



N-Channel 500-V (D-S) MOSFETs

PRODUCT SUMMARY				
Part Number	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)
VN50300L	500	300 @ $V_{GS} = 10$ V	1 to 4.5	0.033
VN50300T		300 @ $V_{GS} = 10$ V	1 to 4.5	0.022

FEATURES

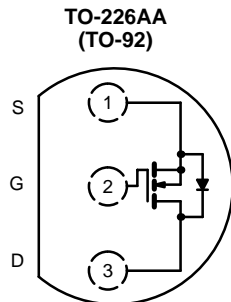
- Moderate On-Resistance: 240 Ω
- Secondary Breakdown Free: 520 V
- Low Power/Voltage Driven
- Low Input and Output Leakage
- Excellent Thermal Stability

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

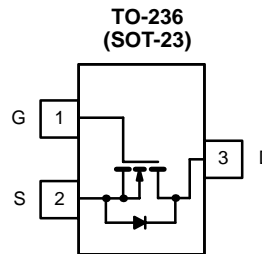


Top View
VN50300L

Device Marking
Front View

"S" VN5
0300L
xxyy

"S" = Siliconix Logo
xxyy = Date Code



Top View
VN50300T

Device Marking
Top View

V1 w//

V1 = Part Number Code for VN50300T
w = Week Code
// = Lot Traceability

ABSOLUTE MAXIMUM RATINGS (TA = 25°C UNLESS OTHERWISE NOTED)				
Parameter	Symbol	VN50300L	VN50300T	Unit
Drain-Source Voltage	V_{DS}	500	500	V
Gate-Source Voltage	V_{GS}	± 30	± 30	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	$T_A = 25^\circ\text{C}$	0.033	A
		$T_A = 100^\circ\text{C}$	0.021	
Pulsed Drain Current ^a	I_{DM}	0.013	0.08	
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	350	$^\circ\text{C}/\text{W}$
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	Limits			Unit
			Min	Typ ^a	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 10\ \mu\text{A}$	500	520		V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 10\ \mu\text{A}$	1	3.5	4.5	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$ $T_J = 125^\circ\text{C}$			± 100	nA
					± 500	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 250\text{ V}, V_{GS} = 0\text{ V}$ $T_J = 125^\circ\text{C}$			0.05	μA
					5	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 10\text{ V}, V_{GS} = 10\text{ V}$	15	30		mA
Drain-Source On-Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 10\text{ mA}$ $V_{GS} = 10\text{ V}, I_D = 5\text{ mA}$ $T_J = 125^\circ\text{C}$		250	300	Ω
					240	
				450	700	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 10\text{ mA}$	5	14		mS
Common Source Output Conductance ^b	g_{os}			0.005		
Dynamic						
Input Capacitance	C_{iss}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$		5	20	μF
Output Capacitance	C_{oss}			1.7	10	
Reverse Transfer Capacitance	C_{rss}			0.5	5	
Switching^c						
Turn-On Time	$t_{d(on)}$	$V_{DD} = 25\text{ V}, R_L = 2.5\text{ k}\Omega$ $I_D \cong 10\text{ mA}, V_{GEN} = 10\text{ V}$ $R_G = 25\ \Omega$		4.5	8	ns
	t_r			7	12	
Turn-Off Time	$t_{d(off)}$			8	20	
	t_f			60	90	

