KODENSHI AUK

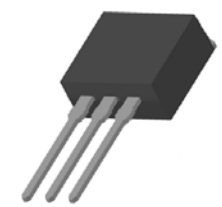
SUN0465I2

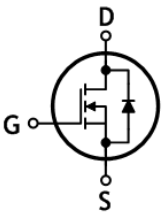
New Generation N-Ch Power MOSFET

HIGH SPEED SWITCHING APPLICATION

Features

- Low drain-source On resistance: $R_{DS(on)}$=2.3Ω (Typ.)
- Low gate charge: Q_g=10nC (Typ.)
- Low reverse transfer capacitance: C_{rss}=4.7pF (Typ.)
- RoHS compliant device
- 100% avalanche tested



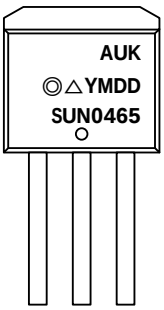


I2-PAK

Ordering Information

Part Number	Marking	Package
SUN0465I2	SUN0465	I2-PAK

Marking Information



Column 1: Manufacturer
Column 2: Production Information
e.g.) ◎△YMDD
-. ◎: Option Code (H: Halogen Free)
-. △: Factory Management Code
-. YMDD: Date Code (Year, Month, Date)
Column 3: Device Code

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

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		650	V
Gate-source voltage	V_{GSS}		±30	V
Drain current (DC) *	I_D	T_c=25°C	4	A
		T_c=100°C	2.53	A
Drain current (Pulsed) *	I_{DM}		16	A
Single avalanche energy (Note 2)	E_{AS}		86.7	mJ
Repetitive avalanche current (Note 1)	I_{AR}		4	A
Repetitive avalanche energy (Note 1)	E_{AR}		11	mJ
Power dissipation	P_D		110	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. 1.13	°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	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250uA, V_{DS}=V_{GS}	3	-	5	V
Drain-source cut-off current	I_{DSS}	V_{DS}=650V, V_{GS}=0V	-	-	1	uA
		V_{DS}=650V, T_c=150°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=2A	-	2.3	3	Ω
Forward transfer conductance (Note 3)	g_{fs}	V_{DS}=10V, I_D=2A	-	4.4	-	S
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	721	-	pF
Output capacitance	C_{oss}		-	54	-	
Reverse transfer capacitance	C_{rss}		-	4.7	-	
Turn-on delay time (Note 3,4)	$t_{d(on)}$	V_{DS}=325V, I_D=4A, R_G=25Ω	-	42	-	ns
Rise time (Note 3,4)	t_r		-	28	-	
Turn-off delay time (Note 3,4)	$t_{d(off)}$		-	69	-	
Fall time (Note 3,4)	t_f		-	22	-	
Total gate charge (Note 3,4)	Q_g	V_{DS}=520V, V_{GS}=10V, I_D=4A	-	10	14	nC
Gate-source charge (Note 3,4)	Q_{gs}		-	5	-	
Gate-drain charge (Note 3,4)	Q_{gd}		-	1.5	-	

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	-	-	4	A
Source current (Pulsed)	I_{SM}		-	-	16	A
Forward voltage	V_{SD}	V_{GS}=0V, I_{SD}=4A	-	-	1.4	V
Reverse recovery time (Note 3,4)	t_{rr}	I_{SD}=4A, V_{GS}=0V dI_F/dt=100A/us	-	498	-	ns
Reverse recovery charge (Note 3,4)	Q_{rr}		-	0.98	-	uC

Note:
1. Repeated rating: Pulse width limited by safe operating area
2. L=10mH, I_{AS}=4A, 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 Electrical Characteristics Curves

