KODENSHI AUK

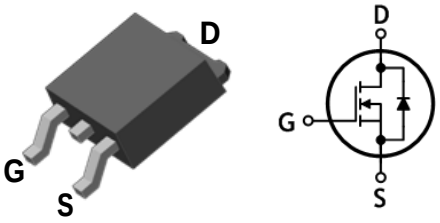
SMN630LD

Logic Level N-Ch Power MOSFET

200V LOGIC N-Channel MOSFET

Features

- Drain-Source breakdown voltage: BV_{DSS}=200V (Min.)
- Low gate charge: Q_g=12nC (Typ.)
- Low drain-source On-Resistance: $R_{DS(on)}$=0.34Ω (Typ.)
- 100% avalanche tested
- RoHS compliant device

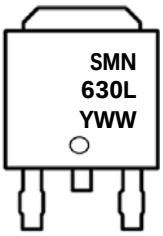


TO-252

Ordering Information

Part Number	Marking	Package
SMN630LD	SMN630L	TO-252

Marking Information



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

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

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		200	V
Gate-source voltage	V_{GSS}		±20	V
Drain current (DC) *	I_D	T_c=25°C	9	A
		T_c=100°C	5.7	A
Drain current (Pulsed) *	I_{DM}		36	A
Avalanche current (Note 2)	I_{AS}		9	A
Single pulsed avalanche energy (Note 2)	E_{AS}		216	mJ
Repetitive avalanche current (Note 1)	I_{AR}		9	A
Repetitive avalanche energy (Note 1)	E_{AR}		4.5	mJ
Power dissipation	P_D		45	W
Junction temperature	T_J		150	°C
Storage temperature range	T_{stg}		-55~150	°C

* Limited only maximum junction temperature

Thermal Characteristics

Characteristic	Symbol	Rating	Unit
Thermal resistance, junction to case	$R_{th(j-c)}$	Max. 2.77	°C/W
Thermal resistance, junction to ambient	$R_{th(j-a)}$	Max. 50	

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	200	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250uA, V_{DS}=V_{GS}	1	-	2.5	V
Drain-source cut-off current	I_{DSS}	V_{DS}=200V, V_{GS}=0V	-	-	1	uA
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
Drain-source on-resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=4.5A	-	0.34	0.4	Ω
		V_{GS}=5V, I_D=4.5A	-	0.37	0.44	Ω
Forward transfer conductance (Note 3)	g_{fs}	V_{DS}=10V, I_D=4.5A	-	5.5	-	S
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz	-	575	804	pF
Output capacitance	C_{oss}		-	84	112	
Reverse transfer capacitance	C_{rss}		-	10.5	15	
Turn-on delay time (Note 3,4)	$t_{d(on)}$	V_{DD}=100V, I_D=9A R_G=25Ω	-	20	-	ns
Rise time (Note 3,4)	t_r		-	79	-	
Turn-off delay time (Note 3,4)	$t_{d(off)}$		-	155	-	
Fall time (Note 3,4)	t_f		-	42	-	
Total gate charge (Note 3,4)	Q_g	V_{DS}=160V, V_{GS}=10V I_D=9A	-	12	17	nC
Gate-source charge (Note 3,4)	Q_{gs}		-	3	-	
Gate-drain charge (Note 3,4)	Q_{gd}		-	2	-	

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	-	-	9	A
Source current (Pulsed)	I_{SM}		-	-	36	A
Forward voltage	V_{SD}	V_{GS}=0V, I_S=9A	-	-	1.5	V
Reverse recovery time (Note 3,4)	t_{rr}	I_S=9A, V_{GS}=0V dI_S/dt=100A/us	-	125	-	ns
Reverse recovery charge (Note 3,4)	Q_{rr}		-	0.5	-	uC

Note:
1. Repeated rating: Pulse width limited by safe operating area
2. L=4mH, I_{AS}=9A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C
3. Pulse test: Pulse width≤300us, Duty cycle≤2%
4. Essentially independent of operating temperature typical characteristics

