

Product Summary

Part Number	$V_{(BR)DSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$V_{GS(th)}$ (V)	I_D (A)
TP1220L	-120	20 @ $V_{GS} = -4.5$ V	-1 to -2.4	-0.12
TP2020L	-200	20 @ $V_{GS} = -4.5$ V	-1 to -2.4	-0.12
VP2020L	-200	20 @ $V_{GS} = -4.5$ V	-0.8 to -2.5	-0.12
BSS92	-200	20 @ $V_{GS} = -10$ V	-0.8 to -2.8	-0.15

Features

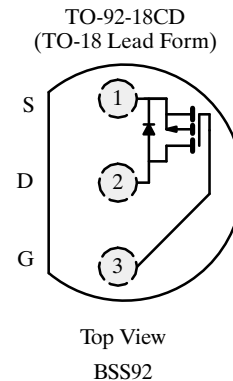
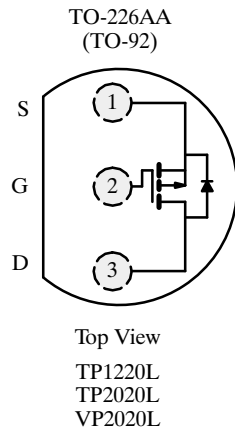
- High-Side Switching
- Secondary Breakdown Free: -220 V
- Low On-Resistance: 11.5 Ω
- Low-Power/Voltage Driven
- Excellent Thermal Stability

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	TP1220L	TP2020L	VP2020L	BSS92	Unit
Drain-Source Voltage	V_{DS}	-120	-200	-200	-200	V
Gate-Source Voltage	V_{GS}	± 20	± 20	± 20	± 20	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	$T_A = 25^\circ\text{C}$	-0.12	-0.12	-0.12	-0.15	A
	$T_A = 100^\circ\text{C}$	-0.08	-0.08	-0.08	-0.09	
Pulsed Drain Current	I_{DM}	-0.48	-0.48	-0.48	-0.6	
Power Dissipation	$T_A = 25^\circ\text{C}$	0.8	0.8	0.8	1.0	W
	$T_A = 100^\circ\text{C}$	0.32	0.32	0.32	0.4	
Maximum Junction-to-Ambient	R_{thJA}	156	156	156	125	$^\circ\text{C/W}$
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.

