KODENSHI AUK

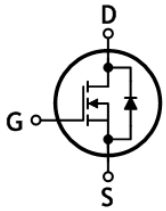
SJMN190R65F

Super Junction MOSFET

N-Channel Super Junction MOSFET

Features

- Drain-Source voltage: V_{DS}=700V (@T_J=150°C)
- Low drain-source On resistance: $R_{DS(on)}$=0.19Ω (Max.)
- Ultra low gate charge: Qg=20nC(Typ.)
- RoHS compliant device
- 100% avalanche tested

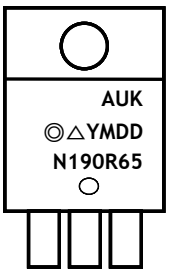


TO-220F-3L

Ordering Information

Part Number	Marking	Package
SJMN190R65F	N190R65	TO-220F-3L

Marking Information



Column 1: Manufacturer
Column 2: Production Information
e.g.) ◎△YMDD
-. ◎△: Factory Management Code
-. YMDD: Date Code (Year, Month, Daily)
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) (Note 1)	I_D	T_c=25°C	20	A
		T_c=100°C	12.6	A
Drain current (Pulsed) (Note 1)	I_{DM}		80	A
Single pulsed avalanche energy (Note 2)	E_{AS}		265	mJ
Repetitive avalanche current (Note 1)	I_{AR}		7	A
Repetitive avalanche energy (Note 1)	E_{AR}		3.2	mJ
Power dissipation	P_D		32	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. 3.9	°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	650	-	-	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}=650V, V_{GS}=0V	-	-	1	uA
		V_{DS}=650V, 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=10A	-	-	0.19	Ω
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz	-	1533	-	pF
Output capacitance	C_{oss}		-	846	-	
Reverse transfer capacitance	C_{rss}		-	23	-	
Turn-on delay time (Note 3)	$t_{d(on)}$	V_{DS}=350V, I_D=20A, R_G=25Ω	-	25	-	ns
Rise time (Note 3)	t_r		-	21	-	
Turn-off delay time (Note 3)	$t_{d(off)}$		-	60	-	
Fall time (Note 3)	t_f		-	4	-	
Total gate charge (Note 4)	Q_g	V_{DS}=400V, V_{GS}=10V, I_D=10A	-	36	-	nC
Gate-source charge (Note 4)	Q_{gs}		-	10	-	
Gate-drain charge (Note 4)	Q_{gd}		-	10	-	

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	-	-	20	A
Source current (Pulsed)	I_{SM}		-	-	80	A
Forward voltage	V_{SD}	V_{GS}=0V, I_S=20A	-	-	1.2	V
Reverse recovery time (Note 3,4)	t_{rr}	I_S=20A, V_{GS}=0V, dI_S/dt=100A/us	-	383	-	ns
Reverse recovery charge (Note 3,4)	Q_{rr}		-	4.6	-	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. Guaranteed by design, not subject to production testing
4. Pulse test: Pulse width≤300us, Duty cycle≤2%