Typical Characteristics Curves

Fig. 1 I_D - V_{DS}

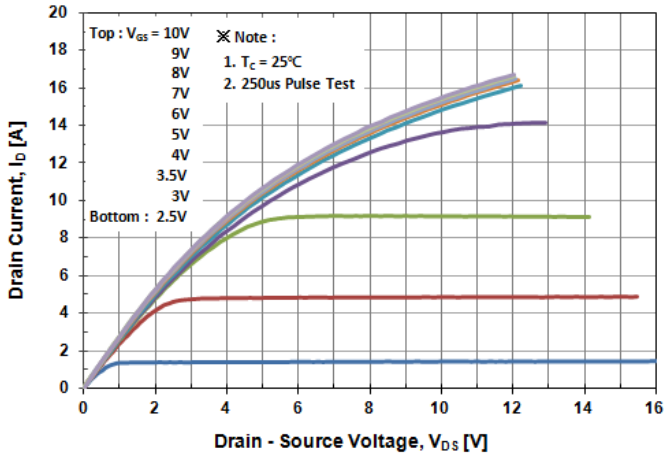


Fig. 2 I_D - V_{GS}

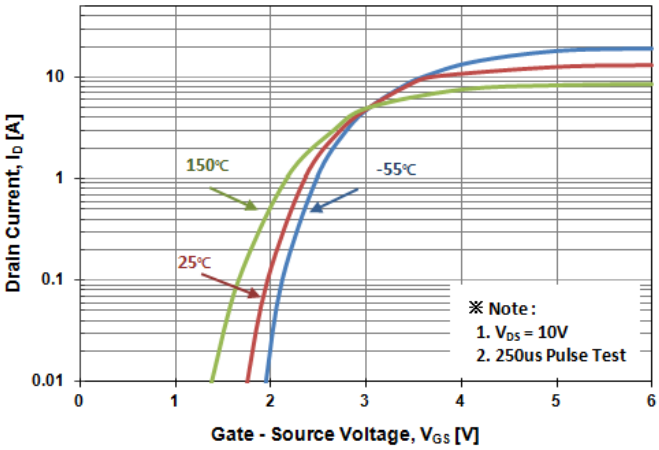


Fig. 3 $R_{DS(ON)}$ - I_D

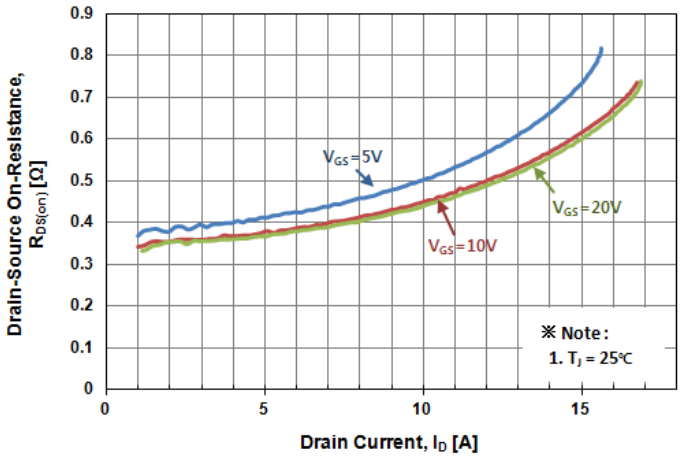


