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TPM1509PHD8
P-Channel MOSFET

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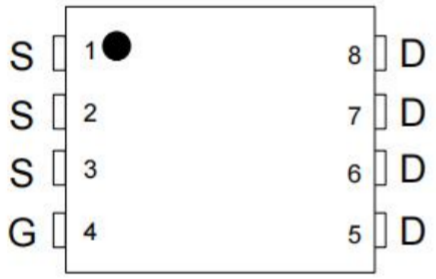
Product Summary

- V_{DS} -150 V
- I_{DS} -9.0A
- $R_{DS\ (ON)}$ (at V_{GS}=-10V) <296mΩ

Application

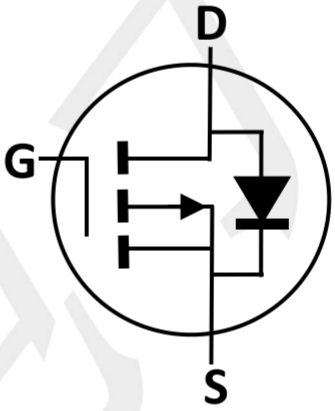
- Load switch
- Portable equipment and battery Powered systems
- Active Clamp in Intermediate DC/DC Power Supplies

Package and Pin Configuration



PDFN3X3-8

Circuit diagram



Equivalent Circuit

Marking

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	-150	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	-9	A
	T_C=125°C		-4	
Pulsed Drain Current		I_{DM}	-15	A
Total Power Dissipation	T_C=25°C	P_{DTOT}	52	W
Operating Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{stg}	-55 to +150	°C

Thermal Characteristic

PARAMETER		Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance	PCB Mount (Note)	R_{thJA}	81	°C/W

Note : When mounted on 1" square PCB (FR4 material).

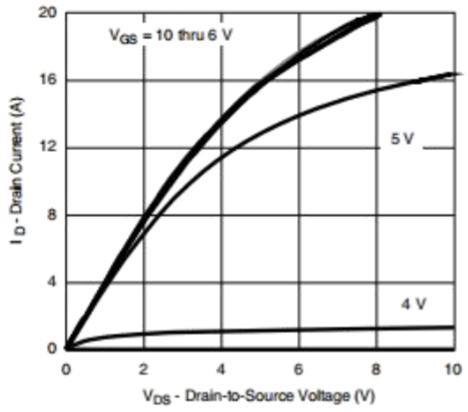
Electrical Characteristics (T_A=25℃unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	BV_{DSS}	-150	--	--	V
Gate-Source Threshold Voltage	V_{DS}=V_{GS}, I_D= -250μA	$V_{GS(th)}$	-2	-3	-4	V
Gate-Source Leakage	V_{DS}=0V, V_{GS}= ±20V	I_{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V_{DS}= -120V, V_{GS}=0V	I_{DSS}	--	--	-1	μA
	V_{DS}= -120V, T_J=55°C		--	--	-10	μA
Drain-Source On-State Resistance (Note 1)	V_{GS}= -10V, I_D= -1A	R_{DS}(on)	--	242	296	mΩ
	V_{GS}= -10V, T_J= 125°C		--	420	--	
	V_{GS}= -6V, I_D= -3A		--	261	316	
Forward Transconductance (Note 2)	V_{DS}= -15V, I_D= -4A	g_{fs}	--	12	--	S
Dynamic (Note 2)						
Total Gate Charge (Note 3)	V_{DS} = -75V, I_D = -3A, V_{GS} = -6V	Q_g	--	23.2	35	nC
Gate-Source Charge (Note 3)		Q_{gs}	--	5.4	--	
Gate-Drain Charge (Note 3)		Q_{gd}	--	8.4	--	
Input Capacitance	V_{DS} = -50V, V_{GS} = 0V, F= 1.0MHz	C_{iss}	--	1190	--	pF
Output Capacitance		C_{oss}	--	61	--	
Reverse Transfer Capacitance		C_{rss}	--	42	--	
Switching						
Turn-On Delay Time (Note 3)	V_{DD} = -75V, I_D= -3A, V_{GS} = -10V, R_{GEN} = 1Ω	$t_{d(on)}$	--	11	18	nS
Rise Time (Note 3)		t_r	--	28	42	
Turn-Off Delay Time (Note 3)		$t_{d(off)}$	--	52	78	
Fall Time (Note 3)		t_f	--	35	53	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	V_{GS} = 0V, I_F = -3A	V_{SD}	--	-0.8	-1.2	V
Continuous Source Current	Integral reverse diode in the MOSFET	I_S	--	--	-9	A
Pulsed Current (Note 1)		I_{SM}	--	--	-15	A

