ACE4N600H

600V N-Channel MOSFET

Features

- Fast switching
- Integrate fast recovery diode
- Fast switching speed
- 100% avalanche tested
- Improved dv/dt capability

Application

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-Source Voltage (V_{GS} = 0V)		V_{DSS}	600	V
Continuous Drain Current		I_D	4	A
Pulsed Drain Current (note1)		I_{DM}	16	A
Gate-Source Voltage		V_{GSS}	±30	V
Single Pulse Avalanche Energy (note2)		E_{AS}	80	mJ
Avalanche Current (note1)		I_{AR}	4	A
Repetitive Avalanche Energy (note1)		E_{AR}	20	mJ
Power Dissipation (T_C= 25ºC)	TO-220	P_D	36	W
	TO-220F		75	
	TO-252			
Operating Junction and Storage Temperature Range		T_J/T_{STG}	-55~150	℃

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS} = 4A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25 ºC

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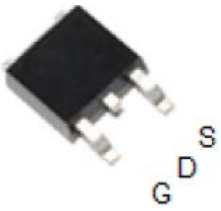
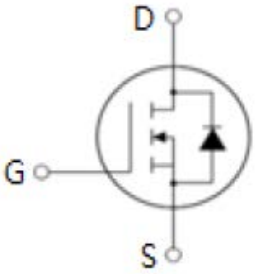
Packaging Type

TO-252



TO-220

TO-220F



Ordering information

ACE4N600H XX + H

- Halogen - free
- Pb - free
- YM：TO-252
- ZM：TO-220
- ZMF：TO-220F

Thermal Resistance

Parameter	Symbol	Value			Unit
		TO-252	TO-220	TO-220F	
Thermal Resistance, Junction-to-Case	R_{thJC}	1.67		3.47	K/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	60		62.5	

Electrical Characteristics

T_A=25°C, unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	600			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 600V, V_{GS} = 0V, T_J= 25 ºC			1	μA
Gate-Source Leakage	I_{GSS}	V_{GS}= ±30V			±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = 250μA	3.0		4.0	V
Drain-Source On-Resistance (Note)	$R_{DS(on)}$	V_{GS} = 10V, I_D = 2.0A		2.3	2.7	Ω
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz		580		pF
Output Capacitance	C_{oss}			69.5		pF
Reverse Transfer Capacitance	C_{rss}			10.9		pF
Total Gate Charge	Q_g	V_{DD} = 480V, I_D = 4.0A, V_{GS} = 10V		15		nC
Gate-Source Charge	Q_{gs}			2.5		nC
Gate-Drain Charge	Q_{gd}			7.5		nC
Turn-on Delay Time	$t_{d(on)}$	V_{DD} 300V, I_D =4.0A, R_G = 25 Ω		12		ns
Turn-on Rise Time	t_r			22		ns
Turn-off Delay Time	$t_{d(off)}$			50		ns
Turn-off Fall Time	t_f			48		ns
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C= 25 ºC			4	A
Pulsed Diode Forward Current	I_{SM}				16	
Body Diode Voltage	V_{SD}	T_J = 25 ºC, I_{SD} = 4.0A, V_{GS} = 0V			1.4	V
Reverse Recovery Time	t_{rr}	V_{GS} = 0V,I_S = 4.0A, di_F/dt =100A /μs		83		ns
Reverse Recovery Charge	Q_{rr}			0.38		μC

Note:

Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

Typical Performance Characteristics T_J = 25 ºC, unless otherwise noted

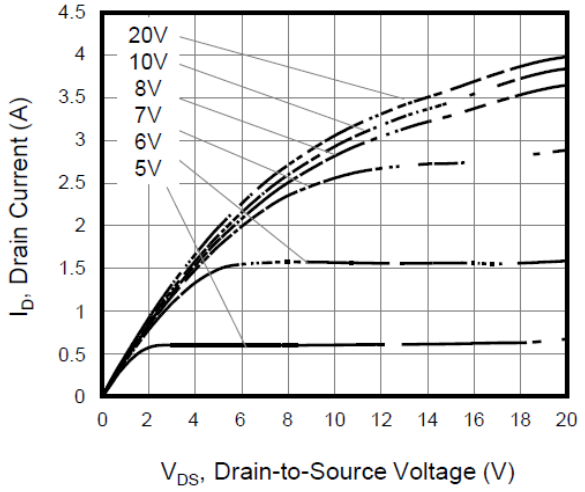


Figure1. Output Characteristics (T_J= 25ºC)

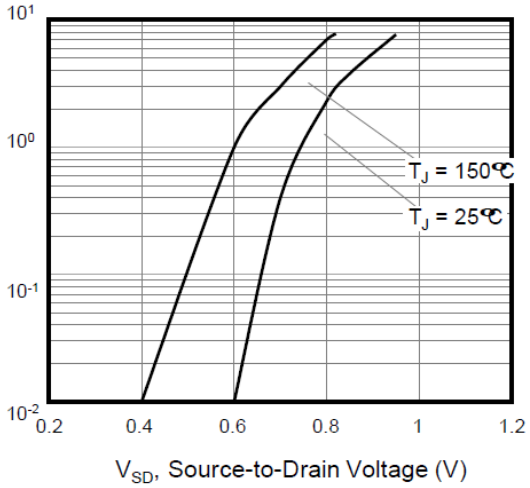


