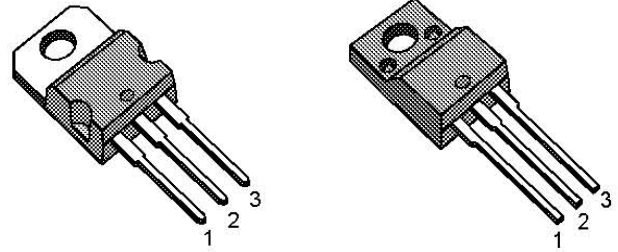


TYPE	V <sub>DSS</sub>	R <sub>DS(on)</sub>	I <sub>D</sub>
BUZ80A	800V	<3 Ω	3.8A
BUZ80AFI	800V	<3 Ω	2.4A

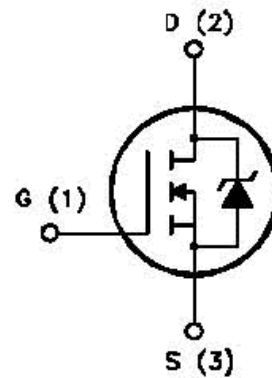
- Typical R<sub>DS(on)</sub>=2.5 Ω
- AVALANCHE RUGGED TECHNOLOGY
- 100% AVALANCHE TESTED
- REPETITIVE AVALANCHE DATA AT 100
- LOW INPUT CAPACITANCE
- LOW GATE CHARGE
- APPLICATION ORIENTED CHARACTERIZATION



TO-220

ISOWATT220

INTERNAL SCHEMATIC DIAGRAM



### APPLICATIONS

- HIGH CURRENT, HIGH SPEED SWITCHING
- SWITCH MODE POWER SUPPLIES (SMPS)
- CONSUMER AND INDUSTRIAL LIGHTING
- DC-AC INVERTERS FOR WELDING EQUIPMENT AND UNINTERRUPTIBLE POWER SUPPLY (UPS)

### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BUZ80A	BUZ80AFI	
V <sub>DS</sub>	Drain-source Voltage (V <sub>GS</sub> =0)	800		V
V <sub>DGR</sub>	Drain-gate Voltage (R <sub>GS</sub> =20kΩ)	800		V
V <sub>GS</sub>	Gate-source Voltage	±20		V
I <sub>D</sub>	Drain Current (continuous) at Tc=25	3.8	2.4	A
I <sub>D</sub>	Drain Current (continuous) at Tc=100	2.3	1.4	A
I <sub>DM(•)</sub>	Drain Current (pulsed)	15	15	A
P <sub>tot</sub>	Total Dissipation at Tc=25	100	40	W
	Derating Factor	0.8	0.32	W/
V <sub>ISO</sub>	Insulation Withstand Voltage (DC)	-	2000	V
T <sub>stg</sub>	Storage Temperature	-65 to 150		
T <sub>j</sub>	Max. Operating Junction Temperature	150		

(•) Pulse width limited by safe operating area



# BUZ80A/BUZ80AFI

## N-Channel Enhancement Mode Power MOS Transistor

### THERMAL DATA

			To-220	ISOWATT220	
Rthj-case	Thermal Resistance Junctions-case	MAX	1.25	3.12	/W
Rthj-amb	Thermal Resistance Junctions-ambient	Max	62.5		/W
Rthc-sink	Thermal Resistance Case-sink	Typ	0.5		/W
TI	Maximum Lead Temperature For Soldering Purpose		300		

### AVALANCHE CHARACTERISTICS

Symbol	Parameter	Max Value	Unit
$I_{AR}$	Avalanche Current, Repetitive or Not-Repetitive (pulse width limited by $T_{jmax}$ , <1%)	3.8	A
$E_{AS}$	Single Pulse Avalanche Energy (starting $T_j=25^\circ C$ , $I_D=I_{AR}$ , $V_{DD}=50V$ )	200	mJ
$E_{AR}$	Repetitive Avalanche Energy (pulse width limited by $T_{jmax}$ , <1%)	8	mJ
$I_{AR}$	Avalanche Current, Repetitive or Not-Repetitive ( $T_c=100^\circ C$ , pulse width limited by $T_{jmax}$ , <1%)	2.2	A

