



Through Hole Bridge Rectifier With MOS Integrated

Reverse Voltage - 1000 V

Forward Current - 4.0 A

Bridge Features:

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

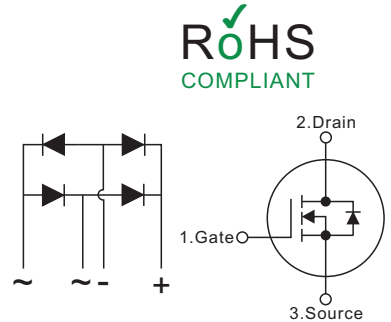
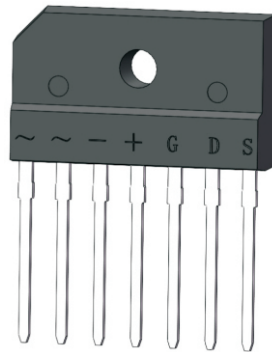
MOS Features:

- $R_{DS(ON)} < 1.3 \Omega$ @ $V_{GS}=10V, I_D=4.0A$
- 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	B410M8N60	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	4.0	A
Maximum Forward Voltage at 2.0 A	V_F	1.0	V
Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load	I_{FSM}	100	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	B410M8N60	Units
Drain-Source Voltage	V_{DSS}	600	V
Gate-Source Voltage	V_{GSS}	± 30	V
Continuous Drain Current	I_D	8 4.5	A
Pulsed Drain Current (Note 2)	I_{DM}	32	A
Avalanche Energy Single Pulsed (L = 10mH, I _{AS} = 8.6A, V _{DD} = 50V, R _G = 25 Ω , Starting T _J = 25 °C)	E_{AS}	490	mJ
Peak Diode Recovery dv/dt (I _{SD} \leq 8A, di/dt \leq 200A/ μs , V _{DD} \leq BVD _{SS} , Starting T _J = 25 °C)	dv/dt	50	V/ns
Power Dissipation	P_D	109	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 OF MOSFET		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}	$V_{DS}=600V, V_{GS}=0V$			1	μA	
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS}=30V, V_{DS}=0V$			100	nA	
	Reverse		$V_{GS}=-30V, V_{DS}=0V$			-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		$R_{DS(ON)}$	$V_{GS}=10V, I_D=4.0A$		0.9	1.3	Ω	
DYNAMIC CHARACTERISTICS								
Input Capacitance		C_{ISS}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$		1080		pF	
Output Capacitance		C_{OSS}				90		pF
Reverse Transfer Capacitance		C_{RSS}				2.5		pF
SWITCHING CHARACTERISTICS								
Total Gate Charge (Note 1)		Q_G	$V_{DS}=300V, V_{GS}=10V,$ $I_D=8A, R_G=25\Omega$ (NOTE1,2)		22		nC	
Gate-Source Charge		Q_{GS}				5		nC
Gate-Drain Charge		Q_{GD}				5.5		nC
Turn-On Delay Time (Note 1)		$t_{D(ON)}$	$V_{DS}=300V, V_{GS}=10V,$ $I_D=4A, R_G=25\Omega$ (NOTE1,2)		12		ns	
Turn-On Rise Time		t_R				20		ns
Turn-Off Delay Time		$t_{D(OFF)}$				74		ns
Turn-Off Fall Time		t_F				33		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS								
Maximum Body-Diode Continuous Current		I_S				8	A	
Maximum Body-Diode Pulsed Current		I_{SM}				32	A	
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	$I_S=8A, V_{GS}=0V$			1.4	V	
Reverse Recovery Time (Note 1)		t_{rr}	$I_S=8A, V_{GS}=0V,$			506	ns	
Reverse Recovery Charge		Q_{rr}	$di/dt=100A/\mu s$			2.7		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

