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TPMV164ENER
N-Channel MOSFET

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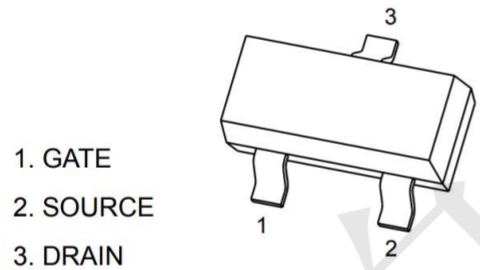
Product Summary

- V_{DS} 60 V
- I_D 3A
- $R_{DS(ON)}$ (V_{GS}=10V) ≤105mΩ
- ESD protected gate, typical 6kV (HBM)

Application

- Interfacing Switching
- Load Switch
- Portable equipment and battery
- DC/DC Converter

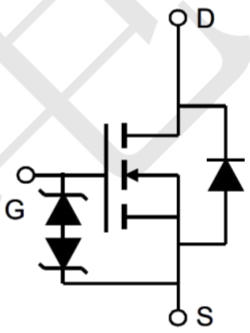
Package and Pin Configuration



1. GATE
2. SOURCE
3. DRAIN

SOT23

Circuit diagram



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

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	3	A
Pulsed Drain Current (t = 100 μs)	I_{DM}	10	A
Electrostatic Discharge Rating Human Body Model	ESD	6.0	KV
Maximum Power Dissipation	P_D	0.35	W
Operating Junction Temperature Range	T_J	+155	℃
Storage Temperature Range	T_{stg}	-55 to +150	℃

Thermal Characteristic

PARAMETER		Symbol	Value	Unit
Thermal Resistance from Junction to Ambient(t≤10s)	PCB Mount (Note)	$R_{\theta JA}$	357	°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= 10μA	BV_{DSS}	60	--	--	V
Gate-Source Threshold Voltage	V_{DS}=V_{GS} , I_D= 250μA	$V_{GS(th)}$	0.5	1.0	2.0	V
Gate-Source Leakage	V_{DS}=0V, V_{GS}= ±20V	I_{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V_{DS}= 60V, V_{GS}=0V	I_{DSS}	--	--	1.0	μA
Drain-Source On-State Resistance (Note 1)	V_{GS}= 10V, I_D= 3A	R_{DS}(on)	--	--	105	mΩ
	V_{GS}= 4.5V, I_D= 3A		--	--	125	
Forward Transconductance (Note 2)	V_{DS}= 15V, I_D= 2A	g_{fs}	--	2.0	--	S
Dynamic (Note 2)						
Input Capacitance	V_{DS} = 30V, V_{GS} = 0V, F= 1.0MHz	C_{iss}	--	247	--	pF
Output Capacitance		C_{oss}	--	34	--	
Reverse Transfer Capacitance		C_{rss}	--	19.5	--	
Switching						
Turn-On Delay Time (Note 3)	V_{DS} = 30V, I_D= 1.5A, V_{GEN}= 10V, R_G = 1Ω	$t_{d(on)}$	--	6.0	--	nS
Rise Time (Note 3)		t_r	--	15	--	
Turn-Off Delay Time (Note 3)		$t_{d(off)}$	--	15	--	
Fall Time (Note 3)		t_f	--	10	--	
Total Gate Charge	V_{DS} = 30V, I_D= 3A, V_{GS}= 4.5V	Q_g	--	6.0	--	nC
Gate-Source Charge		Q_{gs}	--	1.0	--	
Gate-Drain Charge		Q_{gd}	--	1.3	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	V_{GS} = 0V, I_F = 1A	V_{SD}	--	0.85	1.2	V
Continuous Source Current	Integral reverse diode in the MOSFET	I_S	--	--	3	A
Pulsed Current (Note 1)		I_{SM}	--	--	10	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

