

TPM25015PHW3

P-Channel Enhancement Power MOSFET

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Product Summary

- V_{DS} -250 V
- I_{DS} -15A
- $R_{DS(ON)}$ (at $V_{GS} = -10V$) $< 520m\Omega$ (Typ)

Application

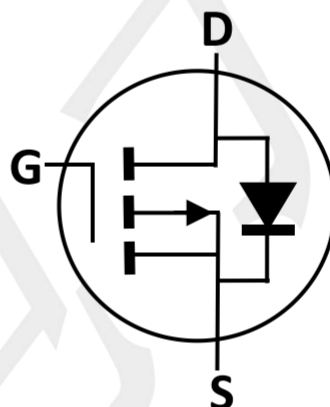
- Reverse Battery protection
- Load switch
- Power management
- PWM Application

Package and Pin Configuration



TO-263

Circuit diagram



Equivalent Circuit

Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V _{DS}	-250	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current	T _C =25°C	I _D	-15	A
	T _C =100°C		-12	A
Pulsed Drain Current (note1)		I _{DM}	-60	A
Maximum Power Dissipation T _C =25°C		P _D	106	W
Operating Junction Temperature Range		T _J	-55 to +150	°C
Storage Temperature Range		T _{stg}	-55 to +150	°C

Thermal Characteristic

PARAMETER	Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	62	$^\circ C/W$
Thermal Resistance Junction-Case	$R_{\theta JC}$	1.21	

notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2 . When mounted on 2" square PCB (FR4 material).

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Electrical Characteristics (T_A=25 °C unless otherwise noted)

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	BV _{DSS}	-250	--	--	V
Gate-Source Threshold Voltage	V _{DS} =V _{GS} , I _D = -250μA	V _{GS(th)}	-2.0	-3.0	-4.0	V
Gate-Source Leakage	V _{DS} =0V, V _{GS} = ±20V	I _{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V _{DS} = -200V, V _{GS} =0V	I _{DSS}	--	-0.1	-1	μA
	V _{DS} = -200V, T _J =125°C		--	-10	-50	μA
Drain-Source On-State Resistance (Note 1)	V _{GS} = -10V, I _D = -3A	R _{DS(on)}	--	520	580	mΩ
	V _{GS} = -6.5V, I _D = -2A		--	550	620	
Forward Transconductance (Note 2)	V _{DS} = -10V, I _D = -2A	g _{fs}	--	9	--	S
Dynamic (Note 2)						
Total Gate Charge (Note 3)	V _{DS} = -100V, I _D = -2A, V _{GS} = -10V	Q _g	--	60	--	nC
Gate-Source Charge (Note 3)		Q _{gs}	--	12	--	
Gate-Drain Charge (Note 3)		Q _{gd}	--	9	--	
Input Capacitance	V _{DS} = -100V, V _{GS} = 0V, F = 1.0MHz	C _{iss}	--	3600	--	pF
Output Capacitance		C _{oss}	--	470	--	
Reverse Transfer Capacitance		C _{rss}	--	180	--	
Switching						
Turn-On Delay Time (Note 3)	V _{DD} = -100V, I _D = -2A, V _{GS} = -10V, R _{GEN} = 6Ω	t _{d(on)}	--	38	--	nS
Rise Time (Note 3)		t _r	--	20	--	
Turn-Off Delay Time (Note 3)		t _{d(off)}	--	126	--	
Fall Time (Note 3)		t _f	--	56	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	V _{GS} = 0V, I _{SD} = -10A	V _{SD}	--	-0.8	-1.2	V
Continuous Source Current	Integral reverse diode in the MOSFET	I _S	--	--	-15	A
Pulsed Current (Note 1)		I _{SM}	--	--	-60	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)

