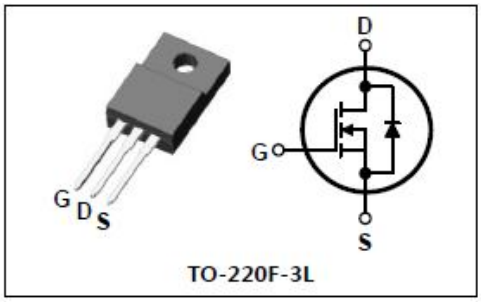
KODENSHI AUK

KMK1350F

Advanced N-Ch Power MOSFET

SWITCHING REGULATOR APPLICATIONS

PIN Connection



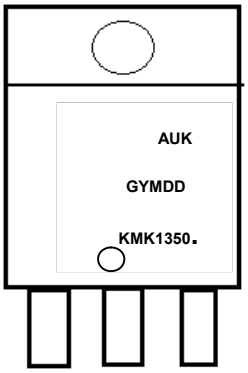
Features

- High Voltage : BV_{DSS}=500V(Min.)
- Low C_{rss} : C_{rss}=23 pF(Typ.)
- Low gate charge : Qg=36nC(Typ.)
- Low $R_{DS(on)}$: $R_{DS(on)}$=0.48Ω(Max.)

Ordering Information

Type NO	Marking	Package code
KMK1350F	KMK1350.	TO-220F-3L

Marking Diagram



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Column 1 : Manufacturer

Column 2 : Production Information

e.g.) GYMDD

-. G : Factory management code

-. YMDD : Date Code (year, month, date)

Column 3 : Device Code

Absolute maximum ratings (T_C=25℃ unless otherwise noted)

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		500	V
Gate-source voltage	V_{GSS}		±30	V
Drain current (DC) *	I_D	T_C=25℃	13	A
		T_C=100℃	8.2	A
Drain current (Pulsed)*	I_{DM}		52	A
Power dissipation	P_D		40	W
Avalanche current (Single) ②	I_{AS}		13	A
Single pulsed avalanche energy ②	E_{AS}		751	mJ
Avalanche current (Repetitive) ①	I_{AR}		13	A
Repetitive avalanche energy ①	E_{AR}		19.5	mJ
Junction temperature	T_J		150	℃
Storage temperature range	T_{stg}		-55~150	

* Limited by maximum junction temperature

Characteristic		Symbol	Typ.	Max	Unit
Thermal resistance	Junction-case	$R_{th(J-C)}$	-	3.12	℃/W
	Junction-ambient	$R_{th(J-A)}$	-	62.5	℃/W

Electrical Characteristics (T_C=25℃ unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	I_D=250uA, V_{GS}=0V	500	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250uA, V_{DS}=V_{GS}	2.0	-	4.0	V
Drain-source cut-off current	I_{DSS}	V_{DS}=500V, V_{GS}=0V	-	-	1	uA
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V	-	-	±100	nA
Drain-source on-resistance ④	$R_{DS(on)}$	V_{GS}=10V, I_D=6.5A	-	0.4	0.48	Ω
Forward transfer conductance ④	g_{fs}	V_{DS}=10V, I_D=6.5A	-	15	-	S
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V f=1MHz	-	1960	2450	pF
Output capacitance	C_{oss}		-	190	237	
Reverse transfer capacitance	C_{rss}		-	23	29	
Turn-on delay time	$t_{d(on)}$	V_{DD}=250V, I_D=13A R_G=25Ω ③④	-	25	-	ns
Rise time	t_r		-	100	-	
Turn-off delay time	$t_{d(off)}$		-	130	-	
Fall time	t_f		-	100	-	
Total gate charge	Q_g	V_{DS}=400V, V_{GS}=10V I_D=13A ③④	-	36	45	nC
Gate-source charge	Q_{gs}		-	8.3	-	
Gate-drain charge	Q_{gd}		-	9.8	-	

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

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	13	A
Source current (Pulsed) ①	I_{SM}		-	-	52	
Forward voltage ④	V_{SD}	V_{GS}=0V, I_S=13A	-	-	1.4	V
Reverse recovery time	t_{rr}	I_S=13A, V_{GS}=0V dI_F/dt=100A/us	-	410	-	ns
Reverse recovery charge	Q_{rr}		-	4.5	-	uC

Note ;

