

General Description

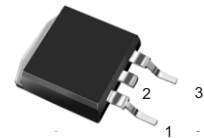
The JHD3101 is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The JHD3101 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

Product Summary			
V _{DS}	R _{DS(on)} (mΩ) Max	I _D (A)	Q _g (Typ)
-30V	42@10V	-20	6.1nc

Features

- Super Low Gate Charge
- 100% EAS Guaranteed
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

TO-252
JHD3101



Mechanical Data

- Case:TO-252 Package

Application

- Switching applications

Ordering Information

Part No.	Package Type	Package	Quality(box)
JHD3101	TO-252	Tape & Reel	3000

Pin Definition:

1. Gate
2. Drain
3. Source

Block Diagram

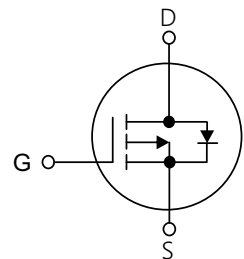


Table1 Absolute Maximum Ratings (T_C=25°C, unless otherwise specified)

Parameter	Symbol	TO-252	Unit
Drain-Source Voltage	V _{DS}	-30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	T _C =25° C	-20
		T _C =100° C	-13
Pulsed Drain Current (Note 1)	I _{DM}	-40	A
Power Dissipation T _C =25° C	P _D	25	W
Operating Junction and Storage Temperature	T _J /T _{STG}	-55~+150	°C

Table 2. Thermal Characteristics

Parameter	Symbol	TO-252	Unit
Thermal resistance Junction to Ambient	$R_{\theta JA}$	62	$^{\circ}C/W$

Table 3. Electrical Characteristics ($T_J=25^{\circ}C$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$			-1	μA
Gate- Source Leakage Current	Forward	I_{GSS}			100	nA
	Reverse				-100	nA
On Characteristics(Note 4)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2		-2.5	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-10A$			42	m Ω
		$V_{GS}=-4.5V, I_D=-6A$			78	
Dynamic Characteristics(Note 5)						
Input Capacitance	C_{ISS}	$V_{DS}=-15V, V_{GS}=0V, f=1MHz$		585		pF
Output Capacitance	C_{OSS}			100		pF
Reverse Transfer Capacitance	C_{RSS}			85		pF
Switching Characteristics (Note 5)						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-15V, I_D=-15A,$ $V_{GS}=-10V, R_G=3.3\Omega$		2.6		ns
Turn-On Rise Time	t_R			8.6		ns
Turn-Off Delay Time	$t_{d(off)}$			33.6		ns
Turn-Off Fall Time	t_f			6		ns
Total Gate Charge	Q_G	$V_{DS}=-15V, I_D=-15A,$ $V_{GS}=-4.5V$		6.1		nC
Gate-Source Charge	Q_{GS}			3.1		nC
Gate-Drain Charge	Q_{GD}			1.8		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1A$			-1.2	V
Maximum Continuous Drain-Source Diode Forward Current	I_S				-20	A
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_F=-15A$ $di_F/dt=100A/\mu s$ (Note 1)		6.1		ns
Reverse Recovery Charge	Q_{RR}			1.4		nC