Fig.1 Continuous Drain Current vs. TC

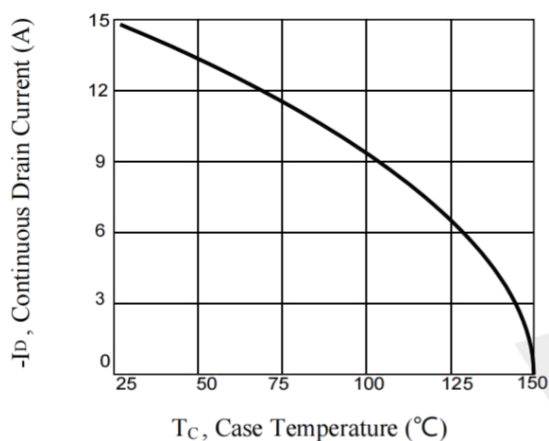


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

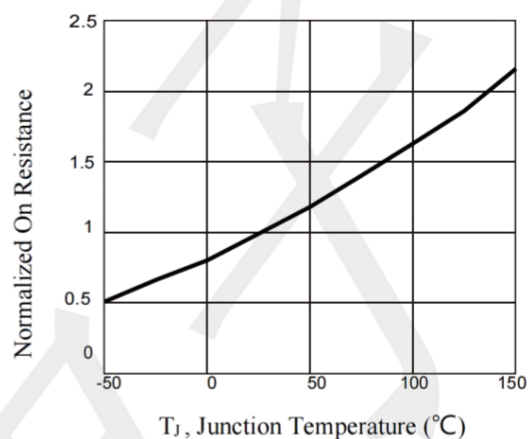


Fig.3 Normalized V_{th} vs. T_J

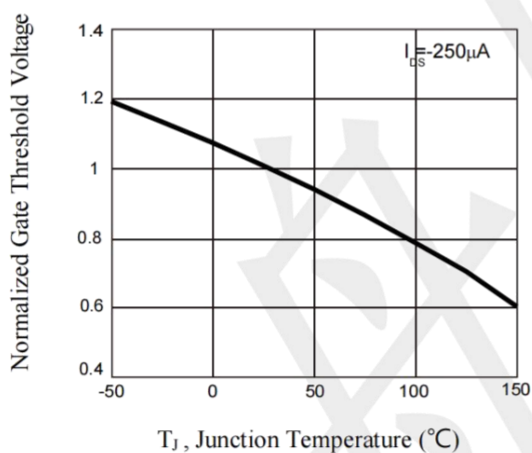


Fig.4 Gate Charge Waveform

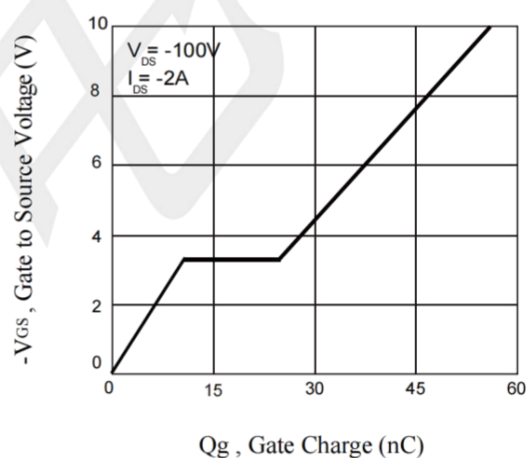


