Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

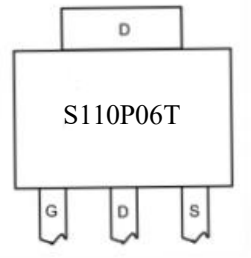
Bvdss	Rdson	ID
-60V	5.5mΩ	-110A

RoHS

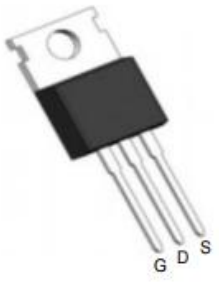
Application

- DC-DC Converters
- Synchronous-rectification applications
- Power management functions

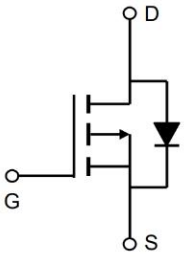
Package



Marking and pin assignment



TO-220 top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
110P06	S110P06T	TO-220	50

Absolute Maximum Ratings (T_J=25℃ unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25° C	I_D	-110	A
	T_C=100° C	I_D	-70	A
Pulsed Drain Current		I_{DM}[1]	-440	A
Single Pulse Avalanche Energy		E_{AS}[2]	960	mJ
Power Dissipation	T_C = 25℃	P_D	180	W
Operating junction and storage temperature		T_J, T_{STG}	150, -55 ~ 150	℃
Maximum Temperature for Soldering		T_L	260	℃

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.69	℃/W
Thermal Resistance, Junction -to-Ambient	$R_{\theta JA}$	60	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HLS110P06T	TO-220	1	2	3	Tube

Electrical Characteristics (Tj=25℃ unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=-250μA	-60	-	-	V
Gate-body Leakage current	I_{GSS}	V_{GS}=±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-60V, V_{GS}=0V	-	-	1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS} , I_D = -250μA	-1.6	-2.0	-2.4	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -15A	-	5.5	7.0	mΩ
Input Capacitance	C_{ISS}	V_{DS} = -30V,V_{GS} =0V, f =1MHz	-	5403	-	pF
Output Capacitance	C_{OSS}		-	941	-	
Reverse Transfer Capacitance	C_{RSS}		-	48	-	
Gate Resistance	R_g	V_{GS}=0V,V_{DS} Open	-	2.0	-	Ω
Total Gate Charge	Q_g	V_{GS} = -10V,V_{DS} = -30V, I_D = -15A	-	80.2	-	nC
Gate-Source Charge	Q_{gs}		-	15.2	-	
Gate-Drain Charge	Q_{gd}		-	11	-	
Turn-On Delay Time	$T_{d(on)}$	V_{GS} = -10V, V_{DS} = -30V, R_G = 3Ω, I_D = -15A,R_L = 0.75Ω	-	4.5	-	ns
Rise Time	T_R		-	2.5	-	
Turn-Off Delay Time	$T_{d(off)}$		-	14.5	-	
Fall Time	T_F		-	3.5	-	
Diode Forward Current	I_S	T_C=25℃	-	-	-110	A
Diode Forward Voltage	V_{SD}	I_S=-15A, V_{GS}=0V	-	-	-1.2	V
Reverse Recovery time	T_{rr}	I_S=-15A, V_{DD}=-30V dI/dt=100A/μs	-	60	-	ns
Reverse Recovery Charge	Q_{rr}		-	105	-	nC

Typical Performance Characteristics

Fig1:Typ. output characteristics

ID=f(-VDS)

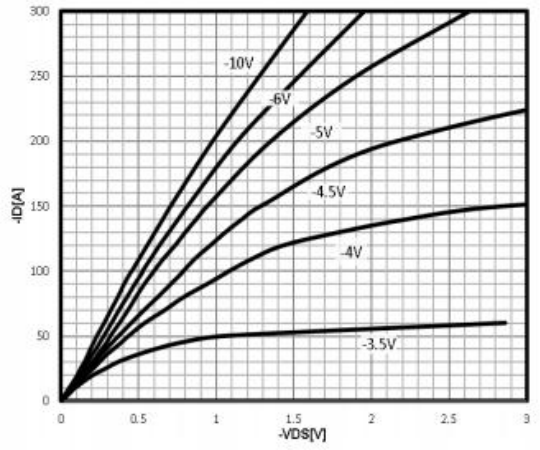


Fig2:Typ. drain-source on resistance

RDS(on)=f(-ID)