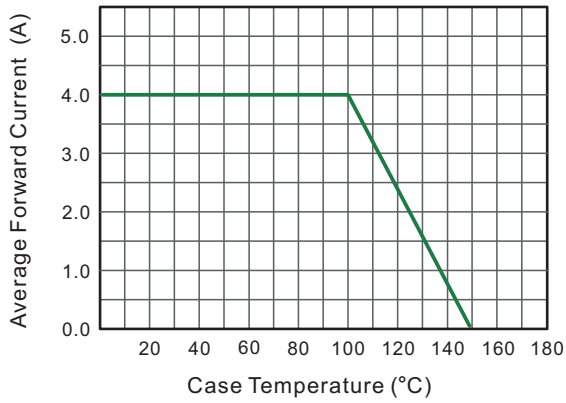


Fig.2 Typical Reverse Characteristics

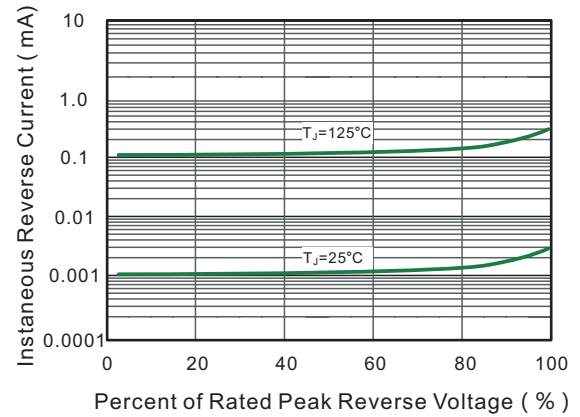


