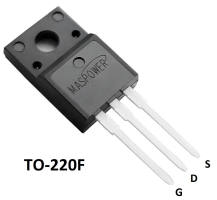
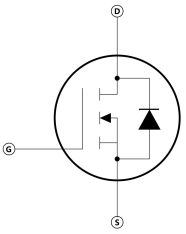
Features

- Ultra low $R_{DS(on)(typ.)}$=0.16Ω
- Ultra low gate charge(typ. Q_g=40nC)
- 100% UIS tested
- RoHS compliant



Applications

- Power factor correction(PFC)
- Switched mode power supplies(SMPS)
- Uninterruptiable power supply(UPS)



Absolute Ratings (Tc=25℃ unless otherwise specified)

Parameter	Symbol		Value	Unit
Drain-Source Voltage	V_{DSS}		650	V
Transient Gate-Source Voltage	V_{GSM}		±30	V
Continuous Gate-Source Voltage(DC)	V_{GSS}		±20	V
Drain Current -continuous	I_D	T_C=25℃	20	A
		T_C=100℃	13	A
Drain Current - pulse (note 1)	I_{DM}		60	A
Single Pulsed Avalanche Energy (note 2)	E_{AS}		600	mJ
Power Dissipation	P_D		33	W
Operating and Storage Temperature Range	T_J,T_{STG}		-55~+150	℃
Solding temperature,wave solding only allowed at leads.(1.6mm for 10s)	T_{sold}		260	℃

Electrical Characteristics(T_{CASE}=25℃ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Drain-Source Voltage	BV_{DSS}	I_D=250uA,V_{GS}=0V	650	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V,V_{GS}=0V, T_C=25℃	-	-	1	uA
Gate-body leakage current,forward	I_{GSSF}	V_{DS}=0V,V_{GS}=20V	-	-	100	nA
Gate-body leakage current,reverse	I_{GSSR}	V_{DS}=0V,V_{GS}=20V	-	-	-100	nA

On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	2.5	3.0	4.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=10A, T_J=25℃	-	0.16	0.18	Ω
		V_{GS}=10V, I_D=10A, T_J=150℃	-	0.42	-	Ω
Forward Transconductance	g_{fs}	V_{DS}=10V,I_D=10A (note 4)	-	2.2	-	S
Dynamic Characteristics						
Gate resistance	R_g	F=1.0MHz open drain	-	5.08	-	Ω
Input capacitance	C_{iss}	V_{DS}=100V, V_{GS}=0V, F=1.0MHz	-	1921	-	pF
Output capacitance	C_{oss}		-	65.1	-	pF
Reverse transfer capacitance	C_{rss}		-	1.2	-	pF
Switching Characteristics						
Turn-On delay time	$t_{d(on)}$	V_{DD}=400V,I_D=10A, R_G=10Ω(note 4,5)	-	67.0	-	ns
Turn-On rise time	t_r		-	12.1	-	ns
Turn-Off delay time	$t_{d(off)}$		-	71.6	-	ns
Turn-Off Fall time	t_f		-	7.9	-	ns
Total Gate Charge	Q_g	V_{DS}=520V,I_D=10A, V_{GS}=0 to 10V (note4,5)	-	40	-	nC
Gate-Source charge	Q_{gs}		-	8.8	-	nC
Gate-Drain charge	Q_{gd}		-	14.4	-	nC
Gate-plateau voltage	V_p		-	4.7	-	V
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain -Source Diode Forward Current	I_S		-	-	20	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	60	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=10A	-	-	1.1	V
Reverse recovery time	t_{rr}	V_{GS}=0V,I_S=10A dI_F/dt=100A/us (note 4) V_R=400V	-	252.3	-	ns
Reverse recovery charge	Q_{rr}		-	2561.5	-	uC
Peak reverse recovery current	I_{RRM}		-	21.3	-	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance,Junction-to-Case,Max	$R_{th(J-C)}$	3.7	℃/W
Thermal Resistance, Junction-to-Ambient,minimal Footprint [4] ,Max	$R_{th(J-A)}$	62	

Notes:

