

TN0601L, VN0606L/M, VN66AFD

N-Channel Enhancement-Mode MOSFET Transistors

Product Summary

Part Number	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)
TN0601L	60	1.8 @ $V_{GS} = 10$ V	0.5 to 2	0.47
VN0606L		3 @ $V_{GS} = 10$ V	0.8 to 2	0.33
VN0606M		3 @ $V_{GS} = 10$ V	0.8 to 2	0.39
VN66AFD		3 @ $V_{GS} = 10$ V	0.8 to 2.5	1.46

Features

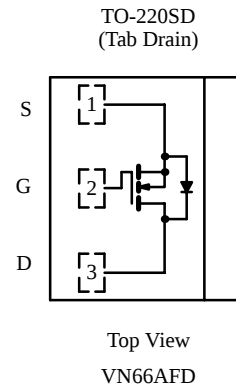
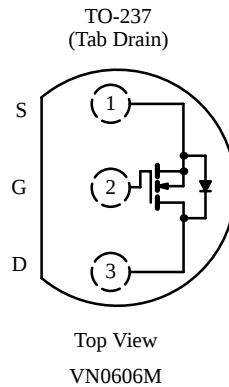
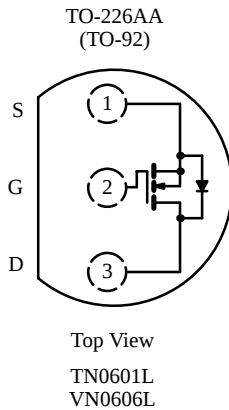
- Low On-Resistance: 1.2 Ω
- Low Threshold: <1.6 V
- Low Input Capacitance: 35 pF
- Fast Switching Speed: 9 ns
- Low Input and Output Leakage

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



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

Parameter	Symbol	TN0601L	VN0606L	VN0606M	VN66AFD ^b	Unit
Drain-Source Voltage	V_{DS}	60	60	60	60	V
Gate-Source Voltage	V_{GS}	± 20	± 30	± 30	± 30	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	$T_A = 25^\circ\text{C}$	0.47	0.33	0.39	A
		$T_A = 100^\circ\text{C}$	0.29	0.21	0.25	
Pulsed Drain Current ^a	I_{DM}	1.5	1.6	2	3	
Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	0.8	0.8	1.0	W
		$T_A = 100^\circ\text{C}$	0.32	0.32	0.4	
Maximum Junction-to-Ambient	R_{thJA}	156	156	125		$^\circ\text{C/W}$
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

- a. Pulse width limited by maximum junction temperature.
b. Reference case for all temperature testing.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70201.

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Specifications^a

Parameter	Symbol	Test Conditions	Typ ^b	Limits						Unit
				TN0601L		VN0606L VN0606M		VN66AFD		
				Min	Max	Min	Max	Min	Max	
Static										
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 10 μA	70	60		60		60		V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 0.25 mA	1.6	0.5	2					
		V _{DS} = V _{GS} , I _D = 1 mA	1.7			0.8	2	0.8	2.5	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 30 V					± 100		± 100	nA
		T _C = 125°C							± 500	
		V _{DS} = 0 V, V _{GS} = ± 20 V			± 10					
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0 V					10			μA
		T _J = 125°C					500			
		V _{DS} = 48 V, V _{GS} = 0 V			1				1	
		T _J = 125°C			100					
		T _C = 125°C							10	
On-State Drain Current ^c	I _{D(on)}	V _{DS} = 10 V, V _{GS} = 4.5 V	0.5	0.25						A
		V _{DS} = 10 V, V _{GS} = 10 V	2.4	1		1.5		1.5		
Drain-Source On-Resistance ^c	r _{DS(on)}	V _{GS} = 3.5 V, I _D = 0.04 A	4		5					Ω
		V _{GS} = 4.5 V, I _D = 0.25 A	2		3					
		T _J = 125°C	3.8		6					
		V _{GS} = 5 V, I _D = 0.3 A	2.3						5	
		V _{GS} = 10 V, I _D = 0.5 A	1.2				3			
		T _J = 125°C	2.3				6			
		V _{GS} = 10 V, I _D = 1 A	1.3		1.8				3	
		T _C = 125°C	2.5						6	
Forward Transconductance ^c	g _{fs}	V _{DS} = 10 V, I _D = 0.5 A	350	200		170		170		mS
Common Source Output Conductance ^c	g _{os}	V _{DS} = 10 V, I _D = 0.1 A	0.3							
Dynamic										
Input Capacitance	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	35		60		50		50	pF
Output Capacitance	C _{oss}		25		50		40		40	
Reverse Transfer Capacitance	C _{rss}		6		10		10		10	
Switching ^d										
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	8		15		10		15	ns
Turn-Off Time	t _{OFF}		9		15		10		15	

