

# 2N6661/VN88AFD

## N-Channel Enhancement-Mode MOSFET Transistors

### Product Summary

Part Number	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max ( $\Omega$ )	$V_{GS(th)}$ (V)	$I_D$ (A)
2N6661	90	4 @ $V_{GS} = 10$ V	0.8 to 2	0.9
VN88AFD	80	4 @ $V_{GS} = 10$ V	0.8 to 2.5	1.29

### Features

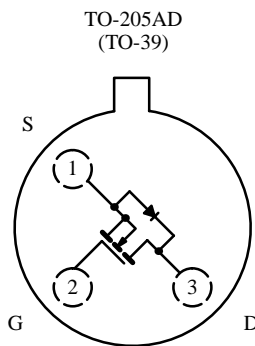
- Low On-Resistance: 3.6  $\Omega$
- Low Threshold: 1.6 V
- Low Input Capacitance: 35 pF
- Fast Switching Speed: 6 ns
- Low Input and Output Leakage

### Benefits

- Low Offset Voltage
- Low-Voltage Operation
- Easily Driven Without Buffer
- High-Speed Circuits
- Low Error Voltage

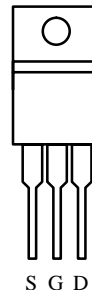
### Applications

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays

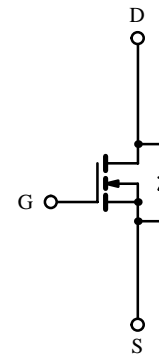


Top View  
2N6661

TO-220SD  
(Tab-Drain)



Front View  
VN88AFD



N-Channel MOSFET

### Absolute Maximum Ratings ( $T_C = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	2N6661	VN88AFD	Unit
Drain-Source Voltage	$V_{DS}$	90	80	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	$\pm 30$	
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ )	$I_D$	$T_C = 25^\circ\text{C}$	0.9	A
		$T_C = 100^\circ\text{C}$	0.7	
Pulsed Drain Current <sup>a</sup>	$I_{DM}$	$\pm 3$	$\pm 3$	
Power Dissipation	$P_D$	$T_C = 25^\circ\text{C}$	6.25	W
		$T_C = 100^\circ\text{C}$	2.5	
Maximum Junction-to-Ambient <sup>b</sup>	$R_{thJA}$	170		$^\circ\text{C}/\text{W}$
Maximum Junction-to-Case	$R_{thJC}$		8.3	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$

#### Notes

- Pulse width limited by maximum junction temperature.
- This parameter not registered with JEDEC.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70224.

