

Description

The DMN3010LK3-13 is the new generation trench N-channel MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications

Features

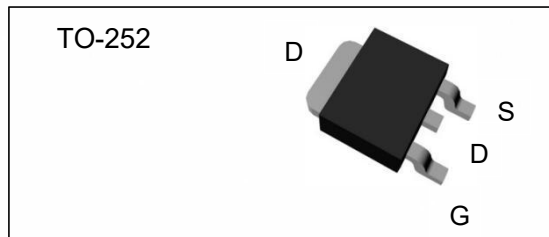
- High - speed switching
- Excellent gate charge x $R_{DS(ON)}$ product (FOM) for extremely low $R_{DS(ON)}$
- **100% UIS Tested**
- **100% Avalanche Tested**
- Lead-Free, Halogen-Free; RoHS Compliant

Applications

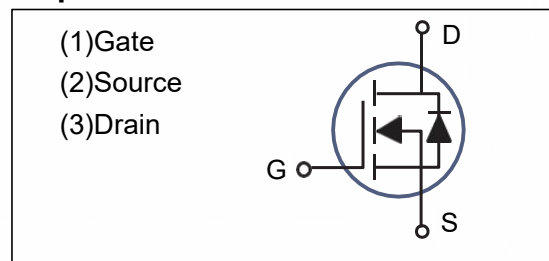
- PMW Application
- Load Switch
- POL Applications

V_{DSS}	30V
I_D	90A
$R_{DS(ON) Typ}$	3.2mΩ @ $V_{GS}=10V$

Outline



Equivalent



Packaging specifications

Part No.	Package	Marking	Basic ordering unit.(pcs)
DMN3010LK3-13	TO-252-3L		2500

Absolute Maximum Ratings

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous ^(Note2)	$T_C=25^{\circ}C$	I_D	90	A
	$T_C=70^{\circ}C$		70	A
-Pulsed ^(Note 1- Note 2)		I_{DM}	360	A
Single Pulse Avalanche Energy ^(Note 3)		E_{AS}	130	mJ
Maximum Power Dissipation	$T_C=25^{\circ}C$	P_D	88	W
	$T_C=70^{\circ}C$		59.8	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C
Thermal Resistance Junction-Ambient		$R_{\theta JA}$	62	°C /W
Thermal Resistance Junction-Case		$R_{\theta JC}$	1.7	°C/W

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V , I _D =250uA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V , V _{GS} =0V			1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V , V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250uA	1	1.6	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V , I _D =20A		3.2	4.2	mΩ
		V _{GS} =4.5V , I _D =10A		5	6.5	mΩ
Forward Transconductance	g _{FS}	V _{GS} =10V , I _D =10A		15		S
DYNAMIC CHARACTERISTICS Note4						
Input Capacitance	C _{ISS}	V _{DS} =15V , V _{GS} =0 V , f =1.0MHz		2200		pF
Output Capacitance	C _{OSS}			295		pF
Reverse Transfer Capacitance	C _{RSS}			255		pF
Gate resistance	R _g	V _{GS} =0V,V _{DS} =0V, F=1MHz		1.8		Ω
Total Gate Charge	Q _g	V _{DS} =15V , I _D =20A , V _{GS} =10V		24		nC
Gate-Source Charge	Q _{gs}			4		nC
Gate-Drain Charge	Q _{gd}			14		nC
SWITCHING CHARACTERISTICS Note4						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =15V , I _D =20A , V _{GS} =10V , R _{GEN} =6 Ω		13		ns
Rise Time	tr			20		ns
Turn-Off Delay Time	t _{D(OFF)}			43		ns
Fall Time	tf			14		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =10A		0.8	1.2	V

Notes:

- 1、Pulse Test Width < 300us, Duty Cycle < 2%
- 2、Drain current limited by maximum junction temperature.
- 3、tating $T_j=25^{\circ}\text{C}$, $L=0.5mH$, $V_{DD}=15V$
- 4、Guaranteed by design, not subject to production testing.

