Preliminary – **LD7912**

500V N-Channel Power MOSFET

Features

- BV_{DSS} = 500V, I_D = 1.2A
- $R_{DS(ON,MAX)}$ = 5.6Ω@Vgs=10V
- Low intrinsic capacitance
- RoHS and green compliant packages
- SOT-89 package

General Description

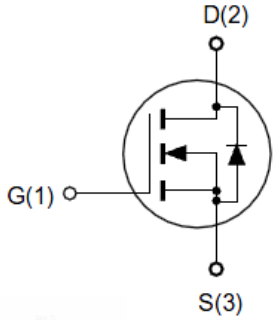
The LD7912 is an N-channel power MOSFET for high input voltage. It provides very low input capacitance of gate charging.

The typical application of LD7912 is used to be a low cost SMPS, standby power or charger.

Applications

- Low power SMPS power supply
- Standby power

Equivalent Block Diagram

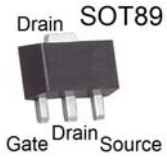


Ordering Information

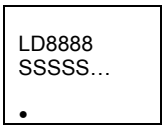
		Packing Options	
Part No.	Package	Bag(BG)	Tape & Reel (TR)
LD7912	SOT-89-3	LD7912L5-BG	LD7912L5-TR

- Package material default is “Green” package.

Package Pin Out



Product Marking



- Line 1 – “LD” is a fixed character
  8888: product name
- Line 2 – SSSSS…: lot number

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta}J_C$	Thermal Resistance, Junction-Case Max	3.125	°C /W
$R_{\theta}J_A$	Thermal Resistance, Junction-Ambient	60	°C /W

Notes: Surface mounted on FR4 board t ≤ 10sec

Absolute Maximum Ratings

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	500	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Drain Current-Continuous	1	A
I_{DM}	Drain Current-Pulsed [*1]	4	A
E_{AS}	Single Pulse D-S Avalanche Energy [*2]	40	mJ
I_{AR}	Avalanche Current [*1]	1	A
dv/dt	Peak Diode Recovery [*3]	3.5	V/ns
P_D	Maximum Power Dissipation @ T_J = 25˚C	40	W
T_J, T_{STG}	Operating and Store Temperature Range	-55 to 150	°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

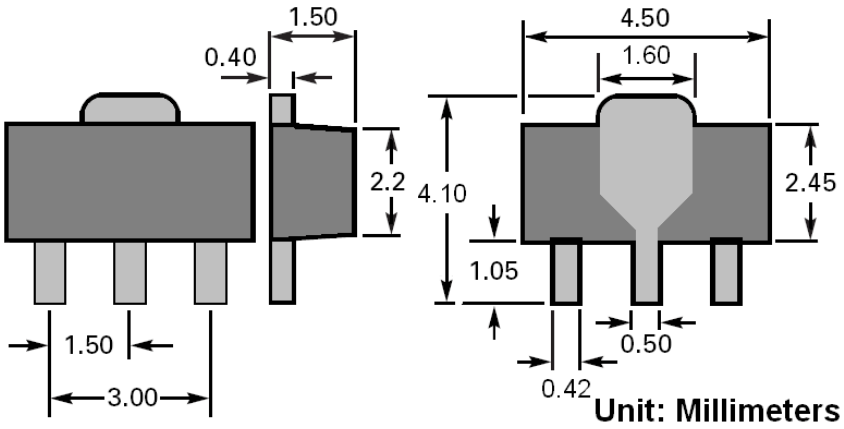
T_A = 25°C unless specified, otherwise minimum and maximum values are guaranteed by production testing requirements.

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250μA	500	–	–	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 0.6A	–	5.2	5.6	Ω
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	3.1	4.0	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 10V, V_{GS} = 0V	–	–	1.0	μA
		V_{DS} = 400V, V_{GS} = 0V	–	–	1.0	
		V_{DS} = 500V, V_{GS} = 0V	–	–	1.0	
Reverse Gate Body Leakage	I_{GSSR}	V_{GS} = -30V, V_{DS} = 0V	–	–	-100	nA
Forward Gate Body Leakage	I_{GSSF}	V_{GS} = 30V, V_{DS} = 0V	–	–	100	nA
Forward Transconductance	g_{fs}	V_{DS} = 50V, I_D = 0.5A	–	0.75	--	S
Dynamic Characteristics						
Total Gate Charge	Q_g	V_{DD} = 400V, I_D = 1A, V_{GS} = 10V [*4*5]	–	7	12	nC
Gate-Source Charge	Q_{gs}		–	2.5	–	
Gate-Drain Charge	Q_{gd}		–	3.5	–	
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	–	190	–	pF
Output Capacitance	C_{oss}		–	38	–	
Reverse Transfer Capacitance	C_{rss}		–	4	–	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	V_{GS} = 10V, I_D = 0.5A, V_{DS} = 200V, R_G = 4.7Ω [*4*5]	–	22	–	nS
Turn-On Rise Time	t_r		–	24	–	
Turn-Off Delay Time	$t_{d(off)}$		–	20	–	
Turn-Off Fall Time	t_f		–	26	–	
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward	I_S	V_{GS} = 0V	–	–	1	A
Maximum Pulsed Current	I_{SM}	V_{GS} = 0V	–	–	4.0	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_S = 0.6A	–	–	1.5	V
Reverse Recovery Time	t_{rr}	V_{GS} = 0V, I_S = 1A, dI_F/dt = 100A/μS [*4]	–	330	–	nS
Reverse Recovery Charge	Q_{rr}		–	780	–	μC
Reverse Recovery Current	I_{RRM}		–	4.7	–	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. L=75mH, V_{DD}=50V, R_G=25Ω, Starting T_J=25ºC
3. I_{SD} ≤ 0.5A, di/dt ≤ 300A/μS, V_{DD} ≤ BV_{DSS}, Starting T_J=25ºC
4. Pulse test: pulse width ≤ 300μS.
5. Essentially independent of operating temperature

Package Outline



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