Fig. 4 I_S - V_{SD}

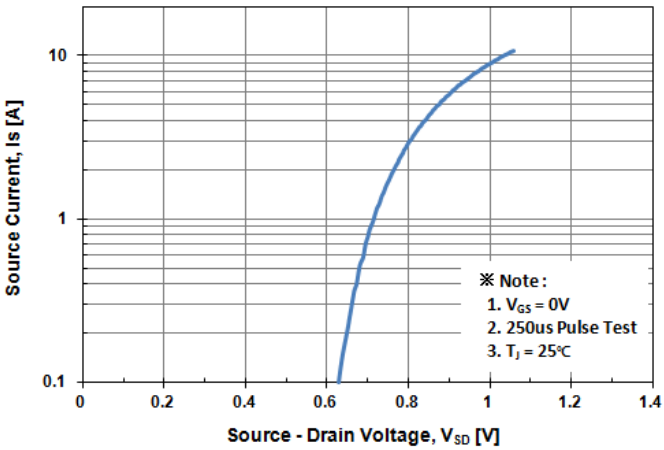


Fig. 5 Capacitance - V_{DS}

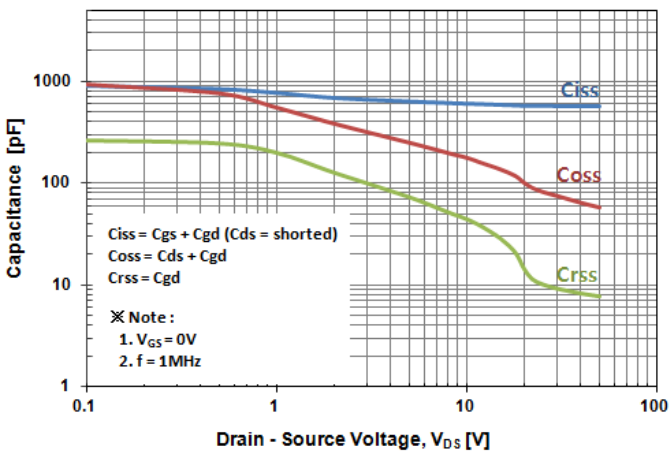


Fig. 6 V_{GS} - Q_G

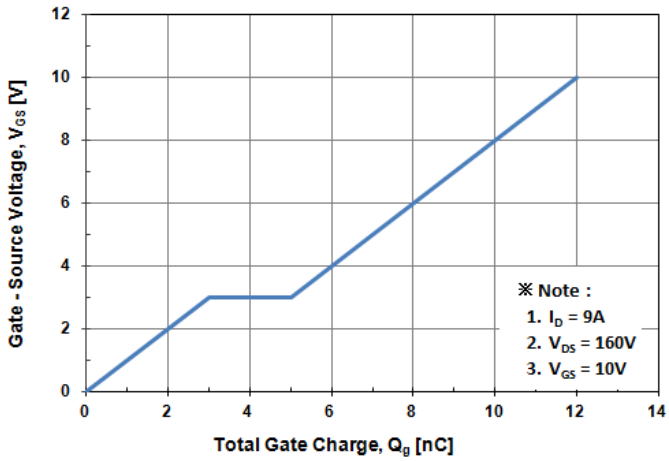


Fig. 7 BV_{DSS} - T_J

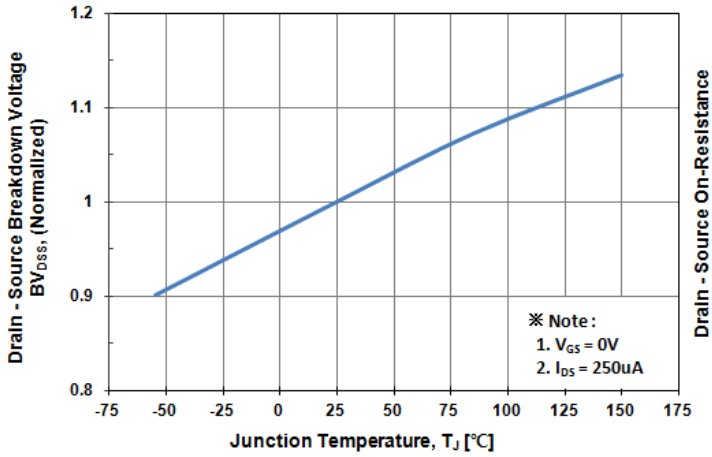


