

## P-Channel Enhancement-Mode MOSFET Transistor

### Product Summary

$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max ( $\Omega$ )	$V_{GS(th)}$ (V)	$I_D$ (A)
-240	10 @ $V_{GS} = -4.5$ V	-0.8 to -2.5	-0.18

### Features

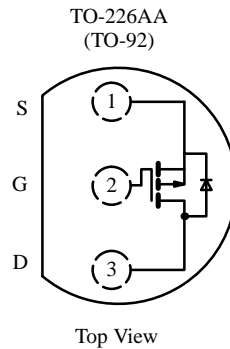
- High-Side Switching
- Secondary Breakdown Free: -255 V
- Low On-Resistance: 8  $\Omega$
- Low-Power/Voltage Driven
- Excellent Thermal Stability

### Benefits

- Ease in Driving Switches
- Full-Voltage Operation
- Low Offset Voltage
- Easily Driven Without Buffer
- No High-Temperature “Run-Away”

### Applications

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Power Supply, Converters
- Motor Control
- Switches



### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Limits	Unit	
Drain-Source Voltage	$V_{DS}$	-240	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ )	$I_D$	$T_A = 25^\circ\text{C}$	-0.18	A
		$T_A = 100^\circ\text{C}$	-0.11	
Pulsed Drain Current <sup>a</sup>	$I_{DM}$	-0.72		
Power Dissipation	$P_D$	$T_A = 25^\circ\text{C}$	0.8	W
		$T_A = 100^\circ\text{C}$	0.32	
Maximum Junction-to-Ambient	$R_{thJA}$	156	$^\circ\text{C}/\text{W}$	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150	$^\circ\text{C}$	

Notes

a. Pulse width limited by maximum junction temperature.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70211.

