

Dual N-Channel Enhancement Mode Power MOSFET

● **Features**

$V_{DS} = 30V$

$I_D = 10A$

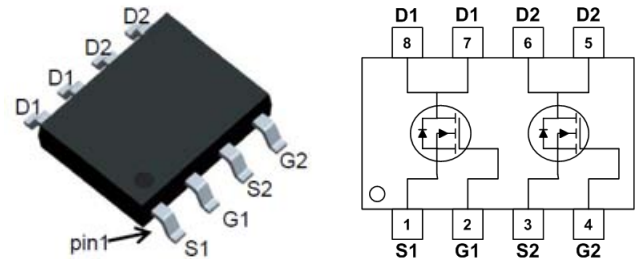
$R_{DS(ON)} \leq 12m\Omega (V_{GS}=10V)$

● **General Description**

The TDNM1230UX is the high cell density trench N-ch MOSFETs, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

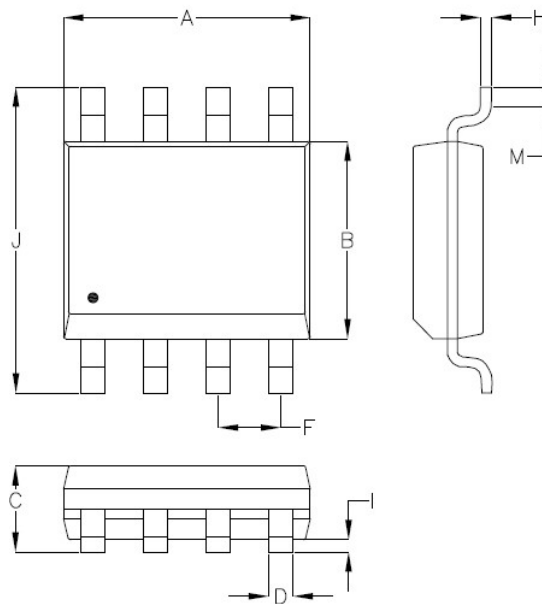
The TDNM1230UX meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

● **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



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

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate Source Voltage		V_{GS}	±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
Turn-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	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1MHZ	--	940	--	pF
Output Capacitance	C _{oss}		--	131	--	pF
Reverse Transfer Capacitance	C _{rss}		--	109	--	pF