Fig.3 Typical Forward Characteristic

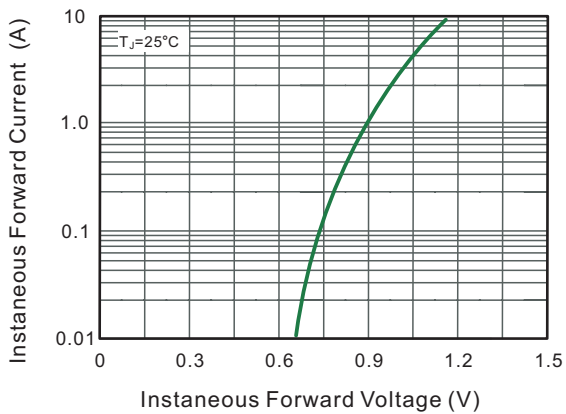
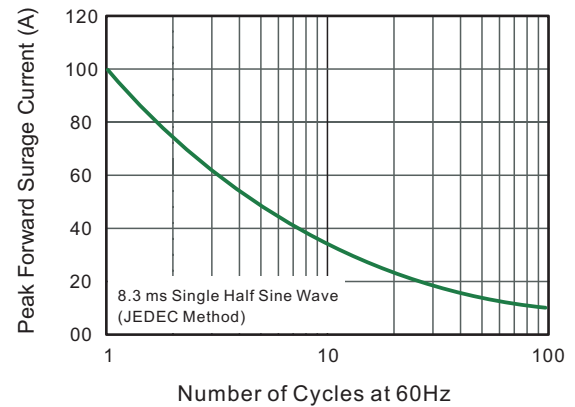
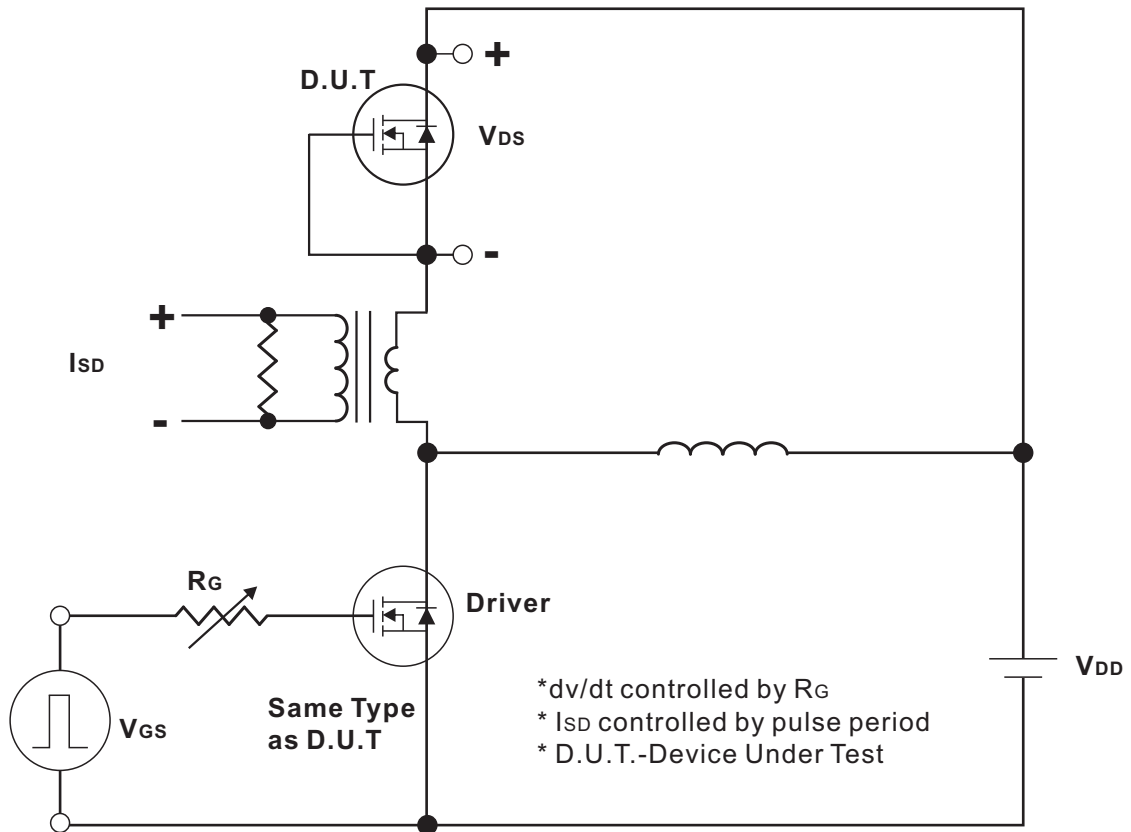