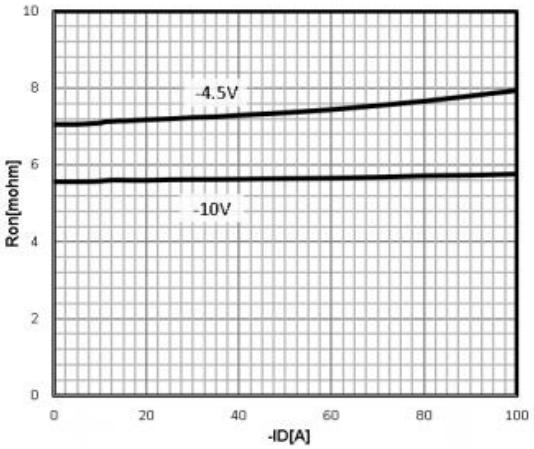


Fig3:Typ. transfer characteristics

$-I_D=f(-V_{GS})$;

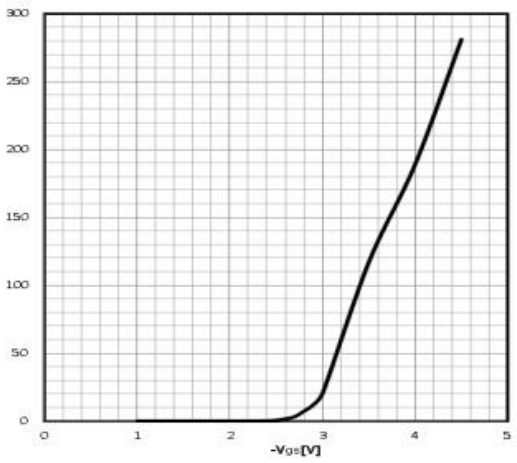


Fig4:Drain-source on-state resistance

$R_{DS(on)}=f(Tj)$;ID=-15A; VGS=-10V

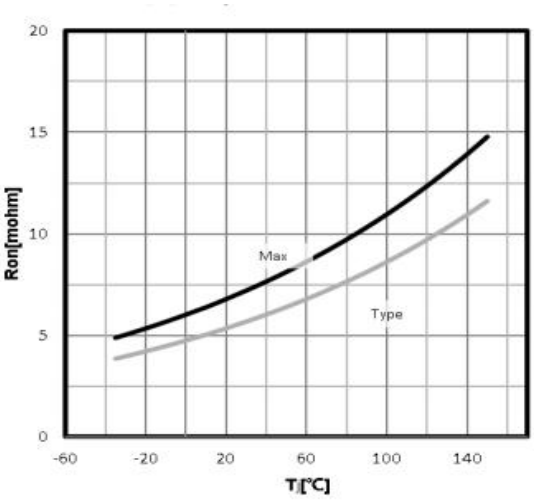


Fig5:Typ. transfer characteristics F

-VTH=f(Tj); ID=-250uA

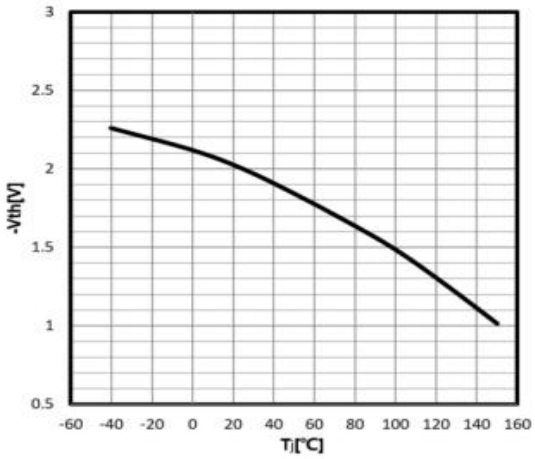


Fig6:Drain-source on-state resistance

VBR(DSS)=f(Tj); ID=-250uA

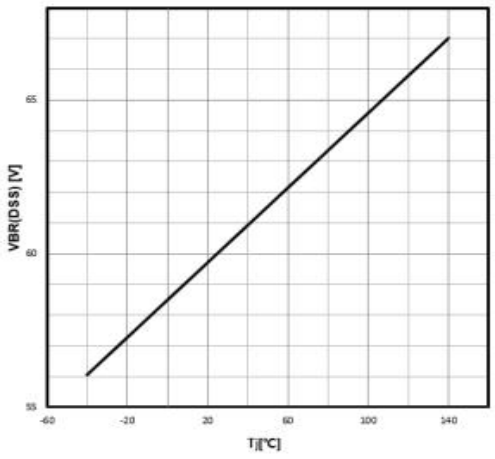


Fig7:Typ. gate charge

VGS=f(Qg), ID=-15A;