1:Pulse width limited by maximum junction temperature

2:L=48mH,I_{AS}=5A,V_{DD}=60V,Starting T_J=25℃

3:I_{SD}≤10A,di/dt≤200A/us,V_{DD}≤BV_{DSS},Starting T_J=25℃

4:Pulse Test:Pulse Width≤200us,Duty Cycle≤2%

5:Essentially independent of operating temperature

Electrical Characteristics Diagrams

Figure 1. Typ. Output Characteristics

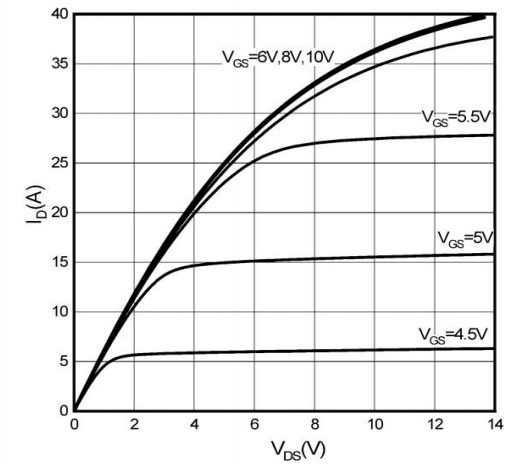


Figure 2. Transfer Characteristics

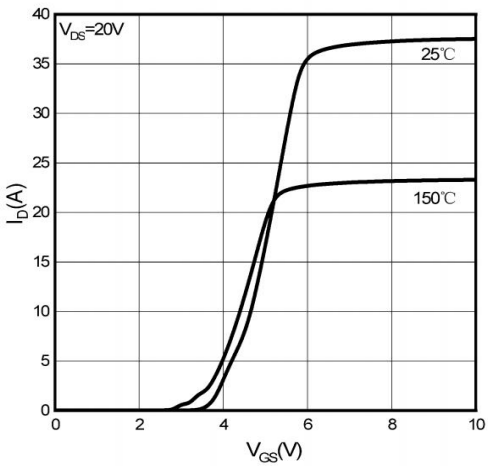


