

TP1220L, TP/VP2020L, BSS92

P-Channel Enhancement-Mode MOSFET Transistors

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

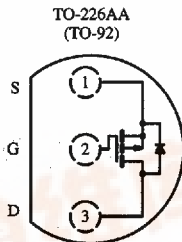
- High-Side Switching
- Secondary Breakdown Free: -220 V
- Low On-Resistance: 11.5 Ω
- Low-Power/Voltage Driven
- Excellent Thermal Stability

Benefits

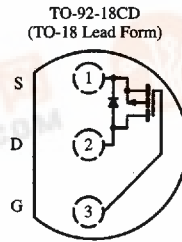
- Ease in Driving Switches
- Full-Voltage Operation
- Low Offset Voltage
- Easily Driven Without Buffer
- No High-Temperature "Run-Away"

Applications

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



Top View
TP1220L
TP2020L
VP2020L



Top View
BSS92

Absolute Maximum Ratings (T_A = 25°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	V	
Continuous Drain Current (T _J = 150°C)	I _D	T _A = 25°C	-0.12	-0.12	-0.12	-0.15	A
		T _A = 100°C	-0.08	-0.08	-0.08	-0.09	
Pulsed Drain Current ^a	I _{DM}	-0.48	-0.48	-0.48	-0.6	A	
Power Dissipation	P _D	T _A = 25°C	0.8	0.8	0.8	1.0	W
		T _A = 100°C	0.32	0.32	0.32	0.4	
Maximum Junction-to-Ambient	R _{thJA}	156	156	156	125	°C/W	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150				°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 #70210.

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	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$ $I_D = -10\ \mu\text{A}$	TP1220L -200	-120							V
			TP2020L -220	-200							
		$V_{GS} = 0\text{ V}$, $I_D = -250\ \mu\text{A}$	-220					-200			
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -1\text{ mA}$	-1.9	-1	-2.4	-0.8	-2.5	-0.8	-2.8		
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$ $T_J = 125^\circ\text{C}$			± 10		± 10		± 10 0	nA	
					± 50		± 50				
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 0.8 \times V_{(BR)DSS}$ $V_{GS} = 0\text{ V}$ $T_J = 125^\circ\text{C}$			-1		-1				
			$V_{DS} = -200\text{ V}$, $V_{GS} = 0\text{ V}$ $T_J = 125^\circ\text{C}$			-100		-100			μA
			$V_{DS} = -60\text{ V}$, $V_{GS} = 0\text{ V}$								-60 -200 -0.2
On-State Drain Current ^c	$I_{D(on)}$	$V_{DS} = -10\text{ V}$, $V_{GS} = -4.5\text{ V}$	-250	-50			-100			mA	
Drain-Source On-Resistance ^c	$r_{DS(on)}$	$V_{GS} = -10\text{ V}$, $I_D = -0.1\text{ A}$	11.5		20				20	Ω	
		$V_{GS} = -4.5\text{ V}$, $I_D = -0.1\text{ A}$ $T_J = 125^\circ\text{C}$	15				20				
		$V_{GS} = -4.5\text{ V}$, $I_D = -0.05\text{ A}$	15		20						
		$T_J = 125^\circ\text{C}$	28		40						
Forward Transconductance ^c	g_{fs}	$V_{DS} = -10\text{ V}$, $I_D = -0.1\text{ A}$	170	60			100			mS	
		$V_{DS} = -25\text{ V}$, $I_D = -0.1\text{ A}$	170					60			
Diode Forward Voltage	V_{SD}	$I_S = -0.3\text{ A}$, $V_{GS} = 0\text{ V}$	-0.9						-1.2	V	
Dynamic											
Input Capacitance	C_{iss}	$V_{DS} = -25\text{ V}$, $V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$	30		60		70		130	pF	
Output Capacitance	C_{oss}		10		20		20		30		
Reverse Transfer Capacitance	C_{rss}		3		10		10		15		
Switching^d											
Turn-On Time	t_{ON}	$V_{DD} = -25\text{ V}$, $R_L = 250\ \Omega$ $I_D \cong -0.1\text{ A}$, $V_{GEN} = -10\text{ V}$ $R_G = 25\ \Omega$	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

