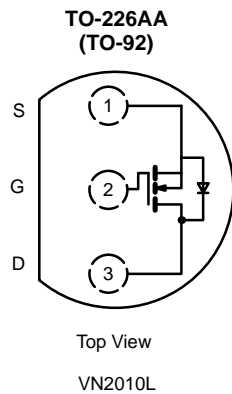


## N-Channel 200-V (D-S) MOSFETs

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

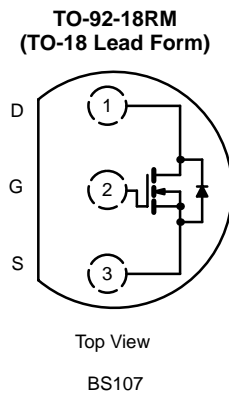
- Low On-Resistance: 6  $\Omega$
- Secondary Breakdown Free: 220 V
- Low Power/Voltage Driven
- Low Input and Output Leakage
- Excellent Thermal Stability
- Low Offset Voltage
- Full-Voltage Operation
- Easily Driven Without Buffer
- Low Error Voltage
- No High-Temperature "Run-Away"
- High-Voltage Drivers: 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	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	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**

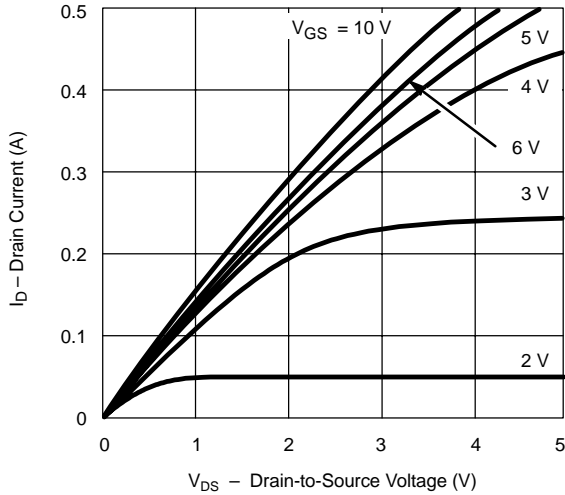
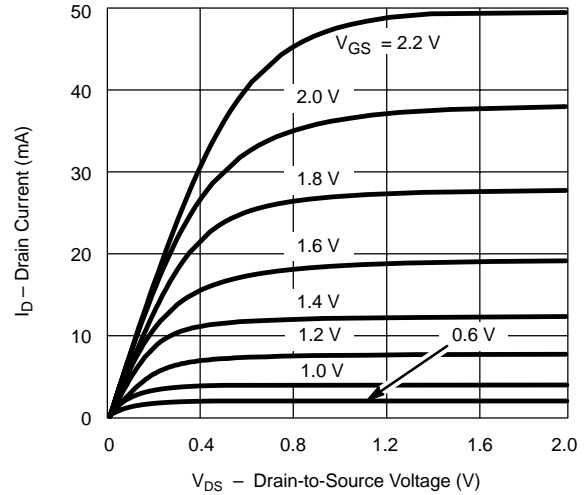
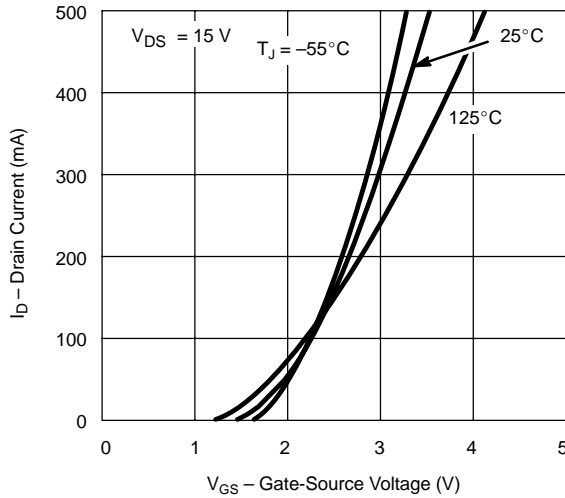
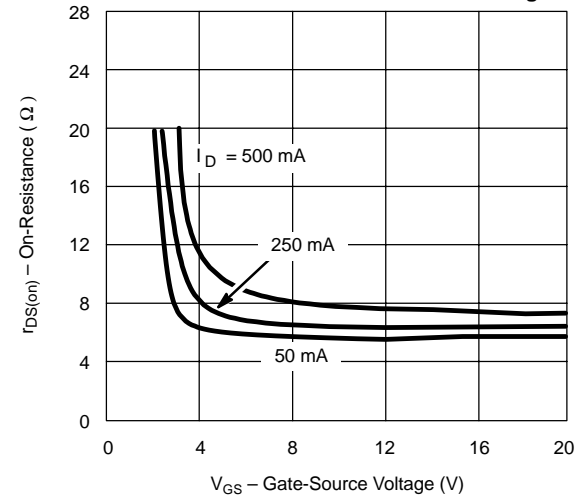
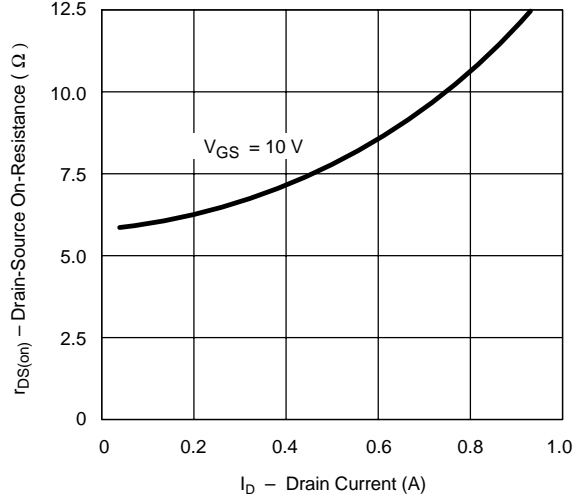
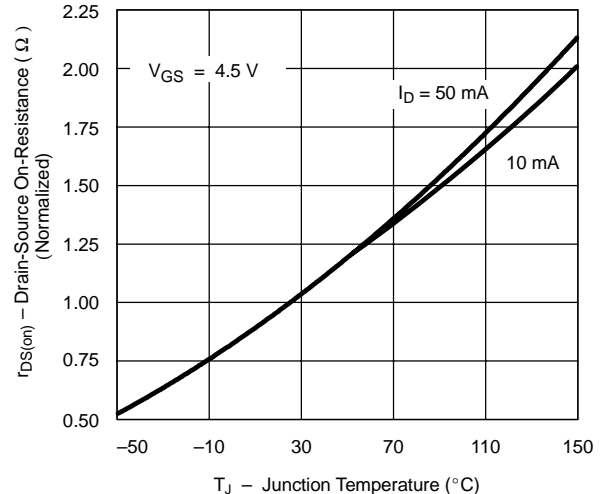
a. Pulse width limited by maximum junction temperature.

