KODENSHI AUK

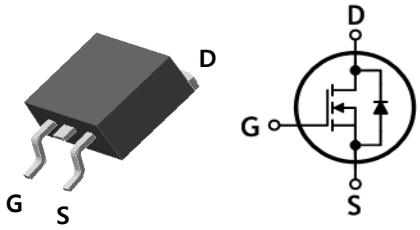
SJMN380R70B

Super Junction MOSFET

N-Channel Super Junction MOSFET

Features

- Drain-Source voltage: V_{DS}=750V (@T_J=150°C)
- Low drain-source On resistance: $R_{DS(on)}$=0.38Ω (Max.)
- Ultra low gate charge: Qg=20nC(Typ.)
- RoHS compliant device
- 100% avalanche tested

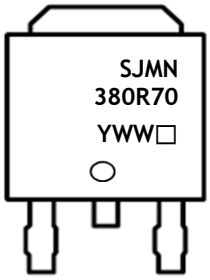


TO-263 (D^2-PAK)

Ordering Information

Part Number	Marking	Package
SJMN380R70B	SJMN380R70	TO-263 (D^2-PAK)

Marking Information



Column 1, 2: Device Code
Column 3: Production Information
e.g.) YWW□
-. YWW: Date Code (year, week)
-. □: Management Code

Absolute maximum ratings (T_C=25°C unless otherwise noted)

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		700	V
Gate-source voltage	V_{GSS}		±30	V
Drain current (DC) (Note 1)	I_D	T_c=25°C	11	A
		T_c=100°C	7	A
Drain current (Pulsed) (Note 1)	I_{DM}		44	A
Single pulsed avalanche energy (Note 2)	E_{AS}		263	mJ
Repetitive avalanche current (Note 1)	I_{AR}		7	A
Repetitive avalanche energy (Note 1)	E_{AR}		10.5	mJ
Power dissipation	P_D		105	W
Diode dv/dt ruggedness (Note 3)	dv/dt		15	V/ns
MOSFET dv/dt ruggedness (Note 4)	dv/dt		50	V/ns
Junction temperature	T_J		150	°C
Storage temperature range	T_{stg}		-55~150	°C

Thermal Characteristics

Characteristic	Symbol	Rating	Unit
Thermal resistance, junction to case	$R_{th(j-c)}$	Max. 1.19	°C/W
Thermal resistance, junction to ambient	$R_{th(j-a)}$	Max. 62.5	

Electrical Characteristics (T_C=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	I_D=250uA, V_{GS}=0	700	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250uA, V_{DS}=V_{GS}	2	3	4	V
Drain-source cut-off current	I_{DSS}	V_{DS}=700V, V_{GS}=0V	-	-	1	uA
		V_{DS}=700V, T_J=125°C	-	-	100	uA
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V	-	-	±100	nA
Drain-source on-resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=5.5A	-	0.3	0.38	Ω
Internal gate resistance	R_g	f=1MHz, Open drain	-	20	-	Ω
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz	-	858	-	pF
Output capacitance	C_{oss}		-	470	-	
Reverse transfer capacitance	C_{rss}		-	21	-	
Turn-on delay time (Note 5)	$t_{d(on)}$	V_{DS}=350V, I_D=11A, R_G=25Ω	-	17	-	ns
Rise time (Note 5)	t_r		-	14	-	
Turn-off delay time (Note 5)	$t_{d(off)}$		-	40	-	
Fall time (Note 5)	t_f		-	5	-	
Total gate charge (Note 6)	Q_g	V_{DS}=400V, V_{GS}=10V, I_D=6A	-	20	-	nC
Gate-source charge (Note 6)	Q_{gs}		-	6.5	-	
Gate-drain charge (Note 6)	Q_{gd}		-	5.5	-	

Source-Drain Diode Ratings and Characteristics (T_C=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	11	A
Source current (Pulsed)	I_{SM}		-	-	44	A
Forward voltage	V_{SD}	V_{GS}=0V, I_S=11A	-	-	1.2	V
Reverse recovery time (Note 5, 6)	t_{rr}	I_S=11A, V_{GS}=0V, dI_S/dt=100A/us	-	270	-	ns
Reverse recovery charge (Note 5, 6)	Q_{rr}		-	2.8	-	uC

