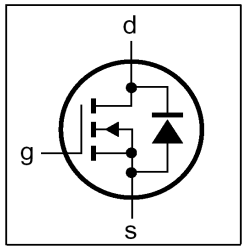
上海贝岭 SHANGHAI BELLING

BLV640

N-channel Enhancement Mode Power MOSFET

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

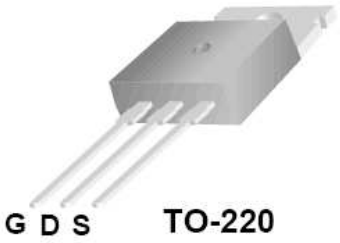


BV_{DSS}	200V
$R_{DS(ON)}$	0.18Ω
I_D	18A

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°C unless otherwise noted)

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

Thermal Characteristics

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

Electrical Characteristics (T_C=25C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	200	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=11A	-	-	0.18	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	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	uA
	Drain-Source Leakage Current Tc=125℃	V_{DS}=160V, V_{GS}=0V	-	-	50	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ± 30V	-	-	±100	nA
Qg	Total Gate Charge	V_{DD}=160V I_D=18A V_{GS}=10V Note3	-	35.7	70	nC
Qgs	Gate-Source Charge		-	6.7	13	nC
Qgd	Gate-Drain Charge		-	17.5	39	nC
$t_{(on)}$	Turn-on Delay Time	V_{DD}=100V I_D=18A R_G=25Ω 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
Ciss	Input Capacitance	V_{DS}=25V V_{GS}=0V f = 1MHz	-	1312	-	pF
Coss	Output Capacitance		-	159	-	pF
Crss	Reverse Transfer Capacitance		-	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/us	-	3.4	7.1	uC