Figure2. Body Diode Forward Voltage

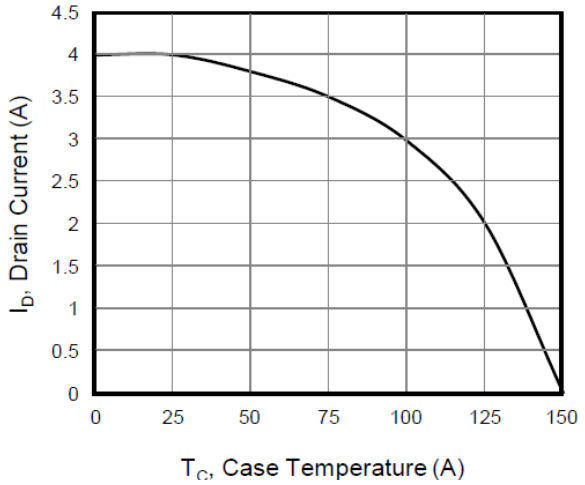


Figure3. Drain Current vs. Temperature

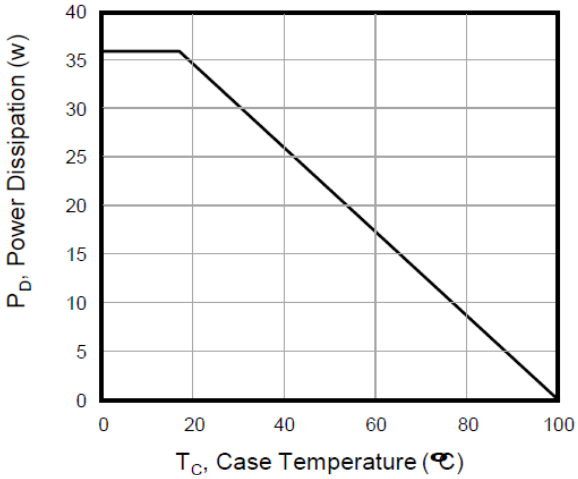


Figure4. Power Dissipation vs. Temperature

