Siliconix incorporated

VN2010 SERIES

N-Channel Enhancement-Mode MOS Transistors

PRODUCT SUMMARY

PART NUMBER	$V_{(BR)DSS}$ (V)	$r_{DS(ON)}$ (Ω)	I_D (A)	PACKAGE
VN2010L	200	10	0.19	TO-92
VN2020L	200	20	0.08	TO-92

TO-92 BOTTOM VIEW

1 SOURCE
2 GATE
3 DRAIN

Performance Curves: **VNDQ20** (See Section 7)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	VN2010L	VN2020L	UNITS
Drain-Source Voltage		V_{DS}	200	200	V
Gate-Source Voltage		V_{GS}	±30	±30	
Continuous Drain Current	T_A = 25°C	I_D	0.19	0.08	A
	T_A = 100°C		0.12	0.055	
Pulsed Drain Current[1]		I_{DM}	0.8	0.5	
Power Dissipation	T_A = 25°C	P_D	0.8	0.8	W
	T_A = 100°C		0.32	0.32	
Operating Junction and Storage Temperature		T_j, T_{stg}	-55 to 150		°C
Lead Temperature (1/16" from case for 10 seconds)		T_L	300		

THERMAL RESISTANCE

THERMAL RESISTANCE	SYMBOL	VN2010L	VN2020L	UNITS
Junction-to-Ambient	R_{thJA}	156	156	°C/W

[1]Pulse width limited by maximum junction temperature

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ELECTRICAL CHARACTERISTICS[1]			LIMITS					
				VN2010L		VN2020L		
PARAMETER	SYMBOL	TEST CONDITIONS	TYP[2]	MIN	MAX	MIN	MAX	UNIT
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	1.3	0.8	1.8	0.8	2	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V	± 1		±10		±10	nA
		V_{DS} = 0 V, V_{GS} = ±20 V, T_J = 125°C	± 5					nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 160 V, V_{GS} = 0 V	0.001		1		1	µA
		V_{DS} = 160 V, V_{GS} = 0 V, T_J = 125°C	1		100		100	µA
On-State Drain Current[3]	$I_{D(ON)}$	V_{DS} = 10 V, V_{GS} = 10 V	700	100		100		mA
Drain-Source On-Resistance[3]	$r_{DS(ON)}$	V_{GS} = 4.5 V, I_D = 50 mA	7		10		20	Ω
		V_{GS} = 4.5 V, I_D = 50 mA, T_J = 125°C	12.5		20		40	Ω
Forward Transconductance[3]	g_{FS}	V_{DS} = 15 V, I_D = 100 mA	180	125		125		mS
Common Source Output Conductance[3]	g_{OS}	V_{DS} = 15 V, I_D = 50 mA	150					µS
DYNAMIC								
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz	35		60		60	pF
Output Capacitance	C_{oss}		9		30		30	pF
Reverse Transfer Capacitance	C_{rss}		1		15		15	pF
SWITCHING[4]								
Turn-On Time	t_{ON}	V_{DD} = 25 V, R_L = 250 Ω, I_D = 100 mA, V_{GEN} = 10 V, R_G = 25 Ω	5		20		20	ns
Turn-Off Time	t_{OFF}		21		30		30	ns

NOTES:
1. T_A = 25 °C unless otherwise noted.
2. For design aid only, not subject to production testing.
3. Pulse test; PW = 300 µs, duty cycle ≤ 2%
4. Switching time is essentially independent of operating temperature.