Normalized Maximum Transient Thermal Impedance

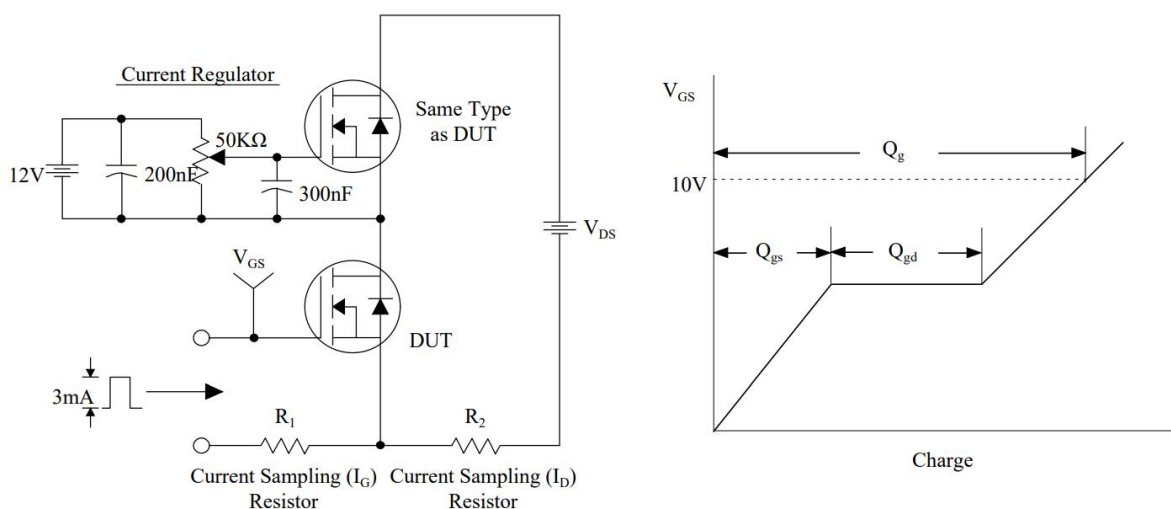


Figure 12. Gate Charge Test Circuit & Waveform

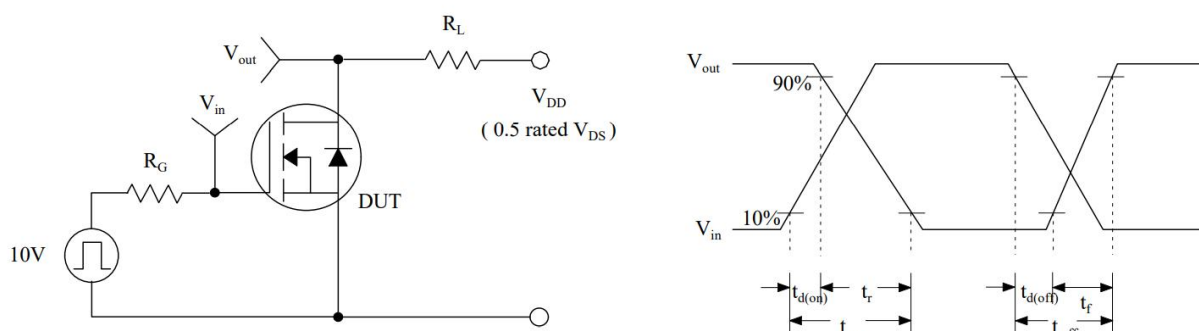


Figure 13. Resistive Switching Test Circuit & Waveforms

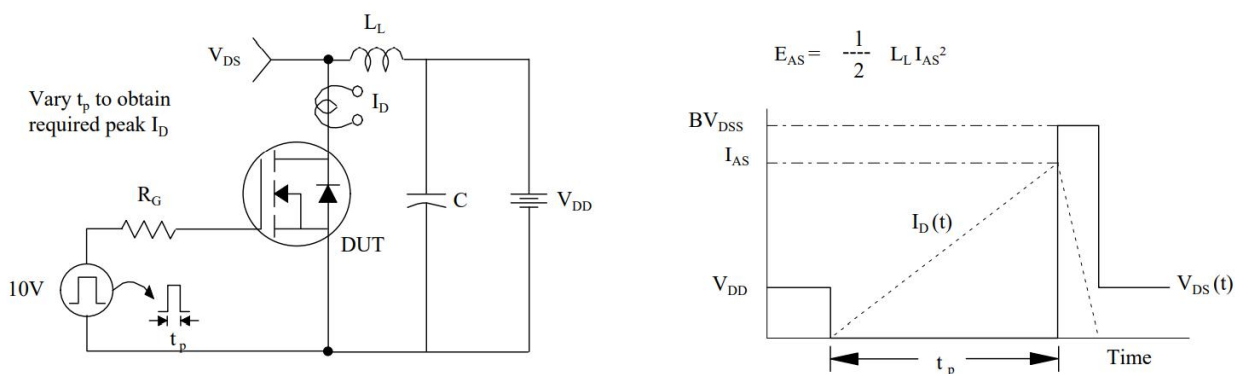
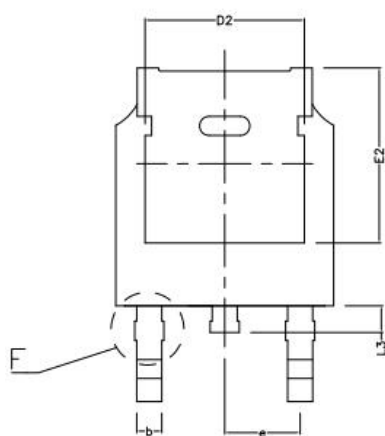
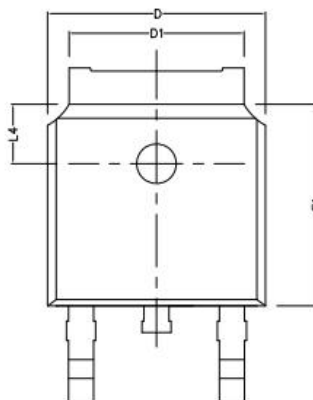


Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms

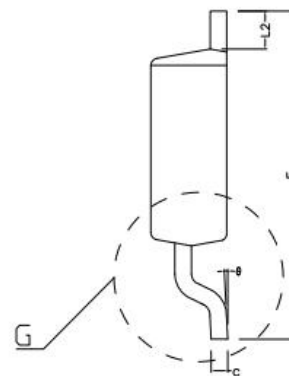
TO252 Package Information



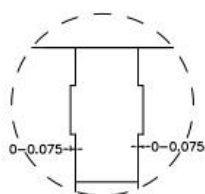
BOTTOM VIEW



