

TP0610L VP0610L BS250
 TP0610T VP0610L

Product Summary

Part Number	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)
TP0610L	-60	10 @ $V_{GS} = -10$ V	-1 to -2.4	-0.18
TP0610T	-60	10 @ $V_{GS} = -10$ V	-1 to -2.4	-0.12
VP0610L	-60	10 @ $V_{GS} = -10$ V	-1 to -3.5	-0.18
VP0610L	-60	10 @ $V_{GS} = -10$ V	-1 to -3.5	-0.12
BS250	-45	14 @ $V_{GS} = -10$ V	-1 to -3.5	-0.18

For applications information see AN804.

Features

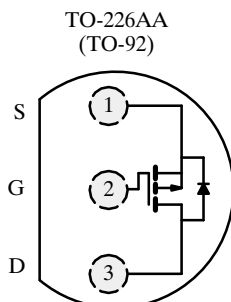
- High-Side Switching
- Low On-Resistance: 8 Ω
- Low Threshold: -1.9 V
- Fast Switching Speed: 16 ns
- Low Input Capacitance: 15 pF

Benefits

- Ease in Driving Switches
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Switching
- Easily Driven Without Buffer

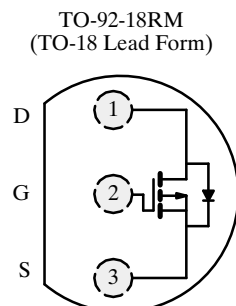
Applications

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Power Supply, Converter Circuits
- Motor Control



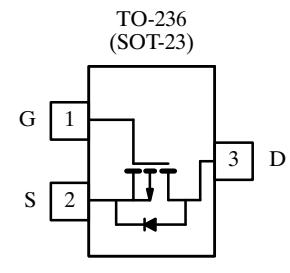
Top View

TP0610L
 VP0610L



Top View

BS250



Top View

TP0610T (T0)*
 VP0610T (V0)*

*Marking Code for TO-236

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

Parameter	Symbol	TP0610L	TP0610T	VP0610L	VP0610L	BS250	Unit	
Drain-Source Voltage	V_{DS}	-60	-60	-60	-60	-45	V	
Gate-Source Voltage	V_{GS}	± 30	± 30	± 30	± 30	± 25		
Continuous Drain Current ($T_j = 150^\circ\text{C}$)	I_D	$T_A = 25^\circ\text{C}$	-0.18	-0.12	-0.18	-0.12	-0.18	
		$T_A = 100^\circ\text{C}$	-0.11	-0.07	-0.11	-0.07		
Pulsed Drain Current ^a	I_{DM}	-0.8	-0.4	-0.8	-0.4		A	
Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	0.8	0.36	0.8	0.36	0.83	
		$T_A = 100^\circ\text{C}$	0.32	0.14	0.32	0.14		
Maximum Junction-to-Ambient	R_{thJA}	156	350	156	350	150	$^\circ\text{C}/\text{W}$	
Operating Junction & Storage Temperature Range	T_j, T_{stg}	-55 to 150						$^\circ\text{C}$

Notes

a. Pulse width limited by maximum junction temperature.

