



Through Hole Bridge Rectifier With MOS Integrated

Reverse Voltage - 1000 V

Forward Current - 6.0 A

Bridge Features:

- Glass Passivated Chip
- Low forward voltage drop
- High Surge Forward Current Capability
- Component in accordance to ROHS 2002/95/EC

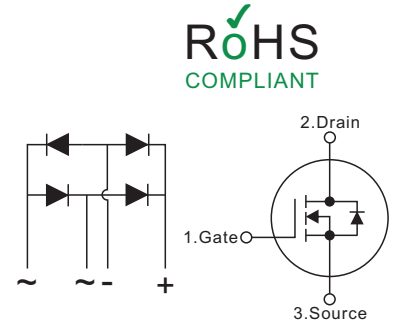
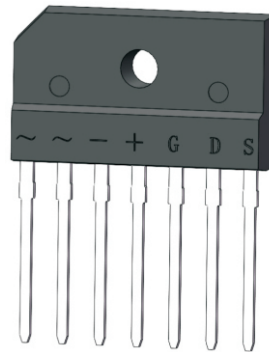
MOS Features:

- $R_{DS(ON)} < 1.0 \Omega$ @ $V_{GS}=10V, I_D=5.0A$
- Fast switching capability
- Avalanche energy tested
- Improved dv/dt capability, high ruggedness

KBJ-7L Package

Mechanical Data

- Package: KBJ-7L
- Epoxy meets UL 94V-0 flammability rating
- Terminals: Pure tin plated leads, solderable per J-STD-002 and JESD22-B102.
- Approx Weight: 4.56g (0.16oz)



ROHS
COMPLIANT

Maximum rating and electrical characteristics of rectifier bridge

Ratings at 25 °C ambient temperature unless otherwise specified.

Single phase half-wave 60 Hz, resistive or inductive load, for capacitive load current derate by 20 %.

Parameter of Bridge	Symbols	B610M10N60	Units
Maximum Repetitive Peak Reverse Voltage	V_{RRM}	1000	V
Maximum RMS voltage	V_{RMS}	700	V
Maximum DC Blocking Voltage	V_{DC}	1000	V
Average Rectified Output Current	I_O	6.0	A
Maximum Forward Voltage at 3.0 A	V_F	1.0	V
Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load	I_{FSM}	110	A
Maximum DC Reverse Current at Rated DC Blocking Voltage	I_R	5 500	μA
Operating and Storage Temperature Range	T_j, T_{stg}	-55 ~ +150	°C

Maximum rating and electrical characteristics of MOSFET

Parameter of MOSFET	Symbols	B610M10N60	Units
Drain-Source Voltage	V_{DSS}	600	V
Gate-Source Voltage	V_{GSS}	± 30	V
Continuous Drain Current	I_D	10 6	A
Pulsed Drain Current (Note 2)	I_{DM}	40	A
Avalanche Energy Single Pulsed (L = 20mH, I _{AS} = 10A, V _{DD} = 50V, R _G = 25 Ω , Starting T _J = 25 °C)	E_{AS}	700	mJ
Power Dissipation	P_D	50	W
Operation Junction Temperature and Storage Temperature	T_j, T_{stg}	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating: Pulse width limited by maximum junction temperature.



Electrical Characteristics (Ta=25°C, Unless Otherwise Specified)

