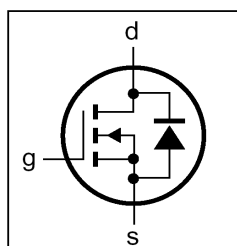


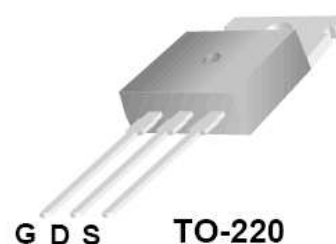
- **Avalanche Energy Specified**
- **Fast Switching**
- **Simple Drive Requirements**



<b><math>BV_{DSS}</math></b>	<b>200V</b>
<b><math>R_{DS(ON)}</math></b>	<b>0.18<math>\Omega</math></b>
<b><math>I_D</math></b>	<b>18A</b>

### Description

This advanced low voltage MOSFET is produced using Belling's proprietary MOS technology. Designed for high efficiency switch mode power supply.



### Absolute Maximum Ratings ( $T_C=25^{\circ}\text{C}$ unless otherwise noted )

Symbol	Parameter	Value	Units
$V_{DS}$	Drain-Source Voltage	200	V
$V_{GS}$	Gate-Source Voltage	$\pm 30$	V
$I_D$	Continuous Drain Current	18	A
	Continuous Drain Current ( $T_C=100^{\circ}\text{C}$ )	11	A
$I_{DM}$	Drain Current (pulsed) (Note 1)	72	A
$P_D$	Power Dissipation	125	W
	Linear Derating Factor	1.0	W/ $^{\circ}\text{C}$
$E_{AS}$	Single Pulsed Avalanche Energy (Note2)	580	mJ
$I_{AR}$	Avalanche Current	18	A
$E_{AR}$	Repetitive Avalanche Energy	13	mJ
$T_j$	Operating Junction Temperature Range	-55 to +150	$^{\circ}\text{C}$
$T_{SDG}$	Storage Temperature Range	-55 to +150	$^{\circ}\text{C}$

### Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{th\ j-c}$	Thermal Resistance, Junction to case Max.	0.5	$^{\circ}\text{C}/\text{W}$
$R_{th\ j-a}$	Thermal Resistance, Junction to Ambient Max.	62.5	$^{\circ}\text{C}/\text{W}$

**Electrical Characteristics** ( $T_C=25^{\circ}\text{C}$  unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	200	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=11A$	-	-	0.18	$\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
$g_{fs}$	Forward Transconductance(note3)	$V_{DS}=15V, I_D=11A$	6.7	-	-	S
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=200V, V_{GS}=0V$	-	-	1	$\mu A$
	Drain-Source Leakage Current $T_C=125^{\circ}\text{C}$	$V_{DS}=160V, V_{GS}=0V$	-	-	50	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 30V$	-	-	$\pm 100$	nA
$Q_g$	Total Gate Charge	$V_{DD}=160V$ $I_D=18A$	-	35.7	70	nC
$Q_{gs}$	Gate-Source Charge	$V_{GS}=10V$	-	6.7	13	nC
$Q_{gd}$	Gate-Drain Charge	Note3	-	17.5	39	nC
$t_{(on)}$	Turn-on Delay Time	$V_{DD}=100V$ $I_D=18A$ $R_G=25\Omega$ Note3	-	40	-	ns
$t_r$	Turn-on Rise Time		-	132	-	ns
$t_{(off)}$	Turn-off Delay Time		-	93	-	ns
$t_f$	Turn-off Fall Time		-	31	-	ns
$C_{iss}$	Input Capacitance	$V_{DS}=25V$	-	1312	-	pF
$C_{oss}$	Output Capacitance	$V_{GS}=0V$	-	159	-	pF
$C_{rss}$	Reverse Transfer Capacitance	$f = 1\text{MHz}$	-	38	-	pF