TP0610L/T, VP0610L/T, BS250

Specifications^a

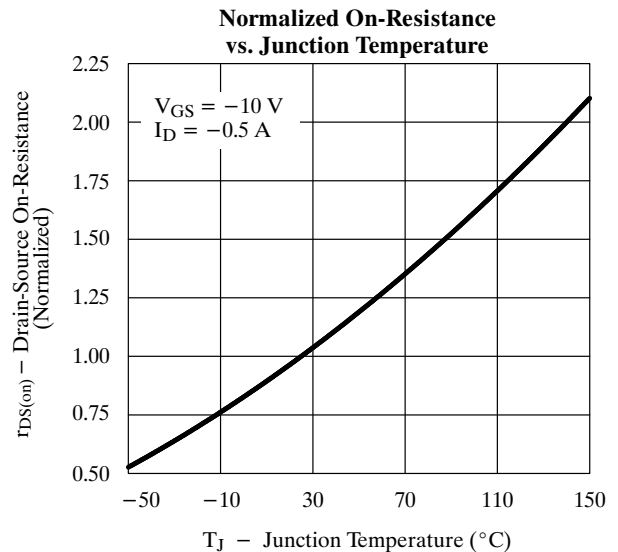
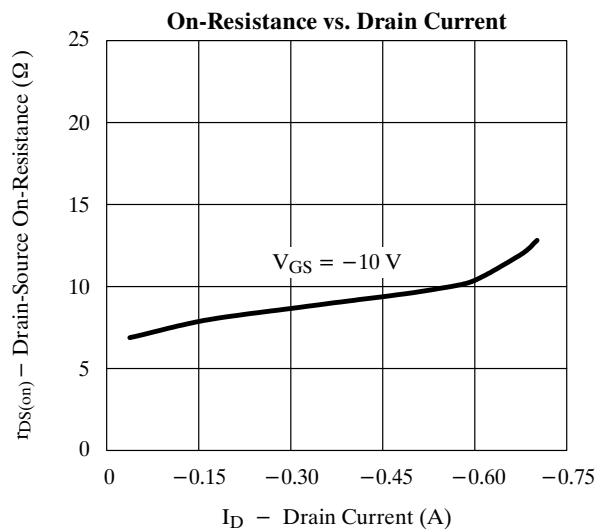
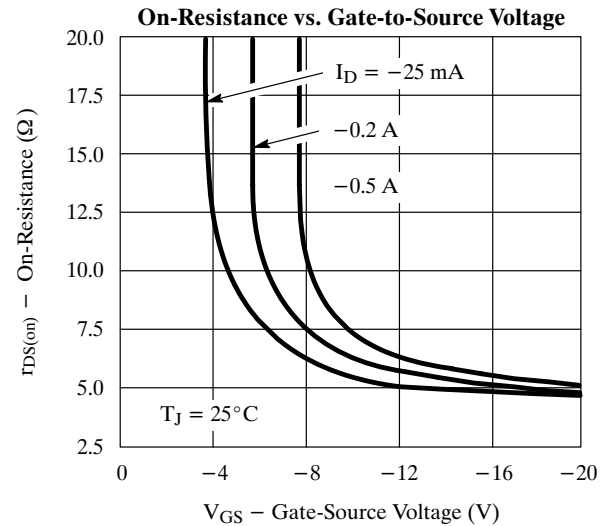
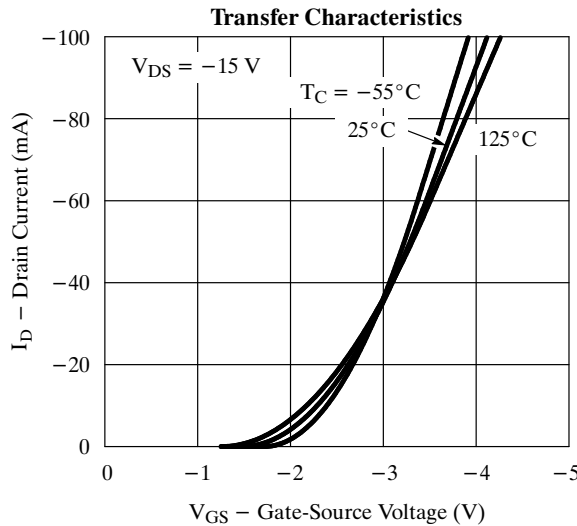
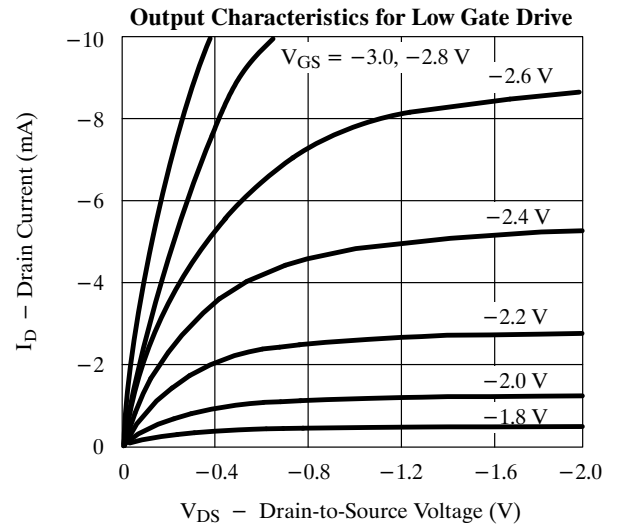
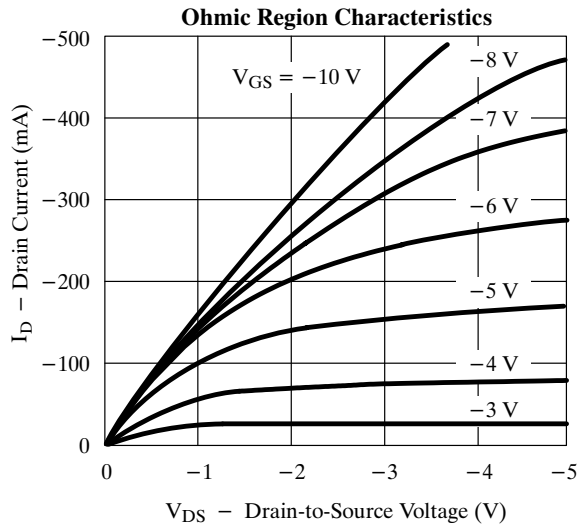
Parameter	Symbol	Test Conditions	Typ ^b	Limits						Unit	
				TP0610L/T		VP0610L/T		BS250			
				Min	Max	Min	Max	Min	Max		
Static											
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -10\ \mu\text{A}$	-70	-60		-60					V
		$V_{GS} = 0\text{ V}, I_D = -100\ \mu\text{A}$						-45			
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -1\text{ mA}$	-1.9	-1	-2.4	-1	-3.5	-1	-3.5		
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 10		± 10				nA
		$V_{DS} = 0\text{ V}, V_{GS} = \pm 15\text{ V}$			± 50				± 20		
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -48\text{ V}, V_{GS} = 0\text{ V}$			-1		-1				μA
		$T_J = 125^\circ\text{C}$			-20		-20				
		$V_{DS} = -25\text{ V}, V_{GS} = 0\text{ V}$							-0.5		
On-State Drain Current ^c	$I_{D(on)}$	$V_{DS} = -10\text{ V}, V_{GS} = -4.5\text{ V}$	-180	-50							mA
		$V_{DS} = -10\text{ V}$ $V_{GS} = -10\text{ V}$	L	-750			-60				
			T				-22				