Fig.4 Maximum Non-Repetitive Peak Forward Surge Current

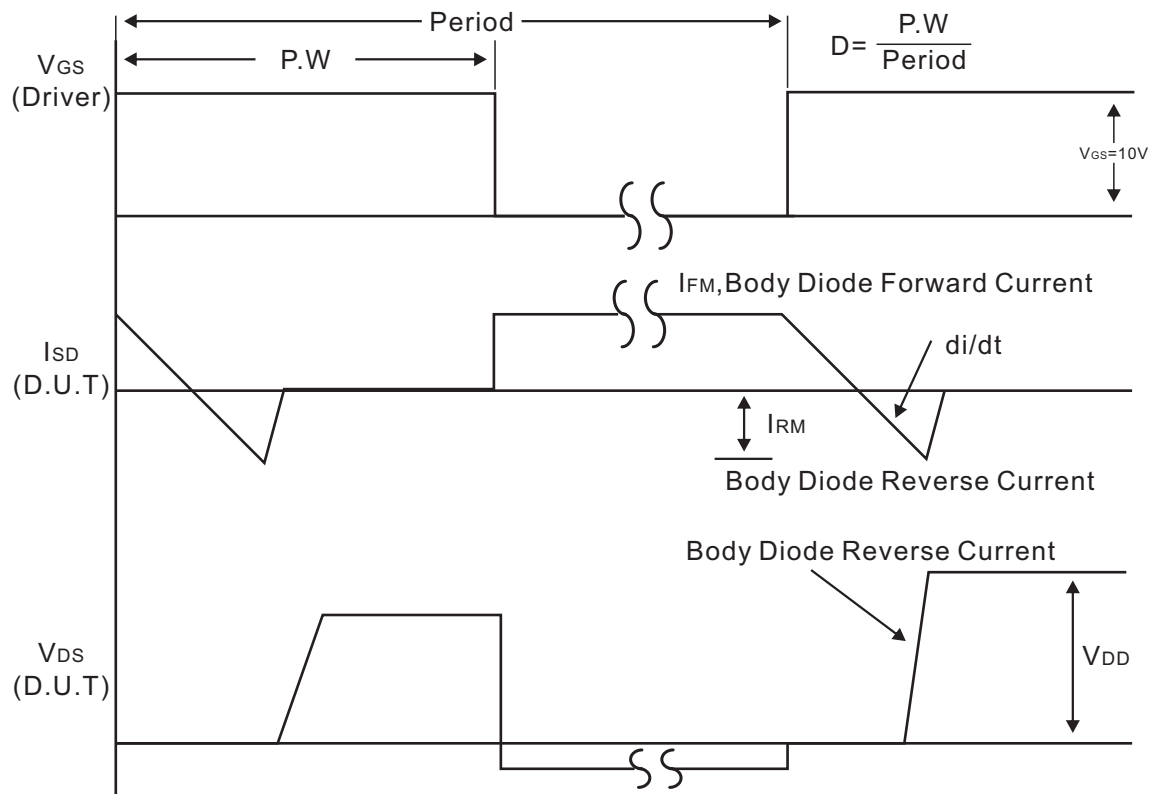




Test Circuits and waveforms



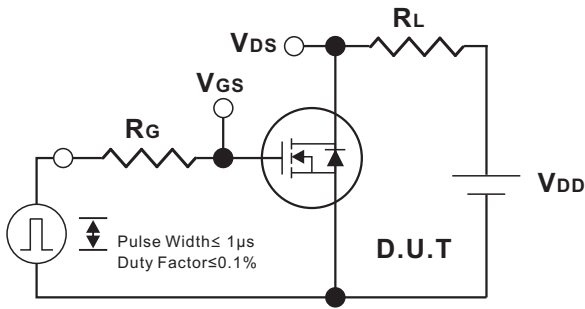
Peak Diode Recovery dv/dt Test Circuit



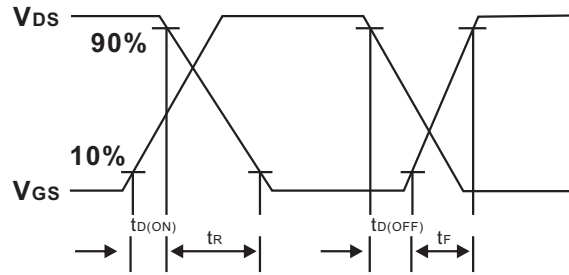
Body Diode Forward Voltage Drop
Peak Diode Recovery dv/dt Waveforms