① Repetitive rating : Pulse width limited by maximum junction temperature

② L=0.8mH, I_{AS}=13A, V_{DD}=50V, R_G=25Ω, Starting T_J=25℃

③ Pulse Test : Pulse width≤300us, Duty cycle≤2%

④ Essentially independent of operating temperature

Electrical Characteristic Curves

Fig. 1 I_D - V_{DS}

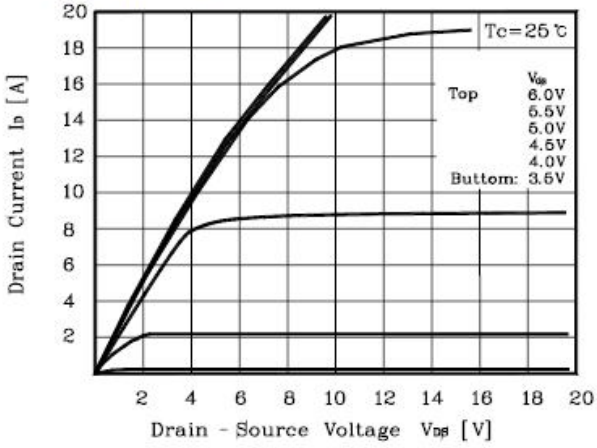


Fig. 2 I_D - V_{GS}

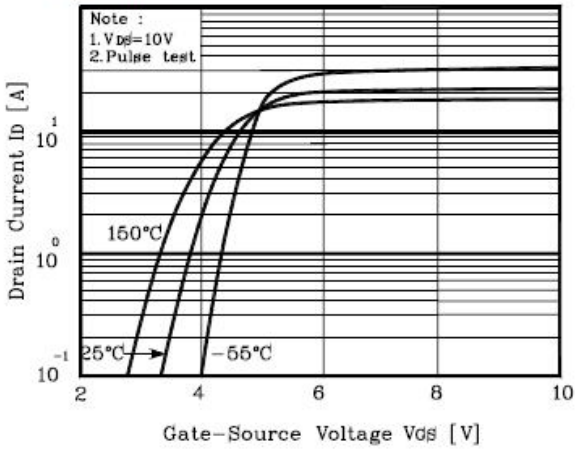


Fig. 3 $R_{DS(on)}$ - I_D

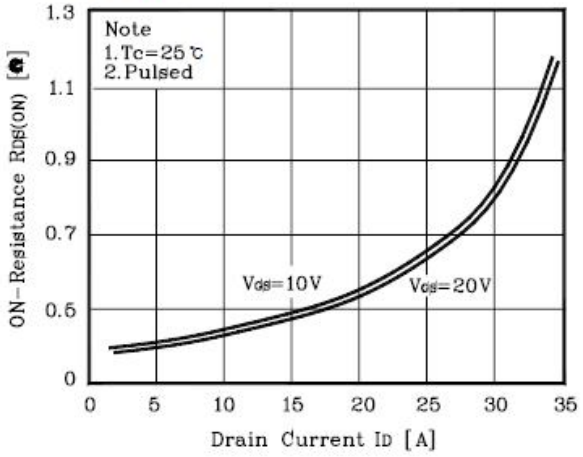


Fig. 4 I_S - V_{SD}

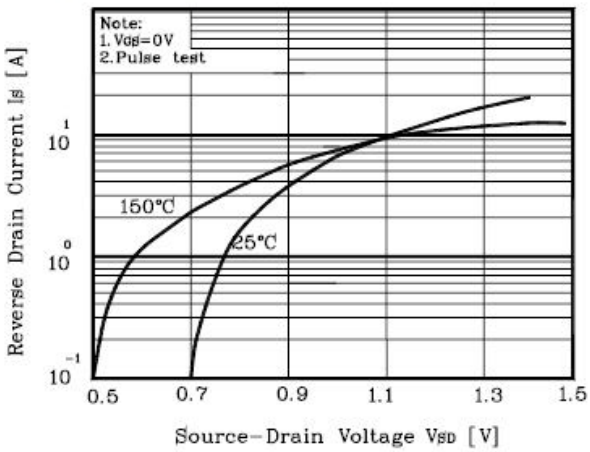


Fig. 5 Capacitance - V_{DS}

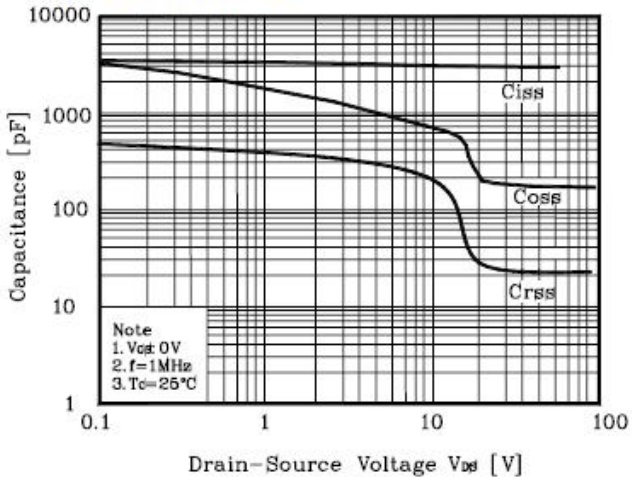
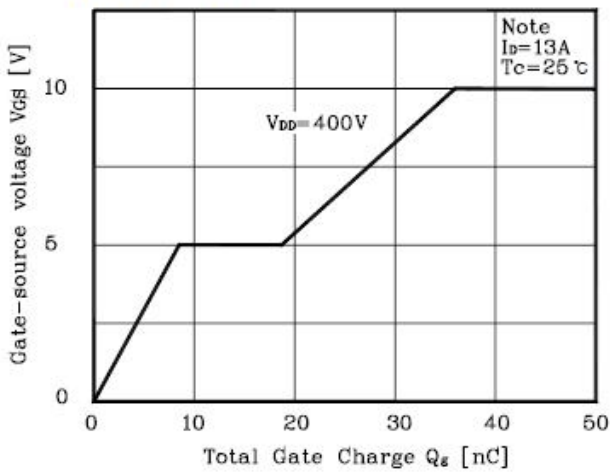