Fig. 1 Typical Output Characteristics

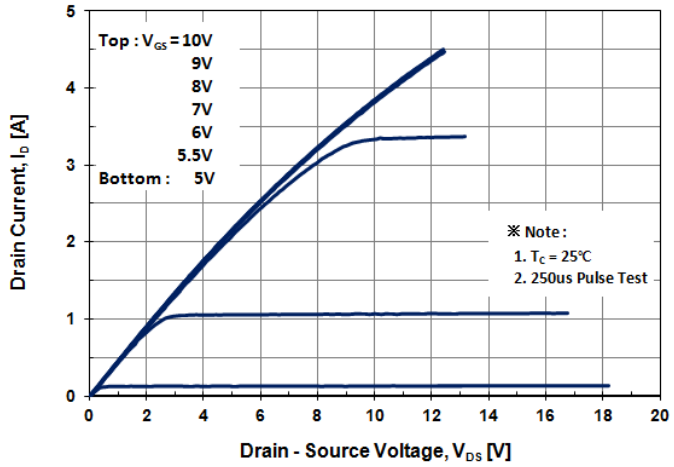


Fig. 2 Typical Output Characteristics

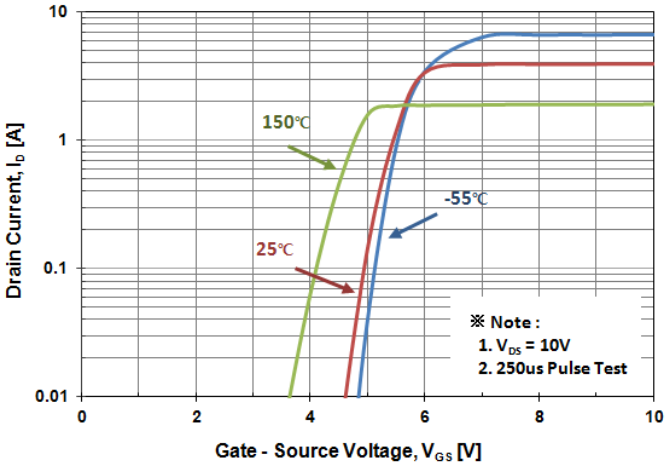


Fig.3 On-Resistance Variation with Drain Current and Gate Voltage

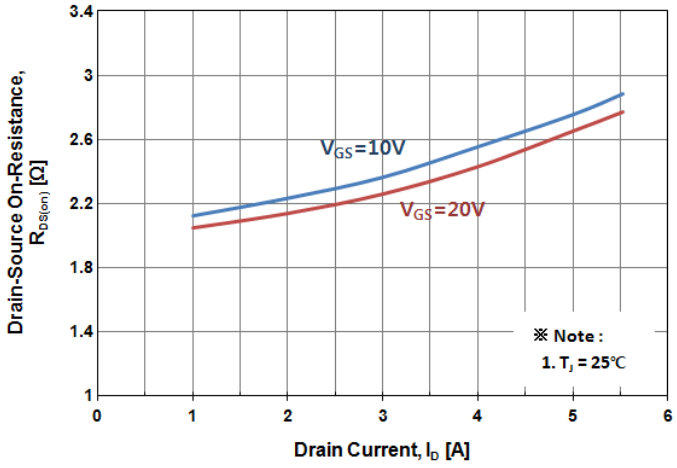