**Source-Drain Diode Characteristics**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$I_S$	Continuous Source Diode Forward Current		-	-	18	A
$I_{SM}$	Pulsed Source Diode Forward Current (note1)		-	-	72	A
$V_{SD}$	Forward On Voltage	$V_{GS}=0V, I_S=18A$	-	-	2.0	V
$t_{rr}$	Reverse Recovery Time	$V_{GS}=0V, I_S=180A$	-	300	600	ns
$Q_{rr}$	Reverse Recovery Charge	$dI_F/dt = 100A/\mu s$	-	3.4	7.1	$\mu C$

**Note:**

- (1) Repetitive Rating: Pulse width limited by maximum junction temperature
- (2)  $V_{DD}=50V, L=2.7\text{mH}, I_{AS}=18A, R_G=25\Omega$ , starting  $T_j=25^{\circ}\text{C}$
- (3) Pulse width  $\leq 300 \mu s$ ; duty cycle  $\leq 2\%$

**Typical Characteristics**

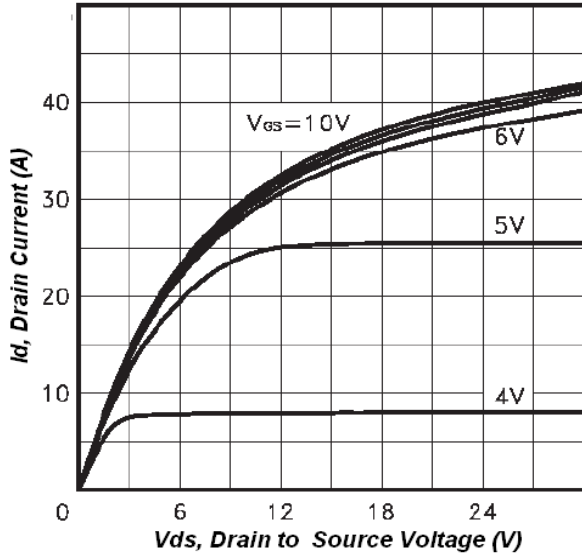


Fig 1. Typical Output Characteristics

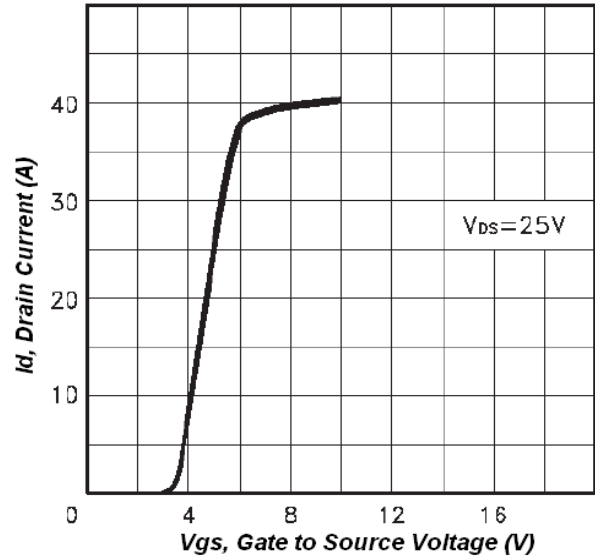


Fig 2. Transfer Characteristics