Parameter	Symbols	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{DS}=0V, I_D=250\mu A$	600			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V$			10	μA
Gate- Source Leakage Current	Forward	I_{GSS}			100	nA
	Reverse				-100	
On Characteristics						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=5A$		0.9	1.0	Ω
Forward Transfer Conductance	g_{fs}	$V_{DS}=15V, I_D=5A$		5.0		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$		1643		pF
Output Capacitance	C_{OSS}			143		pF
Reverse Transfer Capacitance	C_{RSS}			11		pF
Gate resistance	R_G			2.6		Ω
Switching Characteristics						
Total Gate Charge (Note 1)	Q_G	$V_{DD}=480V, V_{GS}=10V,$ $I_D=10A, I_G=1mA$ (NOTE1,2)		19		nC
Gate-Source Charge	Q_{GS}			6.3		nC
Gate-Drain Charge	Q_{GD}			6.6		nC
Turn-On Delay Time (Note 1)	$t_{D(ON)}$	$V_{DD}=300V, V_{GS}=10V,$ $I_D=10A, R_G=25\Omega$ (NOTE1,2)		33		ns
Turn-On Rise Time	t_R			60		ns
Turn-Off Delay Time	$t_{D(OFF)}$			59		ns
Turn-Off Fall Time	t_F			39		ns
Drain-source Diode Characteristics And Maximum Ratings						
Maximum Body-Diode Continuous Current	I_S				10	A
Drain-Source Diode Forward Voltage (Note 1)	V_{SD}	$I_S=10A, V_{GS}=0V$			1.4	V
Reverse Recovery Time (Note 1)	t_{rr}	$I_S=10A, V_{GS}=0V,$ $di/dt=100A/\mu s$		425		ns
Reverse Recovery Charge	Q_{rr}			4.3		μC

Notes:

1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.
2. Essentially independent of operating temperature.



