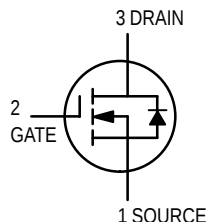
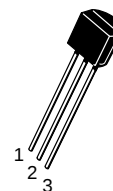


# TMOS FET Transistor

## N-Channel — Enhancement



**VN2410L**



CASE 29-04, STYLE 22  
TO-92 (TO-226AA)

### MAXIMUM RATINGS

| Rating                                   | Symbol         | Value    | Unit           |
|------------------------------------------|----------------|----------|----------------|
| Drain-Source Voltage                     | $V_{DSS}$      | 240      | Vdc            |
| Drain-Gate Voltage                       | $V_{DGR}$      | 60       | Vdc            |
| Gate-Source Voltage                      | $V_{GS}$       | $\pm 20$ | Vdc            |
| — Continuous                             | $V_{GSM}$      | $\pm 40$ | Vpk            |
| — Non-repetitive ( $t_p \leq 50 \mu s$ ) |                |          |                |
| Continuous Drain Current                 | $I_D$          | 200      | mAdc           |
| Pulsed Drain Current                     | $I_{DM}$       | 500      | mAdc           |
| Power Dissipation @ $T_C = 25^\circ C$   | $P_D$          | 350      | mW             |
| Derate above $25^\circ C$                |                | 2.8      | 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<br>Purposes, 1/16" from case for 10<br>seconds | $T_L$           | 300   | $^\circ C$   |

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ C$ unless otherwise noted)

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

### STATIC CHARACTERISTICS

|                                                                                                                                      |               |        |           |              |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|-----------|--------------|
| Drain-Source Breakdown Voltage<br>( $V_{GS} = 0, I_D = 100 \mu A$ )                                                                  | $V_{(BR)DSS}$ | 240    | —         | Vdc          |
| Zero Gate Voltage Drain Current<br>( $V_{DS} = 120 V_{dc}, V_{GS} = 0$ )<br>( $V_{DS} = 120 V_{dc}, V_{GS} = 0, T_A = 125^\circ C$ ) | $I_{DSS}$     | —<br>— | 10<br>500 | $\mu A_{dc}$ |
| Gate-Body Leakage<br>( $V_{DS} = 0, V_{GS} = \pm 15 V$ )                                                                             | $I_{GSS}$     | —      | $\pm 100$ | nAdc         |
| Gate Threshold Voltage<br>( $V_{DS} = V_{GS}, I_D = 1.0 mA$ )                                                                        | $V_{GS(th)}$  | 0.8    | 2.0       | Vdc          |
| On-State Drain Current <sup>(1)</sup><br>( $V_{GS} = 10 V, V_{DS} \geq 2.0 V_{DS(on)}$ )                                             | $I_{D(on)}$   | 1.0    | —         | Adc          |
| Drain-Source On Resistance <sup>(1)</sup><br>( $V_{GS} = 2.5 V, I_D = 0.1 A$ )<br>( $V_{GS} = 10 V, I_D = 0.5 A$ )                   | $r_{DS(on)}$  | —<br>— | 10<br>10  | $\Omega$     |
| Forward Transconductance <sup>(1)</sup><br>( $V_{DS} = 10 V, I_D = 0.5 A$ )                                                          | $g_{fs}$      | 300    | —         | mS           |

1. Pulse Test; Pulse Width  $< 300 \mu s$ , Duty Cycle  $\leq 2.0\%$ .

TMOS is a registered trademark of Motorola, Inc.

REV 1

**VN2410L****ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (Continued)

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

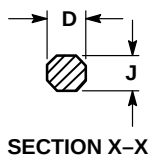
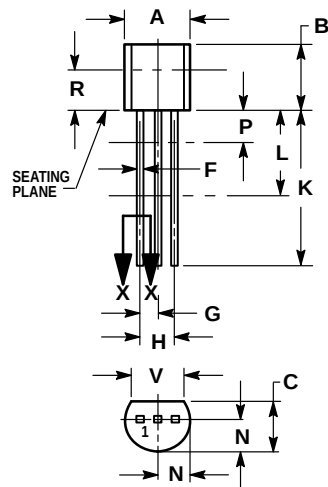
**DYNAMIC CHARACTERISTICS**

|                              |                                                            |           |   |     |    |
|------------------------------|------------------------------------------------------------|-----------|---|-----|----|
| Input Capacitance            | $(V_{DS} = 25\text{ Vdc}, V_{GS} = 0, f = 1.0\text{ MHz})$ | $C_{iss}$ | — | 125 | pF |
| Output Capacitance           |                                                            | $C_{oss}$ | — | 50  | pF |
| Reverse Transfer Capacitance |                                                            | $C_{rss}$ | — | 20  | pF |

**SWITCHING CHARACTERISTICS**

|               |                                                                                     |             |   |     |    |
|---------------|-------------------------------------------------------------------------------------|-------------|---|-----|----|
| Turn-On Time  | $(V_{DD} = 60\text{ Vdc}, I_D = 0.4\text{ A}, R_L = 150\ \Omega, R_G = 25\ \Omega)$ | $t_{(on)}$  | — | 8.0 | ns |
|               |                                                                                     | $t_{(r)}$   | — | 8.0 | ns |
| Turn-Off Time |                                                                                     | $t_{(off)}$ | — | 23  | ns |
|               |                                                                                     | $t_{(f)}$   | — | 34  | ns |

## PACKAGE DIMENSIONS



**CASE 029-04  
(TO-226AA)  
ISSUE AD**

## NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K MINIMUM. 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  | 0.022 | 0.41        | 0.55 |
| F   | 0.016  | 0.019 | 0.41        | 0.48 |
| 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:

- PIN 1. SOURCE  
2. GATE  
3. DRAIN

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola 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 consequential or incidental damages. "Typical" parameters which may be provided in Motorola 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. Motorola does not convey any license under its patent rights nor the rights of others. Motorola 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 Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola 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 Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

Mfax is a trademark of Motorola, Inc.

**How to reach us:**

**USA/EUROPE/Locations Not Listed:** Motorola Literature Distribution;  
P.O. Box 5405, Denver, Colorado 80217. 303-675-2140 or 1-800-441-2447

**JAPAN:** Nippon Motorola Ltd.: SPD, Strategic Planning Office, 4-32-1,  
Nishi-Gotanda, Shinagawa-ku, Tokyo 141, Japan. 81-3-5487-8488

**Mfax™:** RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609  
– US & Canada ONLY 1-800-774-1848

**ASIA/PACIFIC:** Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,  
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

**INTERNET:** <http://motorola.com/sps>