Figure 3. On-Resistance vs. Drain Current

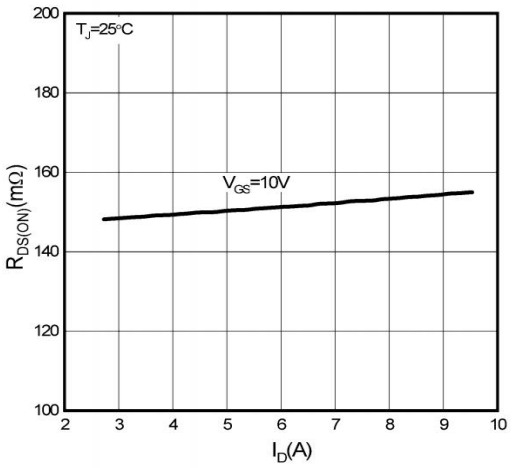


Figure 4.On-Resistance vs.Temperature

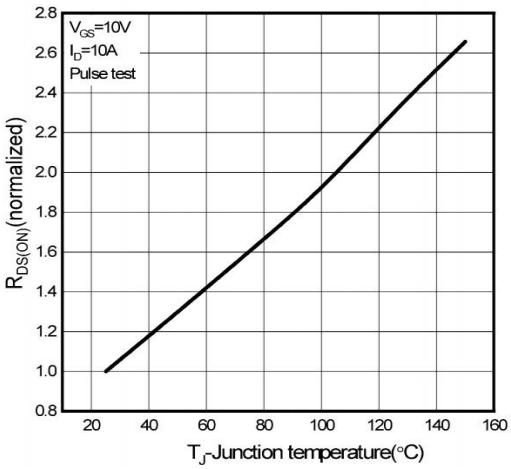


Figure 5.Breakdown Voltage vs.Temperature

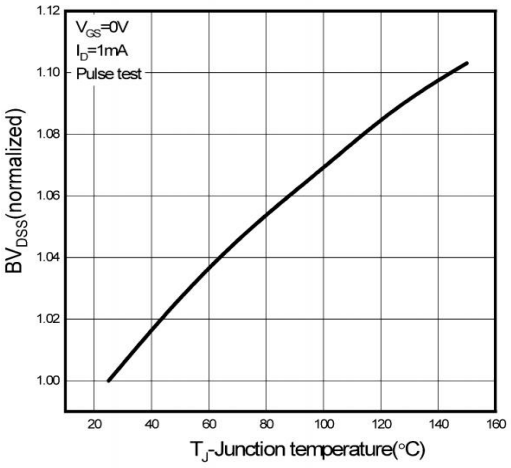


Figure 6.Threshold Voltage vs.Temperature

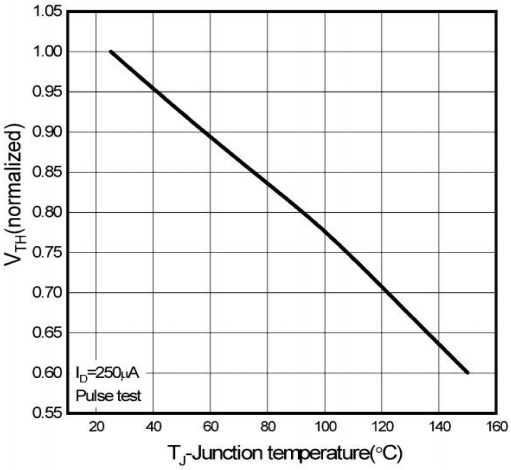


Figure 7.Body-Diode Characteristics

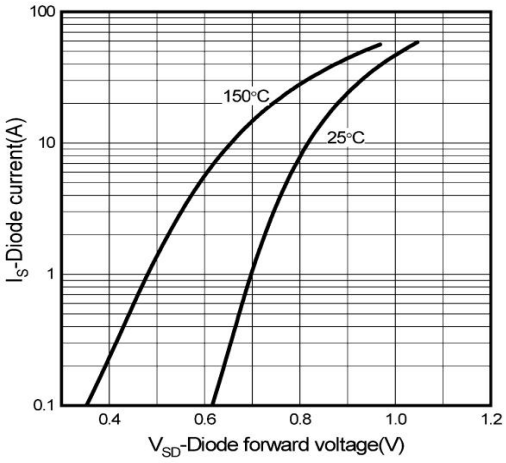


Figure 8.Capacitance Characteristics