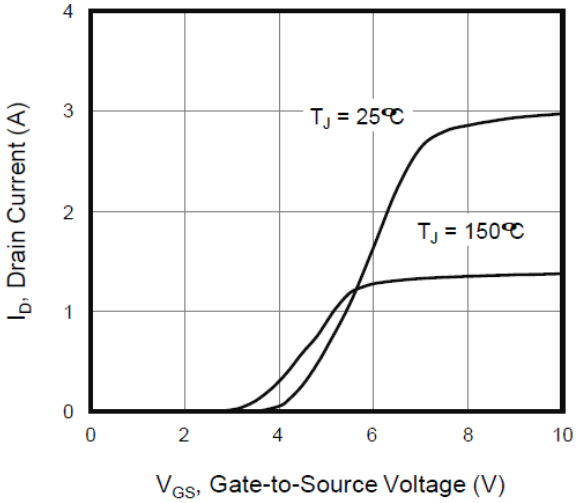


Figure5. Transfer Characteristics

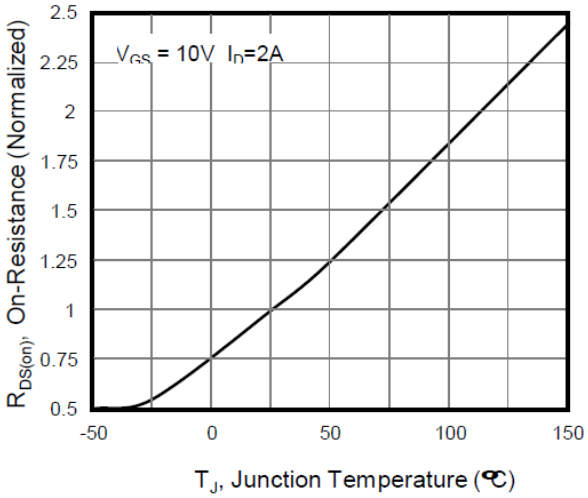


Figure6. On-Resistance vs. Temperature

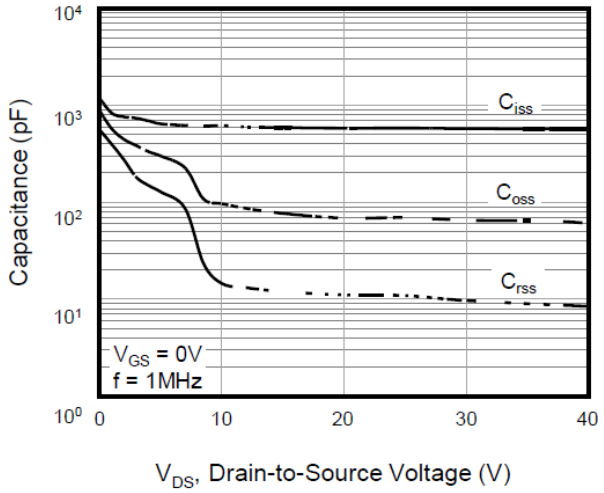


Figure7. Capacitance

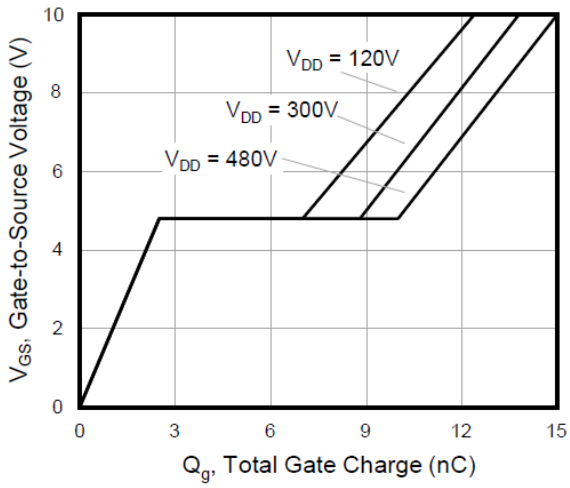


