



P-Channel Enhancement Mode Power MOSFET

● Features

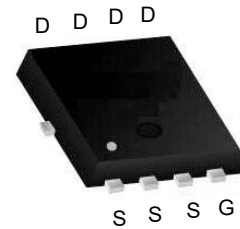
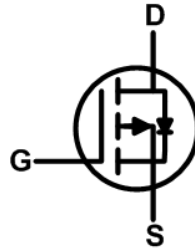
$V_{DS} = -30V$
 $I_D = -70A$
 $R_{DS(ON)} \leq 7.2m\Omega (V_{GS} = 10V)$

● General Description

The TPM0730N5X is the high cell density trenched P-ch MOSFETs, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

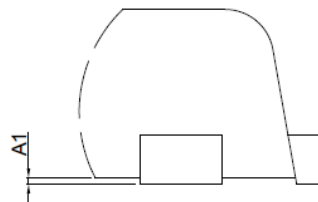
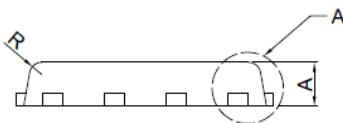
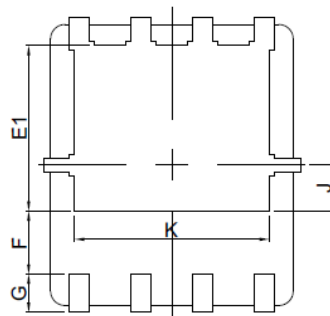
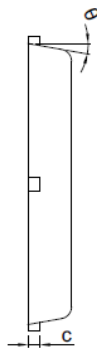
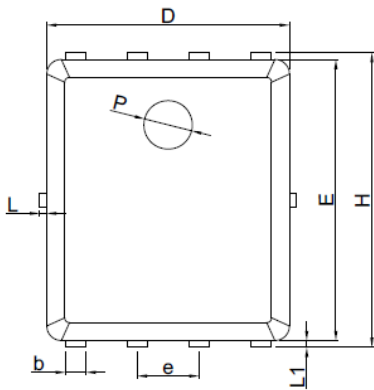
The TPM0730N5X meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

● Pin Configurations



● Package Information

PDFN5X6-8L



DETAIL "A"

SYMBOL	MIN	NOM	MAX
A	0.80	0.90	1.00
A ₁	0.00	0.03	0.05
b	0.35	0.42	0.49
c	0.254REF		
D	4.90	5.00	5.10
F	1.40REF		
E	5.70	5.80	5.90
e	1.27BSC		
H	5.95	6.08	6.20
L1	0.10	0.14	0.18
G	0.60REF		
K	4.00REF		
L	—	—	0.15
J	0.95BSC		
P	1.00REF		
E1	3.40REF		
θ	6°	10°	14°
R	0.25REF		

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● 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	-70	A
	TA=100°C		-50	
Drain Current (Pulse) *B		I_{DM}	-200	A
Power Dissipation	TA=25°C	P_D	90	W
	TA=100°C		54	
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150	°C
Single Pulse Avalanche Energy		E_{AS}	80	mJ
Thermal Resistance ,Junction-to-Ambient		$R_{\theta JA}$	50	°C/W

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$	--	--	-1	uA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-1.2	--	-2.5	V
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	±100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$	--	--	7.2	mΩ
		$V_{GS}=-4.5V, I_D=-15A$	--	--	12	mΩ
Diode Forward Voltage	V_{SD}	$I_{SD}=-1A, V_{GS}=0V$	--	--	-1.2	V
Switching						
Total Gate Charge	Q_g	$V_{GS}=-10V, V_{DD}=-15V, I_D=-18A$	--	60	--	nC
Gate- Source Charge	Q_{gs}		--	9	--	nC
Gate- Drain Charge	Q_{gd}		--	15	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=-10V, V_{DD}=-15V, I_D=-20A, R_{GEN}=3.3\Omega$	--	17	--	ns
Turn-on Rise Time	t_r		--	40	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	55	--	ns
Turn-off Fall Time	t_f		--	13	--	ns
Dynamic						
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=-25V, f=1MHz$	--	3450	--	pF
Output Capacitance	C_{oss}		--	255	--	pF
Reverse Transfer Capacitance	C_{rss}		--	140	--	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.