Typical characteristic curve of bridge

Fig.1 Typical Forward Current Derating Curve

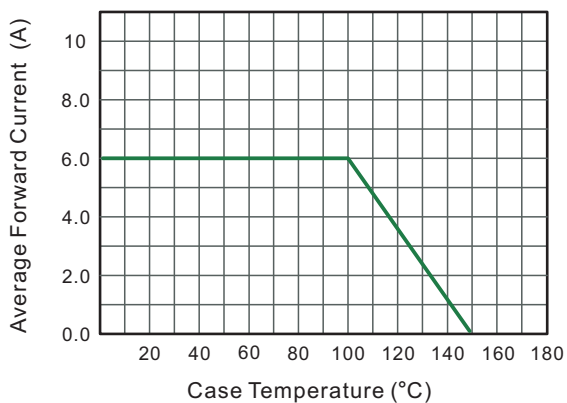


Fig.2 Typical Reverse Characteristics

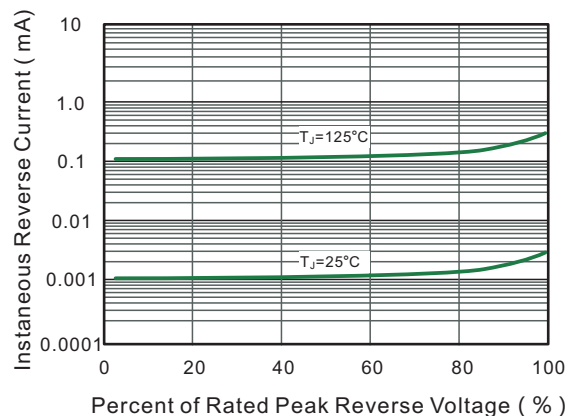


Fig.3 Typical Forward Characteristic

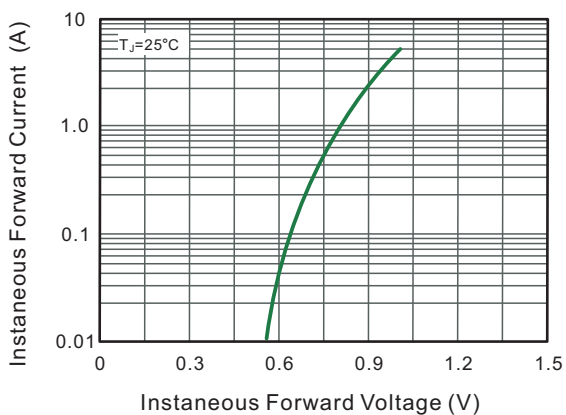
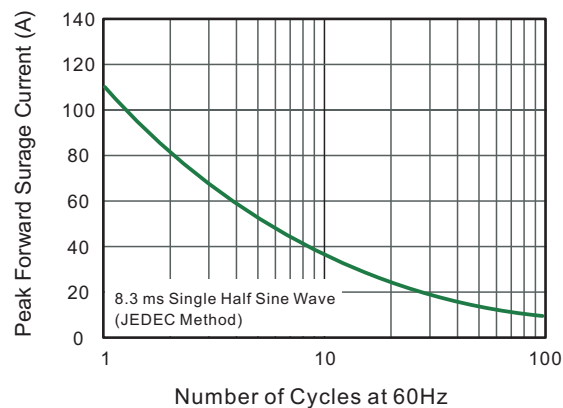
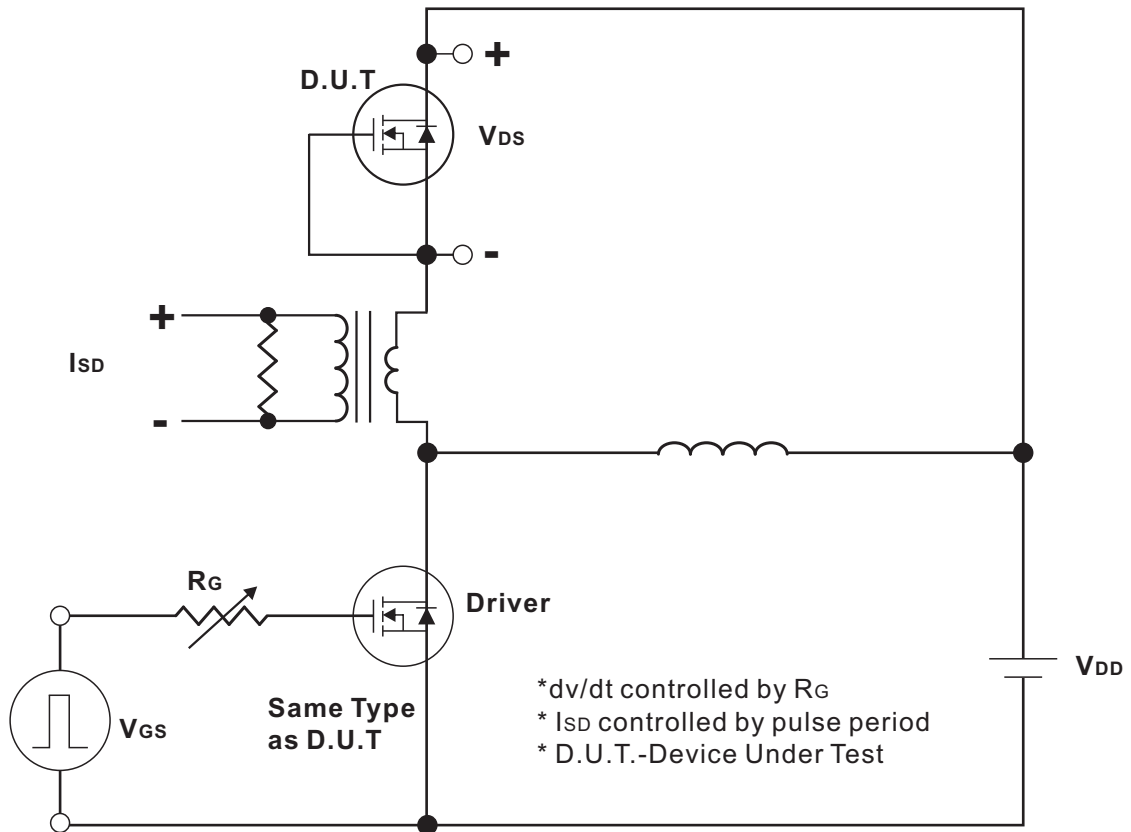