Fig. 4 Body Diode Forward Voltage Variation with Source Current

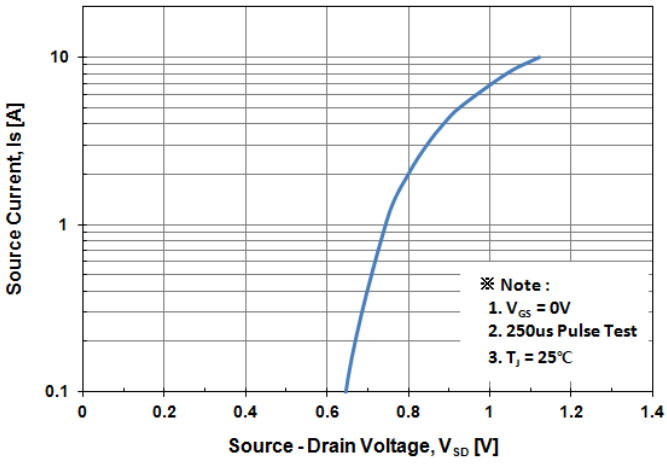


Fig. 5 Typical Capacitance Characteristics

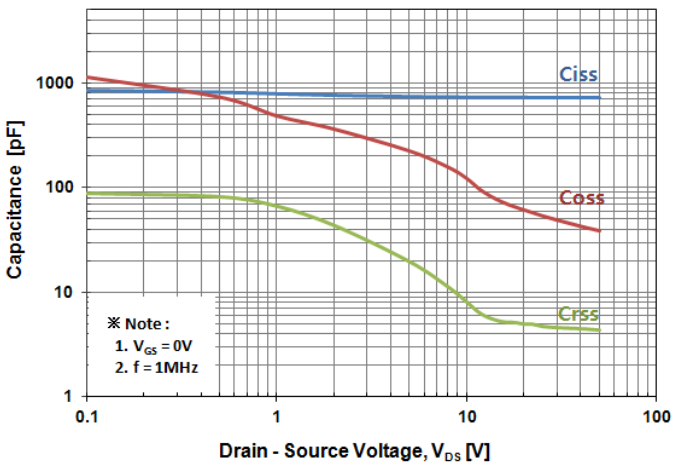


Fig. 6 Typical Total Gate Charge Characteristics

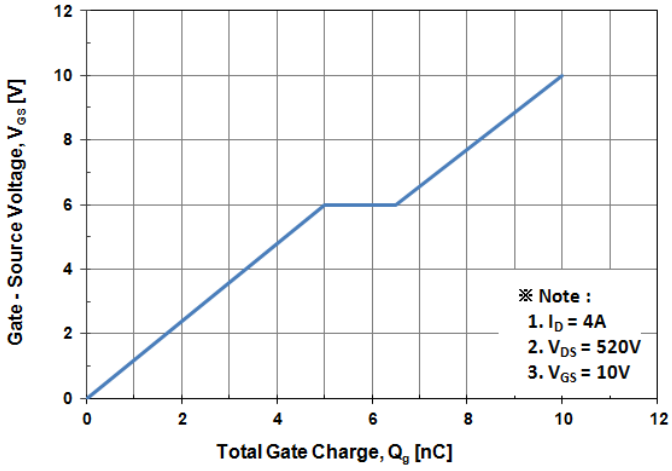


