

N-Channel 80-V and 90-V (D-S) MOSFETS

PRODUCT SUMMARY				
Part Number	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (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

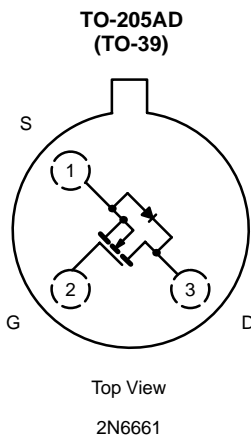
- Low On-Resistance: 3.6 Ω
- Low Threshold: 1.6 V
- Low Input Capacitance: 35 pF
- Fast Switching Speed: 6 ns
- Low Input and Output Leakage

BENEFITS

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

APPLICATIONS

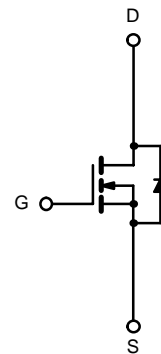
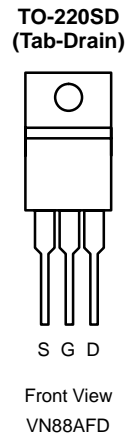
- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays



Device Marking
Side View

2N6661
"S" flxxyy

"S" = Siliconix Logo
f = Factory Code
ll = Lot Traceability
xyyy = Date Code



Device Marking
Front View

VN88AFD
"S" xxyy

"S" = Siliconix Logo
xyyy = Date Code

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	2N6661	VN88AFD	Unit
Drain-Source Voltage	V_{DS}	90	80	V
Gate-Source Voltage	V_{GS}	± 20	± 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 ^a	I_{DM}	± 3	± 3	
Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	6.25	W
		$T_C = 100^\circ\text{C}$	2.5	
Thermal Resistance, Junction-to-Ambient ^b	R_{thJA}	170		$^\circ\text{C/W}$
Thermal Resistance, 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.



SPECIFICATIONS (T _A = 25 °C UNLESS OTHERWISE NOTED)								
Parameter	Symbol	Test Conditions	Typ ^a	Limits				Unit
				2N6661		VN88AFD		
				Min	Max	Min	Max	
Static								
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 10 μA	125	90		80		V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 1 mA	1.6	0.8	2	0.8	2.5	
		T _J = -55 °C	1.8					
		T _J = 125 °C	1.3					
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±15 V			±100		±100	nA
		T _J = 125 °C			±500		±500	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 90 V, V _{GS} = 0 V			10			μA
		V _{DS} = 80 V, V _{GS} = 0 V					10	
		V _{DS} = 0.8 × V _{(BR)DSS} , V _{GS} = 0 V					1	
		T _J = 125 °C			500		500	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 15 V, V _{GS} = 10 V	1.8	1.5				A
		V _{DS} = 10 V, V _{GS} = 10 V	1.8			1.5		
Drain-Source On-Resistance ^b	r _{DS(on)}	V _{GS} = 5 V, I _D = 0.3 A	3.8		5.3		5.6	Ω
		V _{GS} = 10 V, I _D = 1 A	3.6		4		4	
		T _J = 125 °C ^d	6.7		9		8	
Forward Transconductance ^b	g _{fs}	V _{DS} = 10 V, I _D = 0.5 A	350	170		170		mS
Diode Forward Voltage	V _{SD}	I _S = 0.86 A, V _{GS} = 0 V	0.9					V
Dynamic								
Input Capacitance	C _{iss}	V _{DS} = 24 V, V _{GS} = 0 V f = 1 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			
Switching^c								
Turn-On Time	t _{ON}	V _{DD} = 25 V, R _L = 23 Ω I _D ≅ 1 A, V _{GEN} = 10 V R _G = 25 Ω	6		10		15	ns
Turn-Off Time	t _{OFF}		8		10		15	