Fig.6 V_{GS} - Q_G



Electrical Characteristic Curves

Fig. 7 V_{DSS} - T_J

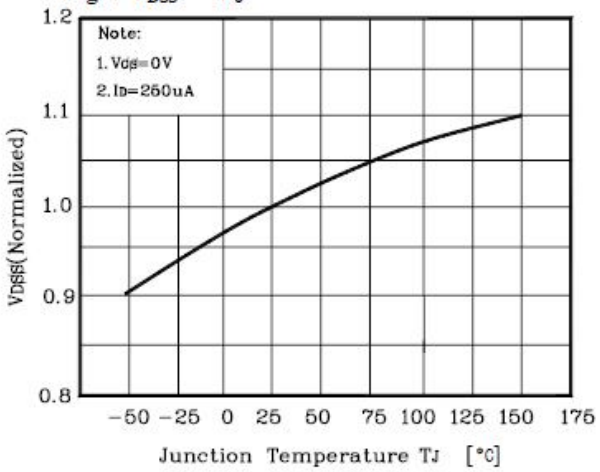


Fig.8 $R_{DS(on)}$ - T_J

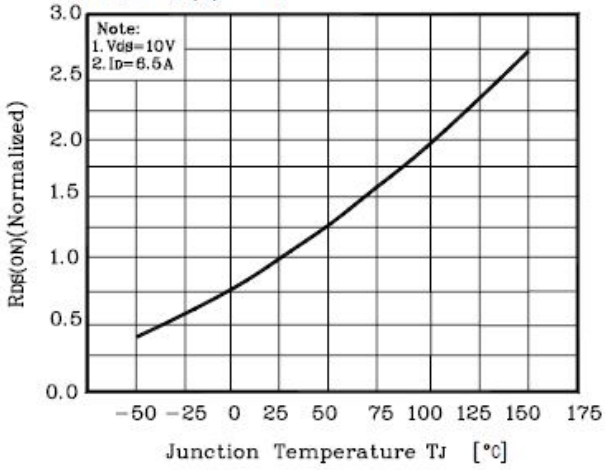


Fig. 9 I_D - T_C

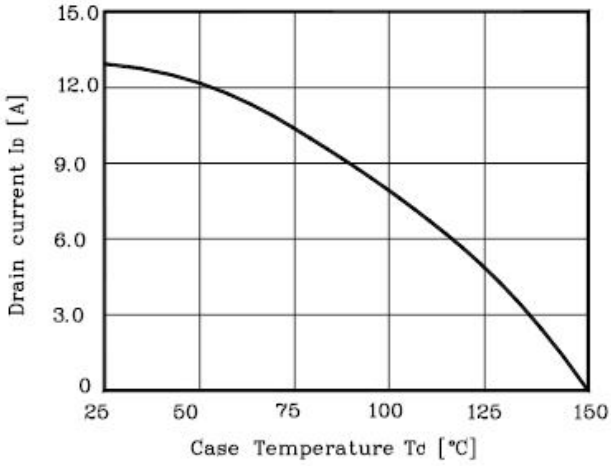


