Dual N-Channel Enhancement Mode Power MOSFET

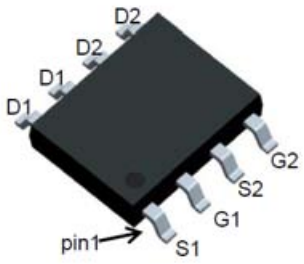
● Features

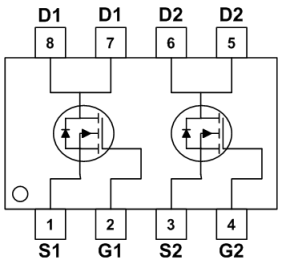
V_{DS}= 30V
I_D= 10A
$R_{DS(ON)}$≤ 12mΩ(V_{GS}=10V)

● General Description

The TDNM1230UX is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.
The TDNM1230UX meet the RoHS and Green Product requirement , 100 % EAS guaranteed with full function reliability approved.

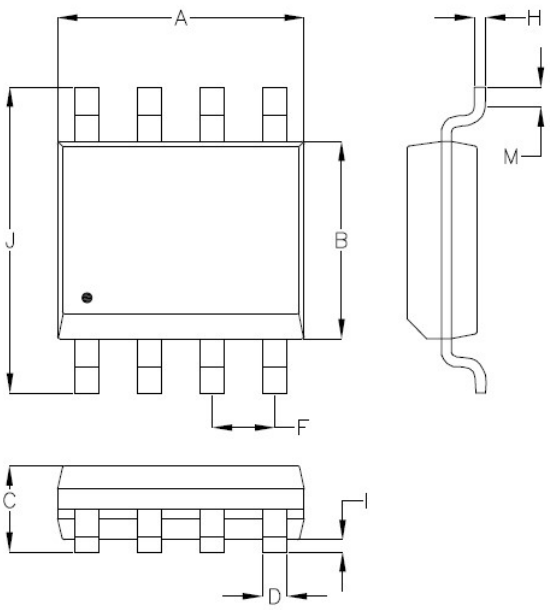
● Pin Configurations





● Package Information

SOP8



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.700	5.150	0.185	0.203
B	3.700	4.100	0.146	0.161
C	1.23	1.753	0.048	0.069
D	0.310	0.510	0.012	0.020
F	1.070	1.470	0.042	0.058
H	0.160	0.254	0.006	0.010
I	0.050	0.254	0.002	0.010
J	5.750	6.250	0.226	0.246
M	0.400	1.270	0.016	0.050

Dual N-Channel Enhancement Mode Power MOSFET

- **Absolute Maximum Ratings (@TA=25°C unless otherwise noted)**

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate Source Voltage		V_{GSS}	±20	V
Drain Current (Continuous) *AC	TA=25°C	I_D	10	A
	TA=100°C		8	
Drain Current (Pulse) *B		I_{DM}	36	A
Power Dissipation	TA=25°C	P_D	1.5	W
	TA=100°C		1.0	
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150	°C
Single Pulse Avalanche Energy		E_{AS}	24.2	mJ
Thermal Resistance ,Junction-to-Ambient		$R_{\theta JA}$	85	°C/W

- **Electrical Characteristics (@TA=25°C unless otherwise noted)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V，I_D=250uA	30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V，V_{GS}=0V	--	--	1	uA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}，I_{DS}=250uA	1.2	--	2.5	V
Gate Leakage Current	I_{GSS}	V_{GS}=±20V，V_{DS}=0V	--	--	±100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS}=10V，I_D=8A	--	--	12	mΩ
		V_{GS}=4.5V，I_D=6A	--	--	18	mΩ
Diode Forward Voltage	V_{SD}	I_{SD}=1A，V_{GS}=0V	--	--	1	V
Switching						
Total Gate Charge	Q_g	V_{GS}=4.5V，V_{DS}=15V，I_D=8A	--	9.6	--	nC
Gate- Source Charge	Q_{gs}		--	3.9	--	nC
Gate- Drain Charge	Q_{gd}		--	3.4	--	nC
Tum-on Delay Time	$t_{d(on)}$	V_{GS}=10V，V_{DD}=15V，I_D=8A，R_{GEN}=1.5Ω	--	4.2	--	ns
Turn-on Rise Time	t_r		--	8.2	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	31	--	ns
Turn-off Fall Time	t_f		--	4	--	ns
Dynamic						
Input Capacitance	Ciss	V_{GS}=0V，V_{DS}=15V，f=1MHZ	--	940	--	pF
Output Capacitance	Coss		--	131	--	pF
Reverse Transfer Capacitance	Crss		--	109	--	pF

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR- 4 board with 2oz. Copper, in a still air environment with TA=25C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature .

C: The current rating is based on the t< 10s junction to ambient thermal resistance rating.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

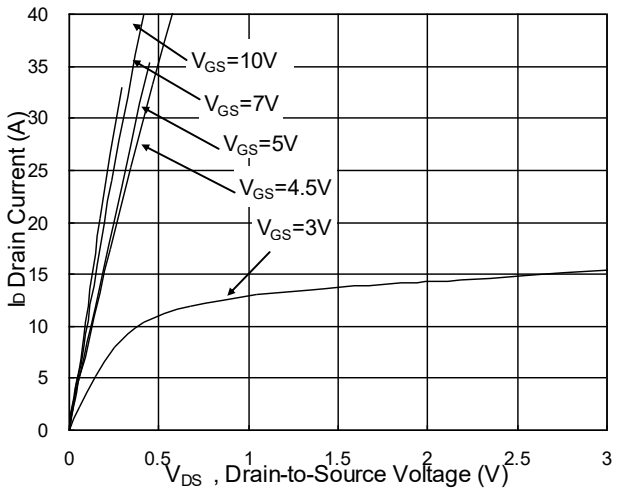


Fig.1 Typical Output Characteristics

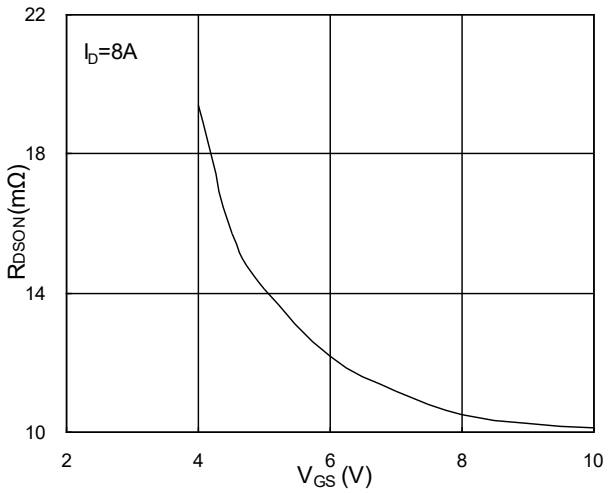


Fig.2 On-Resistance vs. G-S Voltage

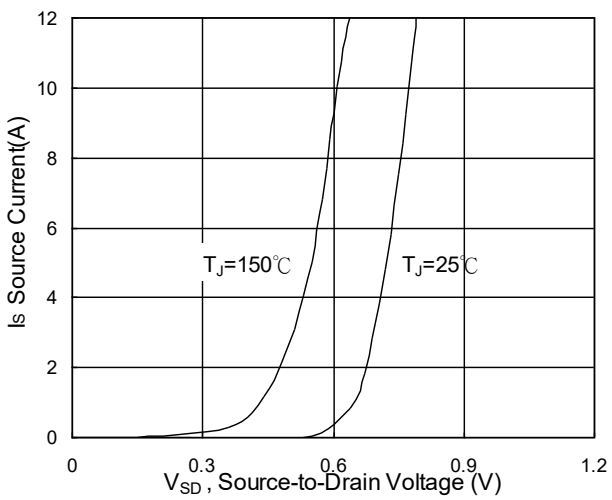