### ELECTRICAL CHARACTERISTICS ( $T_{case}=25^\circ C$ unless otherwise specified)

#### OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	$I_D=250\mu A$ $V_{GS}=0$	800			V
$I_{DSS}$	Zero Gate Voltage Drain Current ( $V_{GS}=0$ )	$V_{DS}=\text{Max Rating}$ $V_{DS}=\text{Max Rating} \times 0.8$ $T_c=125$			250 1000	$\mu A$ $\mu A$
$I_{GSS}$	Gate-body leakage Current ( $V_{DS}=0$ )	$V_{GS}=\pm 20V$			$\pm 100$	nA

#### ON(\*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$ $I_D=1mA$	2	3	4	V
$R_{DS(on)}$	Static Drain-source On Resistance	$V_{GS}=10V$ $I_D=1.7A$ $V_{GS}=10V$ $I_D=1.7A$ $T_c=100$		2.5	3 6	$\Omega$ $\Omega$
$I_{D(on)}$	On State Drain Current	$V_{GS}>I_{D(on)} \times R_{DS(on)max}$ $V_{GS}=10V$	3.8			A

#### DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$g_{fs}^*$	Forward Transconductance	$V_{DS}> I_{D(on)} \times R_{DS(on)max}$ $I_D=1.7A$	1			s
$C_{iss}$	Input Capacitance	$V_{DS}=25V$ $f=1MHz$ $V_{GS}=0$			1100	pF
$C_{oss}$	Output Capacitance				150	pF
$C_{rss}$	Reverse Transfer Capacitance				55	pF

### ELECTRICAL CHARACTERISTICS (Continued)

#### SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Time	$V_{DD}=30V$ $I_D=2.3A$		65	90	ns
$t_r$	Rise Time	$R_G=50\Omega$ $V_{GS}=10V$ (see test circuit, figure 3)		150	200	ns
$(di/dt)_{on}$	Turn-on Current Slope	$V_{DD}=600V$ $I_D=3.8A$ $R_G=50\Omega$ $V_{GS}=10V$ (see test circuit, figure 5)		80	110	A/ $\mu s$
Qg	Total Gate Charge	$V_{DD}=400V$ $I_D=5A$ $V_{GS}=10V$		55	70	nC
Qgs	Gate-Source Charge			8		nC
Qgd	Gate-Drain Charge			26		nC

#### SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{r(Voff)}$	Off-voltage Rise Time	$V_{DS}=600V$ $I_D=3.8A$		110	145	ns
$t_f$	Fall Time	$R_G=50\Omega$ $V_{GS}=10V$		140	190	ns
$t_c$	Cross-over Time	(see test circuit, figure 5)		150	200	ns

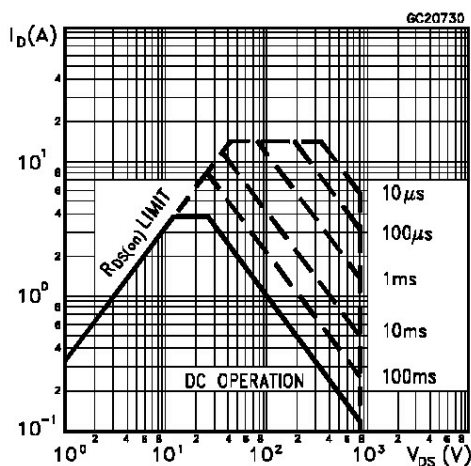
#### SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{SD}$	Source-drain Current				3.8	A
$I_{SDM}(\bullet)$	Source-drain Current (pulsed)				15	A
$V_{SD}(\ast)$	Forward On Voltage	$I_{SD}=7.6A$ $V_{GS}=0$			2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=3.8A$ $di/dt=100A/\mu s$		500		ns
Qrr	Reverse Recovery Charge	$V_R=100V$ $T_j=150$		4.3		$\mu C$
$I_{RRM}$	Reverse Recovery Current	(see test circuit, figure 5)		17		A

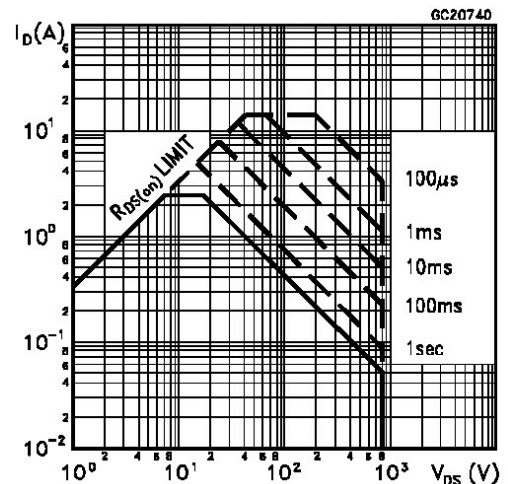
(\*) Pulsed: Pulse duration=300 $\mu s$ , duty cycle 1.5%