Fig. 10 Safe Operating Area

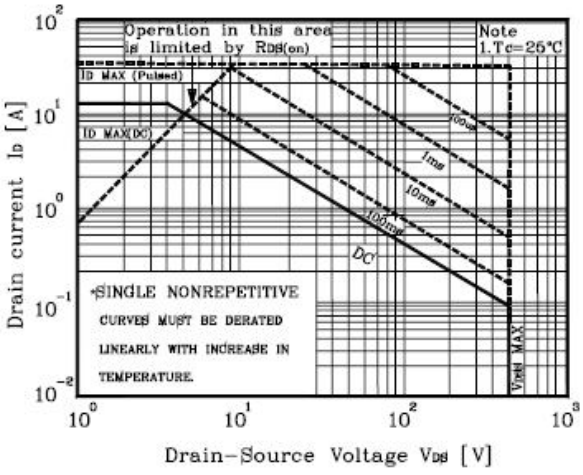


Fig. 11 Gate Charge Test Circuit & Waveform

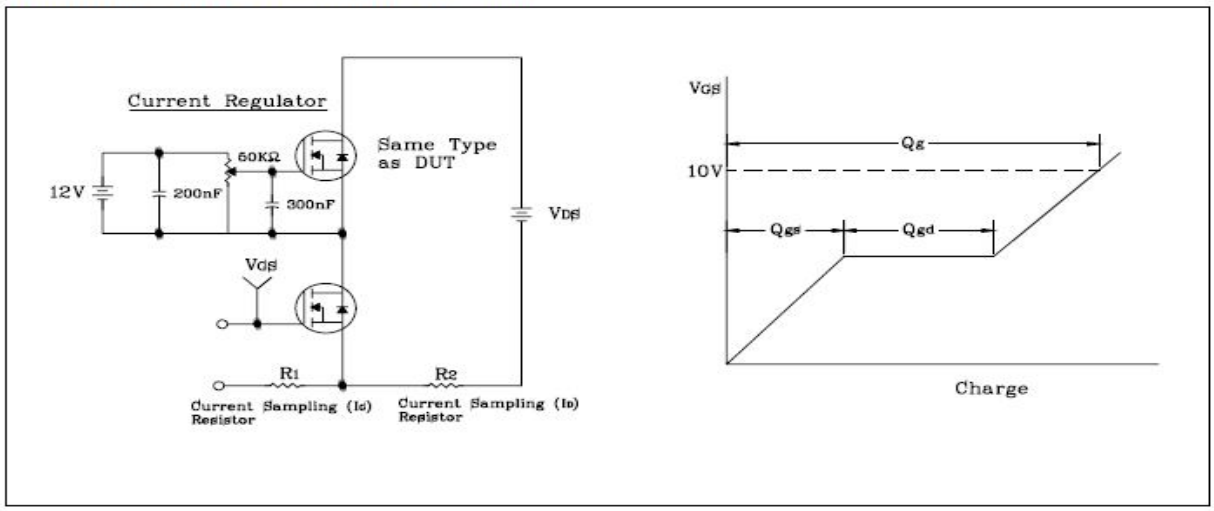


Fig. 12 Resistive Switching Test Circuit & Waveform

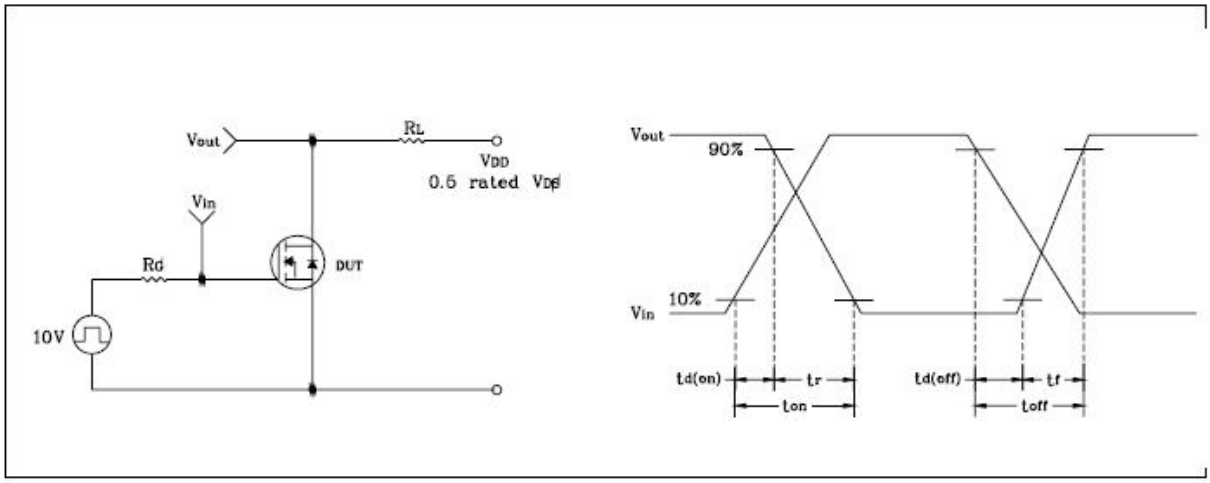