Typical Performance Characteristics

Fig.1 Continuous Drain Current vs. TC

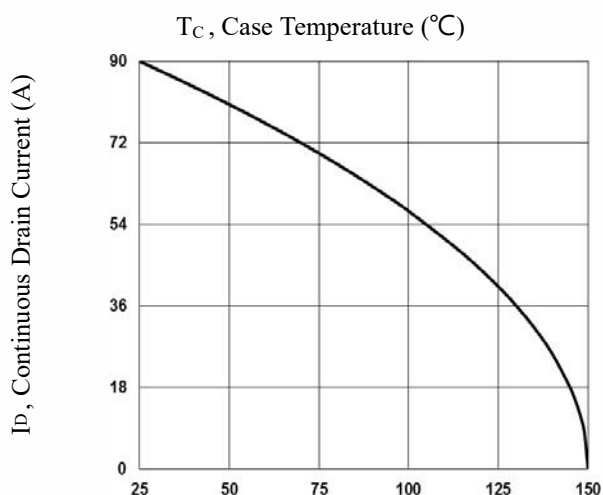


Fig.2 Normalized RDSON vs. TJ

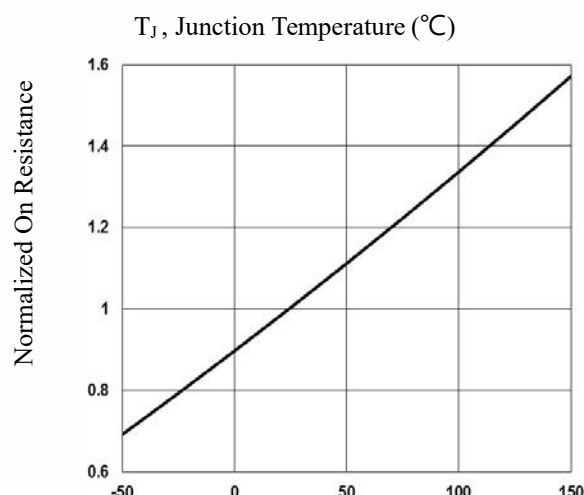


Fig.3 Normalized Vth vs. TJ

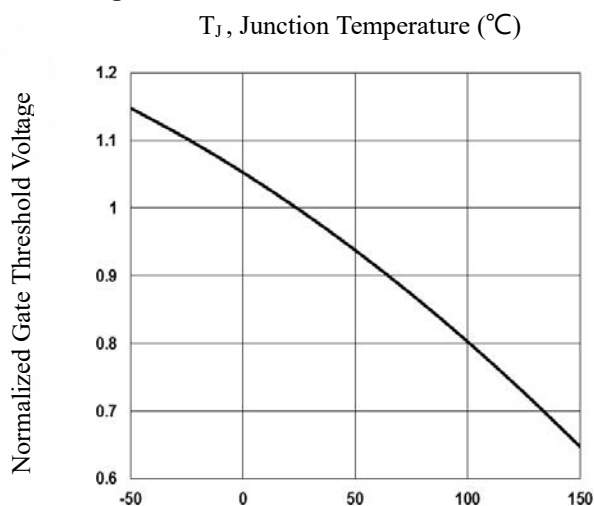


Fig.4 Gate Charge Waveform

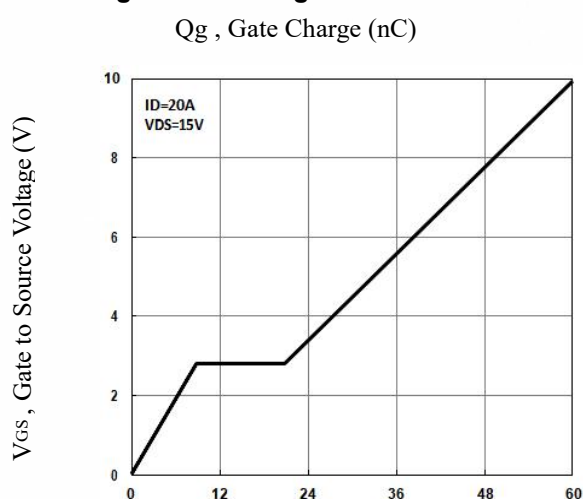


Fig.5 Normalized Transient Response

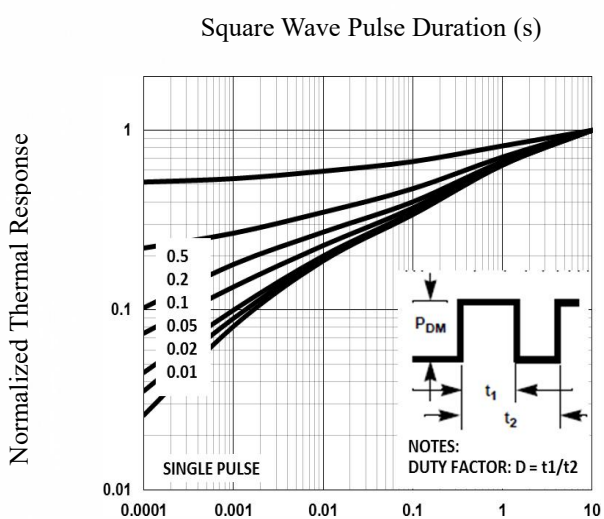


Fig. 6 Maximum Safe Operation Area

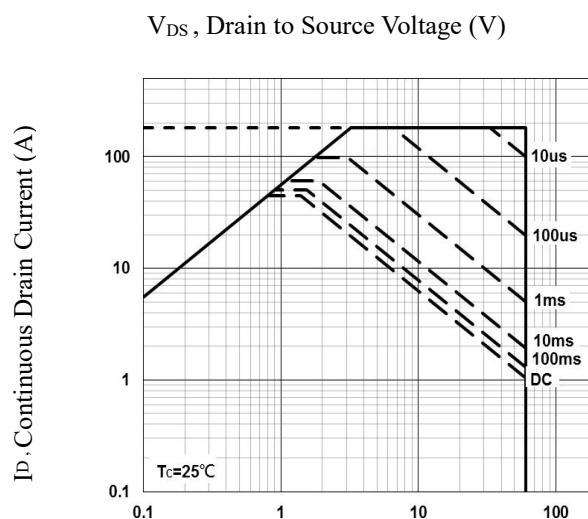


