

N-Channel Enhancement-Mode MOS Transistors

Product Summary

Part Number	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)
VN2010L	200	10 @ $V_{GS} = 4.5$ V	0.8 to 1.8	0.19
BS107		28 @ $V_{GS} = 2.8$ V	0.8 to 3	0.12

Features

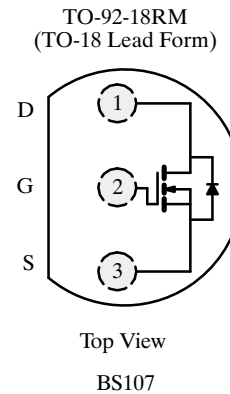
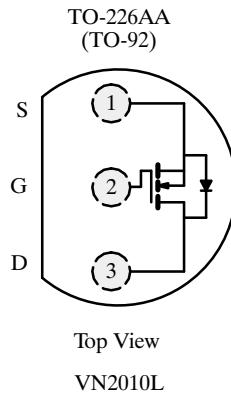
- Low On-Resistance: 6 Ω
- Secondary Breakdown Free: 220 V
- Low Power/Voltage Driven
- Low Input and Output Leakage
- Excellent Thermal Stability

Benefits

- Low Offset Voltage
- Full-Voltage Operation
- Easily Driven Without Buffer
- Low Error Voltage
- No High-Temperature "Run-Away"

Applications

- High-Voltage Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Transistors, etc.
- Telephone Mute Switches, Ringer Circuits
- Power Supply, Converters
- Motor Control



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

Parameter	Symbol	VN2010L	BS107	Unit
Drain-Source Voltage	V_{DS}	200	200	V
Gate-Source Voltage	V_{GS}	± 30	± 25	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	0.19	0.12	A
		0.12		
Pulsed Drain Current	I_{DM}	0.8		
Power Dissipation	P_D	0.8	0.5	W
		0.32		
Maximum Junction-to-Ambient	R_{thJA}	156	250	$^\circ\text{C/W}$
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.

