

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)
VN1206L	120	6 @ $V_{GS} = 10$ V	0.8 to 2	0.23
VN1206M		6 @ $V_{GS} = 10$ V	0.8 to 2	0.26
VN1210M		10 @ $V_{GS} = 2.5$ V	0.8 to 2	0.2

Features

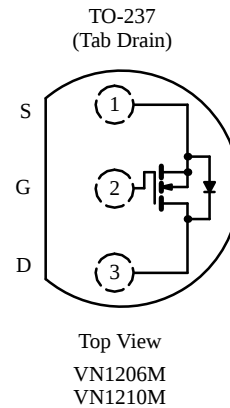
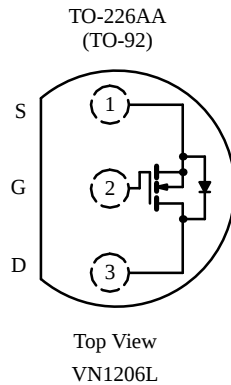
- Low On-Resistance: 3.8 Ω
- Low Threshold: 1.4 V
- Low Input Capacitance: 35 pF
- Fast Switching Speed: 10 ns
- Low Input and Output Leakage

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	VN1206L	VN1206M	VN1210M	Unit
Drain-Source Voltage	V_{DS}	120	120	120	V
Gate-Source Voltage	V_{GS}	± 30	± 30	± 30	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	$T_A = 25^\circ\text{C}$	I_D	0.23	0.26	A
	$T_A = 100^\circ\text{C}$		0.15	0.13	
Pulsed Drain Current ^a	I_{DM}	2	2	2	
Power Dissipation	$T_A = 25^\circ\text{C}$	P_D	0.8	1	W
	$T_A = 100^\circ\text{C}$		0.32	0.4	
Maximum Junction-to-Ambient	R_{thJA}	156	125	125	$^\circ\text{C/W}$
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 #70227.