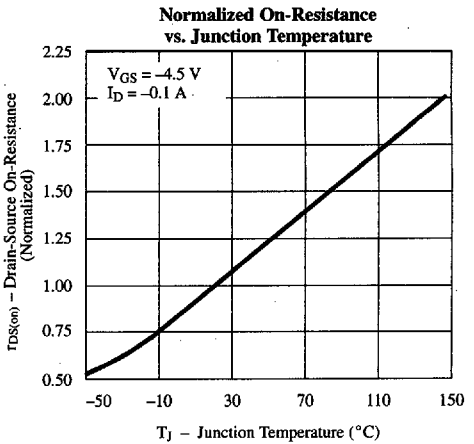
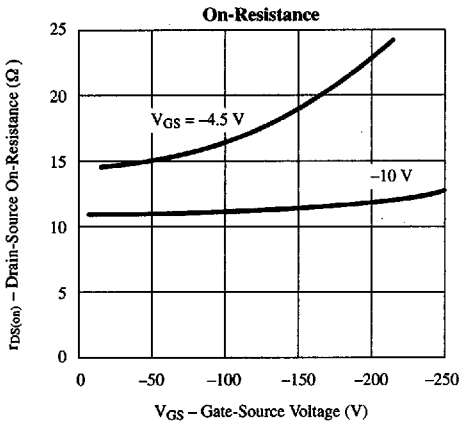
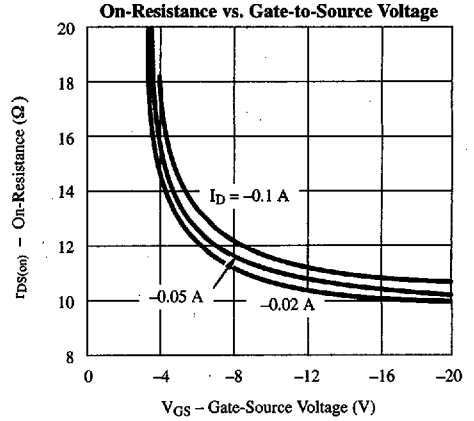
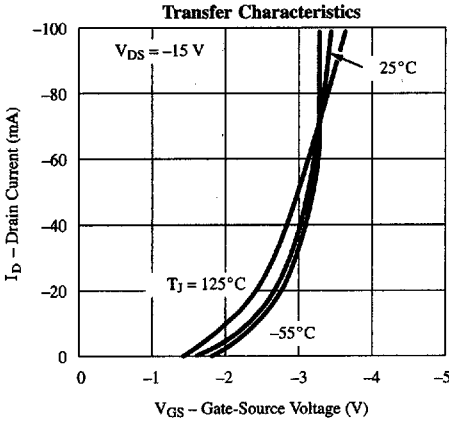
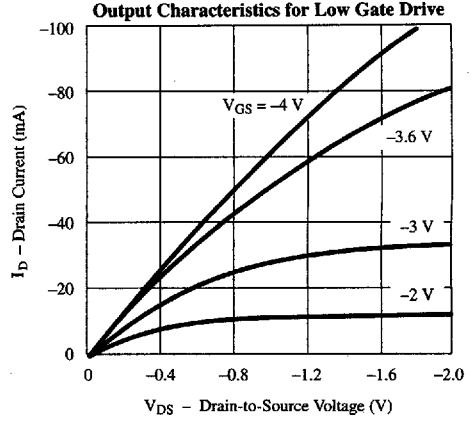
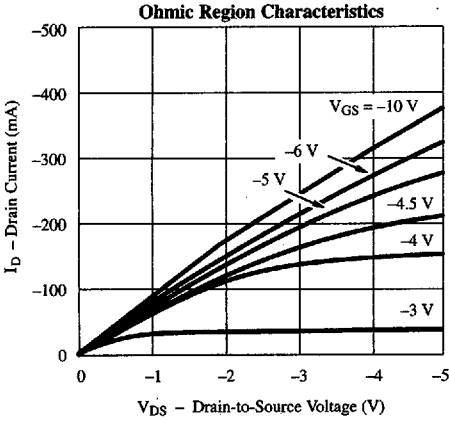
- a. $T_A = 25^\circ\text{C}$ unless otherwise noted.
- b. For DESIGN AID ONLY, not subject to production testing.
- c. Pulse test: $PW \leq 300\ \mu\text{s}$ duty cycle $\leq 2\%$.
- d. Switching time is essentially independent of operating temperature.