Note：

(1) Repetitive Rating: Pulse width limited by maximum junction temperature

(2) Vdd=50V, L=2.7mH, Ias=18A, Rg=25Ω, staring Tj=25C

(3) Pulse width ≤ 300 us; duty cycle ≤ 2%

Typical Characteristics

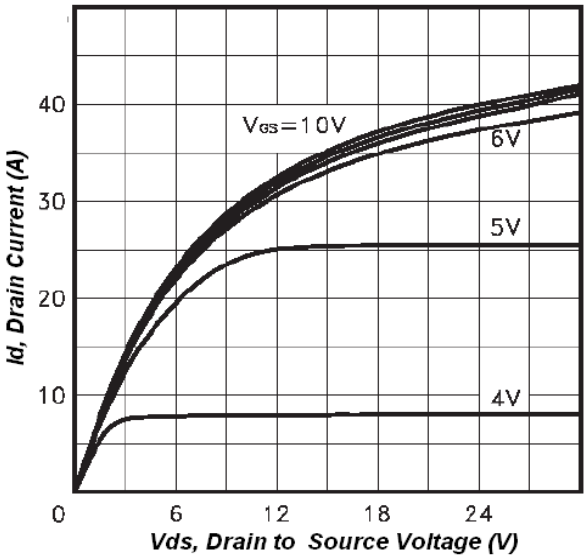


Fig 1. Typical Output Characteristics

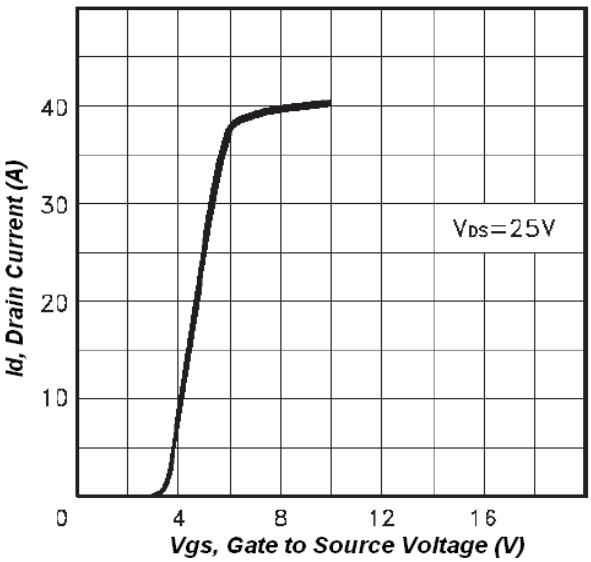


Fig 2. Transfer Characteristics

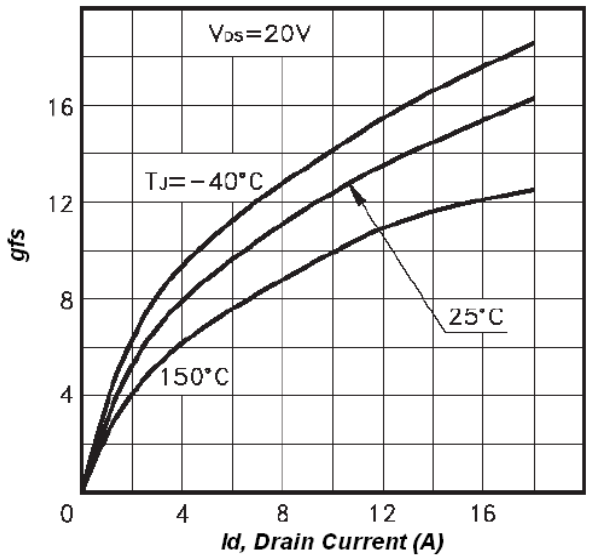


