Siliconix

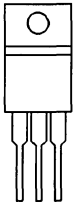
BUZ171

P-Channel Enhancement-Mode Transistor

Product Summary

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
−50	0.40	−7.0

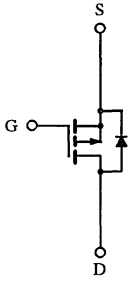
TO-220AB



DRAIN connected to TAB

G D S

Top View



P-Channel MOSFET

Absolute Maximum Ratings (T_C = 25°C Unless Otherwise Noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	−50	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_C = 25°C	I_D	−7.0	A
	T_C = 100°C		−4.5	
Pulsed Drain Current[a]		I_{DM}	−28	
Power Dissipation	T_C = 25°C	P_D	40	W
	T_C = 100°C		16	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to 150	°C
Lead Temperature ($^1/_{16}$" from case for 10 sec.)		T_L	300	

Thermal Resistance Ratings

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient	R_{thJA}		75	°C/W
Junction-to-Case	R_{thJC}		3.1	
Case-to-Sink	R_{thCS}	1.0		

Notes:
a. Pulse width limited by maximum junction temperature

Specifications (T_J = 25°C Unless Otherwise Noted)

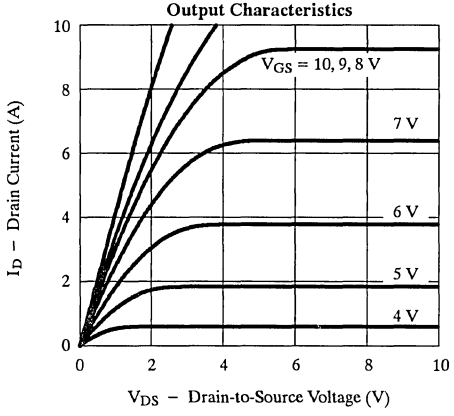
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = −250 µA	−50			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = −1 mA	−2.1		−4.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = −50, V_{GS} = 0 V			−250	µA
		V_{DS} = −50 V, V_{GS} = 0 V, T_J = 125°C			−1000	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = −10 V, V_{GS} = −10 V	−7.0			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = −10 V, I_D = −4.5 A		0.24	0.40	Ω
		V_{GS} = −10 V, I_D = −4.5 A, T_J = 125°C		0.40	0.72	
Forward Transconductance[b]	g_{fs}	V_{DS} = −15 V, I_D = −4.5 A	1.5	2.8		S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = −25 V, f = 1 MHz		600	1200	pF
Output Capacitance	C_{oss}			325	500	
Reverse Transfer Capacitance	C_{rss}			100	230	
Total Gate Charge[c]	Q_g	V_{DS} = −25 V, V_{GS} = −10 V, I_D = −7 A		16	20	nC
Gate-Source Charge[c]	Q_{gs}			3.8		
Gate-Drain Charge[c]	Q_{gd}			7.5		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = −30 V, R_L = 10 Ω $I_D \simeq$ −2.9 A, V_{GEN} = −10 V, R_G = 25 Ω		10	30	ns
Rise Time[c]	t_r			50	95	
Turn-Off Delay Time[c]	$t_{d(off)}$			25	90	
Fall Time[c]	t_f			50	75	
Source-Drain Diode Ratings and Characteristics (T_C = 25°C)						
Continuous Current	I_S				−7.0	A
Pulsed Current	I_{SM}				−28	
Forward Voltage[b]	V_{SD}	I_F = −7 A, V_{GS} = 0 V			−2.8	V
Reverse Recovery Time	t_{rr}	I_F = −7 A, dI_F/dt = 100 A/µs		70		ns
Reverse Recovery Charge	Q_{rr}			0.15		µC

Notes:
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
c. Independet of operating temperature.

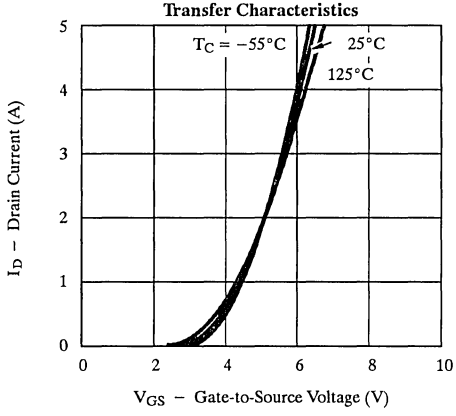
Typical Characteristics (25°C Unless Otherwise Noted)

Negative signs omitted for clarity.