Fig. 7 Breakdown Voltage Variation vs. Temperature

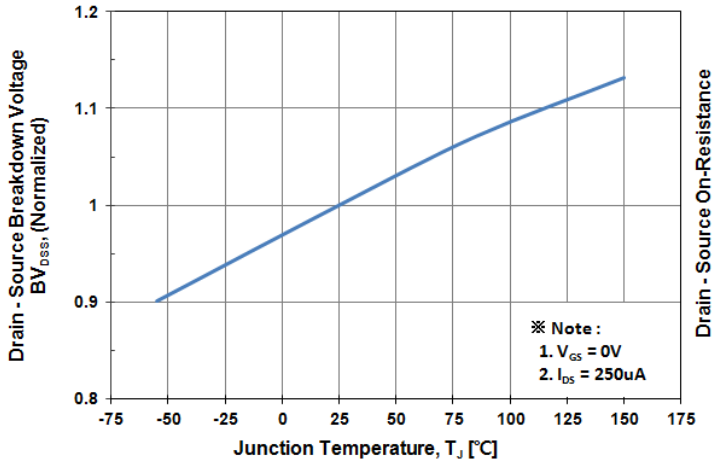


Fig. 8 On-Resistance Variation vs. Temperature

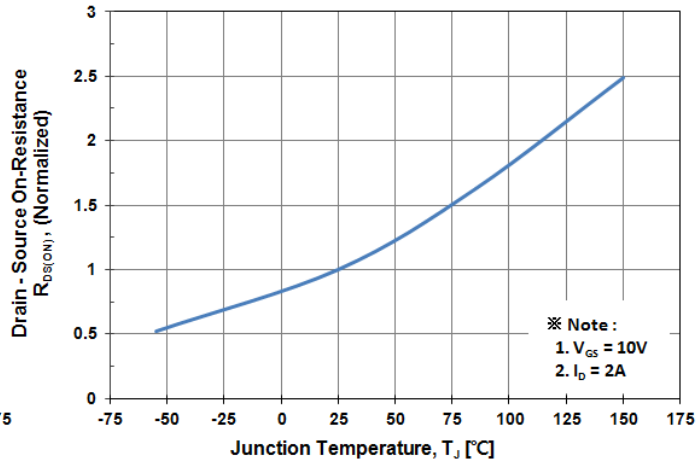


Fig. 9 Maximum Drain Current vs. Case Temperature

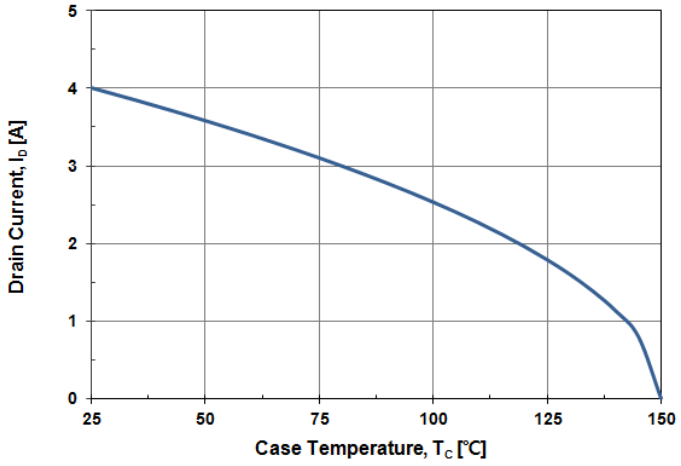


Fig. 10 Maximum Safe Operating Area