Note:
1. Calculated continuous current based on maximum allowable junction temperature
2. L=10mH, I_{AS}=7A, V_{DD}=50V, Starting T_J=25°C
3. I_S≤11A, V_{DS}≤400V, dIs/dt≤100A/us, T_J=25°C
4. V_{DS}≤400V, I_S≤11A
5. Guaranteed by design, not subject to production testing
6. Pulse test: Pulse width≤300us, Duty cycle≤2%

Typical Electrical Characteristics Curves

Fig. 1 Typical Output Characteristics

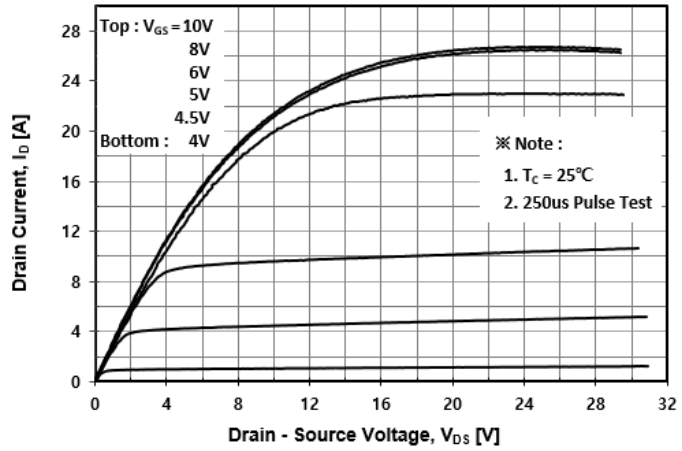


Fig. 2 Typical Transfer Characteristics

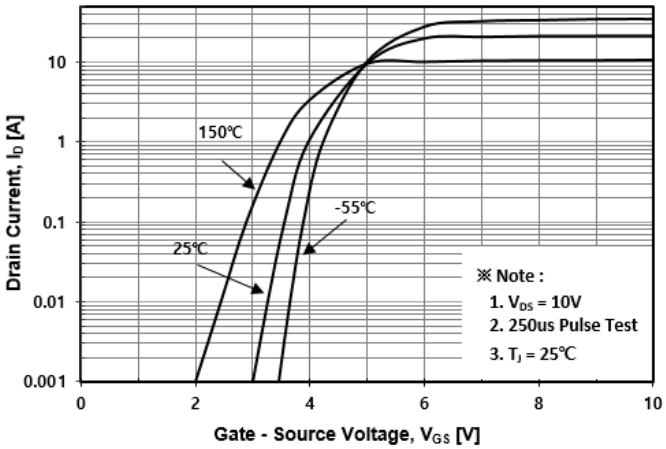


Fig.3 On-Resistance Variation with Drain Current and Gate Voltage

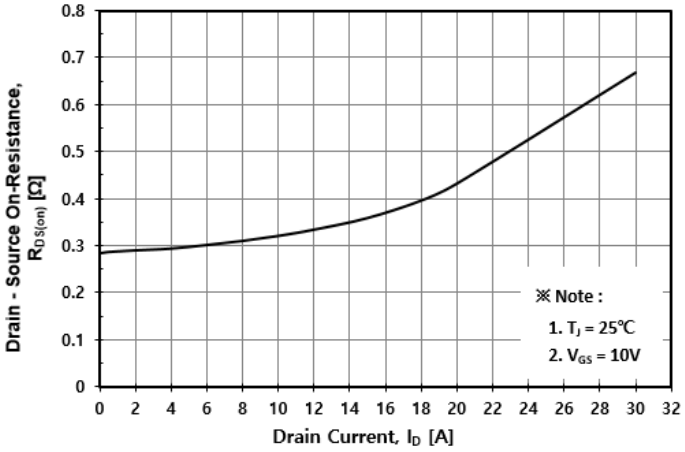


Fig. 4 Body Diode Forward Voltage Variation with Source Current

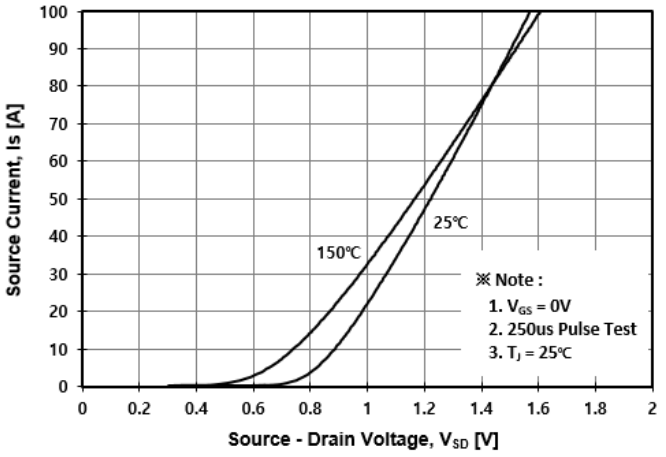