Notes : 1 Repetitive Rating:Pulse width limited by maximum junction temperature

2 $L=0.1mH, V_{GS}=-10V, I_{AS}=-19A, V_{DD}=-25V$, Starting $T_J=25^{\circ}C$

4 Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

5 Guaranteed by design, not subject to production

Typical Test Circuit

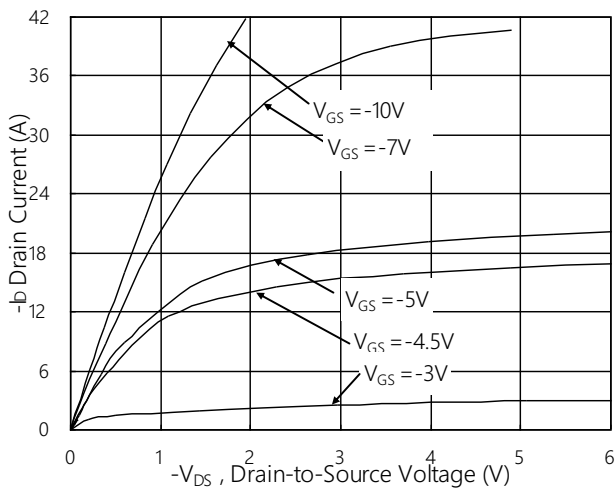


Fig.1 Typical Output Characteristics

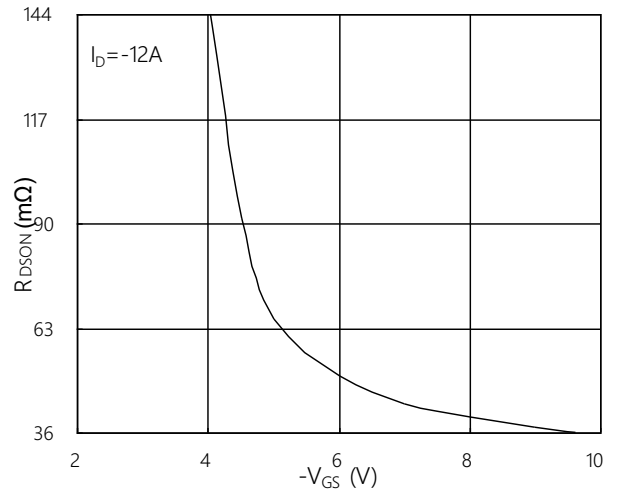


Fig.2 On-Resistance v.s Gate-Source

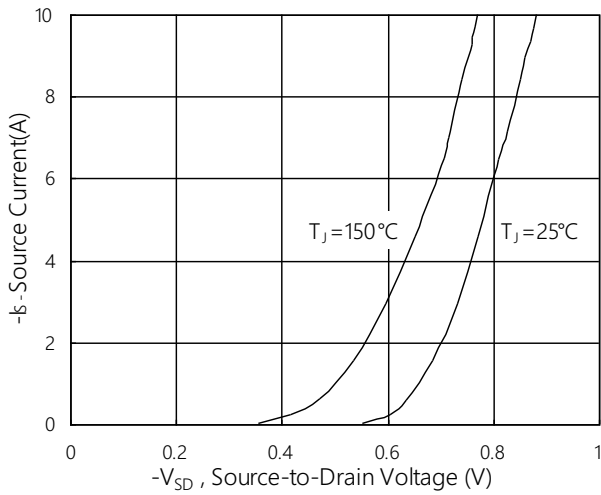


Fig.3 Forward Characteristics of Reverse

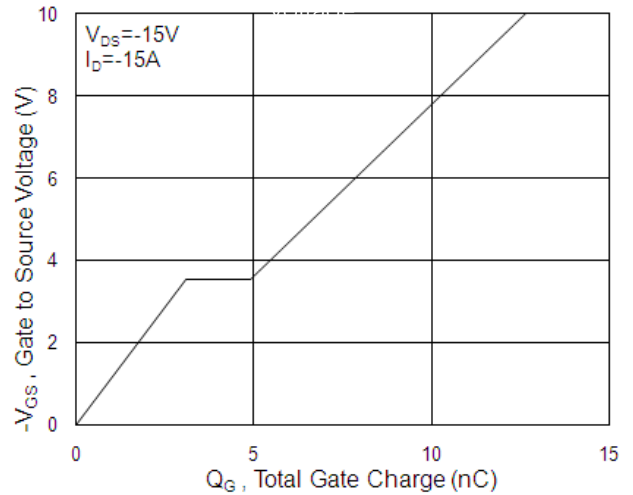