Fig.4 Maximum Non-Repetitive Peak Forward Surge Current

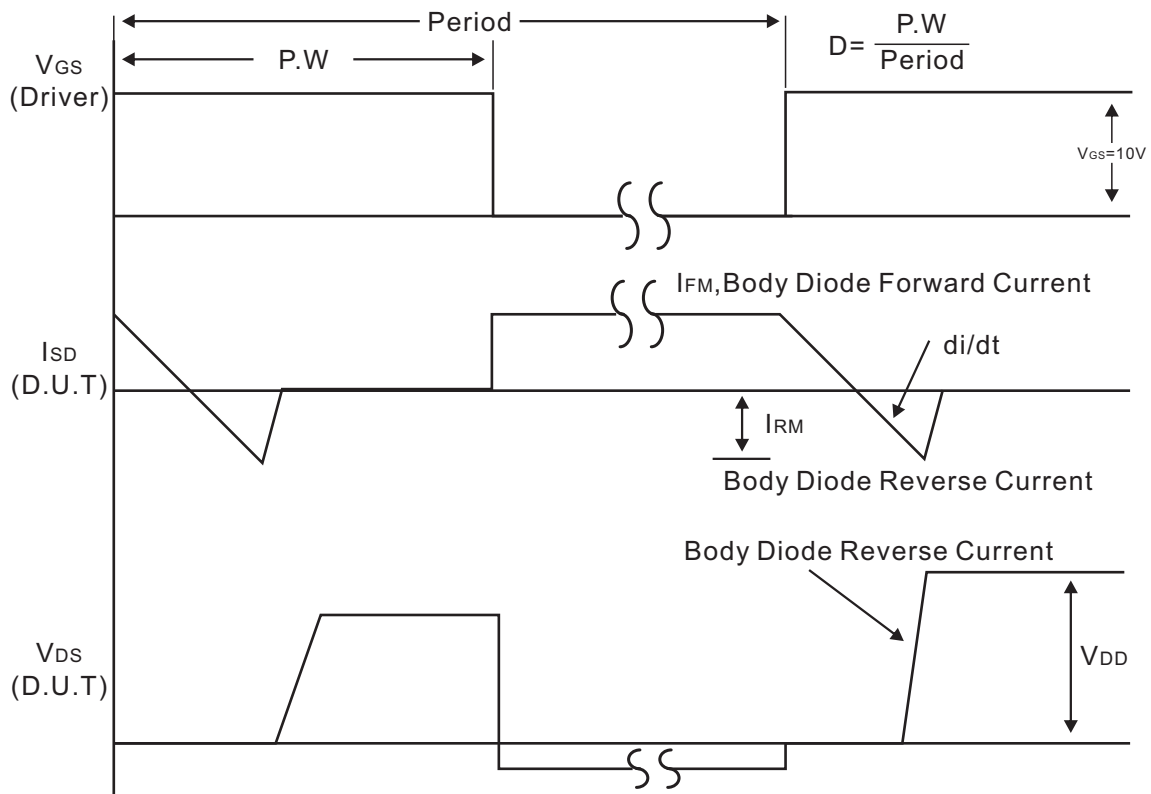




Test Circuits and waveforms



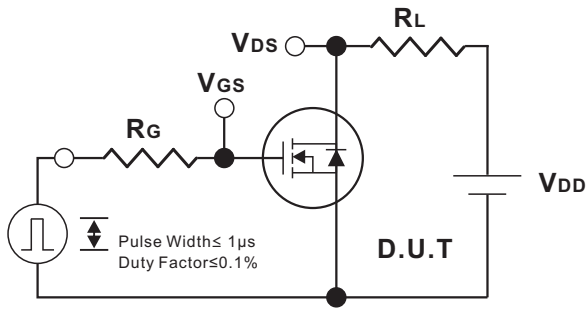
Peak Diode Recovery dv/dt Test Circuit



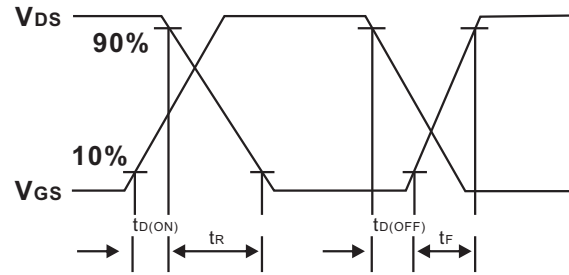
Body Diode Forward Voltage Drop
Peak Diode Recovery dv/dt Waveforms