(•) Pulse width limited by safe operating area

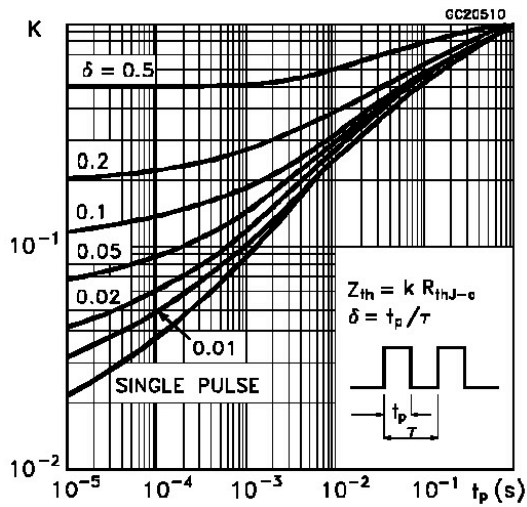
Safe Operating Areas For TO-220 Package



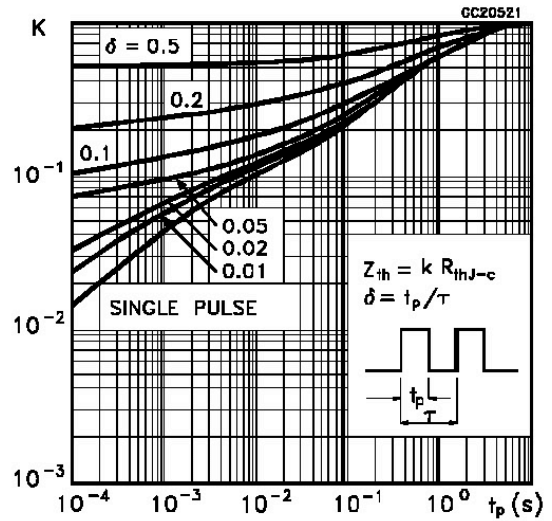
Safe Operating Areas For ISOWATT220 Package



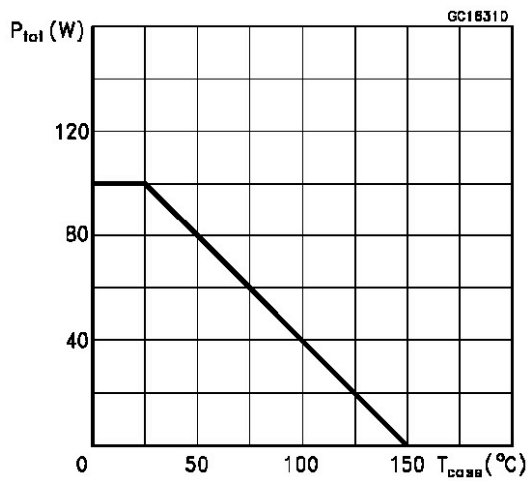
Thermal Impedance For To-220 Package



Thermal Impedance For ISOWATT220 Package

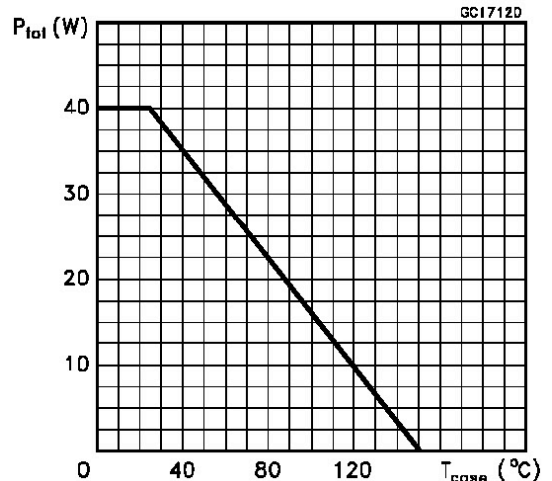


Derating Curve For To-220 Package



Output Characteristics

Derating Curve For ISOWATT220 Package



Transfer Characteristics