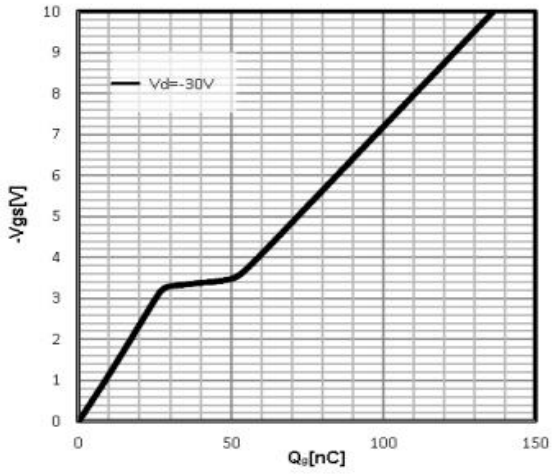


Fig8:Typ. capacitances

C =f(VDS); VGS=0V; f =1MHz

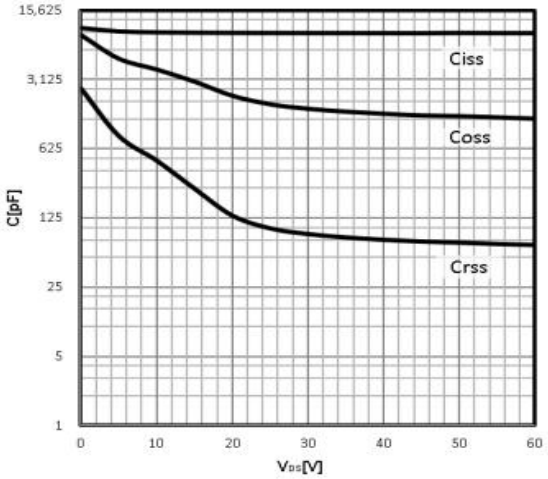


Fig9:Power Dissipation

$P_{tot}=f(T_C)$

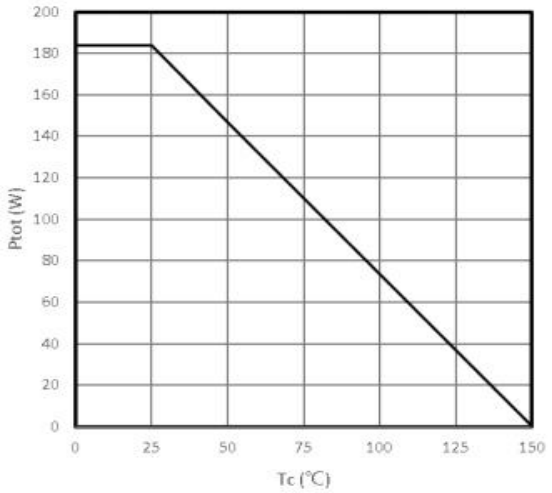


Fig10:Maximum Drain Current

-ID=f(TC)

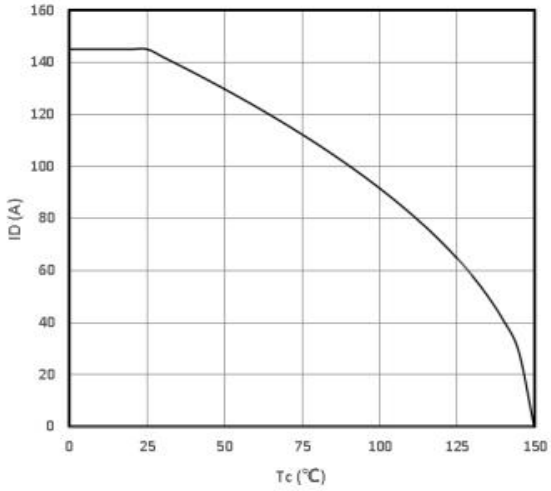


Fig11:Safe operating area

ID=f(VDS)