Figure 7a. Switching Test Circuit

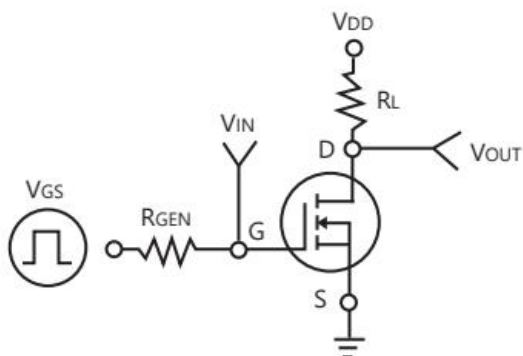


Figure 7b. Switching Waveforms

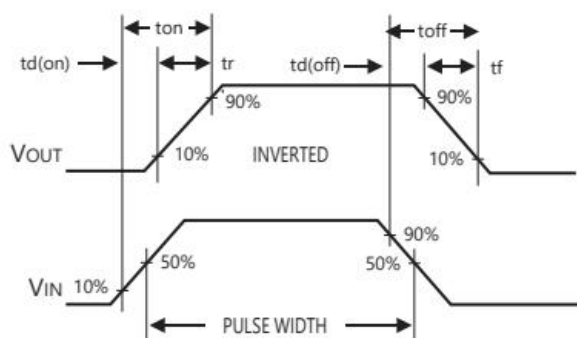


Figure 8a. Unclamped Inductive Test Circuit

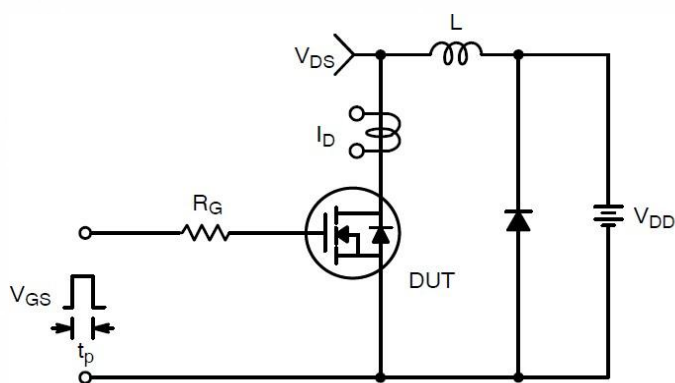
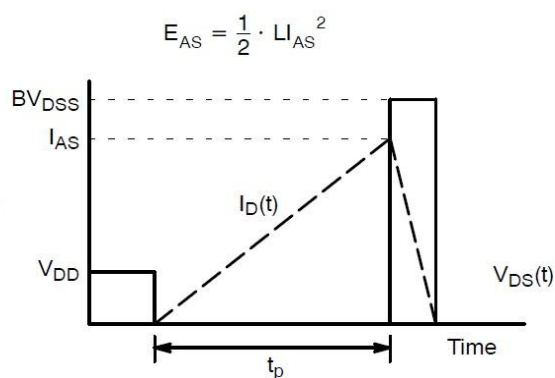


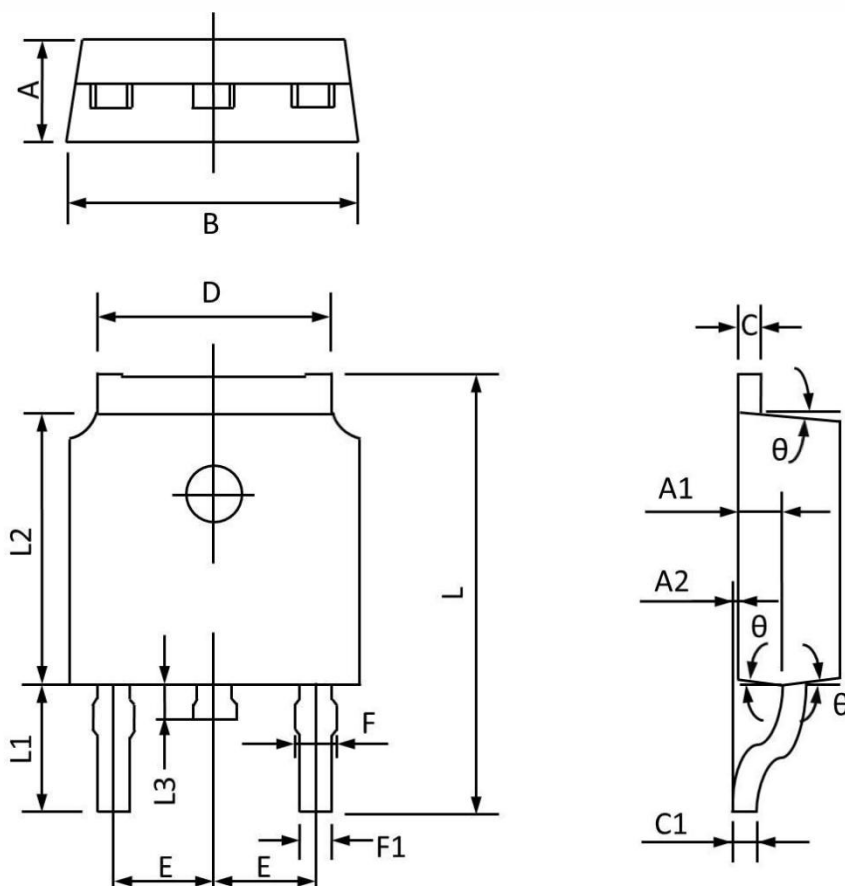
Figure 8b. Unclamped Inductive Waveform



NOTICE

NKGL reserves the to make modifications,enhancements,improvements,corrections or other changes without further notice to any product herein.NKGL does not assume any liability arising out of the application or use of any product described herein.

TO-252-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.450	2.150	0.096	0.085
A1	1.200	0.910	0.047	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.300	0.268	0.248
C	0.580	0.350	0.023	0.014
C1	0.550	0.380	0.022	0.015
D	5.500	5.100	0.217	0.201
E	2.390	2.000	0.094	0.079
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.300	0.244	0.209
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°