AUK Semiconductor

STK0765BF

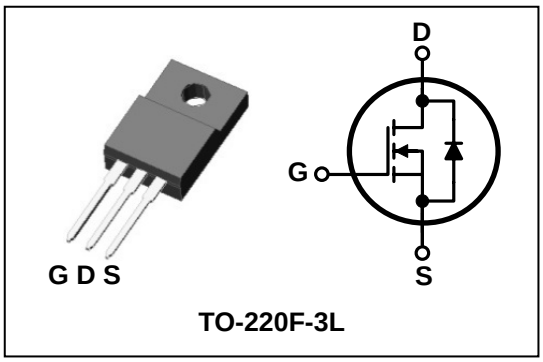
Advanced Power MOSFET

SWITCHING REGULATOR APPLICATIONS

Features

- High Voltage: BV_{DSS}=650V(Min.)
- Low C_{rss} : C_{rss}=13pF(Typ.)
- Low gate charge : Qg=32nC(Typ.)
- Low $R_{DS(on)}$:$R_{DS(on)}$=1.2Ω(Typ.)

PIN Connection



Ordering Information

Type No.	Marking	Package Code
STK0765BF	STK0765	TO-220F-3L

Absolute maximum ratings

(Tc=25°C)

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		650	V
Gate-source voltage	V_{GSS}		±30	V
Drain current (DC)	I_D	(Tc=25℃)	7	A
		(Tc=100℃)	4.4	A
Drain current (Pulsed) *	I_{DP}		28	A
Drain power dissipation	P_D		52	W
Single pulsed avalanche energy ②	E_{AS}		340	mJ
Avalanche current (Repetitive) ①	I_{AR}		5.2	A
Repetitive avalanche energy ①	E_{AR}		13	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	$R_{th(J-C)}$	-	2.4	℃/W
	Junction-ambient	$R_{th(J-a)}$	-	62.5	

Electrical Characteristics (Tc=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	I_D=250μA, V_{GS}=0	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250μA, V_{DS}= V_{GS}	2.0	-	4.0	V
Drain-source cut-off current	I_{DSS}	V_{DS}=650V, V_{GS}=0V	-	-	1	μA
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=3.5A	-	1.2	1.6	Ω
Forward transfer conductance ④	g_{fs}	V_{DS}=10V, I_D=3.5A	-	8.1	-	S
Input capacitance	Ciss	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	974	1460	pF
Output capacitance	Coss		-	105	236	
Reverse transfer capacitance	Crss		-	13	20	
Turn-on delay time	$t_{d(on)}$	V_{DD}=300V, I_D=7A R_G=25Ω ③④	-	18	-	ns
Rise time	t_r		-	19	-	
Turn-off delay time	$t_{d(off)}$		-	72	-	
Fall time	t_f		-	28	-	
Total gate charge	Q_g	V_{DS}=300V, V_{GS}=10V I_D=7A ③④	-	32	48	nC
Gate-source charge	Q_{gs}		-	6.5	9.8	
Gate-drain charge	Q_{gd}		-	11	17	

Source-Drain Diode Ratings and Characteristics (Tc=25°C)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Units
Continuous source current	I_S	Integral reverse diode in the MOSFET	-	-	7	A
Pulsed-source current ①	I_{SM}		-	-	28	
Forward voltage ④	V_{SD}	V_{GS}=0V, I_S=7A	-	-	1.4	V
Reverse recovery time	t_{rr}	I_s=7A, V_{GS}=0 dI_S/dt=100A/us	-	648	-	ns
Reverse recovery charge	Q_{rr}		-	4.8	-	uC

Note ;

① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature

② L=10mH, I_{AS}=7A, 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}

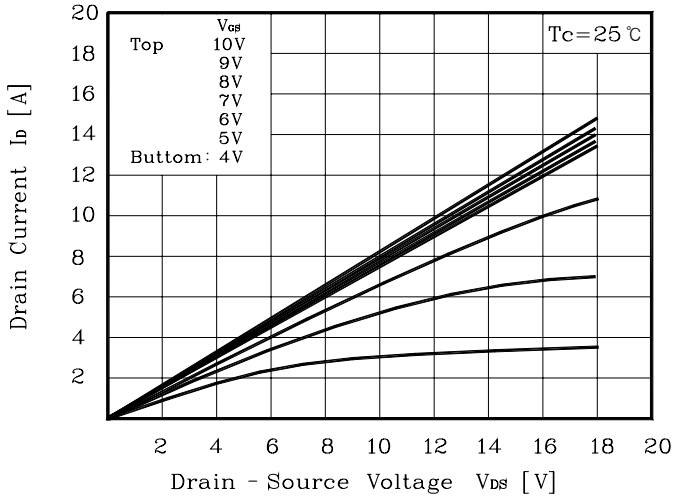


Fig. 2 I_D - V_{GS}

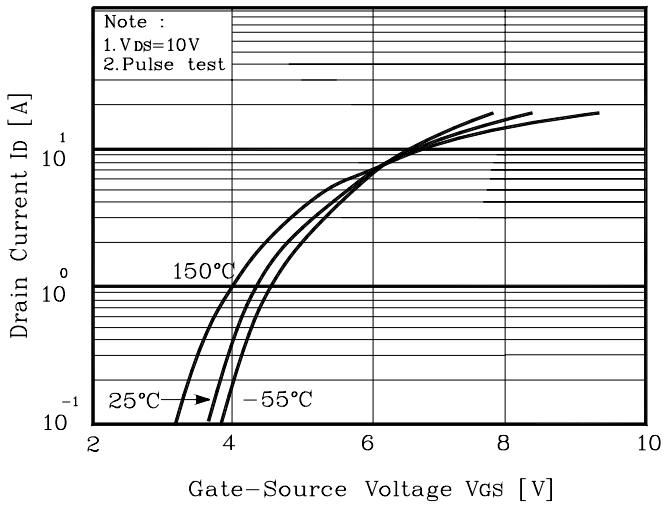