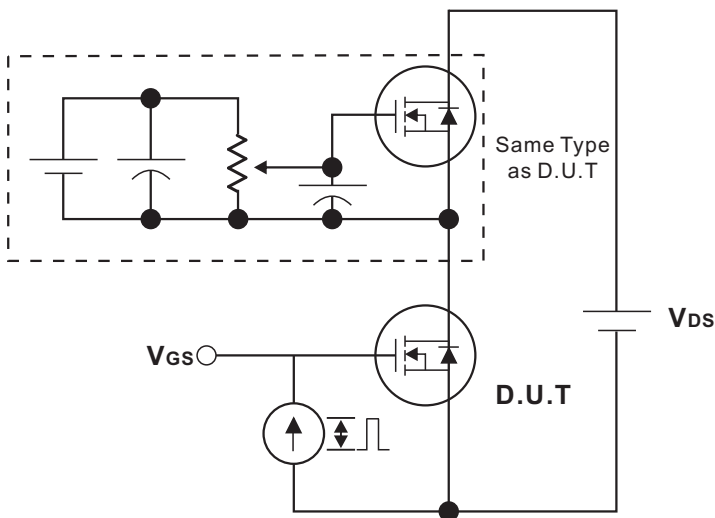
Test Circuits and waveforms



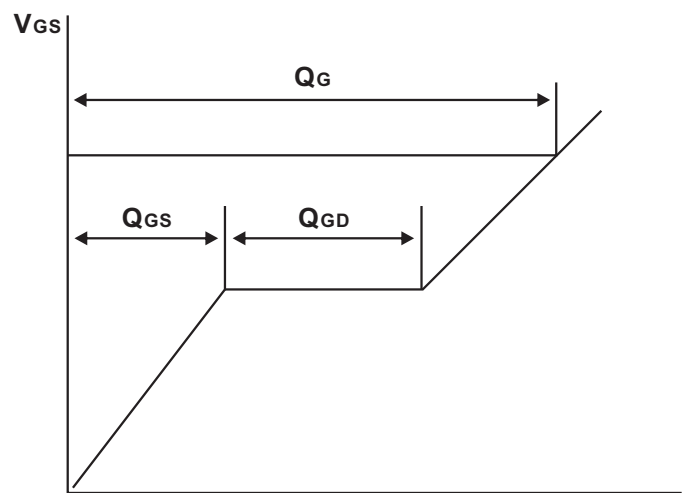
Switching Test Circuit



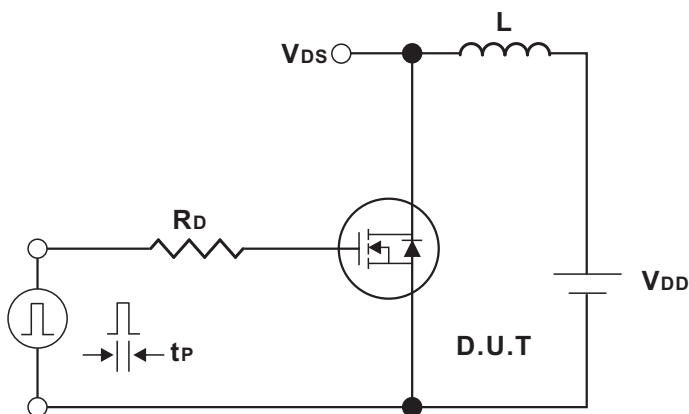
Switching Waveforms



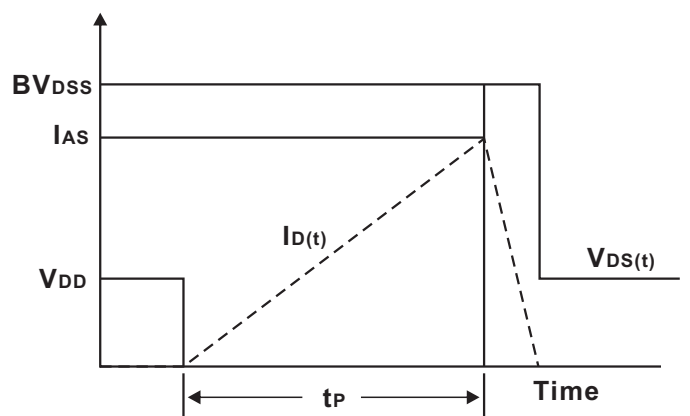
Gate Charge Test Circuit



Charge
Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



Typical Characteristics of MOSFET

Fig.1 Typical Output Characteristics

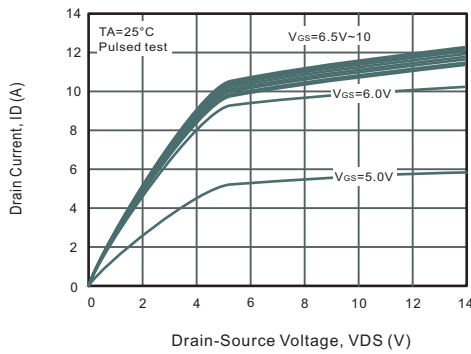


Fig.2 Drain-Source On-Resistance vs. Gate-Source Voltage