Fig 3. Transconductance

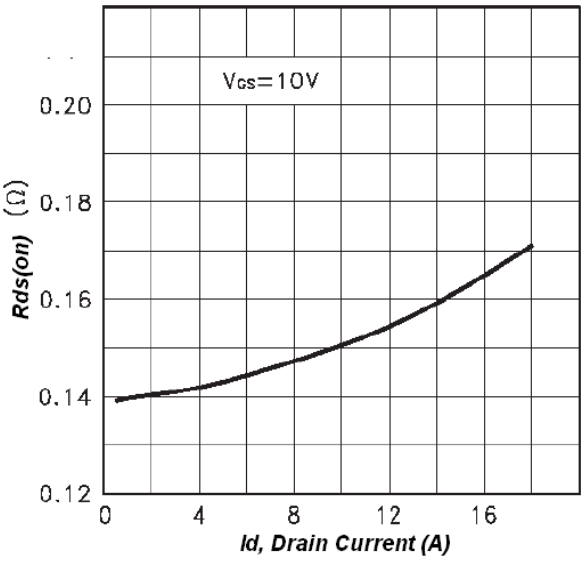


Fig 4. On-Resistance vs. Drain Current

Typical Characteristics （continued）

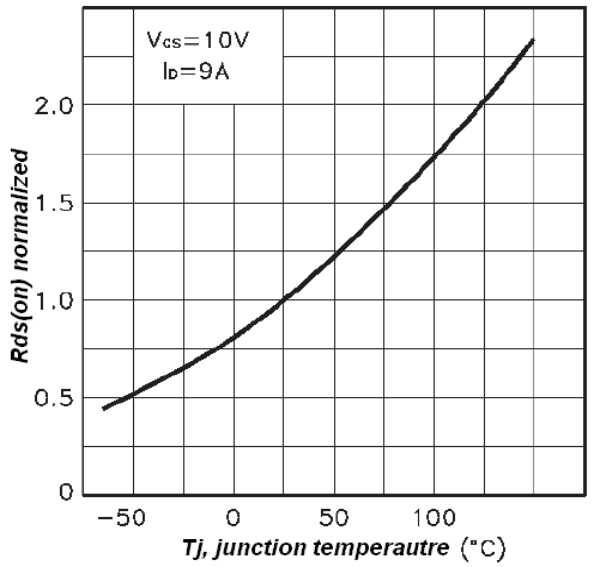


Fig 5. On-Resistance vs. Junction Temperature

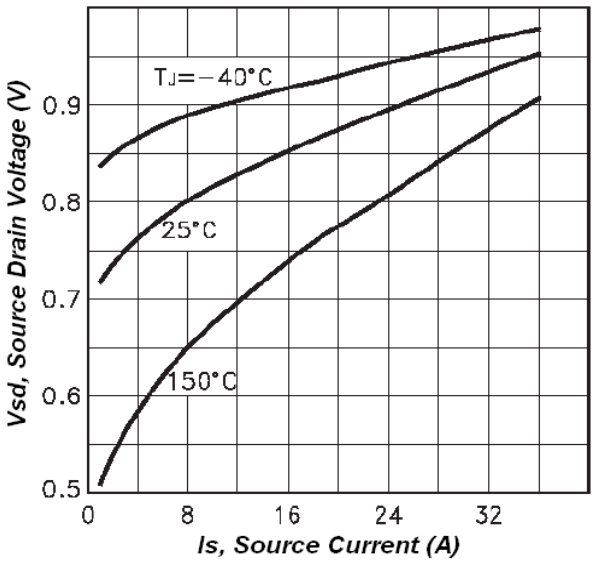


Fig 6. Body Diode Forward Voltage

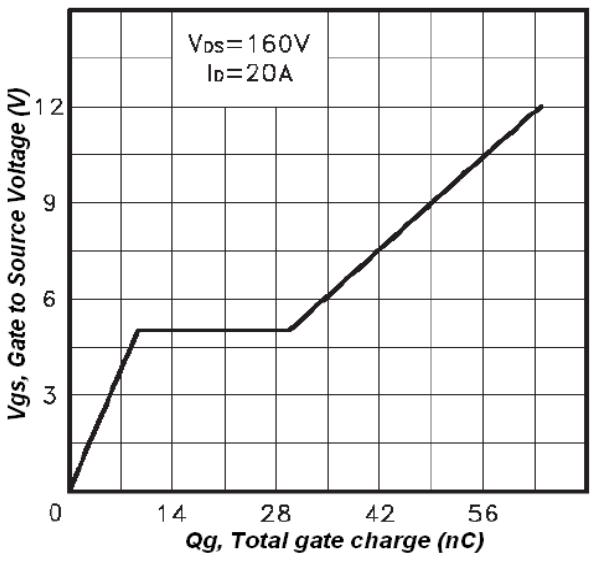


Fig 7. Gate Charge Characteristics