Fig. 3 $R_{DS(on)}$ - I_D

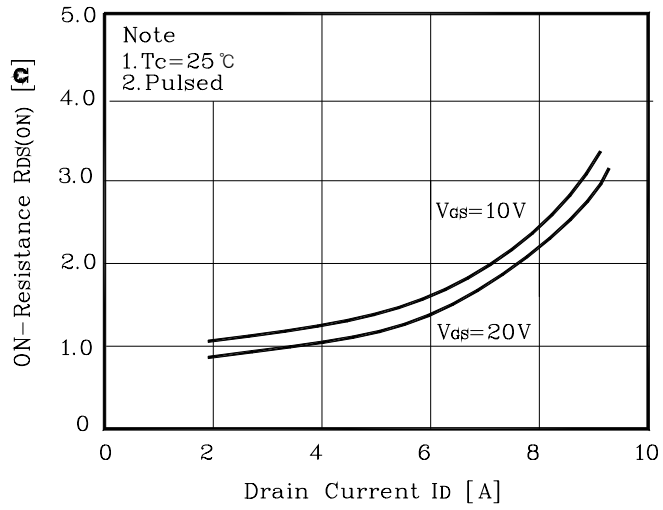


Fig. 4 I_S - V_{SD}

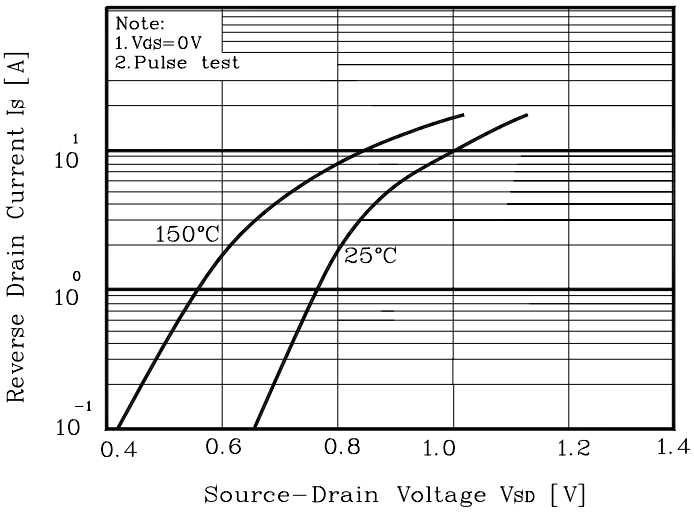


Fig. 5 Capacitance - V_{DS}

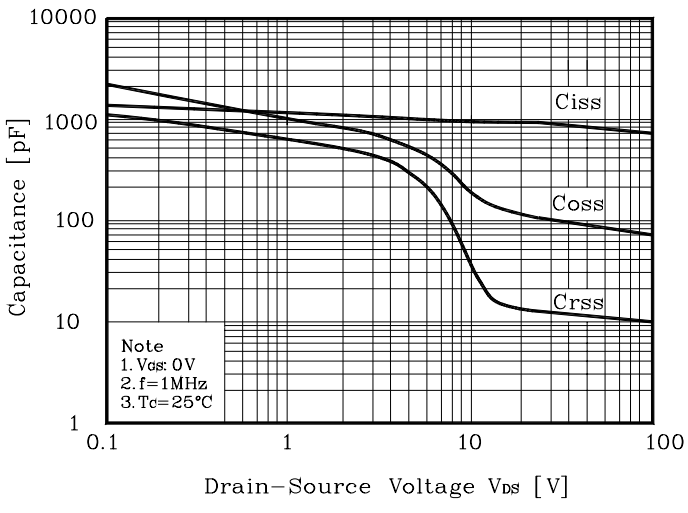


Fig.6 V_{GS} - Q_G