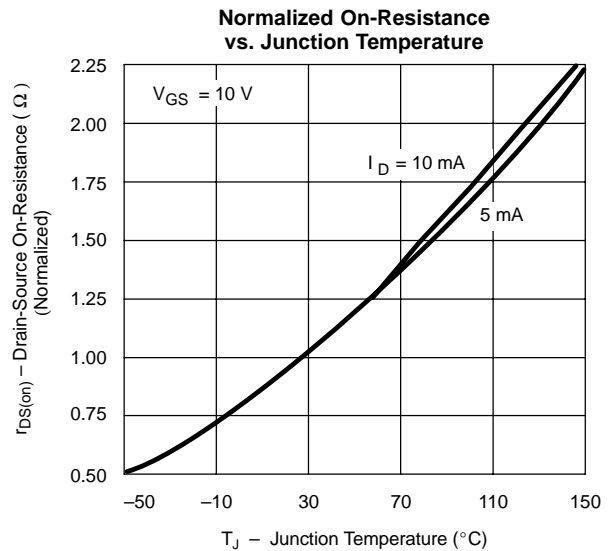
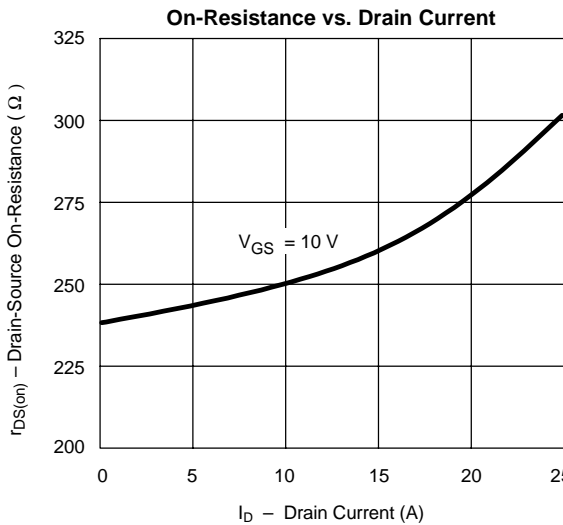
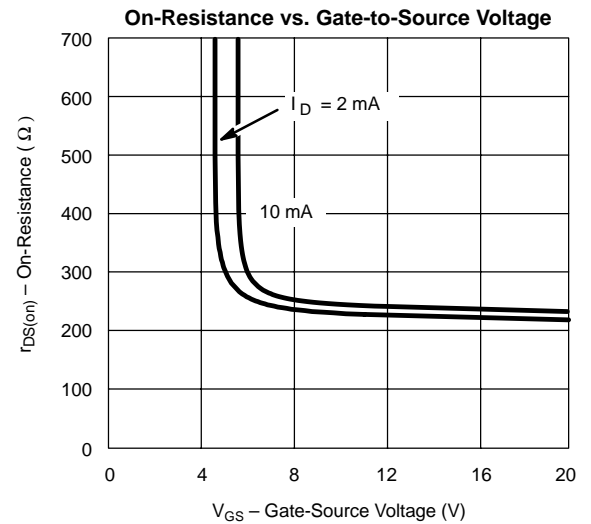
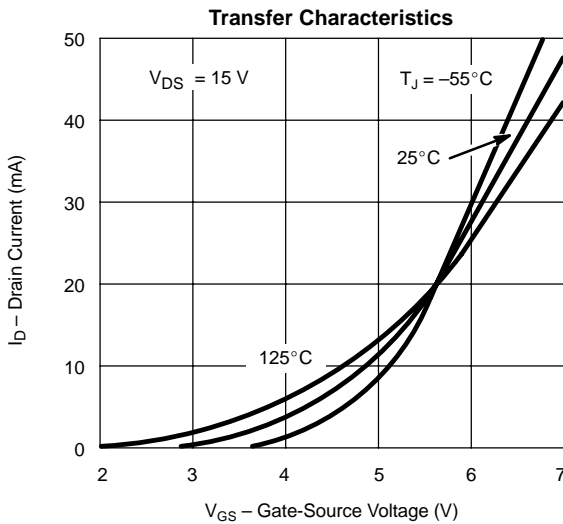
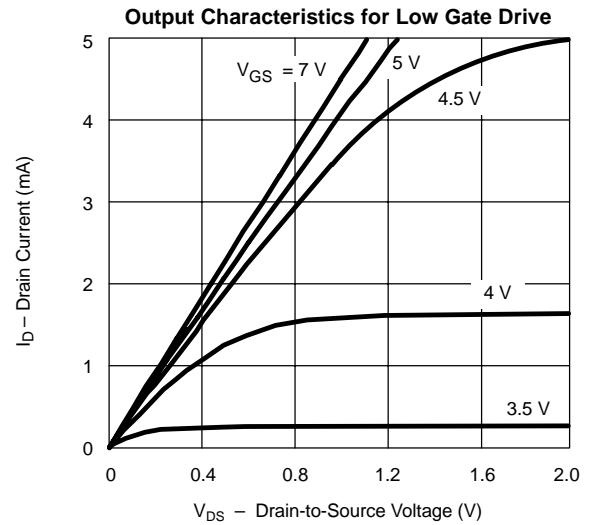
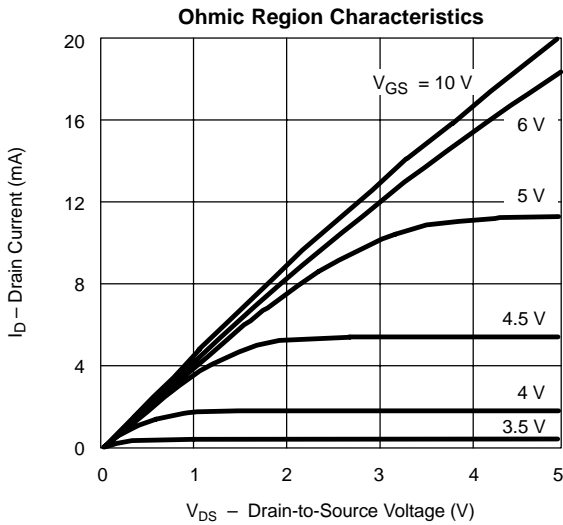
Notes