Fig. 5 Typical Capacitance Characteristics

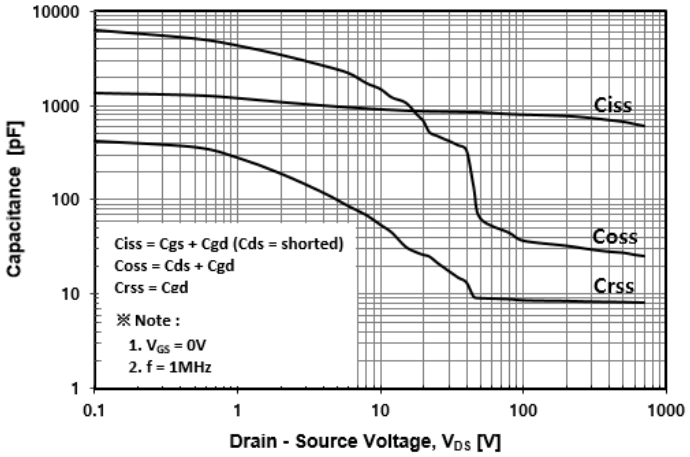


Fig. 6 Typical Total Gate Charge Characteristics

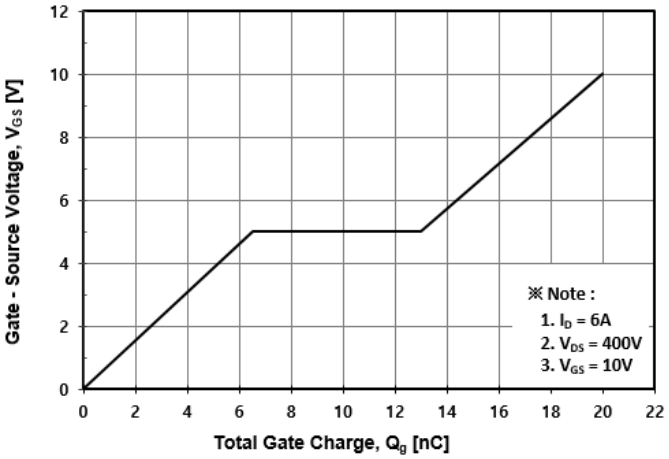


Fig. 7 Breakdown Voltage Variation vs. Temperature

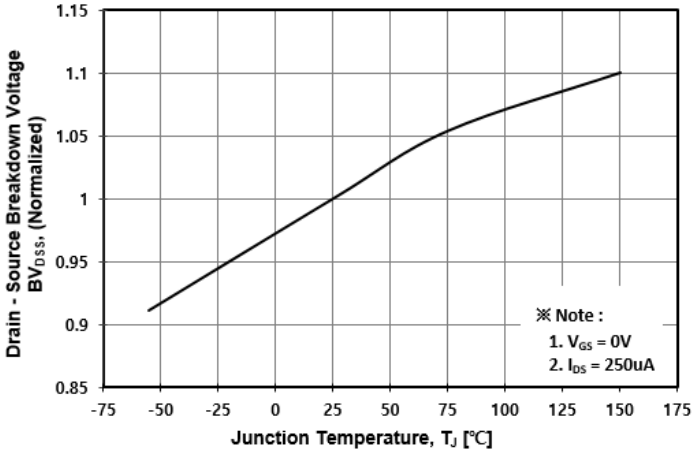


Fig. 8 On-Resistance Variation vs. Temperature

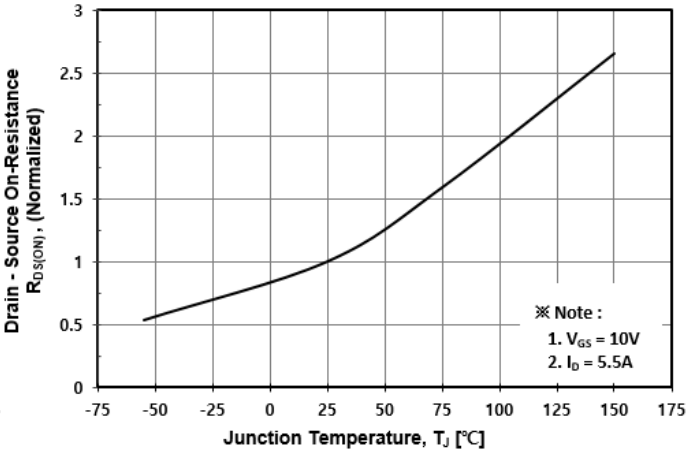


Fig. 9 Maximum Drain Current vs. Case Temperature