Figure8. Gate Charge

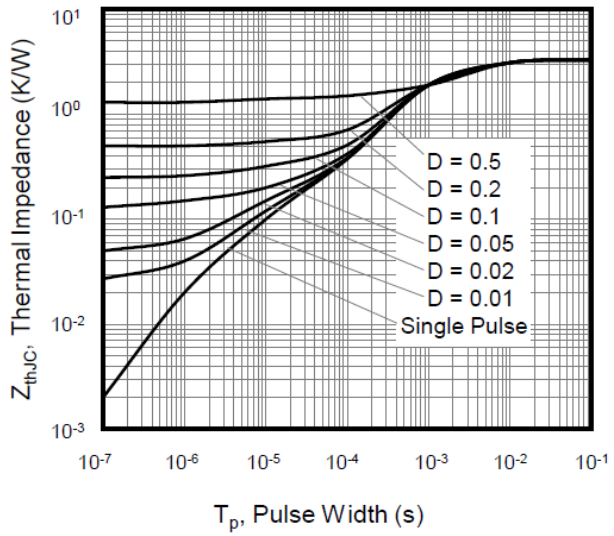


Figure9. Transient Thermal Impedance
TO-220F

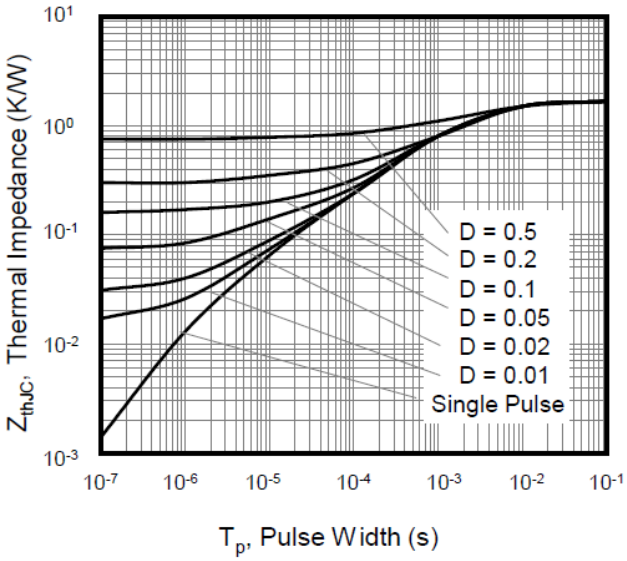


Figure10. Transient Thermal Impedance
TO-220, TO-252

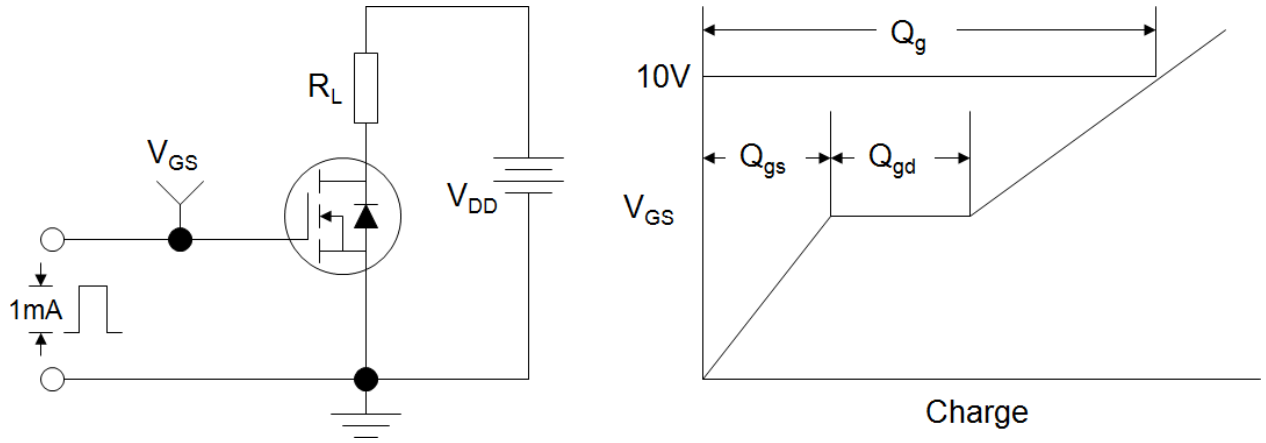


