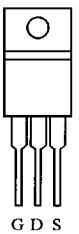
N-Channel Enhancement-Mode Transistors

Product Summary

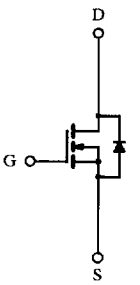
Part Number	$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
BUZ71	50	0.10	14
BUZ71A	50	0.12	13

TO-220AB



Top View

DRAIN connected to TAB



N-Channel MOSFET

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

Parameter		Symbol	BUZ71	BUZ71A	Unit
Drain-Source Voltage		V_{DS}	50	50	V
Gate-Source Voltage		V_{GS}	±20	±20	
Continuous Drain Current	T_C = 25°C	I_D	14	13	A
	T_C = 100°C		9	8.2	
Pulsed Drain Current		I_{DM}	56	48	
Power Dissipation	T_C = 25°C	P_D	40	40	W
	T_C = 100°C		16	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		

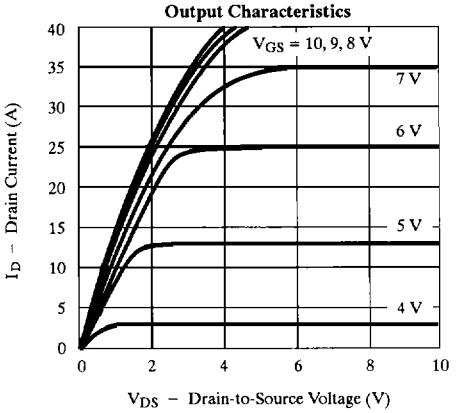
Specifications (T_J = 25°C Unless Otherwise Noted)

Parameter	Symbol	Test Condition		Min	Typ[a]	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 = 250 µA		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} = 40 V, V_{GS} = 0 V				250	µA
		V_{DS} = 40 V, V_{GS} = 0 V, T_J = 125°C				1000	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 2 V, V_{GS} = 10 V	BUZ71	14			A
			BUZ71A	13			
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 6 A	BUZ71		0.7	0.10	Ω
			BUZ71A		0.10	0.12	
		V_{GS} = 10 V, I_D = 6 A, T_J = 125°C	BUZ71		0.13	0.18	
			BUZ71A		0.17	0.20	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 6 A		3.0	8.0		S
Dynamic							
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz			400	650	pF
Output Capacitance	C_{oss}				150	450	
Reverse Transfer Capacitance	C_{rss}				35	280	
Total Gate Charge[c]	Q_g	V_{DS} = 25 V, V_{GS} = 10 V, I_D = 13 A			14	30	nC
Gate-Source Charge[c]	Q_{gs}				3		
Gate-Drain Charge[c]	Q_{gd}				4		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 30 V, R_L = 10 Ω, $I_D \simeq$ 3 A, V_{GEN} = 10 V, R_G = 25 Ω			10	30	
Rise Time[c]	t_{rr}				20	85	
Turn-Off Delay Time[c]	$t_{d(off)}$				40	90	
Fall Time[c]	t_f				25	110	
Source-Drain Diode Ratings and Characteristics (T_C = 25°C)							
Continuous Current	I_S		BUZ71			14	A
			BUZ71A			13	
Pulsed Current	I_{SM}		BUZ71			56	
			BUZ71A			48	
Foward Voltage[b]	V_{SD}	I_F = I_S, V_{GS} = 0 V	BUZ71			1.8	V
			BUZ71A			2.2	
Reverse Recovery Time	t_{rr}	I_F = I_S, dI_F/dt = 100 A/µs			120		ns
Reverse Recovery Charge	Q_{rr}				0.5		µC

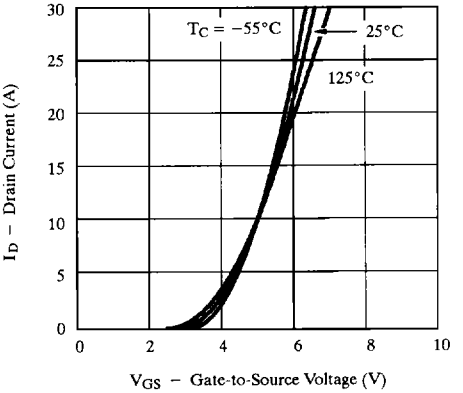
Notes:
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
c. Independent of operating temperature.

Typical Characteristics (25°C Unless Otherwise Noted)