Typical Electrical Characteristics Curves

Fig. 1 Typical Output Characteristics

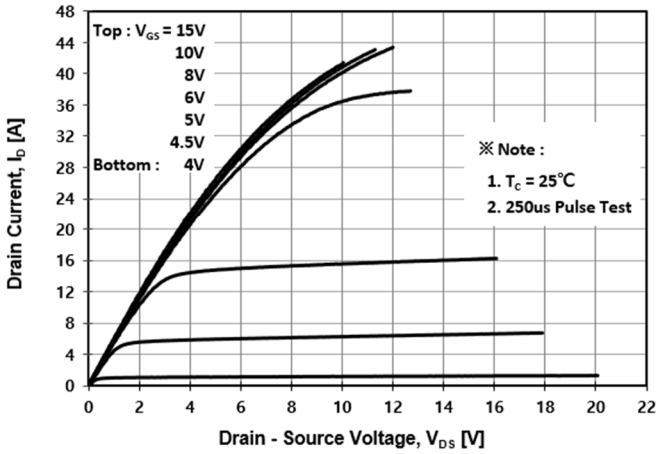


Fig. 2 Typical Transfer Characteristics

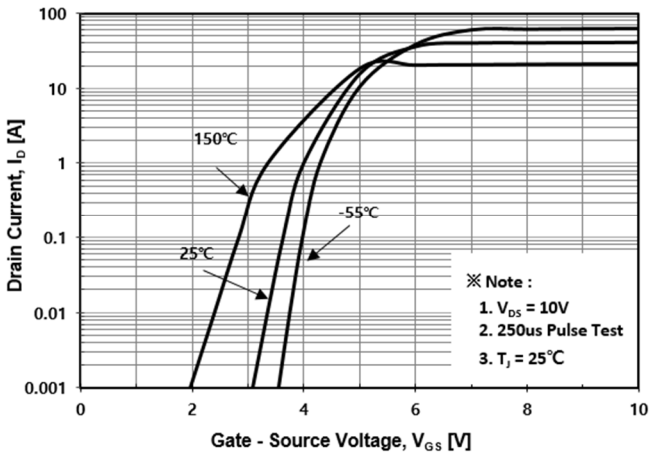


Fig.3 On-Resistance Variation with Drain Current and Gate Voltage