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● TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

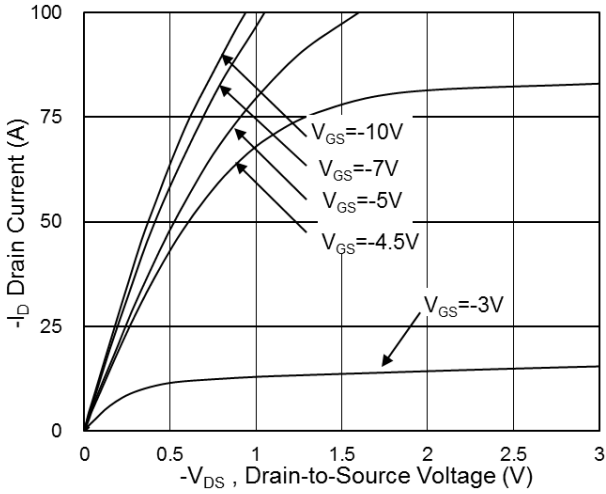


Fig.1 Typical Output Characteristics

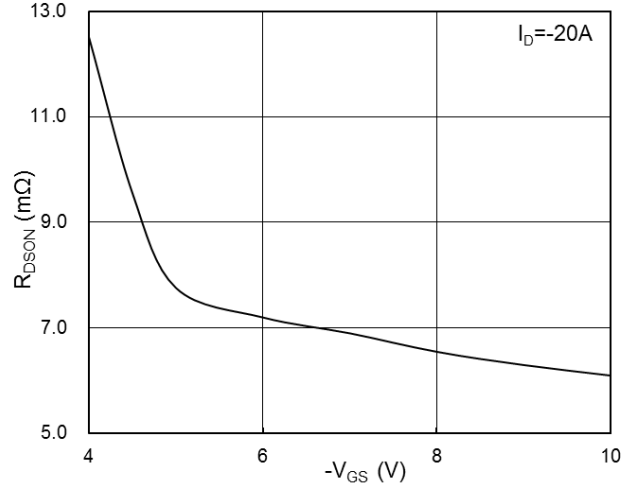


Fig.2 On-Resistance vs. Gate-Source Voltage

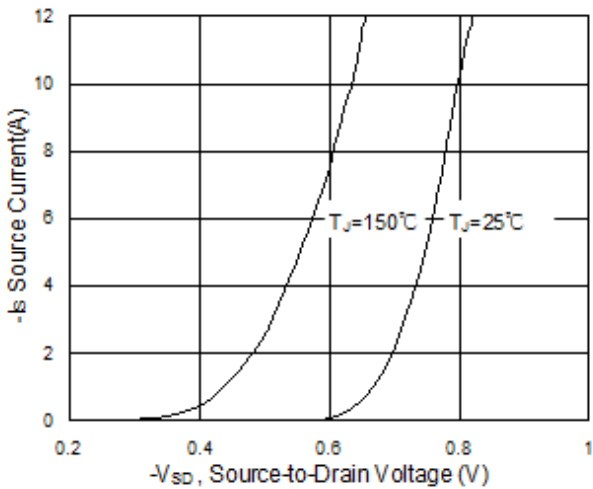


Fig.3 Forward Characteristics of Reverse