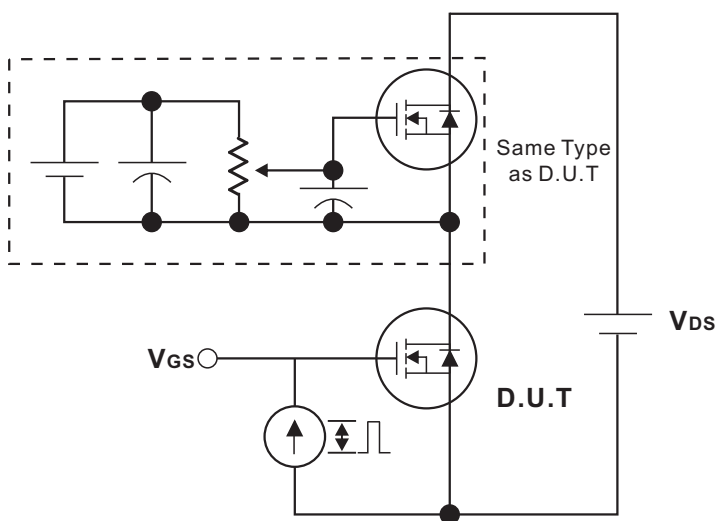
Test Circuits and waveforms



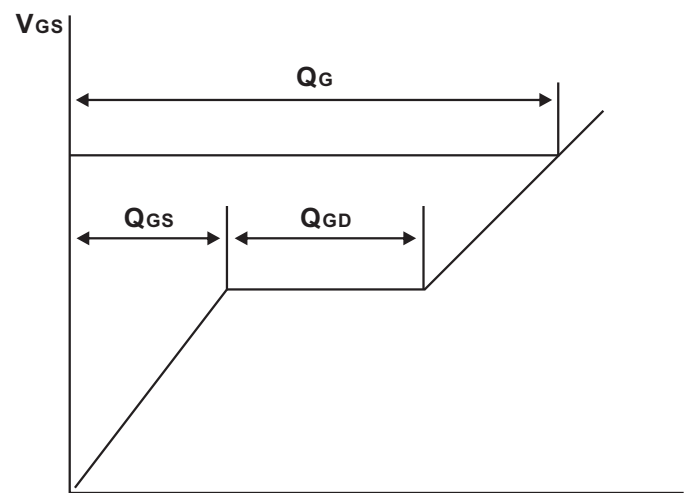
Switching Test Circuit



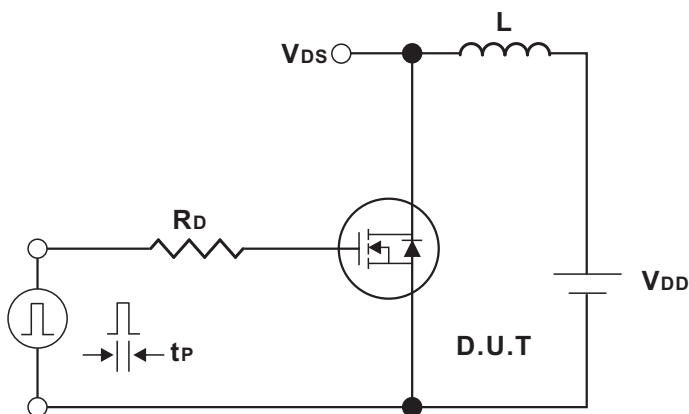
Switching Waveforms



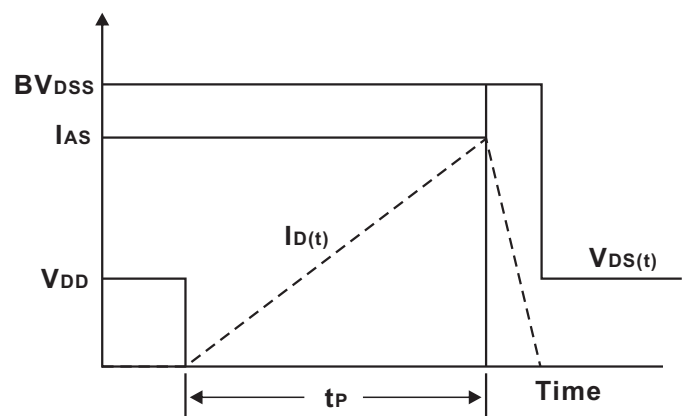
Gate Charge Test Circuit



Charge
Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



Typical characteristic curve of MOSFET

Fig.1 Typical Output Characteristics

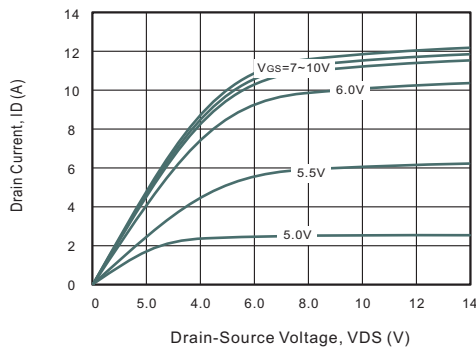