Drain-Source On-Resistance ^c	$r_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -25\text{ mA}$	11		25						Ω
		$V_{GS} = -10\text{ V}$ $I_D = -0.5\text{ A}$	L	8		10		10			
			$T_J = 125^\circ\text{C}$	15		20		20			
		$V_{GS} = -10\text{ V}$ $I_D = -0.2\text{ A}$	T	6.5		10		10		14	
Forward Transconductance ^c	g_{fs}	$V_{DS} = -10\text{ V}, I_D = -0.5\text{ A}$	L	125	80		80				mS
		$V_{DS} = -10\text{ V}$ $I_D = -0.1\text{ A}$	T	90	60		70				
Diode Forward Voltage	V_{SD}	$I_S = -0.5\text{ A}, V_{GS} = 0\text{ V}$	-1.1								V
Dynamic											
Input Capacitance	C_{iss}	$V_{DS} = -25\text{ V}, V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$	15		60		60				pF
Output Capacitance	C_{oss}		10		25		25				
Reverse Transfer Capacitance	C_{rss}		3		5		5				
Switching^d											
Turn-On Time	t_{ON}	$V_{DD} = -25\text{ V}, R_L = 133\ \Omega$ $I_D = -0.18\text{ A}, V_{GEN} = -10\text{ V}$ $R_G = 25\ \Omega$	8							10	ns
	$t_{d(on)}$		6		10		10				
	t_r		10		15		15				
Turn-Off Time	t_{OFF}		8							10	
	$t_{d(off)}$		7		15		15				
	t_f		8		20		20				

Notes

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

VPDS06

Typical Characteristics (25°C Unless Otherwise Noted)



TP0610L/T, VP0610L/T, BS250

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