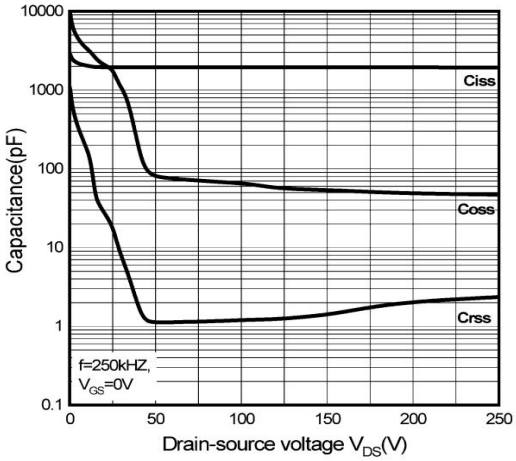


Figure 9.Gate Charge Characteristics

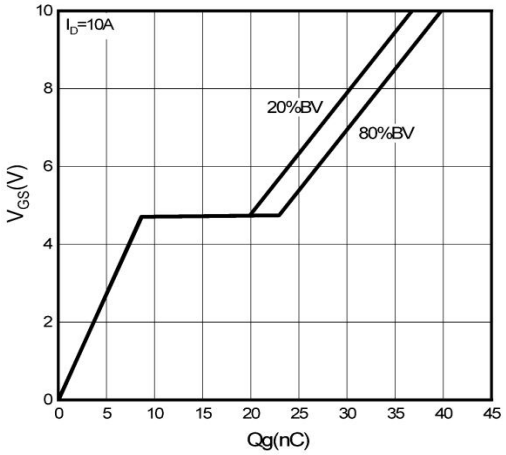


Figure 10.Drain Current Derating

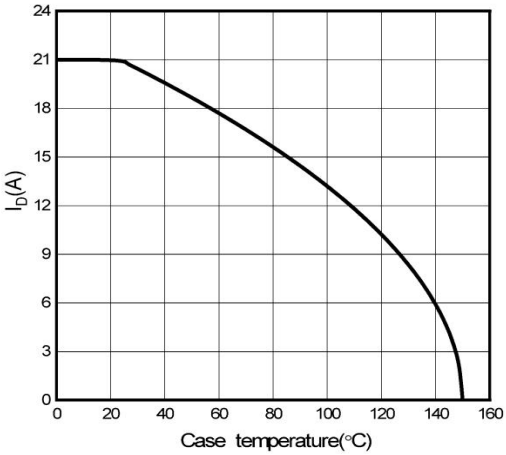


Figure 11.Power Dissipation vs.Temperature

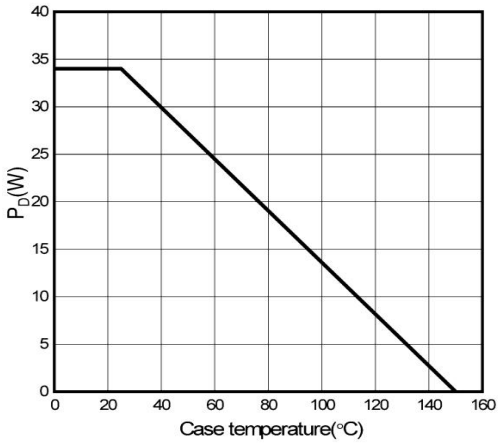


Figure 12. Safe Operating Area

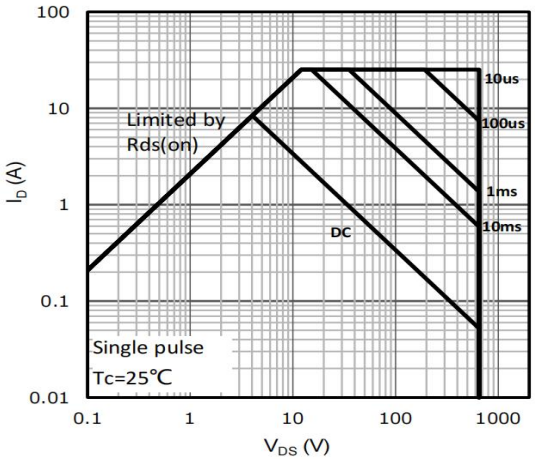
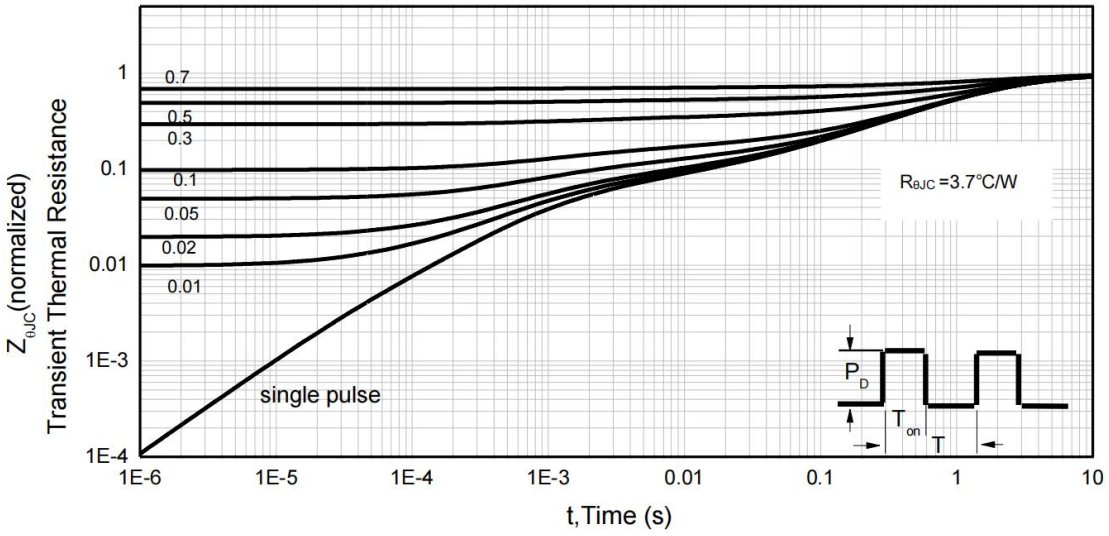
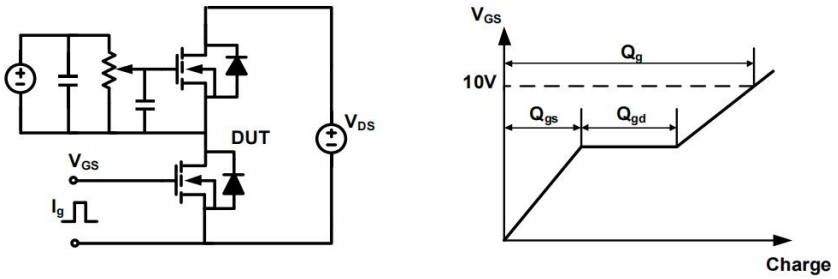


