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TPM30NB1EC6
30V Dual N-Channel MOSFET

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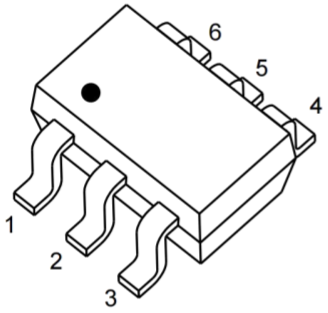
Product Summary

- V_{DS} 30 V
- I_{DS} 800mA
- $R_{DS\ (ON)}$ (at V_{GS}=4.5V) ≤ 450mΩ
- $R_{DS\ (ON)}$ (at V_{GS}=2.5V) ≤ 650mΩ

Application

- Reverse Battery protection
- Load switch
- Power management
- Motor Control

Package and Pin Configuration



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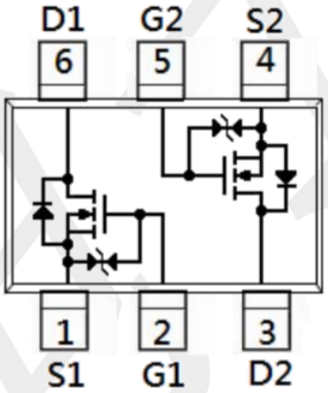
Circuit diagram



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

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current	I_D	800	mA
Drain Current-Pulsed (Note1)	I_{DM}	2100	mA
Total Power Dissipation	P_{DTOT}	0.35	W
Operating Junction Temperature Range	T_J	-55 to +150	℃
Storage Temperature Range	T_{stg}	-55 to +150	℃

Thermal Characteristic

PARAMETER		Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance	PCB Mount (Note2)	R_{thJA}	833	°C/W

Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2.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}	30	--	--	V
Gate-Source Threshold Voltage	V_{DS}=V_{GS} , I_D= 250μA	$V_{GS(th)}$	0.5	0.8	1.2	V
Gate-Source Leakage	V_{DS}=0V, V_{GS}= ±12V	I_{GSS}	--	--	±20	μA
Zero Gate Voltage Drain Current	V_{DS}= 30V, V_{GS}=0V	I_{DSS}	--	--	1	μA
	V_{DS}= 24V, T_J=125°C		--	--	10	μA
Drain-Source On-State Resistance (Note 1)	V_{GS}= 4.5V, I_D= 0.5A	R_{DS}(on)	--	350	450	mΩ
	V_{GS}= 2.5V, I_D= 0.5A		--	450	650	
Forward Transconductance (Note 2)	V_{DS}= 4V, I_D= 0.3A	g_{fs}	--	1.1	--	S
Dynamic (Note 2)						
Total Gate Charge (Note 3)	V_{DS} = 10V, I_D = 0.25A, V_{GS} = 4.5V	Q_g	--	2.6	--	nC
Gate-Source Charge (Note 3)		Q_{gs}	--	0.9	--	
Gate-Drain Charge (Note 3)		Q_{gd}	--	0.6	--	
Input Capacitance	V_{DS} = 16V, V_{GS} = 0V, F= 1.0MHz	C_{iss}	--	72.9	--	pF
Output Capacitance		C_{oss}	--	18.3	--	
Reverse Transfer Capacitance		C_{rss}	--	7.4	--	
Switching						
Turn-On Delay Time (Note 3)	V_{DD} = 10V, I_D= 0.5A, V_{GS} = 4.5V, R_{GEN} = 10Ω	$t_{d(on)}$	--	5.5	--	nS
Rise Time (Note 3)		t_r	--	4.1	--	
Turn-Off Delay Time (Note 3)		$t_{d(off)}$	--	14.5	--	
Fall Time (Note 3)		t_f	--	6.5	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	V_{GS} = 0V, I_F = 0.5A	V_{SD}	--	0.8	1.2	V

