New Jersey Semi-Conductor Products, Inc.

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U.S.A.

VN2406
VN2410

N-Channel Enhancement-Mode Vertical DMOS FETs

Ordering Information

BV_{DSS} / BV_{DGS}	$R_{DS(ON)}$ (max)	$I_{D(ON)}$ (min)	Order Number / Package
			TO-92
240V	6.0Ω	1.0A	VN2406L
240V	10Ω	1.0A	VN2410L

Features

- Free from secondary breakdown
- Low power drive requirement
- Ease of paralleling
- Low C_{ISS} and fast switching speeds
- Excellent thermal stability
- Integral Source-Drain diode
- High input impedance and high gain
- Complementary N- and P-channel devices

Applications

- Motor controls
- Converters
- Amplifiers
- Switches
- Power supply circuits
- Drivers (relays, hammers, solenoids, lamps, memories, displays, bipolar transistors, etc.)

Package Option

S G D
TO-92

Note: See Package Outline section for dimensions.

Absolute Maximum Ratings

Drain-to-Source Voltage	BV_{DSS}
Drain-to-Gate Voltage	BV_{DGS}
Gate-to-Source Voltage	± 20V
Operating and Storage Temperature	-55°C to +150°C
Soldering Temperature*	300°C

* Distance of 1.6 mm from case for 10 seconds.

Quality Semi-Conductors

Thermal Characteristics

Package	I_D (continuous)*	I_D (pulsed)	Power Dissipation @ T_C = 25°C	θ_{jc} °C/W	θ_{ja} °C/W	I_{DR}*	I_{DRM}
TO-92	0.9A	5.0A	1.0W	125	170	0.18A	1.7A

* I_D (continuous) is limited by max rated T_j.

Electrical Characteristics (@ 25°C unless otherwise specified)

Symbol	Parameter		Min	Typ	Max	Unit	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage		240			V	V_{GS} = 0V, I_D = 0.1mA
$V_{GS(th)}$	Gate Threshold Voltage		0.8		2	V	V_{GS} = V_{DS}, I_D = 1mA
I_{GSS}	Gate Body Leakage				100	nA	V_{GS} = 20V, V_{DS} = 0V
I_{DSS}	Zero Gate Voltage Drain Current				10	µA	V_{GS} = 0V, V_{DS} = 120V
					500		V_{GS} = 0V, V_{DS} = 120V T_A = 125°C
$I_{D(ON)}$	ON-State Drain Current		1.0			A	V_{GS} = -10V, V_{DS} = 15V
$R_{DS(ON)}$	Static Drain-to-Source ON-State Resistance	All			10	Ω	V_{GS} = 2.5V, I_D = 0.1A
		VN2410			10		V_{GS} = 10V, I_D = 0.5A
		VN2406			6		V_{GS} = 10V, I_D = 0.5A
$\Delta R_{DS(ON)}$	Change in $R_{DS(ON)}$ with Temperature			1.0	1.4	%/°C	V_{GS} = 10V, I_D = 0.55A
G_{FS}	Forward Transconductance		300			m℧	V_{DS} = 10V, I_D = 0.5A
C_{ISS}	Input Capacitance				125	pF	V_{GS} = 0V, V_{DS} = 25V f = 1 MHz
C_{OSS}	Common Source Output Capacitance				50		
C_{RSS}	Reverse Transfer Capacitance				20		
$t_{d(ON)}$	Turn-ON Delay Time				8	ns	V_{DD} = 60V I_D = 0.4A R_{GEN} = 25Ω
t_r	Rise Time				8		
$t_{d(OFF)}$	Turn-OFF Delay Time				23		
t_f	Fall Time				24		
V_{SD}	Diode Forward Voltage Drop	VN2410		1.2		V	V_{GS} = 0V, I_{SD} = 0.19A
		VN2406		1.2		V	V_{GS} = 0V, I_{SD} = 0.8A

Notes:
1. All D.C. parameters 100% tested at 25°C unless otherwise stated. (Pulse test: 300µs pulse, 2% duty cycle.)
2. All A.C. parameters sample tested.

Switching Waveforms and Test Circuit