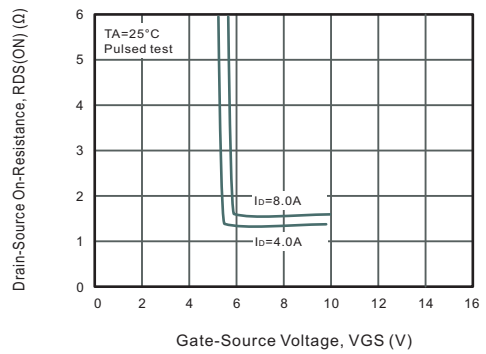


Fig.3 Gate Charge Characteristics

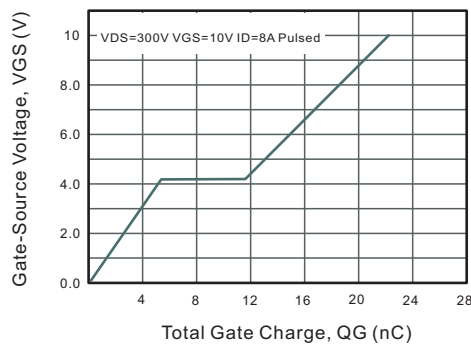


Fig.4 Capacitance Characteristics

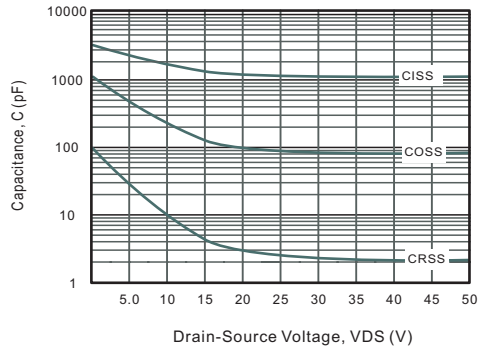


Fig.5 Drain-Source On-Resistance vs. Junction Temperature

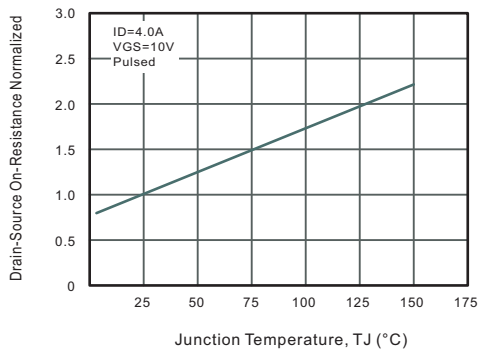


Fig.6 Breakdown Voltage vs. Junction Temperature

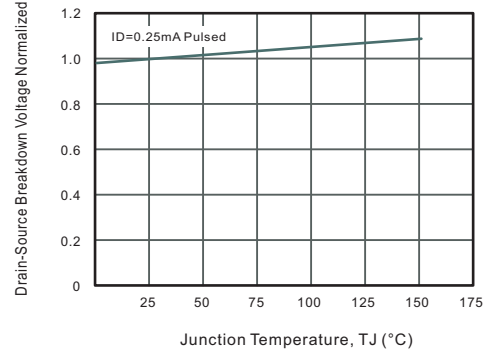


Fig.7 Gate Threshold Voltage vs. Junction Temperature

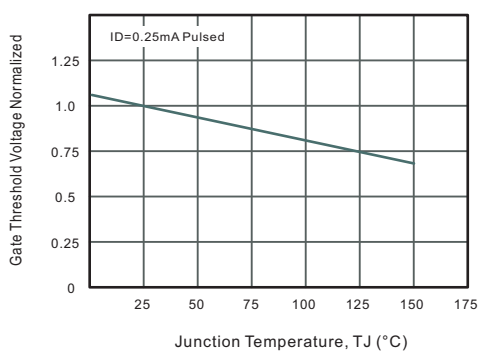
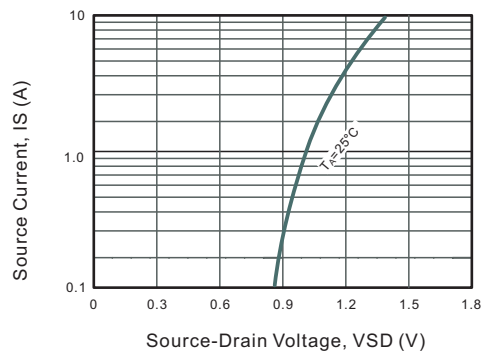