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

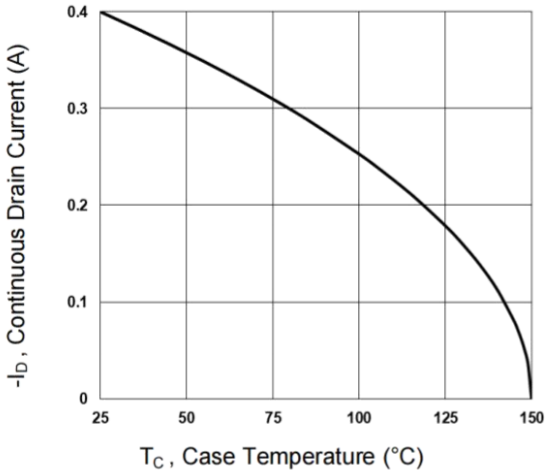


Figure 1. Continuous Drain Current vs. T_C

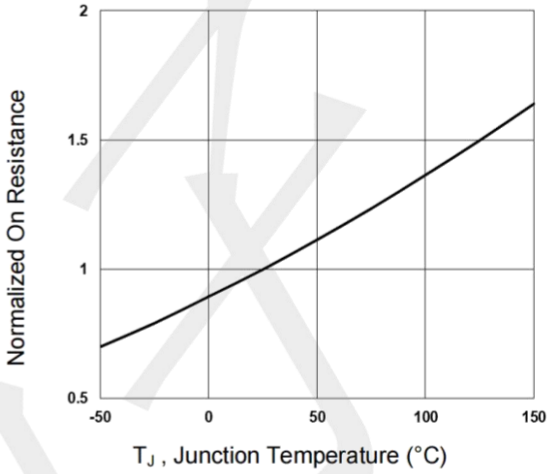


Figure 2. Normalized R_{DSON} vs. T_J

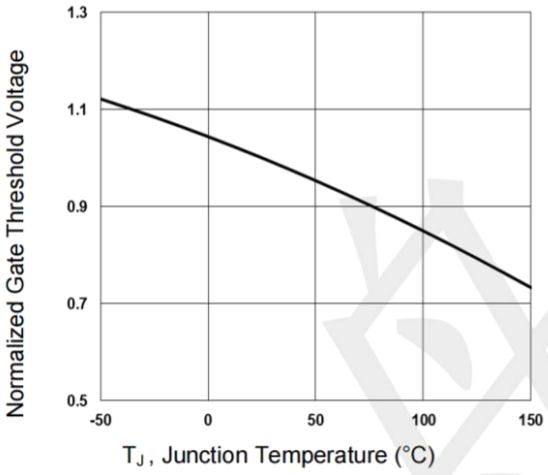


Figure 3. Normalized V_{th} vs. T_J

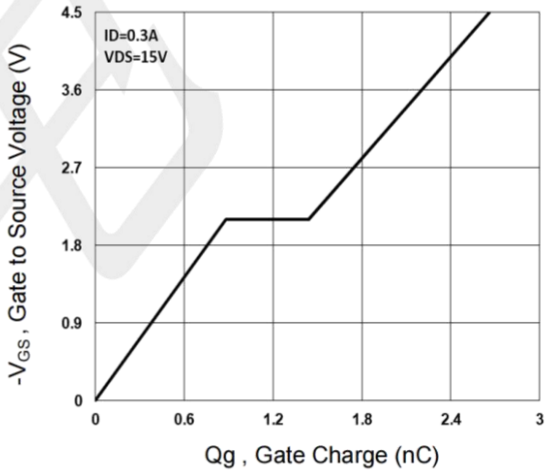