VPDQ20

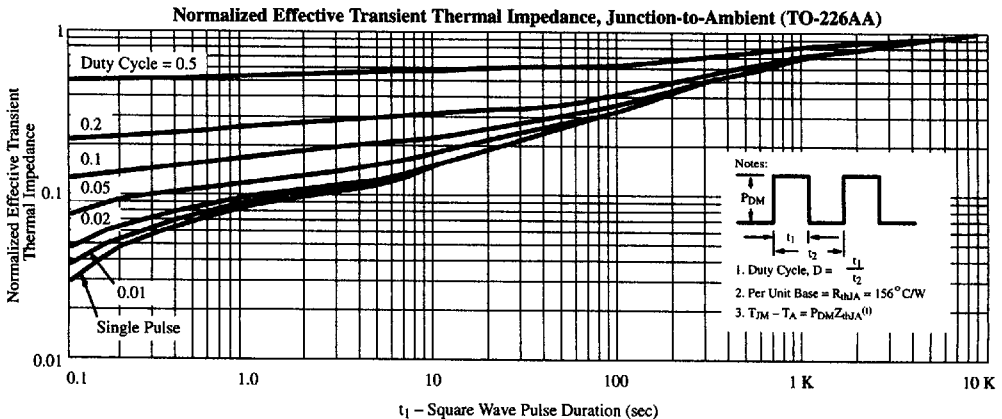
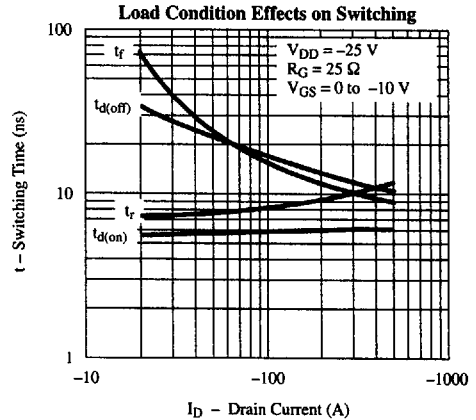
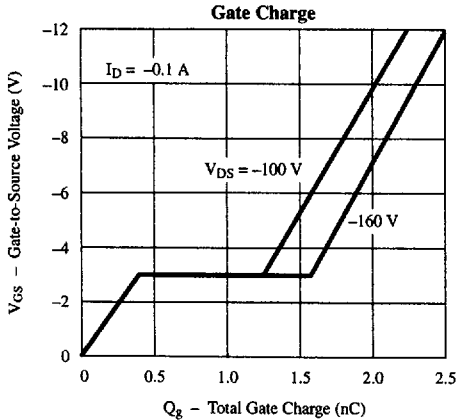
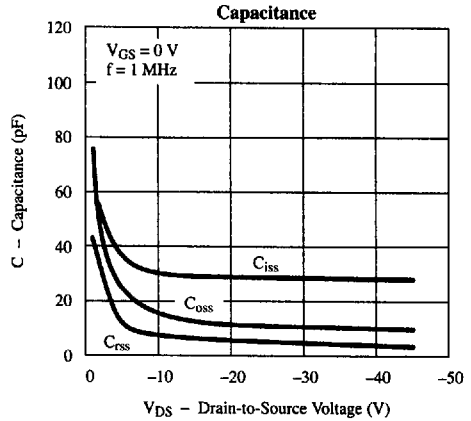
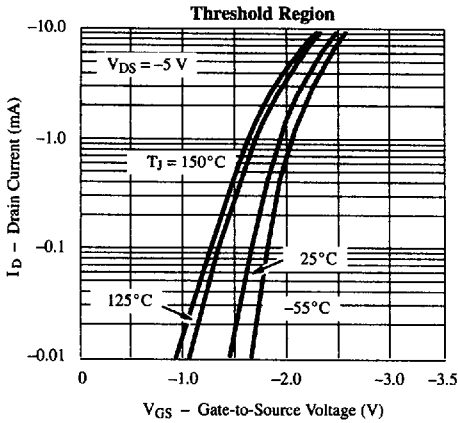
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TEMIC
Semiconductors

Typical Characteristics (25°C Unless Otherwise Noted)



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



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Low Power MOSFETS