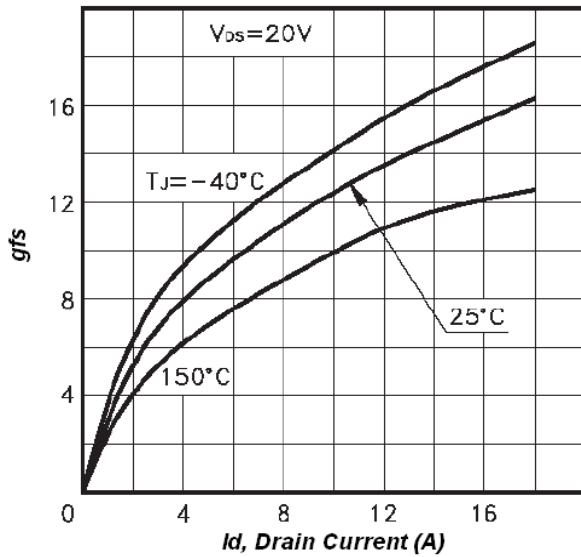


Fig 3. Transconductance

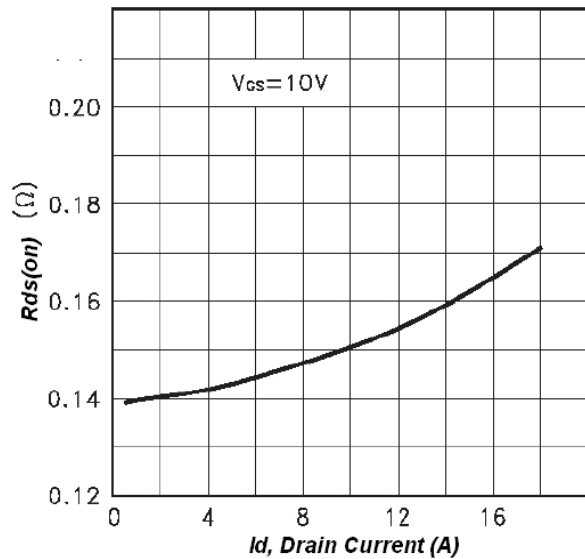


Fig 4. On-Resistance vs. Drain Current

**Typical Characteristics (continued)**

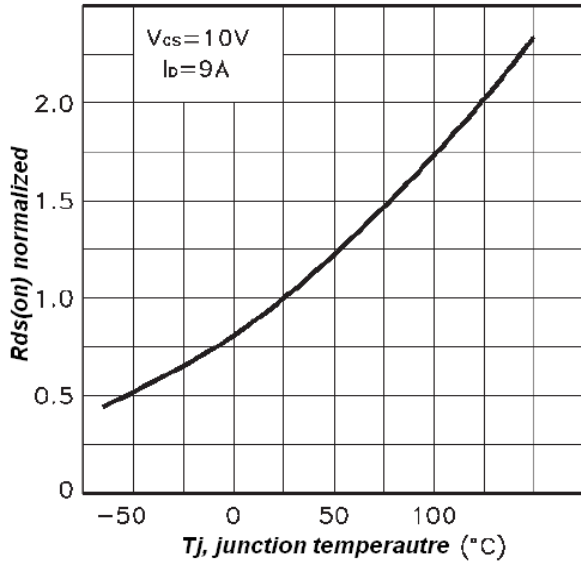


Fig 5. On-Resistance vs. Junction Temperature

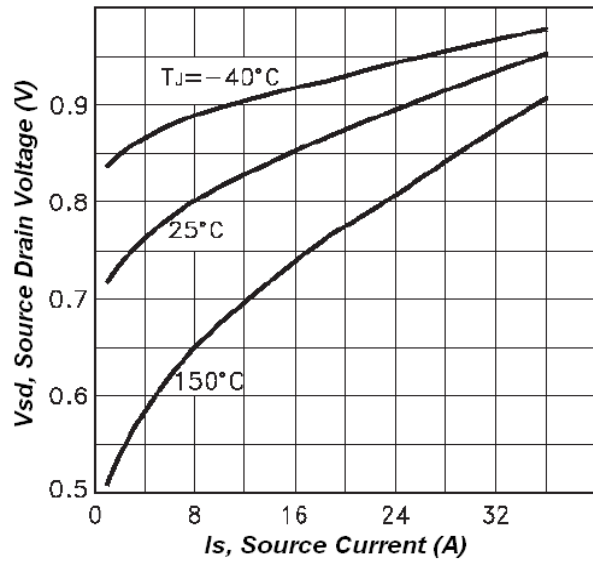


Fig 6. Body Diode Forward Voltage

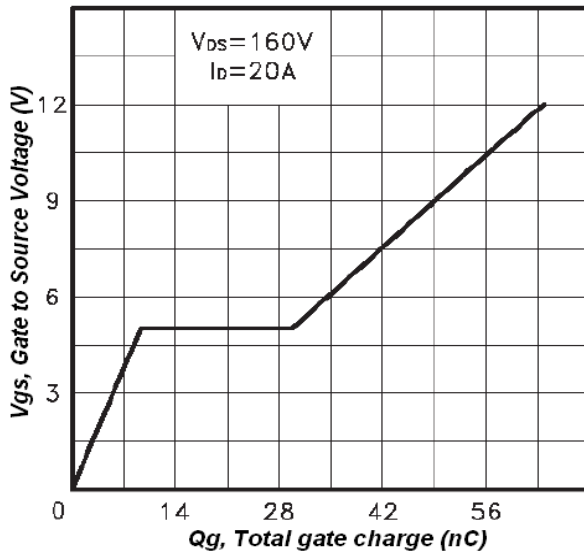