Notes

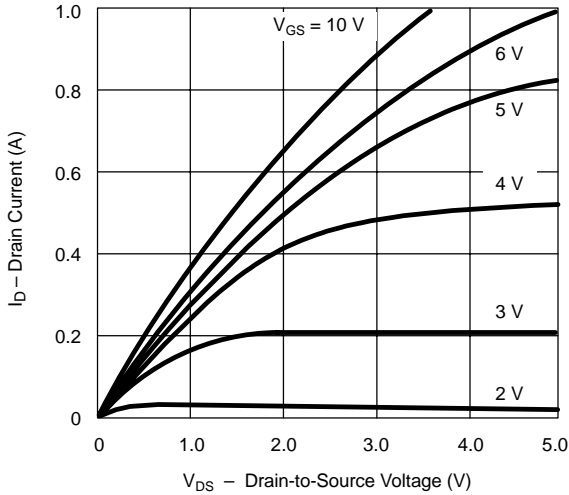
- a. For DESIGN AID ONLY, not subject to production testing.
- b. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
- c. Switching time is essentially independent of operating temperature.
- d. This parameter not registered with JEDEC.

VNDQ09

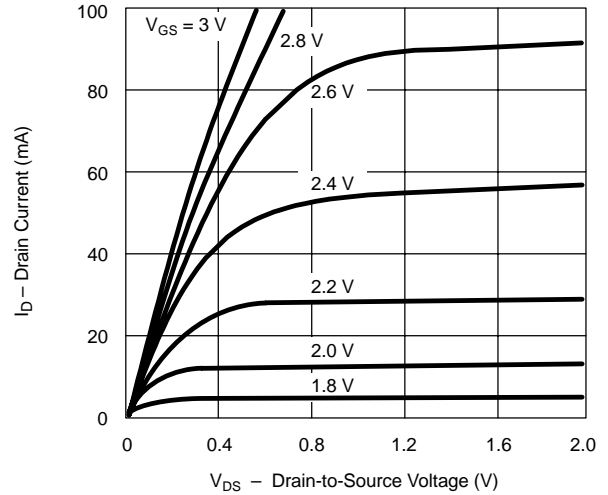


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

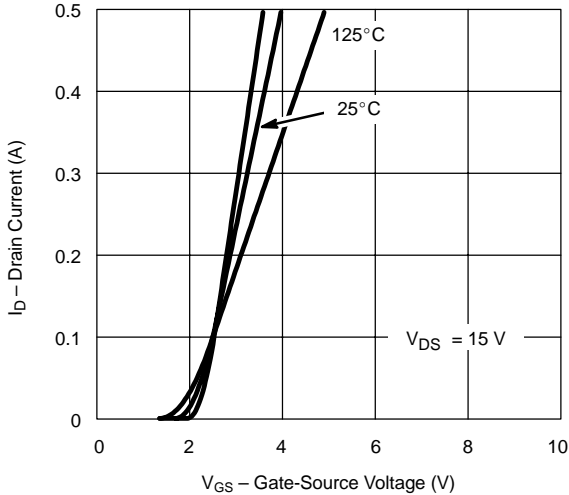
Ohmic Region Characteristics



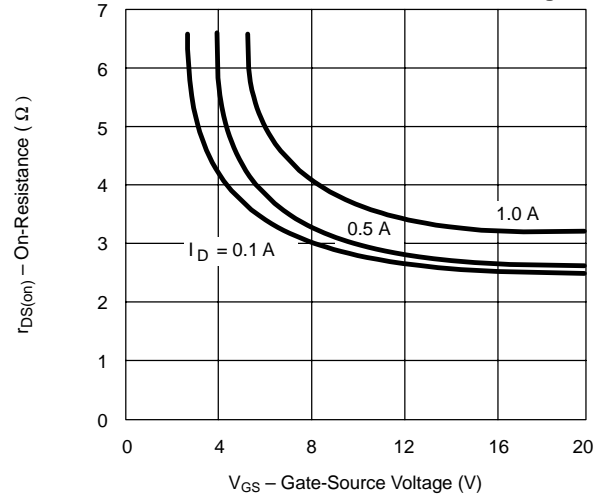
Output Characteristics for Low Gate Drive



