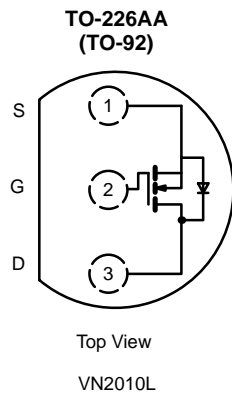


## N-Channel 200-V (D-S) MOSFETs

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

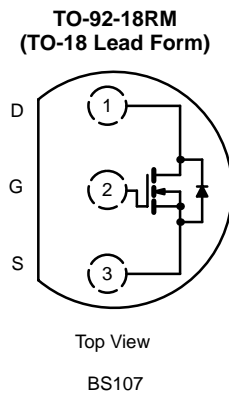
- Low On-Resistance: 6  $\Omega$
- Secondary Breakdown Free: 220 V
- Low Power/Voltage Driven
- Low Input and Output Leakage
- Excellent Thermal Stability
- Low Offset Voltage
- Full-Voltage Operation
- Easily Driven Without Buffer
- Low Error Voltage
- No High-Temperature "Run-Away"
- High-Voltage Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Transistors, etc.
- Telephone Mute Switches, Ringer Circuits
- Power Supply, Converters
- Motor Control



Device Marking Front View

"S" VN  
2010L  
xxyy

"S" = Siliconix Logo  
xxyy = Date Code



Device Marking Front View

"S" BS  
107  
xxyy

"S" = Siliconix Logo  
xxyy = Date Code

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	$V_{GS}$	$\pm 30$	$\pm 25$		
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ )	$I_D$	$T_A = 25^\circ\text{C}$	0.19	0.12	A
		$T_A = 100^\circ\text{C}$	0.12		
Pulsed Drain Current <sup>a</sup>	$I_{DM}$	0.8			
Power Dissipation	$P_D$	$T_A = 25^\circ\text{C}$	0.8	0.5	W
		$T_A = 100^\circ\text{C}$	0.32		
Thermal Resistance, 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.

# VN2010L/BS107

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

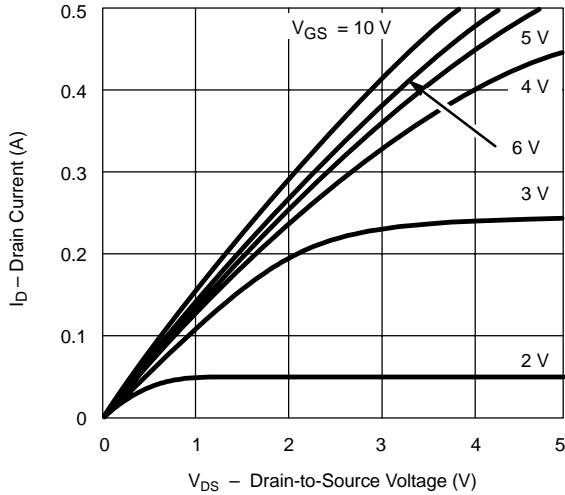
**Notes**

- For DESIGN AID ONLY, not subject to production testing.
- Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
- Switching time is essentially independent of operating temperature.

