| TYPE	V_{DSS}	$R_{DS(on)}$	I_D
BUZ80A	800V	<3 Ω	3.8A
BUZ80AFI	800V	<3 Ω	2.4A

- Typical $R_{DS(on)}$=2.5 Ω
- AVALANCHE RUGGED TECHNOLOGY
- 100% AVALANCHE TESTED
- REPETITIVE AVALANCHE DATA AT 100℃
- LOW INPUT CAPACITANCE
- LOW GATE CHARGE
- APPLICATION ORIENTED CHARACTERIZATION
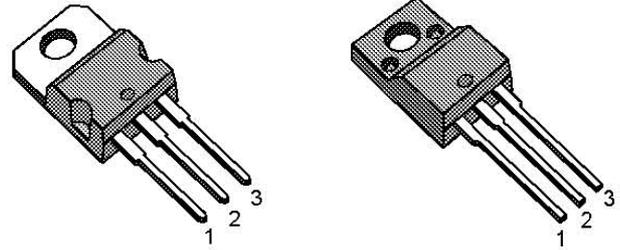
TO-220   ISOWATT220

INTERNAL SCHEMATIC DIAGRAM
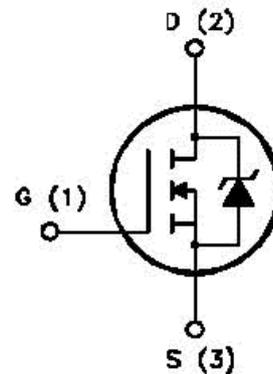
APPLICATIONS

- 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_{DS}	Drain-source Voltage (V_{GS}=0)	800		V
V_{DGR}	Drain-gate Voltage (R_{GS}=20kΩ)	800		V
V_{GS}	Gate-source Voltage	±20		V
I_D	Drain Current (continuous) at Tc=25℃	3.8	2.4	A
I_D	Drain Current (continuous) at Tc=100℃	2.3	1.4	A
$I_{DM(•)}$	Drain Current (pulsed)	15	15	A
Ptot	Total Dissipation at Tc=25℃	100	40	W
	Derating Factor	0.8	0.32	W/℃
V_{ISO}	Insulation Withstand Voltage (DC)	-	2000	V
Tstg	Storage Temperature	-65 to 150		℃
Tj	Max. Operating Junction Temperature	150		℃

(•) Pulse width limited by safe operating area

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 Tjmax, δ <1%)	3.8	A
E_{AS}	Single Pulse Avalanche Energy (starting Tj=25℃,I_D=I_{AR}, V_{DD}=50V)	200	mJ
E_{AR}	Repetitive Avalanche Energy (pulse width limited by Tjmax, δ <1%)	8	mJ
I_{AR}	Avalanche Current, Repetitive or Not-Repetitive (Tc=100℃, pulse width limited by $T_j$max, δ <1%)	2.2	A

ELECTRICAL CHARACTERISTICS (T_{case}=25℃ unless otherwise specified)

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	I_D=250μA V_{GS}=0	800			V
I_{DSS}	Zero Gate Voltage Drain Current (V_{GS}=0)	V_{DS}=Max Rating			250	μA
		V_{DS}=Max Rating x 0.8 Tc=125℃			1000	μA
I_{GSS}	Gate-body leakage Current (V_{DS}=0)	V_{GS}=±20V			±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		2.5	3	Ω
		V_{GS}=10V I_D=1.7A Tc=100℃			6	Ω
$I_{D(on)}$	On State Drain Current	V_{GS}>$I_{D(on)}$ x $R_{DS(on)max}$ V_{GS}=10V	3.8			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
gfs(*)	Forward Transconductance	V_{DS}> $I_{D(on)}$ x $R_{DS(on)max}$ I_D=1.7A	1			s
Ciss	Input Capacitance	V_{DS}=25V f=1MHz V_{GS}=0			1100	pF
Coss	Output Capacitance				150	pF
Crss	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 $\quad$ I_D=2.3A		65	90	ns
tr	Rise Time	R_G=50Ω $\quad$ V_{GS}=10V		150	200	ns
		(see test circuit, figure 3)				
(di/dt)on	Turn-on Current Slope	V_{DD}=600V $\quad$ I_D=3.8A		80	110	A/µs
		R_G=50 Ω $\quad$ V_{GS}=10V				
		(see test circuit, figure 5)				
Qg	Total Gate Charge	V_{DD}=400V $\quad$ I_D=5A $\quad$ 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 $\quad$ I_D=3.8A		110	145	ns
t_f	Fall Time	R_G=50 Ω $\quad$ V_{GS}=10V		140	190	ns
tc	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}(•)	Source-drain Current (pulsed)				15	A
V_{SD}(*)	Forward On Voltage	I_{SD}=7.6A V_{GS}=0			2	V
trr	Reverse Recovery Time	I_{SD}=3.8A $\quad$ di/dt=100A/µs		500		ns
Qrr	Reverse Recovery Charge	V_R=100V $\quad$ Tj=150℃		4.3		µC
I_{RRM}	Reverse Recovery Current	(see test circuit, figure 5)		17		A