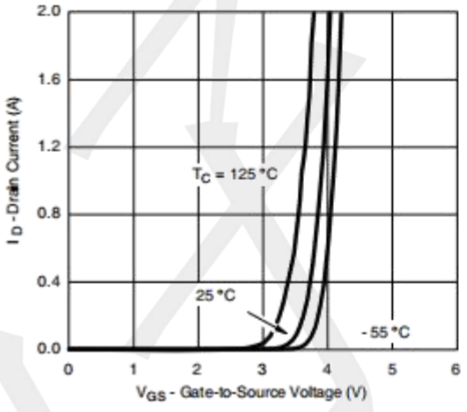
Notes:

1. Pulse test; pulse width ≤ 300 μS, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

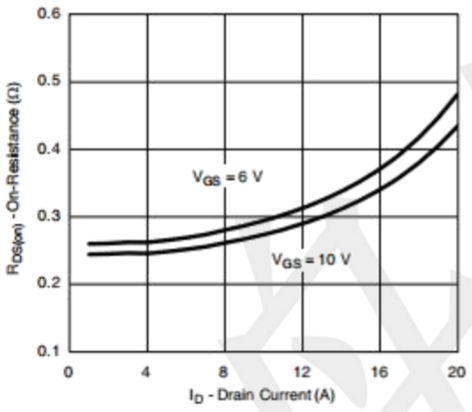
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



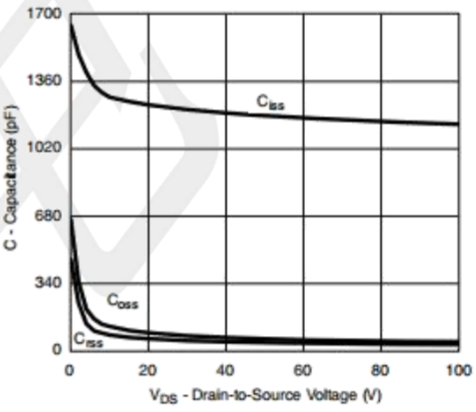
Output Characteristics



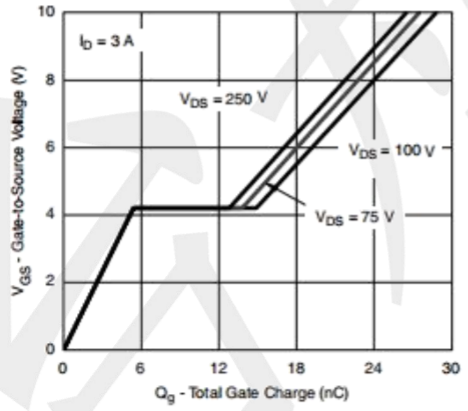
Transfer Characteristics



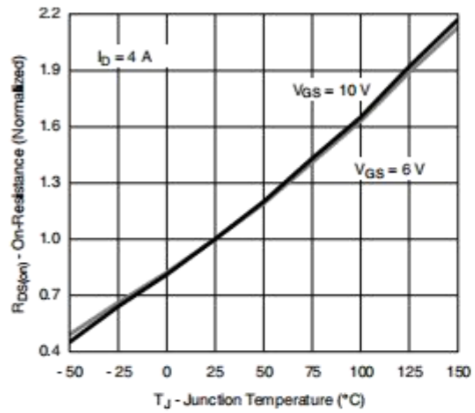
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