SPECIFICATIONS ( $T_A = 25^\circ\text{C}$ 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	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 100\ \mu\text{A}$	220	200		200		V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1\text{ mA}$	1.2	0.8	1.8	0.8	3	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 10$			nA
		$V_{DS} = 0\text{ V}, V_{GS} = \pm 15\text{ V}$					$\pm 10$	
Drain Leakage Current	$I_{DSV}$	$V_{DS} = 70\text{ V}, V_{GS} = 0.2\text{ V}$					1	$\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 130\text{ V}, V_{GS} = 0\text{ V}$					0.03	
		$V_{DS} = 160\text{ V}, V_{GS} = 0\text{ V}$ $T_J = 125^\circ\text{C}$			1		100	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = 10\text{ V}, V_{GS} = 10\text{ V}$	0.7	0.1				A
Drain-Source On-Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = 2.8\text{ V}, I_D = 0.02\text{ A}$	6				28	$\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 0.05\text{ A}$ $T_J = 125^\circ\text{C}$	6		10			
			11		20			
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}, I_D = 0.1\text{ A}$	180	125				mS
Common Source Output Conductance <sup>b</sup>	$g_{os}$	$V_{DS} = 15\text{ V}, I_D = 0.05\text{ A}$	0.15					
<b>Dynamic</b>								
Input Capacitance	$C_{iss}$	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	35		60			pF
Output Capacitance	$C_{oss}$		9		30			
Reverse Transfer Capacitance	$C_{rss}$		1		15			
<b>Switching<sup>c</sup></b>								
Turn-On Time	$t_{ON}$	$V_{DD} = 25\text{ V}, R_L = 250\ \Omega$ $I_D \cong 0.1\text{ A}, V_{GEN} = 10\text{ V}$ $R_G = 25\ \Omega$	5		20			ns
Turn-Off Time	$t_{OFF}$		21		30			

## Notes

- a. For DESIGN AID ONLY, not subject to production testing.  
 b. Pulse test:  $PW \leq 300\ \mu\text{s}$  duty cycle  $\leq 2\%$ .  
 c. 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**


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