Fig.5 Typical Output Characteristics

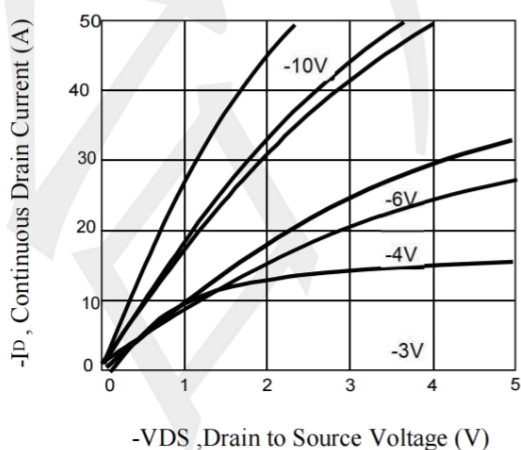
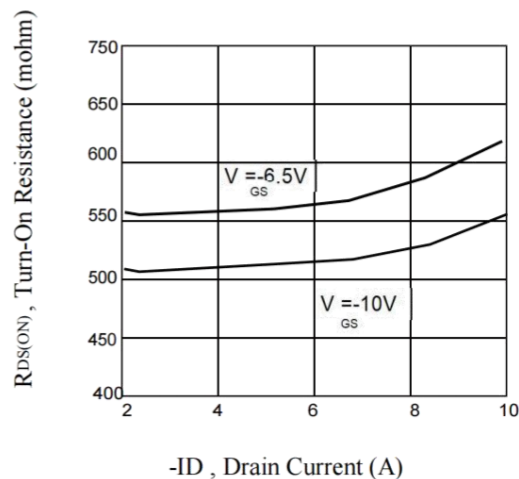
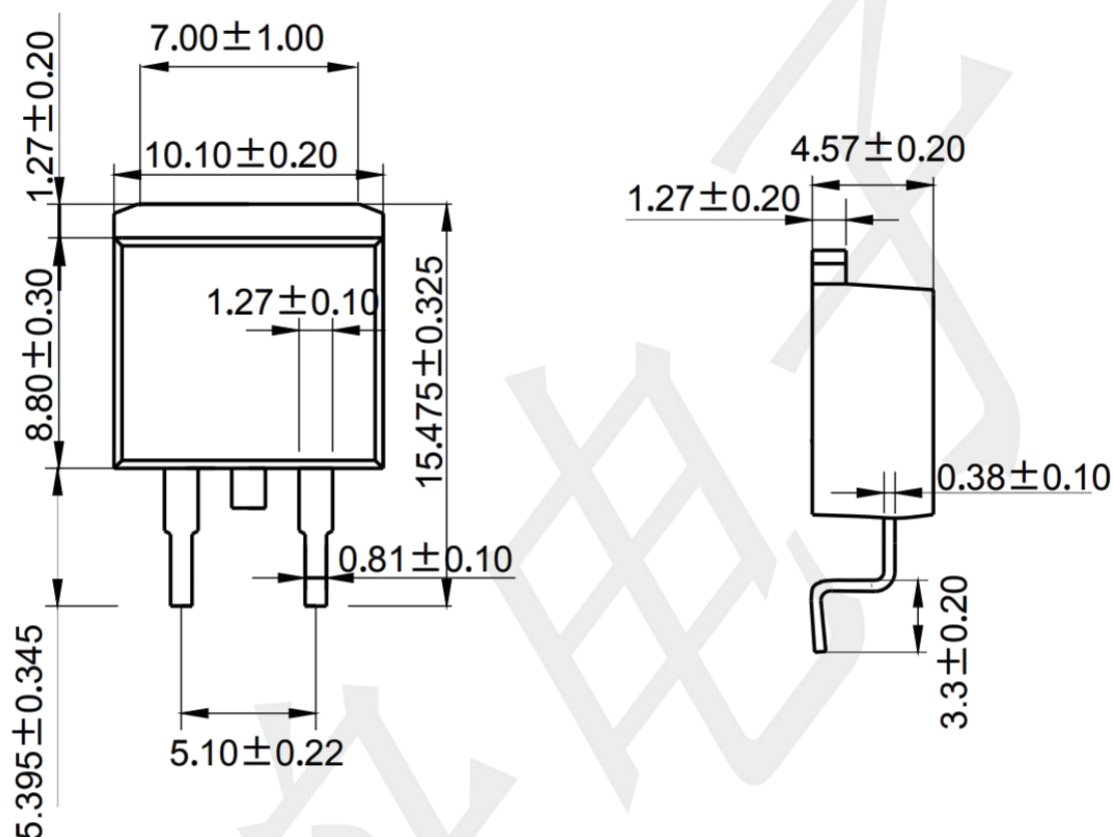


Fig.6 Turn-On Resistance vs. I_D



Package Outline Dimensions (unit: mm)

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Mounting Pad Layout (unit: mm)

