

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)
TN0201L	20	1.2 @ $V_{GS} = 10$ V	0.5 to 2	0.64
TN0401L	40	1.2 @ $V_{GS} = 10$ V	0.5 to 2	0.64
VN0300L	30	1.2 @ $V_{GS} = 10$ V	0.8 to 2.5	0.64
VN0300M	30	1.2 @ $V_{GS} = 10$ V	0.8 to 2.5	0.67

Features

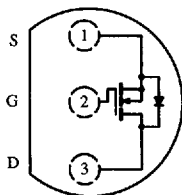
- Low On-Resistance: 0.85 Ω
- Low Threshold: 1.4 V
- Low Input Capacitance: 38 pF
- Fast Switching Speed: 9 ns
- Low Input and Output Leakage
- Low Offset Voltage
- Low-Voltage Operation
- Easily Driven Without Buffer
- High-Speed Circuits
- Low Error Voltage

Benefits

Applications

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

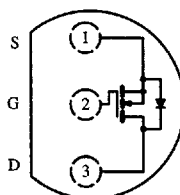
TO-226AA
(TO-92)



Top View

TN0201L
TN0401L
VN0300L

TO-237
(Tab Drain)



Top View

VN0300M

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

Parameter	Symbol	TN0201L	TN0401L	VN0300L	VN0300M	Unit
Drain-Source Voltage	V_{DS}	20	40	30	30	V
Gate-Source Voltage	V_{GS}	± 20	± 20	± 30	± 30	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	0.64	0.64	0.64	0.67	A
		0.38	0.38	0.38	0.43	
Pulsed Drain Current ^a	I_{DM}	1.5	1.5	3	3	W
Power Dissipation	P_D	0.8	0.8	0.8	1	
		0.32	0.32	0.32	0.4	$^\circ\text{C/W}$
Maximum Junction-to-Ambient	R_{thJA}	156	156	156	125	
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.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70199.

