



PWRLITE LD1101S

High Performance N-Ch Vertical Power JFET Transistor with Schottky

Features

- ❖ Trench Power JFET with low threshold voltage V_{th} .
- ❖ Device fully "ON" with $V_{gs} = 0.7V$
- ❖ Optimum for "Low Side" Buck Converters
- ❖ Optimized for Secondary Rectification in isolated DC-DC
- ❖ Low R_g and low C_{ds} for high speed switching
- ❖ No "Body Diode"; extremely low C_{ds}
- ❖ Added Fast Recovery Schottky Diode in same package

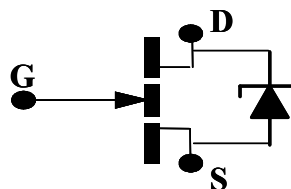
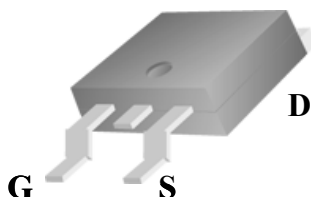
Applications

- ❖ VGA and Graphic Cards
- ❖ DDR, SDRAM for stand-by operation Power Supply
- ❖ DC-DC Converters
- ❖ Synchronous Rectifiers
- ❖ PC Motherboard Converters
- ❖ Step-down power supplies
- ❖ Brick Modules
- ❖ VRM Modules

Description

The Power JFET transistor from Lovoltech is a device that presents a Low $R_{ds(on)}$ allowing for improved efficiencies in DC-DC switching applications. The device is designed with a low threshold such that drivers can operate at 5V, which reduces the driver power dissipation and increases the overall efficiency. Lower threshold produces faster turn-on/turn-off, which minimizes the required dead time. The transistor "No Body Diode" provides a very low associated parasitic capacitance C_{ds} . A Schottky Diode is added for applications where a freewheeling diode is required. Ringing is also reduced so that a lower voltage device may be a better solution.

DPAK Pin Assignments



N – Channel Power JFET
with Schottky

Pin Definitions

Pin Number	Pin Name	Pin Function Description	Product Summary		
			V_{DS} (V)	$R_{ds(on)}$ (Ω)	I_D (A)
1	Gate	Gate. Transistor Gate	20V	0.011	15
2	Drain	Drain. Transistor Drain			
3	Source	Source. Transistor Source			

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Units
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	-10	V
Gate-Drain Voltage	V_{GD}	-20	V
Continuous Drain Current	I_D	30	A
Pulsed Drain Current	I_D	50	A
Junction Temperature	T_J	-55 to 150°C	°C
Storage Temperature	T_{STG}	-65 to 150°C	°C
Lead Soldering Temperature, 10 seconds	T	260°C	°C
Power Dissipation (Derated at 25°C)	P_D	50	W

Preliminary

Thermal Resistance

Symbol	Parameter		DPAK Ratings		Units
$R\Theta_{JA}$	Thermal Resistance Junction-to-Ambient		60		°C/W
$R\Theta_{JC}$	Thermal Resistance Junction-to-Case		3.0		°C/W

Electrical Specifications

($T_A = +25^\circ\text{C}$, unless otherwise noted.)

