PLN-AOD514

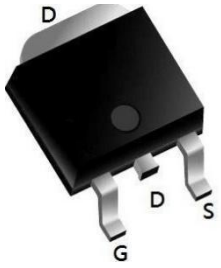
N-Ch 30V Fast Switching MOSFETS

Features

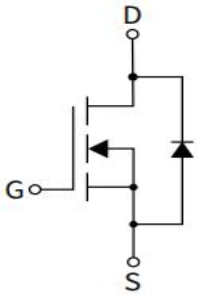
- 100% EAS Guaranteed
- Super Low Gate Charge
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

Application

- PWM applications
- Load Switch
- Power management



TO252-3L top view



Schematic diagram

Absolute Maximum Ratings (T_C=25℃unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current,V_{GS}@10V	T_C= 25℃	I_D	80	A
	T_C=100℃		50	A
Pulsed Drain Current[1]		I_{DM}	350	A
Single Pulsed Avalanche Energy[4]		EAS	100	mJ
Avalanche Current		I_{AS}	-	A
Total Power Dissipation	T_C = 25℃	P_D	50	W
Storage Temperature Range		T_{STG}	-55 ~ 150	℃
Operating Junction Temperature Range		T_J	-55 ~ 150	℃

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Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	29	℃/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	2.5	℃/W

Electrical Characteristics (T_J=25℃,unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	30	-	-	V
Drain to Source Leakage Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V	-	-	1	uA
Gate to Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS},I_D=250μA	1.2	1.6	2	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=30A	-	4.2	6	mΩ
		V_{GS}=4.5V,I_D=20A	-	6	7.5	
Gate Resistance	R_g	V_{DS}=0V,V_{GS}=0V,f=1MHz	-	1.4	-	Ω
Total Gate Charge(10V)[2,3]	Q_g	V_{DS}=15V,V_{GS}=10V, I_D=30A	-	35	-	nC
Gate-Source Charge	Q_{gs}		-	6.6	-	
Gate-Drain(“Miller”) Charge	Q_{gd}		-	7	-	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=15V,V_{GS}=10V, R_G=3Ω,I_D=30A	-	8	-	ns
Rise Time	t_r		-	15	-	
Turn-Off Delay Time	$t_{d(off)}$		-	33	-	
Fall Time	t_f		-	10	-	
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V,f=1MHz	-	2200	-	pF
Output Capacitance	C_{oss}		-	239	-	
Reverse Transfer Capacitance	C_{rss}		-	201	-	
Continuous Source Current	I_S	V_G=V_D=0V,Force Current	-	80	-	A
Pulsed Source Current	I_{SM}		-	350	-	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=40A,T_J=25℃	-	-	0.86	V

Note :

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width=300us, duty cycle=2%.
3. Essentially independent of operating temperature.
4. The EAS data shows Max. rating. The test condition is V_{DD}=15V,V_{GS}=10V,L=0.5mH.

