

AON6418-VB Datasheet

N-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^{a, e}	Q_g (Typ.)
30	0.003 at $V_{GS} = 10$ V	120	71 nC
	0.005 at $V_{GS} = 4.5$ V	90	

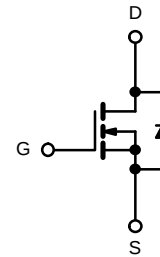
FEATURES

- Trench Power MOSFET
- 100 % R_g and UIS Tested



APPLICATIONS

- Notebook PC Core
- VRM/POL



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$	A
		$T_C = 70^\circ\text{C}$	
		$T_A = 25^\circ\text{C}$	
		$T_A = 70^\circ\text{C}$	
Pulsed Drain Current	I_{DM}	250	mJ
Avalanche Current Pulse	I_{AS}	56	
Single Pulse Avalanche Energy	E_{AS}	60	
Continuous Source-Drain Diode Current	I_S	$T_C = 25^\circ\text{C}$	A
		$T_A = 25^\circ\text{C}$	
Maximum Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	W
		$T_C = 70^\circ\text{C}$	
		$T_A = 25^\circ\text{C}$	
		$T_A = 70^\circ\text{C}$	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, d}	R_{thJA}	41	50	$^\circ\text{C/W}$
Maximum Junction-to-Case	R_{thJC}	0.7	0.9	

Notes:

a. Based on $T_C = 25^\circ\text{C}$.

b. Surface mounted on 1" x 1" FR4 board.

c. $t = 10$ s.

d. Maximum under steady state conditions is 90°C/W .

e. Calculated based on maximum junction temperature. Package limitation current is 80 A.

SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min .	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	30			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = 250 μA		35		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			- 5.5		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.0		2.5	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V			1	μA
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 55 °C			10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	80			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 32 A		0.003		Ω
		V _{GS} = 4.5 V, I _D = 29 A		0.005		
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 32 A		130		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = 12.5 V, V _{GS} = 0 V, f = 1 MHz			3200	pF
Output Capacitance	C _{oss}				1025	
Reverse Transfer Capacitance	C _{rss}				970	
Total Gate Charge	Q _g	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 32 A			71	nC
		V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 29 A			61.5	
Gate-Source Charge	Q _{gs}				34	
Gate-Drain Charge	Q _{gd}				29	
Gate Resistance	R _g	f = 1 MHz		1.4	2.1	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 15 V, R _L = 0.555 Ω I _D ≅ 27 A, V _{GEN} = 10 V, R _g = 1 Ω		18	27	ns
Rise Time	t _r			11	17	
Turn-Off Delay Time	t _{d(off)}			70	105	
Fall Time	t _f			10	15	
Turn-On Delay Time	t _{d(on)}	V _{DD} = 15 V, R _L = 0.625 Ω I _D ≅ 24 A, V _{GEN} = 4.5 V, R _g = 1 Ω		55	83	
Rise Time	t _r			180	270	
Turn-Off Delay Time	t _{d(off)}			55	83	
Fall Time	t _f			12	18	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			80	A
Pulse Diode Forward Current ^a	I _{SM}				100	
Body Diode Voltage	V _{SD}	I _S = 22 A		0.8	1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 20 A, di/dt = 100 A/μs, T _J = 25 °C		52	78	ns
Body Diode Reverse Recovery Charge	Q _{rr}			70.2	105	nC
Reverse Recovery Fall Time	t _a			27		ns
Reverse Recovery Rise Time	t _b			25		