Fig.2 Power Dissipation

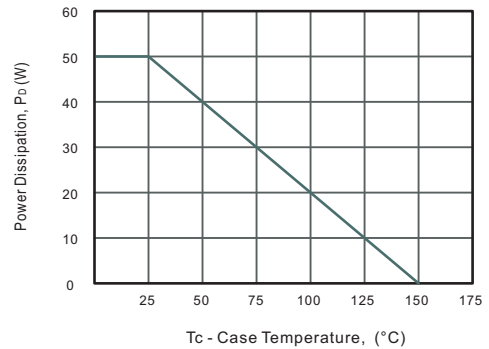


Fig.3 Drain Current Derating

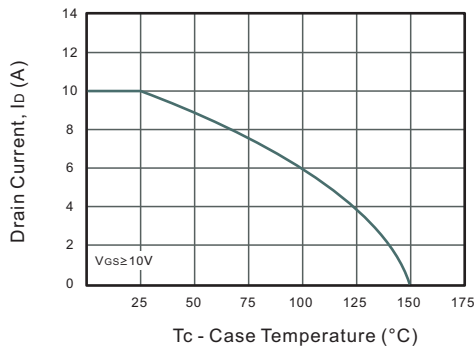


Fig.4 Drain-Source On-Resistance vs. Drain Current

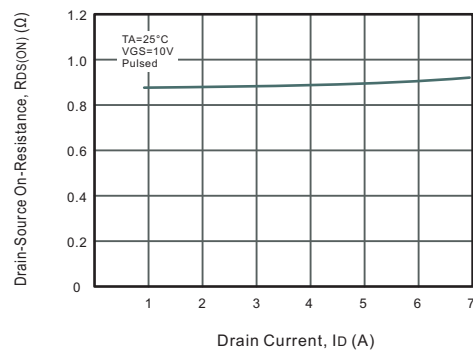


Fig.5 Gate Threshold Voltage vs. Junction Temperature

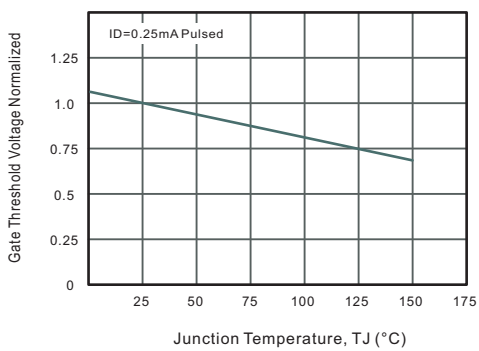


Fig.6 Body-diode Forward Characteristics

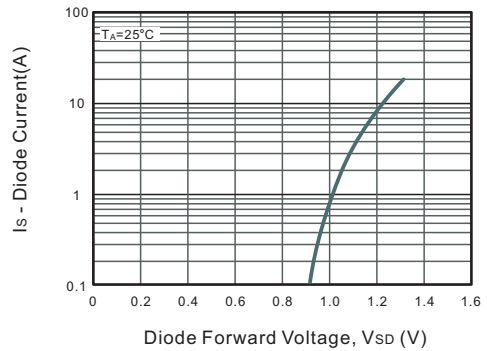