# 2N6661/VN88AFD

## Specifications<sup>a</sup>

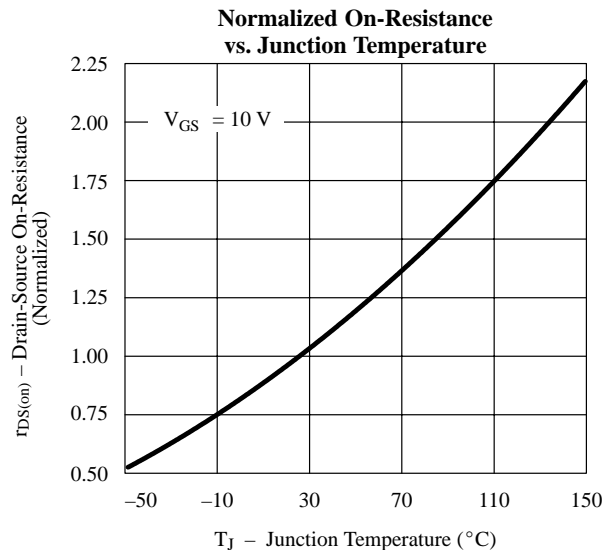
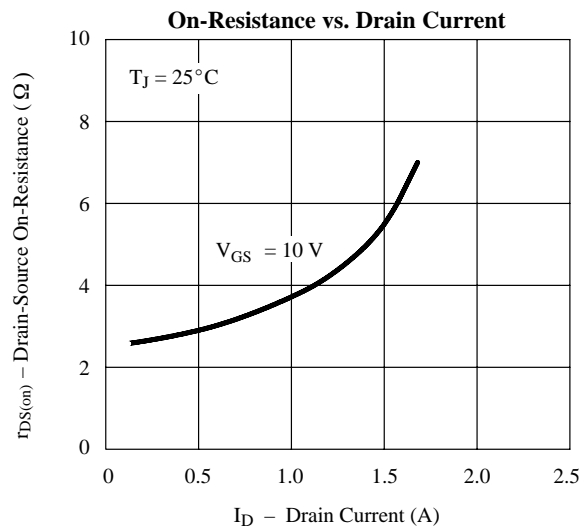
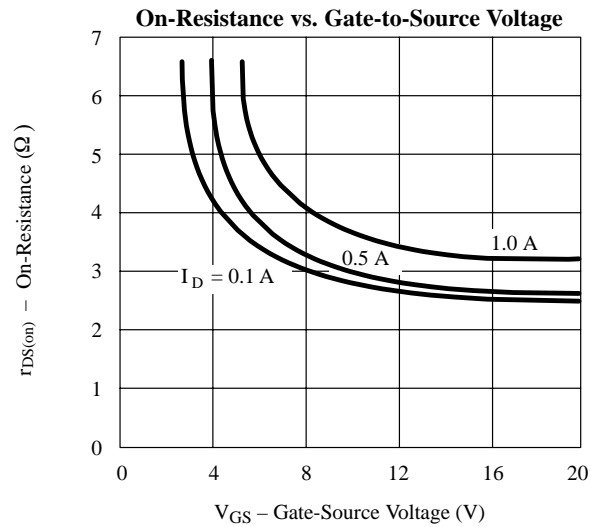
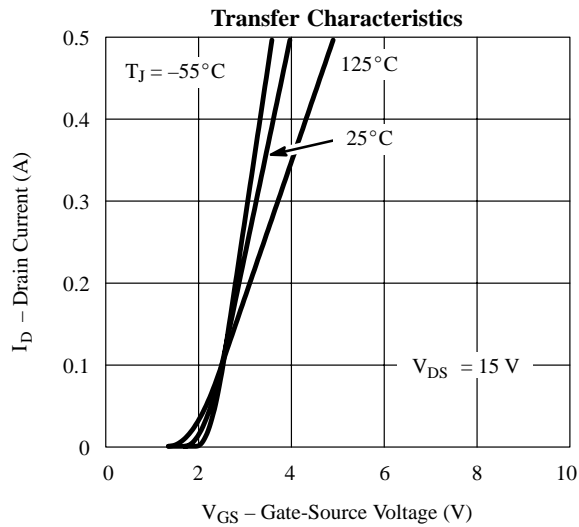
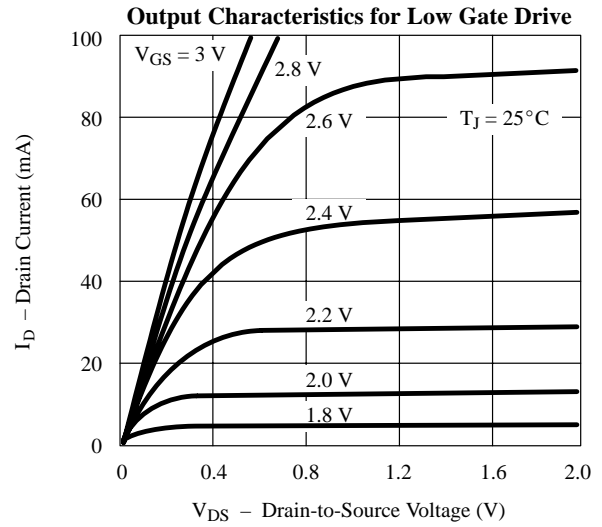
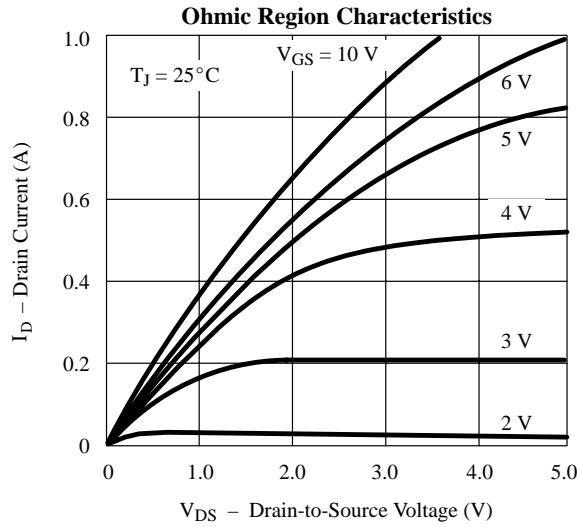
Parameter	Symbol	Test Conditions	Typ <sup>b</sup>	Limits				Unit
				2N6661		VN88AFD		
				Min	Max	Min	Max	
<b>Static</b>								
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0 \text{ V}, I_D = 10 \mu\text{A}$	125	90		80		V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1 \text{ mA}$		0.8	2	0.8	2.5	
			$T_C = 55^\circ\text{C}$	1.8				
			$T_C = 125^\circ\text{C}$	1.3				
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 15 \text{ V}$			$\pm 100$		$\pm 100$	nA
			$T_C = 125^\circ\text{C}$			$\pm 500$		
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 90 \text{ V}, V_{GS} = 0 \text{ V}$			10			$\mu\text{A}$
			$V_{DS} = 80 \text{ V}, V_{GS} = 0 \text{ V}$				10	
			$V_{DS} = 0.8 \times V_{(BR)DSS}, V_{GS} = 0 \text{ V}$				1	
				$T_C = 125^\circ\text{C}$		500		
On-State Drain Current <sup>c</sup>	$I_{D(on)}$	$V_{DS} = 15 \text{ V}, V_{GS} = 10 \text{ V}$	1.8	1.5			A	
			$V_{DS} = 10 \text{ V}, V_{GS} = 10 \text{ V}$	1.8		1.5		