- 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.

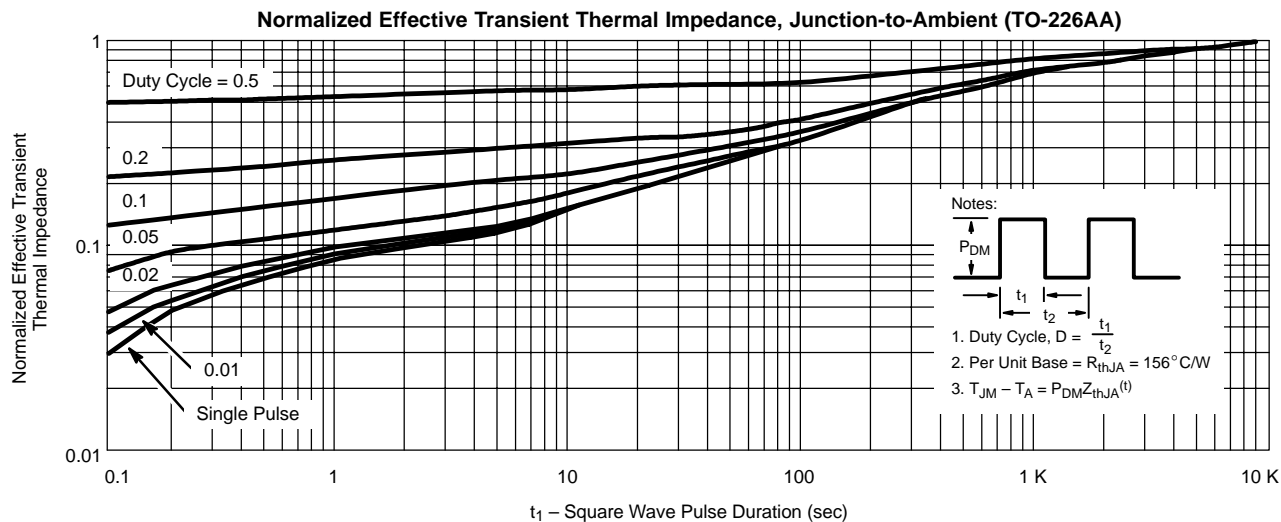
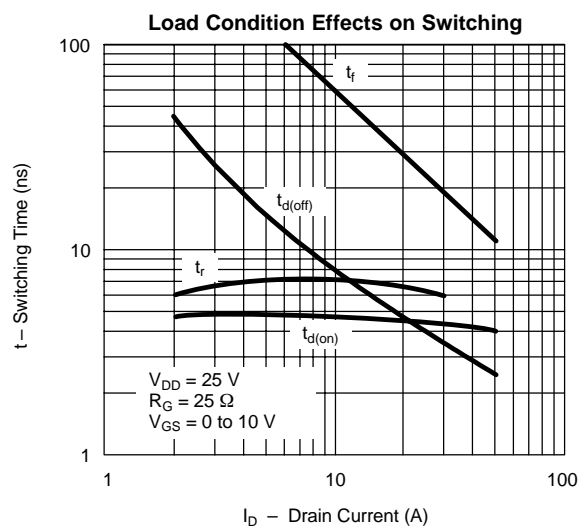
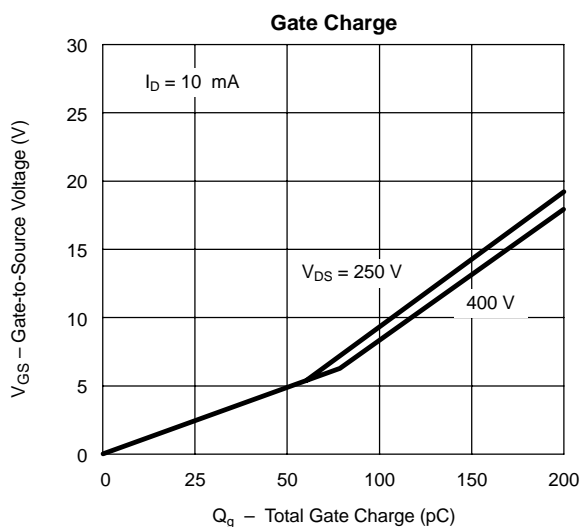