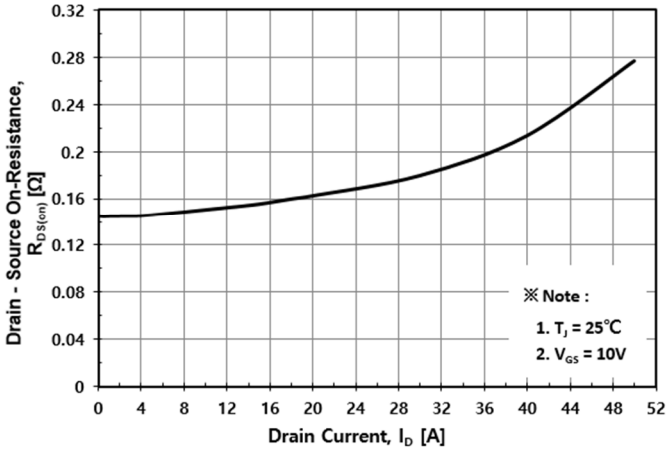


Fig. 4 Body Diode Forward Voltage Variation with Source Current

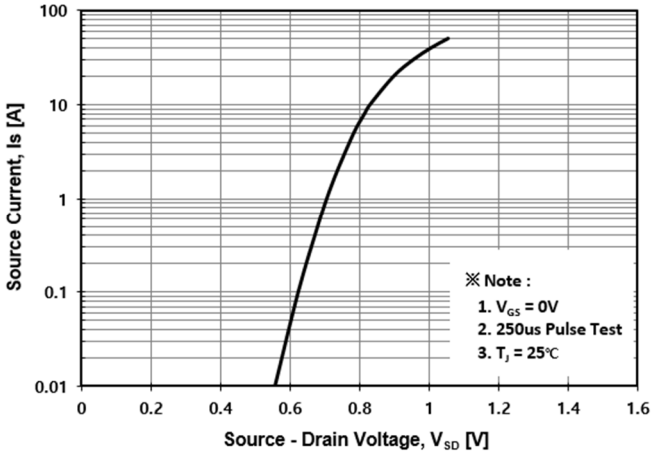


Fig. 5 Typical Capacitance Characteristics

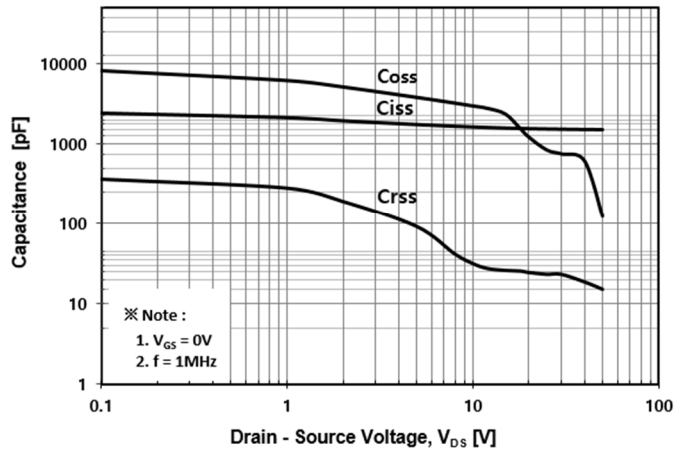


Fig. 6 Typical Total Gate Charge Characteristics

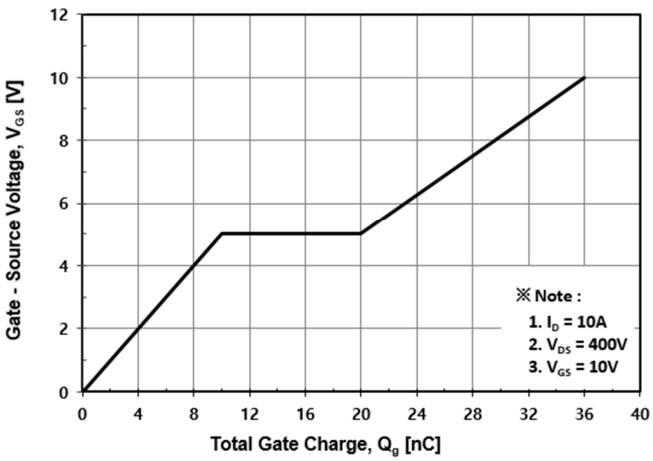