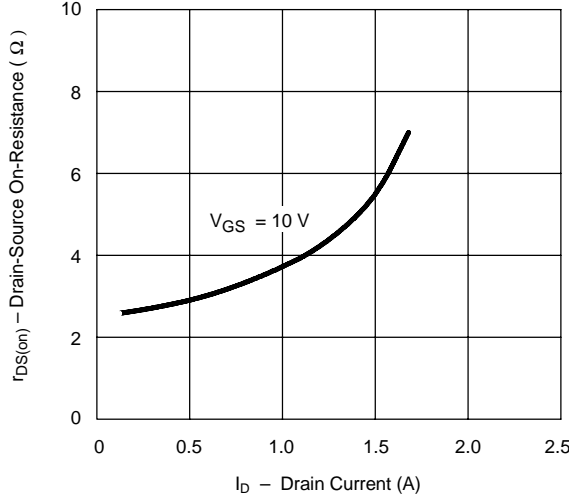
Transfer Characteristics



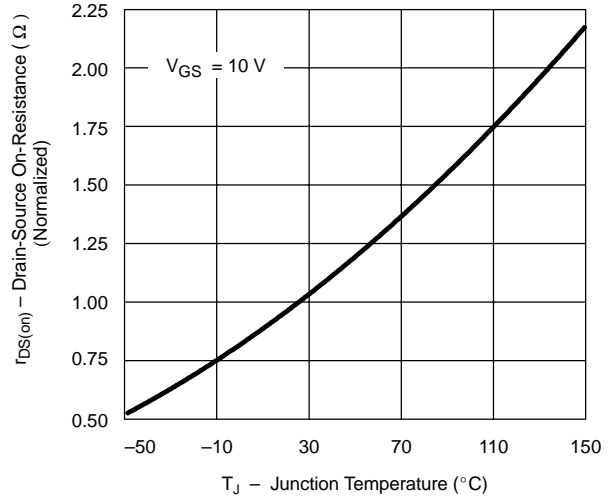
On-Resistance vs. Gate-to-Source Voltage