Fig.7 Drain-Source On-Resistance vs. Junction Temperature

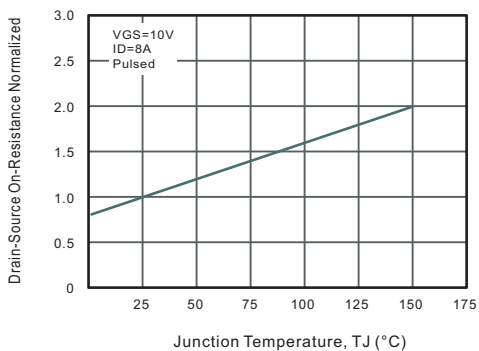
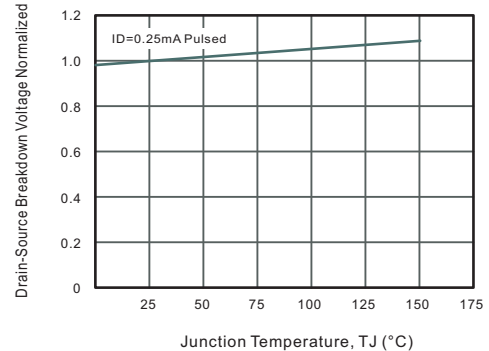


Fig.8 Breakdown Voltage vs. Junction Temperature





Typical characteristic curve of MOSFET

Fig.9 Capacitance Characteristics

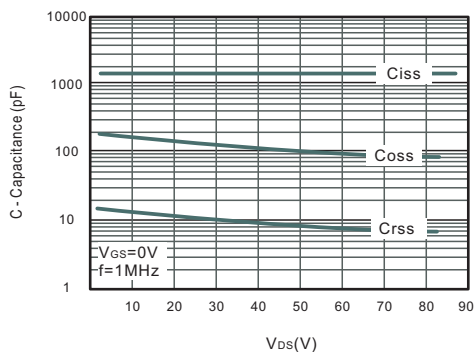


Fig.10 Gate Charge Characteristics

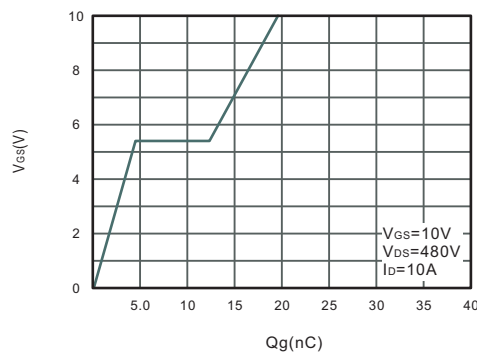
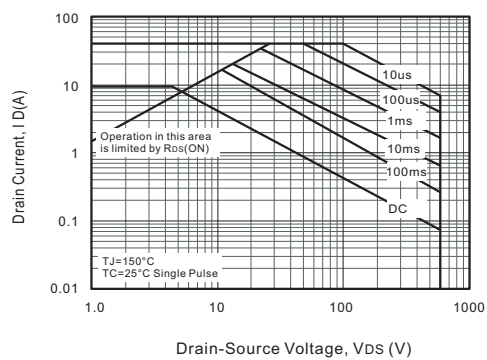