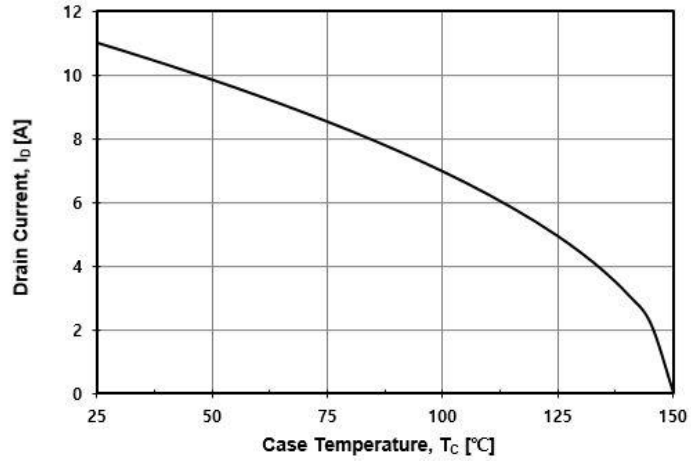


Fig. 10 Maximum Safe Operating Area

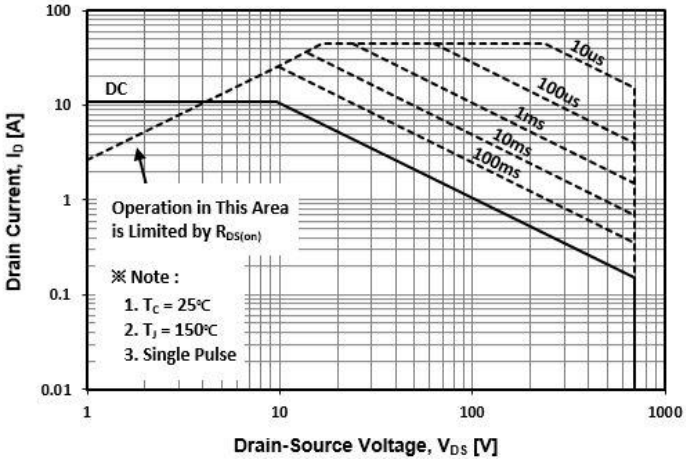


Fig. 11 Transient Thermal Impedance

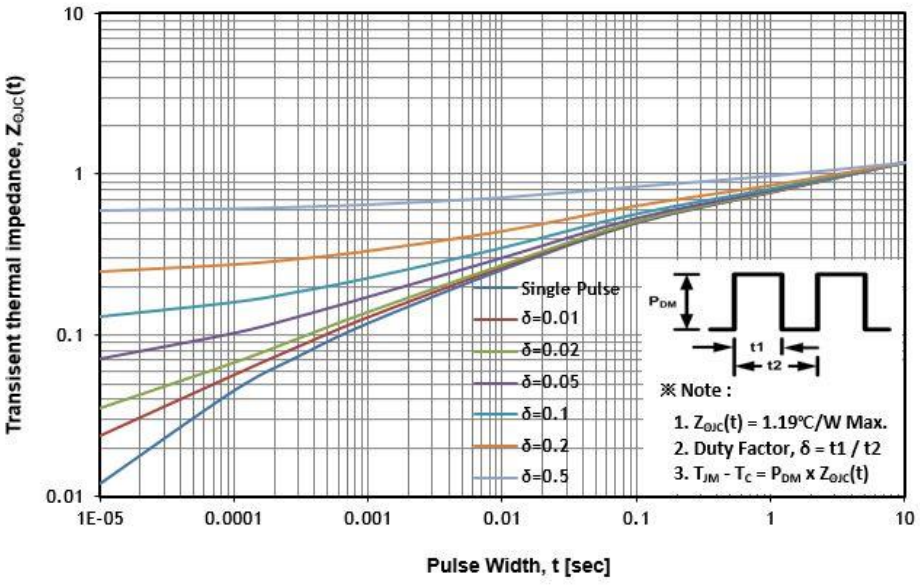
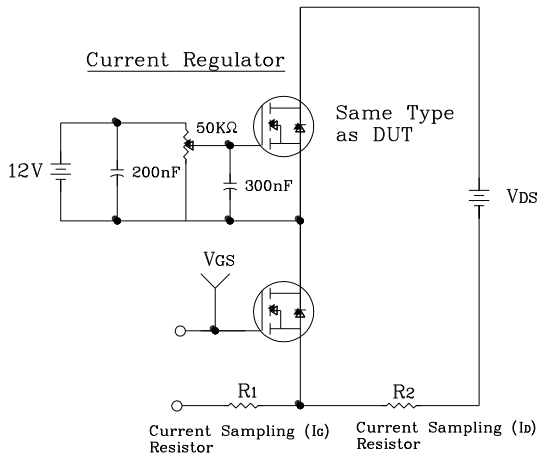


Fig. 12 Gate Charge Test Circuit & Waveform



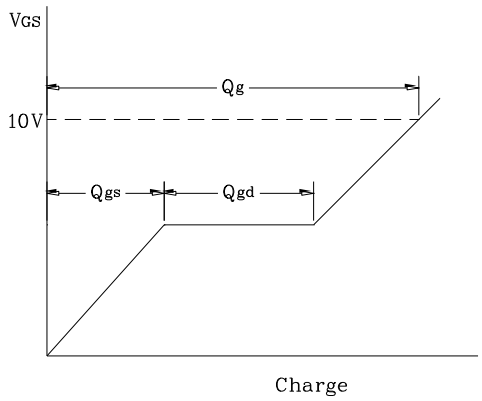
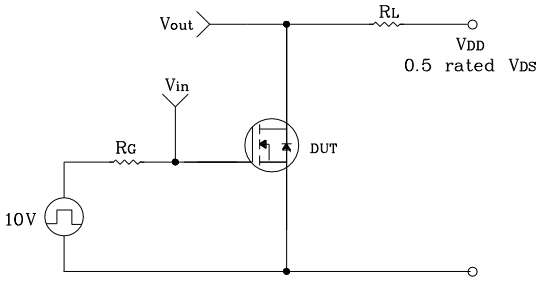