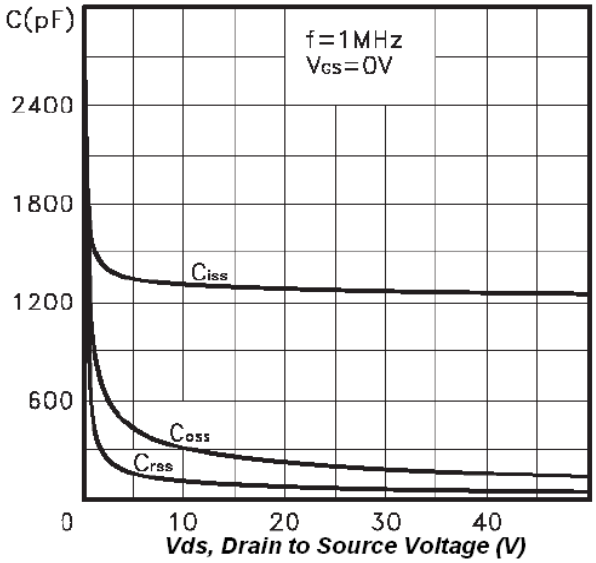


Fig 8. Capacitance Characteristics

Typical Characteristics （continued）

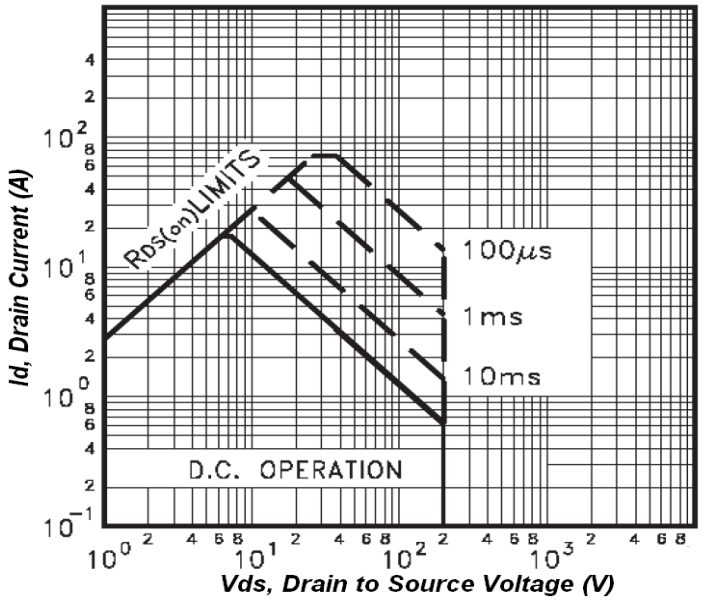


Fig 9. Maximum Safe Operating Area

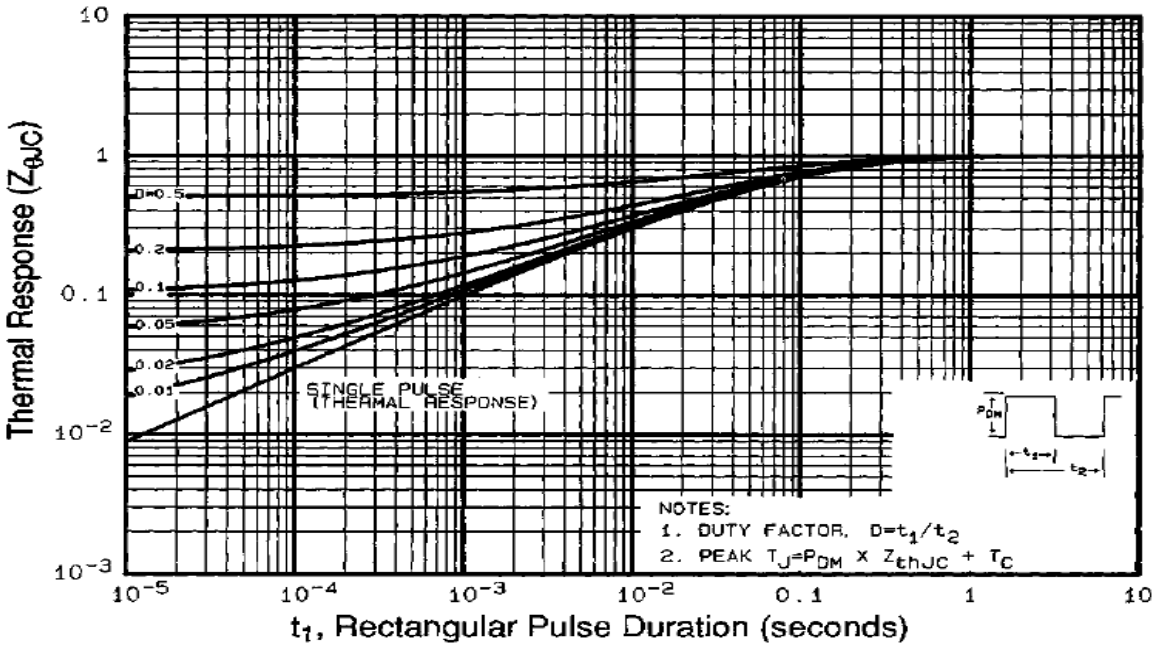


Fig 10. Transient Thermal Response Curve

Test Circuit and Waveform

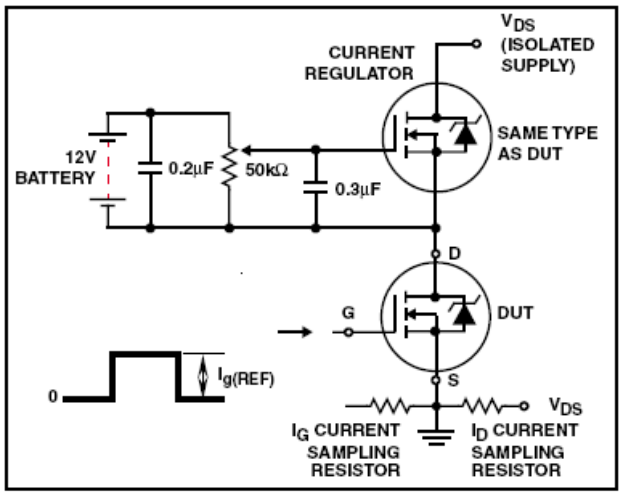


Fig 11. Gate Charge Circuit