The ϕ denotes a specification which apply over the full operating temperature range.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
	Static					
BV _{DSX}	Breakdown Voltage Drain to Source	I _D = 0.5 mA V _{GS} = -2 V	15	20		V
BV _{GDO}	Breakdown Voltage Gate to Drain	I _G = -50μA		-22	-20	V
BV _{GSO}	Breakdown Voltage Gate to Source	I _G = -1 mA		-11	-10	V
R _{DS(ON)}	Static Drain to Source ¹ On Resistance (Current flows drain-to-source) See Fig. 1	I _G = 100 mA, I _D =10A I _G = 40 mA, I _D =10A		10 11	12	mΩ mΩ
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =0.1 V, I _D =250μA	50	200		mV
	Dynamic					
Q _G	Total Gate Charge	ΔV _{Drive} =5V, I _D =15A, V _{DS} =16V		10		nC
Q _{GD}	Gate to Drain Charge			6		nC
Q _{GS}	Gate to Source Charge			0.7		nC
Q _{SW}	Switching Charge			6.7		nC
R _G	Gate Resistance			0.8		Ω
T _{D(ON)}	Turn-on Delay Time	V _{DD} =16V, I _D =15A V _{Drive} = 5 V Clamped Inductive Load		4		ns
T _R	Rise Time			10		
T _{D(OFF)}	Turn-off Delay			2		
T _F	Fall Time			8		
C _{ISS}	Input Capacitance	V _{DS} =10V, V _{GS} = -5 V, 1MHz.		1250		pF
C _{OSS}	Output Capacitance			500		
C _{GS}	Gate-Source Capacitance			900		
C _{GD}	Gate-Drain Capacitance			350		
C _{DS}	Drain-Source Capacitance			150		
	Schottky Diode					
B _V	Reverse Breakdown Voltage	I _R = 0.1 mA	20	25		V
I _R	Reverse Leakage	V _R =25V		0.25	0.3	mA
V _F	Forward Voltage	I _F = 1 A			500	mV
V _F	Forward Voltage	I _F = 3 A			550	mV
V _F	Forward Voltage	I _F = 25 A		800		mV
Q _{rr}	Reverse Recovery Charge	I _s = 15 A di/dt = 100A/us,		15		nC

Notes:

1. Pulse width $\leq 500\mu\text{s}$, duty cycle $\leq 2\%$

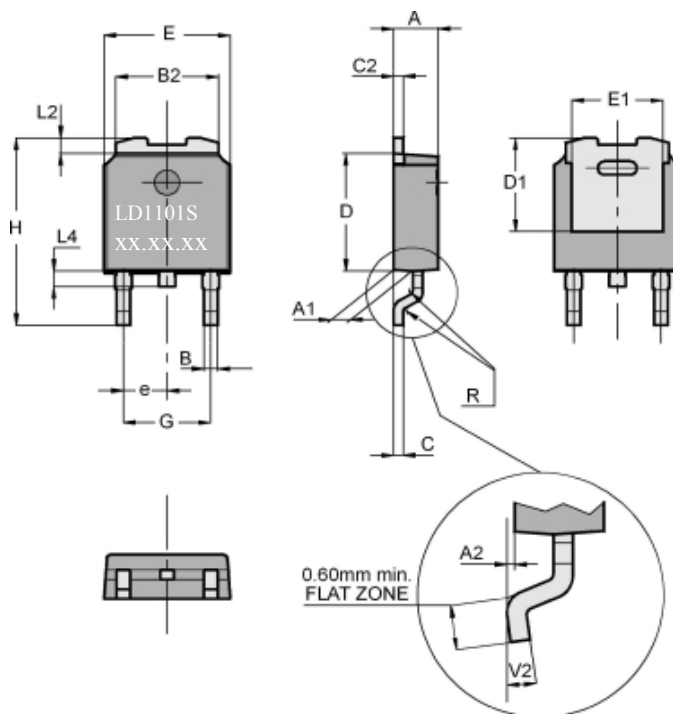
Ordering Information

Product Number	PN Marking	Package
LD1101S	LD1101S	TO252 (DPAK)

Package and Marking Information

DIMENSIONS

DIM.	mm.			inch		
	TYP.	MIN.	MAX.	TYP.	MIN.	MAX.
A		2.20	2.40		0.086	0.094
A1		0.90	1.10		0.035	0.043
A2		0.03	0.23		0.001	0.009
B		0.64	0.90		0.025	0.035
B2		5.20	5.40		0.204	0.212
C		0.45	0.60		0.017	0.023
C2		0.48	0.60		0.019	0.023
D		6.00	6.20		0.236	0.244
D1	5.10			0.201		
E		6.40	6.60		0.252	0.260
E1	4.70			0.185		
e	2.28			0.090		
G		4.40	4.60		0.173	0.181
H		9.35	10.10		0.368	0.397
L2	0.80			0.031		
L4		0.60	1.00		0.023	0.039
R	0.20			0.008		
V2		0°	8°		0°	8°



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- A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Datasheet Identification	Product Status	Definition
Advance Information	In definition or in Design	This datasheet contains the design specifications for product development. Specifications may change without notice.
Preliminary	Initial Production	This datasheet contains preliminary data; additional and application data will be published at a later date. Lovoltech, Inc. reserves the right to make changes at any time without notice in order to improve design.
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