Fig. 8 $R_{DS(on)}$ - T_J

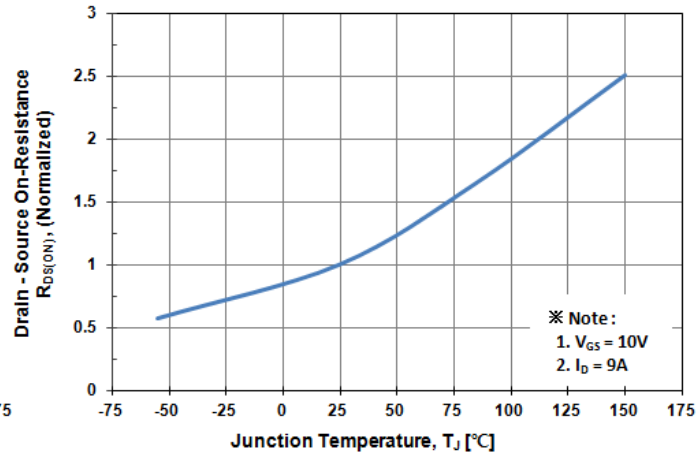


Fig. 9 I_D - T_C

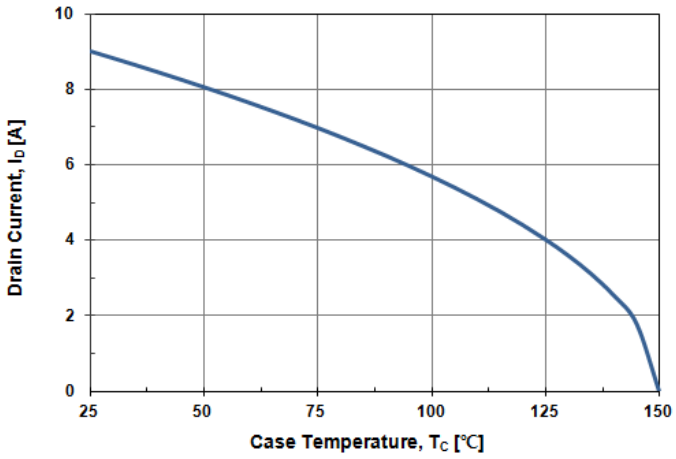


Fig. 10 Safe Operating Area

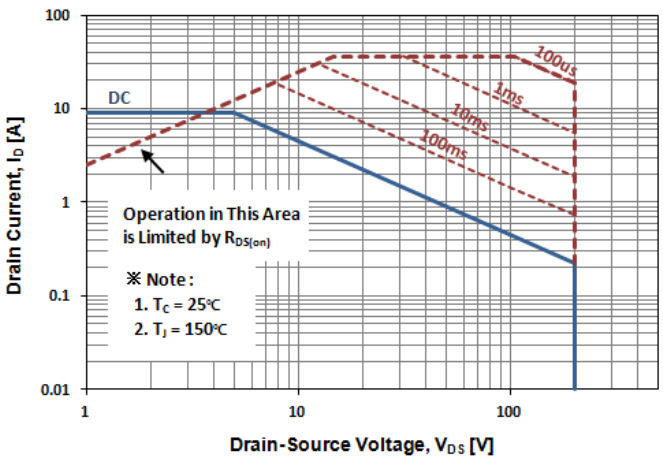