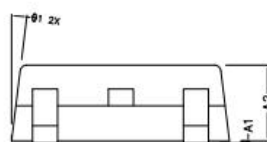
TOP VIEW



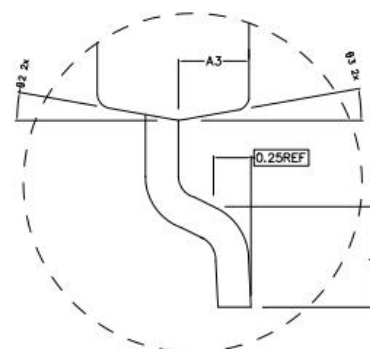
SIDE VIEW



DETAIL F



SIDE VIEW



DETAIL G

	MIN	NORMAL	MAX		MIN	NORMAL	MAX
A1	0.000	0.100	0.150	E2	5.600REF		
A2	2.200	2.300	2.400	e	2.286TYPE		
A3	1.020	1.070	1.120	L	1.400	1.550	1.700
b	0.710	0.760	0.810	L2	1.10REF		
c	0.460	0.508	0.550	L3	0.80REF		
D	6.500	6.600	6.700	L4	1.8REF		
D1	5.330REF			θ	0~8°		
D2	4.830REF			θ1	7° TYPE		
E	9.900	10.100	10.300	θ2	10° TYPE		
E1	6.000	6.100	6.200	θ3	10° TYPE		

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