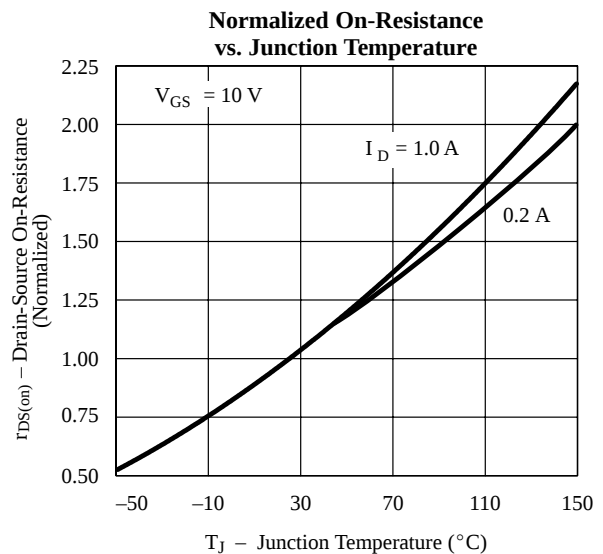
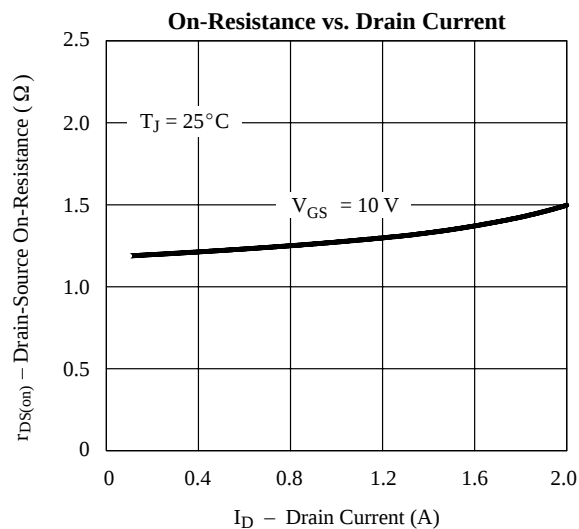
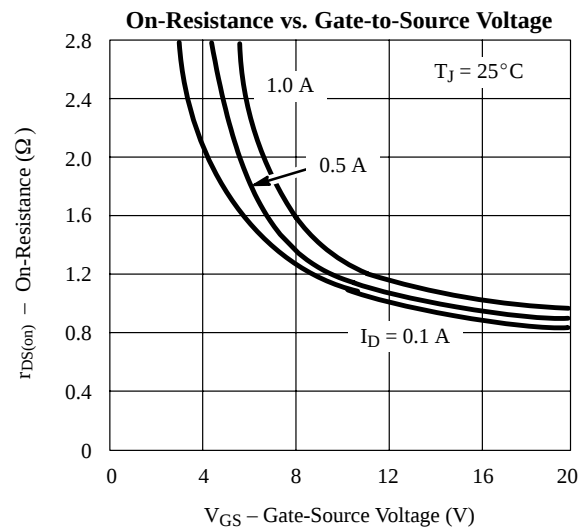
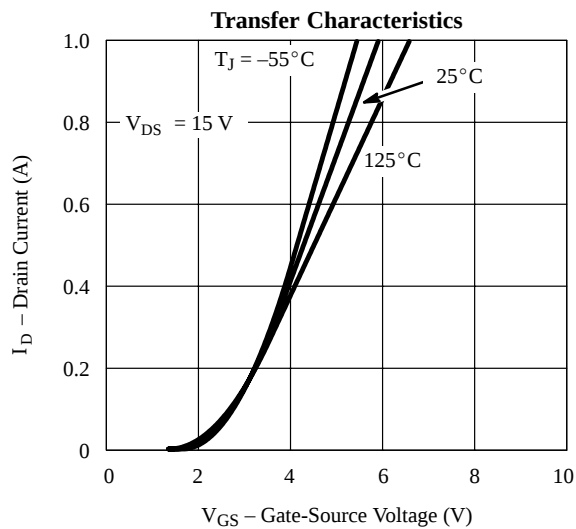
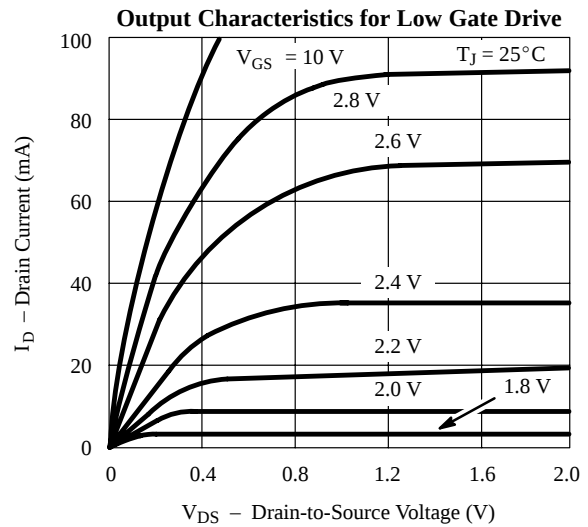
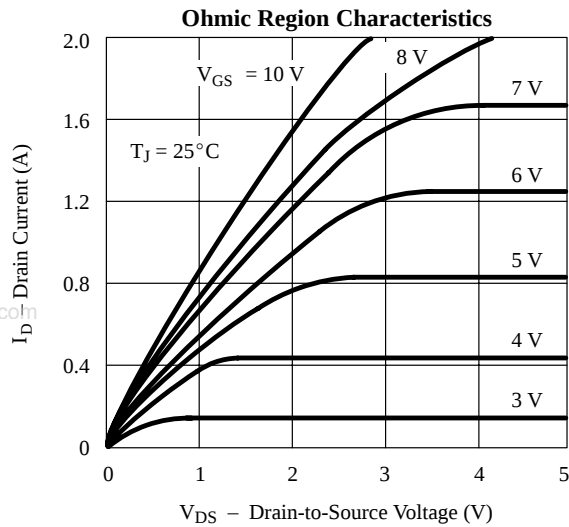
Notes

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

VNDQ06

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Typical Characteristics (25°C Unless Otherwise Noted)



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