Fig. 11 Transient Thermal Impedance

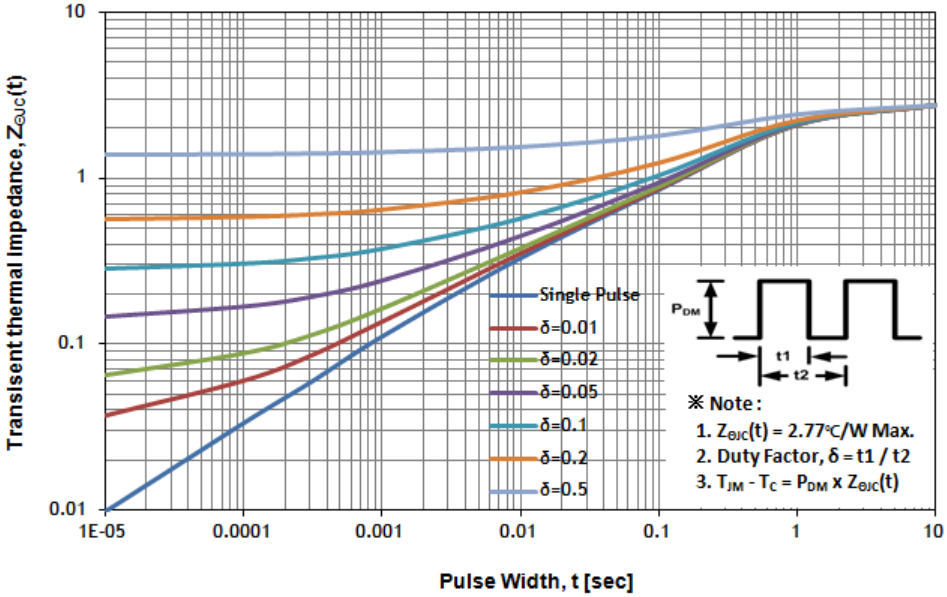
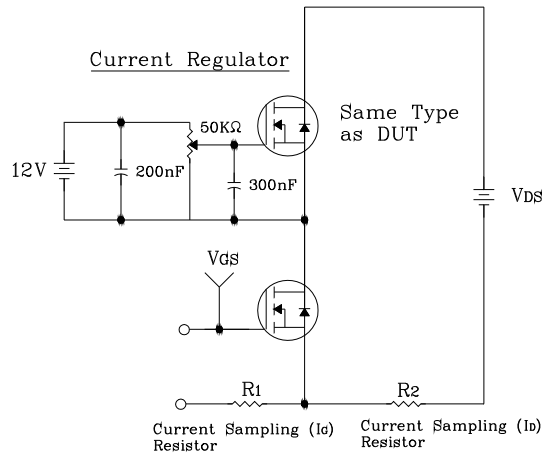


Fig. 12 Gate Charge Test Circuit & Waveform



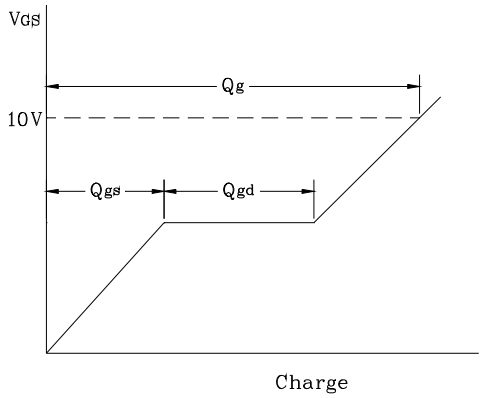
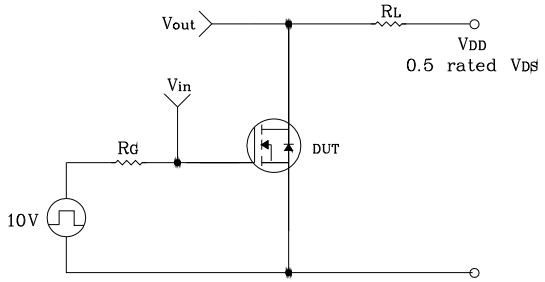