Fig. 13 E_{AS} Test Circuit & Waveform

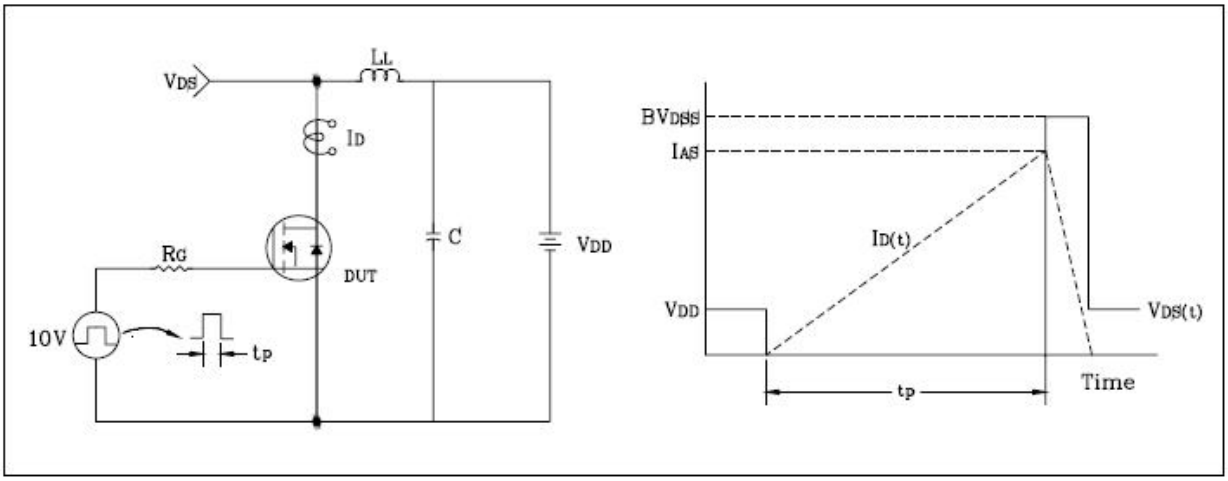
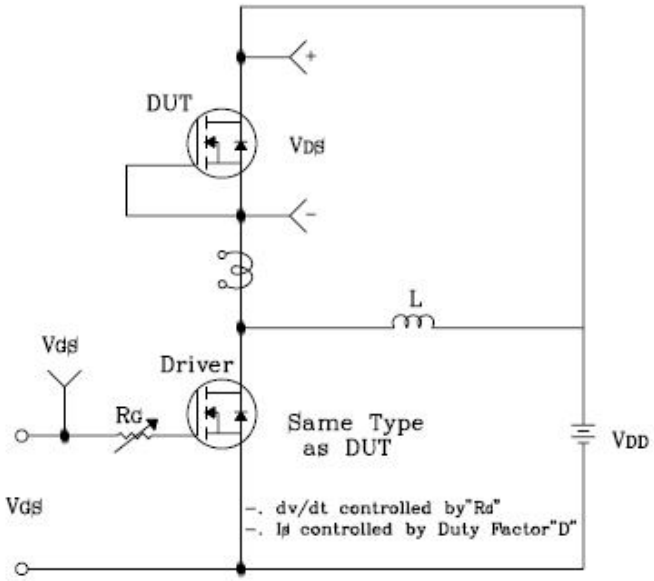
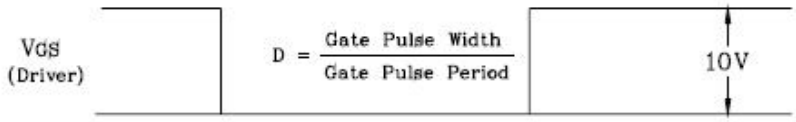
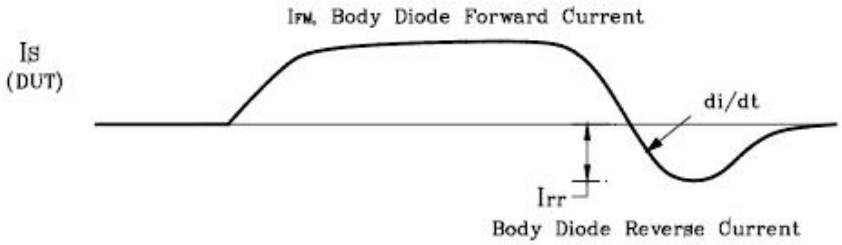
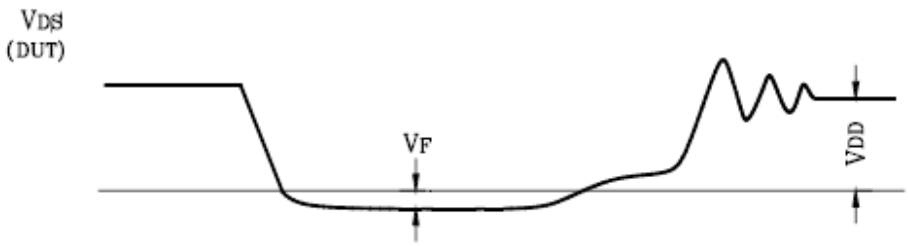