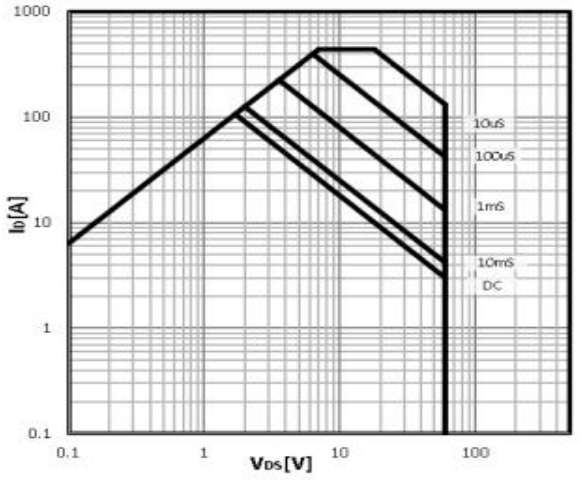


Fig12:Body Diode Forward Voltage Variation

−IF=f(-VDS)

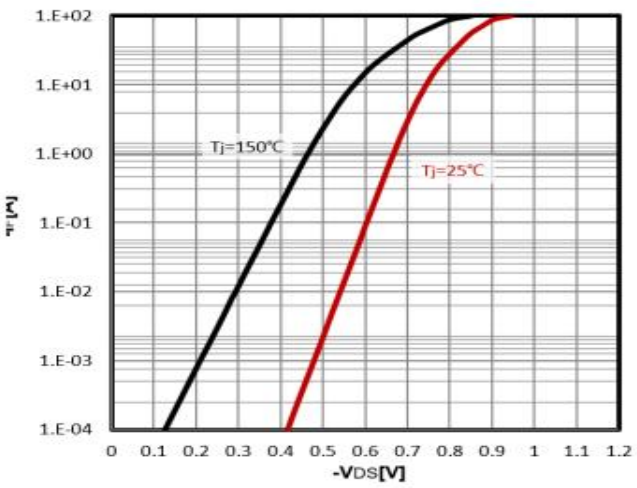
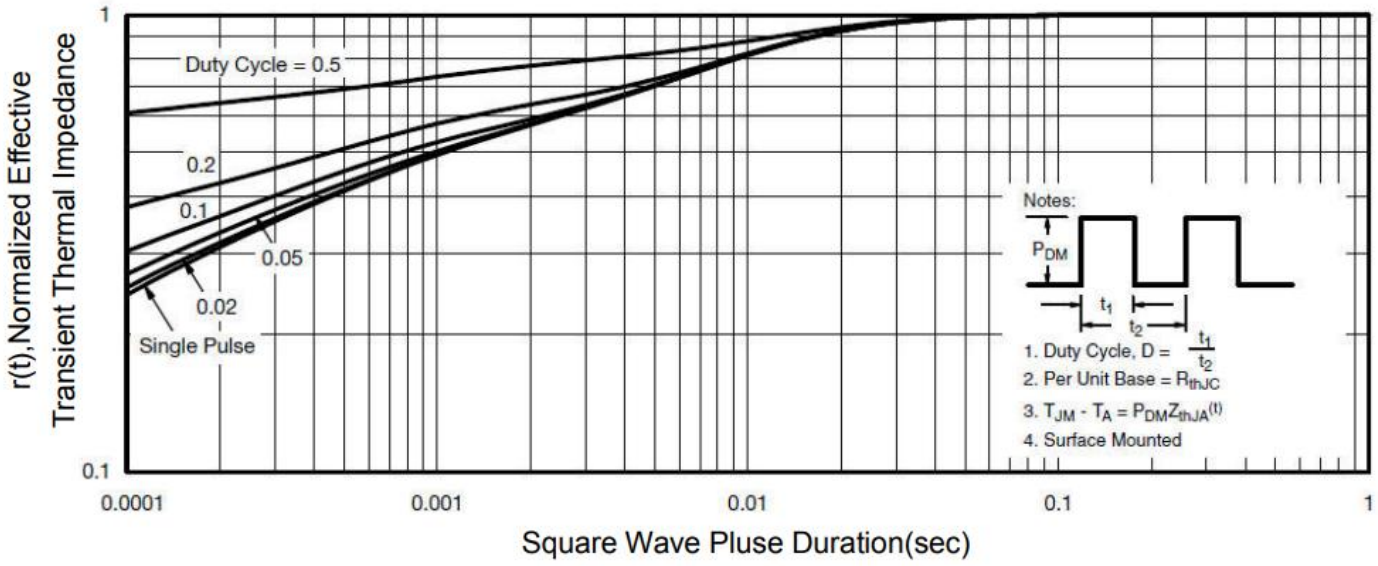