Fig. 13 Resistive Switching Test Circuit & Waveform



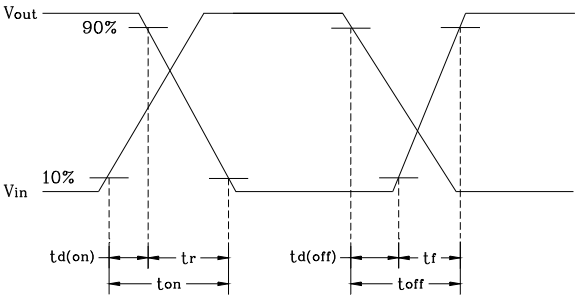
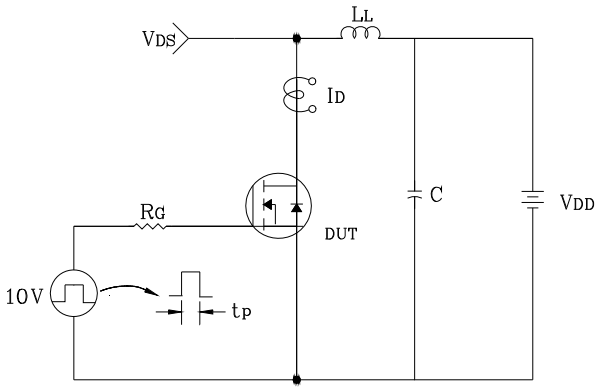


Fig. 14 E_{AS} Test Circuit & Waveform



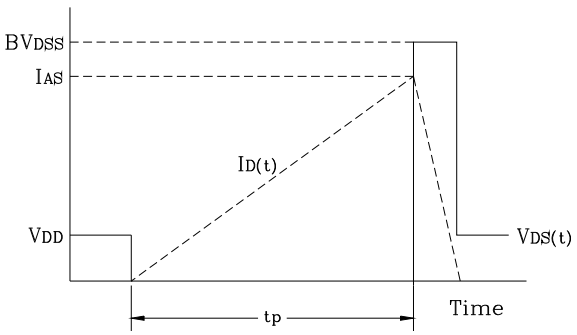
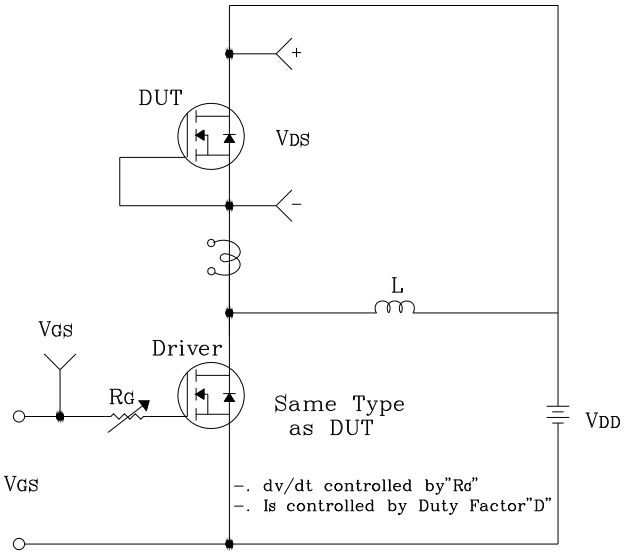
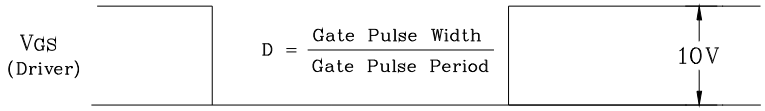
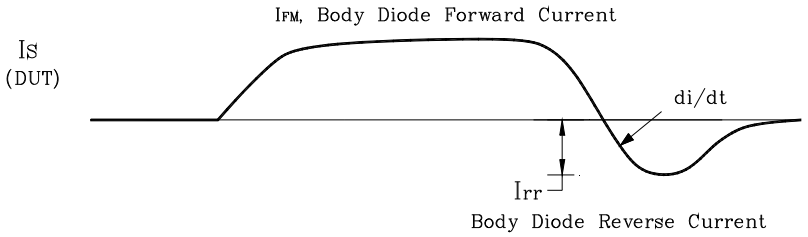
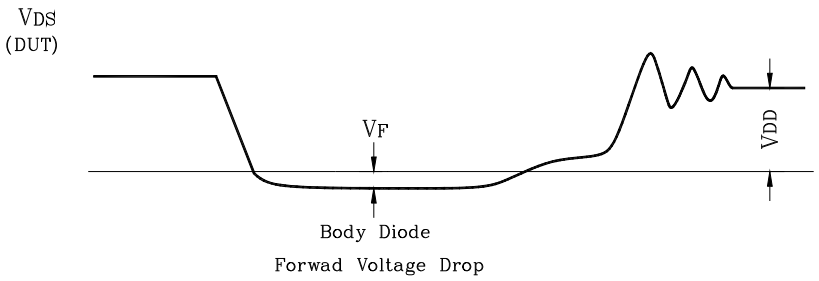