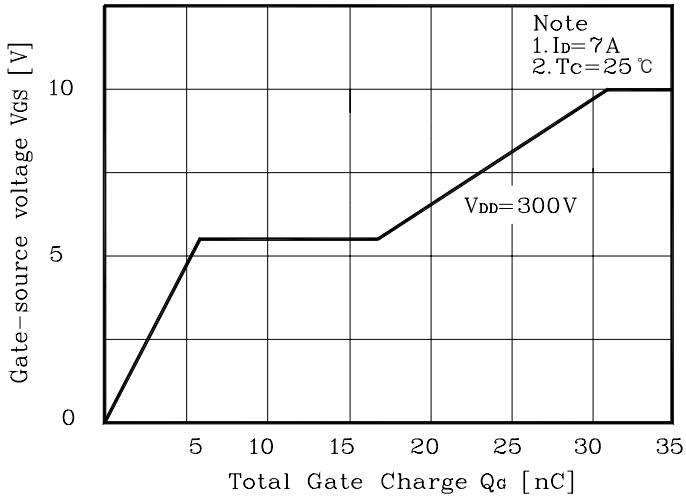


Fig. 7 V_{DSS} - T_J

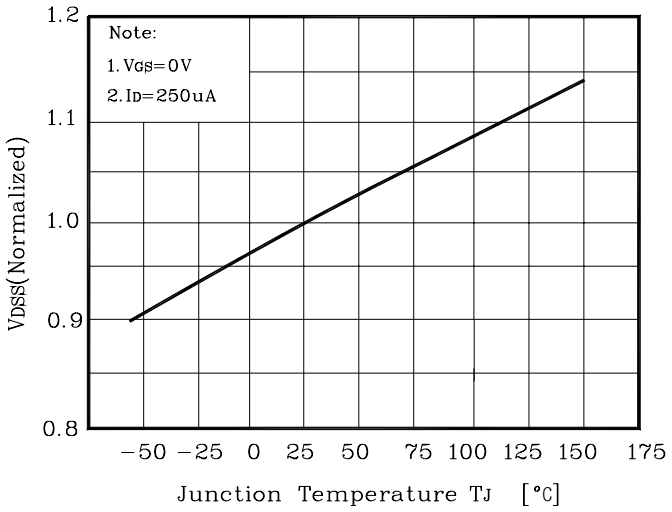


Fig.8 $R_{DS(on)}$ - T_J

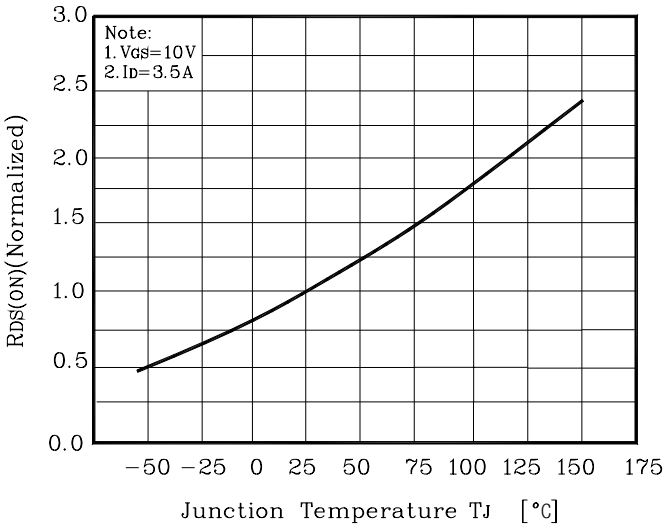


Fig. 9 I_D - T_C

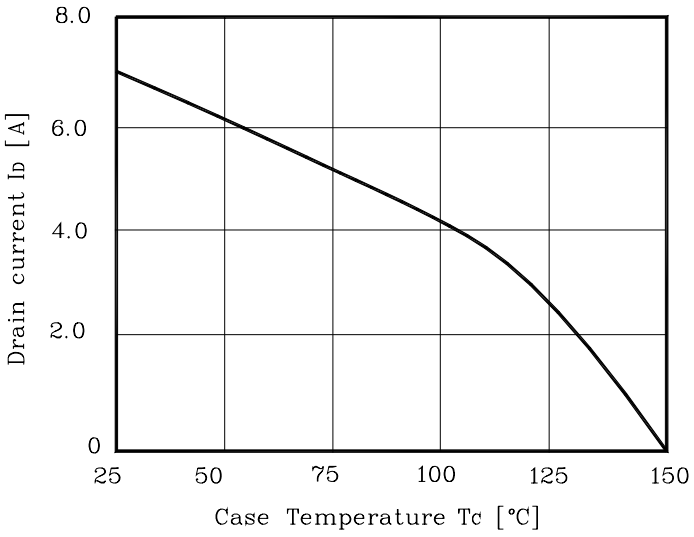


Fig. 10 Safe Operating Area

