

Features

- $BV_{DSS} = 200V$
- $R_{DS(ON,MAX)} = 0.15\Omega @ V_{GS}=10V, I_D = 15A$
- Super high dense cell design
- High power and current handling capability
- RoHS and green compliant packages
- TO-251 and TO-252 packages

Applications

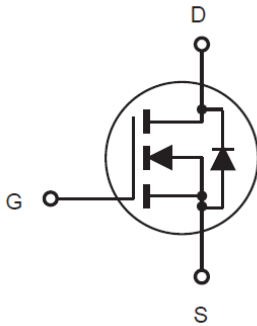
- High voltage SMPS power supply switch
- High efficiency power converter

General Description

The LD7918 is an N-channel enhancement mode power MOSFET. It provides extremely low $R_{DS(ON)}$ resistance and low input capacitance of gate charging.

The typical application of LD7918 is used to be a high efficiency power converter.

Equivalent Block Diagram

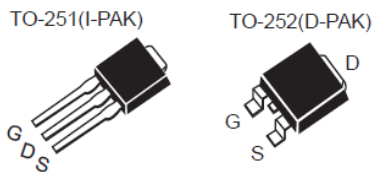


Ordering Information

Part No.	Package	Packing Options	
		Tube (TU)	Tape & Reel (TR)
LD7918	TO-251-3	LD7918T5-TU	LD7918T5-TR
	TO-252-3	LD7918T6-TU	LD7918T6-TR

- Package material default is "Green" package.

Package Pin Out



Product Marking

LD8888	◇ Line 1 – "LD" is a fixed character
SSSSS...	8888: product name
.	◇ Line 2 – SSSSS...: lot number

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-Case Max	1.8	$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance, Junction-Ambient	50	$^{\circ}C/W$

Notes: Surface mounted on FR4 board $t \leq 10sec$

Absolute Maximum Ratings

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current-Continuous, $T_C = 25^\circ\text{C}$	15	A
I_{DM}	Drain Current-Pulsed ^{*1}	60	A
P_D	Maximum Power Dissipation @ $T_J = 25^\circ\text{C}$	83	W
	De-rated while $T_J > 25^\circ\text{C}$	0.66	W/ $^\circ\text{C}$
T_J, T_{STG}	Operating and Store Temperature Range	-55 to 150	$^\circ\text{C}$

The values beyond the boundaries of absolute maximum rating may cause the damage to the device. Functional operation in this context is not implied. Continuous use of the device at the absolute rating level might influence device reliability. All voltages have their reference to device ground.

Electrical Characteristics

$T_A = 25^\circ\text{C}$ unless specified, otherwise minimum and maximum values are guaranteed by production testing requirements.

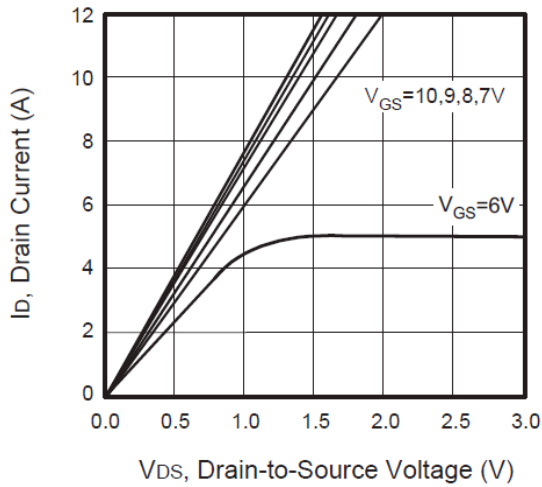
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu\text{A}$	200	–	–	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 160V, V_{GS} = 0V$	–	–	1	μA
Gate Body Leakage, Forward	I_{GSSF}	$V_{GS} = 20V, V_{DS} = 0V$	–	–	100	nA
Gate Body Leakage, Reverse	I_{GSSR}	$V_{GS} = -20V, V_{DS} = 0V$	–	–	-100	nA
On Characteristics^{*2}						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	2	–	4	V
Static Drain-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 10A$	–	0.125	0.15	Ω
Forward Transfer Conductance	g_{FS}	$V_{DS} = 10V, I_D = 9A$	–	9	–	S
Dynamic Characteristics^{*3}						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1.0\text{MHz}$	–	1955	–	pF
Output Capacitance	C_{oss}		–	355	–	
Reverse Transfer Capacitance	C_{rss}		–	55	–	
Switching Characteristics^{*3}						
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, I_D = 11A,$ $V_{DD} = 100V, R_G = 9.1\Omega$	–	21	42	nS
Turn-On Rise Time	t_r		–	5	10	nS
Turn-Off Delay Time	$t_{d(off)}$		–	66	132	nS
Turn-Off Fall Time	t_f		–	11	22	nS
Total Gate Charge	Q_g	$V_{DS} = 160V, I_D = 15A,$ $V_{GS} = 10V$	–	47	61	nC
Gate-Source Charge	Q_{gs}		–	10	–	
Gate-Drain Charge	Q_{gd}		–	16	–	
Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Current	I_S	–	–	–	15	A
Diode Forward Voltage ^{*4}	V_{SD}	$I_S = 15A, V_{GS} = 0V$	–	–	1.5	V