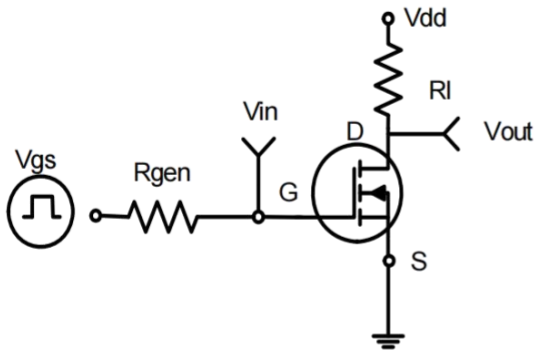


Figure 1:Switching Test Circuit

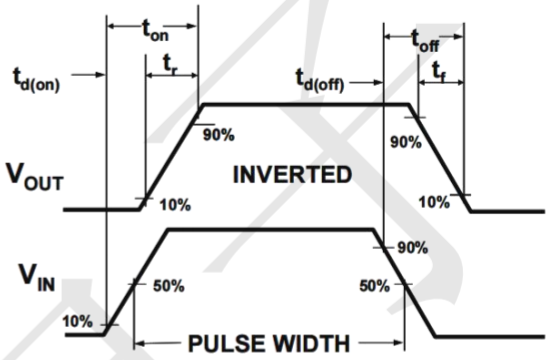


Figure 2:Switching Waveforms

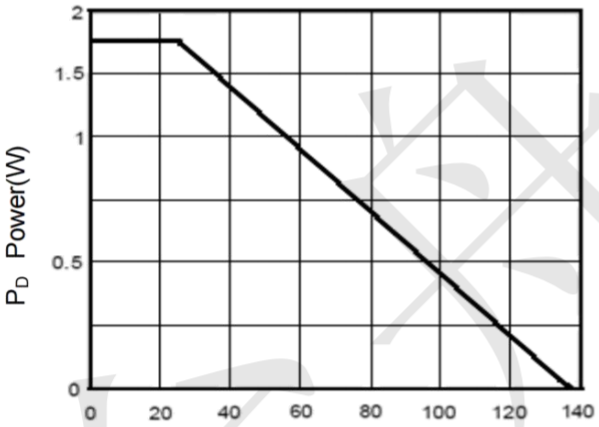


Figure 3 Power Dissipation

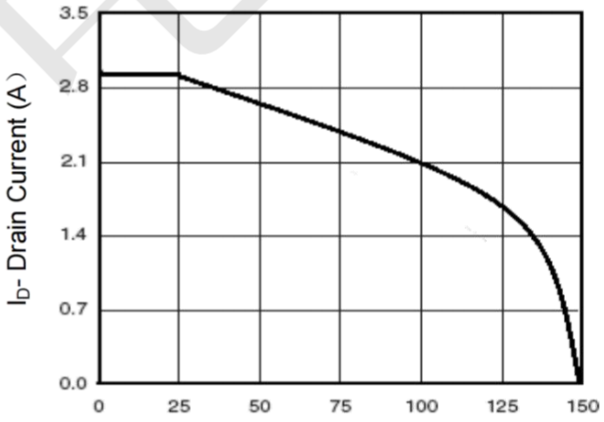


Figure 4 Drain Current

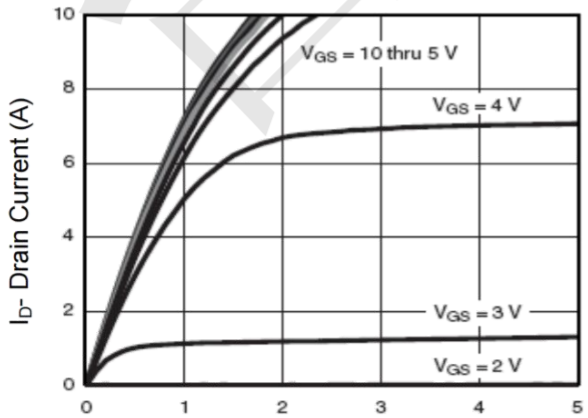


Figure 5 Output Characteristics