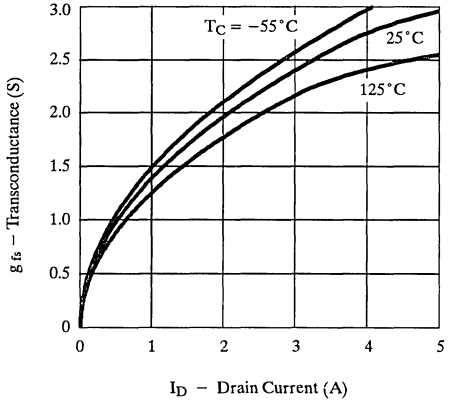
Output Characteristics



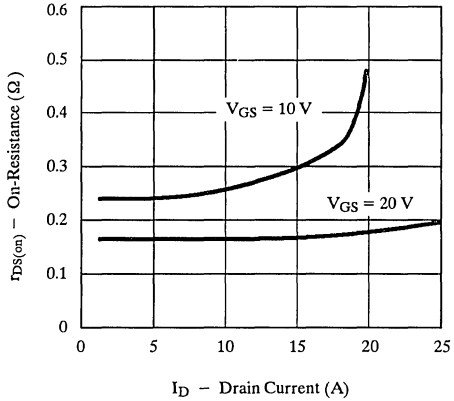
Transfer Characteristics



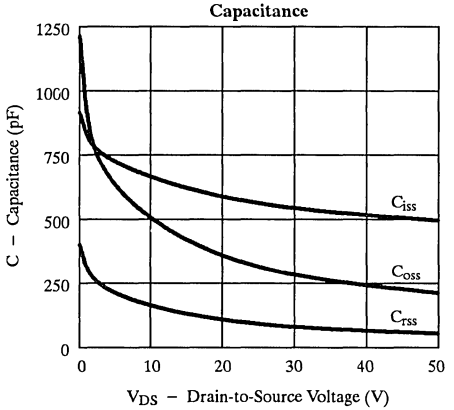
Transconductance



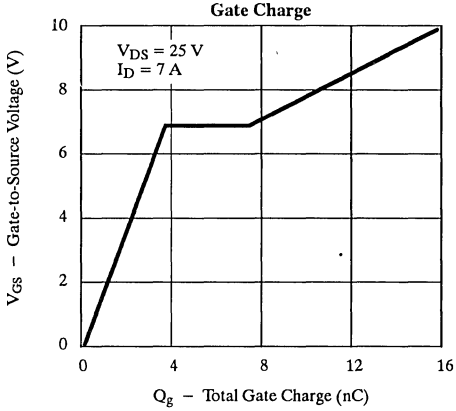
On-Resistance vs. Drain Current



Capacitance



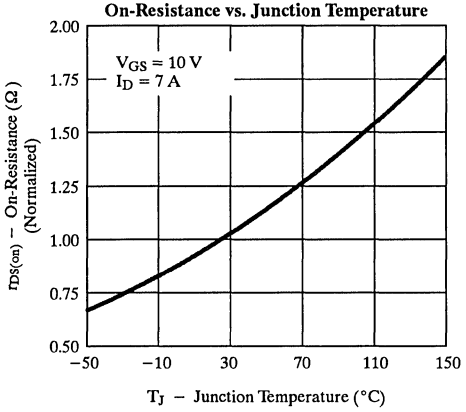
Gate Charge



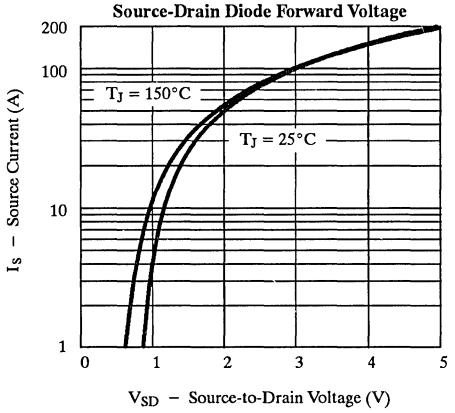
Typical Characteristics (25°C Unless Otherwise Noted)

Negative signs omitted for clarity.

On-Resistance vs. Junction Temperature

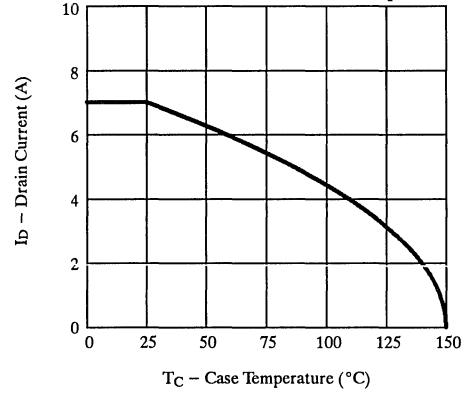


Source-Drain Diode Forward Voltage

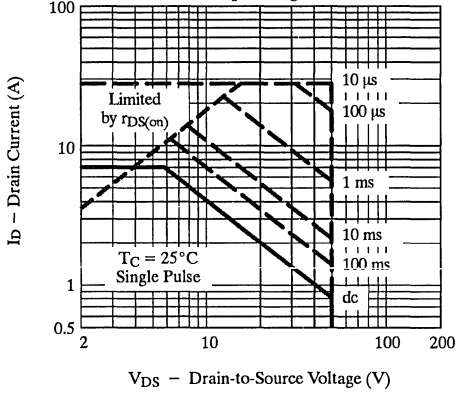


Thermal Ratings

Maximum Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case