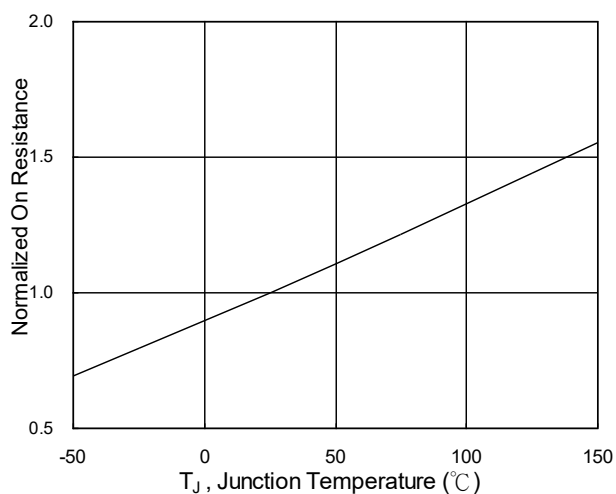
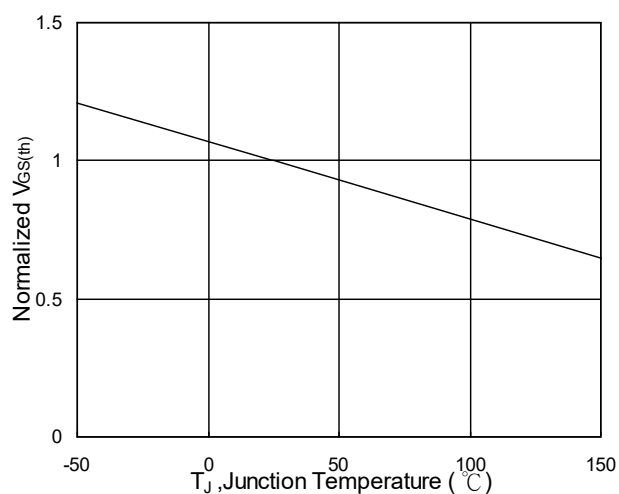
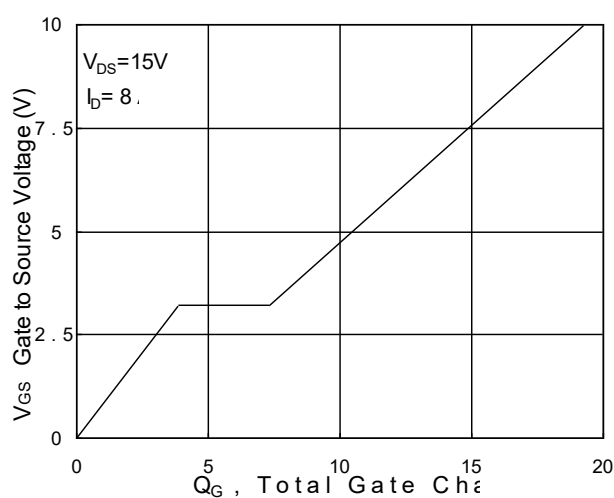
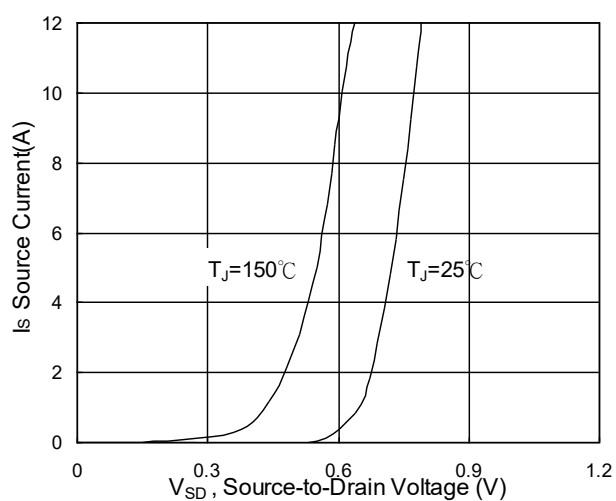
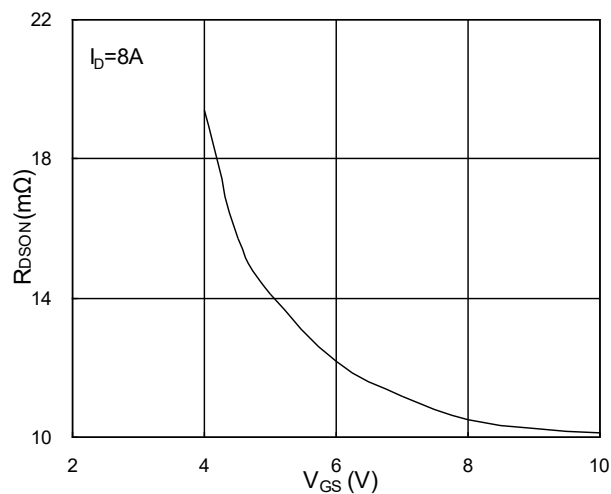
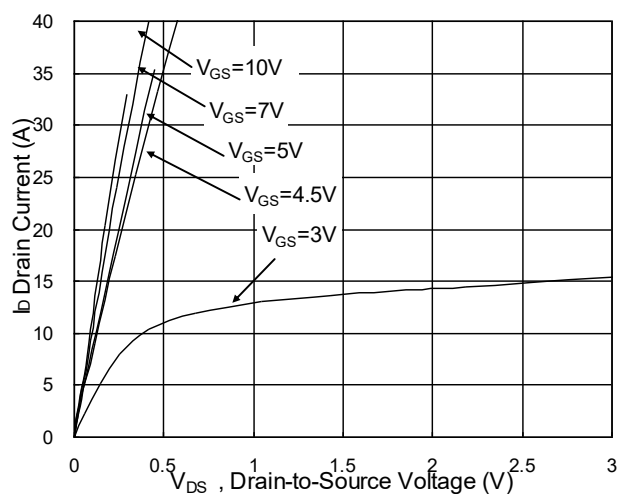
A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA=25C. The value in any given application depends on the user's specific board design.

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

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

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● **TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**



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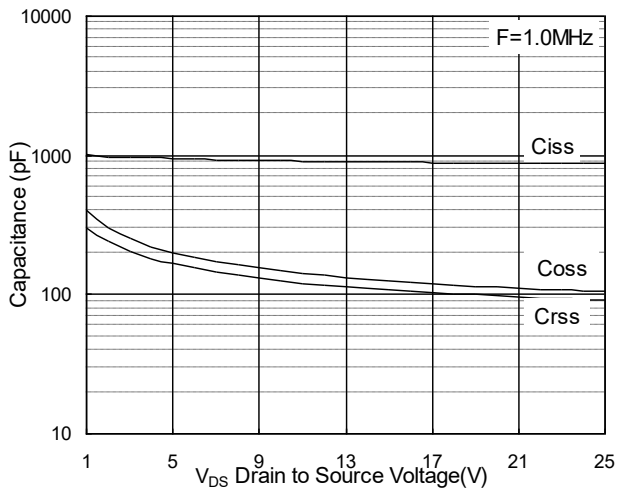