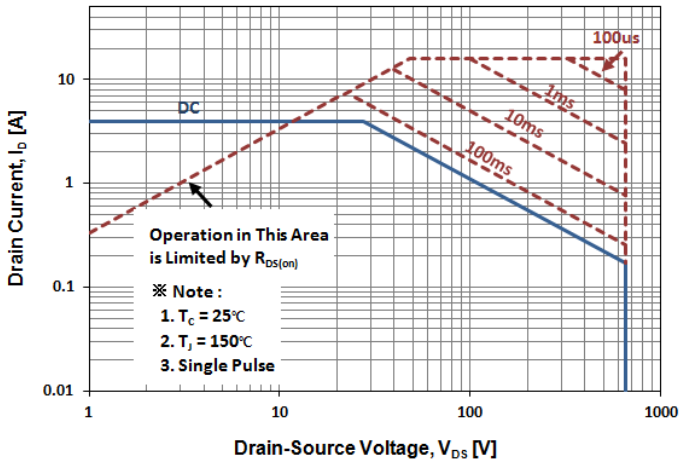


Fig. 11 Transient Thermal Impedance

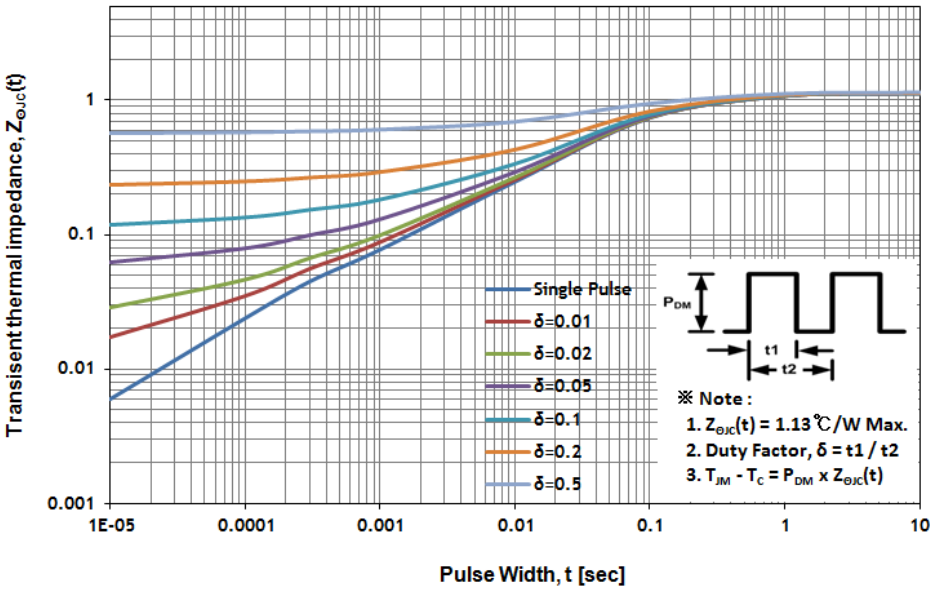
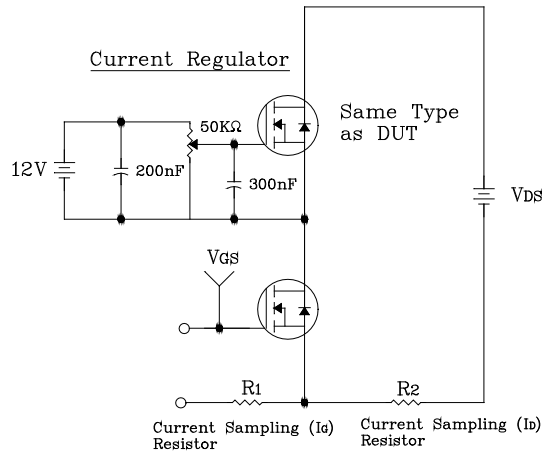


Fig. 12 Gate Charge Test Circuit & Waveform



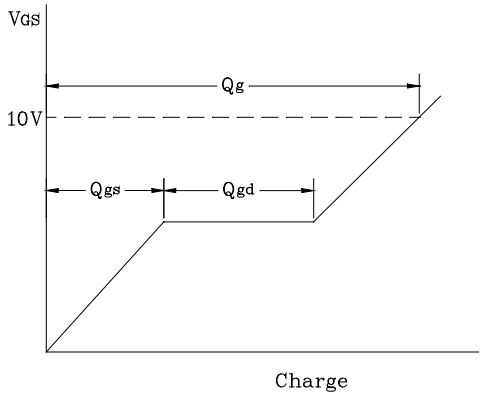
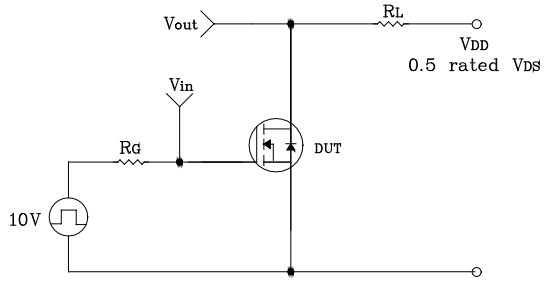