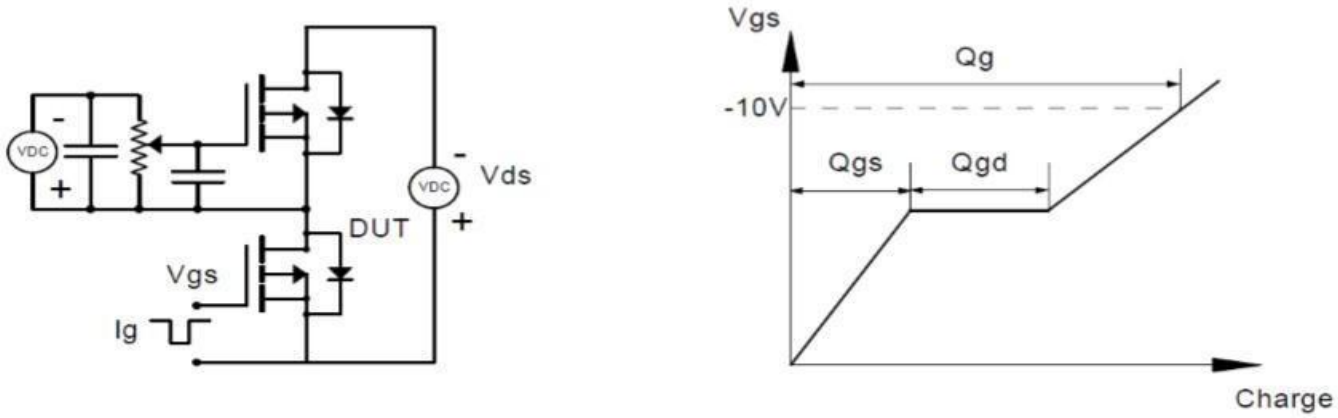
Figure 13: Max. Transient Thermal Impedance

$Z_{thJC}=f(t_p)$

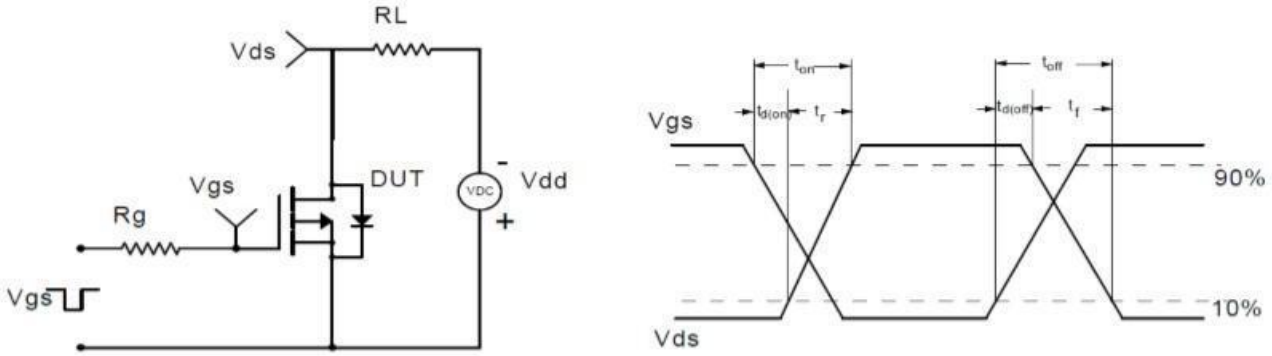


Test Circuit and Waveform:

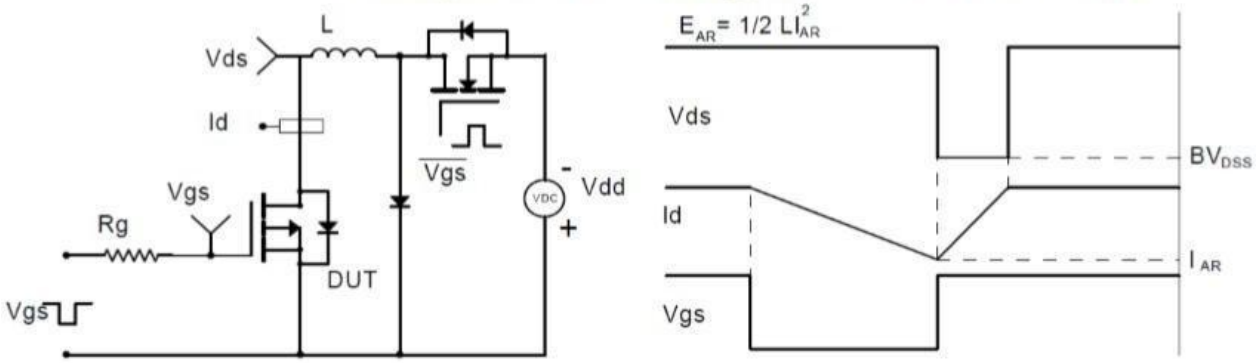
Gate Charge Test Circuit & Waveform



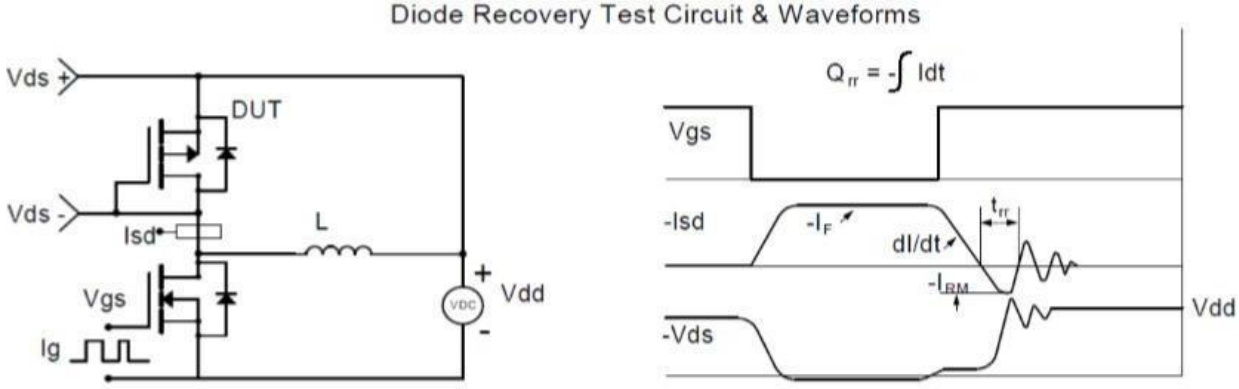
Resistive Switching Test Circuit & Waveforms



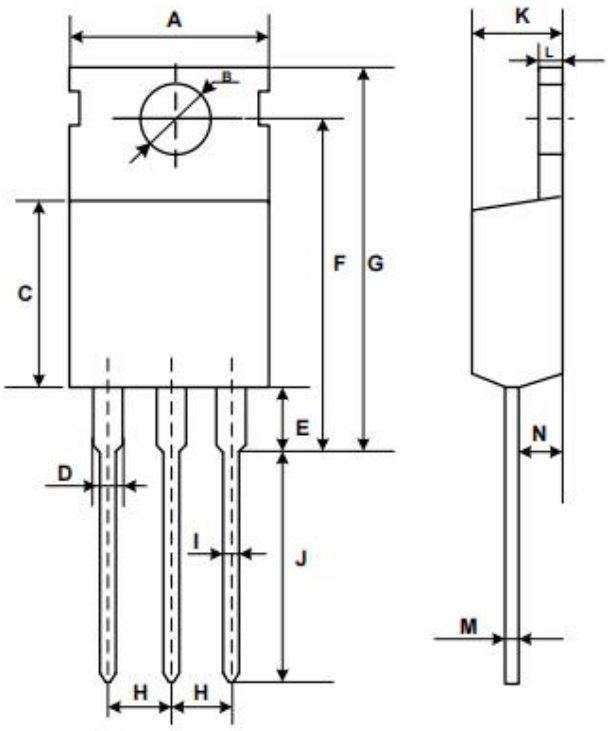
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Dimensions TO-220



OMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	9.70	10.30
B	3.40	3.80
C	8.80	9.40
D	1.17	1.47
E	2.60	3.50
F	15.10	16.70
G	19.55MAX	
H	2.54REF	
I	0.70	0.95
J	9.35	11.00
K	4.30	4.77
L	1.20	1.45
M	0.40	0.65
N	2.20	2.60

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