Notes:

a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

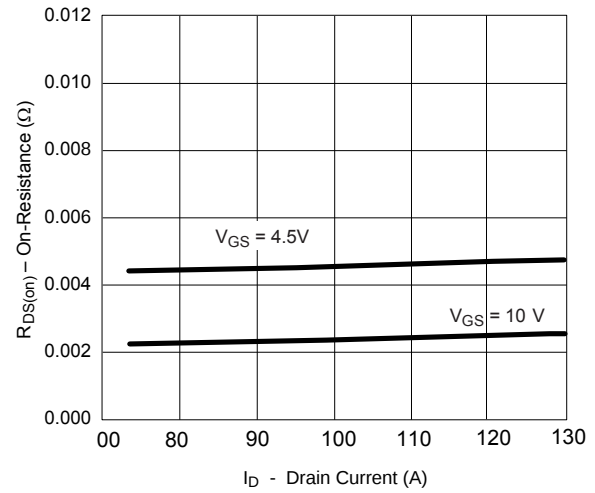
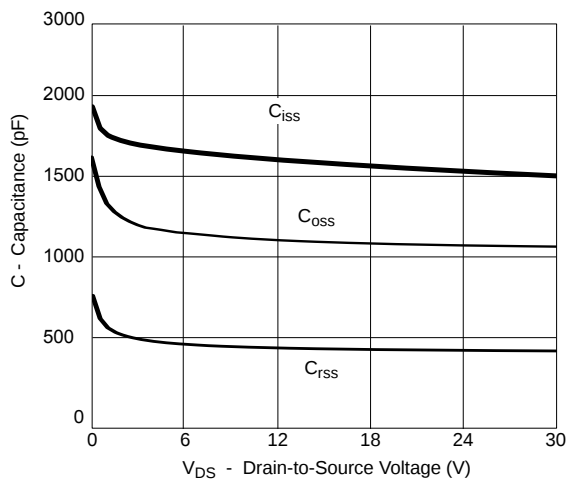
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Output Characteristics

Transfer Characteristics

Transconductance

 $R_{DS(on)}$ vs. Drain Current

Capacitance

Gate Charge

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

On-Resistance vs. Junction Temperature

Forward Diode Voltage vs. Temperature

 $R_{DS(on)}$ vs. V_{GS} vs. Temperature

Threshold Voltage


* $V_{GS} >$ minimum V_{GS} at which $r_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


* The power dissipation P_D is based on $T_{J(max)} = 175$ °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.



The image displays an orthographic projection of a mechanical component, consisting of three main views and a detail view:

- Top View:** Shows a rectangular part with rounded corners. It features four mounting holes along the top edge and four along the bottom edge. Dimensions include a total width of E , a distance from the top edge to the first hole of b , and a distance between the first and second holes of e . A feature control frame at the top left specifies a circular runout tolerance of 0.05 M for the top surface.
- Front View:** Shows the profile of the part with a total height of $E1$. It includes a fillet with a radius R at the top corners. A detail view 'A' is indicated by a circle on the right side.
- Bottom View:** Shows the underside of the part. Dimensions include a total width of D , a distance from the left edge to the first hole of $L1$, a distance between the first and second holes of $D1$, a distance from the last hole to the right edge of L , a total height of $E2$, a distance from the bottom edge to the first hole of $E3$, and a distance from the last hole to the right edge of $L2$.
- Detail View 'A':** A circular detail view showing a fillet with a radius R and a thickness C . The angle of the fillet is θ . The view is labeled "VIEW 'A'" and "VIEW 'A' (SCALE 5:1)".

Fig. 1

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	0.95	1.00	0.033	0.037	0.039
A1	0.00	---	0.05	0.000	---	0.002
b	0.30	0.40	0.50	0.012	0.016	0.020
c	0.15	0.20	0.25	0.006	0.008	0.010
D	5.10	5.20	5.30	0.201	0.205	0.209
D1	4.25	4.35	4.45	0.167	0.171	0.175
E	5.45	5.55	5.65	0.215	0.219	0.222
E1	5.95	6.05	6.15	0.234	0.238	0.242
E2	3.525	3.625	3.725	0.139	0.143	0.147
E3	1.175	1.275	1.375	0.046	0.050	0.054
e	1.27 BSC			0.050 BSC		
L	0.45	0.55	0.65	0.018	0.022	0.026
L1	0	---	0.15	0	---	0.006
L2	0.68 REF			0.027 REF		
θ	0°	---	10°	0°	---	10°

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