Notes :

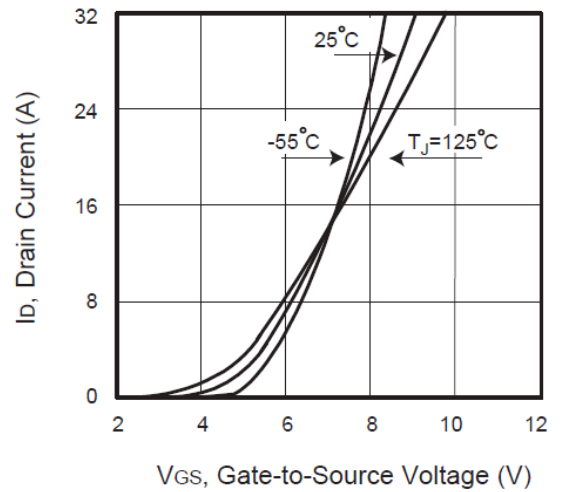
1. Repetitive rating: pulse width limited by maximum junction temperature
2. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
3. Guaranteed by design
4. $L=1\text{mH}, I_{AS}=25A, V_{DD} = 25V, R_G = 25\Omega$, starting $T_J=25^\circ\text{C}$

Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

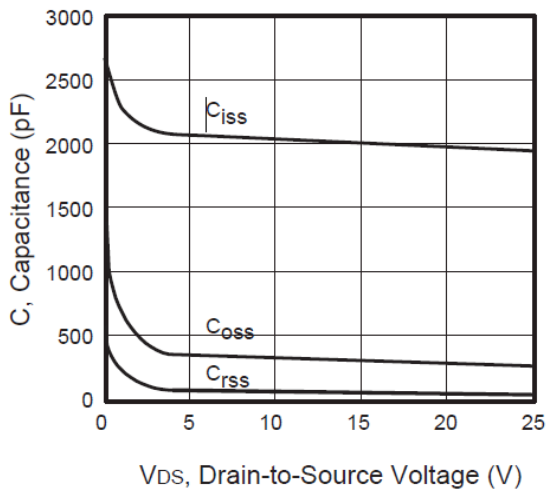
Output Characteristics



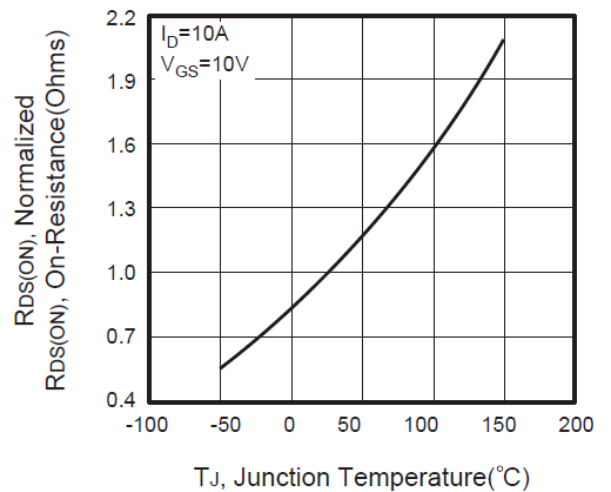
Transfer Characteristics