Specifications^a

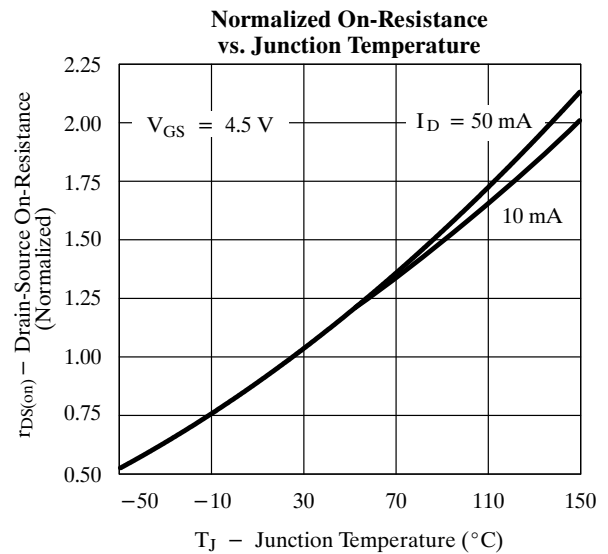
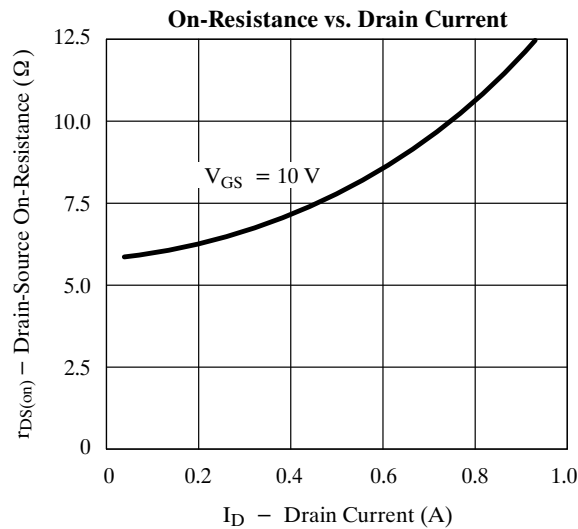
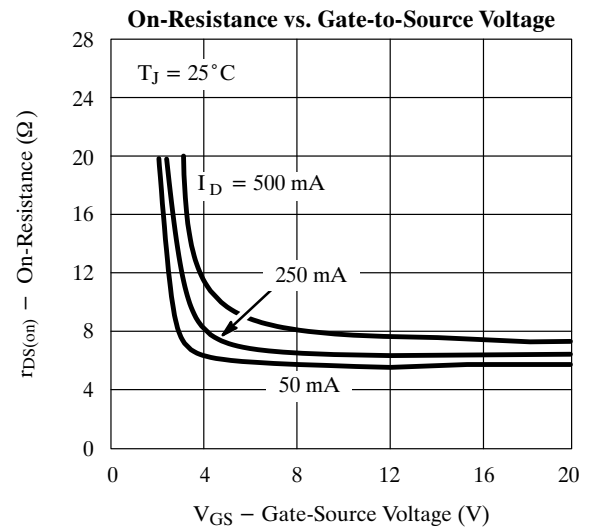
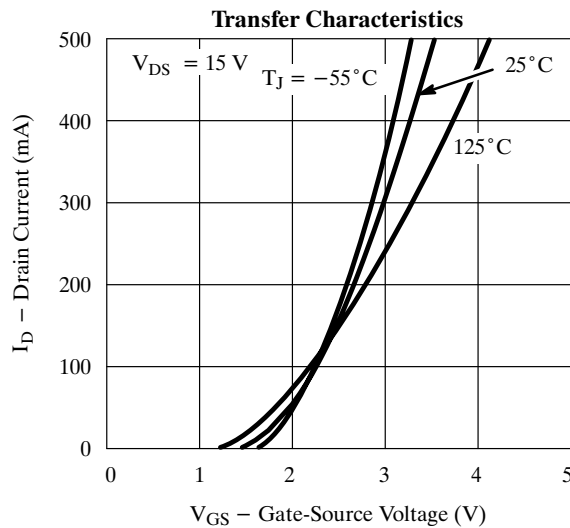
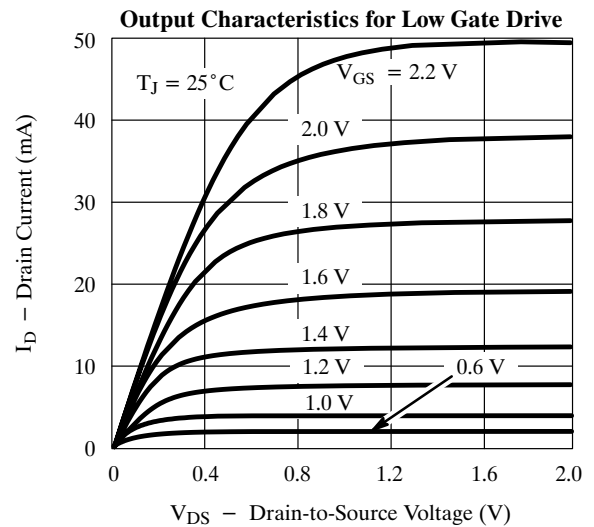
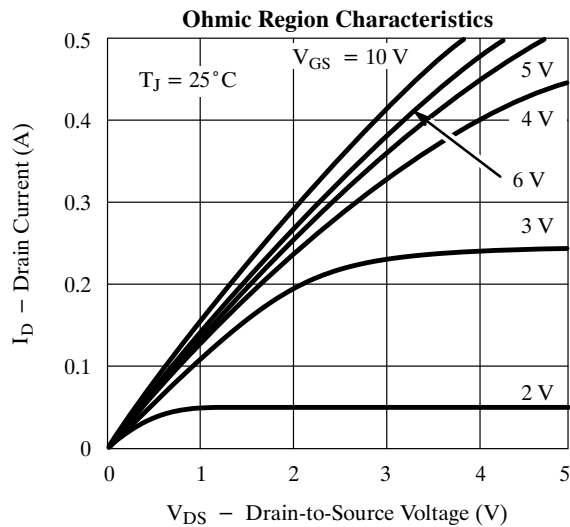
Parameter	Symbol	Test Conditions	Typ ^b	Limits				Unit
				VN2010L		BS107		
				Min	Max	Min	Max	
Static								
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 100 μA	220	200		200		V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 1 mA	1.2	0.8	1.8	0.8	3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 10			nA
		V _{DS} = 0 V, V _{GS} = ± 15 V					± 10	
Drain Leakage Current	I _{DSX}	V _{DS} = 70 V, V _{GS} = 0.2 V					1	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 130 V, V _{GS} = 0 V					0.03	
		V _{DS} = 160 V, V _{GS} = 0 V			1			
		T _J = 125°C			100			
On-State Drain Current ^c	I _{D(on)}	V _{DS} = 10 V, V _{GS} = 10 V	0.7	0.1				A
Drain-Source On-Resistance ^c	r _{DS(on)}	V _{GS} = 2.8 V, I _D = 0.02 A	6				28	Ω
		V _{GS} = 4.5 V, I _D = 0.05 A	6		10			
		T _J = 125°C	11		20			
Forward Transconductance ^c	g _{fs}	V _{DS} = 15 V, I _D = 0.1 A	180	125				mS
Common Source Output Conductance ^c	g _{os}	V _{DS} = 15 V, I _D = 0.05 A	0.15					
Dynamic								
Input Capacitance	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz	35		60			pF
Output Capacitance	C _{oss}		9		30			
Reverse Transfer Capacitance	C _{rss}		1		15			
Switching ^d								
Turn-On Time	t _{ON}	V _{DD} = 25 V, R _L = 250 Ω I _D ≅ 0.1 A, V _{GEN} = 10 V R _G = 25 Ω	5		20			ns
Turn-Off Time	t _{OFF}		21		30			

Notes

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

VNDQ20

Typical Characteristics (25°C Unless Otherwise Noted)



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

