

# VN2406L

Preferred Device

## Small Signal MOSFET 200 mAmps, 240 Volts N-Channel TO-92

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	240	Vdc
Drain-Gate Voltage	$V_{DGR}$	240	Vdc
Gate-Source Voltage – Continuous – Non-repetitive ( $t_p \leq 50 \mu s$ )	$V_{GS}$ $V_{GSM}$	$\pm 20$ $\pm 40$	Vdc Vpk
Continuous Drain Current	$I_D$	200	mA <sub>dc</sub>
Pulsed Drain Current	$I_{DM}$	500	mA <sub>dc</sub>
Power Dissipation @ $T_C = 25^\circ C$ Derate above $25^\circ C$	$P_D$	350 2.8	mW mW/ $^\circ C$
Operating and Storage Temperature	$T_J, T_{stg}$	–	$^\circ C$

### THERMAL CHARACTERISTICS

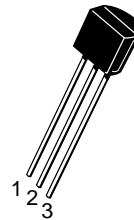
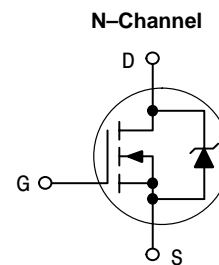
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	312.5	$^\circ C/W$
Maximum Lead Temperature for Soldering Purposes, 1/16" from case for 10 seconds	$T_L$	300	$^\circ C$



ON Semiconductor™

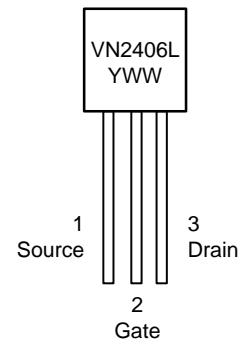
<http://onsemi.com>

**200 mAmps**  
**240 VOLTS**  
 **$R_{DS(on)} = 6 \Omega$**



**TO-92**  
**CASE 29**  
**Style 22**

### MARKING DIAGRAM & PIN ASSIGNMENT



Y = Year  
WW = Work Week

### ORDERING INFORMATION

Device	Package	Shipping
VN2406L	TO-92	1000 Units/Box
VN2406LZL1	TO-92	2000 Ammo Pack

Preferred devices are recommended choices for future use and best overall value.

# VN2406L

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
----------------	--------	-----	-----	------

### STATIC CHARACTERISTICS

Drain–Source Breakdown Voltage (V <sub>GS</sub> = 0, I <sub>D</sub> = 100 μA)	V <sub>(BR)DSS</sub>	240	–	Vdc
Zero Gate Voltage Drain Current (V <sub>DS</sub> = 120 Vdc, V <sub>GS</sub> = 0) (V <sub>DS</sub> = 120 Vdc, V <sub>GS</sub> = 0, T <sub>A</sub> = 125°C)	I <sub>DSS</sub>	– –	10 500	μAdc
Gate– Body Leakage (V <sub>DS</sub> = 0, V <sub>GS</sub> = ±15 V)	I <sub>GSS</sub>	–	±100	nAdc
Gate Threshold Voltage (V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1.0 mA)	V <sub>GS(th)</sub>	0.8	2.0	Vdc
On–State Drain Current (Note 1) (V <sub>GS</sub> = 10 V, V <sub>DS</sub> ≥ 2.0 V <sub>DS(on)</sub> )	I <sub>D(on)</sub>	1.0	–	Adc
Drain–Source On Resistance (Note 1) (V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 0.1 A) (V <sub>GS</sub> = 10 V, I <sub>D</sub> = 0.5 A)	r <sub>DS(on)</sub>	– –	10 6.0	Ω
Forward Transconductance (Note 1) (V <sub>DS</sub> = 10 V, I <sub>D</sub> = 0.5 A)	g <sub>fs</sub>	300	–	mS

### DYNAMIC CHARACTERISTICS

Input Capacitance	(V <sub>DS</sub> = 25 Vdc, V <sub>GS</sub> = 0, f = 1.0 MHz)	C <sub>iss</sub>	–	125	pF
Output Capacitance		C <sub>oss</sub>	–	50	pF
Reverse Transfer Capacitance		C <sub>rss</sub>	–	20	pF

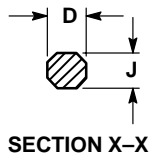
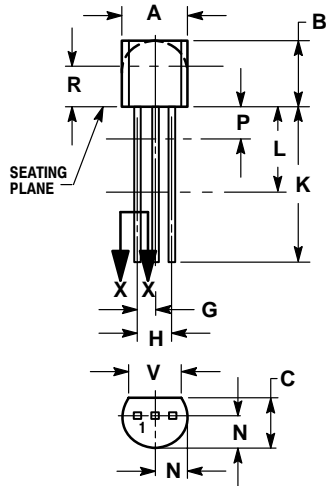
### SWITCHING CHARACTERISTICS

Turn–On Time	(V <sub>DD</sub> = 60 Vdc, I <sub>D</sub> = 0.4 A, R <sub>L</sub> = 150 Ω, R <sub>G</sub> = 25 Ω)	t <sub>(on)</sub>	–	8.0	ns
		t <sub>(r)</sub>	–	8.0	ns
Turn–Off Time		t <sub>(off)</sub>	–	23	ns
		t <sub>(f)</sub>	–	34	ns

1. Pulse Test; Pulse Width < 300 μs, Duty Cycle ≤ 2.0%.

## PACKAGE DIMENSIONS

TO-92  
CASE 29-11  
ISSUE AL




## NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

## STYLE 22:

1. SOURCE
2. GATE
3. DRAIN

**ON Semiconductor** and  are trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer.

## PUBLICATION ORDERING INFORMATION

### Literature Fulfillment:

Literature Distribution Center for ON Semiconductor  
P.O. Box 5163, Denver, Colorado 80217 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** ONlit@hibbertco.com

**N. American Technical Support:** 800-282-9855 Toll Free USA/Canada

**JAPAN:** ON Semiconductor, Japan Customer Focus Center  
4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan 141-0031  
**Phone:** 81-3-5740-2700  
**Email:** r14525@onsemi.com

**ON Semiconductor Website:** <http://onsemi.com>

For additional information, please contact your local  
Sales Representative.