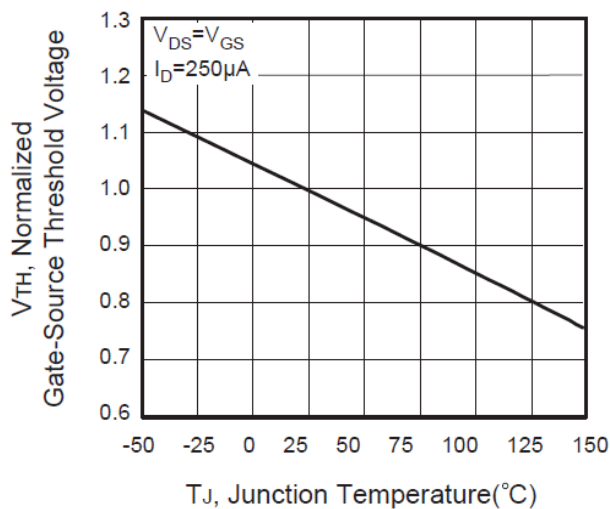
Capacitance vs. Drain-Source Voltage



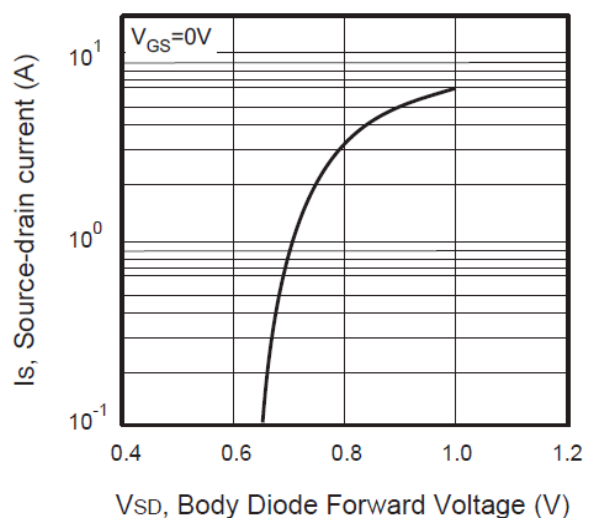
On-Resistance vs. Temperature



Gate Threshold Voltage vs. Temperature

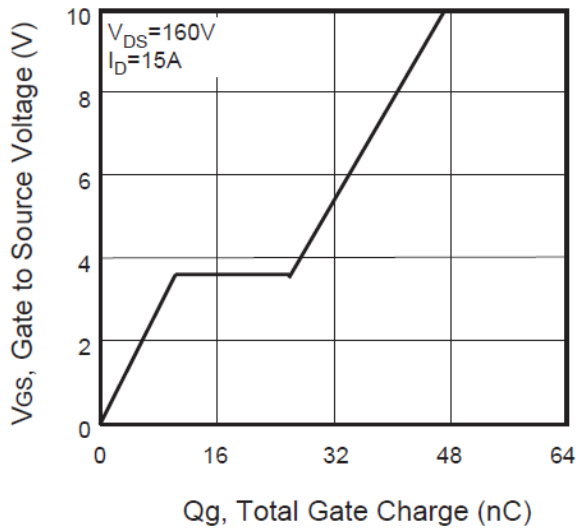


Diode Forward Voltage vs. Source Current

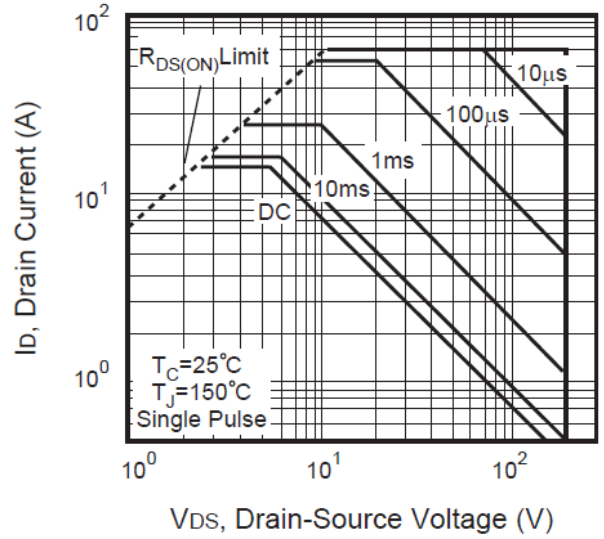


Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

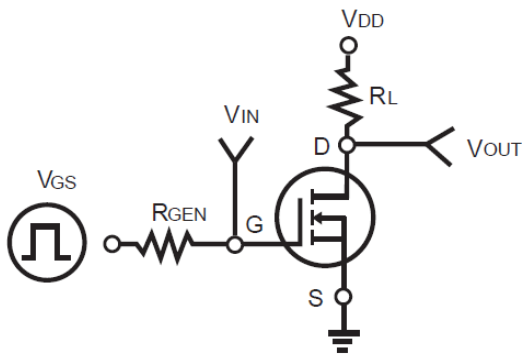
Gate Charge



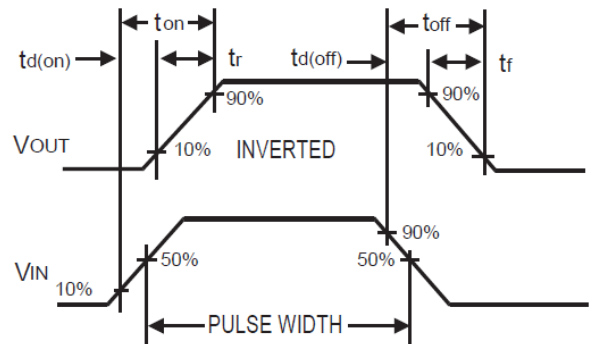
Maximum Safe Operating Area