Specifications^a

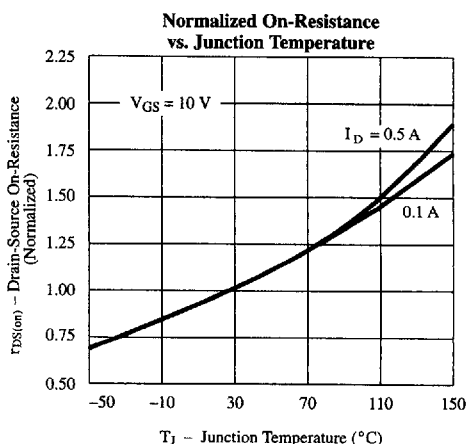
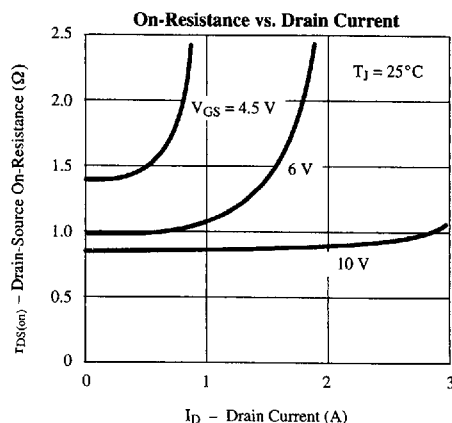
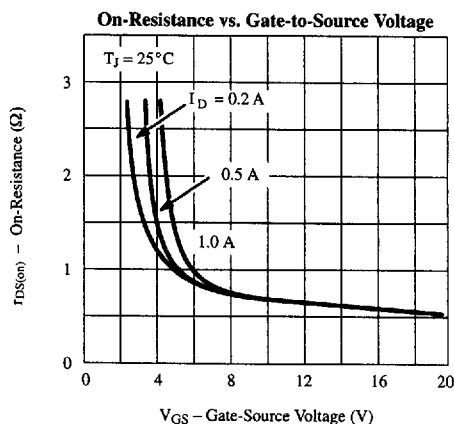
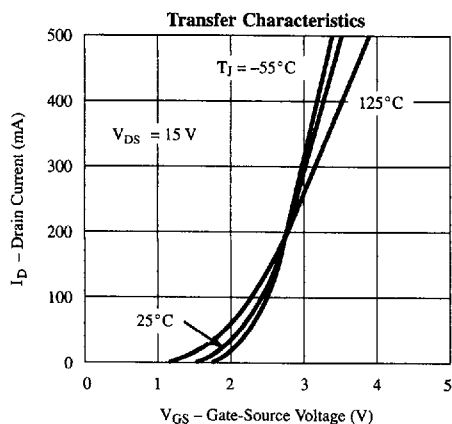
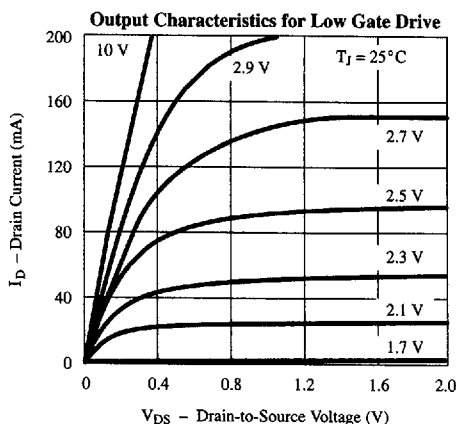
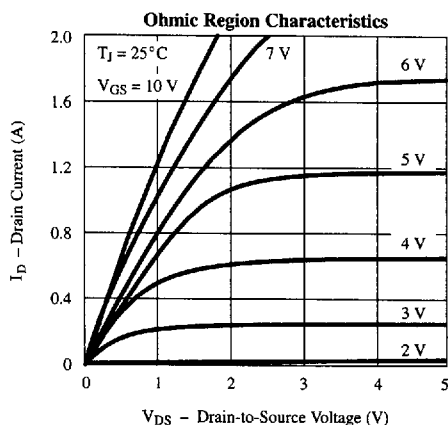
Parameter	Symbol	Test Conditions	Typ ^b	Limits				Unit
				TN0201L TN0401L		VN0300L VN0300M		
				Min	Max	Min	Max	
Static								
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V I _D = 10 μA	TN0201L	55	20			V
			TN0401L	55	40			
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 0.25 mA	1.4	0.5	2			
		V _{DS} = V _{GS} , I _D = 1 mA	1.5			0.8	2.5	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 10			nA
		V _{DS} = 0 V, V _{GS} = ± 30 V				± 10 0		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V					10	μA
		T _J = 125°C					500	
		V _{DS} = 0.8 × V _{(BR)DSS} , V _{GS} = 0 V			1			
		T _J = 125°C			100			
On-State Drain Current ^c	I _{D(on)}	V _{DS} = 10 V, V _{GS} = 4.5 V	0.9	0.25				A
		V _{DS} = 10 V, V _{GS} = 10 V	3.5	1		1		
Drain-Source On-Resistance ^c	r _{DS(on)}	V _{GS} = 3.5 V, I _D = 0.05 A	1.8		4			Ω
		V _{GS} = 5 V, I _D = 0.3 A	1.2				3.3	
		V _{GS} = 4.5 V, I _D = 0.25 A	1.4		2			
		T _J = 125°C	2.6		4			
		V _{GS} = 10 V, I _D = 1 A	0.85		1.2		1.2	
		T _J = 125°C	1.6				2.4	
Forward Transconductance ^c	g _{fs}	V _{DS} = 10 V, I _D = 0.5 A	500	200		200		mS
Dynamic								
Input Capacitance	C _{iss}	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz	38		60		100	pF
Output Capacitance	C _{oss}		33		50		95	
Reverse Transfer Capacitance	C _{rss}		8		15		25	
Switching ^d								
Turn-On Time	t _{ON}	V _{DD} = 15 V, R _L = 14 Ω I _D ≅ 1 A, V _{GEN} = 10 V R _G = 25 Ω	10		30		30	ns
Turn-Off Time	t _{OFF}		13		30		30	

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.

VNDQ03

Typical Characteristics (25°C Unless Otherwise Noted)



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

