

P-Channel Enhancement-Mode MOS Transistor

Product Summary

Part Number	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)
VP2410L	-240	10 @ $V_{GS} = -4.5$ V	-0.8 to -2.5	-0.18

Features

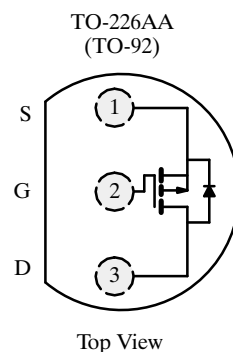
- High-Side Switching
- Secondary Breakdown Free: -255 V
- Low On-Resistance: 8 Ω
- Low-Power/Voltage Driven
- Excellent Thermal Stability

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}	± 20	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	$T_A = 25^\circ\text{C}$	-0.18
		$T_A = 100^\circ\text{C}$	-0.11
Pulsed Drain Current	I_{DM}	-0.72	A
Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	0.8
		$T_A = 100^\circ\text{C}$	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.

Specifications^a

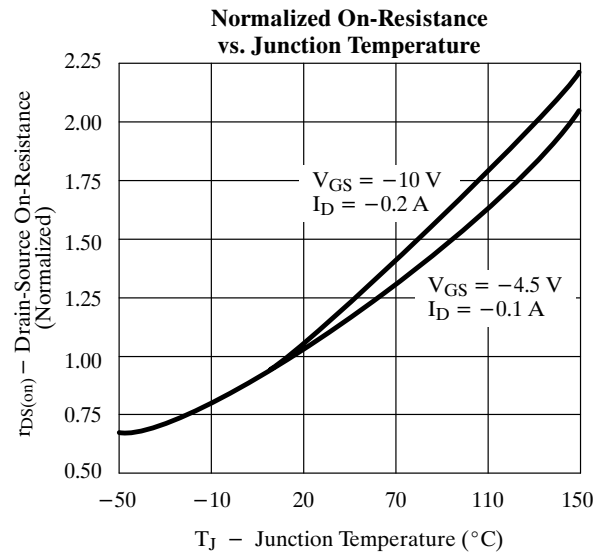
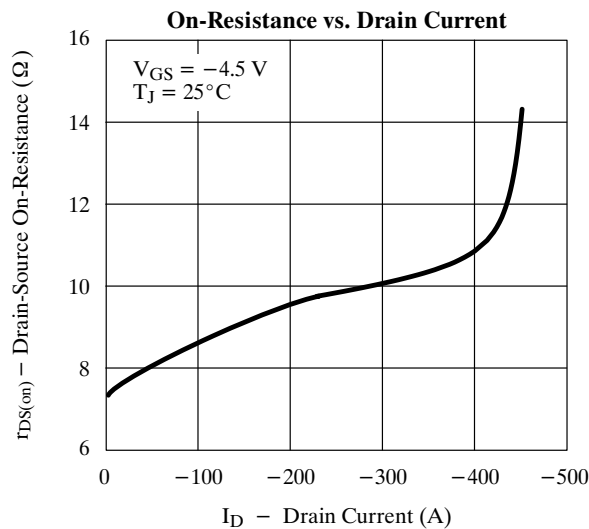
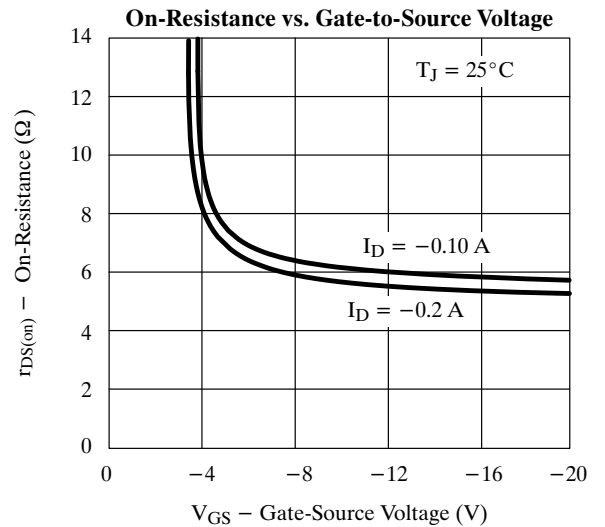
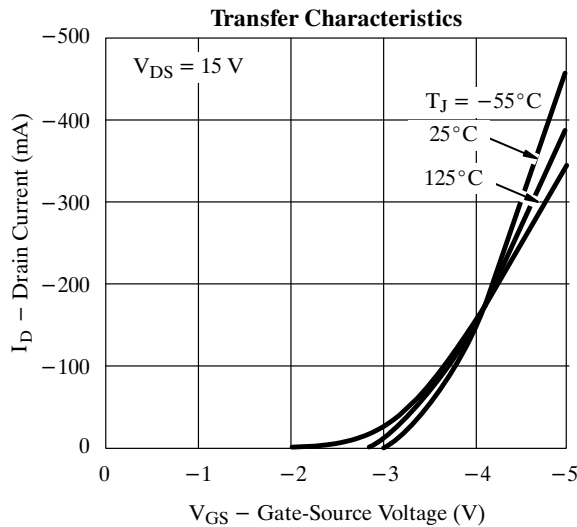
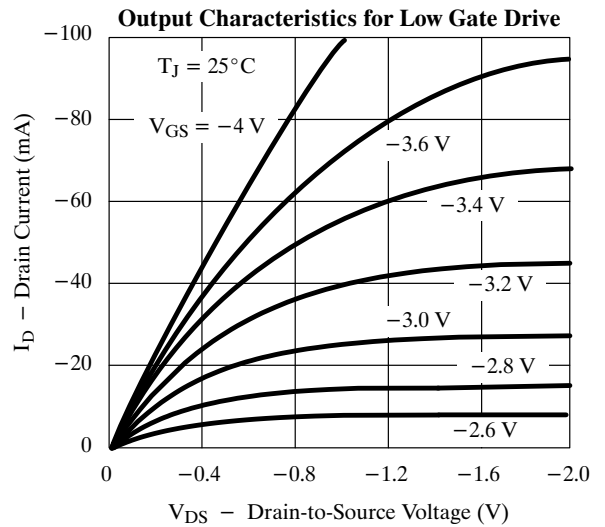
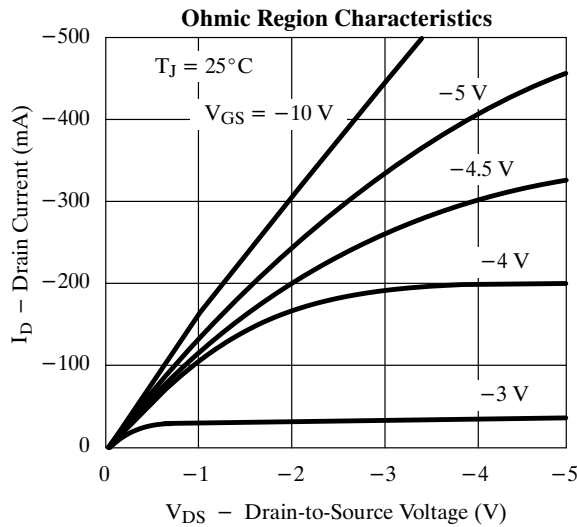
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ ^b	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -5\text{ }\mu\text{A}$	-240	-255		V
		$V_{GS} = 0\text{ V}, I_D = -10\text{ }\mu\text{A}$		-255		
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -1\text{ mA}$		-2.1		
		$V_{DS} = V_{GS}, I_D = -2.5\text{ mA}$	-0.8	-2.2	-2.5	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 10	nA
		$T_J = 125^\circ\text{C}$			± 50	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -180\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$T_J = 125^\circ\text{C}$			-100	
On-State Drain Current ^c	$I_{D(on)}$	$V_{DS} = -10\text{ V}, V_{GS} = -4.5\text{ V}$	-150	-300		mA
Drain-Source On-Resistance ^c	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -0.1\text{ A}$		6		Ω
		$V_{GS} = -4.5\text{ V}, I_D = -0.1\text{ A}$		8	10	
		$T_J = 125^\circ\text{C}$		14.5	20	
Forward Transconductance ^c	g_{fs}	$V_{DS} = -10\text{ V}, I_D = -0.1\text{ A}$	125	175		mS
Common Source Output Conductance ^c	g_{os}	$V_{DS} = -10\text{ V}, I_D = -0.05\text{ A}$		0.125		
Dynamic						
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	
Switching^d						
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)