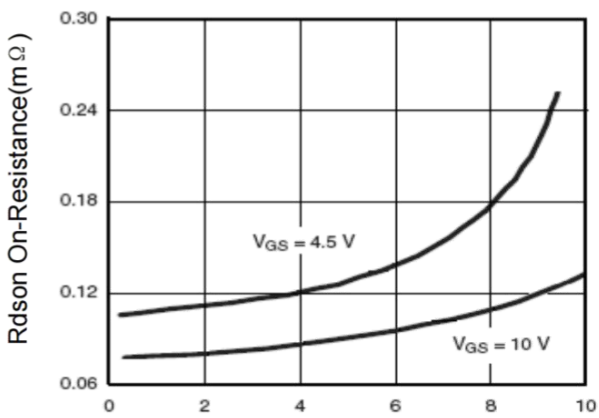


Figure 6 Drain-Source On-Resistance

TYPICAL CHARACTERISTICS

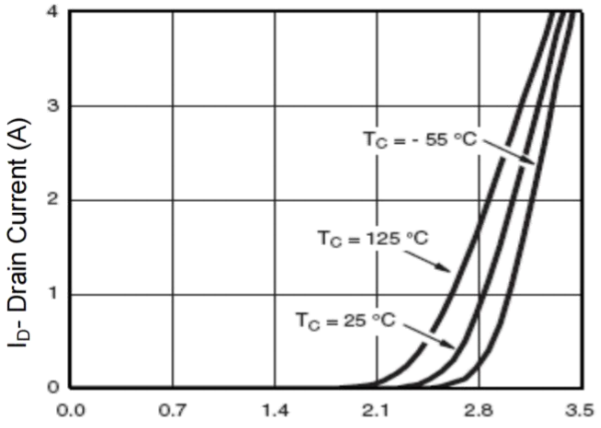


Figure 7 Transfer Characteristics

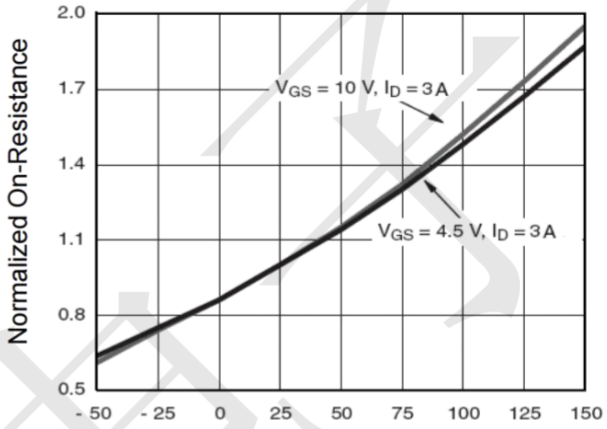


Figure 8 Drain-Source On-Resistance

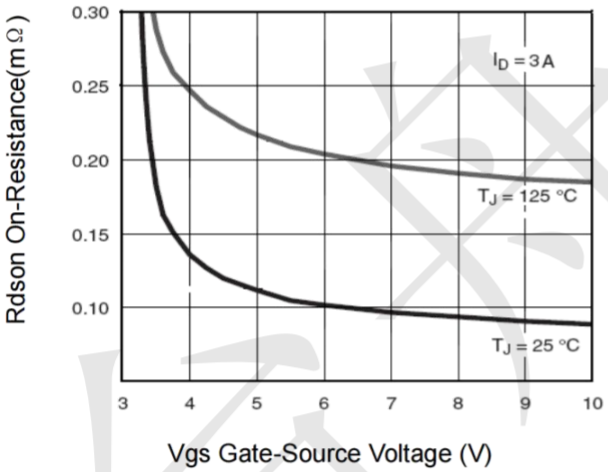


Figure 9 Rdson vs Vgs

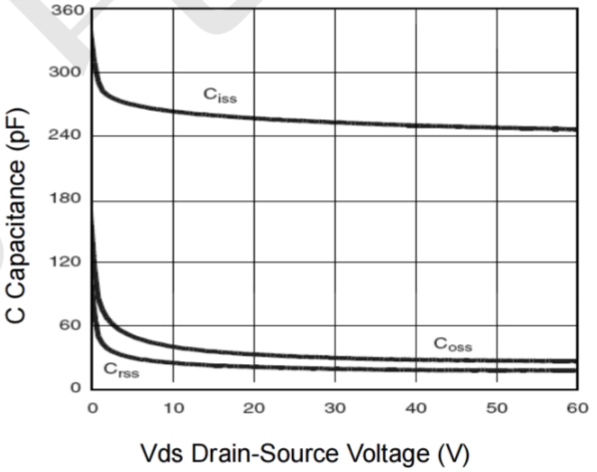