Fig. 15 Diode Reverse Recovery Time Test Circuit & Waveform

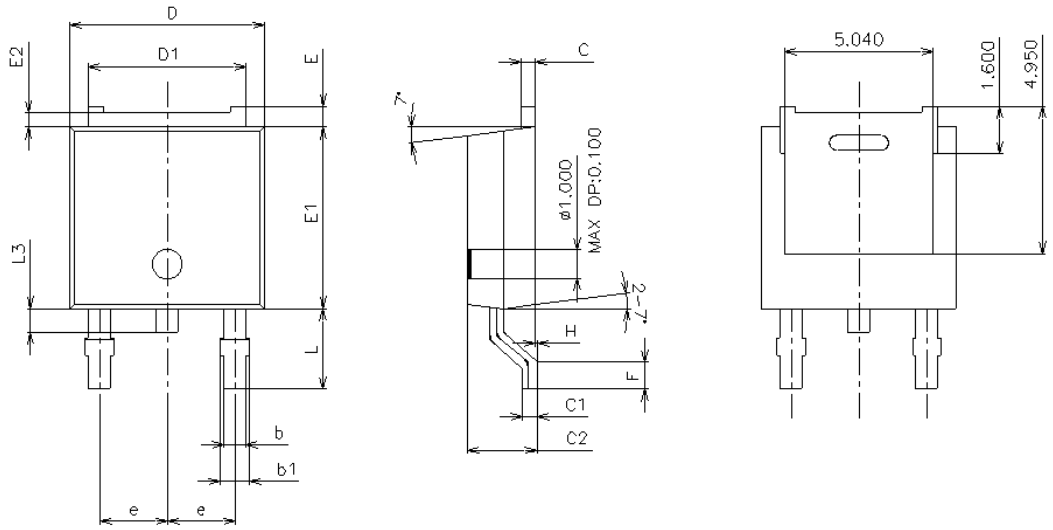


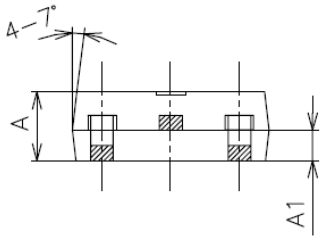






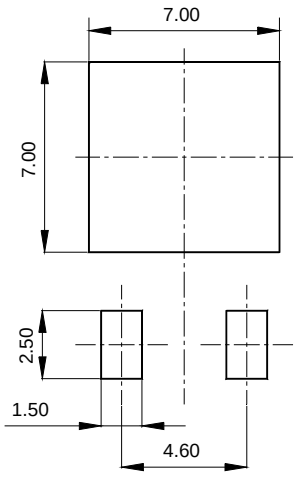
Package Outline Dimensions





SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
D	6.40	6.60	6.80	
D1	5.14	5.34	5.54	
E	0.50	0.70	0.90	
E1	5.90	6.10	6.30	
E2		0.50 TYP		
A	2.20	2.30	2.40	
A1	0.87	1.07	1.27	
C	0.40	0.50	0.60	
C1	0.40	0.50	0.60	
C2	2.10	2.30	2.50	
L	2.50	2.70	2.90	
L3	0.60	0.80	1.00	
b	0.66	0.76	0.86	
b1		0.96 MAX		
e	2.10	2.30	2.50	
F		0.80 MIN		
H	0.00	-	0.10	

Recommended Land Pattern [unit: mm]



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