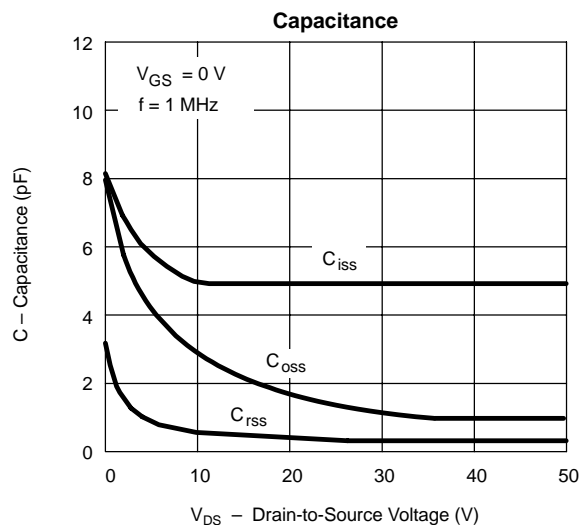
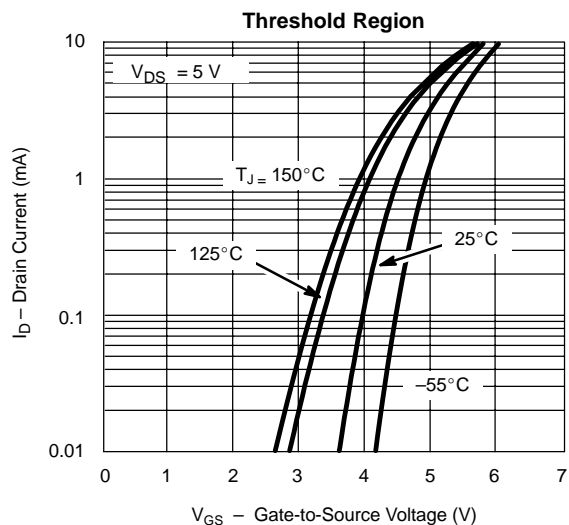
VNDO50



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



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