Fig. 7 Breakdown Voltage Variation vs. Temperature

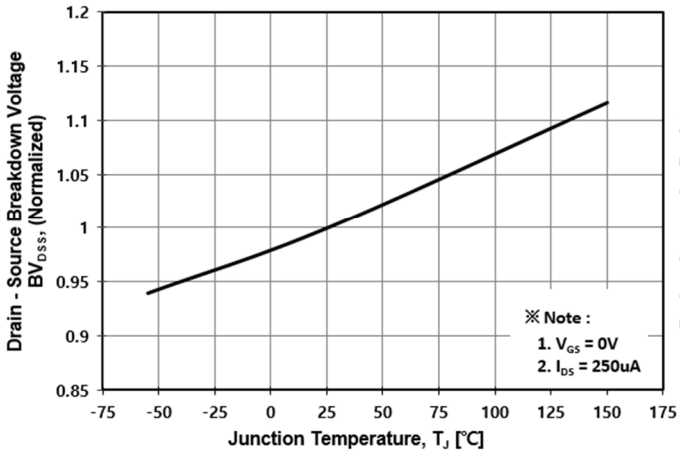


Fig. 8 On-Resistance Variation vs. Temperature

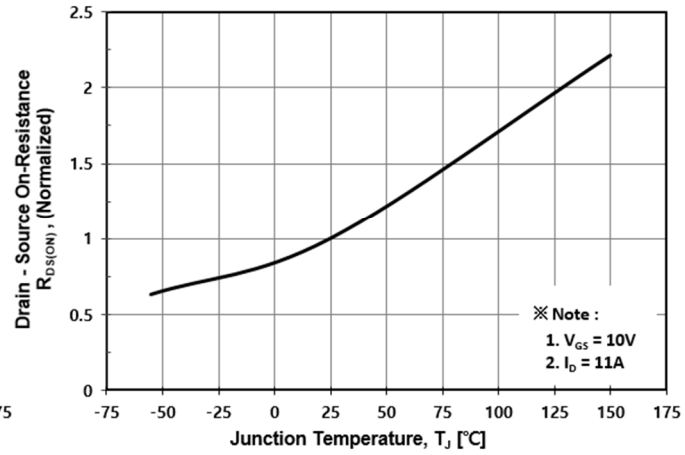


Fig. 9 Maximum Drain Current vs. Case Temperature

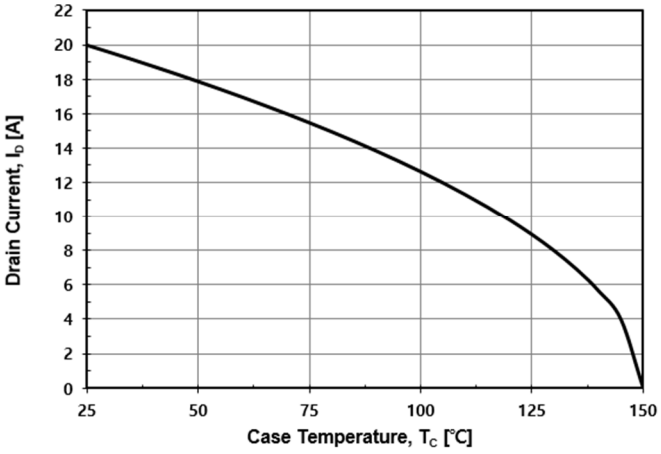