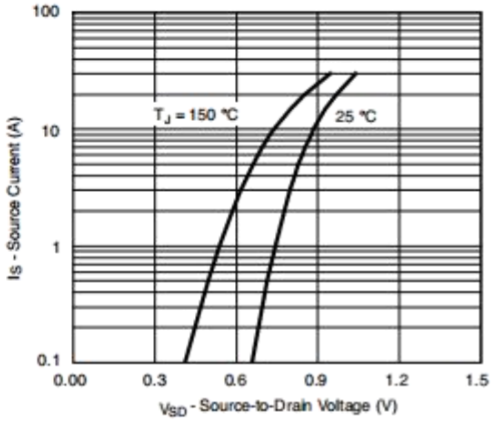


Gate Charge

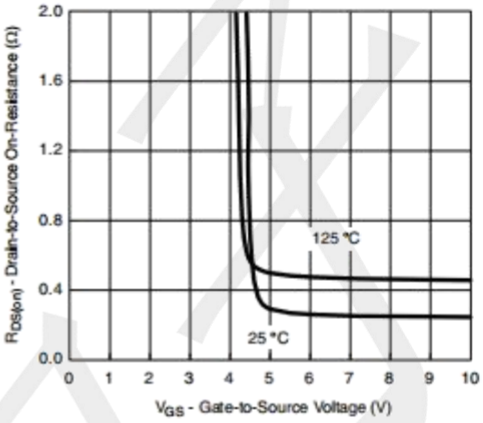


On-Resistance vs. Junction Temperature

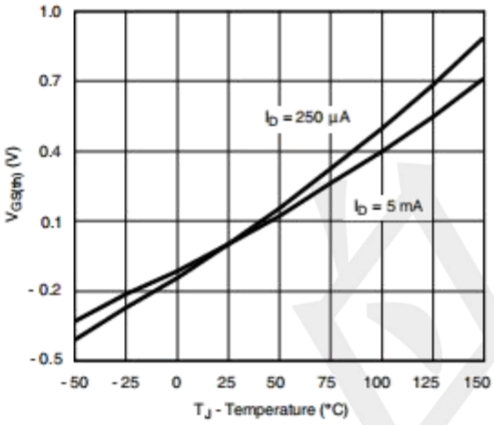
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



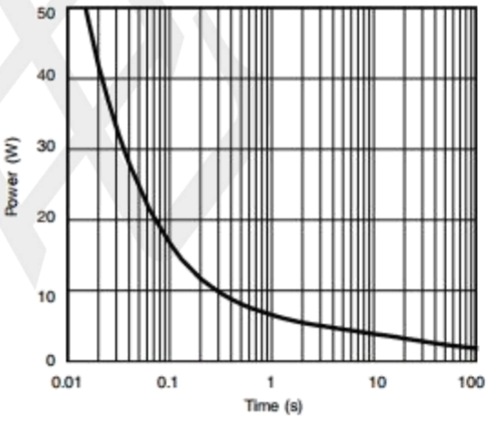
Source-Drain Diode Forward Voltage



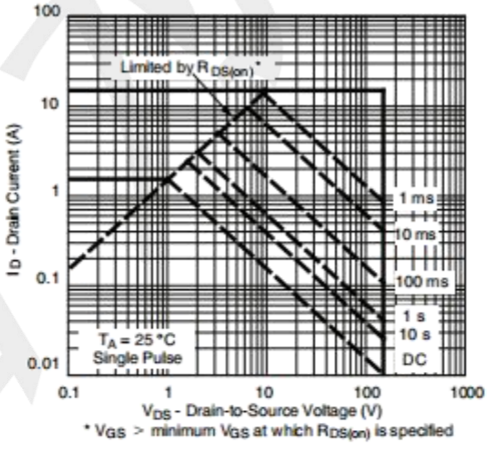
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



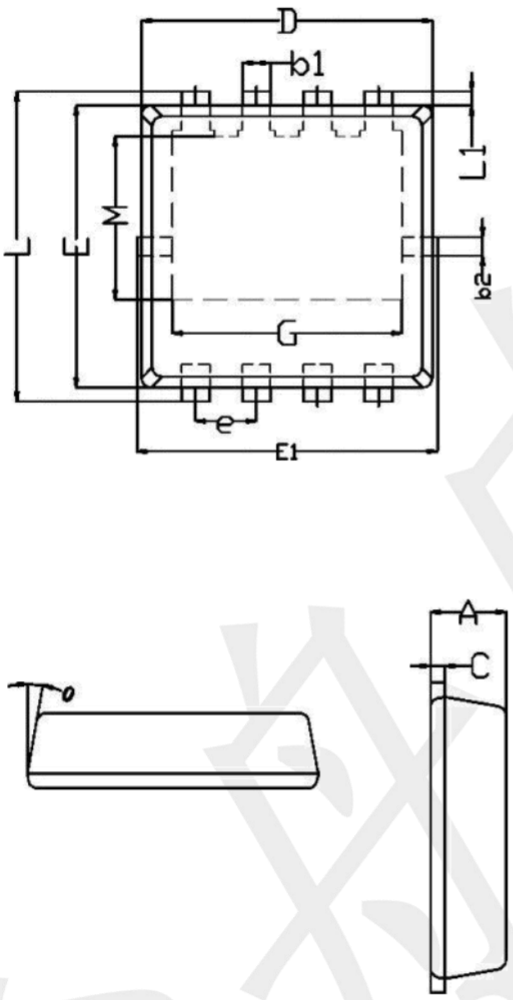
Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Ambient

* The power dissipation PD is based on TJ(max) = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

PDFN3X3-8 Package Information



Syabol	Din in mi		
	Min	Nom	Max
A	0.75	0.80	0.85
LI	0.10	0.15	0.20
bl	0.25	0.30	0.35
b2	0.15	0.20	0.25
C	0.10	0.15	0.20
D	3.050	3.100	3.150
e	0.650OSO		
E	2.950	3.000	3.050
EI	3.150	3.200	3.250
L	3.250	3.300	3.350
M	L685	1.735	1.785
G	2.400	2.450	2.500
0	0"	5,	w

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