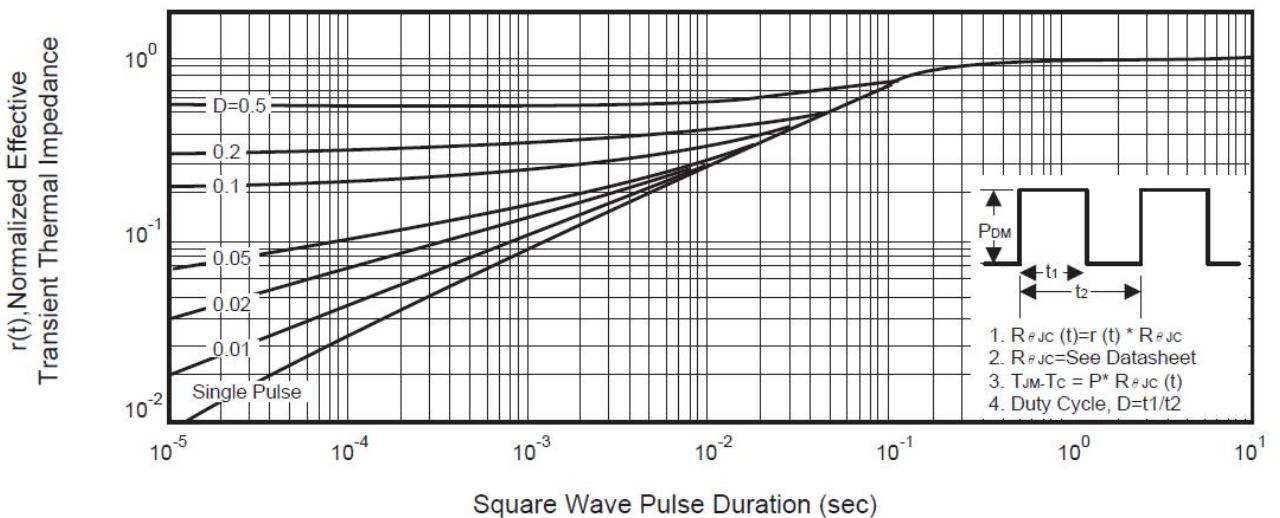
Switching Test Circuit



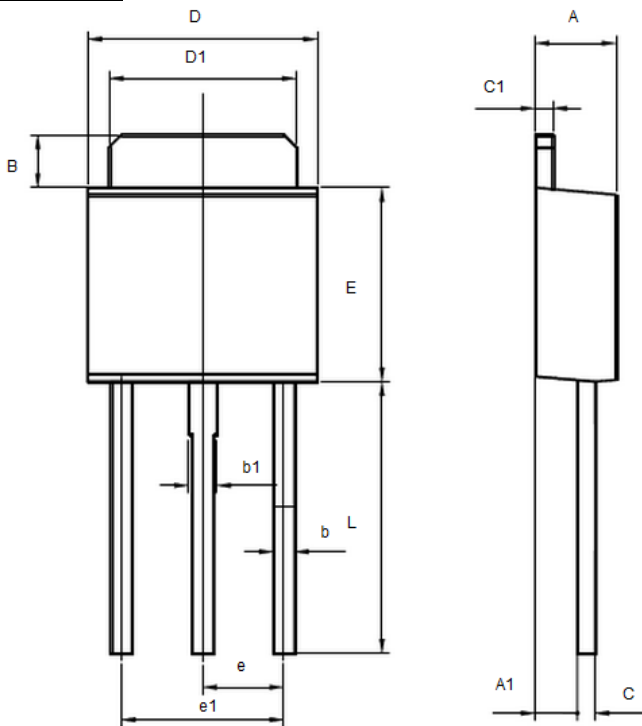
Switching Waveform



Normalized Thermal Transient Impedance, Junction-to-Ambient

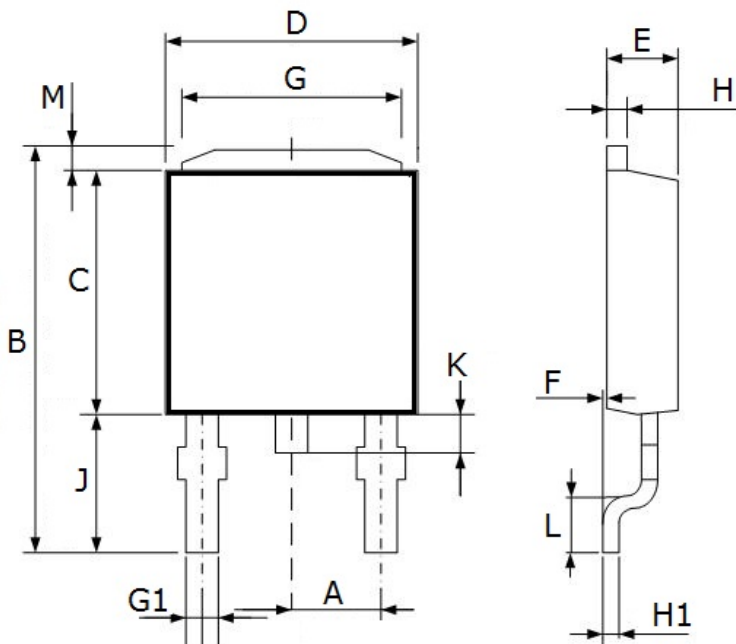


Package Outline
TO-251



TO-251 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.200	2.400	0.087	0.094
A1	1.020	1.270	0.040	0.050
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.200	2.400	0.087	0.094
e1	2.300 TYP		0.091 TYP	
L	4.500	4.700	0.177	0.185
A	7.500	7.900	0.295	0.311

TO-252



TO-252 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.30 TYP		0.090 TYP	
B	10.20	10.80	0.402	0.425
C	5.30	5.70	0.209	0.224
D	6.30	6.70	0.248	0.264
E	2.10	2.50	0.083	0.098
F	0.00	0.20	0.000	0.008
G	4.80	5.20	0.189	0.205
G1	0.40	0.80	0.016	0.031
H	0.40	0.60	0.016	0.024
H1	0.35	0.65	0.014	0.026
J	3.35	3.65	0.132	0.144
K	0.50	1.10	0.020	0.043
L	0.90	1.50	0.035	0.059
M	1.30	1.70	0.051	0.067

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