Fig 7. Gate Charge Characteristics

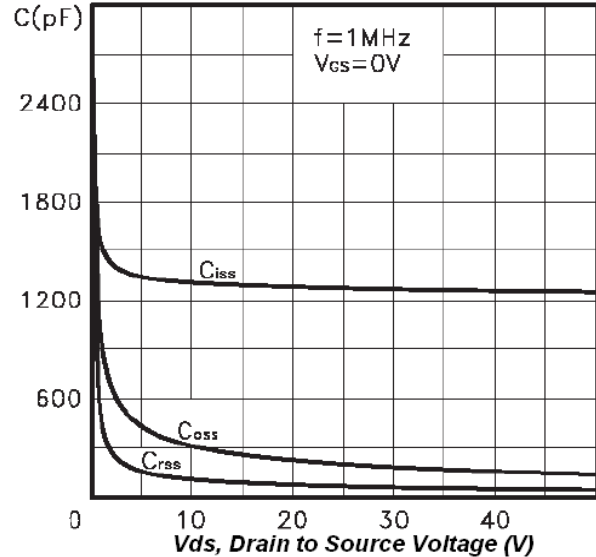


Fig 8. Capacitance Characteristics

**Typical Characteristics (continued)**

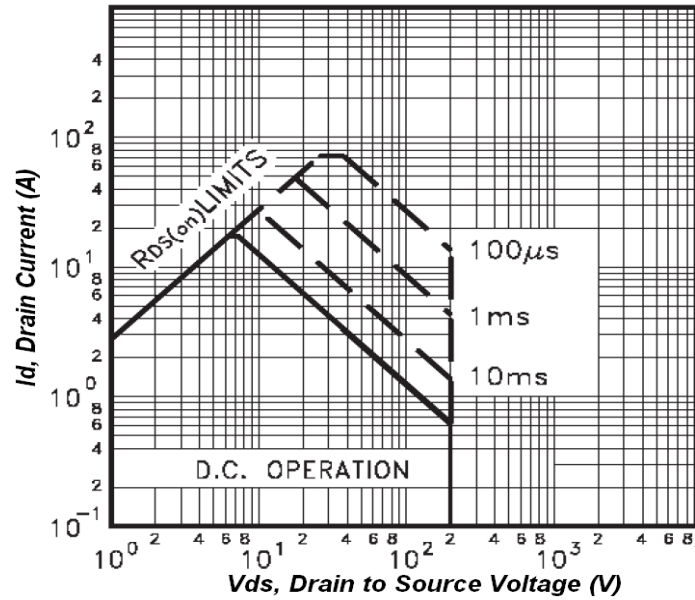


Fig 9. Maximum Safe Operating Area

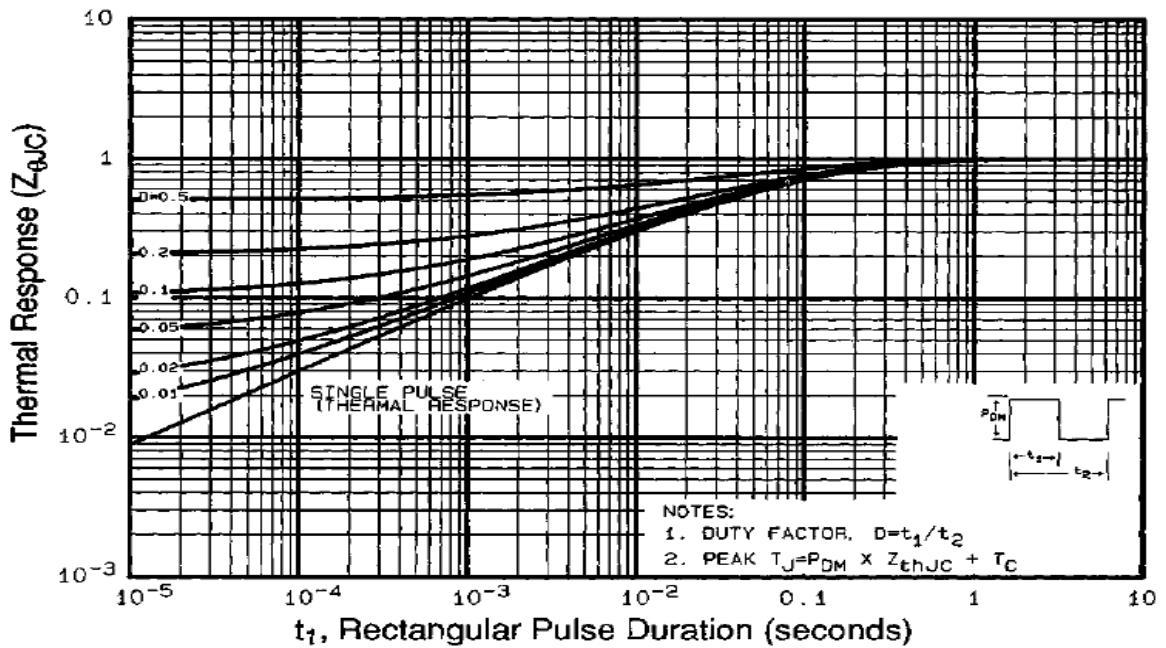


Fig 10. Transient Thermal Response Curve

**Test Circuit and Waveform**

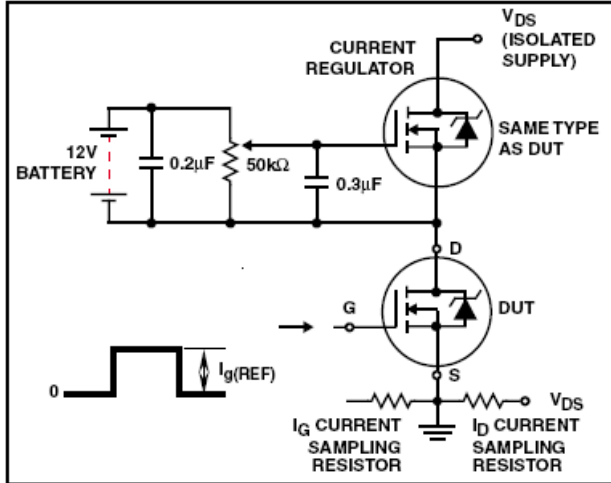


Fig 11. Gate Charge Circuit