Figure 11：Gate Charge Test Circuit and Waveform

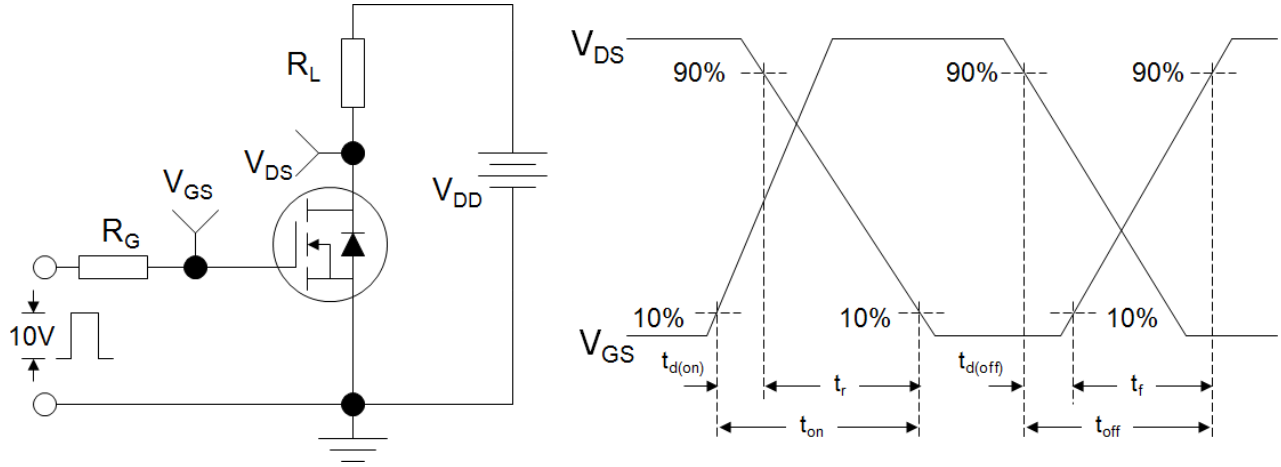


Figure12：Resistive Switching Test Circuit and Waveform

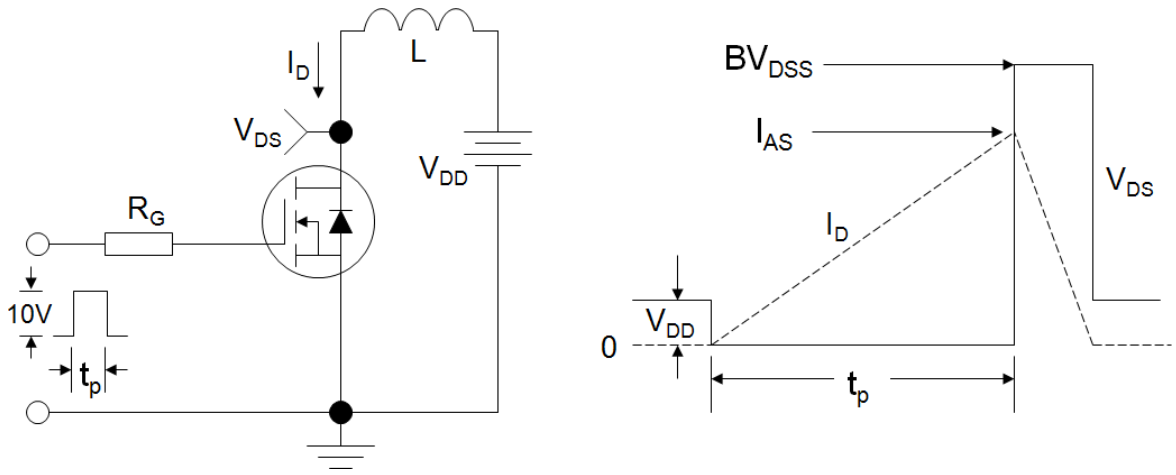
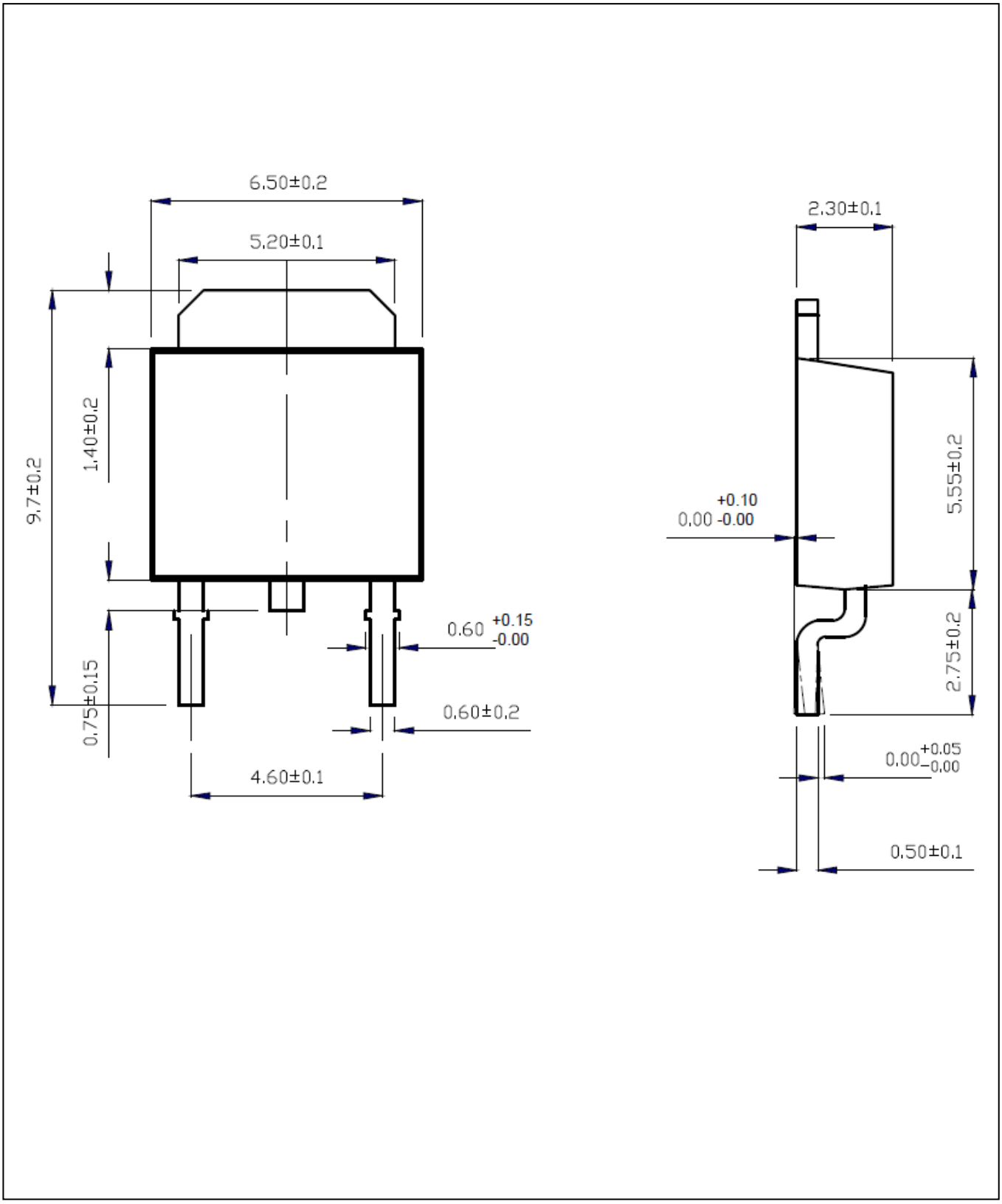


