



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

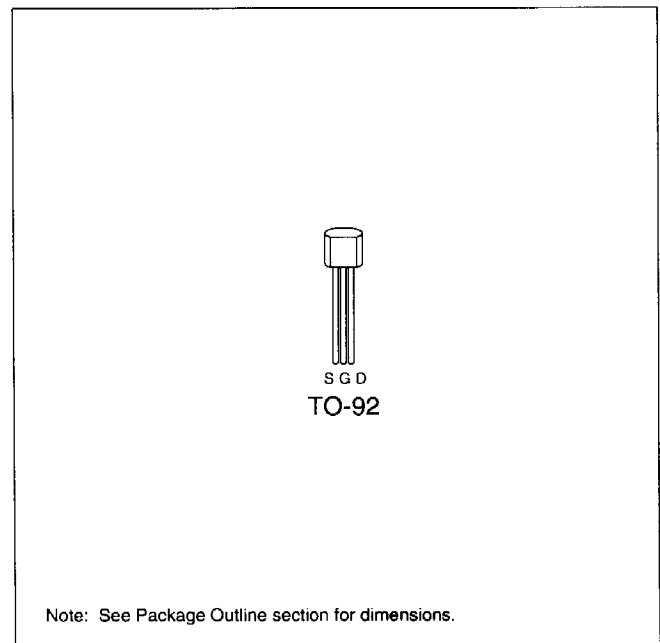
- Motor controls
- Converters
- Amplifiers
- Switches
- Power supply circuits
- Drivers (relays, hammers, solenoids, lamps, memories, displays, bipolar transistors, etc.)

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.

Package Option



Thermal Characteristics

Package	I_D (continuous)*	I_D (pulsed)	Power Dissipation @ $T_C = 25^\circ\text{C}$	θ_{JC} $^\circ\text{C/W}$	θ_{JA} $^\circ\text{C/W}$	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	$V_{GS} = 0V, I_D = 0.1\text{mA}$
$V_{GS(th)}$	Gate Threshold Voltage	0.8		2	V	$V_{GS} = V_{DS}, I_D = 1\text{mA}$
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		$V_{GS} = 0V, V_{DS} = 120V$ $T_A = 125^\circ\text{C}$
$I_{D(ON)}$	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	$\% / ^\circ\text{C}$	$V_{GS} = 10V, I_D = 0.55A$
G_{FS}	Forward Transconductance	300			mS	$V_{DS} = 10V, I_D = 0.5A$
C_{ISS}	Input Capacitance			125	pF	$V_{GS} = 0V, V_{DS} = 25V$ $f = 1\text{MHz}$
C_{OSS}	Common Source Output Capacitance			50		
C_{RSS}	Reverse Transfer Capacitance			20		
$t_{d(ON)}$	Turn-ON Delay Time			8	ns	$V_{DD} = 60V$ $I_D = 0.4A$ $R_{GEN} = 25\Omega$
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:

- All D.C. parameters 100% tested at 25°C unless otherwise stated. (Pulse test: $300\mu\text{s}$ pulse, 2% duty cycle.)
- All A.C. parameters sample tested.

Switching Waveforms and Test Circuit