Fig. 10 Maximum Safe Operating Area

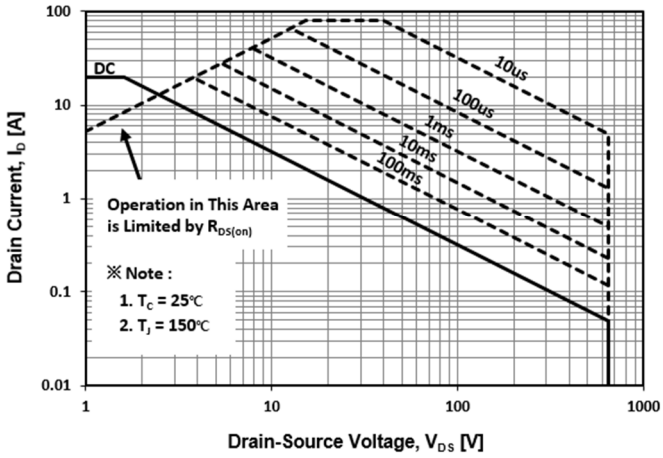


Fig. 11 Transient Thermal Impedance

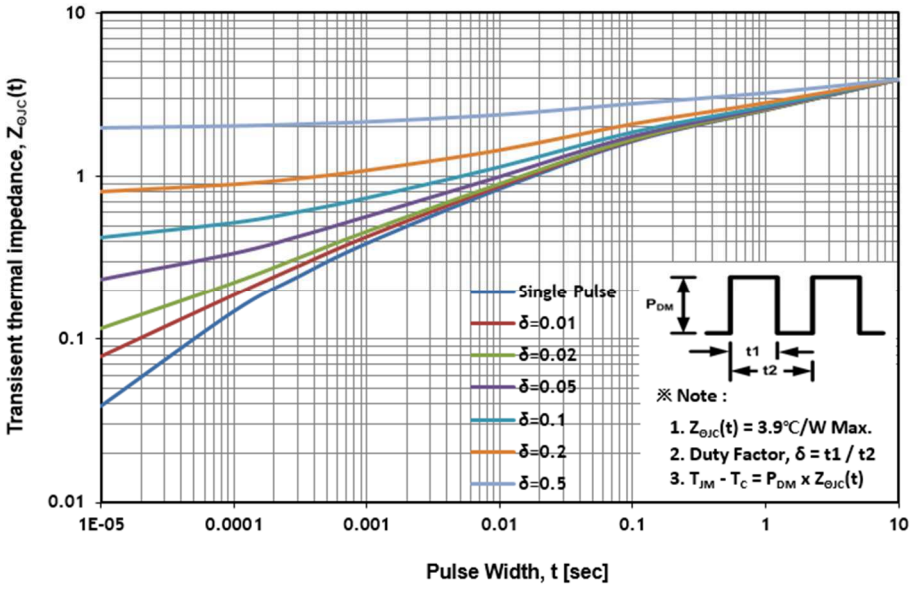


Fig. 12 Gate Charge Test Circuit & Waveform

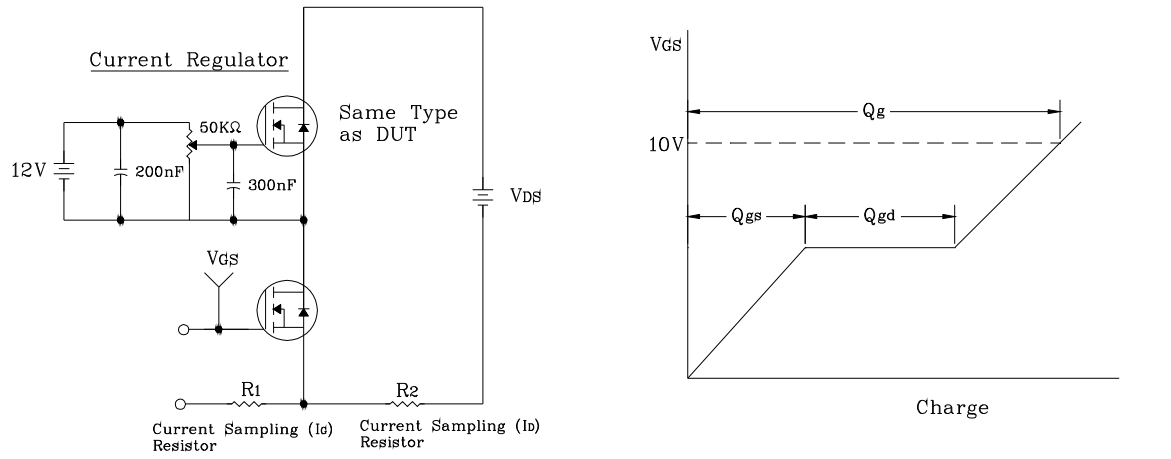


Fig. 13 Resistive Switching Test Circuit & Waveform