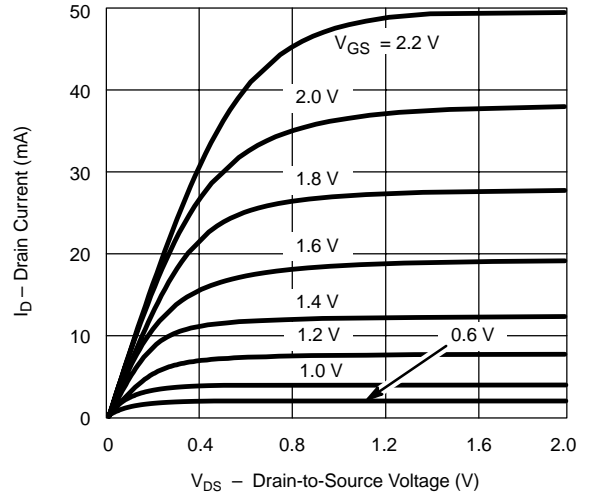
VNDQ20

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

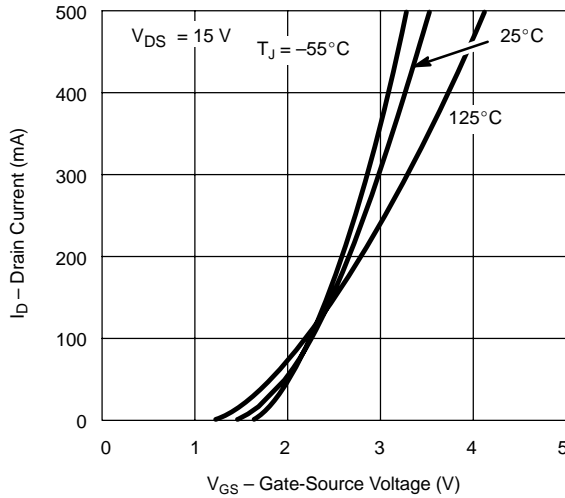
**Ohmic Region Characteristics**



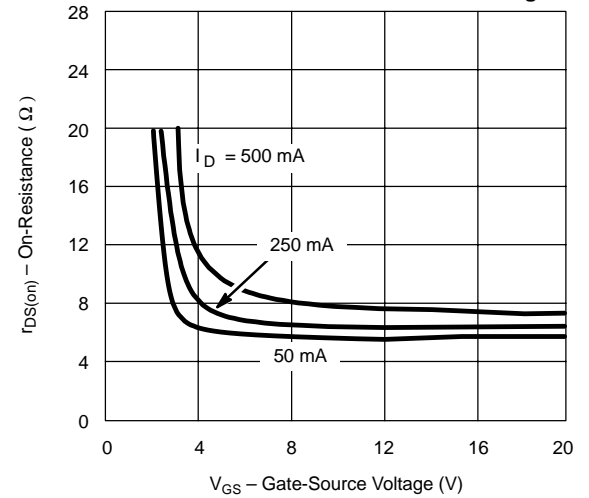
**Output Characteristics for Low Gate Drive**



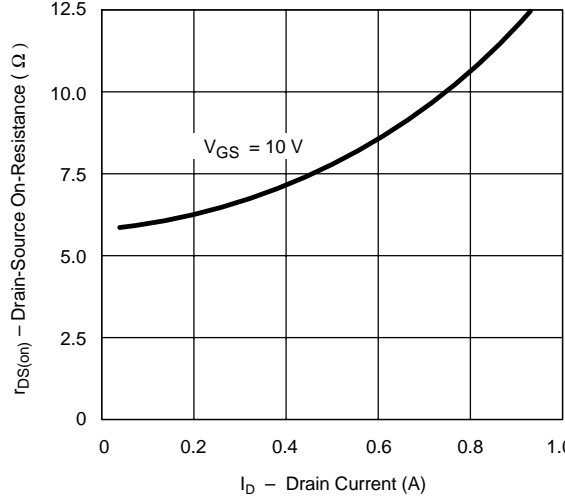
**Transfer Characteristics**



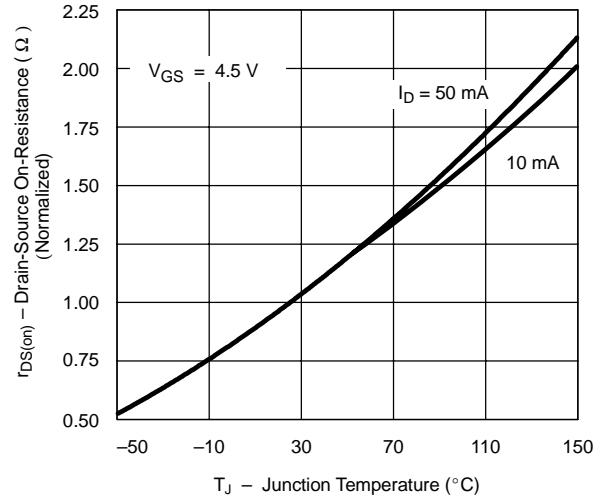
**On-Resistance vs. Gate-to-Source Voltage**



**On-Resistance vs. Drain Current**



**Normalized On-Resistance vs. Junction Temperature**



# VN2010L/BS107

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