Fig.3 Source Drain Forward Characteristics

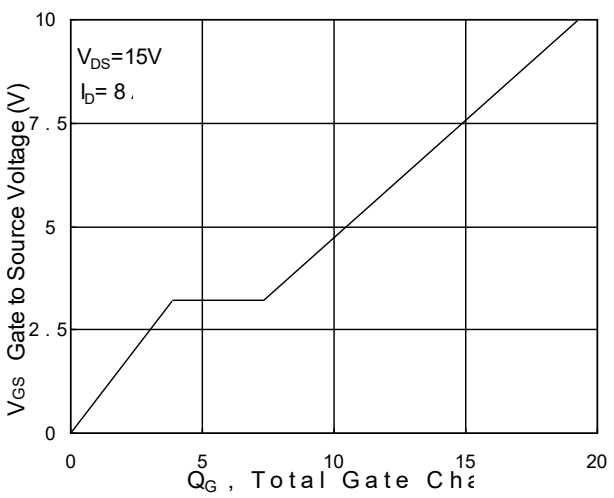


Fig.4 Gate-Charge Characteristics

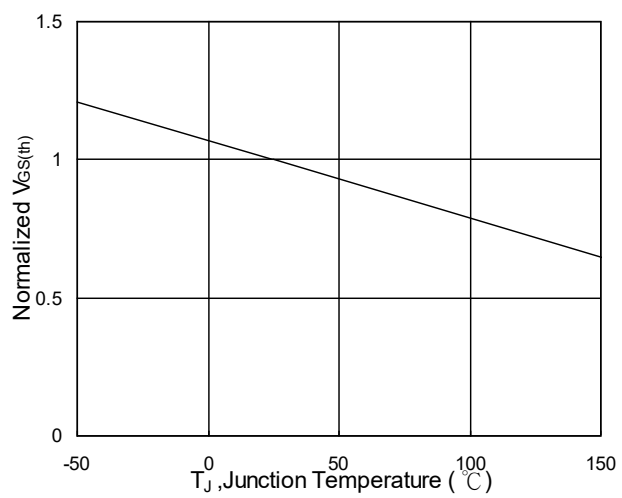


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

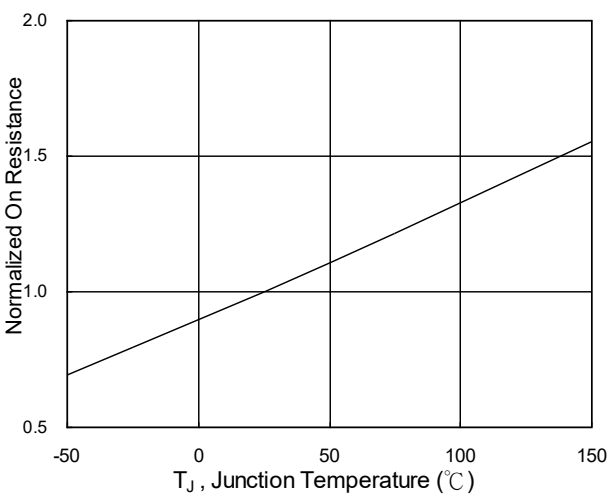


Fig.6 Normalized R_{DSON} vs. T_J

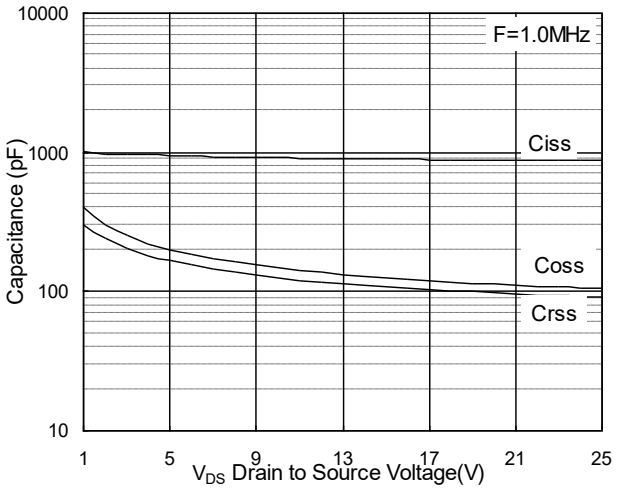


Fig.7 Capacitance