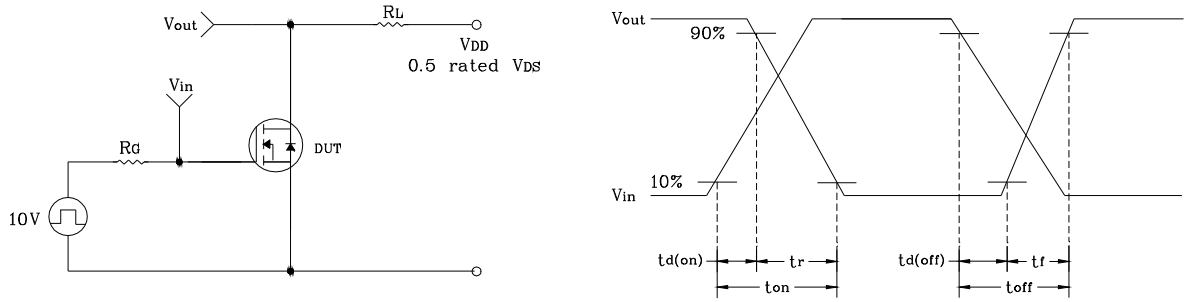


Fig. 14 E_{AS} Test Circuit & Waveform

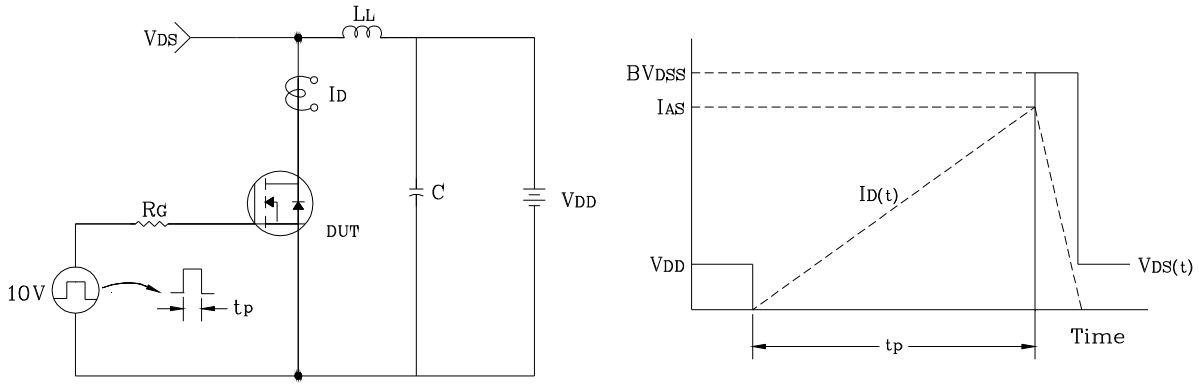
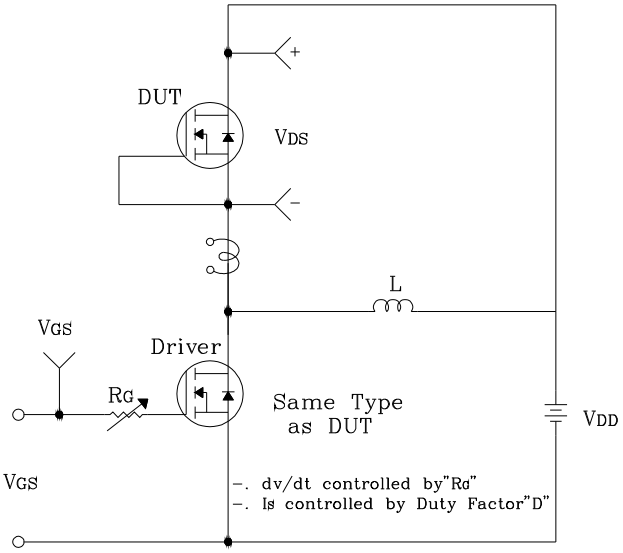
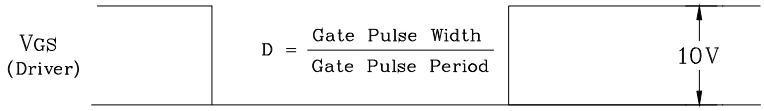
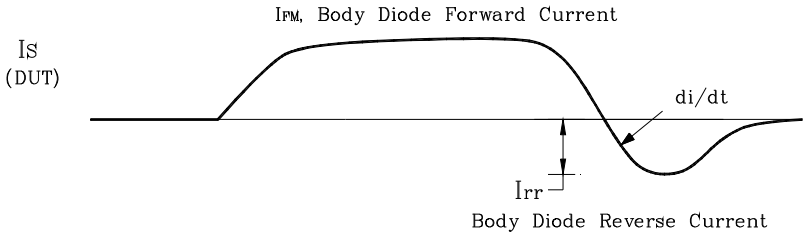
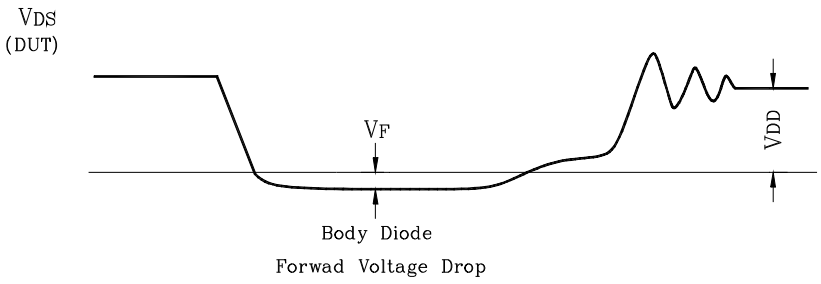