Fig. 13 Resistive Switching Test Circuit & Waveform



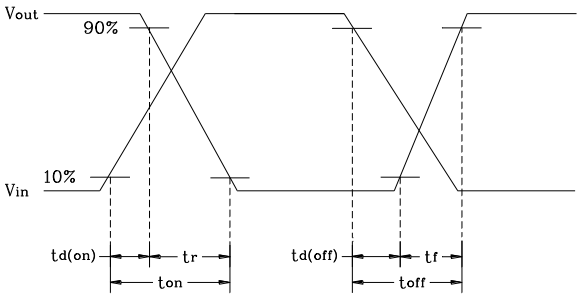
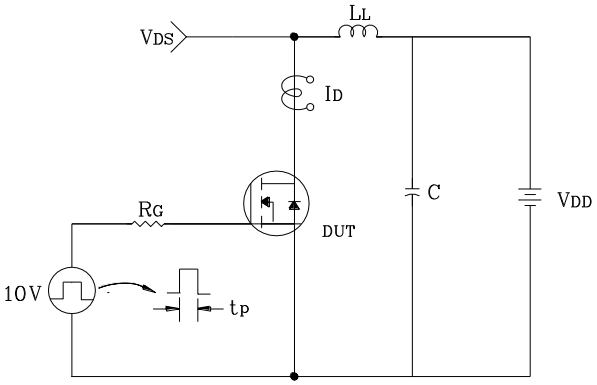


Fig. 14 E_{AS} Test Circuit & Waveform



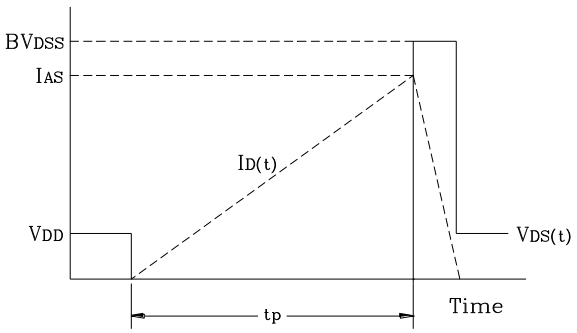
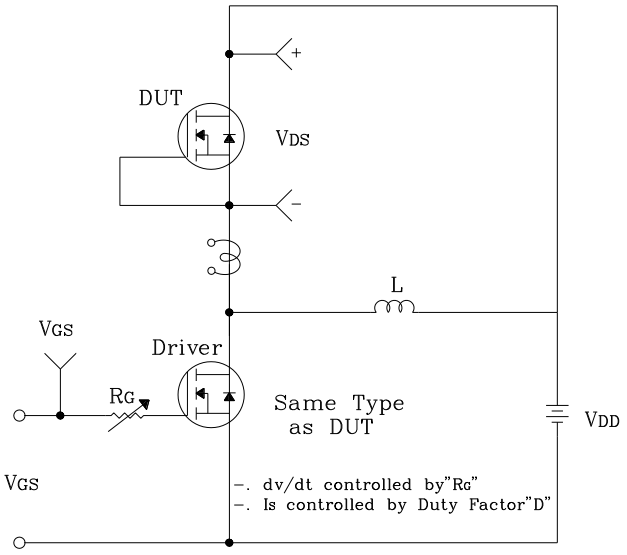
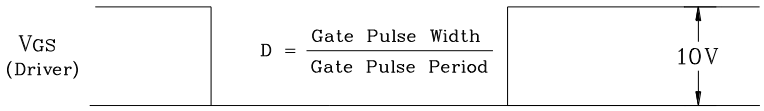
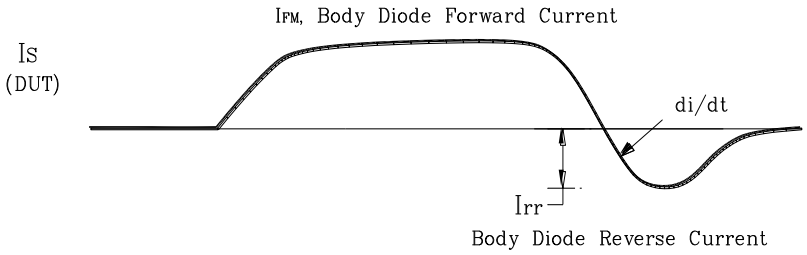
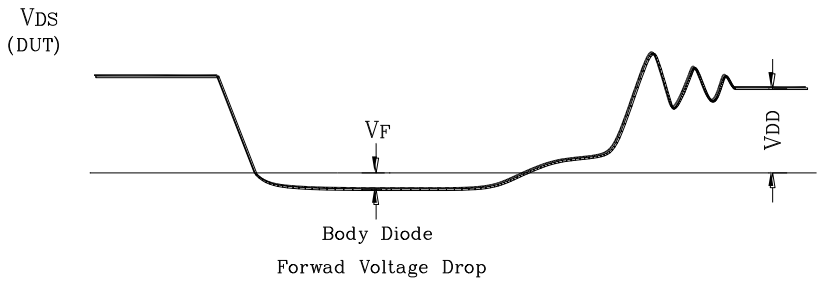