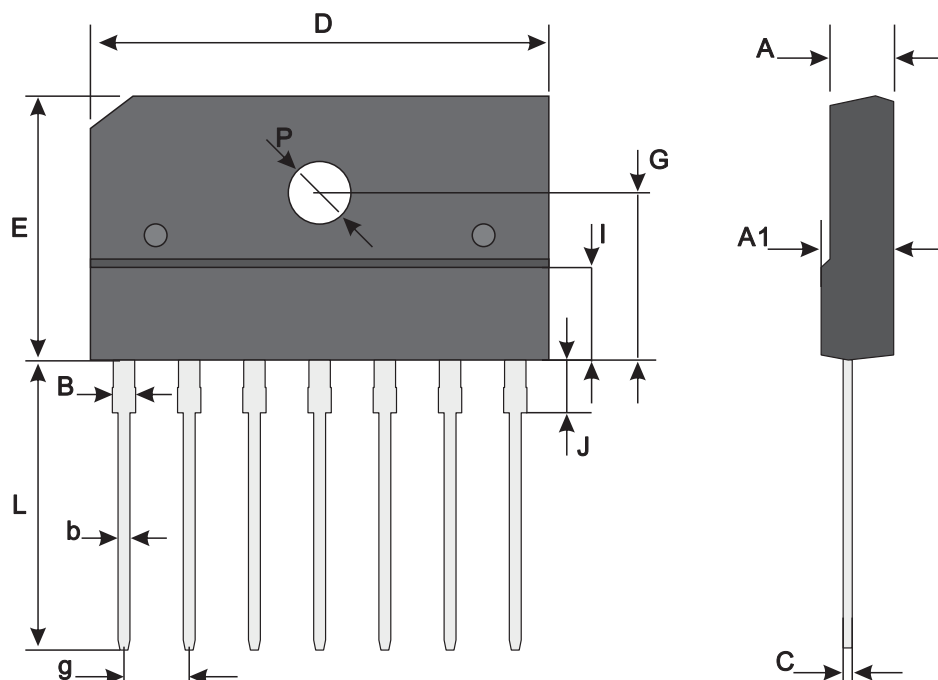
Fig.11 Safe Operating Area





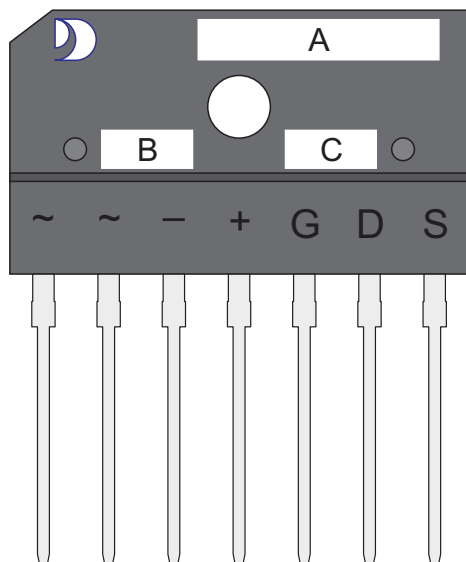
KBJ-7L-Package Outline Dimensions

Through Hole Package ; 7 leads



UNIT		A	A1	B	b	C	D	E	G	g	I	J	L	P
mm	max	3.8	4.8	1.5	1.15	0.75	26.3	15.3	9.7	3.90	5.58	3.7	18.0	φ 3.25 ref.
	typ	3.6	4.6	1.3	1.0	0.55	26.0	15.0	9.5	3.75	5.19	3.5	17.5	
	min	3.4	4.4	1.1	0.85	0.35	25.7	14.7	9.3	3.60	4.80	3.3	17.0	
mil	max	150	189	59	45	30	1035	602	382	154	220	146	709	φ 128 ref.
	typ	142	181	51	39	22	1024	591	374	148	204	138	689	
	min	134	173	43	33	14	1012	579	366	142	189	130	669	

Marking Diagram



A: Marking Area
B: Lot Code
C: Date Code (YWW)
Y: Years(0-9)
WW: Week



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