# VP2410L

## Specifications<sup>a</sup>

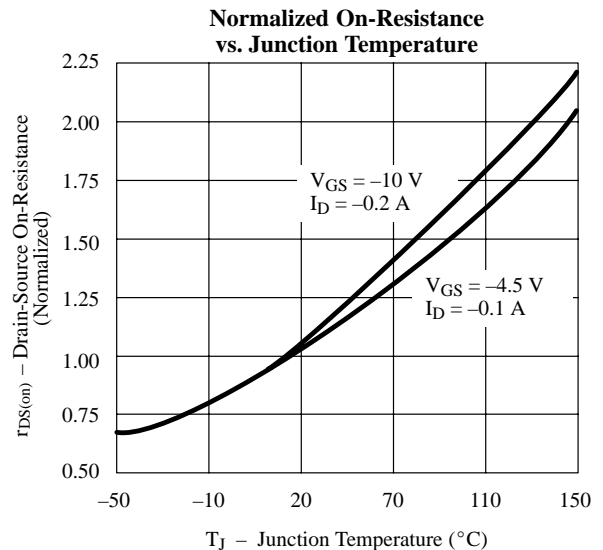
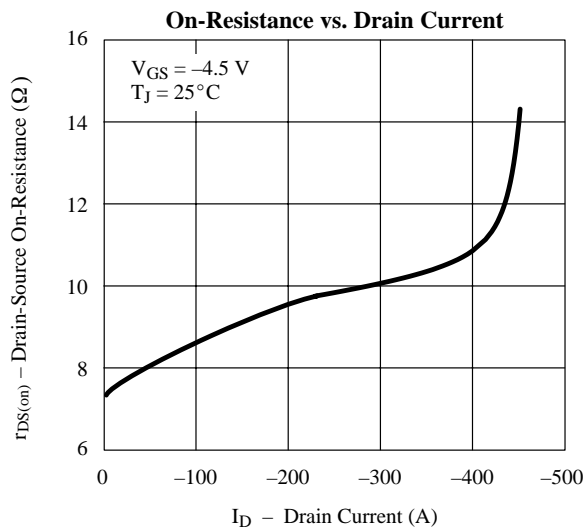
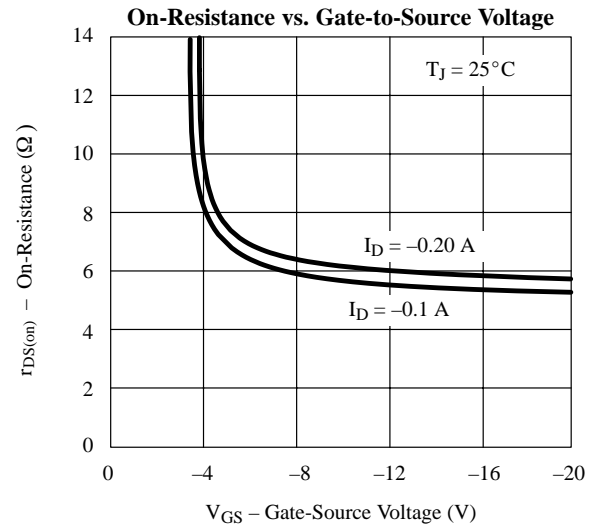
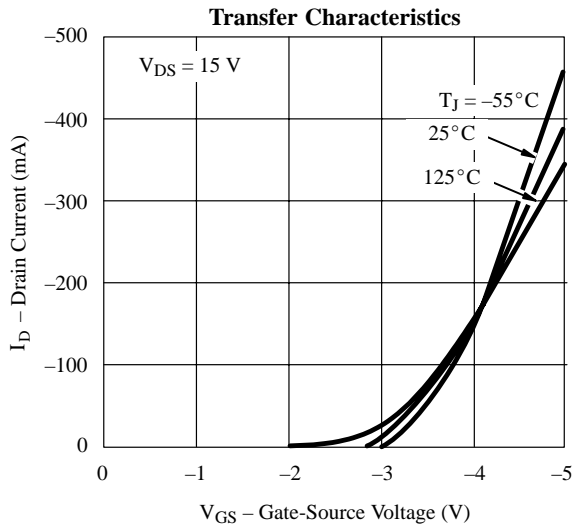
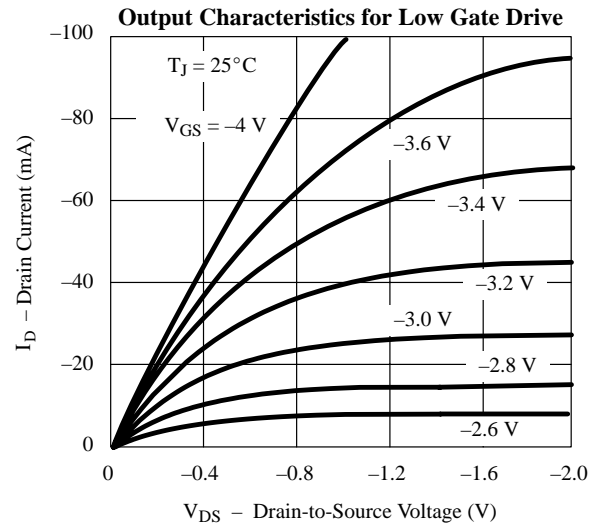
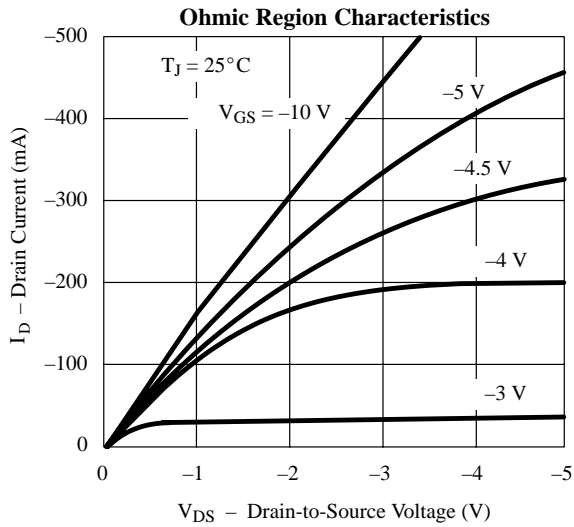
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ <sup>b</sup>	Max	
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -5\text{ }\mu\text{A}$	-240	-255		V
		$V_{GS} = 0\text{ V}, I_D = -10\text{ }\mu\text{A}$		-255		
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -1\text{ mA}$		-2.1		
		$V_{DS} = V_{GS}, I_D = -2.5\text{ mA}$	-0.8	-2.2	-2.5	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 10$	nA
		$T_J = 125^\circ\text{C}$			$\pm 50$	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -180\text{ V}, V_{GS} = 0\text{ V}$			-1	$\mu\text{A}$
		$T_J = 125^\circ\text{C}$			-100	
On-State Drain Current <sup>c</sup>	$I_{D(on)}$	$V_{DS} = -10\text{ V}, V_{GS} = -4.5\text{ V}$	-150	-300		mA
Drain-Source On-Resistance <sup>c</sup>	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -0.1\text{ A}$		6		$\Omega$
		$V_{GS} = -4.5\text{ V}, I_D = -0.1\text{ A}$		8	10	
		$T_J = 125^\circ\text{C}$		14.5	20	
Forward Transconductance <sup>c</sup>	$g_{fs}$	$V_{DS} = -10\text{ V}, I_D = -0.1\text{ A}$	125	175		mS
Common Source Output Conductance <sup>c</sup>	$g_{os}$	$V_{DS} = -10\text{ V}, I_D = -0.05\text{ A}$		0.125		
<b>Dynamic</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -25\text{ V}, V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$		65	95	pF
Output Capacitance	$C_{oss}$			25	30	
Reverse Transfer Capacitance	$C_{rss}$			12	15	
<b>Switching<sup>d</sup></b>						
Turn-On Time	$t_{ON}$	$V_{DD} = -25\text{ V}, R_L = 250\text{ }\Omega$ $I_D \cong -0.1\text{ A}, V_{GEN} = -10\text{ V}$ $R_G = 25\text{ }\Omega$		25		ns
	$t_{d(on)}$			7	15	
	$t_r$			18	30	
Turn-Off Time	$t_{OFF}$			90		
	$t_{d(off)}$			45	70	
	$t_f$			45	60	

### Notes

- $T_A = 25^\circ\text{C}$  unless otherwise noted.
- For DESIGN AID ONLY, not subject to production testing.
- Pulse test:  $PW \leq 300\text{ }\mu\text{s}$  duty cycle  $\leq 2\%$ .
- Switching time is essentially independent of operating temperature.

VPDV24

## Typical Characteristics (25°C Unless Otherwise Noted)



# VP2410L

## Typical Characteristics (25°C Unless Otherwise Noted) (Cont'd)