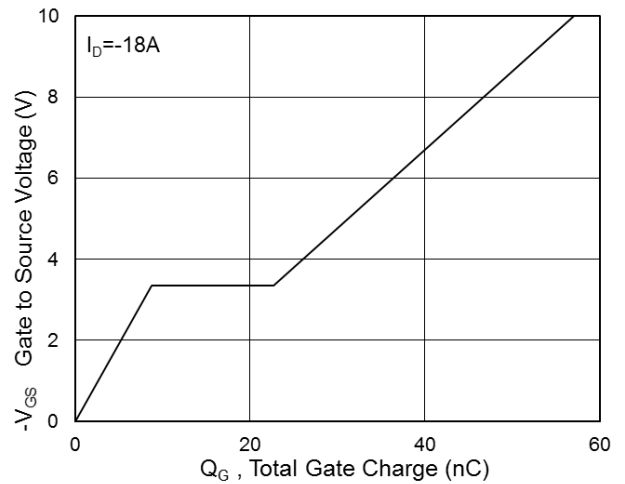


Fig.4 Gate-Charge Characteristics

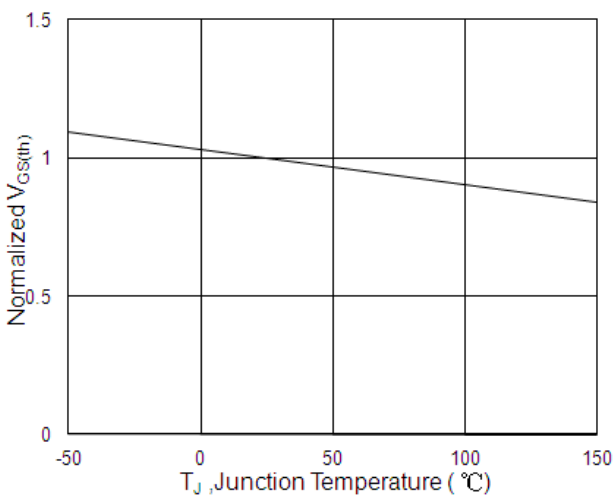


Fig.5 Normalized $-V_{GS(th)}$ vs. T_J

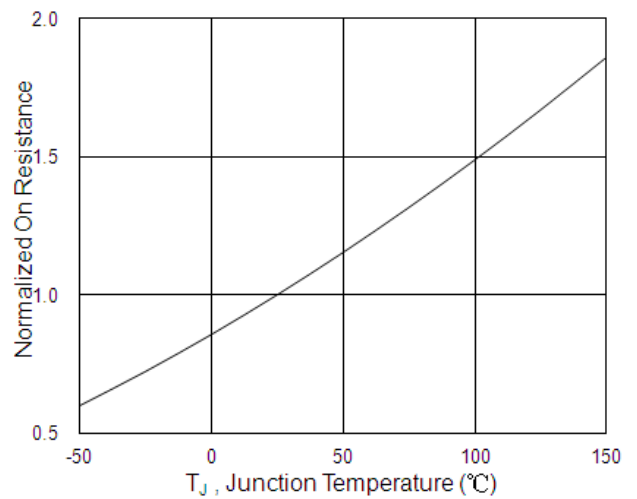


Fig.6 Normalized $R_{DS(on)}$ vs. T_J



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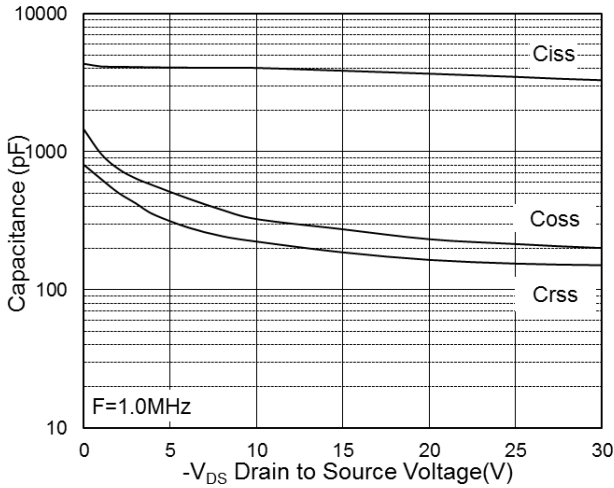