Drain-Source On-Resistance <sup>c</sup>	$r_{DS(on)}$	$V_{GS} = 5 \text{ V}, I_D = 0.3 \text{ A}$	3.8		5.3		$\Omega$	
			$V_{GS} = 10 \text{ V}, I_D = 1 \text{ A}$	3.6		4		4
			$T_C = 125^\circ\text{C}^e$	6.7		9		8
Forward Transconductance <sup>c</sup>	$g_{fs}$	$V_{DS} = 10 \text{ V}, I_D = 0.5 \text{ A}$	350	170		170	mS	
Diode Forward Voltage	$V_{SD}$	$I_S = 0.86 \text{ A}, V_{GS} = 0 \text{ V}$	0.9				V	
<b>Dynamic</b>								
Input Capacitance	$C_{iss}$	$V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}$ $f = 1 \text{ MHz}$	35		50		50	pF
Output Capacitance	$C_{oss}$		15		40		40	
Reverse Transfer Capacitance	$C_{rss}$		2		10		10	
Drain-Source Capacitance	$C_{ds}$		30		40			
<b>Switching<sup>d</sup></b>								
Turn-On Time	$t_{ON}$	$V_{DD} = 25 \text{ V}, R_L = 23 \Omega$ $I_D \cong 1 \text{ A}, V_{GEN} = 10 \text{ V}$ $R_G = 25 \Omega$	6		10		15	ns
Turn-Off Time	$t_{OFF}$		8		10		15	

### Notes

- $T_A = 25^\circ\text{C}$  unless otherwise noted.
- For DESIGN AID ONLY, not subject to production testing.
- Pulse test:  $PW \leq 300 \mu\text{s}$  duty cycle  $\leq 2\%$ .
- Switching time is essentially independent of operating temperature.
- This parameter not registered with JEDEC.

VNDQ09

## Typical Characteristics (25°C Unless Otherwise Noted)



# 2N6661/VN88AFD

## Typical Characteristics (25°C Unless Otherwise Noted) (Cont'd)