TP1220L, TP/VP2020L, BSS92

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Specifications^a

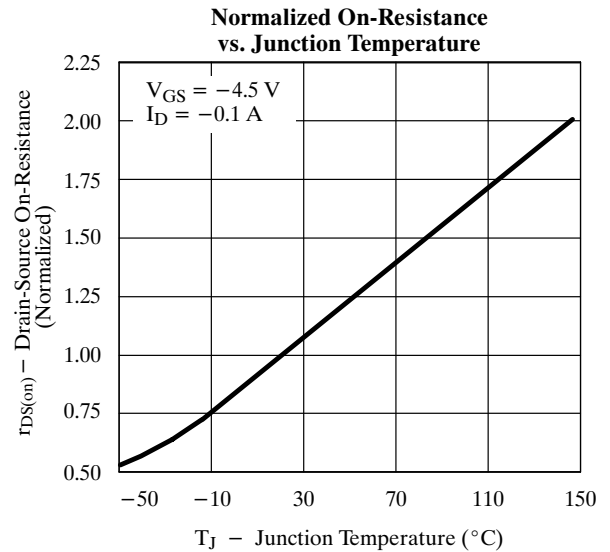
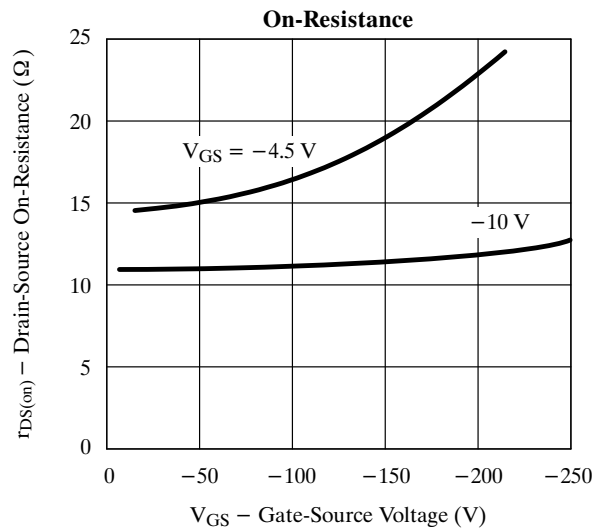
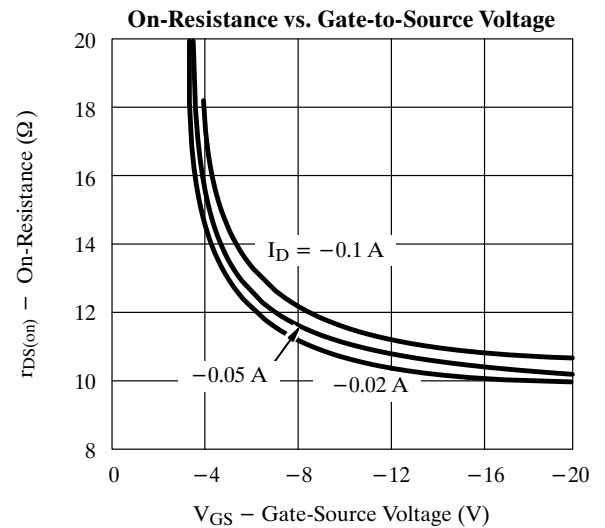
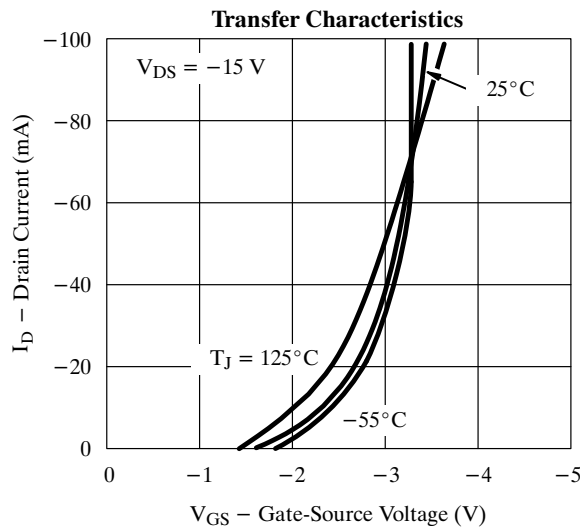
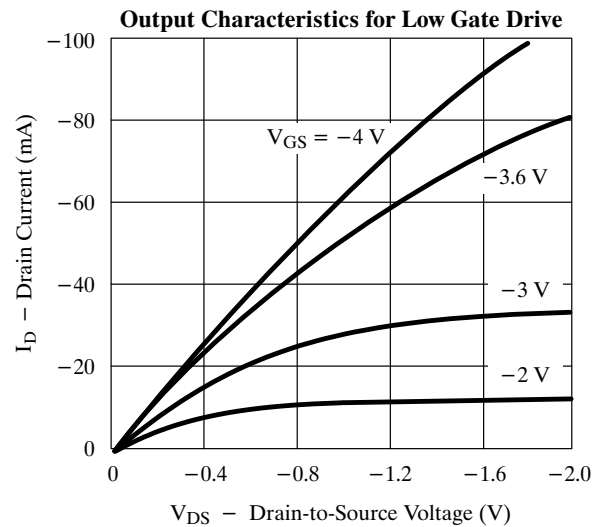
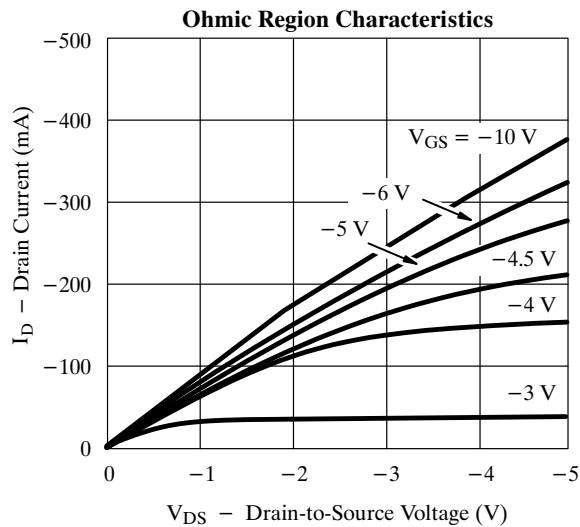
Parameter	Symbol	Test Conditions		Typ ^b	Limits						Unit
					TP1220L TP2020L		VP2020L		BSS92		
					Min	Max	Min	Max	Min	Max	
Static											
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V I _D = -10 μA	TP1220L	-200	-120						V
			TP2020L	-220	-200		-200				
		V _{GS} = 0 V, I _D = -250 μA	-220					-200			
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -1 mA	-1.9	-1	-2.4	-0.8	-2.5	-0.8	-2.8		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±10		±10		±10 0	nA	
		T _J = 125°C			±50		±50				
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 0.8 x V _{(BR)DSS} V _{GS} = 0 V			-1		-1			μA	
		T _J = 125°C			-100		-100				
		V _{DS} = -200 V, V _{GS} = 0 V							-60		
		T _J = 125°C							-200		
		V _{DS} = -60 V, V _{GS} = 0 V							-0.2		
On-State Drain Current ^c	I _{D(on)}	V _{DS} = -10 V, V _{GS} = -4.5 V	-250	-50		-100				mA	
Drain-Source On-Resistance ^c	r _{DS(on)}	V _{GS} = -10 V, I _D = -0.1 A	11.5		20				20	Ω	
		V _{GS} = -4.5 V, I _D = -0.1 A	15				20				
		T _J = 125°C	28				40				
		V _{GS} = -4.5 V, I _D = -0.05 A	15		20						
		T _J = 125°C	28		40						
Forward Transconductance ^c	g _{fs}	V _{DS} = -10 V, I _D = -0.1 A	170	60		100				mS	
		V _{DS} = -25 V, I _D = -0.1 A	170					60			
Diode Forward Voltage	V _{SD}	I _S = -0.3 A, V _{GS} = 0 V	-0.9						-1.2	V	
Dynamic											
Input Capacitance	C _{iss}	V _{DS} = -25 V, V _{GS} = 0 V f = 1 MHz	30		60		70			pF	
Output Capacitance	C _{oss}		10		20		20				
Reverse Transfer Capacitance	C _{rss}		3		10		10				
Switching ^d											
Turn-On Time	t _{ON}	V _{DD} = -25 V, R _L = 250 Ω I _D ≅ -0.1 A, V _{GEN} = -10 V R _G = 25 Ω	14		25					ns	
	t _{d(on)}		6				10				
	t _r		8				15				
Turn-Off Time	t _{OFF}		35		55						
	t _{d(off)}		18				30				
	t _f		17				25				

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.

VPDQ20

Typical Characteristics (25°C Unless Otherwise Noted)



TP1220L, TP/VP2020L, BSS92

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

