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AO6404

N-Channel Enhancement Mode MOSFET

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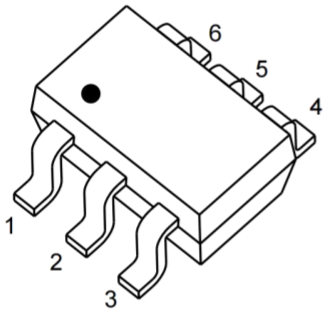
Product Summary

- V_{DS} 20 V
- I_{DS} 9.1A
- $R_{DS\ (ON)}$ (at V_{GS}=4.5V) ≤ 17mΩ
- $R_{DS\ (ON)}$ (at V_{GS}=2.5V) ≤ 24mΩ
- ESD protected gate typical

Application

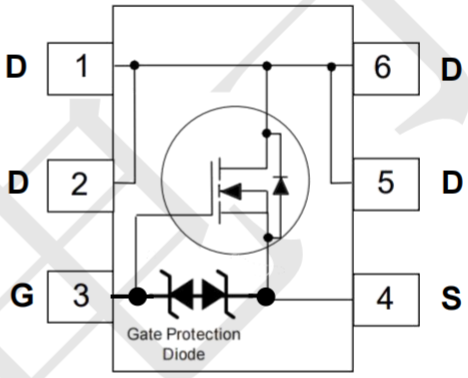
- Reverse Battery protection
- Load switch
- Power management
- Motor Control

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}	20	V
Gate-Source Voltage	V_{GS}	±10	V
Continuous Drain Current	I_D	9.1	A
Drain Current-Pulsed (Note1)	I_{DM}	30	A
Total Power Dissipation	P_{DTOT}	0.66	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}	120	°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}	20	--	--	V
Gate-Source Threshold Voltage	V_{DS}=V_{GS} , I_D= 250μA	$V_{GS(th)}$	0.4	0.6	0.9	V
Gate-Source Leakage	V_{DS}=0V, V_{GS}= ±10V	I_{GSS}	--	--	±10	uA
Zero Gate Voltage Drain Current	V_{DS}= 20V, V_{GS}=0V	I_{DSS}	--	--	1	μA
	V_{DS}= 20V, T_J=125°C		--	--	10	μA
Drain-Source On-State Resistance (Note 1)	V_{GS}= 4.5V, I_D= 3.0A	R_{DS}(on)	--	13	17	mΩ
	V_{GS}= 2.5V, I_D= 2.0A		--	18	24	
Forward Transconductance (Note 2)	V_{DS}= 8V, I_D= 2.0A	g_{fs}	--	9	--	S
Dynamic (Note 2)						
Total Gate Charge (Note 3)	V_{DS} = 10V, I_D = 3.0A, V_{GS} = 4.5V	Q_g	--	15	--	nC
Gate-Source Charge (Note 3)		Q_{gs}	--	2.0	--	
Gate-Drain Charge (Note 3)		Q_{gd}	--	5.5	--	
Input Capacitance	V_{DS} = 10V, V_{GS} = 0V, F= 1.0MHz	C_{iss}	--	700	--	pF
Output Capacitance		C_{oss}	--	132	--	
Reverse Transfer Capacitance		C_{rss}	--	114	--	
Switching						
Turn-On Delay Time (Note 3)	V_{DD} = 10V, I_D= 3.0A, V_{GS} = 4.5V, R_{GEN} = 10Ω	$t_{d(on)}$	--	9.0	--	nS
Rise Time (Note 3)		t_r	--	25	--	
Turn-Off Delay Time (Note 3)		$t_{d(off)}$	--	37	--	
Fall Time (Note 3)		t_f	--	14	--	
Source-Drain Diode Ratings and Characteristics (Note 2)						
Forward Voltage	V_{GS} = 0V, I_F = 1.0A	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