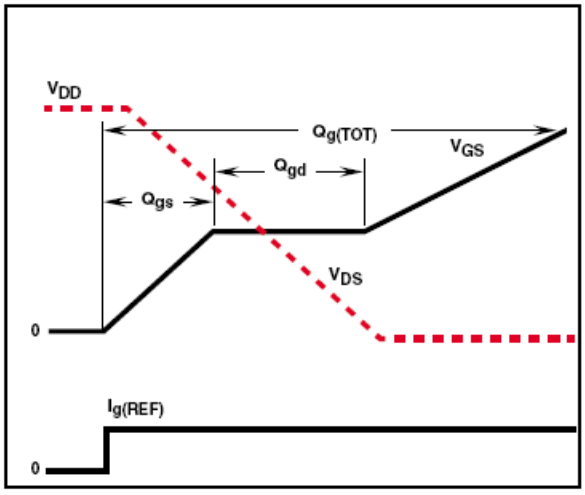


Fig 12. Gate Charge Waveform

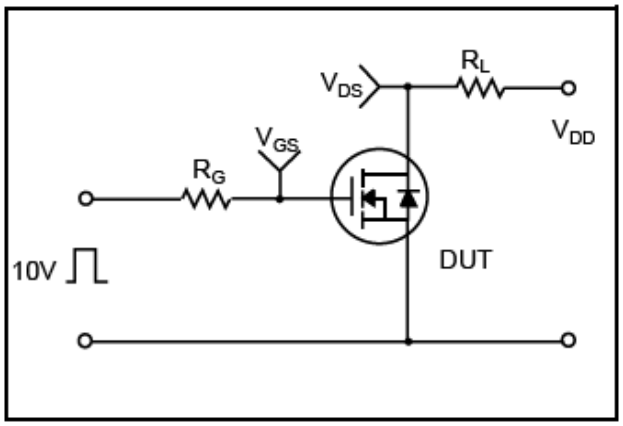


Fig 13. Switching Time Circuit

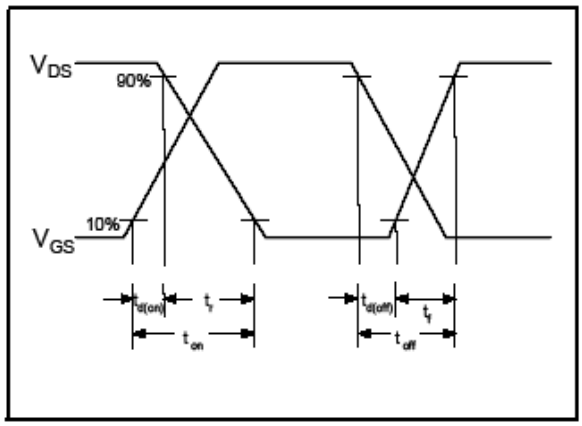


Fig 14. Switching Time Waveform

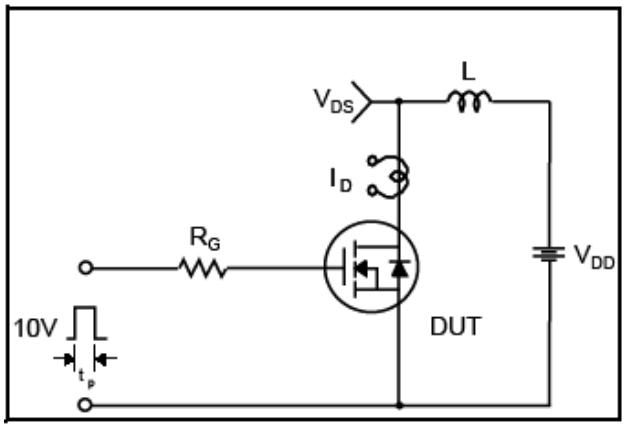


Fig 15. Unclamped Inductive Switching Test Circuit

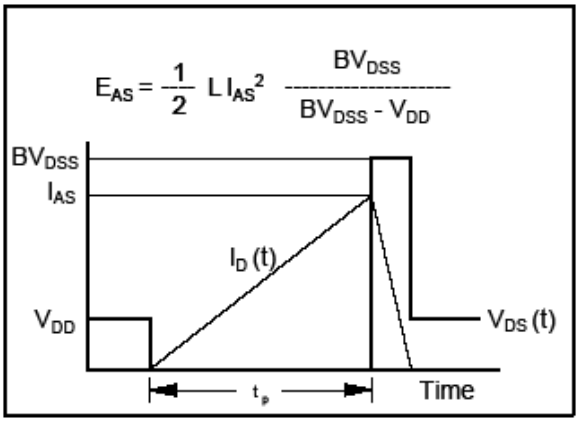


Fig 16. Unclamped Inductive Switching Waveforms