

AON7290-VB Datasheet

N-Channel 100-V (D-S) MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
100	0.010 at $V_{GS} = 10$ V	50

FEATURES

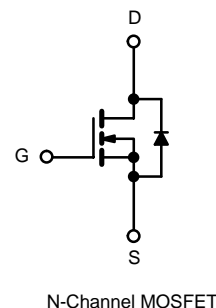
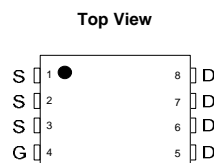
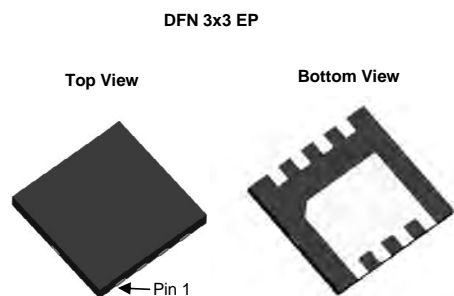
- Trench Power MOSFET
- 175 °C Junction Temperature
- Low Thermal Resistance Package
- 100 % R_g Tested



RoHS
COMPLIANT

APPLICATIONS

- Isolated DC/DC Converters



ABSOLUTE MAXIMUM RATINGS $T_C = 25$ °C, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175$ °C)	I_D	50	A
		45	
Pulsed Drain Current	I_{DM}	60	
Avalanche Current	I_{AS}	51	mJ
Single Pulse Avalanche Energy ^b	E_{AS}	60	
Maximum Power Dissipation ^b	P_D	355 ^c	W
		3.35	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Limit	Unit
Junction-to-Ambient	R_{thJA}	40	°C/W
Junction-to-Case (Drain)	R_{thJC}	0.4	

Notes:

a. Package limited.

b. Duty cycle ≤ 1 %.

c. See SOA curve for voltage derating.

d. When Mounted on 1" square PCB (FR-4 material).

SPECIFICATIONS T _J = 25 °C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{DS} = 0 V, I _D = 250 μA	100			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2		4	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100 V, V _{GS} = 0 V			1	μA
		V _{DS} = 100 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 100 V, V _{GS} = 0 V, T _J = 175 °C			250	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	120			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 30 A		0.010		Ω
		V _{GS} = 10 V, I _D = 30 A, T _J = 125 °C		0.013		
		V _{GS} = 10 V, I _D = 30 A, T _J = 175 °C		0.027		
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	25			S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		3200		pF
Output Capacitance	C _{oss}			410		
Reverse Transfer Capacitance	C _{rss}			210		
Total Gate Charge ^c	Q _g	V _{DS} = 100 V, V _{GS} = 10 V, I _D = 58 A		90	130	nC
Gate-Source Charge ^c	Q _{gs}			23		
Gate-Drain Charge ^c	Q _{gd}			34		
Gate Resistance	R _g		0.5	1.3	3.1	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 100 V, R _L = 1.5 Ω I _D ≅ 58 A, V _{GEN} = 10 V, R _g = 2.5 Ω		24	35	ns
Rise Time ^c	t _r			220	330	
Turn-Off Delay Time ^c	t _{d(off)}			45	70	
Fall Time ^c	t _f			200	300	
Source-Drain Diode Ratings and Characteristics T _C = 25 °C ^b						
Continuous Current	I _S				58	A
Pulsed Current	I _{SM}				110	
Forward Voltage ^a	V _{SD}	I _F = 58 A, V _{GS} = 0 V		1.0	1.5	V
Reverse Recovery Time	t _{rr}	I _F = 30 A, di/dt = 100 A/μs		130	200	ns
Peak Reverse Recovery Current	I _{RM(REC)}			8	12	A
Reverse Recovery Charge	Q _{rr}				0.52	1.2

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.