Figure 4. Gate Charge Waveform

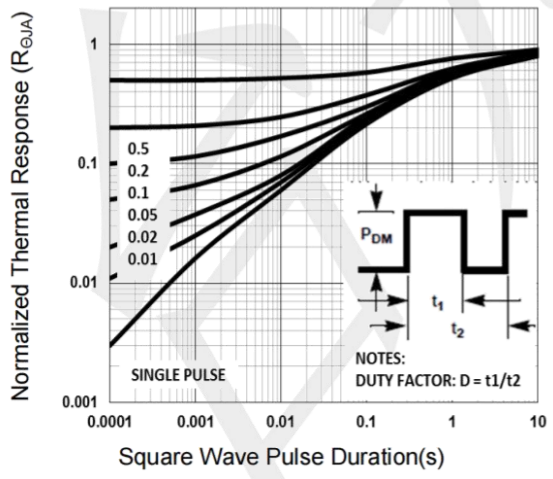


Figure 5. Normalized Transient Response

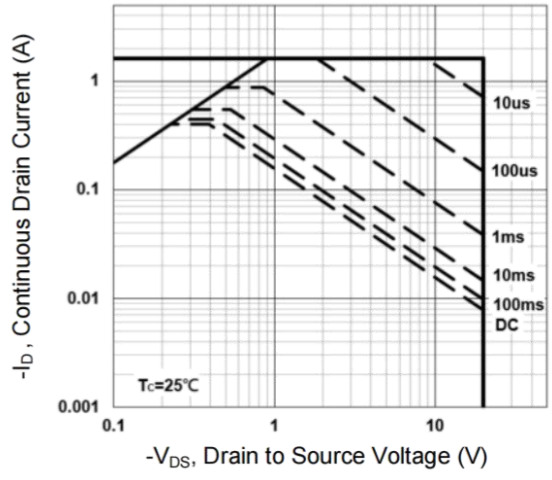


Figure 6. Maximum Safe Operation Area

Package information (Unit: mm)

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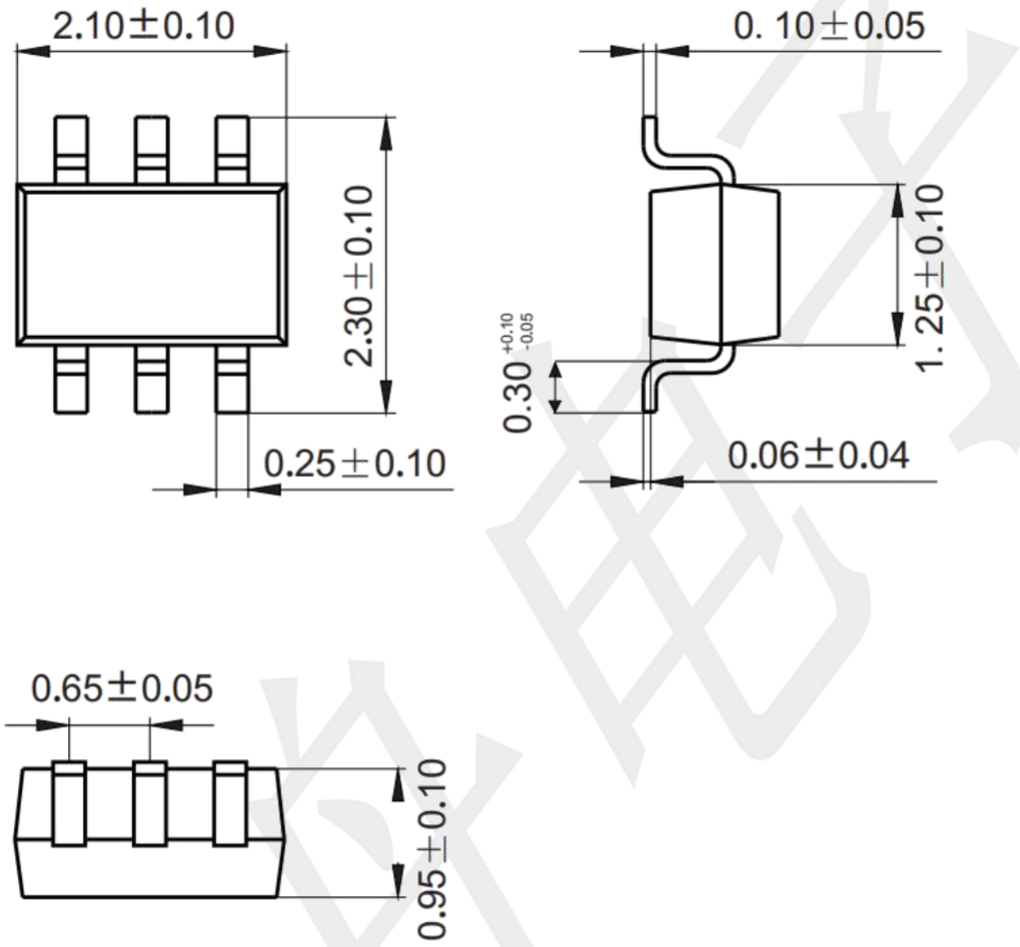

Mounting Pad Layout (unit: mm)