Figure 13：Unclamped Inductive Switching Test Circuit and Waveform

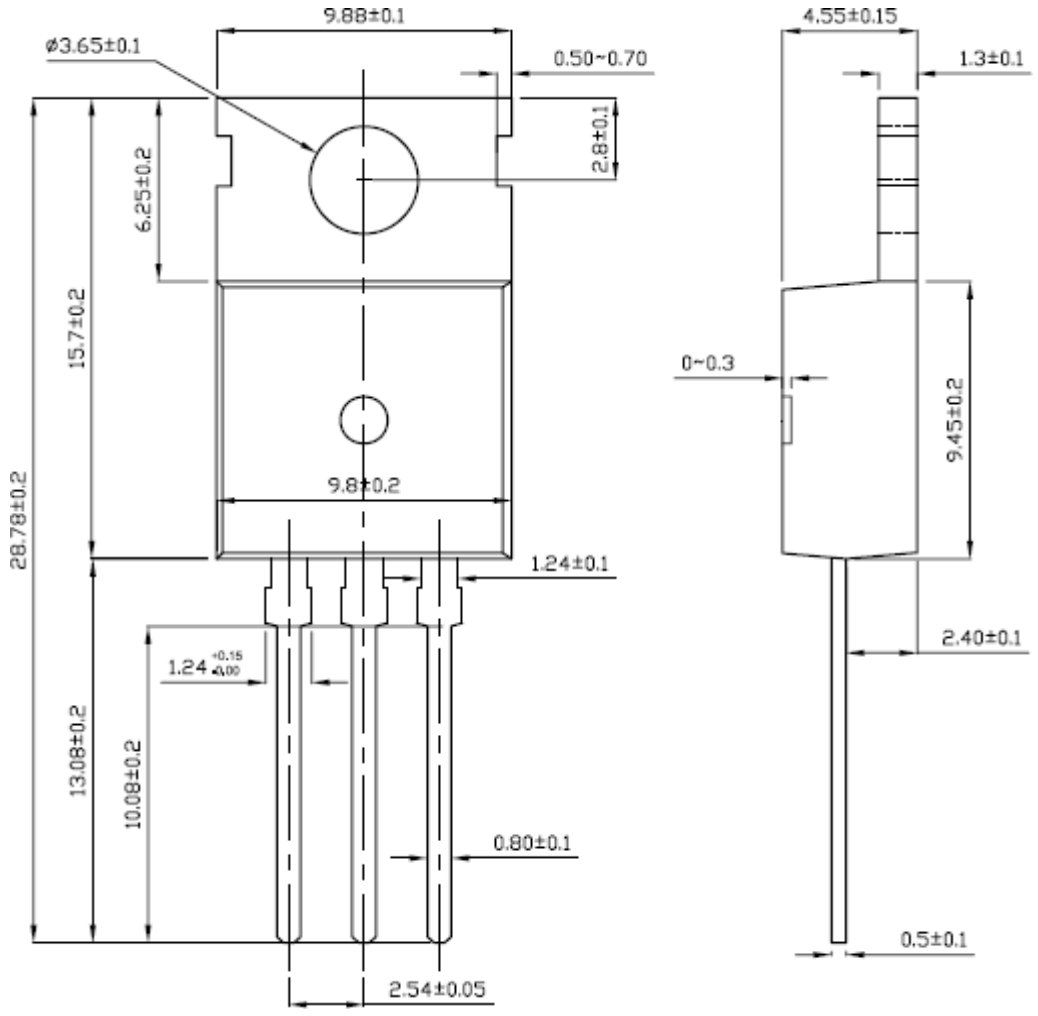
Packing Information

TO-252



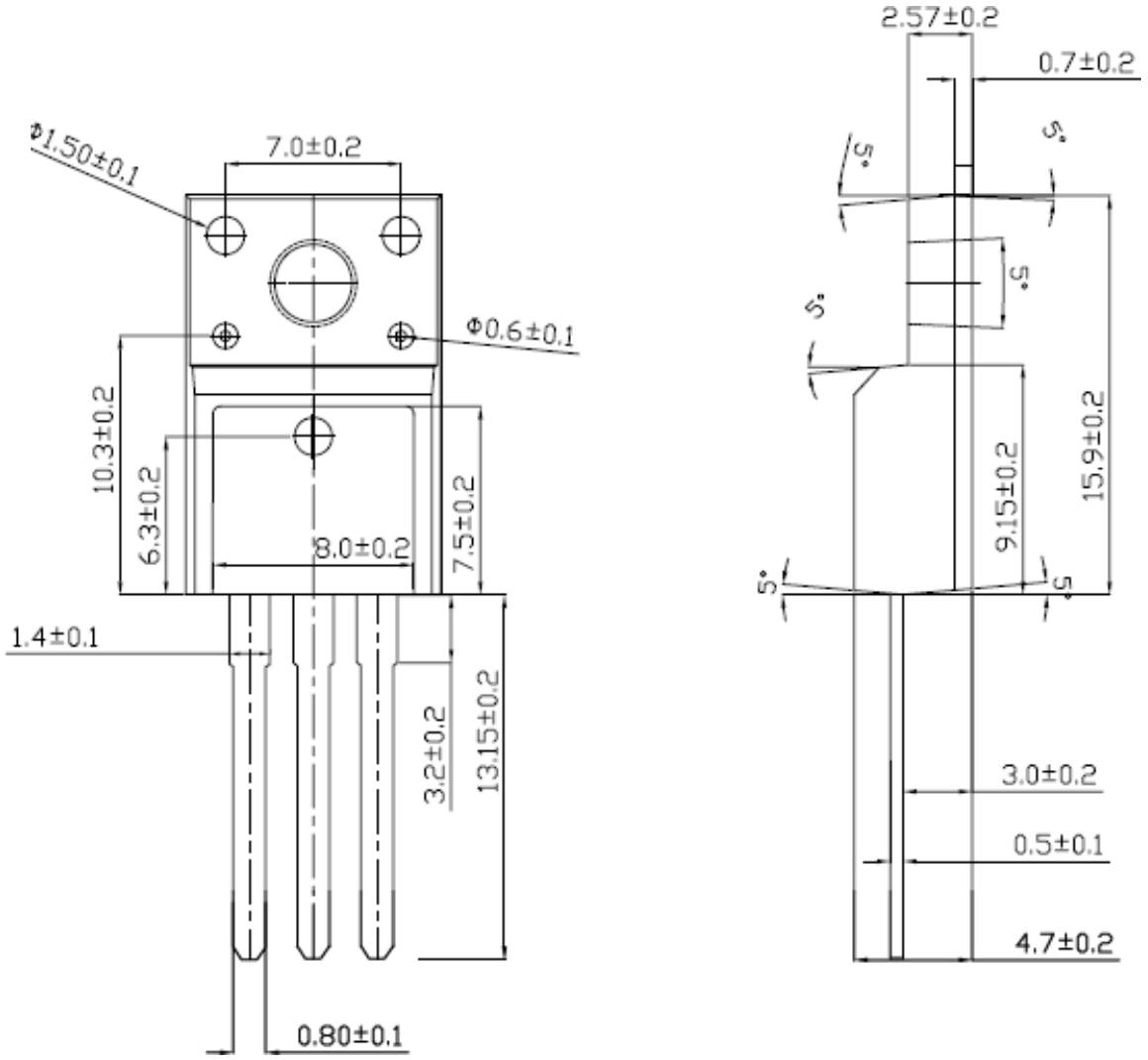
Packing Information

TO-220



Packing Information

TO-220F



Notes

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1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and shoes failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.