Fig. 15 Diode Reverse Recovery Time Test Circuit & Waveform

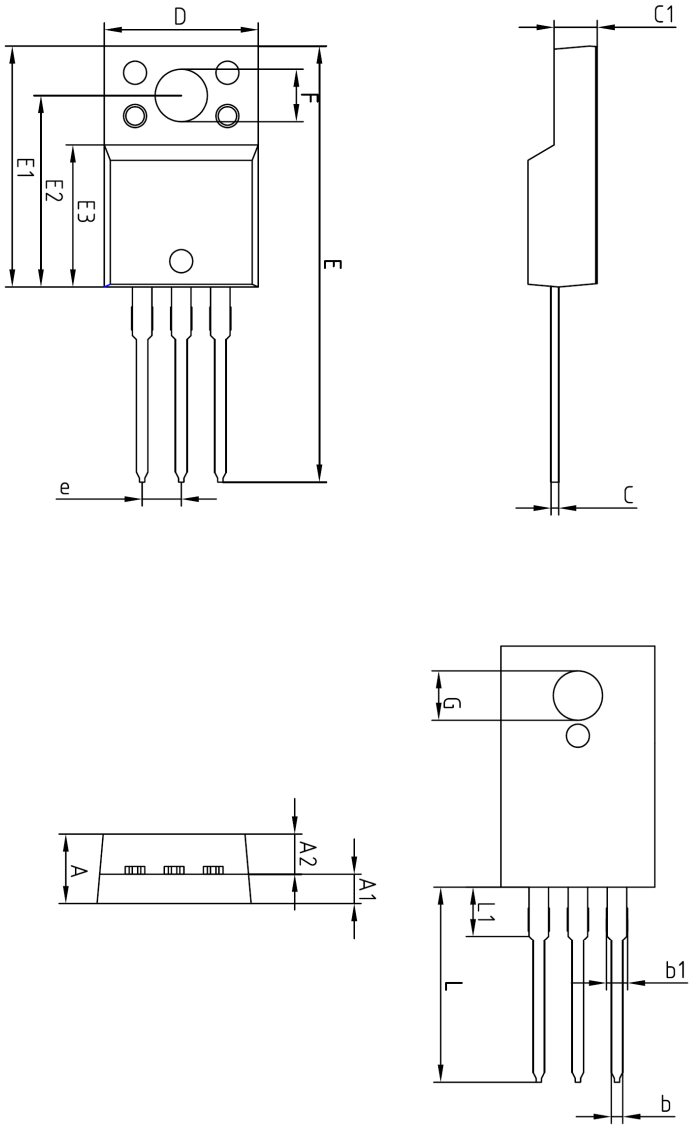








Package Outline Dimensions



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	–	–	4.60	
A1	2.45	2.50	2.55	
A2	1.95	2.00	2.05	
b	0.65	0.75	0.85	
b1	1.07	1.27	1.47	
C	0.40	0.50	0.60	
C1	2.70	2.80	2.90	
D	9.90	10.00	10.10	
E	28.00	–	28.60	
E1	15.50	15.60	15.70	
E2	12.30	12.40	12.50	
E3	9.15	9.20	9.25	
F	3.30	3.40	3.50	
G	3.10	3.20	3.30	
e	2.54 BSC			
L	12.40	–	13.00	
L1	3.46 BSC			

The AUK Corp. products are intended for the use as components in general electronic equipment (Office and communication equipment, measuring equipment, home appliance, etc.).

Please make sure that you consult with us before you use these AUK Corp. products in equipments which require high quality and / or reliability, and in equipments which could have major impact to the welfare of human life(atomic energy control, airplane, spaceship, transportation, combustion control, all types of safety device, etc.). AUK Corp. cannot accept liability to any damage which may occur in case these AUK Corp. products were used in the mentioned equipments without prior consultation with AUK Corp..

Specifications mentioned in this publication are subject to change without notice.