Fig. 15 Diode Reverse Recovery Time Test Circuit & Waveform

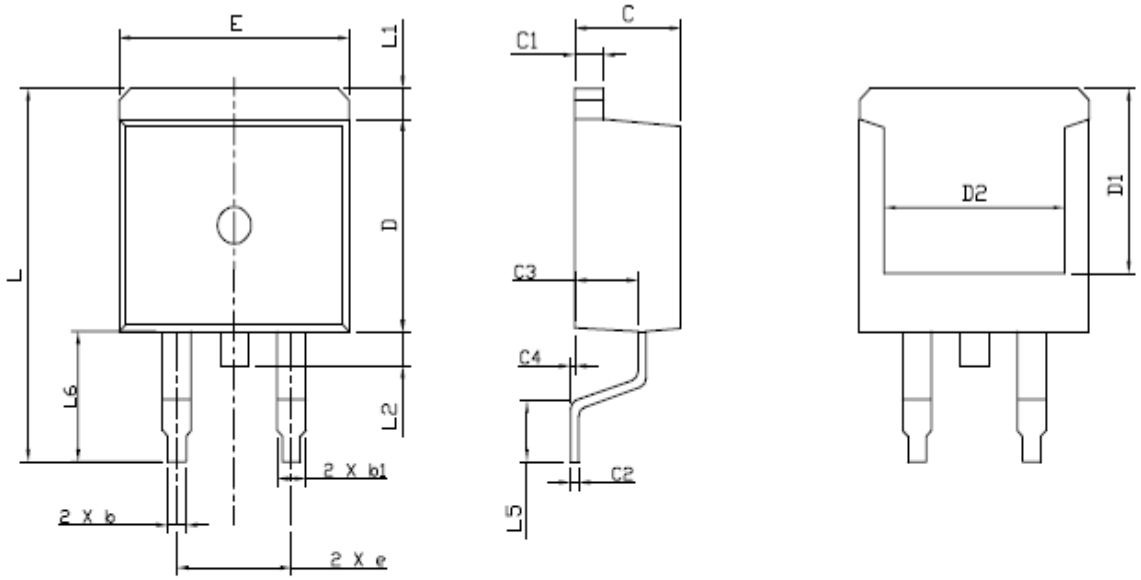


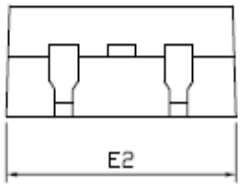






Package Outline Dimensions





SYMBOL	MILLIMETERS		
	MINIMUM	NOMINAL	MAXIMUM
b	0.73	0.80	0.87
b1	1.20	1.27	1.34
C	4.38	4.48	4.58
C1	1.23	1.30	1.37
C2	0.43	0.50	0.57
C3	2.25	2.40	2.55
C4	0.02	0.10	0.18
D	9.10	9.20	9.30
D2	7.90	8.00	8.10
E	9.78	9.88	9.98
e	4.98	5.08	5.18
E2	9.75	9.90	10.05
L	14.95	15.20	15.45
L1	1.15	1.30	1.45
L2	1.50	1.60	1.70
L5	2.25	2.40	2.55
L6	4.60	4.80	5.00

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