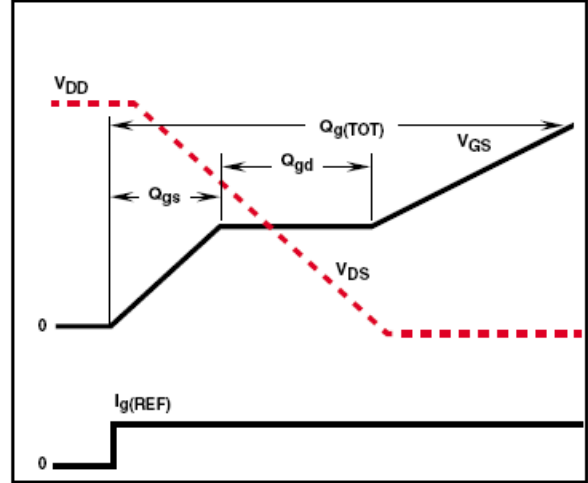


Fig 12. Gate Charge Waveform

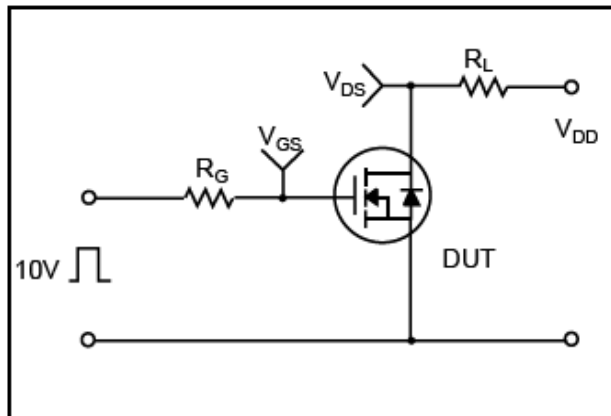


Fig 13. Switching Time Circuit

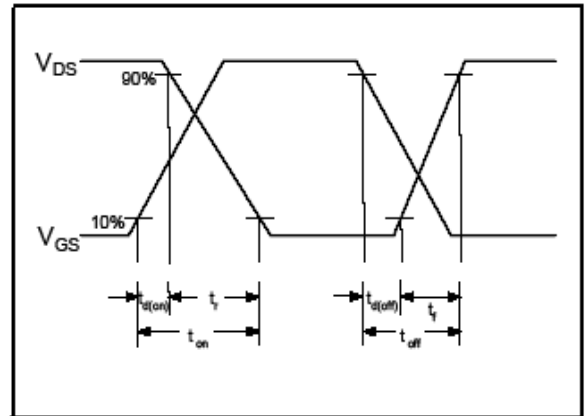


Fig 14. Switching Time Waveform

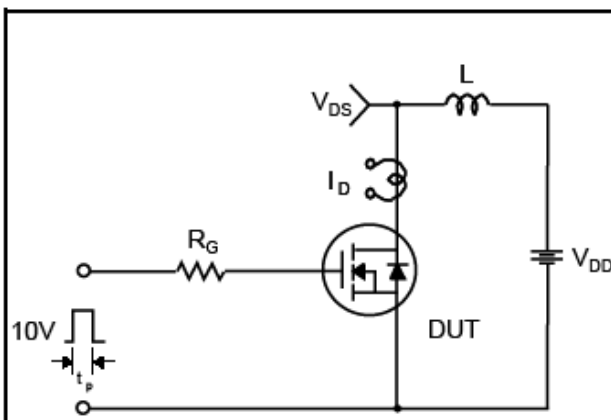


Fig 15. Unclamped Inductive Switching Test Circuit

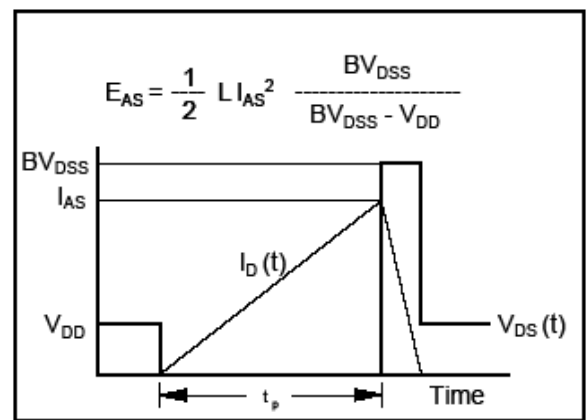


Fig 16. Unclamped Inductive Switching Waveforms