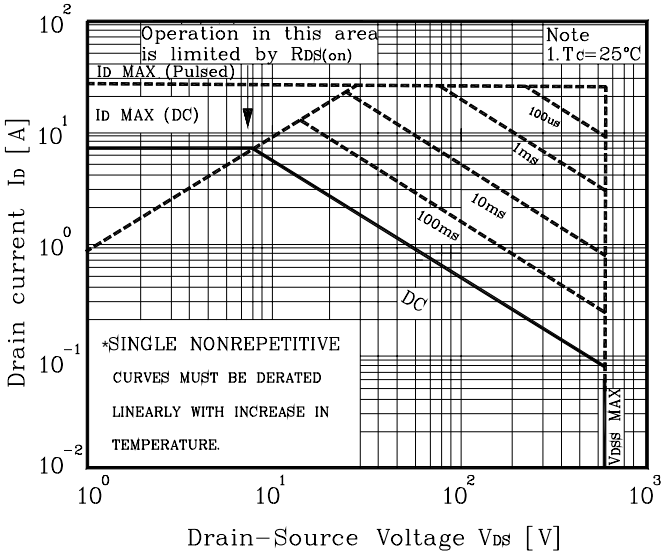


Fig. 10 Gate Charge Test Circuit & Waveform

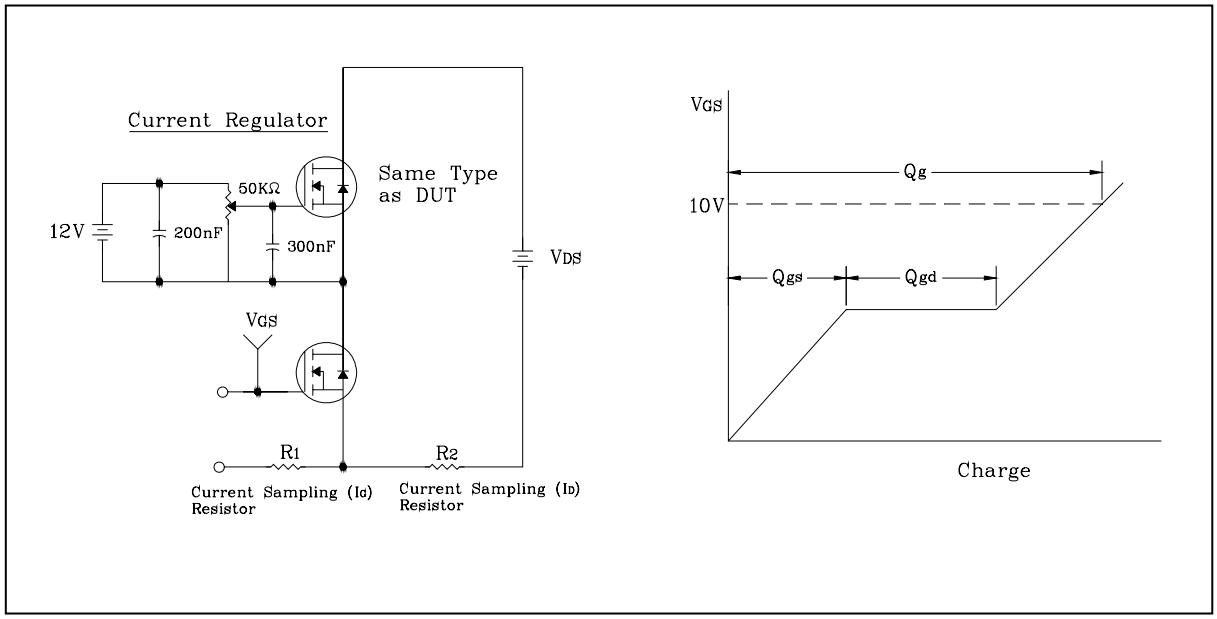


Fig. 11 Resistive Switching Test Circuit & Waveform

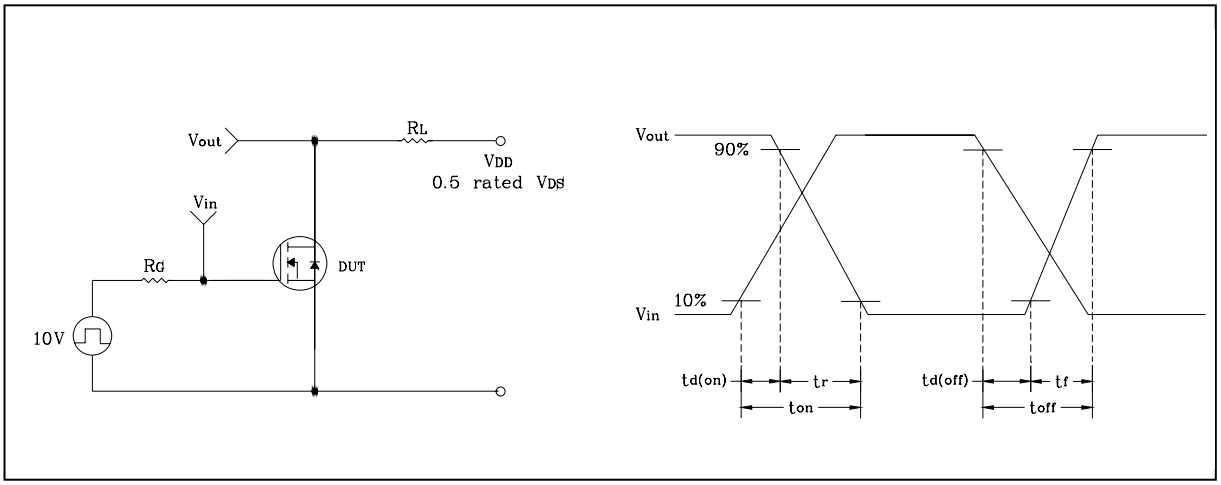