Figure1: Output Characteristics

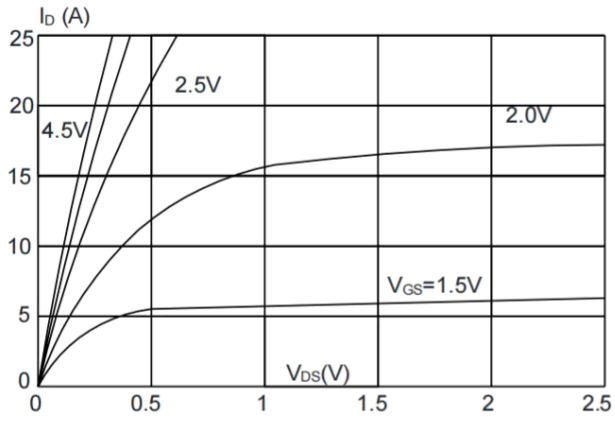


Figure 2: Typical Transfer Characteristics

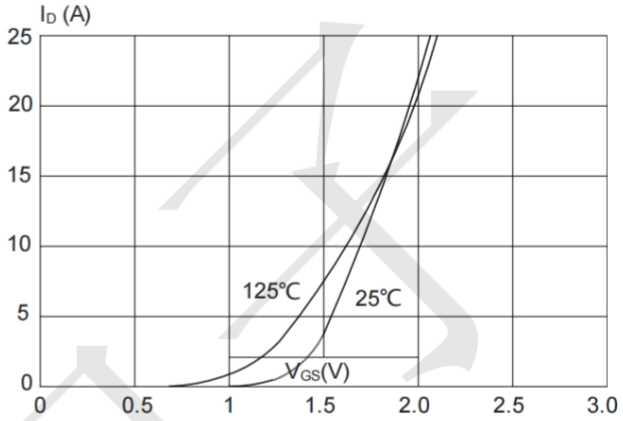


Figure 3: On-resistance vs. Drain Current

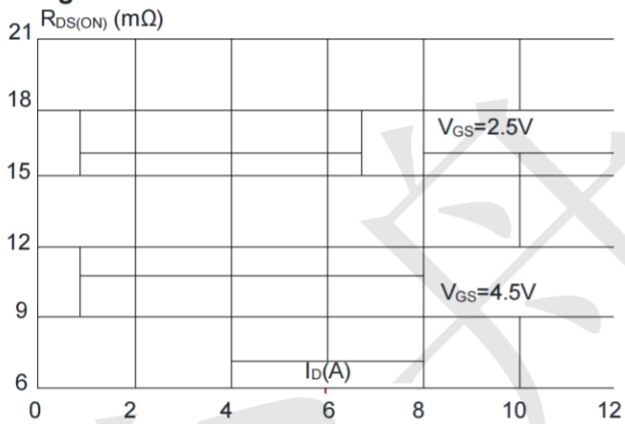


Figure 4: Body Diode Characteristics

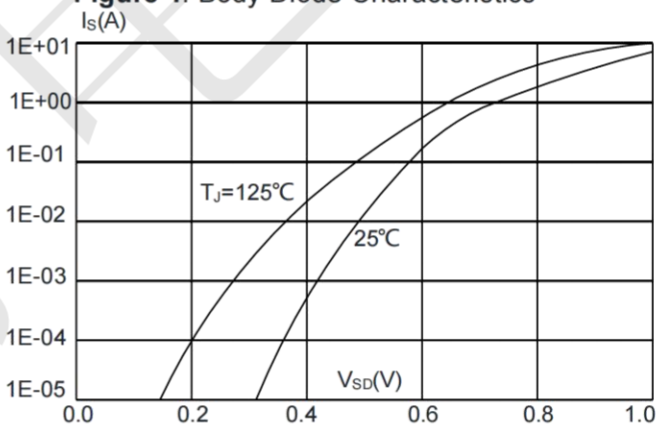