Fig.4 Gate Charge Characteristics

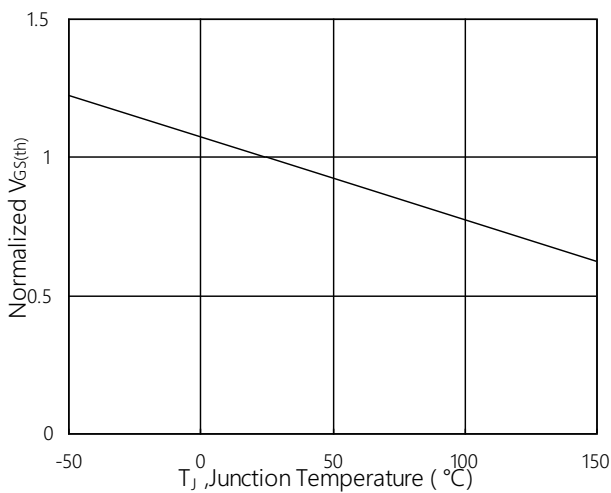


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

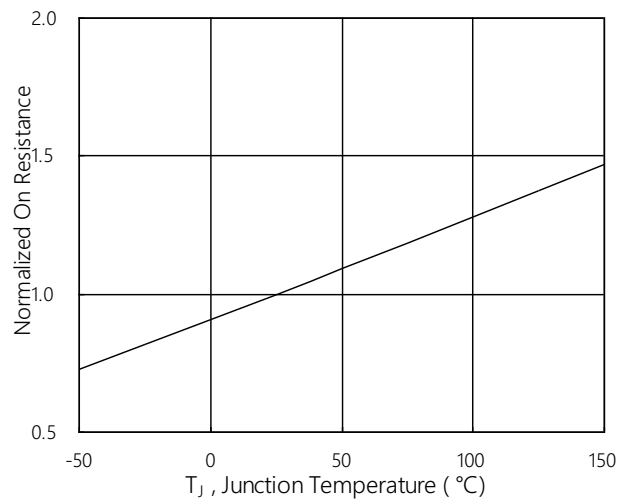


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Test Circuit

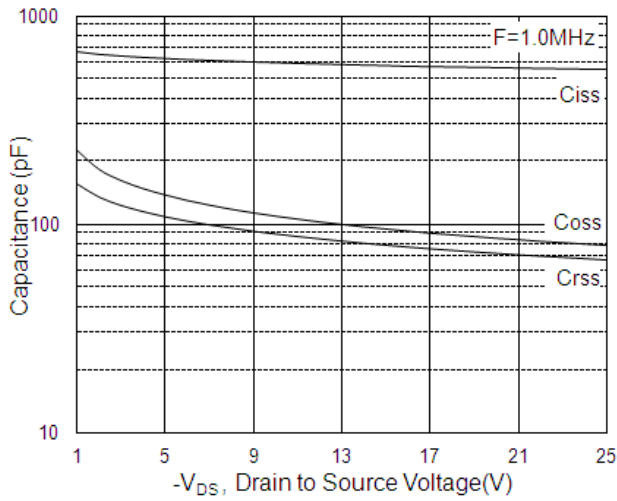


Fig. 7 Capacitance

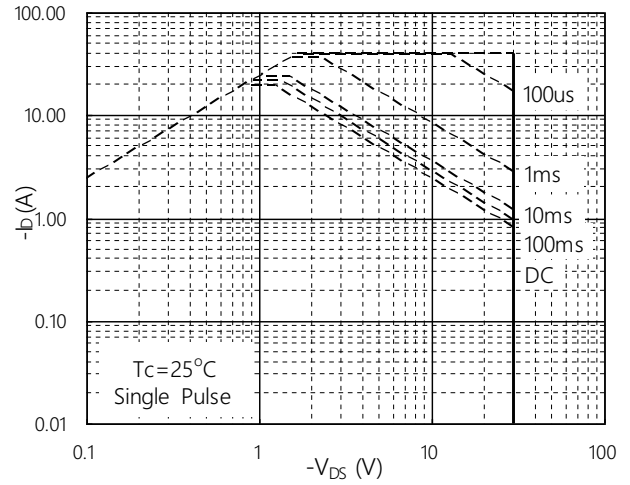


Fig. 8 Safe Operating Area

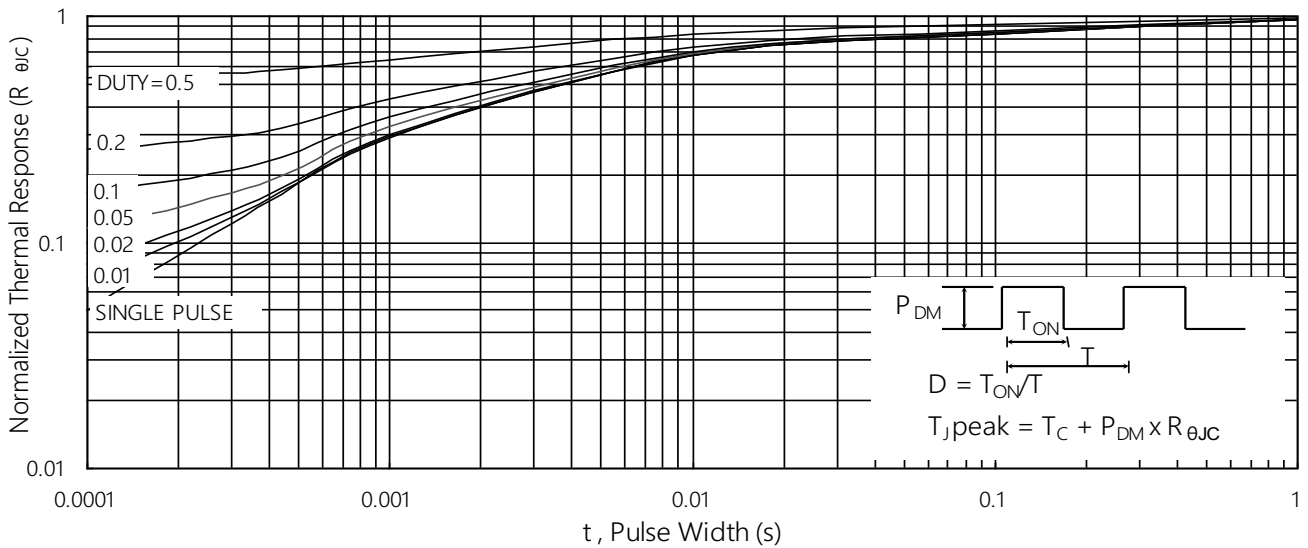


Fig. 9 Normalized Maximum Transient Thermal Impedance

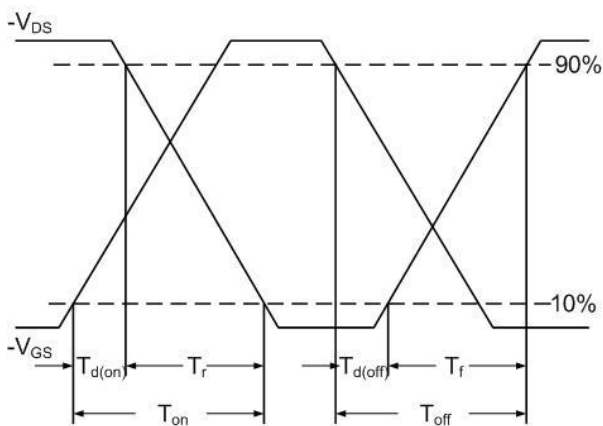


Fig. 10 Switching Time Waveform