Typical Performance Characteristics

Fig1 Output Characteristics

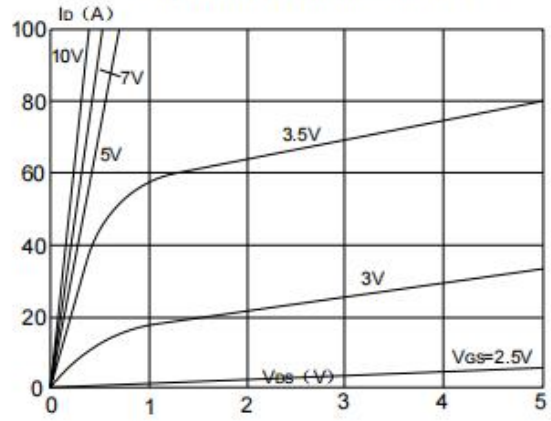


Fig2 Typical Transfer Characteristics

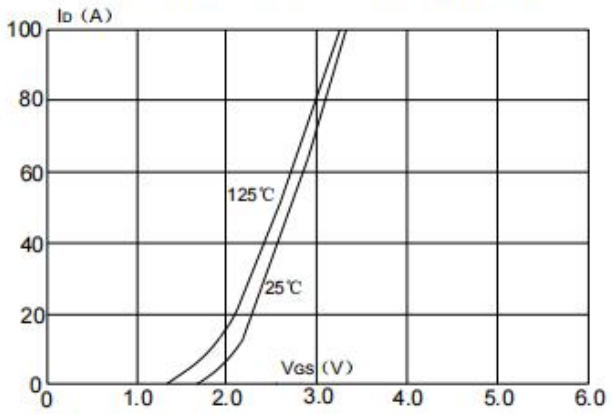


Fig3 On-resistance vs. Drain Current

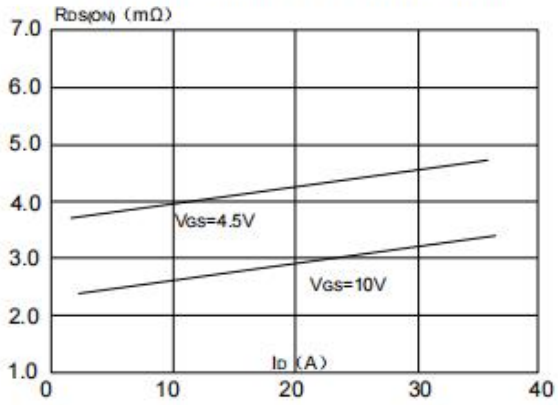


Fig4 Gate Charge Waveform

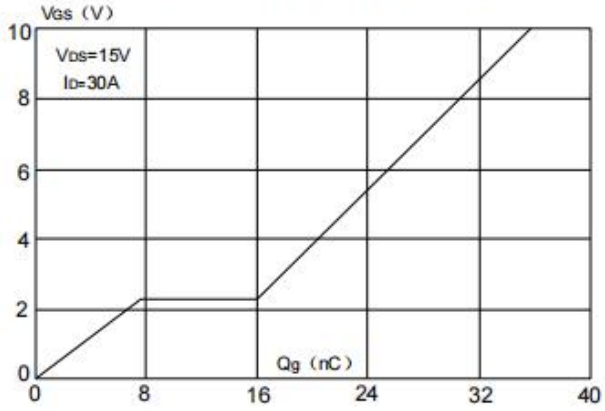


Fig5 Capacitance Characteristics

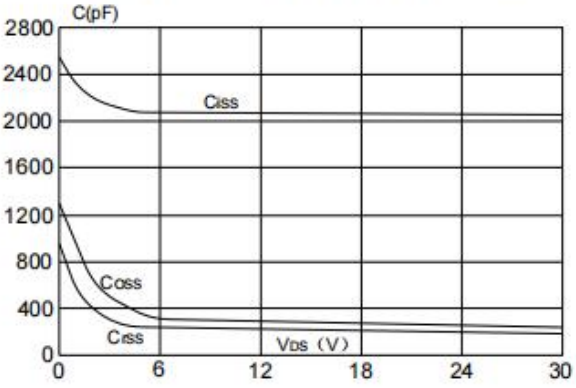


Fig6 Normalized Breakdown Voltage vs. Tj

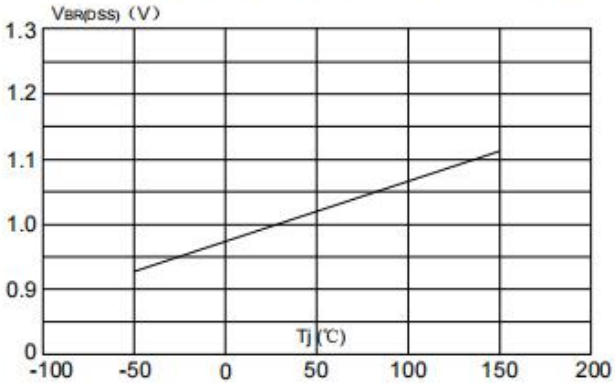


Fig7 Normalized Transient Impedance

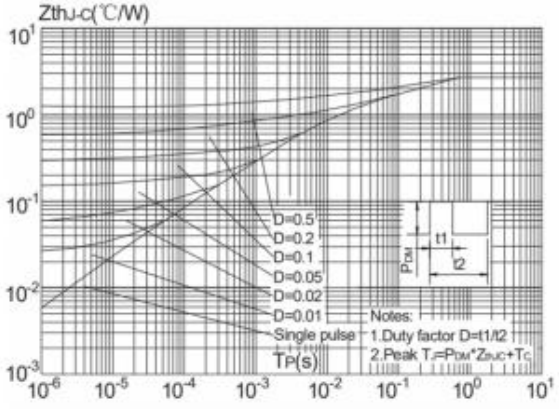


Fig8 Maximum Safe Operation Area

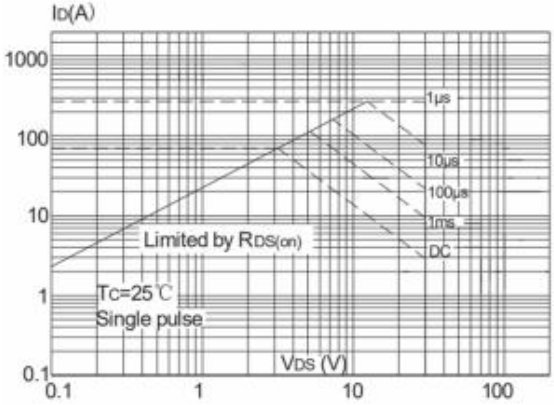