Fig. 13 Resistive Switching Test Circuit & Waveform



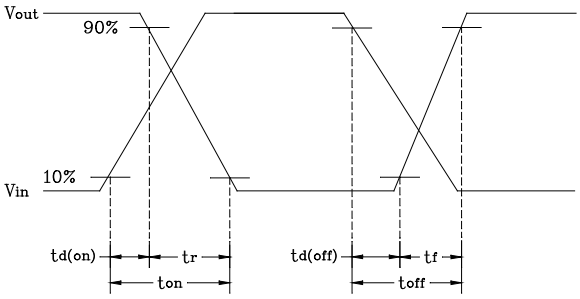
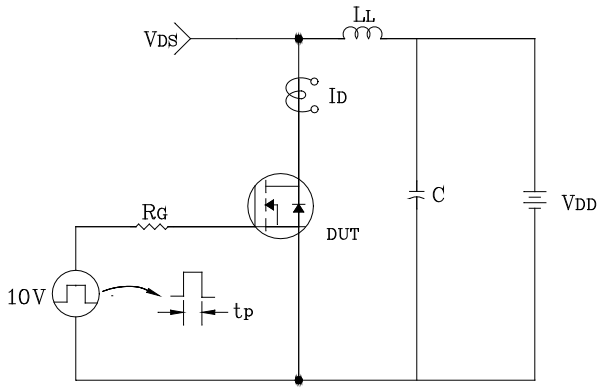


Fig. 14 E_{AS} Test Circuit & Waveform



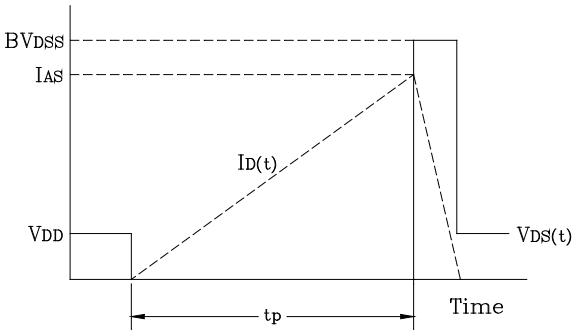
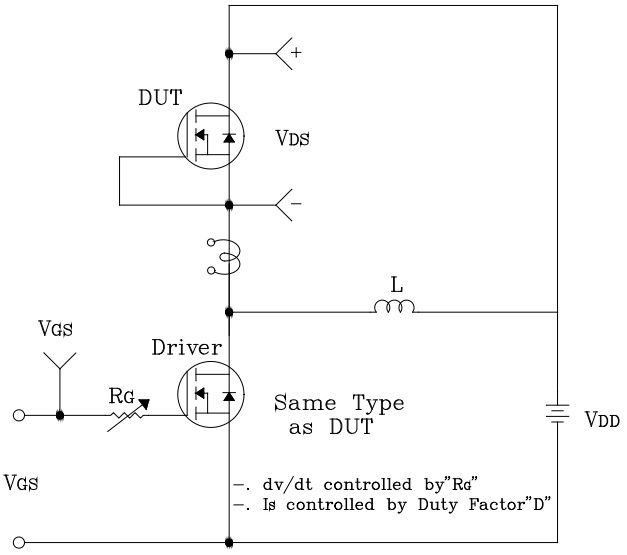
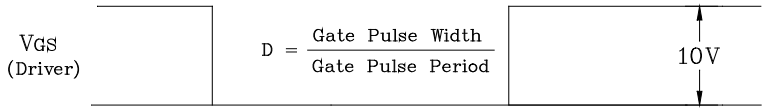
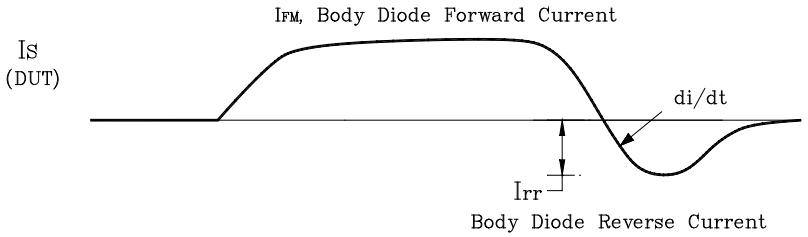
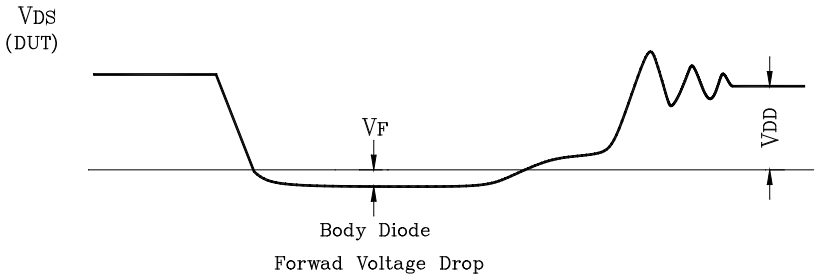