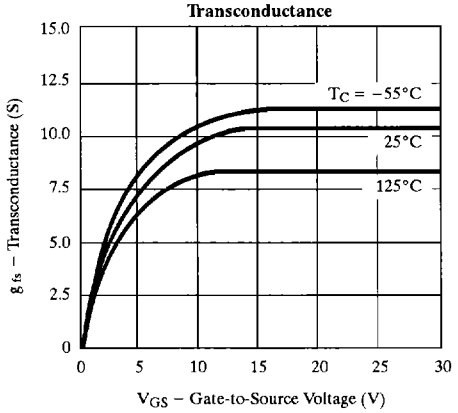
Output Characteristics



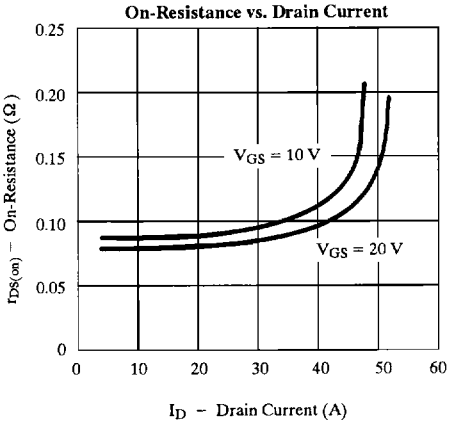
Transfer Characteristics



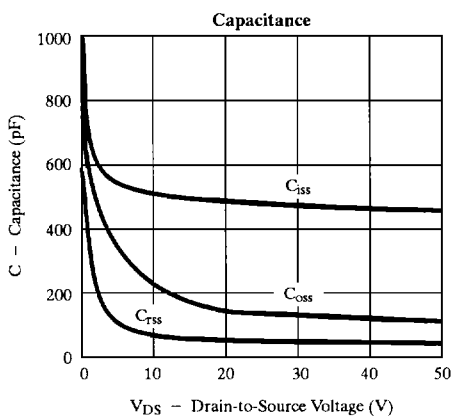
Transconductance



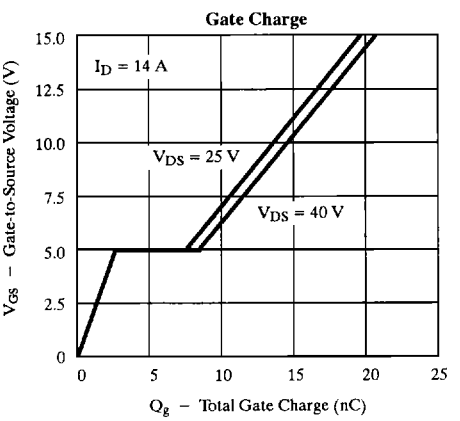
On-Resistance vs. Drain Current



Capacitance

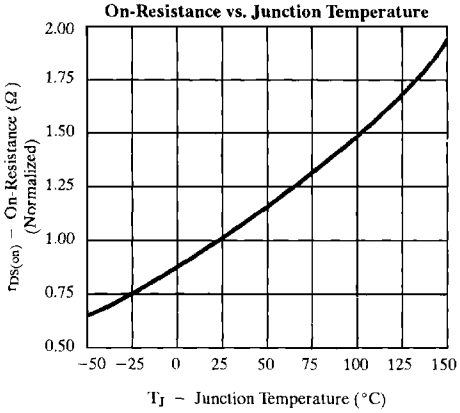


Gate Charge

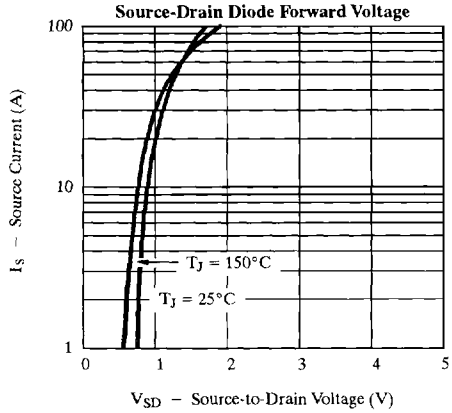


Typical Characteristics (25°C Unless Otherwise Noted)

On-Resistance vs. Junction Temperature

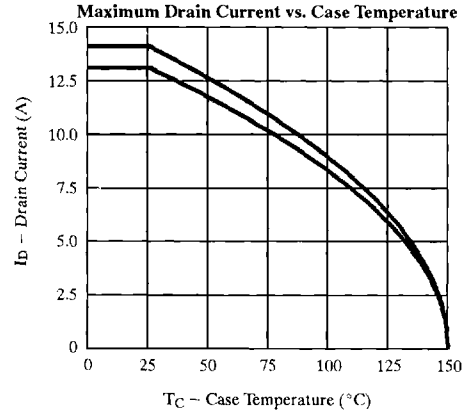


Source-Drain Diode Forward Voltage

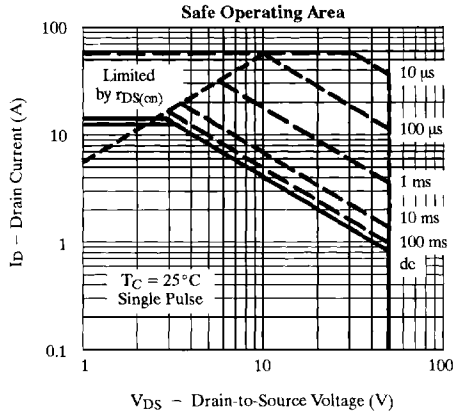
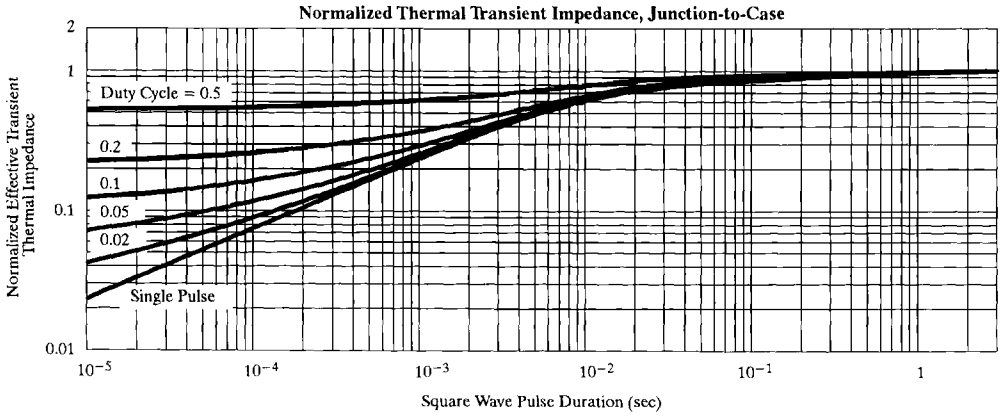


Thermal Ratings

Maximum Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case