Specifications^a

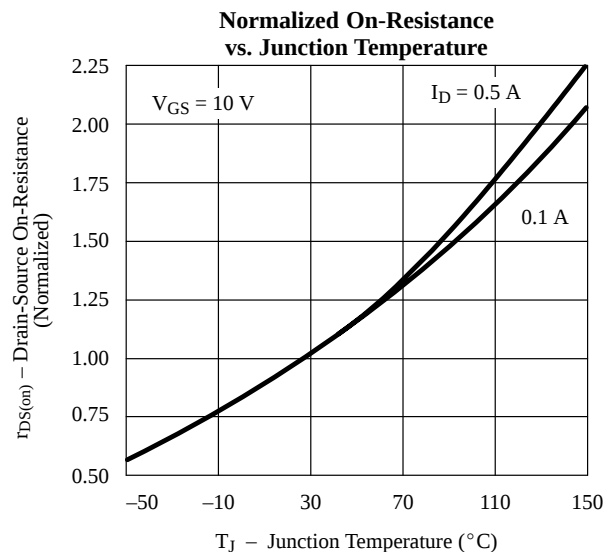
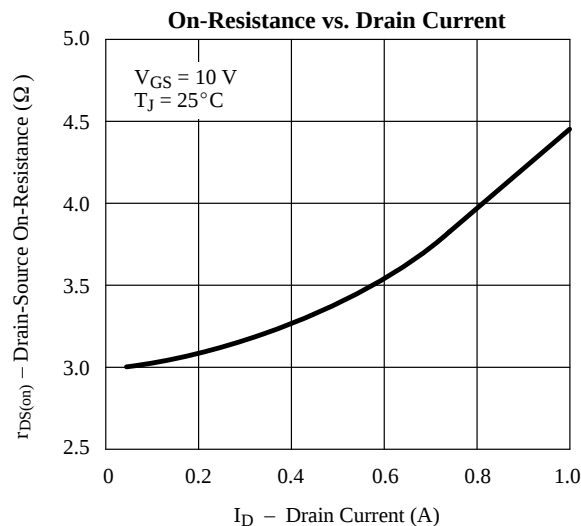
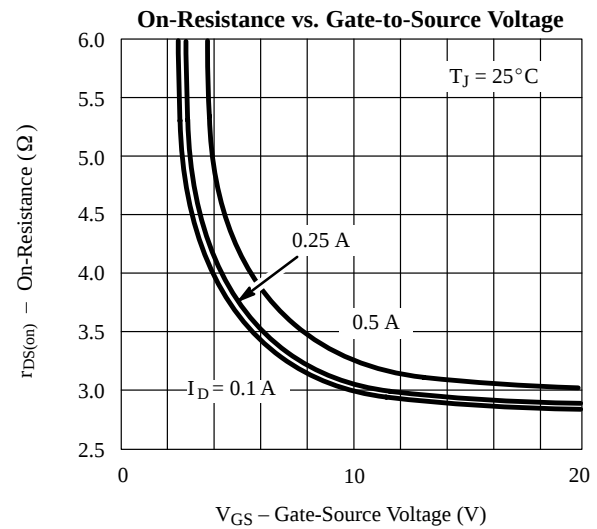
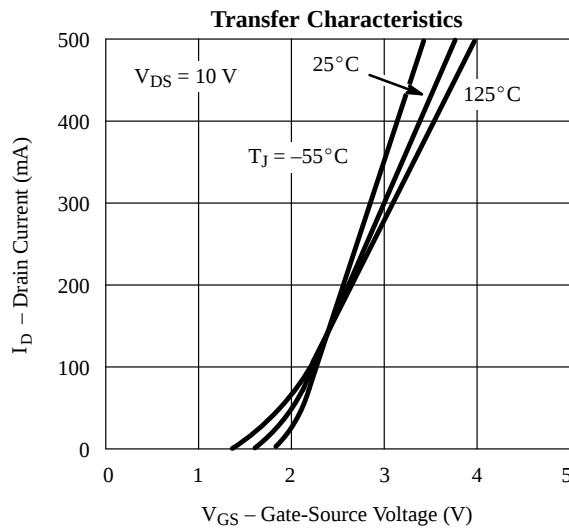
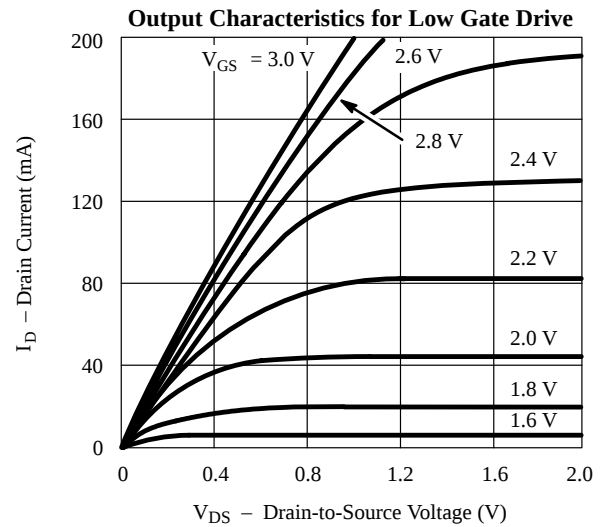
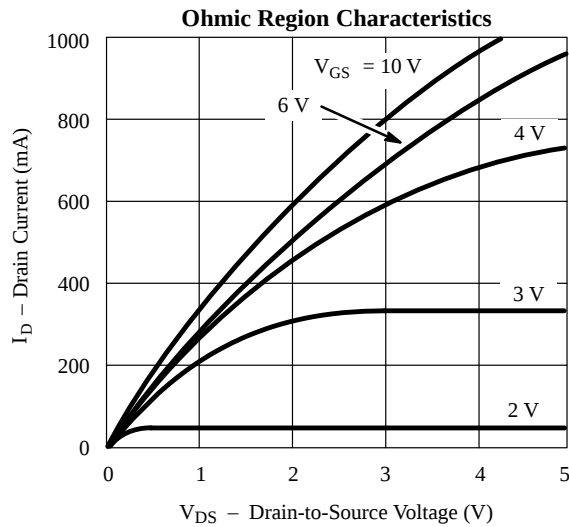
Parameter	Symbol	Test Conditions	Typ ^b	Limits				Unit
				VN1206L VN1206M		VN1210M		
				Min	Max	Min	Max	
Static								
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 100 μA	145	120		120		V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.4					
		V _{DS} = V _{GS} , I _D = 1 mA	1.5	0.8	2	0.8	2	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 15 V T _J = 125°C			± 100		± 100	nA
		V _{DS} = 0 V, V _{GS} = ± 20 V			± 500		± 500	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 96 V, V _{GS} = 0 V T _J = 125°C						μA
		V _{DS} = 120 V, V _{GS} = 0 V			10		10	
		T _J = 125°C			500		500	
On-State Drain Current ^c	I _{D(on)}	V _{DS} = 10 V, V _{GS} = 4.5 V	0.6					A
		V _{DS} = 10 V, V _{GS} = 10 V	1.6	1		1		
Drain-Source On-Resistance ^c	r _{DS(on)}	V _{GS} = 2.5 V, I _D = 0.1 A	6		10		10	Ω
		V _{GS} = 3.5 V, I _D = 0.1 A	4.5					
		V _{GS} = 10 V, I _D = 0.3 A	3.3					
		V _{GS} = 4.5 V, I _D = 0.2 A	3.8					
		T _J = 125°C	7.6					
		V _{GS} = 10 V, I _D = 0.5 A T _J = 125°C	3.3 7		6 14.8		10 24.7	
Forward Transconductance ^c	g _{fs}	V _{DS} = 10 V, I _D = 0.2 A	400					mS
		V _{DS} = 10 V, I _D = 0.5 A	425	300		300		
Common Source Output Conductance ^c	g _{os}	V _{DS} = 7.5 V, I _D = 0.1 A	0.4					
Dynamic								
Input Capacitance	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V f = 1 MHz	35		125		125	pF
Output Capacitance	C _{oss}		15		50		50	
Reverse Transfer Capacitance	C _{rss}		2		20		20	
Switching ^d								
Turn-On Time	t _{ON}	V _{DD} = 60 V, R _L = 150 Ω I _D ≅ 0.4 A, V _{GEN} = 10 V R _G = 25 Ω	6					ns
	t _{d(on)}		3		8		8	
	t _r		3		8		8	
Turn-Off Time	t _{OFF}		10					
	t _{d(off)}		7		18		18	
	t _f		2.5		12		12	

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.

VNDQ12

Typical Characteristics (25°C Unless Otherwise Noted)



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