Figure 13. Normalized Maximum Transient Thermal Impedance (R_{thJC})

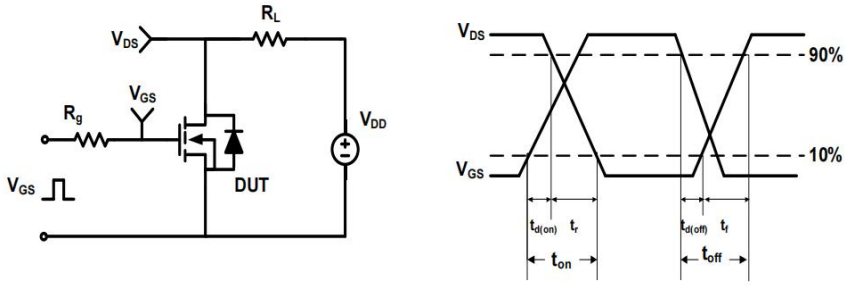


Test Circuit & Waveforms

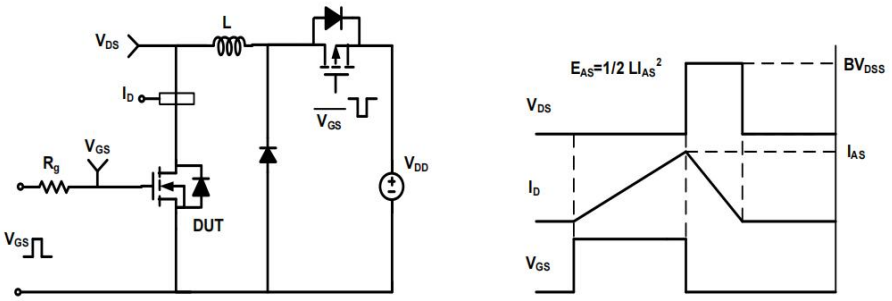
Gate Charge Test Circuit & Waveform



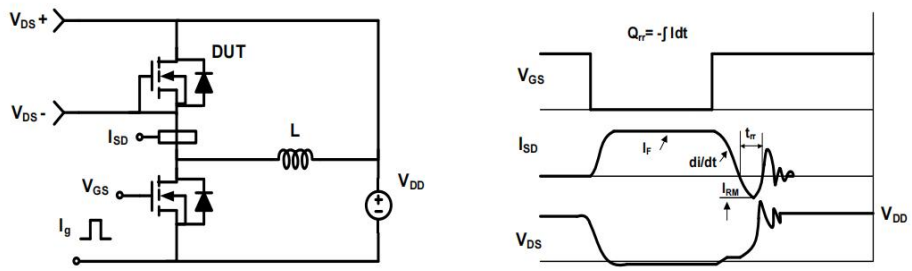
Resistive Switching Test Circuit & Waveform