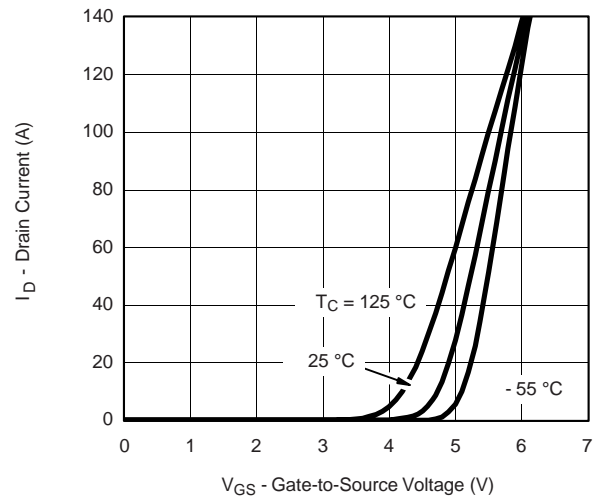
c. Independent of operating temperature.

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



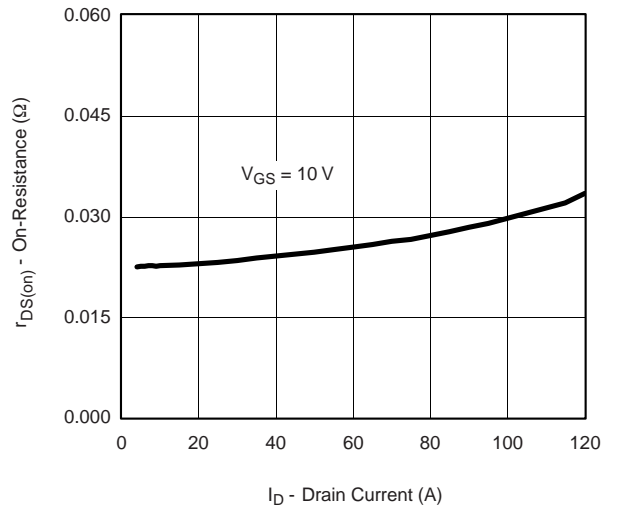
Output Characteristics



Transfer Characteristics