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



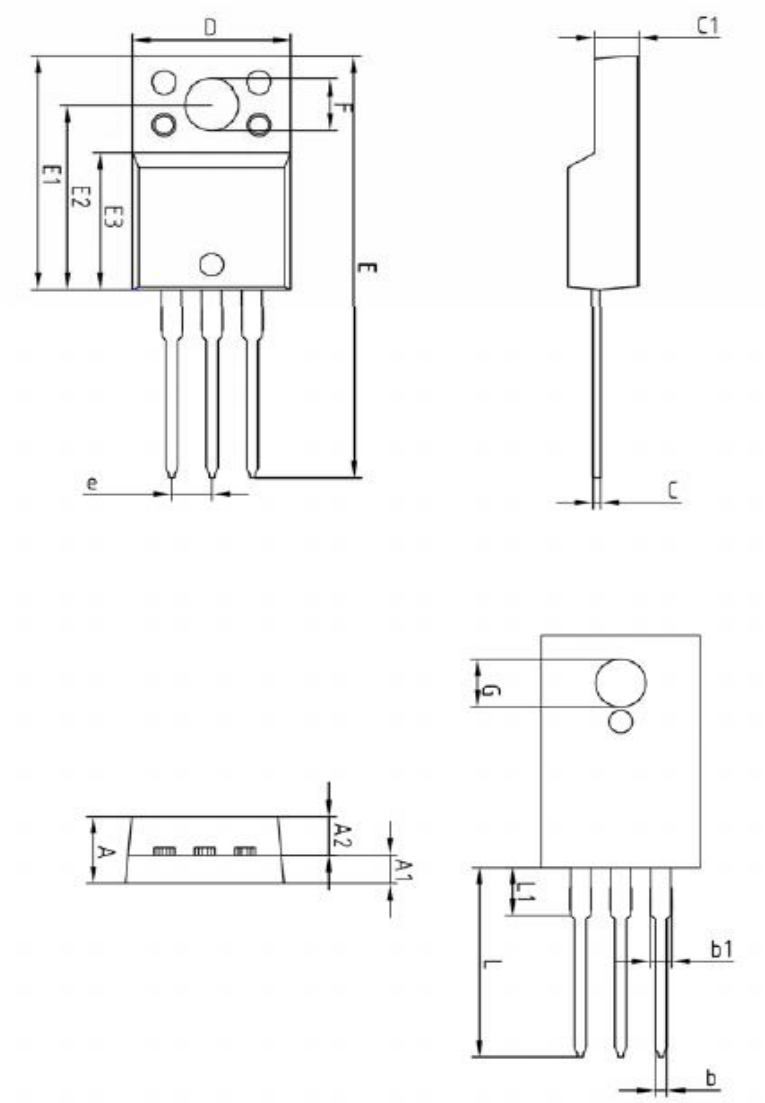






Outline Dimension

unit: mm



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			

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