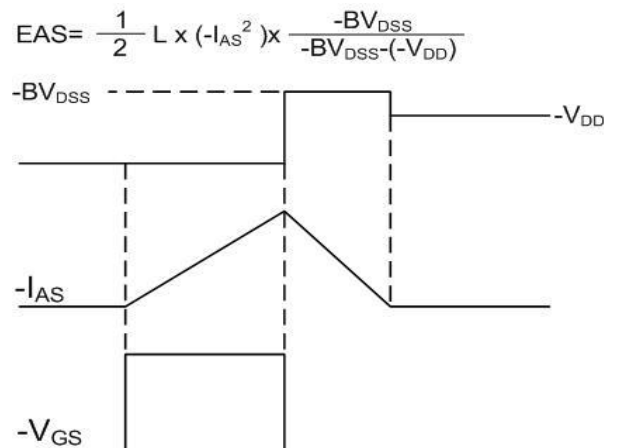
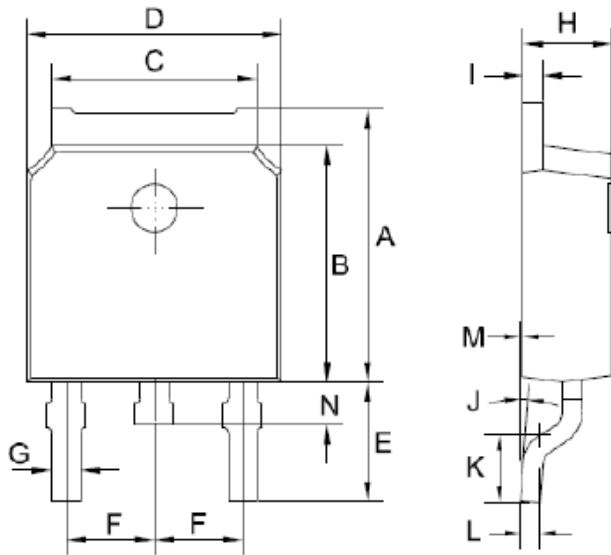


Fig. 11 Unclamped Inductive Switching Waveform

Dimensions

TO-252 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	6.85	7.25	0.270	0.285
B	5.8	6.3	0.228	0.248
C	5	5.53	0.197	0.218
D	6.3	6.8	0.248	0.268
E	2.6	3.3	0.102	0.130
F	2.19	2.39	0.086	0.094
G	0.45	0.85	0.018	0.033
H	2.2	2.4	0.087	0.094
I	0.41	0.61	0.016	0.024
J	0 ^ú	8 ^ú	0 ^ú	8 ^ú
K	1.45	1.85	0.057	0.073
L	0.41	0.61	0.016	0.024
M	0	0.12	0.000	0.005
P	0.6	1	0.024	0.039

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