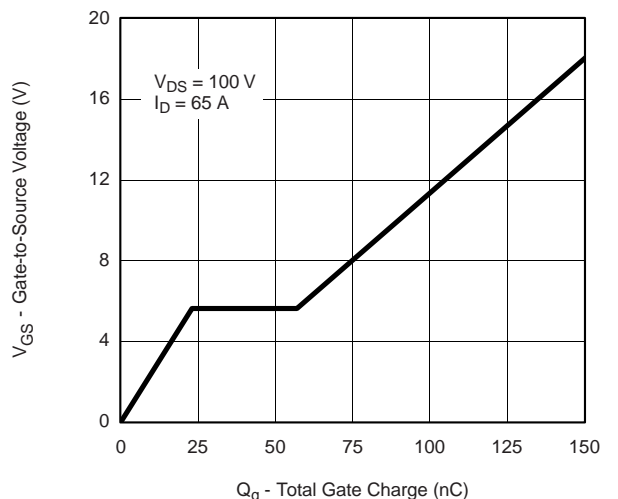
Transconductance



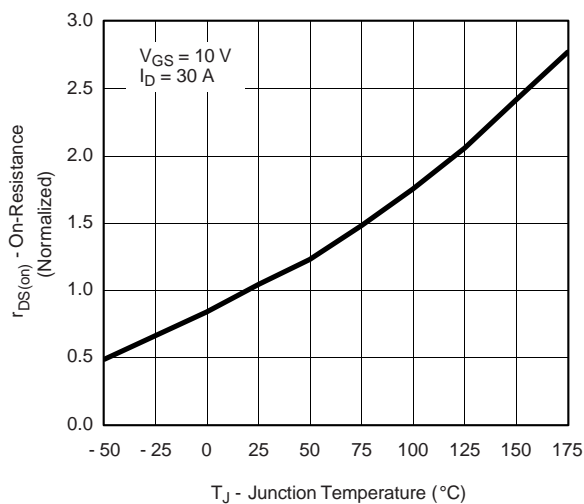
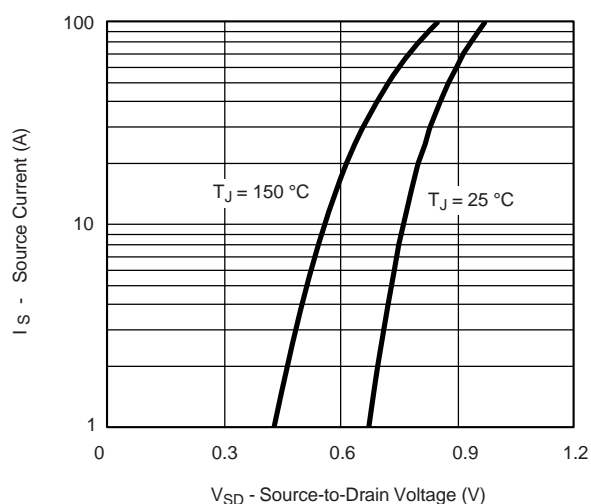
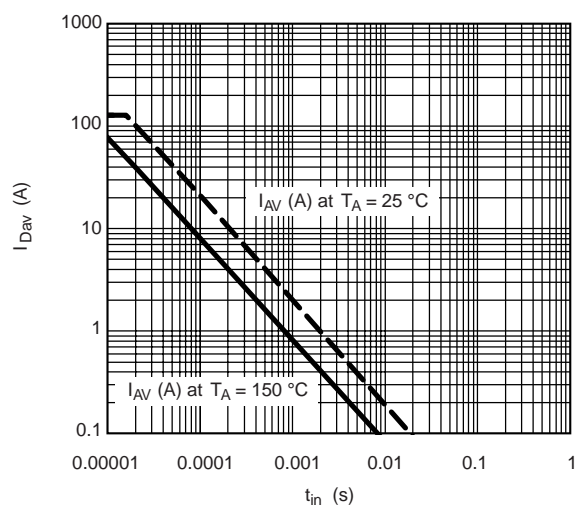
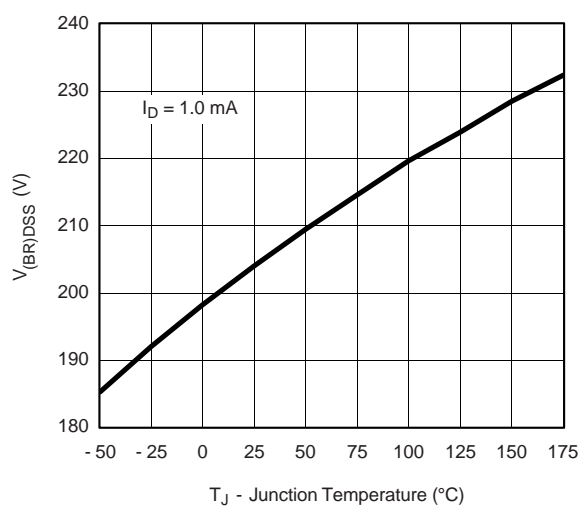
On-Resistance vs. Drain Current