Fig.8 Source Current vs. Source-Drain Voltage





Typical Characteristics

Fig.9 Drain Current vs. Junction Temperature

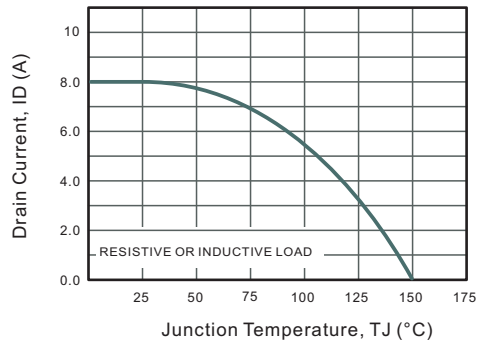


Fig.10 Drain-Source On-Resistance vs. Drain Current

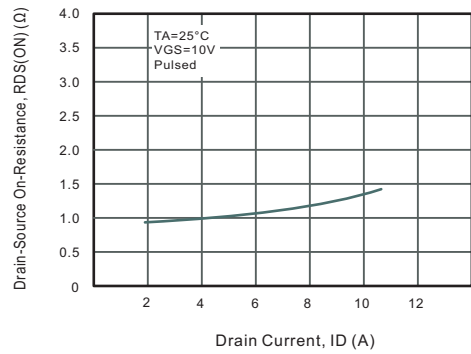


Fig.11 Power Dissipation vs. Junction Temperature

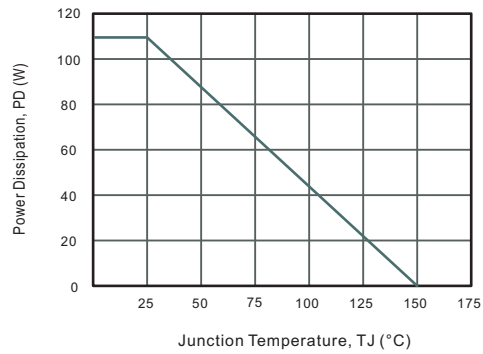
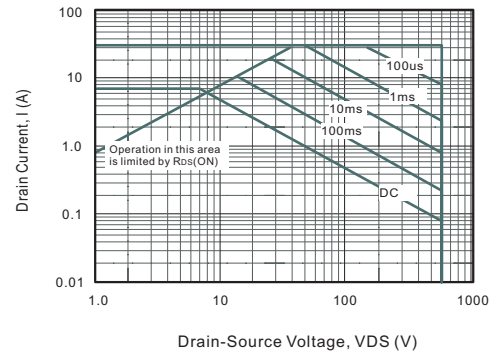


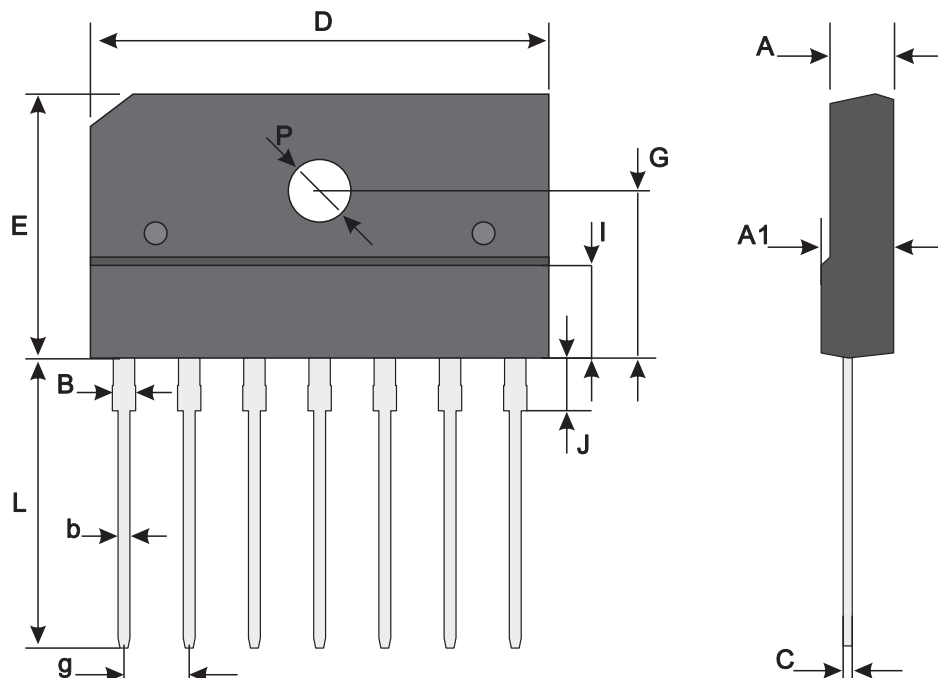
Fig.12 Safe Operating Area





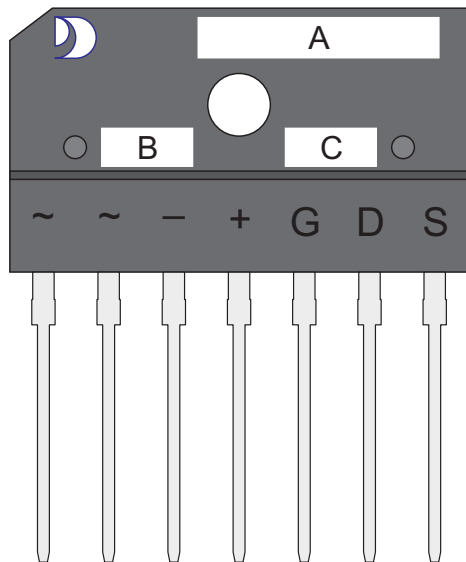
KBJ-7L-Package Outline Dimensions

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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