Fig. 15 Diode Reverse Recovery Time Test Circuit & Waveform

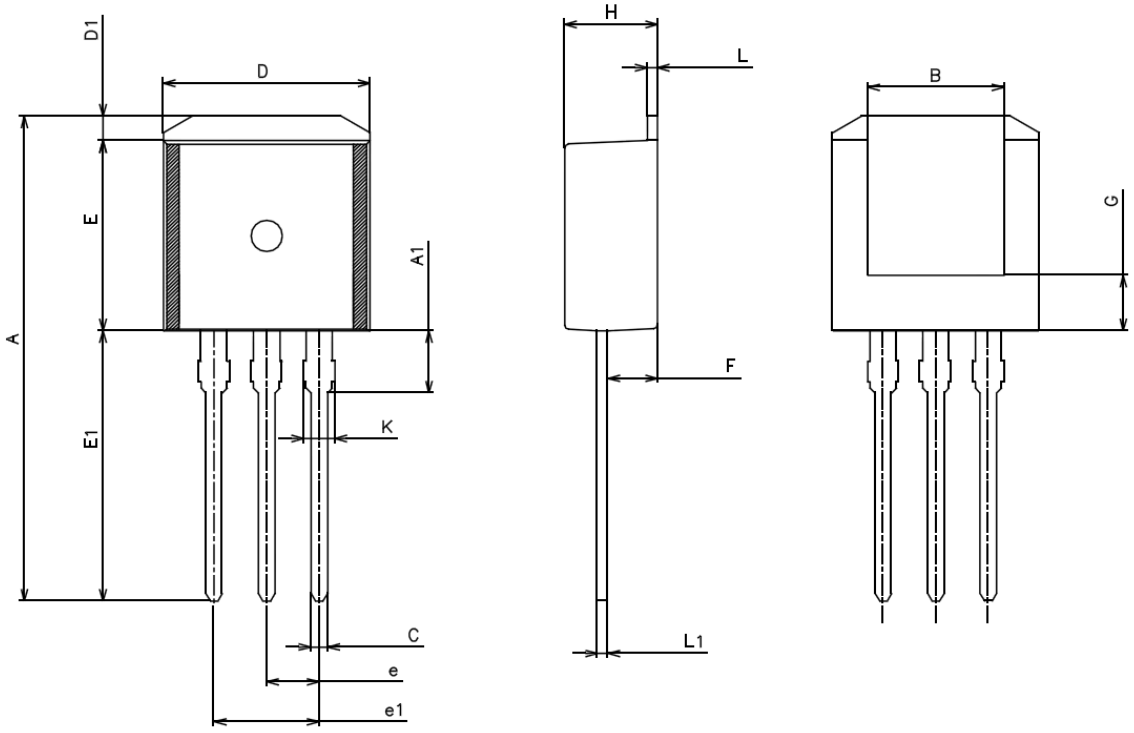








Package Outline Dimensions



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	22.98	23.48	23.98	
A1	2.80	3.00	3.20	
B	6.40	6.60	6.80	
C	0.60	0.80	1.00	
D	9.80	10.00	10.20	
D1	1.00	1.20	1.40	
E	9.05	9.20	9.35	
E1	12.68	13.08	13.48	
e	2.34	2.54	2.74	
e1	4.88	5.08	5.28	
F	2.20	2.40	2.60	
G	2.50	2.70	2.90	
H	4.35	4.50	4.65	
K	1.42	1.52	1.62	
L	0.40	0.50	0.60	
L1	0.40	0.50	0.60	

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