Fig9 Switching Time Waveform

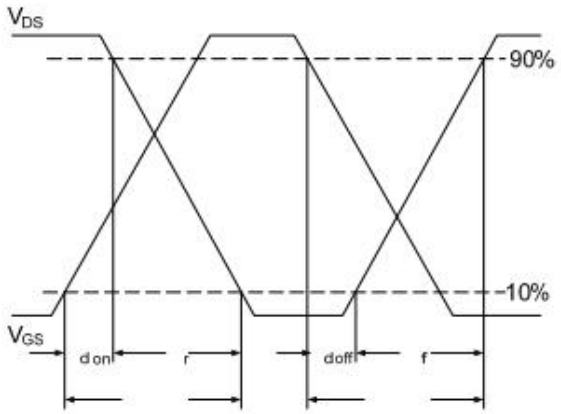
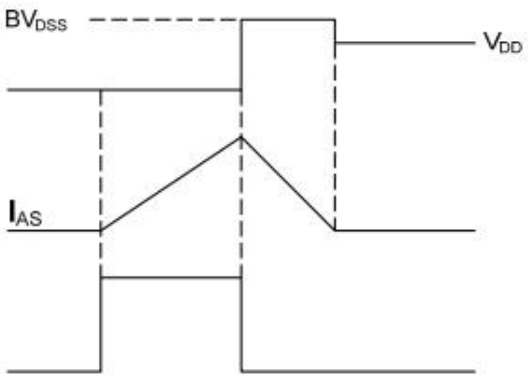
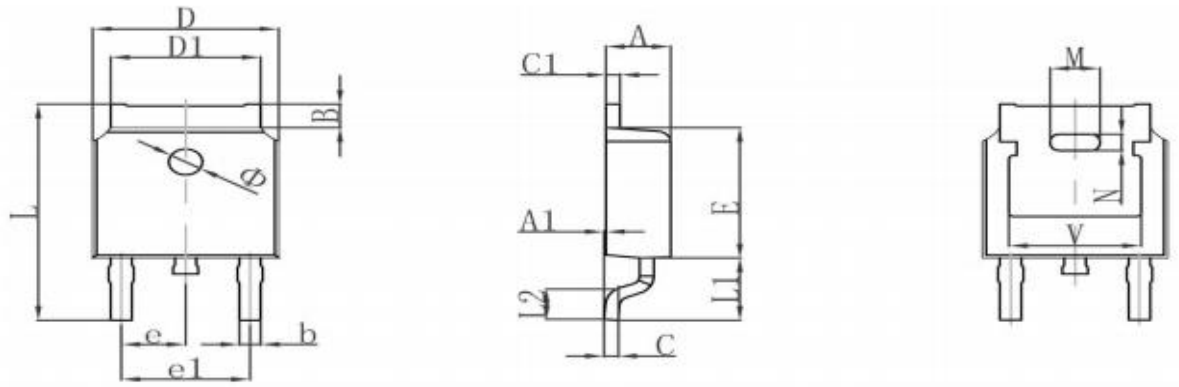


Fig10 EAS Waveform



Package Mechanical Data

TO252-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.100	0.000	0.004
B	0.800	1.400	0.031	0.055
b	0.710	0.810	0.028	0.032
C	0.460	0.560	0.018	0.022
C1	0.460	0.560	0.018	0.022
D	6.500	6.700	0.256	0.264
D1	5.130	5.460	0.202	0.215
E	6.000	6.200	0.236	0.244
e	2.286TYP		0.090TYP	
e1	4.327	4.727	0.170	0.186
M	1.778REF		0.070REF	
N	0.762REF		0.018REF	
L	9.800	10.400	0.386	0.409
L1	2.9REF		0.114REF	
L2	1.400	1.700	0.055	0.067
V	4.830REF		0.190REF	
Φ	1.100	1.300	0.043	0.051