On-Resistance vs. Drain Current

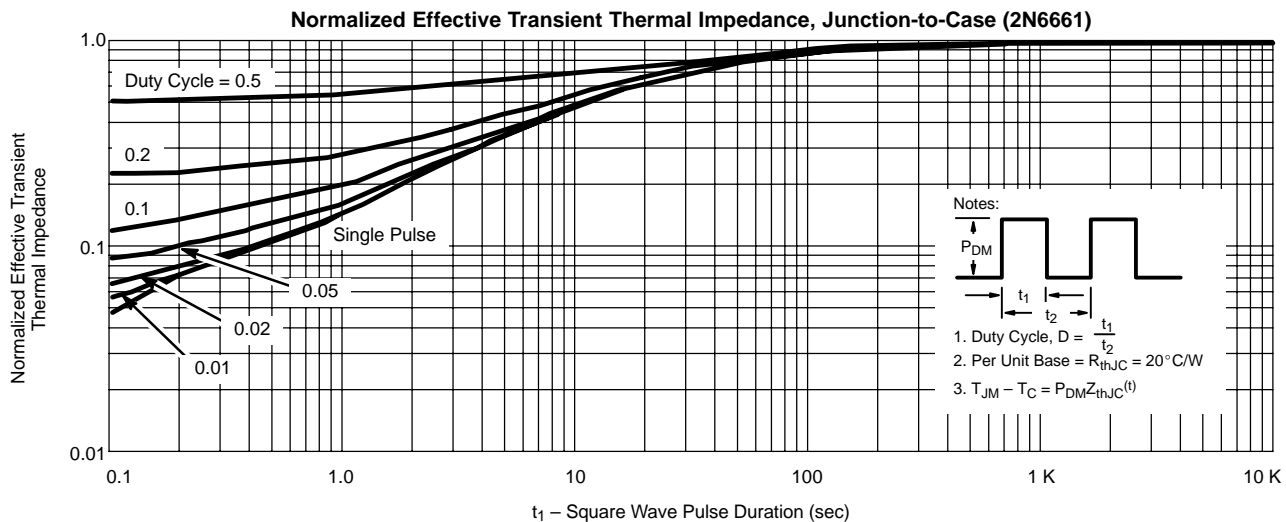
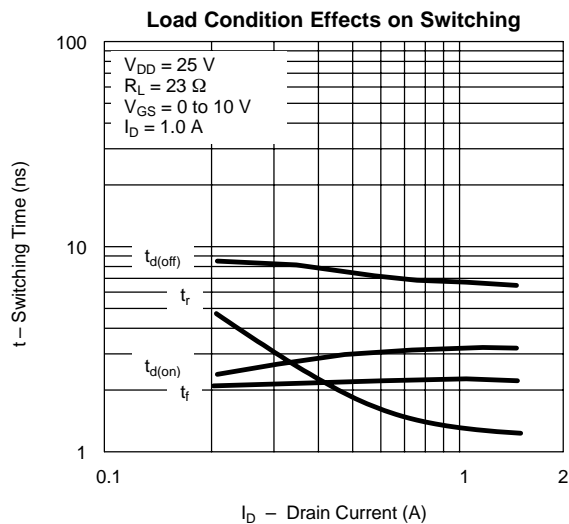
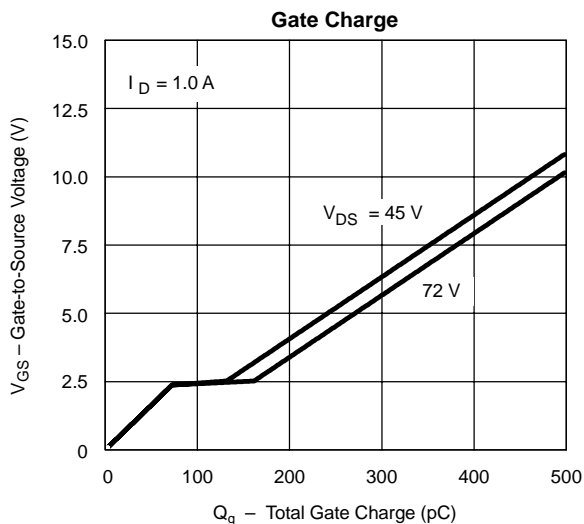
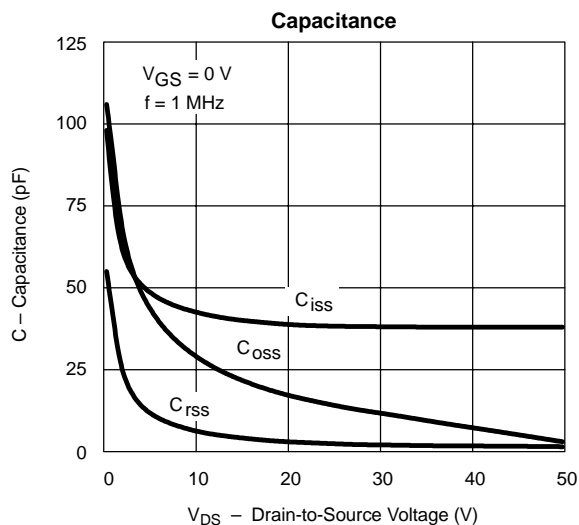
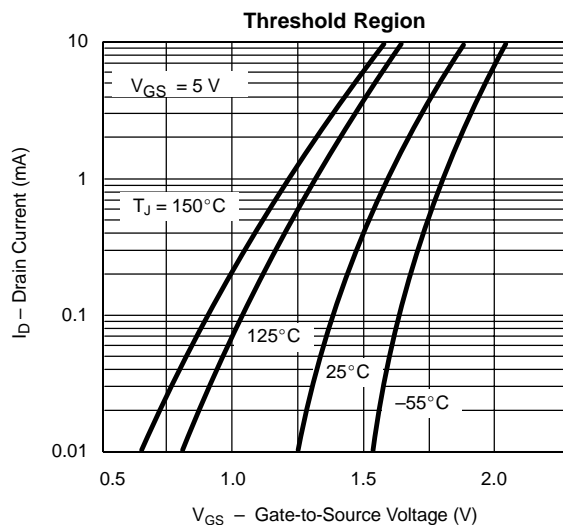


Normalized On-Resistance vs. Junction Temperature





TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)





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