Fig. 12 E_{AS} Test Circuit & Waveform

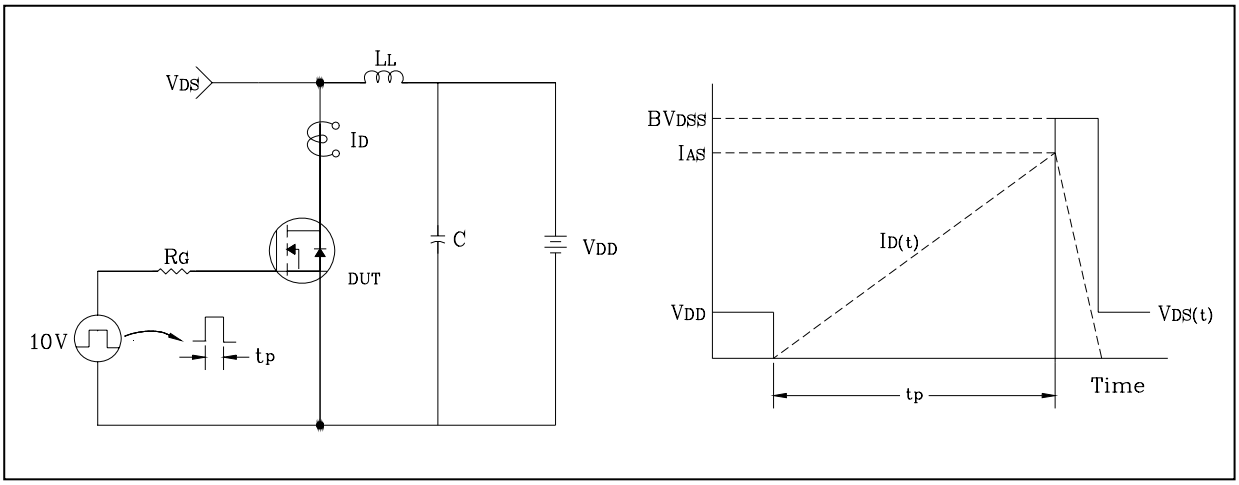
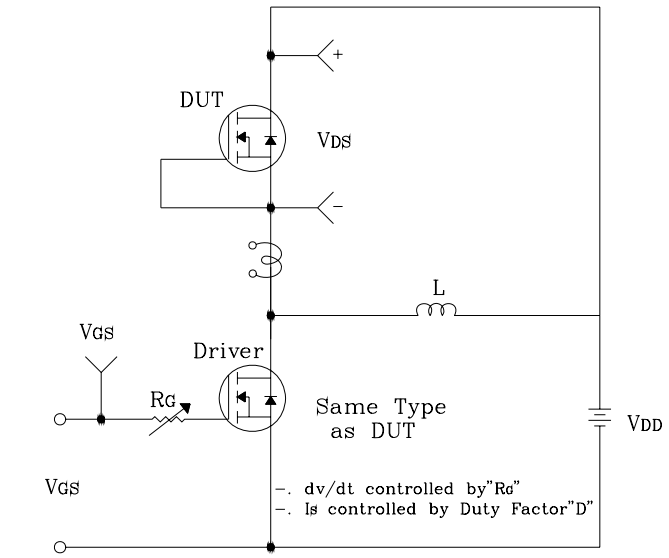
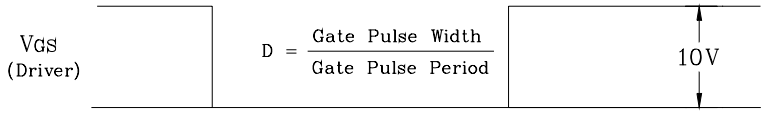
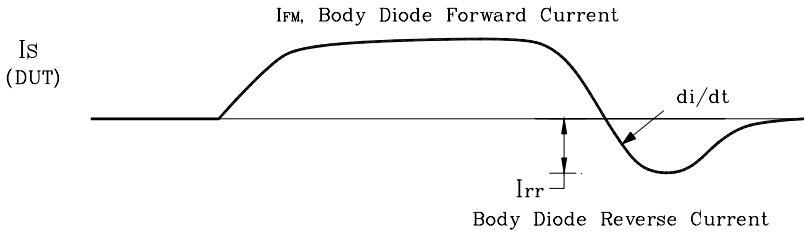
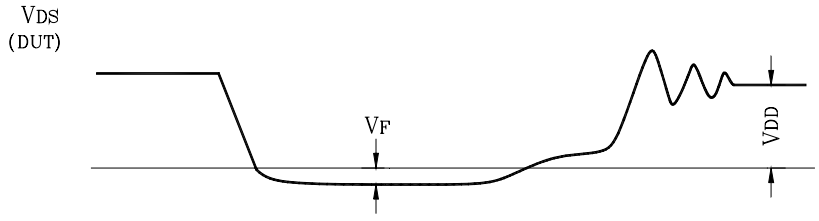