Fig.7 Capacitance

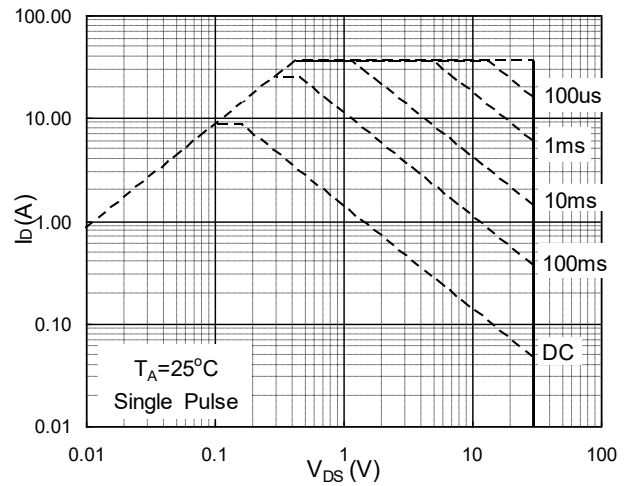


Fig.8 Safe Operating Area

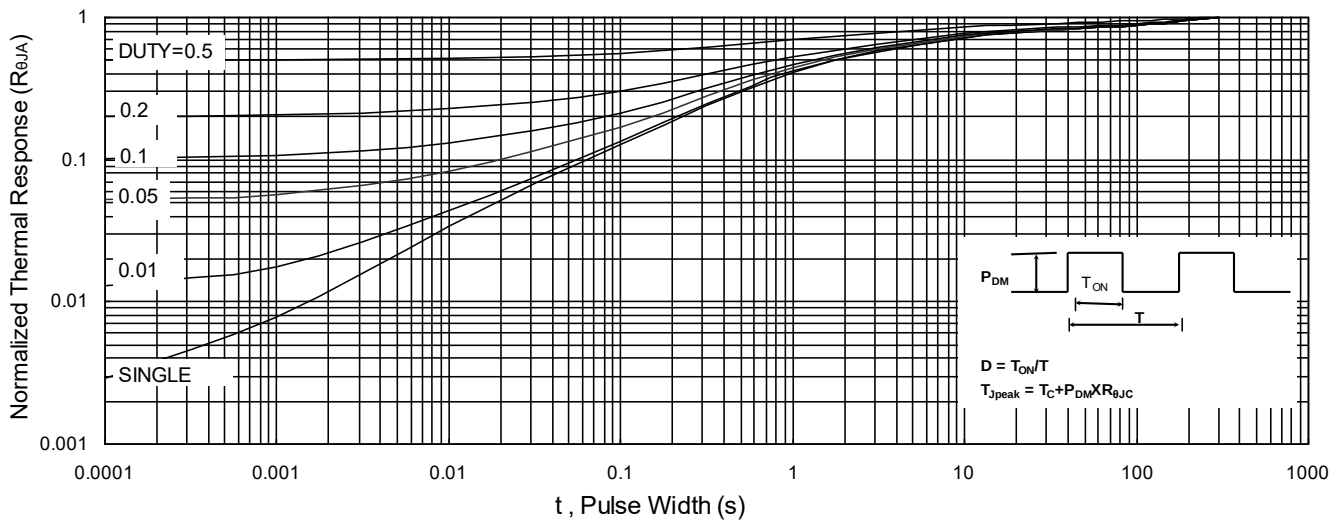


Fig.9 Normalized Maximum Transient Thermal Impedance

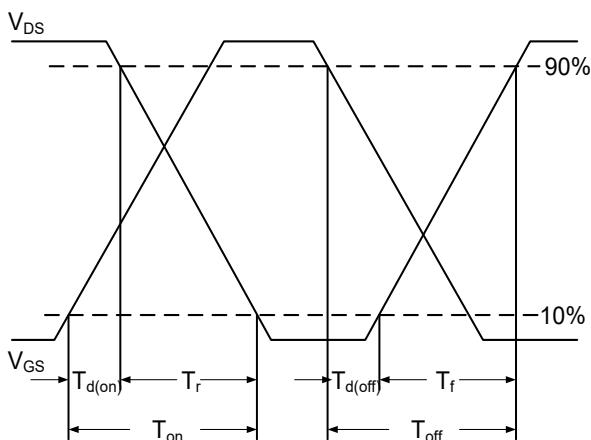


Fig.10 Switching Time Waveform

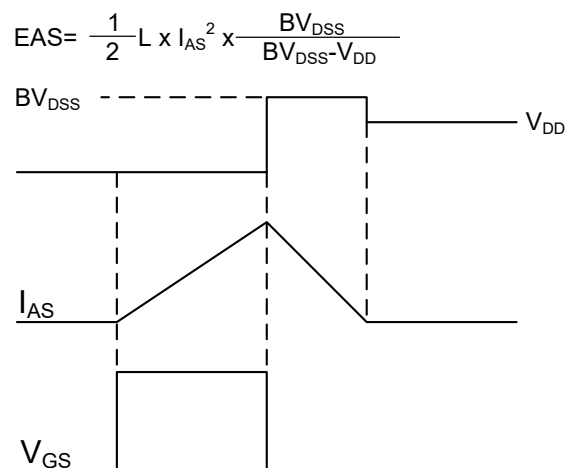


Fig.11 Unclamped Inductive Switching Waveform