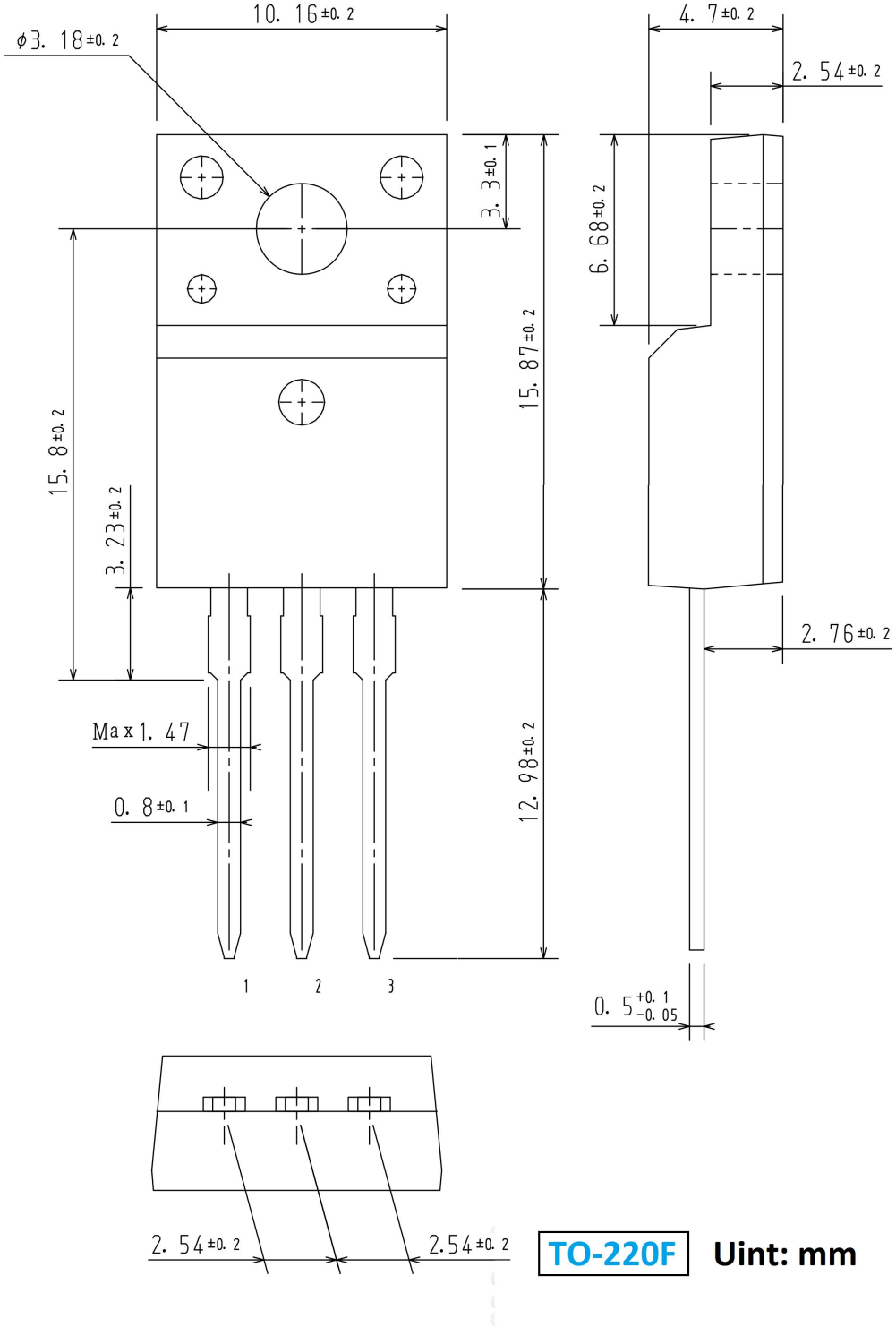
Unclamped Inductive Switching (UIS) Test Circuit & Waveform



Diode Recovery Test Circuit & Waveform



Package Mechanical DATA



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