Figure 5: Gate Charge Characteristics

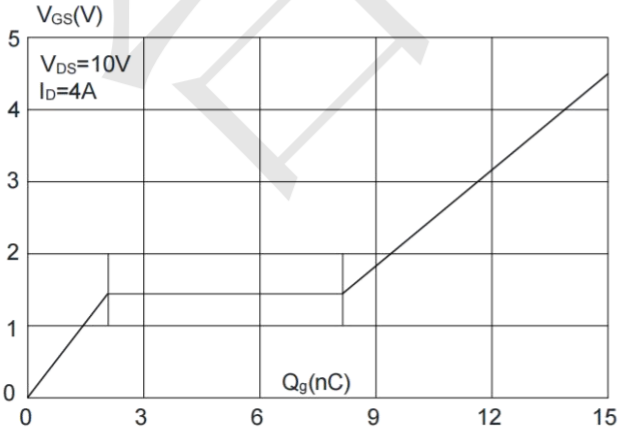
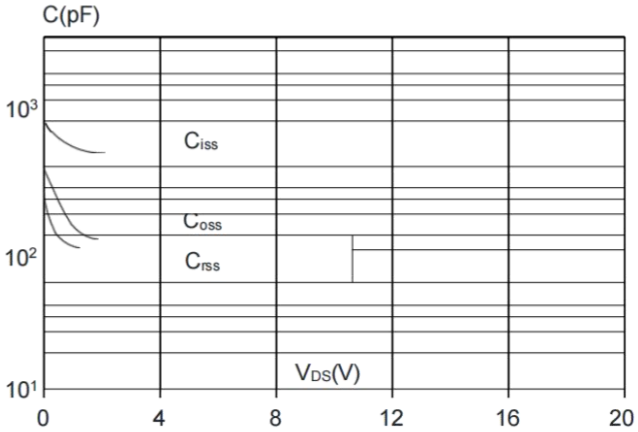
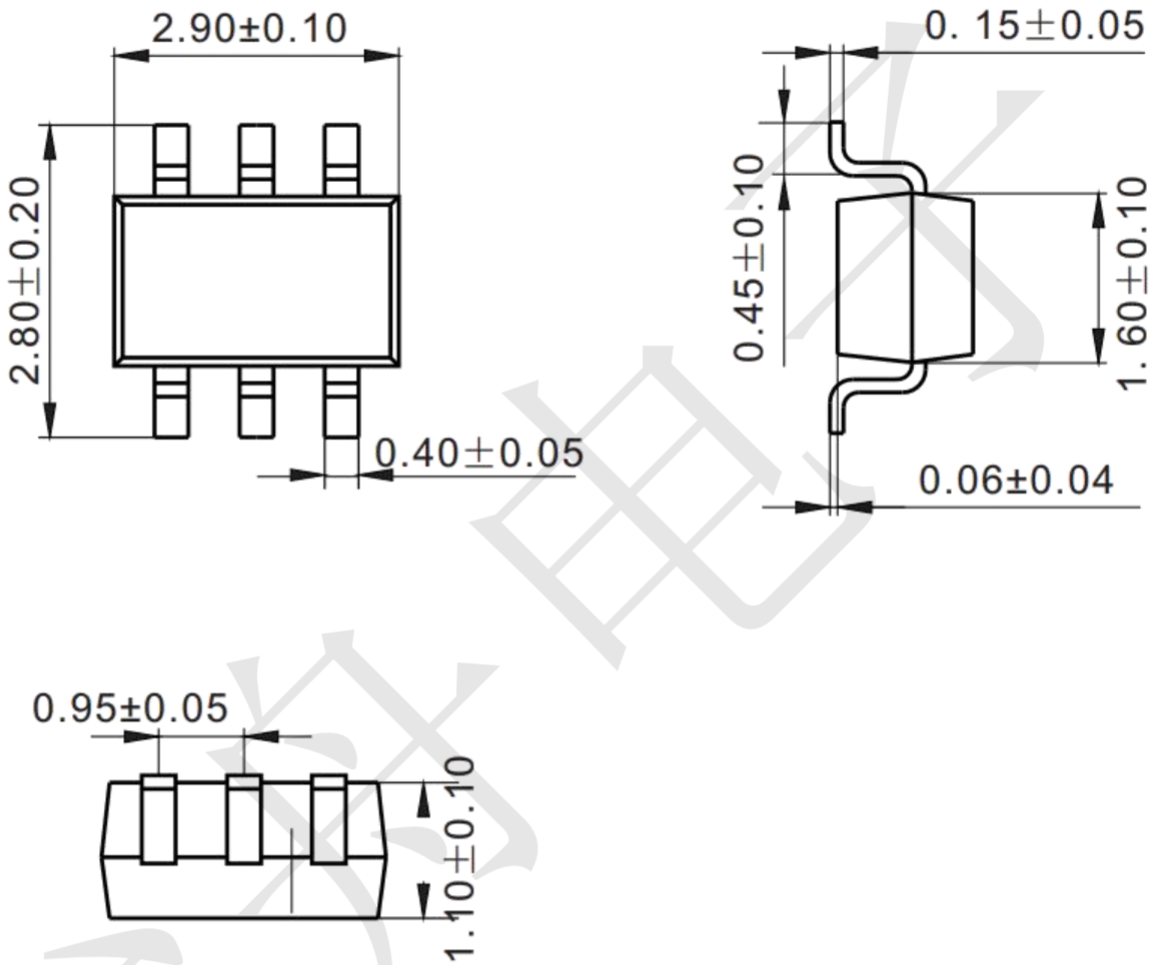


Figure 6: Capacitance Characteristics



Package information (Unit: mm)

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Mounting Pad Layout (unit: mm)