Figure 10 Capacitance vs Vds

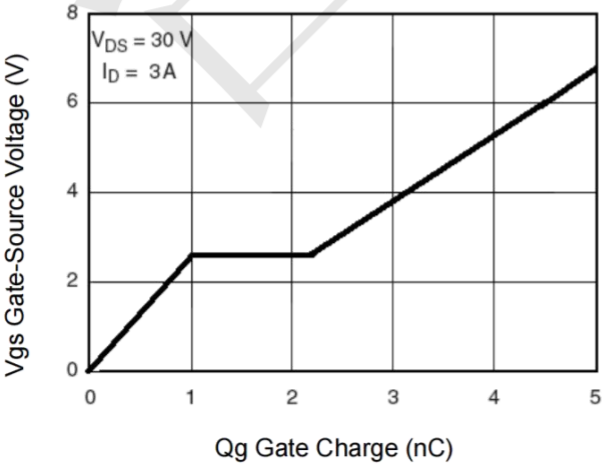


Figure 11 Gate Charge

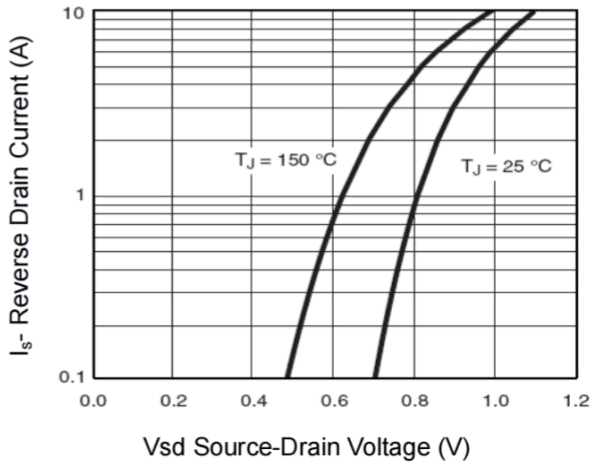


Figure 12 Source- Drain Diode Forward

Package Outline Dimensions (unit: mm)

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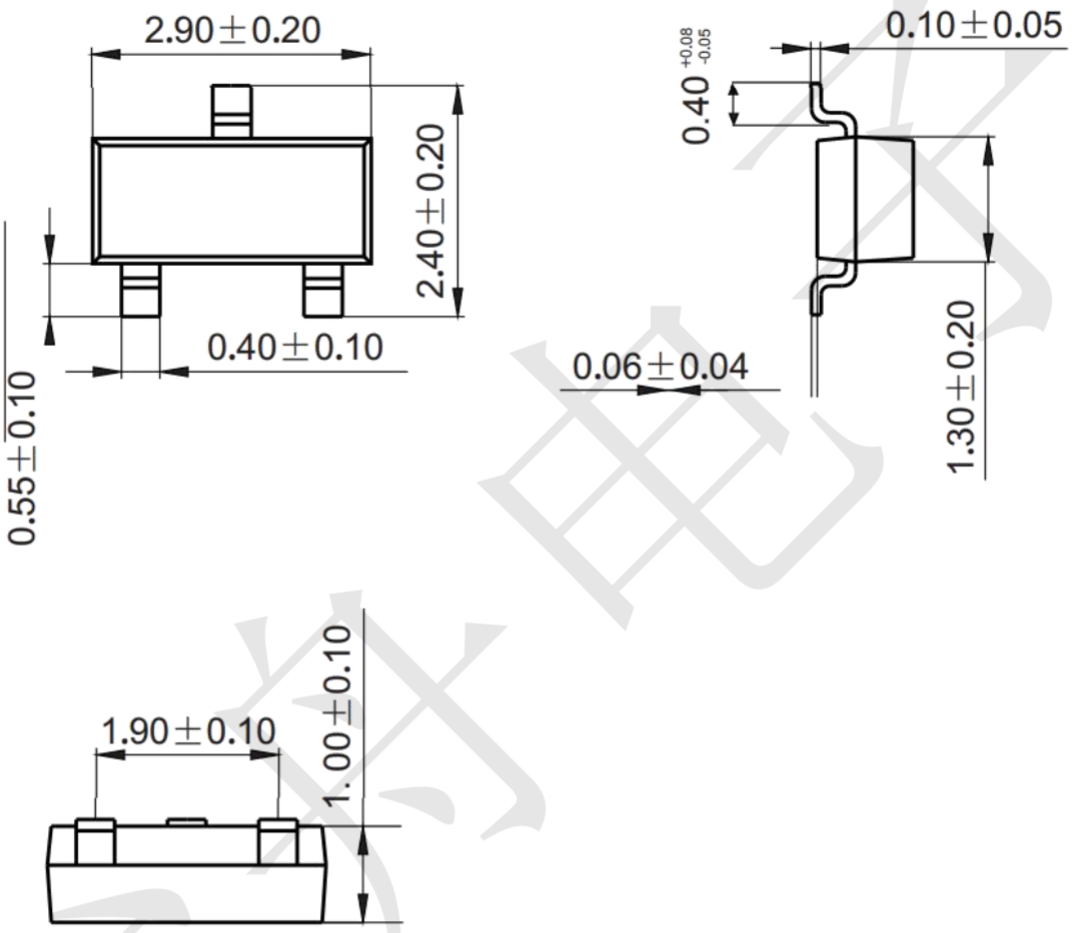

Mounting Pad Layout (unit: mm)