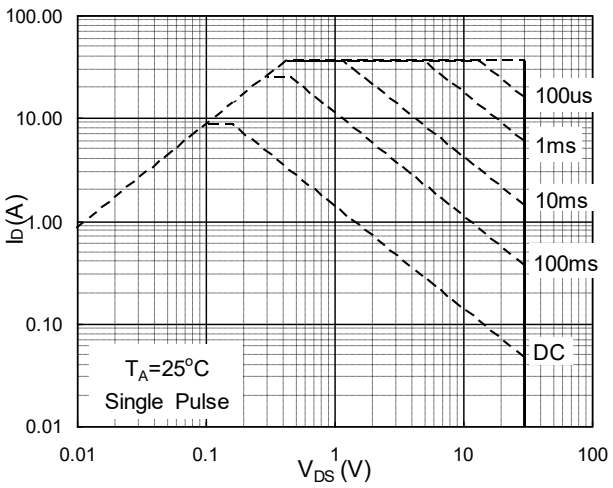


Fig.8 Safe Operating Area

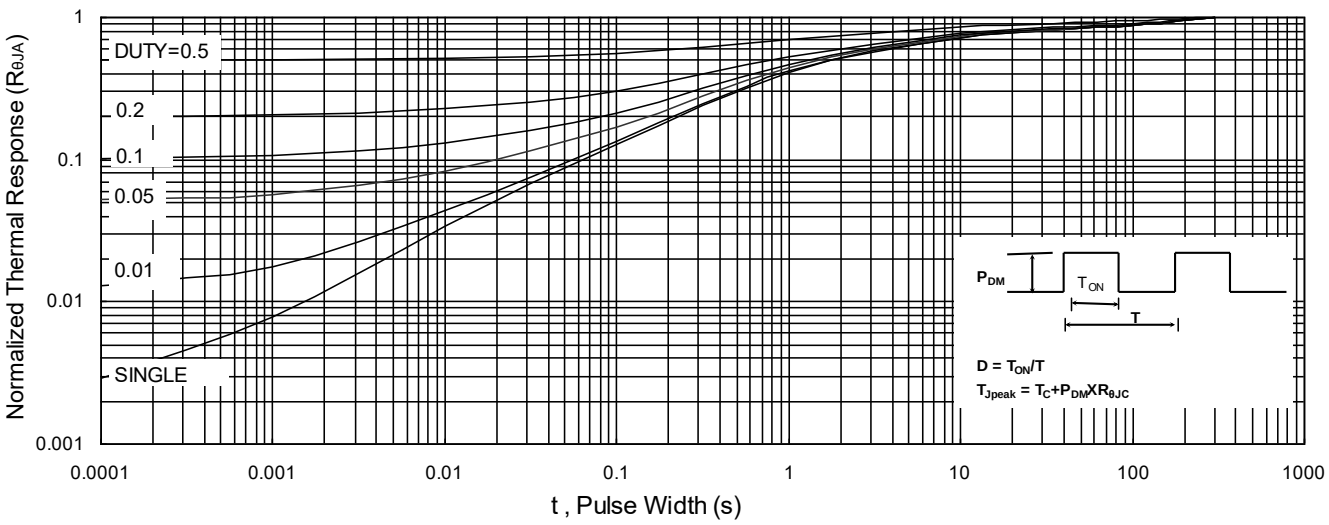


Fig.9 Normalized Maximum Transient Thermal Impedance

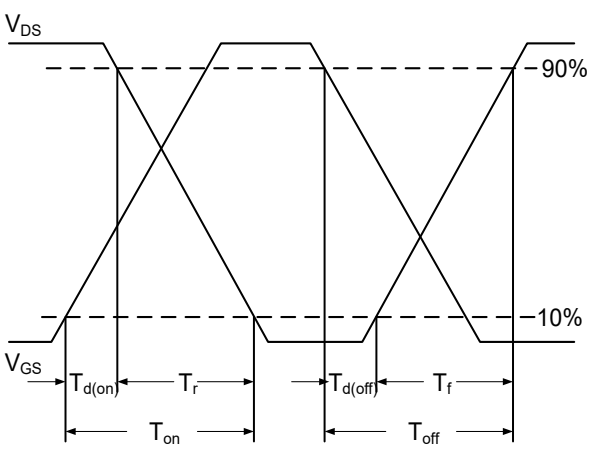


Fig.10 Switching Time Waveform

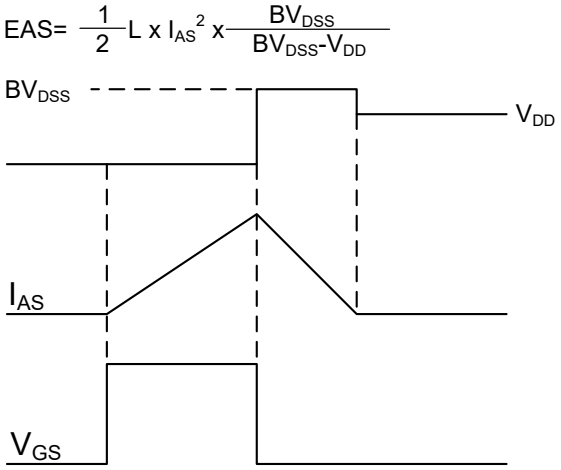


Fig.11 Unclamped Inductive Switching Waveform

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