Fig. 13 Diode Reverse Recovery Time Test Circuit & Waveform

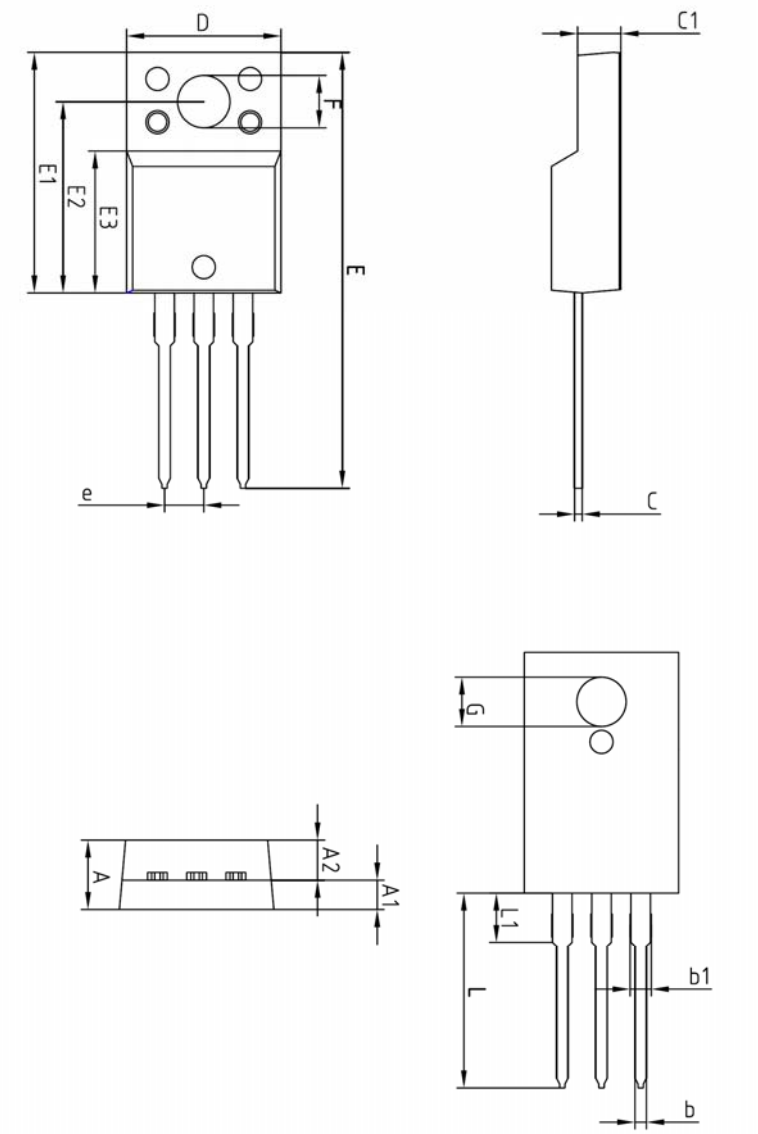








Outline Dimension



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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