Capacitance



Gate Charge

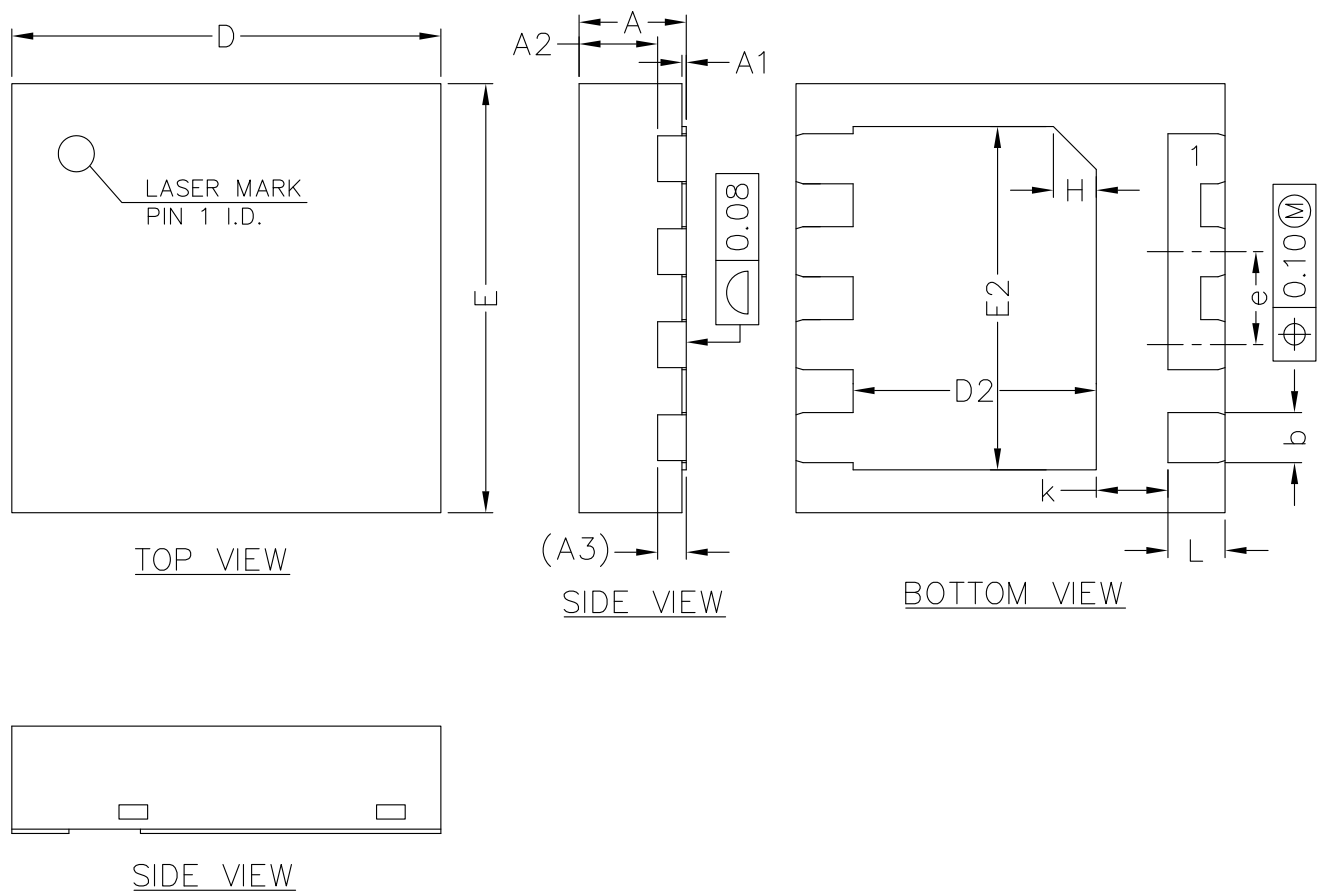
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

On-Resistance vs. Junction Temperature

Source-Drain Diode Forward Voltage

Avalanche Current vs. Time

Drain Source Breakdown vs. Junction Temperature

The graph shows the relationship between Drain Current (I_D) and Ambient Temperature (T_C) for the 2N3866 JFET. The current is constant at approximately 65 mA for temperatures up to 25°C. Beyond 25°C, the current decreases as temperature increases, reaching 0 mA at 175°C.

T_C - Ambient Temperature ($^{\circ}\text{C}$)	I_D - Drain Current (A)
0	65
25	65
50	60
75	55
100	45
125	35
150	25
175	0

Figure 10 is a line graph showing the relationship between Normalized Effective Transient Thermal Impedance (Y-axis) and Square Wave Pulse Duration (s) (X-axis). The Y-axis is logarithmic, ranging from 0.01 to 2. The X-axis is logarithmic, ranging from 10^{-4} to 1. The graph displays several curves corresponding to different duty cycles: 0.5, 0.2, 0.1, 0.05, 0.02, and a Single Pulse. The curves show that the normalized effective transient thermal impedance increases with pulse duration and approaches a value of 1.0 for durations greater than approximately 0.01 seconds. The duty cycle of 0.5 shows the highest impedance for short pulse durations, while the single pulse curve shows the lowest impedance for very short durations.

5



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2	0.50	0.55	0.60
A3	0.20REF		
b	0.30	0.35	0.40
D	2.90	3.00	3.10
E	2.90	3.00	3.10
D2	1.60	1.70	1.80
E2	2.30	2.40	2.50
e	0.55	0.65	0.75
K	0.40	0.50	0.60
L	0.35	0.40	0.45

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