(*) Pulsed: Pulse duration=300µs, duty cycle 1.5%

(•) Pulse width limited by safe operating area

Safe Operating Areas For TO-220 Package
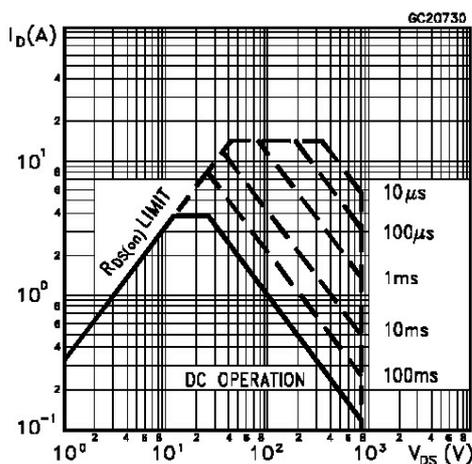

Safe Operating Areas For ISOWATT220 Package
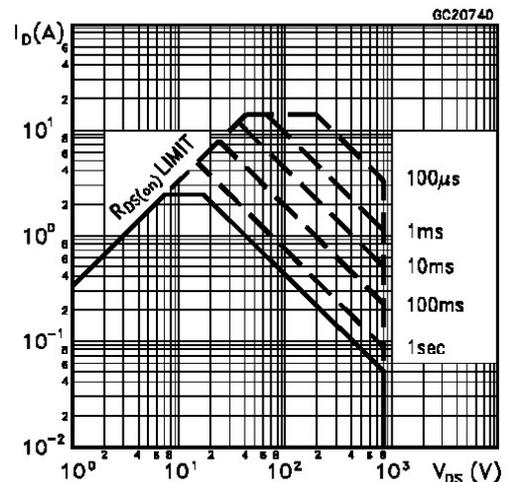
Thermal Impedance For To-220 Package
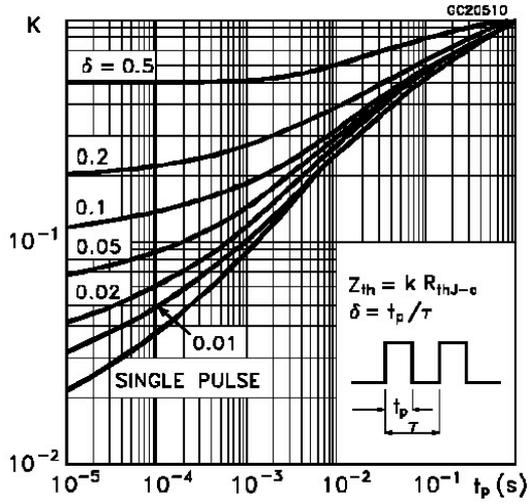

Thermal Impedance For ISOWATT220 Package
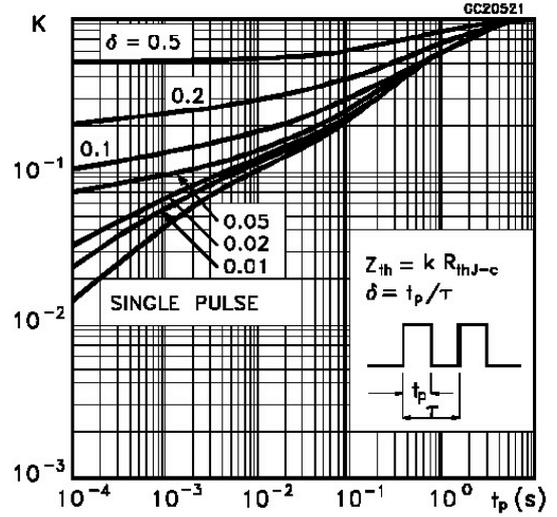
Derating Curve For To-220 Package

Derating Curve For ISOWATT220 Package
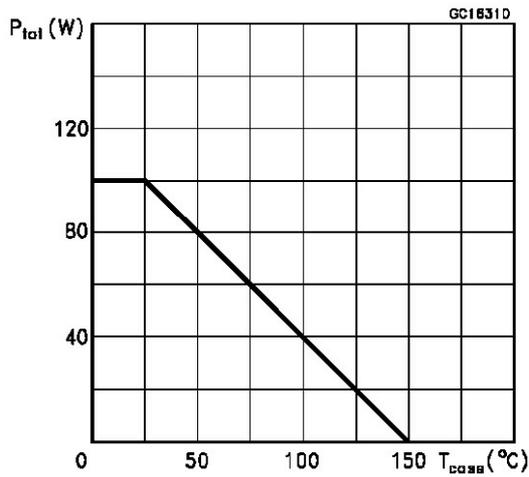
Output Characteristics
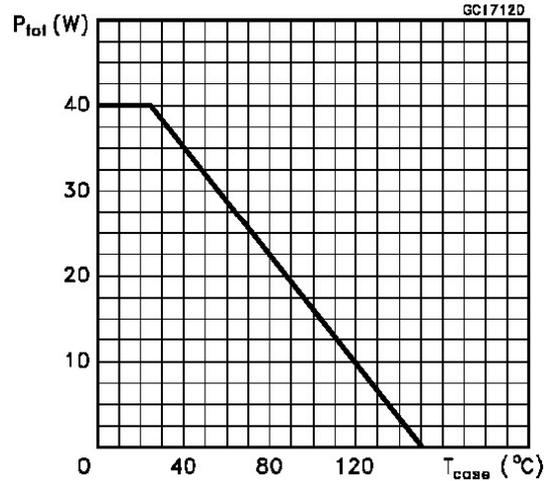
Transfer Characteristics