Fig.7 Capacitance

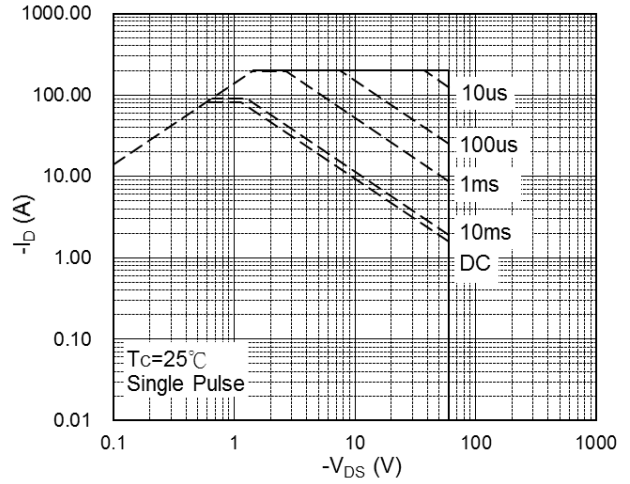


Fig.8 Safe Operating Area

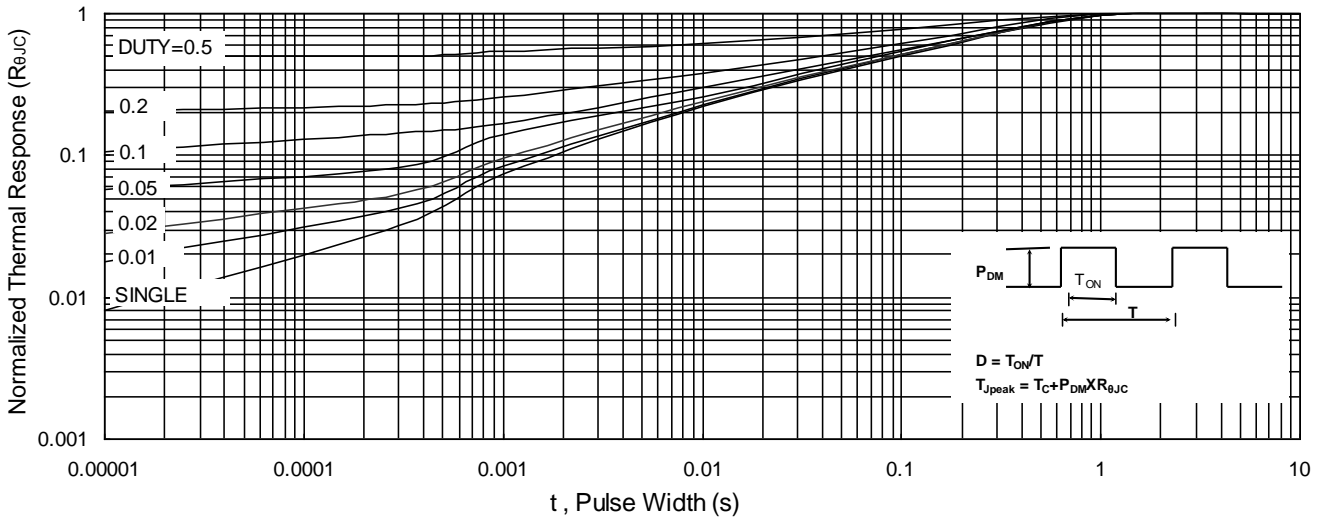


Fig.9 Normalized Maximum Transient Thermal Impedance

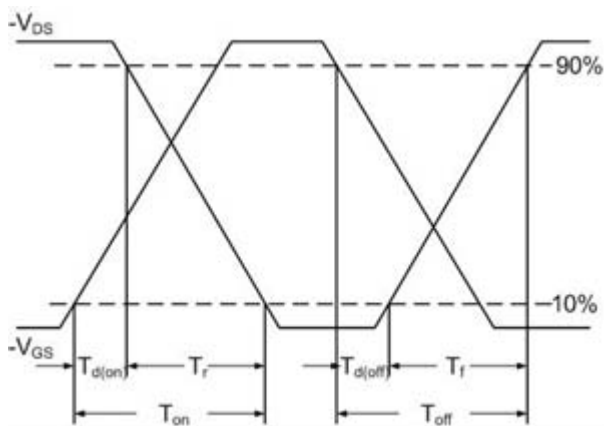


Fig.10 Switching Time Waveform

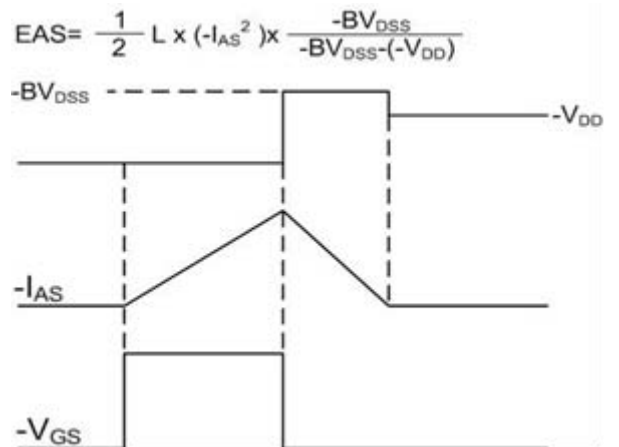


Fig.11 Unclamped Inductive Switching Waveform